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Innovation Academy: Innovation Management in Health & Social Care

Foreword

It is with great pleasure that we present the third volume of **Innovation Academy: Innovation Management in Health & Social Care**, showcasing the research, innovation projects, and practice-informed work of postgraduate learners from the 2025 cohort of the MSc Advanced Health & Care Management (Innovation & Transformation) programme at Swansea University. Building on the strong foundations established by previous editions, this volume continues to demonstrate the programme's commitment to developing leaders who are equipped to navigate complexity, drive transformational change, and advance innovation across health and social care systems.

The projects presented in this collection reflect the increasingly dynamic and interconnected challenges facing contemporary health and care environments. Across themes including service transformation, workforce innovation, digital integration, system collaboration, population health, and organisational culture, learners critically engage with real-world issues through rigorous academic inquiry and applied practice. The result is a body of work that not only advances scholarly understanding but also offers practical, context-sensitive solutions capable of informing service improvement and strategic development.

A defining strength of this volume is its grounding in professional practice. The learners draw directly from their own organisational and sectoral experiences, ensuring that the research presented remains closely connected to operational realities and the needs of patients, communities, and systems. This practice-based approach reflects the core ethos of the Innovation Academy: that meaningful innovation emerges through collaboration, reflective leadership, evidence-informed decision-making, and a sustained commitment to improvement.

The work contained within this publication aligns closely with the strategic ambitions set out in **A Healthier Wales** (Welsh Government, 2018), particularly its emphasis on prevention, integration, person-centred care, and sustainable system transformation. It also supports the priorities outlined in the **Innovation Strategy for Wales** (Welsh Government, 2023), which champions mission-led innovation, translational research, and cross-sector collaboration to deliver social, economic, and health benefits for Wales. Collectively, these projects contribute to the development of a more resilient, equitable, and innovation-driven health and social care ecosystem.

The interdisciplinary nature of the cohort has once again enriched the quality and diversity of perspectives represented within this volume. Learners from health services, social care, public health, life sciences, and wider public service organisations bring a broad range of expertise and lived professional experience to their work. This diversity strengthens knowledge exchange, encourages systems thinking, and reinforces the collaborative culture that underpins the programme.

This publication continues to offer value to a broad readership. For academics and researchers, it provides practitioner-led insight into the application of innovation and transformation methodologies in complex care settings. For policymakers and system leaders, it presents grounded evidence and emerging approaches that may inform future service design, workforce planning, and strategic innovation. For students and professionals, it offers accessible examples of inquiry-driven leadership and applied innovation in action.

The Innovation Academy Research Series reaffirms the shared commitment of Swansea University and the All-Wales Intensive Learning Academy for Innovation in Health and Social Care to advancing innovation scholarship, promoting open-access knowledge exchange, and supporting research that informs policy, strengthens practice, and contributes to the future sustainability of health and social care systems in Wales and beyond.

Warm regards,

Editorial team

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Retention of General Practitioners (GPs) in north Wales; understanding what influences GP career aspirations.

Robyn Watson

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Abstract:

This research project develops the professional understanding of work intentions and motivations of General Practitioners (GP) post qualification in North Wales and how these factors influence decision making around career aspirations. There has been an increase in GPs working in North Wales in recent years but previously a significant shortage of GPs existed. This mixed methods study addresses the personal and professional aspirations of GPs and how the local health board and professional bodies can support the retention of this professional group. The study involved an expert forum and a perceptual questionnaire. The results show significant new and positive insights into the views and behaviours of GPs over their working careers. These results show the many local advantages of North Wales as a 'preferred place of practice' for GPs to live and develop their careers.

Keywords: General Practice, General Practitioner, Primary Care, Retention.

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1 Introduction

General Practitioners (GPs) play a vital role in delivering primary care services, supporting the health of their local population within North Wales, and contributing to the Welsh Government policies around prioritising “care closer to the patient’s home”. In recent years, retention of GPs has become concerning, particularly in rural areas of the region. There has been work undertaken to improve this nationally by increasing GP training places and financial incentives to continue to work in Wales post-qualification; however, there is still a limited understanding of the personal, professional, and systemic factors that influence GPs’ career aspirations and decisions to remain in practice.

This study explores the views of GPs in the North Wales region, focusing on career motivations, working conditions and personal and professional support structures available to them. A mixed methods approach has been taken, which included a literature review, expert forum, and questionnaire. This research aims to gain insights from local GPs that could inform workforce planning, policy development, and local retention strategies, along with contributing to the broader understanding of how employment models, workload, wellbeing, and professional development opportunities shape the sustainability of general practice in North Wales.

2 Scoping literature review

2.1 Background and rationale

The context of this study is the dynamic and complex operating environment of general practice, primary care and Betsi Cadwaladr University Health Board (BCUHB). Various local and national influences are impacting the role and importance of GPs, and these pressures are reshaping the career ambitions of those entering the profession and those who might potentially do so. Since the advent of the NHS, the role of the GP has attracted high social esteem and respect within their communities of practice. In recent times, the typically negative images of the NHS in social and mainstream media articles have done little to promote the profession as a career route. The career itself implies exemplary academic performance, longer degree routes than most other disciplines, and further periods of practice-based training, requiring a considerable personal commitment. The demands of the career, costs of university education, and the pressures and demands of being a GP have impacted the numbers of graduates, and many individuals who aspired to work as a general practitioner are now choosing to pursue work elsewhere in the health sector.

This study focuses on the career aspirations of GPs as a poorly researched issue that has not attracted in-depth review for many years in Wales. The research onion framework was used to systematically design the study methodology (Watson, 2025) using a pragmatic approach that permitted using a broad range of qualitative and quantitative research methods. An initial “scoping” literature review was employed to show the debates in this subject area and to create a broad research question (Munn et al., 2018). The methodology has allowed for flexibility in inclusion criteria, a synthesis of a wide range of evidence, and the potential for a significant contribution to practice (Higgins & Thomas, 2019). The PRISMA scoping review method and checklist supported the literature review process (Tricco et al., 2018).

This scoping review focused on GP retention as the core issue. Specifically, the review identified a gap in the body of knowledge in this subject, which is expressed by the twin research questions:

- What forces impact on the ability to retain GPs?
- What evidence exists to support how GPs can be retained?

2.2 Methods: What evidence exists to support how GPs can be retained? Literature process and quality assurance

The findings from the literature review highlighted five key themes, which have been reviewed within a synthesis matrix format. These are:

- Job satisfaction and retention
- Peer and professional support
- Flexible working
- Manageable workload

These themes were derived from a database search using iFind for high-quality journal articles (a Swansea University publication repository). The search undertaken used Boolean search terms (Table 1).

Table 1. Literature search strings (Author's own)

Search words	Combined with
"General practitioner"	AND "Retention" AND "Job satisfaction" OR EXACT PHRASE "Primary care general practitioner retention"

Eligible publications were reviewed for relevance (title and abstract) using key criteria (table 2).

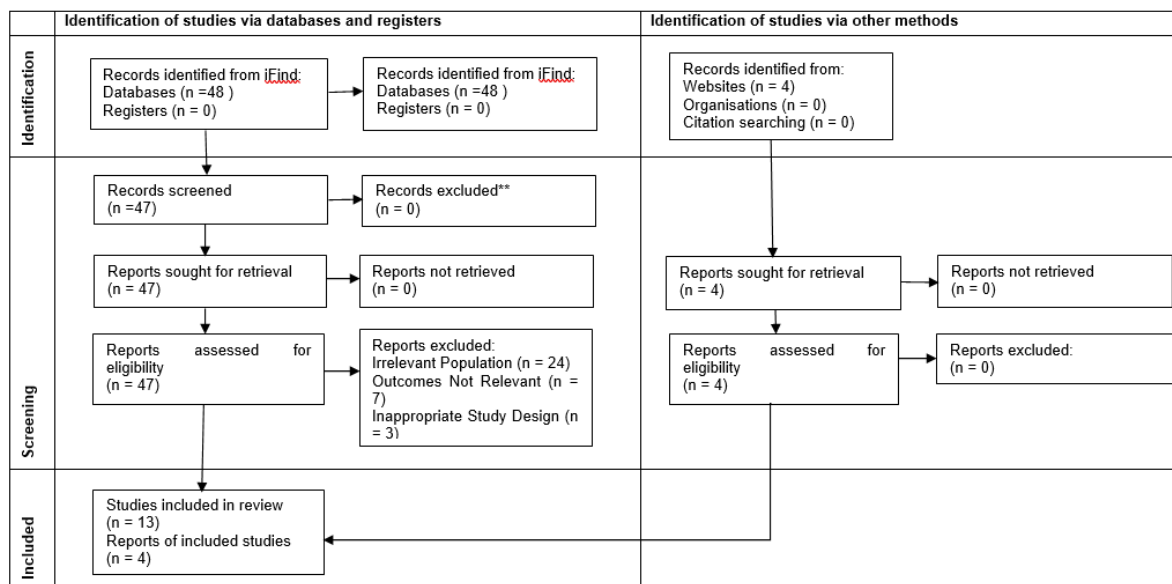
Table 2. Literature criteria (Author's own)

Inclusion	Exclusion
English Peer reviewed journals Articles from 2020	Articles before 2020

The search was undertaken between April and May 2025 and yielded 48 results. Additional sources were identified through manual screening of reference lists, consultation with BCUHB colleagues, reviews of national strategies and committee outputs and other grey literature sources.

The publications were collated within a Microsoft Excel database, and each publication was reviewed (methodology, findings, identifying themes and theoretical perspective taken). The final Excel database was then thematically reviewed (Table 3). Themes were drawn from identified common patterns and concepts across studies. They have been presented in a narrative form within a summary table (Table 4).

Table 3. PRISMA 2020 flow diagram for new systematic reviews (Page et al., 2021)



Sources were screened by title and abstract, followed by a full-text review undertaken independently. The selection process has been detailed within the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA), which was used to structure each literature review phase (Page et al., 2021).

Seventeen publications and reports (from 2020 to 2024) were finally accepted for this study. These publications were primarily United Kingdom-based (or mature economies, e.g. Canada, Australia and Denmark) and included systematic reviews, qualitative studies, surveys and grey literature. Each publication

included within the database consisted of a publication summary, key findings, themes, limitations and implications are presented in Appendix B.

2.3 Synthesis of results

The findings from the selected source materials revealed five recurring themes: job satisfaction and retention, peer and professional support, flexible working, manageable workload and wellbeing (Table 4).

Table 4. Synthesis of Results (Authors own)

Sources	Themes				
	Job satisfaction and retention	Peer and professional support	Flexible working	Manageable workload	Wellbeing and wellness
(Le Floch et al., 2022)	Job satisfaction can lead to improved retention.		Flexibility in work is a key area for job satisfaction.		
(Wieland et al., 2021)	Retention in rural areas is influenced by professional, organisational, and personal factors.	Need for peer and professional support in rural areas.			
(Eaton-Hart et al., 2022)	Higher job satisfaction in rural areas but higher intention to leave.				
(Khan, 2024)	Supportive environment and flexible working are important for retention.	Peer support is important for newly qualified GPs.	Flexible working is important for retention.		
(Fisher & McDermott, 2023)	Practice culture is critical for job satisfaction and retention.	Peer support is crucial for job satisfaction.			
(Cleland Jennifer et al., 2021)	Flexible working and manageable workload are important for delaying retirement.		Flexible working is preferred for delaying retirement.	Manageable workload is important for delaying retirement.	
(Dhanani & Blane, 2022)		Peer support and formalized mentorship are important.		Manageable workload is crucial for retention.	
(Zhou et al., 2022)		Peer support and wider organizational support are linked to job satisfaction.		Manageable workload is linked to job satisfaction and turnover intention.	Wellbeing is linked to job satisfaction and turnover intention.
(Bimpong et al., 2020)			Flexible working is linked to job		Wellbeing is important for job

			satisfaction and retention.		satisfaction and retention.
(Andah et al., 2021)				Manageable workload is important for professional motivation.	Wellbeing is crucial for professional motivation.
(Stutzman et al., 2020)	Meaningful patient relationships and supportive practice environments improve satisfaction		Importance of work-life balance for female physicians		Increased emotional labour and wellbeing of female physicians
(Ferguson et al., 2020)			Flexible working is important for work-life balance.	Manageable workload is important for work-life balance.	Wellbeing is important for work-life balance.
(Dimitar Yordanov et al., 2023)					Different motivations, wellbeing, job retention and quality of care
(RCGP, 2024)	Need for a National Retention Strategy	Importance of supportive environments and professional development		Manageable workloads to ensure the wellbeing of GPs	Manageable workloads to ensure the wellbeing of GPs
(Dimitar Yordanov et al., 2023)		Importance of supportive environments and professional development	Need for flexible working arrangements to retain GPs		
(Health Education Improvement Wales, 2023)	Importance of creating an engaged, healthy, and motivated workforce	Need for seamless workforce models and excellent education and learning	Flexible working arrangements to attract and retain staff	Manageable workloads to ensure the wellbeing of staff	Actions to support the wellbeing and wellness of the workforce
(Welsh Government, 2023)	Improving retention and recruitment by providing a supportive working environment and conditions	Strong, collective, and compassionate leadership to support the workforce	Flexible working arrangements to attract and retain staff	Manageable workloads to ensure the wellbeing of staff	Support the wellbeing and wellness of the workforce

2.4 Summary of evidence

The thematic analysis of themes which influence GP retention and influences career choices included; job satisfaction and retention. The review papers cited a strong link to job satisfaction in areas such as working in a supportive practice, being able to develop relationships with patients through manageable jobs plans. Stutzman notes within a study around female physicians working in rural areas that 'The one thing that sustained all of the physicians was a meaningful relationship with their patients' (Stutzman et al., 2020).

National policies and plans continue to support this approach with Health Education and Improvement Wales (HEIW) Strategic Workforce Plan for Primary Care (SWPPC) identifying retention, workload and wellbeing being key drivers to support with retention within its extensive engagement exercise, which took place between March 2023 and July 2023 and consulted with over 15,000 professionals working within primary care (Health Education and Improvement Wales, 2024).

The second identified theme involved peer and professional support. The importance of GPs feeling supported was an area highlighted within many of the papers, peer support was specifically noted a number of times, noting 'high quality relationships have been associated with productivity', with suggestions to facilitate these relationships through shared spaces, team meetings or teambuilding (Fisher & McDermott, 2023). Looking at a qualitative evaluation of a scheme in Scotland, it found that 'GP fellows were mostly attracted to the idea of support and mentoring from more senior GPs', and found that alongside other factors, having peer support increased their clinical confidence (Dhanani&Blane,2022). The other side of this is professional support, specifically opportunities for professional development, which was highlighted by Yordanov et al. (2023) study. This showed a clear need to facilitate learning for career progression (Dimitar Yordanov et al., 2023). The Royal College of GPs (RCGP) also found '57% of RCGP members do not have enough time to undertake training or Continuing Professional Development (CPD) alongside their practice work', which they propose is a patient safety risk as well as a feature of job dissatisfaction and inhibits career diversification (RCGP, 2024). Such support is particularly important for early-career GPs and those working in rural locations, according to Stutzman and Eaton-Hart's papers (2022). The flexible working theme implies the role of a GP is often inflexible, with GPs tending to work in sessions, not hours. A session is typically four hours and 10 minutes (BMA, 2024) ; these sessions

provide the clinical day (one in the morning and one in the afternoon), with time for lunch and admin generally sitting outside the sessions. In many cases this approach to working is not conducive to flexible working, a positive work-life balance and retention. Many GPs with family or caring responsibilities value flexibility and part-time working to fit in with family commitments, which leads to improved satisfaction and wellbeing (Ferguson et al., 2020). GPs commonly work part-time to gain this flexibility, over other options that NHS professionals generally use, including condensing working hours, starting work earlier or later for a work-life balance. A study of rural female GPs found work-life balance or as they describe it a career-life balance highlighted the 'difficulties in setting up practice in an area without family, friends or professional mentors nearby' (Stutzman et al., 2020). Factors that could support GPs to delay retirement show that work intensity was the most important factor for GPs choosing to retire, and a view that GPs would be willing to delay retirement by four years in the absence of these stressful constraints (Cleland et al., 2021).

Having an unmanageable workload appears as a major contributor to dissatisfaction and reasons for leaving the profession Cleland's view that GP "work intensity" creates fatigue (Cleland Jennifer et al., 2021) , and Ferguson argues 54% of GPs responding to his survey have significant 'work-overload risking burnout' (Ferguson et al., 2020). These studies call for systemic changes to reduce pressure on GPs, and national strategies have been implemented. The Strategic Workforce Plan for Primary Care (Health Education Improvement Wales, 2023) and the Welsh Government's workforce implementation plan aim to reduce workloads, build better job offers and create manageable workloads (Welsh Government, 2023).

Wellbeing, wellness and burnout are common concerns. GPs were found to be more 'likely to report high levels of stress and overload than other doctor groups' (RCGP, 2024) and noted in nine literature review papers. However, suggestions on tackling these issues were limited, implying that wellbeing and mental health awareness are poorly recognised when supporting the GP workforce over the long term. Even though each GP will have different motivations and requirements for wellbeing support and personalised thresholds for workload, burnout remains a significant concern (Yordanov et al., 2023).

Having identified the key themes to frame the knowledge gap, the review shows a current concern to understand the impact of work on GPs throughout their career to make a pragmatic contribution to supporting these highly skilled professionals remain in general practice.

The research questions developed to frame this gap are:

- What forces impact on the ability to retain GPs?
- What evidence exists to supports how GPs can be retained?

2.4.1 Methods and limitations

Limitations of this scoping review have been identified; firstly, only English language sources have been included, which could have excluded some relevant international literature. Grey literature has been included and will lack peer validation; however, most sources are strong and have been peer reviewed. Also, within such a complex area, synthesising the results could oversimplify the results into themes and may not provide enough detail to illustrate the complexities of GP retention fully.

This study has looked at a qualitative, theory building approach using a scoping literature review. This was undertaken using PRISMA, which supported identifying key themes influencing GP retention. The key features of this have been described in the table below.

Table 5. Features of the Study (Author's own)

Feature of the Study	Purpose
Qualitative and theory building approach	To gain insights into the specific nuances and issues faced by GPs at all career stages
Research Strategy	A case study of North Wales
Informants	GPs
Methods	Semi Structured Interviews
Ethical Management	All informants are anonymised. Ethics approval granted by Swansea School of Management June 2025
Limitations	The focus on North Wales as the context of this research

3 Methodology

Although the systematic literature review provides some key themes, it has also highlighted that many strategies have been developed to support GPs to remain in their role. However, it highlighted a gap in the literature, where statistics on GP attrition are frequently used, the GPs personal influencing factors on whether to stay or leave are often not reviewed in detail. The lack of this data has limited the understanding of such a complex area.

This review demonstrates a need to evaluate the long-term impact and effectiveness of GP retention strategies and plans, particularly those outlined in the synthesised results of flexible working opportunities, mentorship and wellbeing. There is an opportunity to develop a mixed-method study, combining quantitative and qualitative approaches to capture and understand the impact of retention interventions, personal career aspirations and other influencing factors. If successful in a North Wales pilot study, there is an opportunity to look at a longitudinal approach to capture the longer-term influences on decision making and the correlating impact.

Building on these findings, the review supports the case for a longitudinal study to evaluate the longer-term impact of retention strategies and influences of career aspirations. Early career and GPs working rurally are a key demographic that leave the profession early or are more impacted by the five themes outlined in the synthesised results. This review did not include a significantly diverse cohort, such as minority ethnic GPs and those working in a portfolio role, as they were not represented in the literature reviewed, rather than being intentionally excluded. This highlights the need for more inclusive research moving forward.

3.1 Conceptual framework development

With the insights from the literature review, personal professional experience, and input from a stakeholder group, a conceptual framework has been developed to help guide the development of a data collection tool, as it has supported the identification of overarching themes that could influence retention.

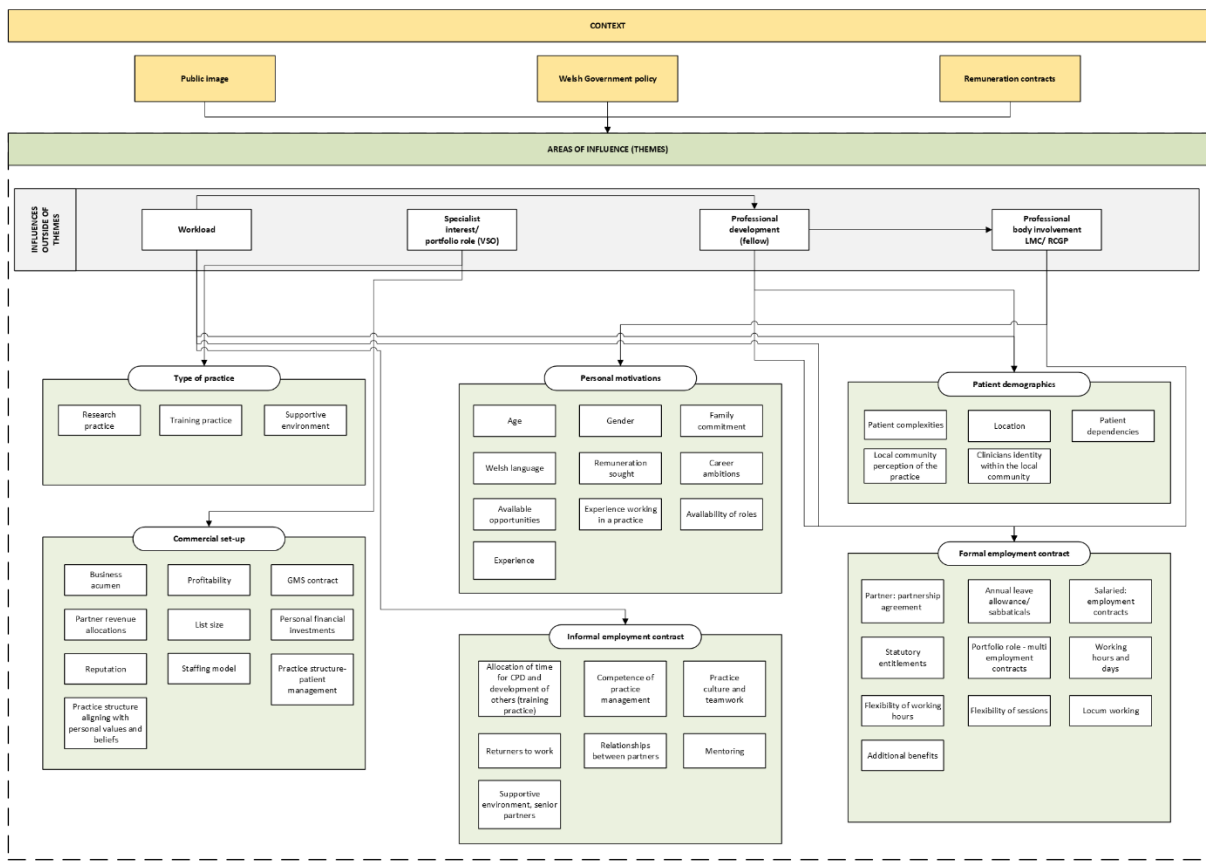


Figure 1. Conceptual framework (Author's own)

The conceptual framework that has been developed aimed to focus on internal and external factors that influence GPs career aspirations. These were looked at in the context of public image, Welsh Government policy, and remuneration contracts. The proposed areas of influence have been broadly separated across six themes and four factors of influence outside of these themes. They include; workload, specialist interest or portfolio role, professional development, professional body involvement, type of practice, patient demographic, personal motivations, commercial set up, formal employment contract, informal employment contract.

Table 6. Conceptual framework, identified themes (Author's own)

Influences outside of themes	
Theme	Detail
Workload	Looking at the volume and intensity of work. High workload has been frequently cited in the literature as a key reason for burnout.
Specialist interest or portfolio role	If they already have diversification in role, it has been cited as a way to improve job satisfaction. If they are not looking at a portfolio role, there is a need to understand what are the factors of influence for that decision.
Professional development	Opportunities for GPs to continue with ongoing learning or continued professional development (CPD). Having no time to undertake CPD is often a sign of a workload in balance and contributing to the signs of burnout.
Professional body involvement	Professional body involvement varies across north Wales, this theme is focused on the support that is available and if that has been accessed by local GPs. It also looks at how professional bodies advocate for their members and the GPs understanding and personal opinion on this.
Areas of influence	
Theme	Detail

Type of practice	This includes if the practice offers a supportive environment to staff and patients, and if it has an area of interest such as undertaking research or is a training practice.
Patient demographic	Appreciating that the patient population and their socioeconomic background and complexities of health needs can affect workload.
Personal motivations	This is a significant area of influence, highlighted though the literature review around individual motivations, and no one size fitting all. This will cover personal motivations in terms of work life balance, experience, language and career ambitions.
Commercial set up	The business set up, if it is an independent or health board practice, and the way the practice is managed and run, as this can influence income, local reputation, the practice list size, staffing model and the way the practice is run (eg: how the daily clinics and patient care is managed)
Formal employment contract	Terms and conditions of employment, whether a partner, salaried or locum GP. Focused on the contributing factors to take up a certain type of employment.
Informal employment contract	Looking to capture the unwritten parts of employment, including practice culture, allocated time for CPD and practice working relationships and capabilities.

3.2 Development of a data collection tool

3.2.1 Alignment with the conceptual framework

The development of a data collection tool has been directly informed by the conceptual framework through the systematic literature review, personal professional experience and consultation with local stakeholders. The themes identified in this review will provide the basis for creating a data collection tool to capture the personal insight of GPs within these areas of influence.

Qualitative and quantitative opportunities were reviewed when initially exploring the style of the collection tool and the questions that will be asked. Considering the opportunity for this tool to be part of a longitudinal study, a quantitative approach will be taken as much as possible. As this will allow for analysis and identification of trends, however, as personal factors appear to be a significant influencing factor within the literature, a small number of open-ended questions could be included to capture individuals' influencing factors that could not be covered within a quantitative questioning style.

The questions have been mapped against the conceptual framework to ensure they align with the themes identified and will provide valuable and relevant data to understand GP retention. They have been grouped under the themes within the conceptual framework, such as personal motivations, which will ask for personal demographic details and explore their family commitments, career ambitions and the local market of available roles that meet their criteria.

3.2.2 Question design process

The proposed questions have been developed based on the themes identified in the literature review and subsequent conceptual framework. These questions have been suggested as they can be matched to a theme or related factor and include a rationale for the benefits of their inclusion. This list was discussed within an expert forum to critically review the questions and ensure they are suitable and relevant, and will support the suggested outputs.

3.3 Expert forum

3.3.1 Development and design process

To ensure that this data collection tool content was appropriate and relevant, a group of experts were asked to be part of a forum, with a semi-structured interview approach. The primary purpose of the interview questions was to understand the group's opinions on the proposed questions and if they considered it would accurately capture views on the key themes that influence GP retention, that had been identified through the literature review and conceptual framework. Questions also included whether the forum agreed the questions were appropriately worded and whether the response data would benefit the research question.

The approach was of a semi-structured interview format, which ensured the opportunity to be more flexible and provide additional insights that may not have been highlighted within the identified themes. The forum was arranged via online conferencing.

3.3.2 Selection of expert panel

The experts were selected based on their professional experience and relevant experience to the research topic. Inclusion criteria were developed and included:

- The individual's involvement in GP workforce planning or retention planning/ strategy.
- Individuals' experience in working in or managing GP practices across North Wales.
- Policy expertise in primary care and/or medical education.
- Mix of professional roles and career stages.

Participants were invited via email with an information sheet outlining the purpose of the study, the role of the expert forum, and ethical considerations. Informed consent was obtained prior to participation. Ethical approval for the expert forum was covered under the broader ethics application approved by Swansea School of Management in June 2025 (Appendix A).

3.3.3 Questions asked of experts

The expert forum was held on the 16th of July 2025 and focused on drawing out insights based on their professional experience. These questions were grouped into themes, including the questions' relevance, practicality, appropriateness, impact, suggested improvements and alignment with the conceptual framework. The forum was recorded using Microsoft Teams transcription, and responses were thematically reviewed to identify commonalities. Where appropriate, changes were made to the questionnaire to improve relevance while ensuring alignment with the conceptual framework, found in Appendix C.

The final version of the survey was piloted with the GPs within the expert forum to test for comprehension and timing, with further refinements made based on their input.

3.3.4 Summary of expert feedback

The data from the expert forum was analysed using Braun and Clarke's six phase framework for thematic analysis (Braun & Clarke, 2006), as this flexible framework fits well within the pragmatic methodology approach taken. The framework provides a step by step approach, starting with familiarisation with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and finally producing a report. This process has supported the analysis and understanding of the qualitative data gained from the forum.

Several areas were discussed within the session, some of which were directly linked to the proposed questions and there was also discussions around the broader context of GP retention. A short presentation was delivered to provide a background to the research topic, themes identified from the literature review and the conceptual framework (Figure 1) a participant commented on the framework;

"I think it'd be a lovely tool for the appraisers to signpost them to this, because that covers literally everything that that affects your job, and I think it's really helpful for doctors to maybe sit with a peer or individually to look at these things and think, oh gosh, this is what the problem is and this is what I can do to address it. I think it's amazing".

Regarding the discussions around the proposed questions, some key themes were highlighted and discussed a number of times when reviewing the questionnaire, the most recurrent ones included emotional burden, reality of the role, flexibility and portfolio roles. The emotional and cognitive burden often described as 'the mental load' was highlighted as a common experience, particularly for women, who are often seen as needing to balance professional and family responsibilities. One participant described this as;

"The overwhelming responsibility of the job of dealing with that uncertainty, taking patients home with you in your brain as well as trying to support the wellbeing of your family."

There was consensus within the forum that this cognitive burden of this overwhelming responsibility of the role of a GP alongside the uncertainty of home and family life. Which included supporting elderly parents or trying to work around caring for your unwell children was a tricky balance. It could be a key factor in why GPs reduce working hours or sessions to gain flexibility within their working week. However, one participant

highlighted that general practice is focused on person centred care, and building a relationship and knowing your patients, and that working full time as a GP was there most satisfying part of their career, as they were able to treat patients from start to finish. However, they reflected that working full time as a GP between the confines of a long working day from eight in the morning to six thirty in the evening is;

“Slightly incompatible with how GPs now want to work” and thus making the *“overwhelming burden too high”* to continue in their role.

The second theme raised was the difference between training as a GP and the reality of the career. There was consensus from the group that some GPs enter the field for a pragmatic reason over passion, which has led to dissatisfaction anecdotally. One participant said;

“They come into GP training, they’re not suited to it... and then they find themselves stuck in a career.”

The role of a GP has significant differences from other medical roles, holding a high degree of uncertainty, management of risk profiles and may not suit a professional's personal values. This dissatisfaction could lead GPs to secure a role that aims to control their risk profile, often working as a locum or within GP out-of-hours. Although different from the emotional and cognitive burden discussed, this does align with the theme of emotional and personal values. Ensuring the questionnaire captures the emotional and cognitive feelings and viewpoints would be a beneficial aim to understand the holistic viewpoint of retention.

The ability to have flexibility in a role and work-life balance was repeatedly cited and aligns with the findings from the literature review. However, the discussion looked at how flexibility for general practice is typically working part-time or as a locum, but this is not true flexible working. One participant stated;

“Reducing your hours isn’t flexible working... it is just taking a pay cut. Flexible working would require condensed working hours, term-time work and school-hour working as options, ensuring pay and terms would stay the same, just the time the hours are worked to flex”.

This aligns with a discussion around the overall structure of general practice, and the model no longer being fit for purpose, a participant reflected;

“The world has turned, but the NHS hasn’t”.

This discussion of the differences in generations around advocating for flexible working and improving their work-life balance was topical, noting visible differences between the older and younger generations of GPs. The younger GPs were described as often more willing to advocate for themselves regarding having a positive work-life balance and less tolerant of unsupportive training and working environments. The group agreed this was positive, citing;

“I think the new generation are braver and will put their hands up...I think they've got it right, to be fair.”

However, looking back at the current set-up of general practice with the focus on patient-centred care and the opening hours, it does not appear to offer truly flexible roles.

The final theme was how GPs look to increase flexibility within their working week, which is to undertake more than one role, described as a portfolio role. The group reflected that the purpose it is to reduce the burden of the main role;

“If I did this full time, I would die,”

This was a stark quote from one participant who has heard this often from colleagues. It appears within the discussion that the second roles are often taken to supplement income and reduce the overall pressure of the typical GP role in practice, both in partnership and salaried roles. Questions around decisions to take on a second role will include these options to understand further the personal decision-making processes and the factors that fed into this.

There were limitations within this group; some participants contributed more than others, which had the potential to shape the direction of the discussions. The group was small, all female and composed of senior professionals from similar organisations in Wales, which may limit the ability to generalise.

Overall, this session further highlighted the complexities of working as a GP and its impact on retention, and how often career aspirations and retention decisions are interlinked across personal, professional and practice experiences. The group agreed on the suggestion that any retention support or strategy would be required to be different based on the GPs' stage in their life, gender and type of employment, such as partner

or salaried, as they would all require a different approach to support made available. The group agreed with the questionnaire approach and questions, with suggestions on refinement of the questionnaire, highlighting the need to include retrospective questions about career choice, to understand the emotional and cognitive burdens experienced by GPs and to clarify the definitions of flexible working. These suggestions have been reviewed, and the questionnaire was updated accordingly.

3.3.5 Final questionnaire (data collection tool)

The final questionnaire, included within Appendix D, has been developed using a structured and iterative process. It has been informed through the literature review and expert consultation, ensuring an alignment with the conceptual framework. The questionnaire consists of 47 quantitative questions, grouped into seven sections:

- Demographics and background
- Current role and practice setting
- Practice model and alignment with values
- Workload and job satisfaction
- Specialist interests and career development
- Secondary roles
- Motivation and attraction to the region

Each question has been mapped to one or more domains of the conceptual framework, which include areas such as formal and informal employment contracts, personal motivations and professional development.

The questionnaire has been created using Microsoft Forms, and branching logic was used to tailor the GPs questions based on their answers, ensuring relevance and reducing the need to ask irrelevant questions.

3.3.6 Distribution of questionnaire

The questionnaire was distributed to General Practitioners (GPs) in the North Wales region. This was undertaken by sharing through personal professional networks and two internal NHS mailing lists to capture a representative sample of GPs. The initial invitation to participate was sent on the 17th of July 2025 with a clear explanation of the study's purpose and instructions for completion. Participants were given a two-week window to complete the questionnaire, with a reminder email sent at the end of the first week to encourage participation.

Participation was voluntary, with the questionnaire stating that by completing it, they consented to be included in the study and that all data would be anonymised. The collected data was securely stored and used solely for this research.

4 Findings

The response rate was positive, with 40 GPs completing the questionnaire. The results have been grouped into the thematic categories outlined in the conceptual framework:

- Personal motivations
- Formal employment contract
- Informal employment contract
- Commercial Set-Up
- Type of practice
- Patient demographics
- Influences outside of themes

This has supported the analysis of the responses within and across the themes to identify trends. The GPs job role has been used to support the differences in responses based on GPs in salaried (employed role) or partnership (business owner) roles, which was highlighted within the expert forum discussion. The two cohorts have differing responsibilities and subsequently differing perspectives and requirements regarding retention.

4.1 Summary of key findings

- GP partners report to work an average of 41 hours per week, exceeding standard full-time hours; they also indicated low flexibility in their roles.
- 45% reported partial or no support for their wellbeing and mental health within the practice.
- Most practices did not identify with income generating indicators despite demonstrating high levels of business acumen.
- 37% of GPs indicated their identity was valued within the community, and 32% did not.
- Among the respondent's job satisfaction peaks in the 21- 25 years post qualification group, then significantly declines.

A limited number of locum GPs completed the questionnaire (n=2). This was too small a sample size for any findings to be reliable and has been excluded from analysis specifically focused on the locum workforce.

4.1.1 Demographics

Of the 40 GPs who completed the questionnaire, 60% were female, 38% male, and 3% preferred not to say. This is a reflective mix based on the demographics of GPs in Wales, 57.3% female and 42.7% male (Welsh Government, 2025). The mean age is approximately 47 years, ranging from the 25-35 bracket to the 65-74 bracket. Most GPs who responded were partners making up 40% of the responses, salaried were 28%, GP out-of-hours 20% and locums 6%. GPs completing work across the BCUHB region, with a high proportion identifying that they work in a rural area, with over a third working in a rural or remote area (37.5%), 35% working in an area that has a level of rurality and 22.5% working in an urban area.

The majority of the GPs live and work in north Wales (n=34), and 53% are Welsh speakers or learning Welsh.

4.1.2 Personal motivations

The personal motivations section shows a comparable split of roles across genders, with no pattern with role type (locum or salaried) based on gender. Most GPs fall into the 45-54 age bracket (male n=6, women n=10). There is no pattern of age influencing main job role; it appears there is a mixture of roles within each age bracket and gender. Looking at second roles, these appear to be most prevalent between the 35- 54 age bracket (n=32), and again, there is no difference across gender.

The Welsh language is spoken by 21 of the GPs; the importance of speaking this language within a working day varied, with 38% having a neutral view. However, when looking at more detail between the fluent Welsh speakers and learners, it is clear that for fluent Welsh speakers, it is an important part of their role, with 66% advising it is extremely or somewhat important.

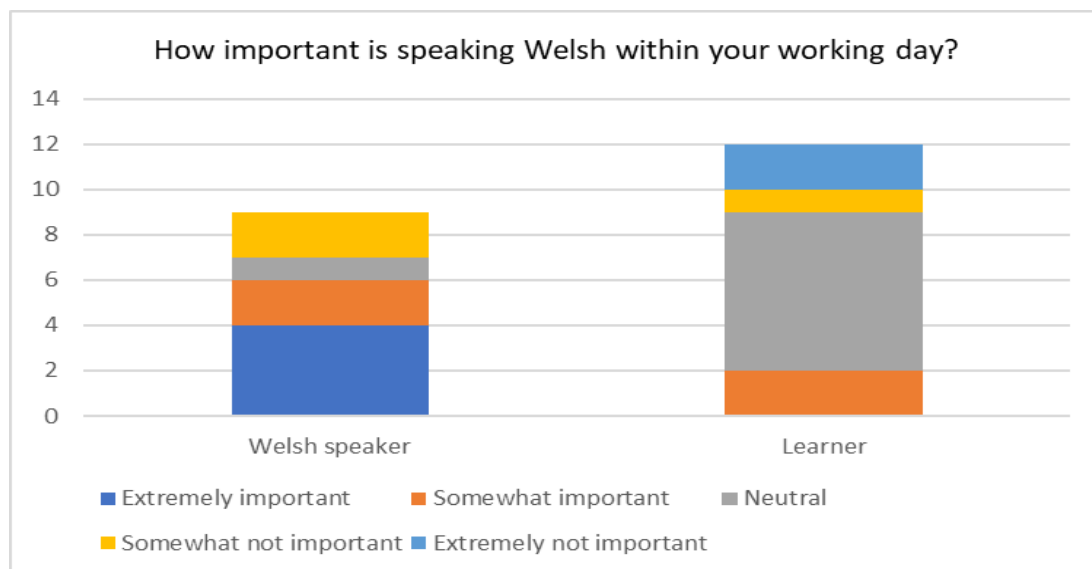


Figure 2. Bar chart of importance of speaking Welsh in working day (Author's own)

For roles and attraction to roles, the majority did not receive any incentive to work in North Wales (72%), a small number received a golden handshake, also known as the GP training incentive scheme payment (n=4) and relocation expenses (n=3). Four GPs were attracted to the role due to the job plan, which protected time within their clinical commitments for professional development in an area of interest. To understand this further, the motivations to choose this career pathway were questioned, with multiple answers accepted. There was a substantial number stating that they wanted to help others, make a difference and had an interest in medicine and healthcare (n=45), answers have been grouped into topics and show a passion for medicine, having a work life balance and the training and mentorship experience shaping their motivation in becoming a GP. The financial element of the role was low scoring (n=4). One of the questions added to the questionnaire following the expert forum was “other career paths felt too competitive or demanding” six GPs selected this.

When discussed within the forum, it was suggested that GPs who come into the role for this reason may struggle as it may not be a fulfilling or suitable role for them, one of the participants stated;

“They went for the path of release resistance in training, but then actually come out with the wrong career” and that perhaps for this cohort it could why they are struggling, a participant noted

“It’s sometimes why people are wobbling is actually because the job’s really, really hard, and they are perhaps not quite the right character to do it without a massive wrap around”.

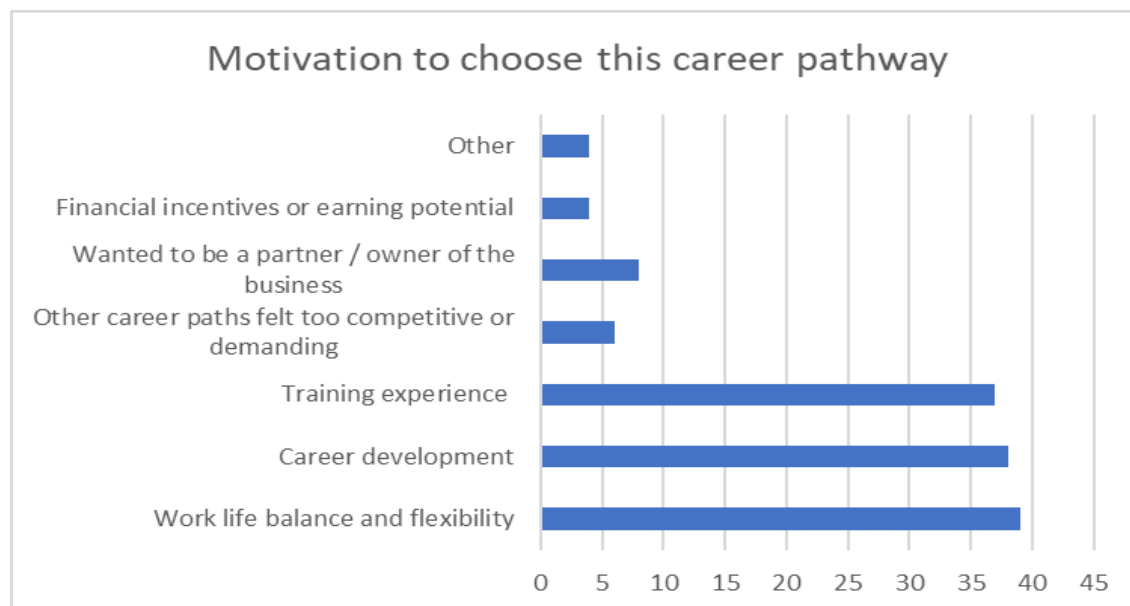


Figure 3. Bar chart of motivational factors to choose a GP career (Author’s own)

4.1.3 Formal employment contract

The formal employment contract section is split into two types: partnership agreements for partners and employment contracts for salaried GPs. Initially, looking at partners across both main and second roles (n=16), and the partnership agreements in terms of pay and profitability, this question was asked across two questions, one around the current practice and the other about the level of importance; both questions were combined to get a detailed view of this topic. Highlighted as an important area, to ensure there is a strong business approach and the practice is profitable, the transparency between partners was highlighted as a positive area; 14 out of the 16 partners agreed or strongly agreed that their practice already has a transparent partner revenue allocation, a clear and equitable profit-sharing model.

Partners worked an estimated mean of 34 hours, which sits just under the health board’s typical view on full-time hours as 37.5. However, when taking into account additional hours which averaged 4.57 hours per week, the total becomes 38.5 hours worked per week in the main role. Working hours and expectations appear inflexible, with 100% of partners reporting not at all to moderate when asked how flexible their role is.

For salaried GP roles, this incorporates roles both within health board run (n=7) and independent practices (n=3), along with GP out of hours (n=8). Salaried GPs average working the equivalent of additional hours to contracted hours. However, they are typically paid for this work either through their salary or time in lieu, but this does not take away from the fact that most salaried GPs are working significantly more than they have been contracted to.

Table 7. Salaried GP working hours (Author's own)

Salaried GP location	Average contracted hours	Average additional hours
GP out of hours	20	20
Health board practice	26	26
Independent practice	26	26

Roles employed by the health board or independent practice offer increased flexibility, with all GPs receiving some level of flexibility within their role.

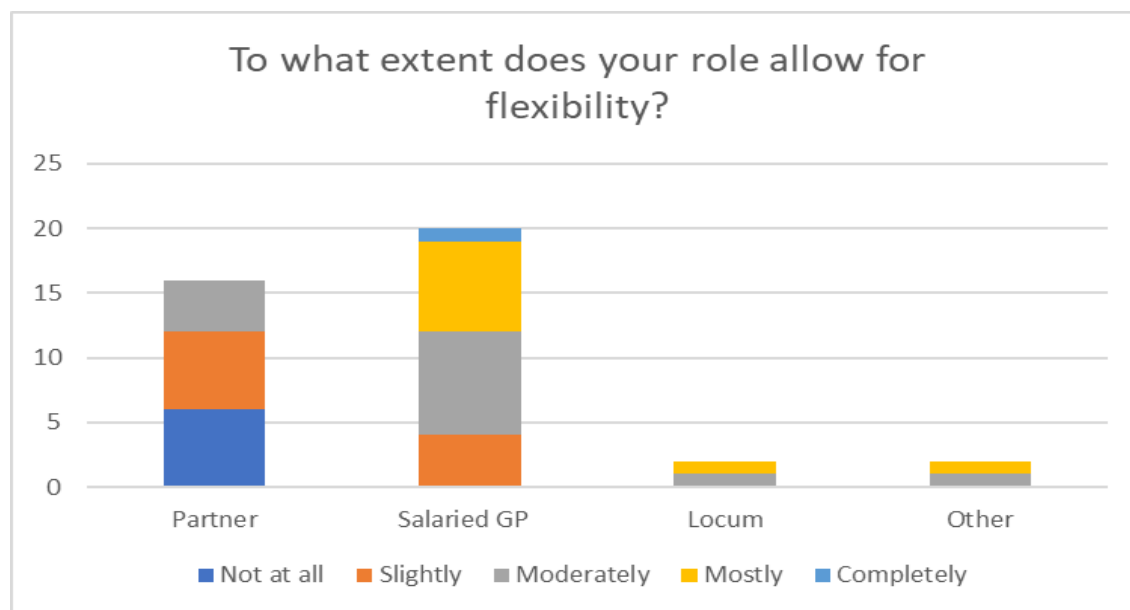


Figure 4. Roles allowing for flexibility (Author's own)

Six out of the 16 partners indicated they had a second role, and one GP indicated four roles. Reasons for pursuing a second role varied; however, the majority stated that 'primary role had become unsustainable, sought second role to reduce pressure or improve workload balance' (n=4) and 'To gain experience in a different clinical or non-clinical area' (n=4). These roles are typically between 0-5 hours a week (n=5); however, partners also report that they are working an additional 0-5 hours per week (n=5) in the second role. Based on the employed and additional hours, it averages to 6.80 hours per week. Taking into account both main and second roles, the partners work an average of 41 hours a week, which is 3.5 hours above a typical full-time contract.

The average for partners' committed hours is less than full-time, this is a significant additional amount of work, with 5.85 additional hours worked each week. This will likely be unpaid due to the partnership contract model, where GPs are paid based on their sessional commitment to the practice, not hours. As business owners, they must ensure continuity of provision regardless of committed hours. Ten out of the 18 GPs have a second role; reasons varied, but differed from partners' reasoning. The main reason was 'To gain experience in a different clinical or non-clinical area' (n=8), and the second highest response was 'To improve work-life balance through varied work' (n=7).

Looking at attraction to role and benefits offered for all GPs, this is limited with 51% advising there are no additional benefits. The purchase of additional annual leave or application for a sabbatical was cited as the most common benefit (20.2%). Parental and career emergency leave is also available to a small cohort (16.3%). When looking at the level of importance GPs placed on these additional benefits when considering

a role, it was low, with 71% citing that it was not important to neutral, which continued to be similar across genders and age brackets.

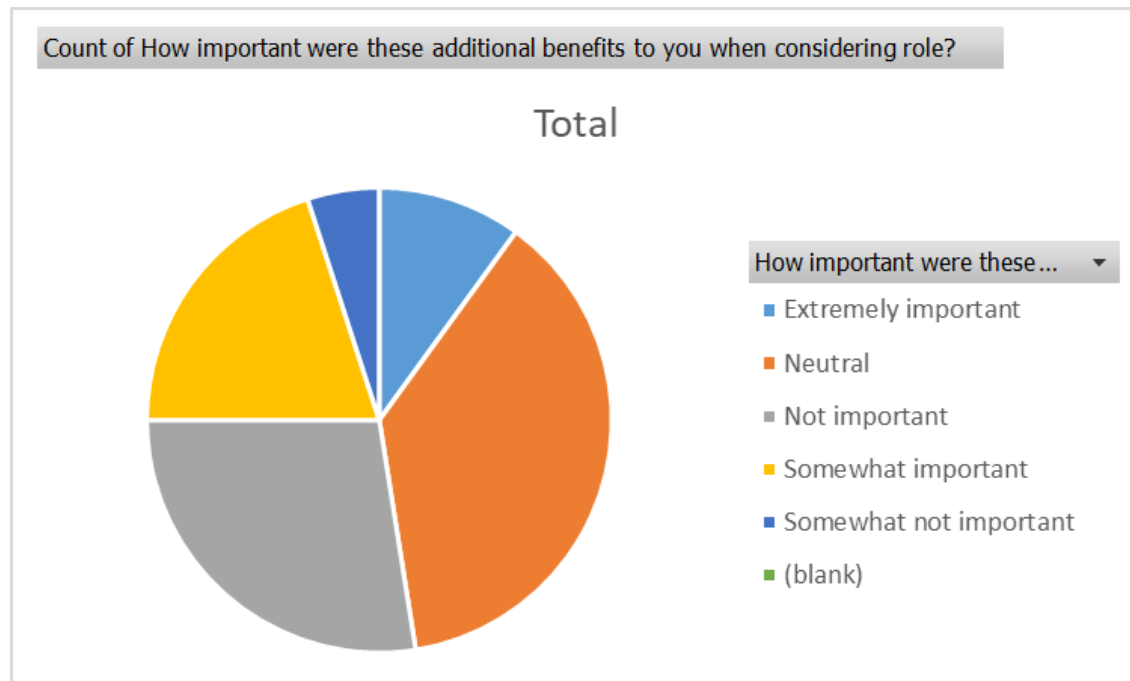


Figure 5. Importance of additional benefits (Author's own)

4.1.4 Informal employment contract

Informal employment contract looked at the practice's culture, formal and informal support, and professional development. Continued Professional Development (CPD) is an indicator to understand if GPs can take time away from clinical duties to undertake essential training. Findings suggest a difference in access to CPD based on role types, notably salaried GPs within health board roles being the most likely to access their full allocation (n=10) in contrast to partners (n=4). Some GPs reported never being able to access CPD (n=5), this is likely due to workload pressures within the practice, lack of clinical cover or unsupportive culture to development. However, this lack of access to CPD will contribute to burn out as GPs will be undertaking the training within their personal time, and hinder professional development, all ultimately having a negative effect on retention.

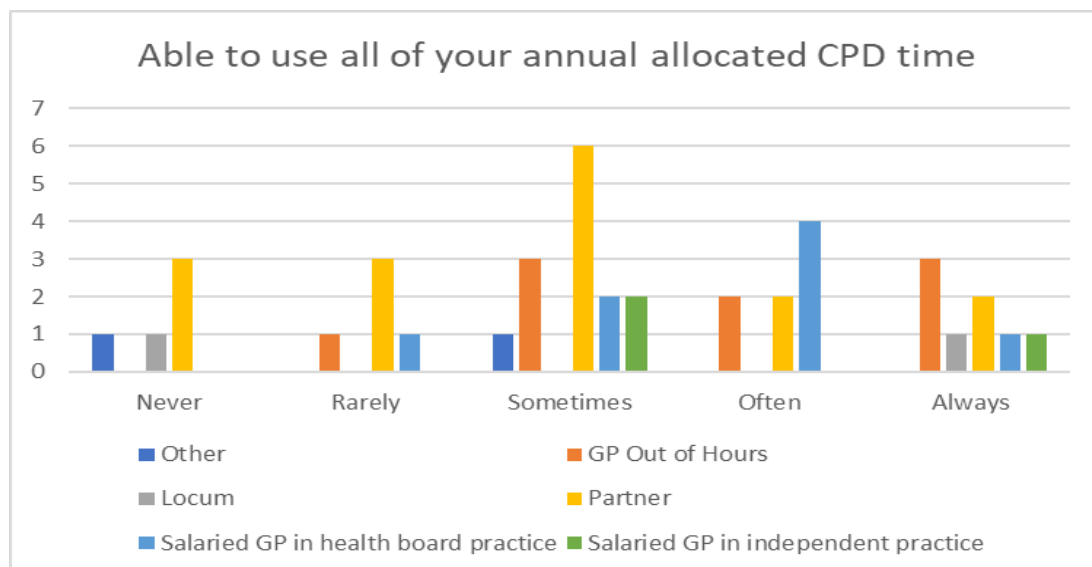


Figure 6. Use of allocated annual CPD (Author's own)

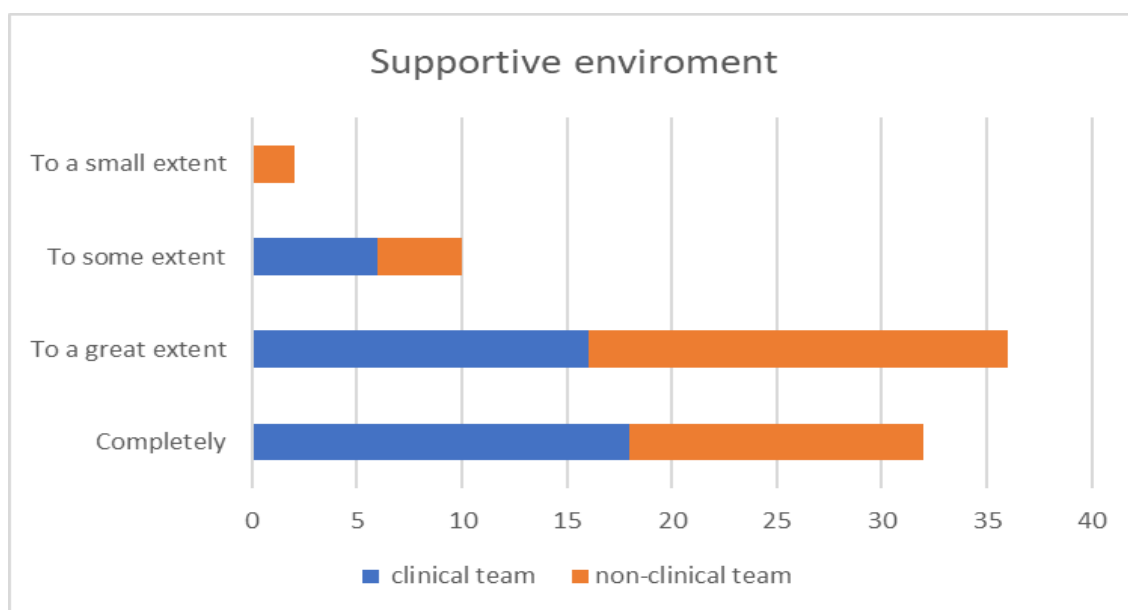


Figure 7. Level of support from the clinical and non-clinical team (Authors own)

The perception of competence of the practice management and clinical team was generally positive, 34 advised that the non-clinical team was either “completely” or supportive to a great extent, suggesting a strong and supportive working environment in a high proportion practices. This is positive to see across the region as it supports the current literature around having a supportive peer and professional network and its impact on retention ‘Relationships with colleagues are particularly important in primary care; doctors can feel isolated and lonely, and finding time to tackle this in the face of workload pressures can be hard’ (Fisher & McDermott, 2023).

GPs were asked if their practice or workplace supported their wellbeing and mental health. Responses were generally positive, with 55% (n=22) responding “yes” that they felt supported. This suggests that the majority feel their workplace is supportive, and a proportion of 45% (n=18) have partial or no support. This shows a real difference in how wellbeing and mental health are supported across practices and how individual experiences and practice culture are prioritised.



Figure 8. Practice/workplace support for wellbeing and mental health (Author's own)

4.1.5 Commercial set-up

To understand the commercial set-up of general practice, it is helpful to consider indicators of business acumen. This includes how forward-thinking the partnership or practice is, if they are looking at expanding into areas such as research or training placements, and their approach to workforce diversification.

There is a pattern of practices who are proactively looking at growing multiple areas of their practice for income generation above the typical General Medical Service (GMS) funding, which provides the core funding to practices delivering primary care services. They appear to be doing this by taking on research and, or students. After excluding respondents who selected “not applicable” to the related questions. Using the criteria that have been defined, 13 practices were identified as demonstrating high levels of business acumen, with a further 15 meeting the criteria to some or a great extent, suggesting that many practices are undertaking work outside of the GMS contract to develop and sustain their practice.

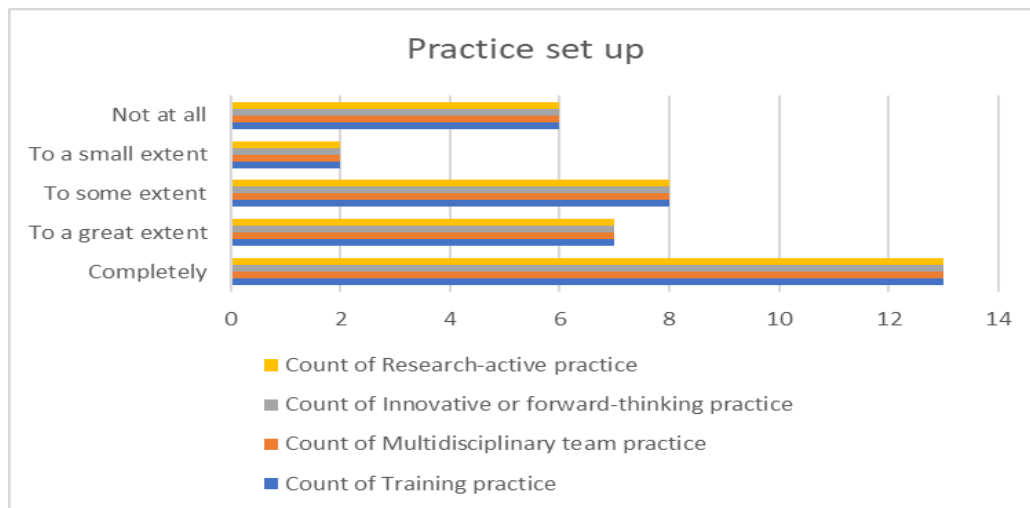


Figure 9. Indicators of business acumen (Author's own)

Exploring partner revenue allocation and profitability, again, indicators have been used and include whether they are a prescription dispensing practice, as this provides additional income, and if they have a high list size and lower staffing levels, along with other typical measures such as income and personal investment to join the partnership. After excluding respondents who selected “not applicable” to the related questions, the majority of the respondents reflected that none of the characteristics applied. This is a real contrast to the questions about business acumen, where they scored highly for diversification, which suggests that overall income generation is low. Although practices may be forward-thinking regarding service delivery, this is not necessarily reflected in high income generation and profitability.

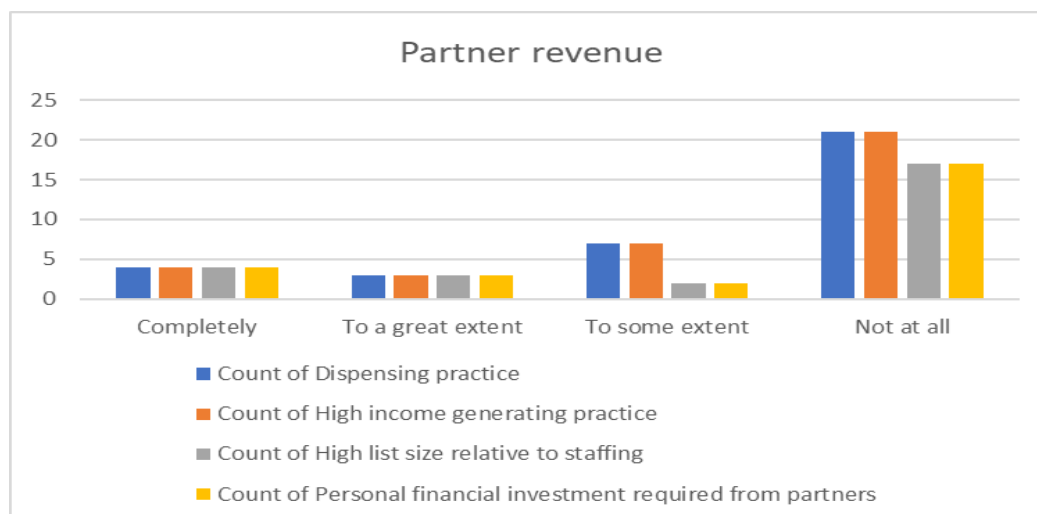


Figure 10. Indicators of partner revenue and profitability (Author's own)

Finally, looking at the practice reputation within the community, and the level of importance that holds for a GP working in that location, this appears to be very important or important for the majority of GPs (n=23). This suggesting the community's perception plays an important role in GP satisfaction and could influence areas such as recruitment, retention, and culture within a practice. A positive practice reputation may support retention and wellbeing of GPs along with attracting GPs to the practice. If the reputation was poor, it could have the opposite effect. Focusing on building a positive relationship with the patient population may increase GPs wellbeing and influence career decisions on if they continue to work within general practice, reduce hours or leave the profession.

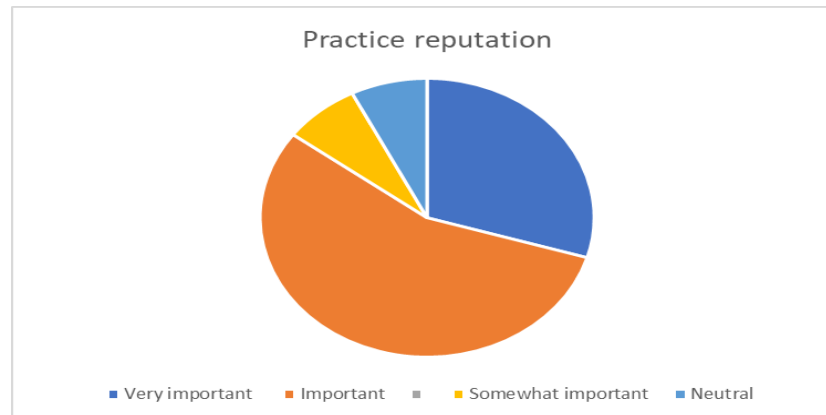


Figure 11. GPs identified level of importance of practice reputation within the local community (Author's own)

4.1.6 Type of practice

This area of the conceptual framework has already been addressed within the commercial set-up and informal employment contract section, and further analysis into this section is not required. However, it highlights the overlap between sections of the framework and their importance. It will be reviewed within the discussion section, with suggestions for altering the framework to reduce duplication across the sections.

4.1.7 Patient demographics

This section aims to understand the patient demographics of the practice, focusing on understanding the complexity of care needs from the patients and the dependency that is felt by the GP and practice, which have been identified as having a direct impact on job satisfaction and retention. When asking GPs about their patient demographic, these practices are almost all working in areas of high social and medical need, including a large proportion of patients with multiple long-term conditions, frailty and mental health needs. This demographic will contribute to increased workload and may influence GPs' working environment, risk of burnout, and ultimately the duration they choose to work at that practice.

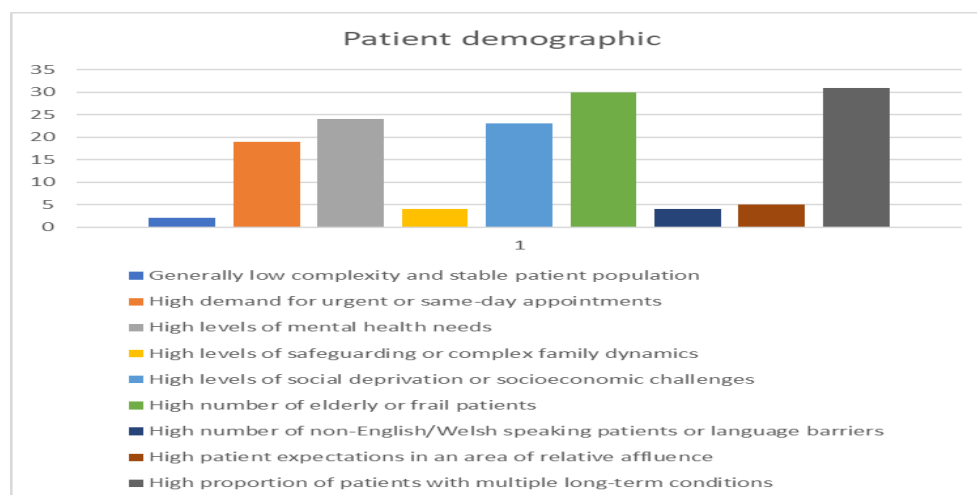


Figure 12. GPs identified patient demographics (Author's own)

The patient's perception and the GPs identity within the community have been explored alongside this. Responses were mixed; 37% (n=15) felt their identity as a GP was valued within the community, while 32% (n=13) did not feel that it was valued. The remaining GPs expressed a neutral view.

Responses for the community perception on job satisfaction mirrored these answers, which shows a correlation between a GPs perceived identity within the community they work in and its effect on job satisfaction and ultimately retention.

4.1.8 Influences outside of themes

The final section focused on influences that looked to sit outside of the identified themes. Two of the influences are around career development, whether through fellowship programmes or specialist interest roles. It initially looked to track job satisfaction based on years of experience, it highlights that satisfaction rates grow from qualification and peak at 21- 25 years qualified at “very satisfied” and “somewhat satisfied” (n=8), and from that point significantly declines. This trend could reflect a number of factors, but highlights an opportunity to look at support and development opportunities for mid to late career GPs.

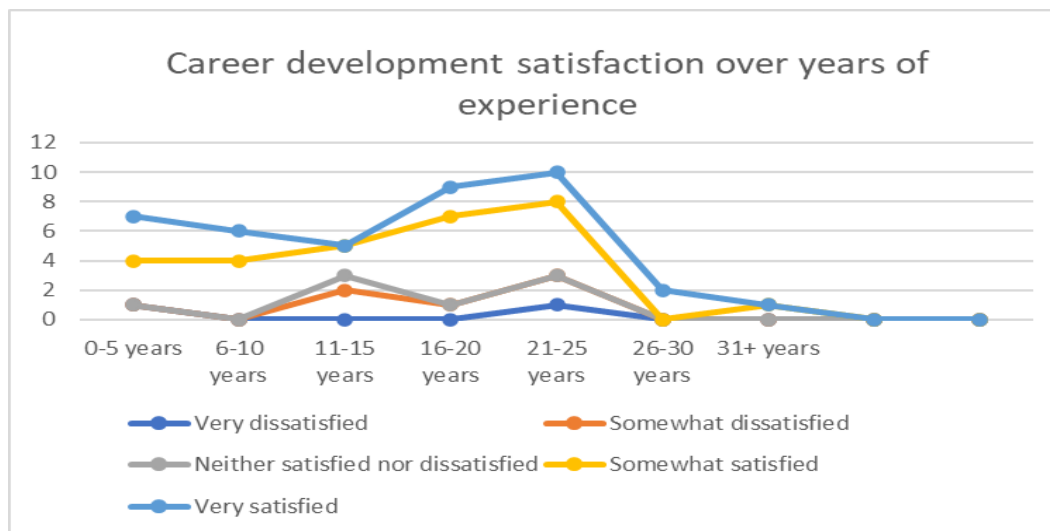


Figure 13. GPs career development satisfaction based on years of experience as a GP (Author's own)

Looking to understand this level of satisfaction further and how it aligns with professional development, 19 GPs indicated they had a specialist interest or portfolio role. However, only five noted that this had made a “very significant” or “significant” impact on their long-term career aspirations. This suggests that while portfolio roles are common, their influence on career development is limited. As highlighted in the formal employment contract section, a second role is often secured to reduce the burden of the main role. Although the role itself may not impact career aspirations, having a change in role and level of responsibility for that proportion of the week could make the remainder of the week more manageable.

5 Discussion

This section will review the twin research question and explore the contribution of this research to the questions.

5.1 Key findings

Table 8. Key findings in relation to the literature review (Author's own)

Theme	Findings
Job satisfaction and retention	Job satisfaction and its role in retention is complex and is interlinked in personal, professional alongside external factors. Workload is high with the average working hours for GP partners being 41 hours per week, this exceeds typical full-time hours and has little flexibility in working patterns. Overall job satisfaction peaks at 21 – 25 years post qualification and then declines significantly, which provides an opportunity to support mid to late career GPs. Finally,

	most GPs entered this profession to help others and to make a difference, however only 37% felt their identity was valued within their community.
Peer and professional support	Findings suggest that peer and professional support is a key area which shapes both job satisfaction and retention. Responses from GPs about their own experience of peer and professional support locally is mixed. 55% of GPs felt their workplace supported their wellbeing and mental health, while 45% reported partial or no support. 34 GPs reported that their non-clinical colleagues were either “completely” or “to a great extent” supportive, indicating a positive practice culture. Informal support such as peer groups were not included within the questionnaire, but the positive support from within the practice may support and improve retention.
Flexible working	Being able to work flexibly is a big factor in satisfaction and retention, the level of flexibility within a GP's role appears to vary based on type of role and employment model. GP partners reported the lowest level of flexibility with 100% stating their role was “not at all” to “moderately” flexible. This lack of flexibility is likely due to them being the business owners and needing to ensure they are providing care in accordance with the General Medical Service (GMS) contract. Salaried GPs across independent and health board practices reported higher levels of flexibility. Additional working hours for salaried GPs are typically paid, whereas partners are likely unpaid for additional hours. This inflexibility in working and additional hours is a factor into why GPs take on a second role, to help cope with the workload across a working week, with partners often pursuing a second role because their primary role has become unsustainable, this portfolio working is being used to make working as a GP more sustainable long term.
Manageable workload	The majority of respondents reported that they work in a practice with high patient demand and complexity of need, with a patient population consisting of patients with multiple long-term conditions, frailty, and poor mental health. This high level of demand affects the manageability of their workload. The data showed a decline in job satisfaction after 25 years post-qualification, which may be linked to ongoing workload pressure. Having identified that portfolio roles and second roles offer a break from general practice within a working week, they do not appear to significantly influence long term career aspirations, indicating that workload remains a challenge even for experienced GPs.
Wellbeing and wellness	Findings show that there is a split of support for GPs wellbeing and wellness locally, with 55% of GPs reporting positive experiences and 45% stating they received partial or no support for their mental health and wellbeing. A proactive approach to wellbeing, including equitable access to support would be beneficial to improve retention.

Table 9. Key findings in relation to the conceptual framework (Author's own)

Theme	Findings
Type of practice	This theme will be covered within the commercial set up and informal employment contract sections. Within the report it has shown there is an overlap between sections of the conceptual framework and although this is important to note the overlap, to avoid duplication the framework will be updated to reduce this across the sections.
Commercial set up	Findings suggest that many practices demonstrate high levels of business acumen, including taking on research, trainees and reviewing practice skill mix, but this does not necessarily translate into high levels of income or practice profits. A large number of GPs scored their practices high on being forward thinking but most did not identify with the income generating characteristics. Partner revenue allocation was reported positively, with 14 out of 16 partners agreeing their practice had a clear and equitable profit-sharing model. The findings show that most partners are commercially aware but within the current climate it appears that it is not always possible for this to translate into financial stability for the practice. This in turn makes it difficult to increase clinical capacity, by being able to fund additional staff to support the reduction of workload across the clinicians working within the practice.
Personal motivations	Reasons for GPs joining the profession were typically around a desire to help others, make a difference, and having a general interest in medicine. Financial incentives to

	work in a practice in Wales were notably of low importance when considering working locally. Motivations were broadly consistent across age and gender, and there were a small number of GPs who indicated they chose general practice because other career paths felt too competitive or demanding. This group may be at greater risk of dissatisfaction, as the expert group discussions suggested that those entering the profession for these reasons may struggle with the role longer term and would likely require different types of support to manage the role. Finally, the importance of the Welsh language varied, fluent speakers placed a greater importance of speaking Welsh within their working day, suggesting speaking the Welsh language within practice may influence personal motivations to work within Wales if they are a fluent Welsh speaker and could be used to support retention of this cohort.
Formal employment contract	This theme showed that partners reported limited flexibility of working hours, but reported a clear and equitable profit-sharing model. In contrast salaried GPs noted the role offered greater flexibility and access to benefits such as additional annual leave, parental leave and lease cars, although over half of all respondents reported receiving no additional employment benefits. This showed that there are positive and negative factors to both role types and individuals would typically gravitate to a role that suits their personal and professional requirements. If this has not happened and a GP is in a role that does not fit their requirements, it needs to be considered that they may not be in the right employment model and offering an open discussion about this either at a practice or health board level could be beneficial.
Informal employment contract	This area appears to play a significant role in a GP's experience within a practice, including practice culture and access to professional development, most had access to CPD but again this varied between salaried and partner GPs. Salaried GPs in health board roles appeared most likely to be able to access their full annual allocation, and partners least likely. Which could cause prevent partners being able to develop professionally and impact on job satisfaction and ultimately retention. Additionally, over half of the GPs felt their wellbeing was supported, a substantial proportion (45%) reported partial or no support, indicating inconsistency in how practices prioritise mental health. Access to development opportunities for all GPs could be an area to review to support retention through professional development.
Patient demographics	The demographics of the patients within the practice has a huge influence on the workload of a GP. Most GPs reported working in areas of deprivation, with patients with multiple long-term conditions, frailty, and low mental health. The complexity of these patients and increased demand on the practice will contribute to a challenging working environment and may increase the risk of burn out and ultimately retention. Alongside this, perceptions of professional identity within the local community were mixed, with only 37% of GPs feeling valued, while 32% did not. This suggests that the community's recognition of the GP role may impact morale and satisfaction. It will be important to understand how the practice is viewed externally can be adapted through engagement, particularly in areas of deprivation to support GP retention.
Influences outside of themes	Workload is a pressure across all GP roles, highlighted within the literature, expert forum and questionnaire. Many of the GPs noted they are working additional hours and report limited flexibility, particularly in partnership roles. One way of managing this appears to be the peruse of a portfolio role or second role, which is used to reduce the pressure within the working week and improve work-life balance, rather than to advance career aspirations. CPD was also included as an area outside of the themes, however this has been addressed within the formal employment contract and again the framework will be updated to reflect this and avoiding duplication. The findings also imply limited engagement with professional bodies or structured career pathways, highlighting a need for a more coordinated approach to support of professional growth, to support retention within the workforce.

Based on the findings and discussion points, the conceptual framework has been revised to include the additional insights discovered through this research.

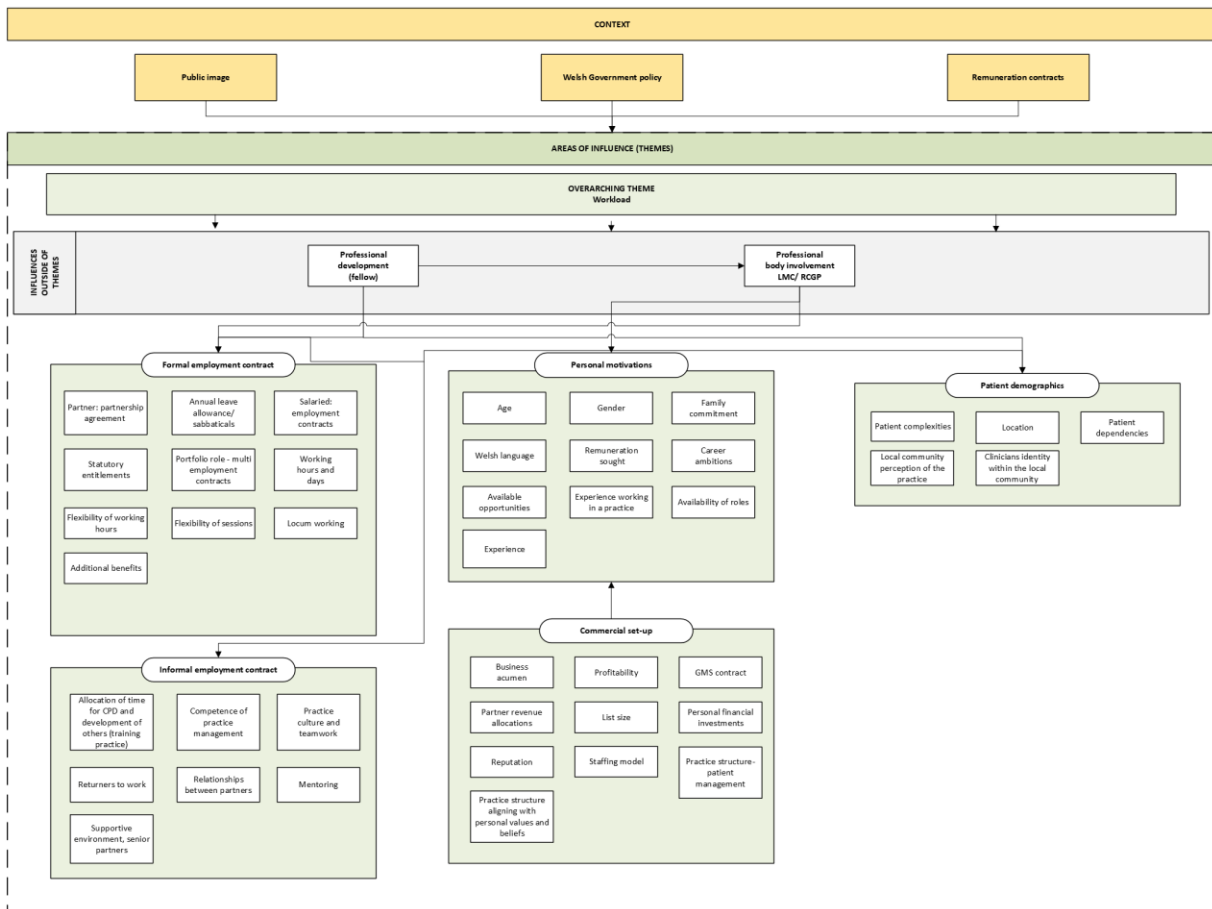


Figure 14. Revised conceptual framework (Author's own)

6 Conclusion

The following section will present the conclusions and implications of this study. The limitations of this study are acknowledged as the selection of experts, which means a sample of the total population of GPs in North Wales was not undertaken, so it is difficult to generalise the findings. However, the researcher has confidence that her interpretations reflect current sentiment from a range of GPs and across a range of practice types.

6.1 Key findings

The following findings were identified through this study:

- Forces that impact the ability to retain GP are multifaceted but can be aligned to a theme outlined in the revised conceptual framework.
- Evidence that exists to understand how to support GPs to retain in the profession is limited; however, literature suggests that each GPs reasons are different and there is no one-size-fits-all solution. However, the key themes identified informed the conceptual framework.
- Although each GP is individual and decisions around leaving the profession are multifactorial, there are areas that have been identified that could support retention locally.
- The unseen workload is significant, with GPs all stating they work additional hours each week. The partners who completed this questionnaire averaged 4.45 additional hours per week, totaling working hours of 41 hours per week.
- Portfolio roles are often used to manage workload and improve work-life balance, rather than career progression.
- 45% of GPs reported partial or no support for their own wellbeing and mental health.

- Job satisfaction appears to peak at 21 – 25 years post qualification and then declines significantly.
- Partners reported limited flexibility, with salaried GPs benefiting from greater flexibility.
- Many practices have high business acumen, such as taking on students and undertaking research, but report low income generation.
- The allocation of partner revenue is generally transparent and equitable.
- Only 37% felt valued by the community, which correlates with job satisfaction and retention.
- Welsh language use is important for fluent speakers and may influence local retention.

6.2 Recommendations

The recommendations include:

- A periodic audit of GPs using a replication of this study in BCUHB and wider across Wales will be executed in partnership with the national retention programme.
- Include diverse cohorts in future research.
- Provision of an induction for newly qualified GPs to understand the role of a salaried and partner and what support is available to them.
- Review the wellbeing offer and implement a consistent proactive approach to wellbeing and mental health support, sharing available resources and identifying any gaps in provision.
- Support for mid- to late-career GPs and the opportunity to offer them mentorship or leadership roles to reduce clinical work while retaining their experience are also needed.
- Recognise and support portfolio roles as a strategy to manage workload and career progression to improve sustainability and retention.
- Promote leadership development for practice management teams and partners to support a positive workplace culture.
- Promote public/ patient awareness advertisements highlighting the role of GPs and practices to support practices to build stronger relationships with local communities.

6.3 Future research

This study has highlighted the need for a longitudinal study to evaluate the longer-term impact of retention strategies and what impact career aspirations have on this. Early career and GPs working rurally appear to be a key demographic that leaves the profession early, or are more impacted by the five themes outlined within the synthesised results. This review did not include a significantly diverse cohort, such as minority ethnic GPs and those working in a portfolio role.

6.4 Reflections

This study has been a big investment of time to unearth the new dimensions of how best to manage the careers of GPs. It is hoped that this study will form the basis of others who are equally passionate about the profession and delivering care “closer to home”.

Robyn Watson

September 2025

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9 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Exploring the Impact of Cross-Sector Peer Learning on Leadership Confidence and Change Implementation Among NHS Middle Managers in Wales: An Action Research Study

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Abstract:

This action research study investigates how cross-industry peer learning influences the leadership confidence of middle managers in NHS Wales. Conducted in partnership with a North Wales based business school, the study focuses on learners within ILM Level 4 and 5 mixed sector leadership cohorts. Drawing on Kolb's experiential learning cycle, Bandura's self-efficacy theory, and Knowles' andragogical principles, the research explores how exposure to diverse professional perspectives contributes to leadership development.

A sequential mixed-methods design was employed, combining a Qualtrics survey (n=17) with six semi-structured interviews. Quantitative data revealed strong learner endorsement of cross-sector interaction, with high agreement on statements related to engagement, applied learning, and increased confidence. Qualitative findings showed that peer learning fostered reflection, challenged assumptions, and promoted behavioural change, particularly when participants were supported in applying new insights within their workplace. However, organisational barriers such as hierarchical culture and limited managerial support often constrained the translation of confidence into sustained action.

The study contributes new evidence to a limited literature base on cross-industry leadership development in health and care. It highlights that leadership confidence is not only a personal trait, but a socially constructed outcome shaped by environment, peer affirmation, and contextual support. The research has practical implications for educators, programme designers, and policymakers seeking to enhance leadership development across sectors.

Keywords: Cross-industry learning, Leadership confidence, NHS Wales, Peer learning, Adult education, Action research.

Definitions

List of Acronyms

BCUHB	Betsi Cadwaladr University Health Board
NHS	National Health Board
ILM	Institute of Leadership and Management
HEIW	Health Education and Improvements Wales
FE	Further Education
CPD	Continuing Professional Development
L&D	Learning and Development
AR	Action Research

Key Definitions Used in This Study

Term	Definition
Cross-Sector Learning	Structured learning involving professionals from different sectors (e.g. NHS, local authorities, private industry), enabling shared reflection and diverse perspectives.
Middle Management in the NHS	Operational leadership roles within NHS Wales – (including BCUHB), responsible for implementing strategy, managing teams, and improving services. These roles are often under supported in formal leadership development.
Experiential Learning	A theory of learning through experience, reflection and application, based on Kolb's (1984) four-stage cycle: concrete experience, reflective observation, abstract conceptualisation, and active experimentation.
Self-Efficacy	An individual's belief in their ability to perform tasks and handle challenges effectively. Self-efficacy influences confidence, decision-making and perseverance (Bandura, 1977).
Andragogy	The theory of adult learning that emphasises self-direction, internal motivation, and the importance of experience and relevance in learning (Knowles, 1984).
Psychological Safety	A learning environment where individuals feel safe to contribute ideas, admit mistakes and take interpersonal risks without fear of judgement (Edmondson, 1999).
Heterogeneous	A group composed of individuals from different sectors, roles, or backgrounds, enabling diverse perspectives and experiences in shared learning (Lumby, 2019).

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1 Introduction

The ability of middle managers in the health and care sector to lead change effectively is a critical factor in the successful implementation of innovation and service improvement. In the context of NHS Wales, where structural and cultural complexity intersect with policy driven targets, the development of confident, capable leaders is essential. However, traditional management training has often fallen short in equipping professionals with the reflective and adaptive skills needed to navigate these challenges. In response, leadership development programmes that draw on experiential and peer-based learning are increasingly being adopted across sectors, offering opportunities for cross-pollination of ideas and shared learning (Jackson & Manley, 2021).

This research explores the extent to which cross-sector, peer learning environments support the development of leadership confidence among middle managers working in NHS Wales, specifically those employed by Betsi Cadwaladr University Health Board (BCUHB). The study investigates how engagement with professionals from other public and private sector backgrounds, including manufacturing, local government, and commercial industry, influences learners' self-efficacy, capacity to lead change, and ability to apply learning within complex organisational settings.

The rationale for this study is grounded in a growing recognition that leadership in health and care requires not only technical competence, but also the ability to reflect, adapt, and innovate. This aligns with national leadership strategies in Wales, such as the 'Leadership and Management Development Framework' (HEIW, 2022), which emphasise collaborative, system-wide learning. Within this context, the Institute of Leadership and Management (ILM) Level 4 and 5 leadership qualifications offered through cross-sector business schools provide a unique environment in which NHS learners engage alongside peers from diverse industries. This creates an opportunity to explore the influence of cross-industry exposure on leadership development within a health and care context.

The study adopts an action research approach, combining semi-structured interviews and a survey with learners who have participated in these mixed-sector programmes. It is underpinned by a conceptual framework that integrates Kolb's experiential learning cycle (1984), Bandura's theory of self-efficacy (1977), and Knowles' andragogical principles (1980). These theories support the examination of how adults learn in peer environments, how confidence is built through experience and reflection, and how theoretical learning is translated into workplace practice.

The research aims to generate practical insights into the design and impact of leadership development initiatives, particularly those that involve cross-sector peer learning. It also seeks to contribute to the growing body of literature on experiential adult learning in professional education. By focusing on the lived experiences of NHS middle managers, the study provides a sector-specific view through which to assess broader educational practices.

In doing so, this research addresses a gap in understanding how cross-industry classroom environments shape leadership behaviour, particularly in public sector organisations where hierarchical structures and cultural resistance can present barriers to innovation (West et al., 2017). The findings will inform future programme design, offering recommendations to educators, policymakers and organisational leaders who seek to develop confident and reflective change leaders in the health and care sector.

2 Background

This project is situated within a cross-sector leadership development programme delivered in North Wales, which includes learners from NHS Wales, local government services, and private industry. The specific context for the study is a series of ILM Level 4 and 5 qualifications delivered within a business school setting, where learners engage in a shared learning experience regardless of their professional background.

Within this environment, NHS staff, including those from Betsi Cadwaladr University Health Board (BCUHB), study alongside peers from industries such as manufacturing, engineering social care, education, and other public services. The programme encourages reflective practice, experiential activities, and peer interaction as core methods of leadership development. Sessions are facilitated by tutors with experience in adult learning, and learning is assessed through work-based assignments and critical reflection on practice.

BCUHB, the largest health board in Wales, operates in a complex and high-pressure environment. Middle managers in this setting often carry responsibility for operational leadership and service delivery but report

limited access to structured leadership development due to matters such as budget and time constraints (Lyons et al. 2020). Their inclusion in mixed-industry ILM programmes offers an opportunity to explore whether this type of environment contributes to increased confidence and capability in leading change.

This study focuses specifically on the perspectives of NHS Wales learners who have completed these programmes. It seeks to understand how working alongside peers from outside the health sector may influence their beliefs, behaviours, and leadership practice. The findings will contribute to ongoing conversations about leadership development in the public sector and the role of cross-sector collaboration in building capacity for innovation.

3 Literature Review

Effective leadership within health and care environments requires not only technical expertise but also the confidence to initiate and manage change. Middle managers, who often act as the bridge between strategic vision and operational reality, play a critical role in implementing workplace innovation. Research suggests that developing leadership confidence is a complex process, influenced by individual experience, organisational culture, and importantly, peer learning (Lyons et al., 2020; Jackson & Manley, 2021).

Cross-industry peer learning, the deliberate exposure to diverse leadership approaches from different sectors, offers a unique opportunity to build confidence through reflection, dialogue, and idea-sharing. Experiential learning models, such as Kolb's (1984) Experiential Learning Cycle, highlight the importance of concrete experience and reflective observation in developing professional skills. Likewise, Bandura's (1977) Social Cognitive Theory emphasises the role of social learning and observed behaviours in building self-efficacy, a crucial ingredient for confident leadership.

This literature review critically explores existing research on how cross-sector peer learning environments can influence leadership confidence, particularly among middle managers in health and care settings, as illustrated in the conceptual framework (Figure 1). Drawing primarily from a review of 58 journals, the following sections identify key themes emerging from the most closely aligned studies.

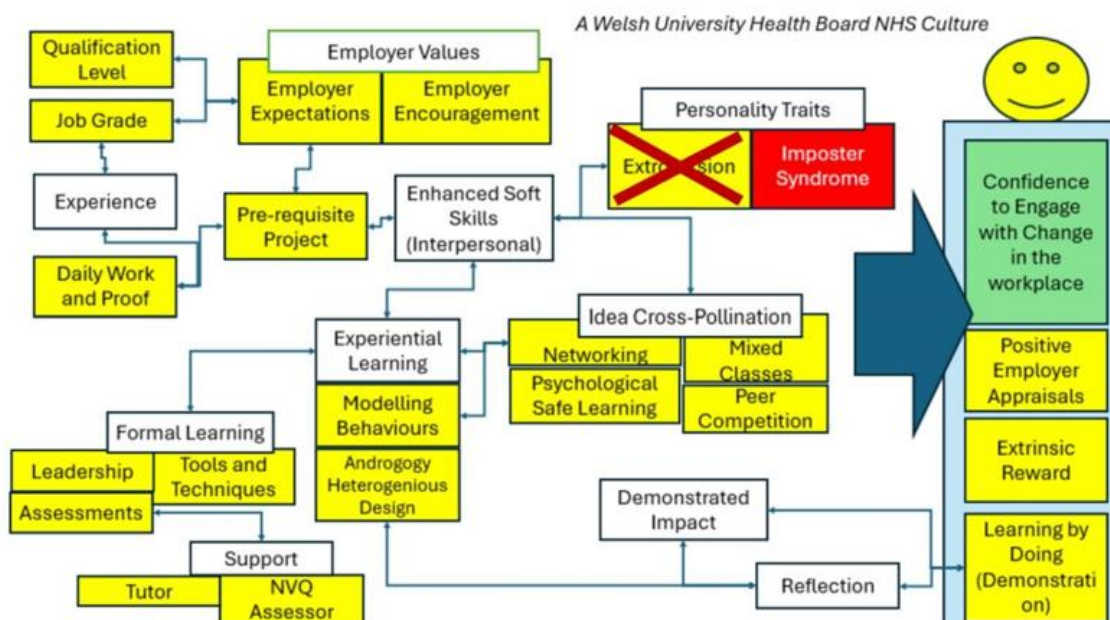


Figure 1. Conceptual Framework: Cross-Sector Peer Learning and Leadership Confidence

3.1 Peer Learning Across Industries and Sectors

Cross-industry peer learning environments encourage leaders to engage with diverse perspectives, challenge assumptions, and develop broader strategic thinking. Yi et al., (2024) examined heterogeneous focus groups comprising medical students, physicians, and nurses, finding that exposure to different professional experiences enhanced participants' empathy, communication, and leadership readiness. Their

three-layered framework of medical humanities education illustrated how diversity of thought fosters reflective learning, a concept closely aligned with Kolb's (1984) model of experiential growth.

Similarly, Behrend et al., (2019) explored the role of interprofessional education in health settings, demonstrating that addressing heterogeneous learning cultures during professional training enhanced the ability to collaborate across traditional boundaries. They found that structured group activities, where differences in professional background were deliberately acknowledged, promoted more meaningful learning and a greater willingness to adapt new ideas into practice.

Lyons et al., (2020), in their systematic review of medical leadership development programmes, noted that initiatives incorporating cross-sector or interdisciplinary peer engagement often achieved stronger outcomes in leadership confidence and innovation application. They argued that encountering alternative leadership models challenges participants to reflect critically on their own practice, broadening their adaptive leadership skills.

Studies such as Burgess et al., (2020) also indicated that small group peer learning approaches in healthcare education, when thoughtfully facilitated, cultivate essential leadership behaviours such as active listening, critical thinking, and collaborative problem-solving. This suggests that peer learning may develop not only technical leadership competencies but also emotional intelligence and readiness for change.

Collectively, these findings suggest that heterogeneous peer learning settings provide an environment conducive to leadership confidence-building, offering health and care middle managers experiential exposure necessary for developing innovative and resilient leadership practices.

3.2 Building Leadership Confidence Through Peer Interaction

Leadership confidence is closely linked to a manager's belief in their own competence and their ability to influence outcomes, a concept defined by Bandura (1977) as self-efficacy. In peer learning environments, interaction with diverse colleagues provides vital opportunities for building this belief through shared experiences, reflection, and feedback.

Tewfik (2022) explores how workplace impostor thoughts, where individuals doubt their own competence despite evident success, can undermine interpersonal effectiveness and leadership growth. Tewfik's findings suggest that supportive peer interactions can mitigate impostor feelings, particularly when individuals realise that peers across sectors face similar leadership challenges. This reflects Bandura's assertion that social comparison and vicarious experiences are powerful mechanisms for developing confidence.

Jackson and Manley (2021) evaluated a multi-professional leadership development programme designed to support leadership in primary care networks. Their study demonstrated that participants reported significant increases in leadership confidence as a result of peer engagement and cross-organisational reflection. Importantly, the programme deliberately paired individuals from different roles and sectors, encouraging cross-pollination of ideas and supportive professional dialogue. This resonates with Kolb's (1984) theory that reflection on diverse experiences promotes transformational learning and behavioural change.

Additionally, van Knippenberg and van Ginkel (2021) argue that leadership for diversity mindsets, where leaders embrace rather than suppress difference within teams, directly enhances leadership confidence. Their work highlights that leaders who engage with multiple perspectives are more adept at managing uncertainty and complexity, key factors in leading organisational change.

These findings align with a broader body of research suggesting that confidence is not simply an internal trait, but a capability strengthened through social learning, peer validation, and experiential reflection (Lyons et al., 2020; Behrend et al., 2019). In this context, cross-industry peer learning emerges as a vital mechanism for equipping health and care middle managers with the confidence needed to act as champions of change within their organisations.

3.3 Leading Change and Innovation Through Cross-Pollination of Ideas

One of the most significant advantages of cross-industry peer learning is its potential to stimulate innovation and support managers in leading workplace change. Exposure to alternative leadership approaches, problem-solving strategies, and organisational cultures provides a fertile environment for creative thinking and the development of new practices.

Yi et al., (2024) demonstrated that participants from different professional backgrounds, when brought together, developed richer insights into complex problems by viewing them through multiple lenses. Their research supports the idea that heterogeneous peer interaction encourages cognitive flexibility, a critical attribute for innovation and effective leadership in dynamic environments such as health and care.

Behrend et al., (2019) further emphasised that managing heterogeneous learning cultures leads to greater adaptability among professionals, promoting the skills necessary to integrate new ideas into traditional settings. In health education, where hierarchical structures and standardised procedures often dominate, the ability to synthesise alternative perspectives is crucial for innovation and meaningful change.

Van Knippenberg and van Ginkel (2021) highlighted that leadership for diversity mindsets fosters information elaboration, the process of building upon and integrating diverse knowledge inputs. They emphasise that diverse teams, when effectively led, are more likely to achieve higher levels of creativity and solution generation. For health and care middle managers, engaging with leadership models from industries such as technology, finance, or manufacturing can inspire novel strategies for patient care, team management, and service improvement.

Lyons et al., (2020) also noted that leadership development programmes incorporating cross-sector engagement were more likely to lead to sustained workplace innovation. Participants who engaged with peers from outside their immediate field demonstrated greater openness to change initiatives and a higher likelihood of implementing new practices.

These findings suggest that cross-industry peer learning can serve as a catalyst for innovation and change leadership. For the demographic at the centre of this study, health and care middle managers in Betsi Cadwaladr University Health Board (BCUHB), exposure to alternative leadership styles and sector practices may enhance individual confidence and drive the evolution of workplace culture towards greater adaptability, collaboration, and continuous improvement.

3.4 Creating a Supportive Environment for Leadership Development

Developing leadership confidence through cross-industry peer learning requires not only exposure to diverse perspectives but also the creation of psychologically safe environments where middle managers feel encouraged to engage, take risks, and reflect openly. Psychological safety, defined by Edmondson (1999) as a climate where individuals feel safe to express ideas and concerns without fear of negative consequences, is increasingly recognised as a cornerstone of effective learning environments. In their study on interprofessional education, Behrend et al., (2019) noted that structured activities designed to promote mutual respect and active listening enhanced the willingness of participants to share experiences, even when these challenged traditional norms or hierarchical expectations. Similarly, Yi et al., (2024) emphasised that heterogeneous group learning was only effective when learners perceived the environment as respectful and non-judgmental.

Adult learners, such as the health and care middle managers involved in this study, bring a wealth of professional experience to peer learning contexts. Knowles' (1980) theory of andragogy suggests that adults are motivated to learn when the material is relevant to their real-world challenges and when they are actively involved in the learning process. Cross-industry peer learning aligns well with andragogical principles, providing opportunities for participants to engage in problem-centred discussions, share practical strategies, and reflect critically on their leadership styles. Jackson and Manley (2021) support this view, noting that leadership programmes that acknowledge and leverage existing professional experience are more likely to result in confidence gains and behaviour change.

Reflection emerges consistently across the literature as a critical mechanism for consolidating learning and enhancing leadership self-efficacy. Kolb's (1984) Experiential Learning Cycle positions reflective observation as a key phase where learners make sense of their experiences and plan for future application. Burgess et al., (2020) observed that structured opportunities for critical reflection within small group learning environments supported deeper integration of leadership concepts into daily practice. Facilitated reflective exercises enable middle managers to link new insights from peers across industries with their own organisational challenges, thereby strengthening their confidence to initiate and lead change.

Employer expectations and encouragement also play a vital role in the development of leadership confidence. Positive feedback, recognition of initiative, and supportive appraisals reinforce the application of newly developed leadership skills. Lyons et al., (2020) identified that leadership development initiatives

were most effective when organisations actively endorsed participation and acknowledged the application of learning outcomes. Without such organisational reinforcement, there is a risk that gains in confidence developed through peer learning may not fully translate into workplace behaviour change.

Finally, the importance of learning through doing should not be underestimated. Experiential activities, opportunities to practise leadership techniques, and visible demonstration of new skills contribute significantly to confidence building. Studies such as those by Behrend et al., (2019) and Jackson and Manley (2021) found that leadership development programmes which included opportunities for action learning, simulation exercises, and live projects were more effective at embedding skills than those reliant solely on theoretical instruction.

Overall, creating psychologically safe, reflective, and practically focused learning environments is essential to maximising the benefits of cross-industry peer learning for health and care middle managers. Acknowledging existing professional expertise, promoting critical reflection, and ensuring organisational reinforcement collectively support the transition from learning to confident leadership practice in the workplace.

3.5 Summary of Key Issues from the Literature

The literature reviewed highlights a strong consensus that cross-industry peer learning offers significant benefits for leadership development, particularly in building confidence and promoting workplace innovation. Studies by Yi et al. (2024), Behrend et al. (2019), and Lyons et al., (2020) demonstrate that exposure to heterogeneous perspectives fosters reflective learning, enhances leadership self-efficacy, and supports the development of more adaptable and innovative leadership practices. Jackson and Manley (2021) further reinforce that structured peer learning opportunities can lead to sustained increases in leadership confidence, while Tewfik (2022) offers insight into the psychological barriers that diverse peer support can help to overcome, such as workplace impostor thoughts.

Key themes emerging from the literature include the role of experiential learning in leadership development (Kolb, 1984), the social construction of confidence through peer interaction (Bandura, 1977), and the importance of idea cross-pollination in stimulating change leadership. Collectively, the evidence suggests that cross-sector peer learning environments offer middle managers the opportunity to reflect on, challenge, and expand their leadership approaches.

Collectively, the evidence suggests that cross-sector peer learning environments offer middle managers valuable opportunities to reflect on, challenge, and develop their leadership practice. These settings promote confidence-building, encourage innovation, and foster a deeper understanding of leadership through exposure to diverse perspectives. However, a clear gap remains in the existing literature: few studies have focused specifically on cross-industry peer learning interventions involving health and care middle managers in the United Kingdom. While broader leadership development programmes have been evaluated, limited attention has been given to the particular dynamics experienced by health and care professionals when engaging with peers from outside their sector in a structured classroom environment.

This action research study addresses this gap by examining how cross-industry peer learning influences the confidence of health and care middle managers to lead workplace change within the BCUHB context. In doing so, it contributes to a growing body of knowledge on the impact of diverse peer learning on leadership development and organisational innovation in healthcare settings.

4 Research Methods

4.1 Introduction to Methodology

This study adopts an Action Research methodology, drawing on a participatory and reflective research tradition suited to practitioner-led inquiry in professional education settings. Action Research is well established in the fields of health, education, and organisational development (Coghlan & Brannick, 2014), and is particularly appropriate where the researcher is embedded in the context and aims to support practical improvement. This approach closely aligns with the purpose of this study, which is to explore real-world leadership experiences and the influence of peer learning within a specific development programme.

Traditional leadership development research has tended to rely on quantitative approaches such as pre- and post-course evaluations, or retrospective surveys (Lyons et al., 2020). While such methods offer useful

generalisations, they often overlook the complexity and personal nature of leadership confidence, especially in cross-industry environments where lived experience, reflection, and dialogue are central to learning. This study takes a different route, adopting qualitative semi-structured interviews to capture the depth of participant insight and provide a richer understanding of how peer learning affects confidence and change readiness.

A constructivist philosophical lens underpins the research, valuing individual experience and the co-construction of knowledge. Rather than aiming to produce generalised findings, the study explores how participants made sense of their learning and applied it in real workplace situations. This approach suits the practical and context-driven nature of the study, which took place within an ILM leadership development programme delivered across multiple sectors in North Wales.

Figure 2 below shows how the study's design decisions are mapped against Saunders et al.'s (2019) Research Onion, a recognised model that helps visualise how different layers of research methodology interconnect. The diagram has been adapted to support the justification for using a mixed methods, interpretivist, and action research approach.

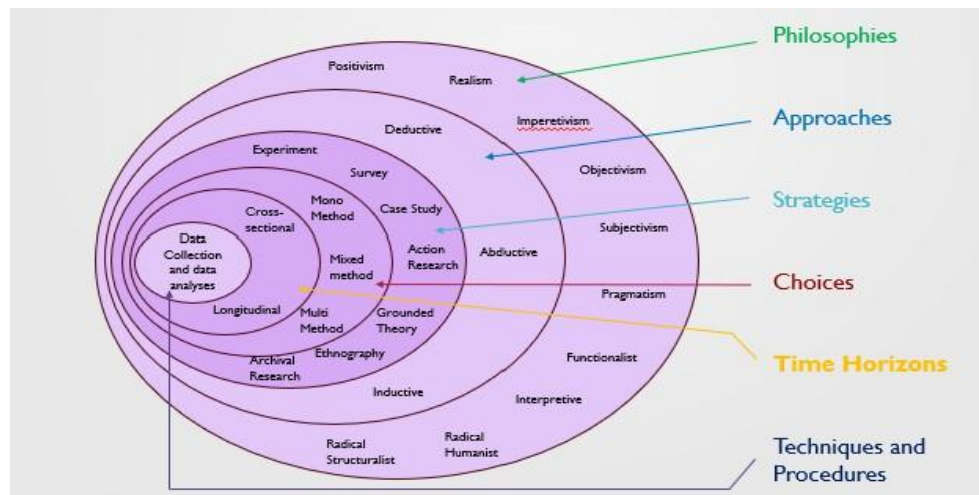


Figure 2: Navigating Research Design Using Saunders' Research Onion

4.2 Research Design

This study adopted a sequential mixed methods design, incorporating both quantitative and qualitative data collection.

- Phase 1 involved a short survey of ILM learners to identify broad patterns in perceived leadership development and to highlight participants suitable for follow-up interviews.
- Phase 2 built on these findings through a series of in-depth, semi-structured interviews exploring participants' lived experiences of cross-industry peer learning and its impact on leadership confidence and change implementation.

This report focuses on the analysis of Phase 2 (interview) data, with the survey results used primarily to inform sampling and thematic development. The combined approach allows for both breadth and depth in understanding the influence of peer learning within the NHS Wales context.

4.3 Participant Selection

Participants were selected using purposive sampling, with a focus on NHS Wales employees, particularly those from Betsi Cadwaladr University Health Board (BCUHB), who had studied alongside peers from other sectors. This sampling strategy ensured alignment with the study's aim to explore how cross-sector peer interaction influences leadership confidence and change implementation within health and care settings.

An initial survey was completed by 17 ILM learners (see Appendix D), capturing self-reported insights into leadership confidence, sector background, and the perceived impact of peer learning. Responses highlighted strong levels of engagement with cross-industry collaboration and were used to identify potential interview participants. Selection was based on the richness of open-text responses and the inclusion of

individuals working across diverse departments within BCUHB. These responses informed the purposive sampling of six participants for Phase 2.

Participants represented a range of clinical and non-clinical roles and had varying levels of prior leadership experience. All had completed ILM qualifications in mixed-industry cohorts, alongside learners from both private (e.g. manufacturing, engineering) and public (e.g. local government) sectors.

4.4 Data Collection

Data collection involved two stages. Firstly, an online survey was distributed to ILM learners across several cohorts using Qualtrics. The survey comprised both closed and open-ended questions designed to capture participants' initial perceptions of leadership confidence, their experiences of learning with peers from different sectors, and any examples of change applied in the workplace. The survey was live for two weeks and yielded 17 responses. These provided early indicators of thematic relevance and informed the selection of participants for Phase 2 interviews.

Secondly, six semi-structured interviews were conducted with selected NHS Wales learners from BCUHB. These interviews aimed to explore participants' experiences of cross-industry peer learning in greater depth, particularly in relation to confidence-building and implementation of workplace change. A consistent thematic guide was used, aligned to the study's conceptual framework, which integrates Kolb's experiential learning theory, Bandura's self-efficacy theory, and Knowles' principles of andragogy. Follow-up questions encouraged depth and clarification of key insights. Interviews were conducted either face-to-face or via Google Meet, recorded and transcribed with full informed consent in line with ethical approval.

The table below provides an overview of the six interview participants selected for Phase 2, including their departmental context, role type, ILM qualification level, and the format through which the interviews were conducted. All participants were employed by Betsi Cadwaladr University Health Board (BCUHB) and had engaged in cross-industry peer learning environments.

Table 1: Overview of Interview Participants

Participant	Department	Role Type	Delivery Format	ILM Level	Interview Format
1	Mental Health Services	Clinical Manager	Cross-Industry	Level 4	Google Meet online
2	Primary Healthcare	Administrative Lead	Cross-Industry	Level 4	Google Meet online
3	Pharmacy	Project Coordinator	Cross-Industry	Level 5	Google Meet online
4	Prison Healthcare (Acute Services)	Operations Manager	Cross-Industry	Level 5	Face to Face
5	Learning Disabilities Services	Middle Manager	Cross-Industry	Level 4	Google Meet online
6	Prison Healthcare (Pharmacy)	Service Improvements Manager	Cross-Industry	Level 4	Face to Face

Note: Table 1 presents a summary of interview participants involved in Phase 2. All were BCUHB middle managers engaged in cross-industry ILM programmes at Level 4 or 5.

4.5 Data Analysis

This study employed a mixed methods analysis approach, reflecting its sequential design. The qualitative interviews were analysed inductively, while survey data provided supporting quantitative insights. Together, they enabled triangulation across learner reflections and broader cohort trends.

4.5.1 Survey Data Analysis

The initial survey data provided a foundation for understanding participants' self-perceived leadership confidence, experiences of peer learning, and application of ILM training in the workplace. Responses were collected from 17 learners and analysed using descriptive statistics (see Figures 3 and 4).

- The cross-sector learning experience was highly rated, with mean scores of 4.69 for both "I found the cross-industry aspect of the course engaging" and "I would recommend cross-sector learning to other middle managers."
- Participants also valued exposure to alternative leadership styles (mean = 4.63) and reported that hearing about other sectors supported creative problem solving (mean = 4.13).

These findings support previous research suggesting that leadership development is enriched by sectoral diversity and varied perspectives (e.g. Lumby, 2019).

Please rate the following statements about your experience with practical, hands-on learning during the course. 16

Please rate the following statements about your experience with practical,....	Average (Please rate the following statements about your experience with practical,...)	Minimum (Please rate the following statements about your experience with practical,...)	Maximum (Please rate the following statements about your experience with practical,...)	Standard Deviation (Please rate the following statements about your experience with practical,...)	Count
I participated in structured activities where I could practise leadership skills	4.44	3.00	5.00	0.61	16
Experiential learning tasks helped me develop practical strategies I now use in the workplace.	4.19	3.00	5.00	0.73	16
Leading group-based tasks during the programme improved my confidence	4.38	4.00	5.00	0.48	16
Learning through experience helped me better understand leadership theory	4.69	4.00	5.00	0.46	16
Reflecting on my own leadership was a valuable part of the experience	4.56	4.00	5.00	0.50	16
Group tasks gave me real opportunities to lead	4.25	3.00	5.00	0.56	16
I learned more through discussion than through lectures alone	3.94	2.00	5.00	0.97	16
The course helped me build soft skills like communication and emotional intelligence	4.13	3.00	5.00	0.70	16

Figure 3: Survey Results — Cross-Industry Learning Engagement

Further questions explored learners' confidence in applying their training to lead change (Figure 4). Strong agreement was observed around:

- Feeling equipped to lead change (4.50),
- Applying learning to real situations (4.56),
- Sustaining change over time (4.44),
- And influencing others to support workplace change (4.44).

Please rate how confident you feel in applying your leadership learning to lead change in your workplace. 16

Please rate how confident you feel in applying your leadership learning to...	Neutral	Agree	Strongly agree
I feel equipped to lead change within my team or department	0	8	8
I feel able to overcome resistance when implementing new ideas	3	8	5
I understand how to influence others to support workplace change	0	9	7
I feel confident applying what I've learned to real situations	0	7	9
I have already started to make changes based on my learning	1	5	10
I believe I can sustain change initiatives over time	0	9	7
I feel confident navigating change across different teams or departments	2	8	6

Figure 4: Survey Results — Leadership Confidence Outcomes

4.5.2 Qualitative Interview Analysis

Interview transcripts were coded thematically using a constructivist grounded theory lens, guided by the conceptual framework incorporating Kolb (1984), Bandura (1997), and Knowles (1980). Themes such as:

- Confidence Development
- Peer Learning and Challenge
- Cross-Industry Reflection
- Innovation and Problem Solving
- Psychological Safety and
- Leadership Identity Formation

These were often interconnected, with peer engagement acting as a catalyst for confidence-building and adaptive leadership.

Participant narratives revealed that the diversity of sectors in the classroom was not only beneficial for reflective practice but acted as a stimulus for critical thinking and creative experimentation. This confirms previous findings by Goleman (2004) and extends the literature by evidencing how cross-industry exposure within leadership development enables broader systemic awareness and lateral thinking in NHS Wales settings.

4.5.3 Word Clouds and Open Comments

In addition to Likert-scale responses, the survey included open-ended questions inviting participants to reflect on their most significant takeaways from the cross-sector learning experience. These qualitative responses provided rich, individualised insights into what learners valued most, reinforcing and deepening the quantitative trends observed. To visualise emerging themes, a word cloud was generated from responses to Question 13 - “What stood out the most?” (Figure 5). This technique offers a clear and accessible way to identify recurring ideas across participants and highlights the emotional, cognitive, and interpersonal dimensions of learning in mixed-industry cohorts.



Figure 5: What Stood Out Most to Participants - Word Cloud

4.6 Limitations and Delimitations

As a small-scale qualitative study, findings are not generalisable to all leadership learners in NHS Wales. Participants were drawn from a single educational provider and may reflect a subset of highly engaged or reflective learners. The self-selecting nature of survey and interview respondents also introduces potential response bias, where those with strong views or positive experiences may have been more inclined to participate.

A further limitation lies in the insider researcher position. As the researcher also facilitates on the ILM programmes studied, existing relationships may have shaped participant responses in ways that subtly reinforced perceived expectations. While every effort was made to maintain neutrality, power dynamics and relational familiarity may have led to socially desirable answers or withheld critique. Reflexive journaling and transparent positionality statements were used to mitigate this risk.

The study is delimited to:

- NHS Wales learners who studied within cross-sector ILM Level 4 or 5 cohorts
- The geographical region of North Wales, particularly BCUHB
- The post-programme reflection stage, focusing on changes in confidence and leadership application

While these boundaries limit scope, they enhance depth and contextual relevance. Future studies could incorporate longitudinal tracking, comparative cohorts across regions, and perspectives from non-NHS learners to broaden the applicability of findings in action.

5 Findings and Analysis

5.1 Peer Learning Across Diverse Sectors: Challenging Assumptions and Broadening Perspective

A consistent finding across all six interviews was the positive impact of learning alongside peers from other sectors. Participants described how the presence of individuals from manufacturing, council services, and prison healthcare created a unique learning environment in which assumptions were challenged, and new perspectives were actively explored. This diversity appeared to foster more critical dialogue, greater openness to change, and a sense of mutual learning that would not have been possible in a single-sector cohort.

One participant noted:

"If I'd been with all NHS people, I think we'd have just kept nodding and agreeing – but having someone from steel or aerospace challenge how we work made me think again. It helped me realise how stuck we can get in NHS ways of thinking."

This finding aligns closely with Kolb's (1984) Experiential Learning Cycle, which highlights the value of concrete experiences followed by reflective observation. The opportunity to encounter unfamiliar approaches and attitudes prompted learners to reconsider their own practices. The same effect is observed in Behrend et al. (2019), who found that structured engagement between professionals from different disciplines enhanced learning by surfacing hidden assumptions and encouraging collaboration beyond conventional boundaries.

Yi et al. (2024) also emphasised that learning environments designed around professional diversity promote empathy and communication, both precursors to confident leadership. Participants in the current study echoed this, often describing how insights from peers helped them question the status quo in their own departments and appreciate alternative ways of managing people or solving problems.

However, some participants admitted that this diversity initially felt uncomfortable. One described being “put on the spot” by a peer who questioned their team's handling of service demand, saying:

“At first I was defensive – I thought, they just don't understand the pressures we're under in healthcare. But later I realised it was a fair challenge, and actually, it made me think of ways to improve.”

This suggests that while diversity can create cognitive dissonance, it also acts as a stimulus for deeper reflection. It strengthens the claim in van Knippenberg and van Ginkel (2021) that diversity of thought, when handled respectfully, leads to better leadership adaptability.

Notably, this finding expands on the existing literature by focusing specifically on cross-industry, rather than interdisciplinary, peer learning. While previous studies have examined multi-professional learning within health (e.g., Behrend et al., 2019; Jackson & Manley, 2021), few have investigated the deliberate mixing of public sector healthcare professionals with those from engineering, food production, or local government. This distinction is important, as it broadens the understanding of how leadership learning is affected not only by different professional lenses, but by fundamentally different organisational cultures.

In summary, peer learning across sectors acted as both a catalyst for critical thinking and a platform for reflective growth. This supports the argument that diversity in learning cohorts is not simply a desirable feature, but a key mechanism for leadership development. It also contributes new evidence that cross industry peer environments can enhance health and care managers' readiness to adapt and innovate, even when the experience challenges their pre-existing views.

5.2 Leadership Confidence: From Self-Doubt to Self-Efficacy

Developing leadership confidence emerged as a central theme across the interviews. While many participants entered the ILM programme feeling uncertain about their leadership identity, most reported significant growth in confidence as a result of their interactions with peers from other sectors. Crucially, this development was not solely due to course content, but rather the social and reflective dimensions of peer engagement.

One participant reflected:

“It wasn't about learning more policies or leadership models. It was realising that I already had the experience, I just hadn't seen myself as a leader until others said, ‘You handled that really well.’ That stuck with me.”

This aligns directly with Bandura's (1977) theory of self-efficacy, which emphasises the role of social reinforcement, vicarious learning, and mastery experiences in building belief in one's own competence. Peer learning environments created opportunities for participants to hear their skills reflected back to them, to compare challenges across contexts, and to validate their leadership instincts through feedback and shared reflection.

This confidence is further supported by survey data, where participants rated their ability to lead teams, make decisions, and initiate change (Figure 6).

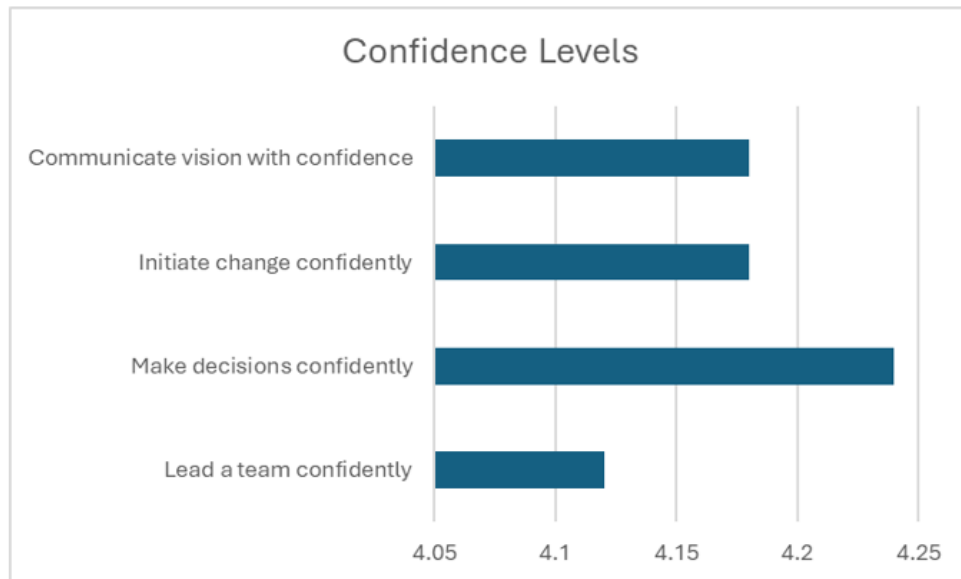


Figure 6: Participant confidence in key leadership tasks after the programme

The literature supports this connection. Tewfik (2022) highlights how impostor thoughts; internalised doubt despite objective competence; can be mitigated through supportive peer interactions. The current study corroborates this: several participants described overcoming doubts by recognising that others, even from very different industries, shared similar uncertainties about leadership.

“When someone from the council said they felt out of their depth too, I thought, it’s not just me. That was powerful.”

Jackson and Manley (2021) similarly found that confidence gains in multi-professional leadership programmes often stemmed from the informal, peer-based learning that occurred between structured sessions. That pattern was echoed in this study, where participants emphasised how side conversations, case study group work, and sharing workplace dilemmas helped them see their own growth.

Quantitative data reinforced the strong sense of learning and encouragement drawn from peers (Figure 7).



Figure 7: Perceived peer support and learning from others across the cohort

However, not all participants experienced a uniform rise in confidence. A few described moments of comparative doubt, feeling “less articulate” than peers from more corporate or commercially driven sectors. In one case, a participant admitted that peers from private industry seemed more assertive and used business terms they didn’t understand, which initially undermined their self-perception as a capable leader.

This nuance adds critical value to the existing literature. While most research frames peer learning as a universally positive mechanism for confidence development (e.g., Lyons et al., 2020), this study reveals that cross-sector comparisons can occasionally deepen insecurities, particularly when professional language or leadership styles differ sharply. This insight suggests that facilitation style and psychological safety are vital to ensure that diversity leads to growth rather than disengagement.

Overall, the findings reinforce that leadership confidence is not simply an internal trait, but a socially constructed capacity, developed through interaction, reflection, and affirmation. Cross-industry peer learning provides a powerful platform for this process, particularly when learners feel safe to share vulnerabilities and are exposed to peers who challenge and support in equal measure. The study adds to the literature by highlighting that self-efficacy in leadership can be enhanced through diversity but also requires careful scaffolding to prevent comparative doubt.

Survey responses supported the finding that participants saw themselves more as leaders by the end of the programme (Figure 8).

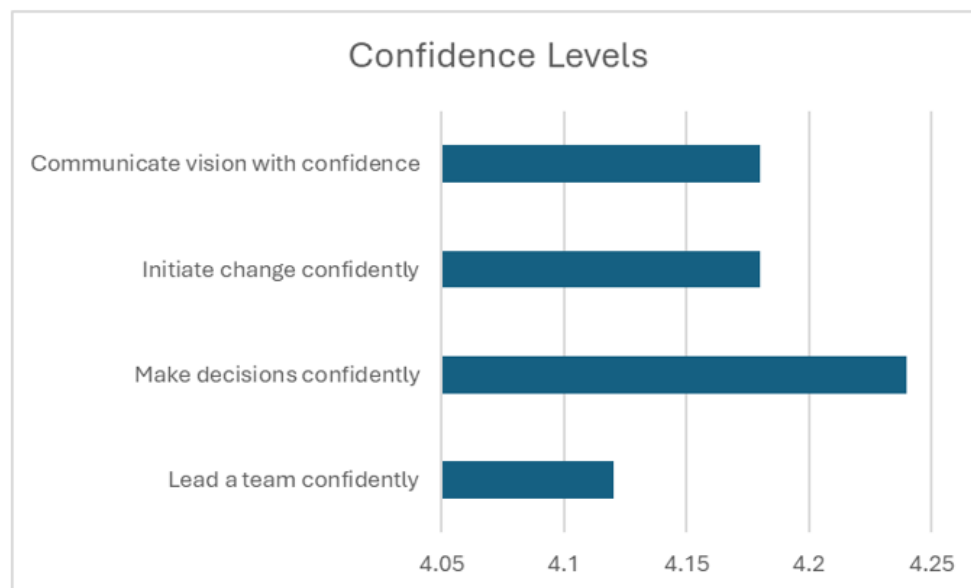


Figure 8: Participant reflections on leadership identity growth after the programme

These findings add complexity to the current understanding of leadership confidence. Rather than viewing confidence as a fixed attribute to be acquired, this study reinforces its fluid and relational nature. Confidence was often described as something ‘noticed’ or ‘reflected back’ by others, suggesting a dynamic loop between internal belief and external validation. This challenges linear models of competence building and supports a socially constructed view of leadership identity (Billett, 2011). Peer affirmation emerged as a powerful mechanism, particularly when learners saw their actions mirrored by those from different sectors.

The experience of growing confidence through peer validation also has implications beyond the immediate context of the programme. Within NHS Wales, middle managers often operate in high pressure, target driven environments where formal recognition is limited, and opportunities for developmental feedback are scarce. This can foster a culture of self-doubt, where individuals question their suitability for leadership despite possessing the necessary experience and competence.

“You doubt yourself because no one ever tells you you’re doing a good job, you just assume you’re not.”

The findings of this study suggest that cross-industry peer learning acts as a counterbalance to this trend by providing a psychologically safe space in which learners can test ideas, share concerns, and receive feedback without fear of hierarchical judgment.

“Being in that room, hearing someone from the private sector say they also feel out of their depth, it just made me breathe easier.”

In this way, the programme functioned not just as a training intervention, but as a restorative space, one in which impostor syndrome could be actively dismantled. This highlights the value of embedding structured peer reflection within leadership development models, particularly for those in emotionally demanding public service roles. The social learning dimension should be seen not as an add-on, but as a core component of building resilient and self-aware leadership capacity.

5.3 Barriers to Change: Organisational Culture and Hierarchy

While participants generally reported increased leadership confidence through cross-industry peer learning, many described significant barriers to applying this confidence in practice. These barriers were most commonly linked to entrenched organisational cultures within NHS Wales, including hierarchical decision-making, resistance to innovation, and inconsistent managerial support.

Several participants expressed frustration that, despite gaining new perspectives and leadership tools, their ideas for change were dismissed or ignored upon return to their departments:

“I went back to work feeling energised and ready to make improvements. But I kept hitting walls, either because of bureaucracy or because my ideas didn’t come from someone more senior.”

This feedback challenges the assumption, common in much of the leadership development literature, that confidence naturally leads to behavioural change. While studies such as Lyons et al. (2020) and Jackson and Manley (2021) highlight increase in confidence and leadership application following structured programmes, this research adds nuance by showing that confidence can be stifled by structural and cultural resistance. In particular, some participants described feeling unable to lead because their roles lacked formal authority, even though they had gained informal credibility within their peer group.

In contrast to private sector peers, who were often described as more empowered to act on change quickly, NHS middle managers felt constrained by slow systems and cautious leadership. One participant compared their experience to that of a peer from a manufacturing firm:

“They talked about trialling something new that week and seeing immediate results. I couldn’t even get a meeting to pitch an idea.”

This insight points to a critical conflict with the literature: while peer learning environments foster readiness for change, the application of that change remains highly context dependent. The health and care sector, particularly within large systems like BCUHB, may not provide the same agility or autonomy seen in other industries. This friction between individual growth and institutional inertia represents a key finding of this study and highlights a limitation in existing frameworks that focus heavily on the learner rather than the environment.

The role of line management also emerged as a significant enabling or inhibiting factor. Participants who reported encouragement from supervisors were far more likely to apply their learning and sustain their confidence. Conversely, others felt discouraged when their developmental efforts were met with indifference:

“There’s no point in pushing an idea when you know your manager won’t back you. It knocks your confidence all over again.”

This finding reinforces conclusions drawn by Behrend et al. (2019) and Knowles (1980), who emphasised that adult learning must be relevant and supported by organisational structures in order to translate into action. Without systemic reinforcement, peer learning risks becoming an isolated experience, rather than a catalyst for organisational transformation.

“I felt so motivated on the course, but when I got back to work, there was no space to try anything new. It was deflating.”

In summary, while the cross-industry learning environment clearly contributed to leadership confidence, the extent to which participants could apply their learning was mediated by organisational culture, role hierarchy, and managerial support. These contextual barriers must be acknowledged in the design of leadership development initiatives, particularly in complex public sector systems. This study contributes a critical perspective by showing that even highly motivated, confident leaders may struggle to implement change when institutional systems are misaligned with their development.

“We talk about innovation all the time, but when I proposed a small change, my manager shut it down straight away. It makes you wonder what the point is.”

Additionally, this study raises critical questions about the readiness of public sector systems to absorb the innovations their staff are trained to lead. Participants' inability to trial new approaches or sustain momentum post-programme suggests a disconnect between individual development and institutional responsiveness. This mirror concerns raised by Pedler and Abbott (2013), who argue that leadership training without structural reform risks creating 'trained incapacity', where empowered individuals become disillusioned in the face of rigid systems. Therefore, leadership development must be embedded in broader organisational strategies that include culture change, systems thinking, and structural enablement.

5.4 Application in Practice: Translating Learning into Leadership

Despite facing cultural and systemic challenges, many participants described tangible ways in which cross industry peer learning influenced their leadership practice. This applied learning often emerged in small, adaptive behaviours rather than large-scale innovation, evidence that change, while not always dramatic, was meaningful and rooted in reflective growth.

Participants described increased willingness to engage staff in decision-making, model inclusive behaviours, and communicate more confidently with senior leaders:

“Before, I'd just stay quiet in those meetings. Now I speak up, I ask questions, and I know my input matters.”

This shift reflects Bandura's (1977) theory of self-efficacy in action, the belief that one's actions can influence outcomes. Importantly, participants attributed this shift not to formal instruction, but to the peer learning process itself: seeing others lead differently, sharing concerns in psychologically safe environments, and receiving validation from outside their usual team.

Several participants noted they had adopted practical tools or approaches shared by peers from outside the NHS:

“There was a guy from the steel industry who talked about daily huddles. I've started doing that with my team, just a five minute catch-up. It's made a difference to how we feel at the start of each shift.”

Such examples support Kolb's (1984) experiential learning model, where active experimentation follows reflection on new ideas. These small acts of applied learning are particularly significant in complex environments like BCUHB, where incremental shifts in practice often precede larger cultural or service changes.

Participants' examples of workplace adaptation reflect a form of incremental innovation, small, context specific changes that improve systems or behaviours over time. While such actions may not attract the same attention as large-scale organisational change, they are essential for building a culture of continuous improvement within public services. In many cases, these micro-changes were initiated informally, without permission or additional resources, suggesting a grassroots approach to leadership that is often undervalued in formal metrics.

“I didn't ask for permission. I just changed the way we were doing handovers to save us half an hour each shift. Nobody questioned it because it worked.”

“The learning made me realise I didn't have to wait for a policy to change, I could just trial something small in my team, reflect, and adapt it.”

This resonates with Argyris and Schön's (1978) concept of “double-loop learning,” where learners do not merely apply new techniques, but also challenge underlying assumptions about how things should be done.

Although the ILM programme did not explicitly use this terminology, its design enabled learners to reflect critically on their own workplace practices, often leading to subtle but meaningful shifts.

“Even just the way I ask questions now, I think differently. I’ve stopped assuming I know the answer, and that’s changed how my team responds.”

“I used to think change had to be massive. Now I see it as lots of little ripples that build up.”

These findings point to the importance of recognising and supporting adaptive leadership at all levels of the NHS, particularly in middle management roles where change is enacted through relationships rather than authority.

However, the ability to apply learning varied. Some participants, particularly those in roles with greater autonomy or within more flexible departments, described sustained changes in leadership behaviour. Others, particularly those working under unsupportive managers or within highly hierarchical settings, felt more limited:

“I’ve changed, but I’m not sure my environment has. I still do what I can, I coach more, I reflect more, but I pick my battles.”

This nuance is critical. It reinforces the importance of designing leadership programmes that not only build individual skills but also support learners in navigating the realities of their workplace contexts. The literature, particularly Jackson and Manley (2021), suggests that action learning sets and follow-up coaching may enhance transfer of learning, yet such structures were not consistently available to participants in this study.

In contrast to more traditional leadership training models that focus on content delivery, the ILM programme studied here appears to have created conditions for transformational learning. Knowles’ (1980) adult learning theory is evident throughout participant reflections: they valued relevance, autonomy, collaboration, and reflection. This aligns with Lyons et al. (2020), who highlight that the most impactful leadership development arises when learners are active participants in shaping the experience.

What also emerged was the value of small, relationship-based shifts in practice. Several participants described listening more attentively, taking time to understand different team perspectives, and inviting feedback from colleagues.

“I started actually listening instead of just waiting to respond. It changed the way people opened up to me.”

“I asked the team what they’d do differently if they were in charge. It sounds obvious, but I’d never thought to ask before.”

These micro level changes, while subtle, reflected deeper shifts in leadership mindset. They illustrate the cumulative power of reflective peer learning, not as a dramatic transformation, but as a layering of insight, behaviour, and confidence over time. This supports the view that leadership development is an ongoing, iterative process rather than a one-off event (Bolden et al., 2022).

Overall, the findings suggest that cross-industry peer learning not only increases leadership confidence but also promotes behavioural change, particularly when participants are empowered to adapt ideas and apply them within their specific contexts. The study’s contribution lies in showing that application is not universal or linear, but contingent, shaped by environment, role, and the presence of reinforcing structures. Programmes seeking to develop confident, innovative leaders must therefore go beyond classroom experience, embedding support mechanisms that enable lasting change in practice.

6 Conclusion

This action research study set out to explore how cross-industry peer learning influences the leadership confidence of health and care middle managers, particularly within NHS Wales and the Betsi Cadwaladr University Health Board (BCUHB). Through a sequential mixed methods design and rich qualitative interviews, the study illuminated the ways in which diverse peer interaction fosters reflective practice, builds self-efficacy, and promotes the adaptation of leadership behaviours in the workplace.

A key finding was that learning in mixed-industry cohorts challenged entrenched assumptions, broadened strategic thinking, and allowed participants to draw parallels between their own roles and those in other sectors. This stimulated greater confidence to lead change and reinforced the value of experiential, adult

oriented learning models. These findings contribute to an emerging but underdeveloped literature on cross sector peer learning in healthcare settings and help address a gap around the lived experiences of NHS Wales middle managers engaged in leadership development.

The implications of this research extend to several domains. For teaching and professional education, the study highlights the value of heterogeneity in cohort composition and the need to create psychologically safe, reflective learning environments. Programmes should deliberately structure opportunities for interindustry dialogue, shared reflection, and practical application. For management practice, findings suggest that leadership development should not stop at classroom delivery but be supported through coaching, action learning, or follow-up sessions to encourage workplace application. For policy, the research affirms the importance of cross-sector collaboration in leadership training, aligning with broader NHS and public service reform goals that call for more adaptable, systems thinking leaders.

However, this study is not without limitations. As noted in the methods section, the sample size was small and drawn from a single provider in North Wales, limiting generalisability. The research focused on post programme reflection and did not include longitudinal tracking of leadership behaviours over time. Additionally, the researcher's existing relationship with participants may have influenced interview dynamics, despite ethical safeguards and reflective neutrality.

Future research could explore how organisational culture moderates the impact of peer learning, particularly in hierarchical or change-resistant environments. It would also be valuable to examine how leadership behaviours evolve over time and whether confidence gains are sustained. Larger scale or longitudinal studies could provide deeper insight into how learning translates into long term change in healthcare systems. Future research should also examine the longitudinal impact of peer learning, particularly the extent to which confidence gains and behavioural changes are sustained over time. A mixed-methods longitudinal design, tracking learners at multiple points post programme, could offer richer insight into how leadership identity evolves and whether workplace constraints erode or amplify initial gains.

Additionally, there is scope to explore how different configurations of cross-sector cohorts influence learning outcomes. For instance, does exposure to private sector peers generate more discomfort but also greater reflective insight compared to peers from other public services? Finally, research should consider the facilitators' role in enabling or constraining peer learning, as this study suggests that psychological safety and group dynamics are pivotal. These strands of inquiry could inform more tailored, context sensitive leadership development that better aligns with the evolving demands of health and care systems in Wales and beyond.

In conclusion, this study demonstrates that cross-industry peer learning has the potential to build leadership confidence and promote adaptive change in complex environments. It reinforces the need for practice based, socially constructed models of leadership development and offers practical insight for educators, managers, and policy makers invested in cultivating confident, innovative leaders within NHS Wales. It also invites a shift in focus, from isolated programme impact to systemic alignment, to ensure that leadership development efforts are not only transformative for individuals, but sustainable across the organisations they seek to improve.

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8 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Designing an Innovation Culture in the Welsh NHS: A Multi-Stakeholder Perspective

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Abstract:

The management of innovation is a key pressure facing all organisations. The most significant challenge is in the context of health and care services where there are severe pressures to change practice, austerity measures and endless new potential innovations that can transform services. Some innovations are proven and others not but the most important challenge to the NHS is how to mobilise and engage with staff who know the most about service delivery and how best to improve through innovating. Wales is a microcosm of the UK and wider public healthcare systems and was chosen as a case study to explore how professionals and organisations are prepared and engaged with the innovation agenda and also to see the gaps that are hindering meaningful progress. The research included social network analysis and a questionnaire given to purposively selected experts, to assess the importance of staff training to develop this new staff capability in Wales. The study finds many shortfalls but also positivity that innovation is possible and brings significant transformation performance improvements beyond what can be achieved by continuous improvement alone.

Keywords: Innovation, healthcare, NHS, Change, training, Wales.

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1 Introduction

1.1 Importance of Innovation

Innovation within healthcare is a dynamic, multi-faceted process, one that requires coordination, shared purpose, and sustained engagement across diverse stakeholders (Greenhalgh et al., 2004). In NHS Wales, the subject of this research, delivering transformation “at scale” depends not only on policy direction but on how those policies are interpreted, enacted, and supported across all levels of the system (See Table 1). This research project, titled *Multi-Stakeholder Perspective*, explores how innovation is experienced, enabled, and embedded across the health and care landscape, with a particular focus on the cultural, strategic, and structural conditions needed for success.

The growing recognition that innovation is an ecosystem of many organisations, and that innovation does not arise from a single source is a key message from Government policies and the academic literatures. Innovation (Table 2) in the health and care context is shaped by multiple actors: clinical staff, policymakers, innovation leads, patients, academics, industry partners, and third sector organisations.

Table 1: National Policies for Innovation

Strategy	Lead body	Focus	Relevance	Key themes
Research and Innovation Strategy for Wales (planned refresh in alignment with Wales Innovates) (2025)	Welsh Government	Coordinating research, development, and innovation efforts across sectors	Supports alignment of academic, NHS and industry innovation activity.	Cross-sector innovation, funding, data, ethical and responsible innovation.
Wales Innovates: Creating a Stronger, Fairer, Greener Wales (2023)	Welsh Government	Cross-sector innovation strategy covering health, economy, environment, and public services.	Sets the national vision for mission-led innovation, co-production, and inclusive economic growth.	Public sector innovation, equity, sustainability, collaboration with academia and industry
Digital Strategy for Wales (2021)	Welsh Government	National digital transformation across all public services, including health and care.	Promotes digital inclusion, access to data, and digital infrastructure to support innovation.	Innovation through digital platforms, workforce digital skills, and public service delivery.
Health and Care Workforce Strategy for Wales: 2020–2030	Health Education and Improvement Wales (HEIW) & Social Care Wales	Long-term workforce planning and development.	Explicitly links innovation to workforce capability, future leadership, digital skills and culture change.	Innovation skills, training, talent development, career pathways for innovators.
A Healthier Wales: Our Plan for Health and Social Care (2018)	Welsh Government	Long-term vision for a “whole system approach” to health and social care	Innovation is central to transforming services, integration, digital transformation, and prevention.	Person-centred care, innovation to support seamless service models, digital and workforce reform.
Value-Based Health Care (VBHC) Framework in Wales	NHS Wales, Welsh Government, Life Sciences Hub Wales	Aligning care with outcomes that matter to patients.	Encourages innovative models of care, outcomes measurement, and service redesign.	Co-production, digital tools, data sharing, person-centred innovation.
Bevan Commission: Prudent Healthcare and Innovation Reports (Ongoing)	Independent expert advisory group to Welsh Government	Thought leadership on innovation, sustainability, and transformation.	Offers practical and strategic insights for embedding innovation across the system.	Prudent innovation, co-production, value, sustainability.
Well-being of Future Generations (Wales) Act (2015)	Welsh Government	Long-term sustainable thinking and decision-making	Encourages innovative approaches to improving population well-being across generations.	Cross-sector innovation, funding, data, ethical and responsible innovation.

Each stakeholder brings unique insights, priorities, capabilities and also constraints to the innovation optimisation process. Yet despite this stakeholder diversity, they are interconnected, dependent and success in one area often depends on alignment and support from others. This project seeks to understand those interdependencies, to surface what supports or hinders innovation from moving beyond isolated pilots to become part of a sustainable, system-wide transformation.

The definitions in Table 2. show that innovation is understood not simply as the generation of new ideas, but as their successful application within specific contexts to achieve measurable value. Across authors and timelines, there is a consistent emphasis on intentionality, application, *and* outcome-focused change. Some, like the Department of Health and OECD, highlight public value and service impact. Greenhalgh and West both situate innovation within the behavioural and organisational culture domain—an area this research particularly builds on. Collectively, these definitions reinforce that innovation in health and care is not a standalone event, but a dynamic, applied, and relational process.

Table 2: Definitions of Innovation. Source (The Researcher)

Definition	Year	Author
A novel set of behaviours, routines, and ways of working that are directed at improving outcomes.	2004	Greenhalgh et al.
A process of translating ideas into goods or services that create value or improve outcomes.	2008	Organisation for Economic CO-operation and Development
The application of new ideas, processes, products or procedures intended to benefit service users.	2011	Department of Health (UK)
The intentional introduction and application of new ideas, processes or procedures, within a role, group or organisation, to benefit outcomes.	2003	West & Farr

The role of innovation for the health and care context therefore presents a new context for innovation and an evolution from the traditional manufacturing context. It is an area of significant importance but also significant confusion hence this research seeks to close this gap.

1.2 About the Researcher

The researcher is an Innovation Programme Manager employed by Cardiff and Vale University Health Board. She holds significant responsibility (across stakeholders in Wales) to foster a culture of innovation, identify and evaluate opportunities, and ensure alignment with national policy and strategic direction. The researcher works at the intersection of clinical need, research, and system improvement as well as at the Welsh Government, academic, and industry partner levels to translate ideas into impact. The background of the researcher draws from her professional training as a registered nurse, of 30 years of NHS experience, which has generated a deep appreciation of frontline challenges and a strong commitment to compassionate, inclusive care. As a Senior Research Nurse supporting the design and delivery of clinical research, the researcher has managed innovation processes and have shaped her belief that innovation must always be grounded in human experience, especially the voices of those too often unheard and excluded from such practices. The researcher's intention is to explore how the national systems of Wales design processes that are truly 'fit for the future'.

2 Literature Review and Gap

A review of key Welsh policy strategies reveals a strong and consistent narrative around the role of innovation in transforming health and care. Documents such as Wales Innovates (2023), the Health and Care Workforce Strategy (2020–2030), and A Healthier Wales (2018) all prioritise cross-sector collaboration, person-centred care, and digital transformation. These strategies also emphasise the importance of workforce capability, ethical practice, and outcome-focused delivery, suggesting that innovation is not simply a technical process, but a cultural and relational one. Together, they paint a picture of a system that aspires to embed innovation as a core function, supported by values such as inclusivity, sustainability, and continuous learning.

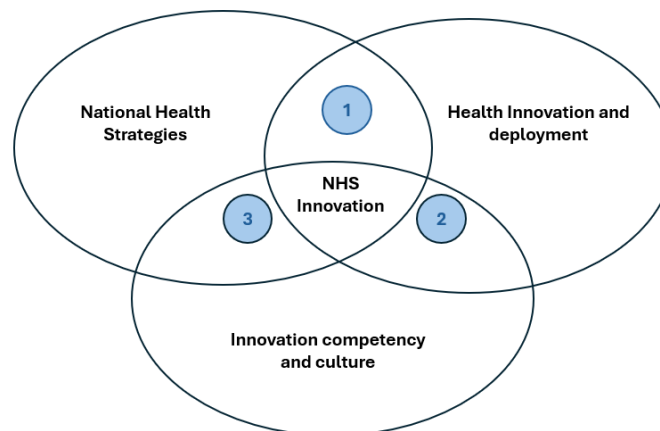


Fig 1: The Literature Framed, Source, The Researcher

Innovation, as a topic and management process, is framed using the three overlapping areas of inquiry articulated in fig 1:

1. Health Innovation and Deployment × Innovation Competency and culture
2. Innovation Competency and culture × National Health Strategies
3. National Health Strategies × Health Innovation and Deployment

Pragmatically, it is hoped the thematic literature review helps bridge the gap between national ambition and organisational reality. By identifying common policy priorities, the analysis clarifies what kinds of innovation activity are being encouraged and, by extension, what types of culture, leadership, and workforce readiness are needed to support them. It also offers a framework for assessing alignment: between what staff experience on the ground and what government envisions at a system level. As someone working at the intersection of policy and practice, this analysis reinforces the importance of translating strategic intent into meaningful support for staff, through training, leadership visibility, and protected time to innovate. It validates the need for this research and informs the criteria by which innovation culture, capacity, and outcomes should be assessed.

At this intersection lies the practical challenge I face every day: how to support people in turning good ideas into real, deliverable, and measurable innovations. Powell et al. (2012) offer a comprehensive taxonomy of implementation strategies, showing that successful innovation is not just about introducing something new, it is about doing so deliberately, with support, structure, and strategic alignment. These findings resonate with the reality in health boards, where innovation often fails not because ideas lack merit, but because staff lack the time, space, or confidence to take them forward.

Table 3: (Source: The Researcher)

Reference	Lead Author(s)	Focus	Relevance	Key Themes
National Health Strategies / Health Innovation and Deployment				
The Conceptualization of Value in the Value Proposition of New Health Technologies	Lehoux et al. (2018)	Defines value in early-stage health tech innovation	Stresses strategic alignment and stakeholder input in innovation	Value, policy, regulation, early design
Problems and Promises of Innovation	Dixon-Woods et al. (2011)	Explores systemic challenges in healthcare innovation	Shows why innovation often fails in practice	Barriers, systems thinking, realism
Strategies for Implementing Clinical Innovations	Powell et al. (2012)	Catalogues 68 implementation strategies	Offers actionable methods for innovation rollout	Deployment, stakeholder engagement, scale

Greenhalgh et al. (2004) underscore this challenge through their concept of absorptive capacity, the ability of individuals and organisations to identify, internalise, and apply new knowledge. In my experience, innovation capacity is not a fixed attribute but a dynamic one, shaped by organisational culture, leadership, and learning opportunities. Reeves et al. (2017) argue for the value of interprofessional learning, which I have found particularly effective when introducing cross-sector innovations involving industry or academic partners. These relationships, sprinkled with mentorship and training, create innovation ecosystems that continue to evolve and support organisational learning.

West et al. (2021) describe innovation as an “imperative” for health and care recovery, especially post-COVID-19. They argue that staff engagement and wellbeing are preconditions for innovation readiness. From my perspective, clinical burnout and morale are often invisible barriers to innovation, and unless we create safe, inclusive spaces for staff to lead change, transformation will remain superficial. This is echoed in the paper by Button et al. (2025) that explains how clinical staff face limited time, high burnout, and competing demands, making engagement with innovation difficult. This paper suggests involving staff in change improves outcomes but adds pressure, something that is palpable in my experience.

Equally, Marjanovic et al. (2020) points to the gap in formal innovation training across the NHS. I have found this to be a core obstacle. Many staff are enthusiastic about change but unsure how to navigate governance, risk, funding, or implementation pathways. This insight underpins my current MSc research, which explores the utility of structured innovation learning opportunities. For innovation to be everyone's business, we must give everyone the tools and confidence to engage with it.

Table 4: (Source: The Researcher)

Reference	Lead Author(s)	Focus	Relevance	Key Themes
Health Innovation and deployment / Innovation Competency and Culture				
Diffusion of Innovations in Service Organizations	Greenhalgh et al. (2004)	Systematic review on innovation adoption	Emphasises leadership, context, readiness	Adoption, leadership, context fit
Innovating for Improved Healthcare	Marjanovic et al. (2020)	Workforce capability and policy in NHS	Calls for structured development pathways	Skills, workforce, innovation training
Recovery and Renewal: Innovation Imperative	West et al. (2021)	Innovation as post-pandemic recovery strategy	Advocates cultural and structural change	Leadership, change, innovation culture

National strategies often set the tone for innovation, but unless these are linked to people and practice, the gap between policy and reality persists.

In *Wales Innovates* (2023), the Welsh Government sets out a bold, mission-led innovation agenda, seeking to create a fairer, greener, and more connected Wales. This aligns well with *A Healthier Wales* (2018), which calls for seamless, preventative, and person-centred care. However, these documents rarely articulate *how* to build the skills, roles, and cultures necessary to realise this vision in practice.

Lehoux et al. (2018) argue that health innovation must address system-level problems like equity, sustainability, and workforce strain—not just introduce new technologies. As an NHS leader, I have seen the consequences of adopting innovations that fail to fit into operational realities. The lesson is clear: strategy must walk hand-in-hand with capability-building and contextual understanding.

Best et al. (2012) and Nutley et al. (2007) both argue for a people-focused model of large-system transformation, which emphasises leadership, trust, and cultural readiness as critical enablers. This reflects my own belief that innovation is fundamentally relational. It cannot be imposed—it must be co-created, understood, and championed at all levels. Without this alignment, policy becomes rhetoric.

The Health and Care Workforce Strategy for Wales: 2020–2030 provides a helpful bridge between national ambition and individual capability. It explicitly recognises the importance of innovation literacy, digital confidence, and leadership development. I have found its principles helpful in guiding team development plans and justifying time for innovation capacity-building, but more work is needed to embed it operationally across all health boards.

Johnson et al. (2016) and Scott et al. (2003) offer further evidence on how organisational culture mediates innovation. In cultures where staff feel psychologically safe and aligned with purpose, innovation becomes a normal part of care. In contrast, in risk-averse or overly hierarchical cultures, even the best ideas struggle to surface. As someone who works across departments, I regularly witness this cultural variation. It reinforces the need for locally led, context-aware innovation approaches that respect existing dynamics while gently nudging systems forward.

Scaling innovation requires more than pilot projects; it requires national systems that are designed to support spread.

Table 5: (Source: The Researcher)

Reference	Lead Author(s)	Focus	Relevance	Key Themes
Innovation Competency and Culture / National Health Strategies				
Health IT and Digital Innovation	Sheikh et al. (2021)	National IT infrastructure for health learning	Aligns with digital strategies in Wales	Digital, learning health systems
Organisational Culture and Healthcare Performance	Scott et al. (2003)	Relationship between culture and performance	Culture as a strategy enabler	Culture, leadership, performance
Foundations for Future Welsh Health Model	McCann, H. (2024)	Vision for future-ready Welsh healthcare	Highlights innovation and workforce alignment	Strategy, innovation, readiness
Clinical Agility Case Study	Button et al. (2025)	Cancer center case study in Wales	Real-world agile innovation in action	Agility, adaptability, teamwork

The work of Paulus, Davis, and Steele (2008) on the Geisinger model illustrates how innovation can be embedded into the infrastructure of a health system. They describe continuous innovation as a cultural and operational norm, supported by IT systems, quality metrics, and organisational incentives. Wales has made progress toward this vision, particularly through the Value-Based Healthcare approach and digital record systems like WCCIS, but significant fragmentation remains.

Dixon-Woods et al. (2011) describe the paradox of innovation enthusiasm: organisations often chase novelty without supporting follow-through. I see this in the “pilot fatigue” that staff report. We must become more honest about what it takes to implement and scale change, including governance reform, digital readiness, and long-term resourcing.

Sheikh et al. (2021) advocate for national learning health systems, digitally enabled environments where data informs real-time improvements and innovation. This is particularly relevant in Wales, where our scale, integrated system, and public service ethos make this an achievable ambition. However, as Uprichard (2020) notes, digital tools must be integrated into broader support systems. Digital learning or platforms alone won't embed change unless staff feel connected to a wider innovation ecosystem.

The Digital Strategy for Wales (2021) frames, digital transformation as a public service priority, but real-world adoption is often slow. I've found that systems are frequently selected without adequate

engagement with frontline needs or deployment capacity. To address this, I advocate for more co-design with clinical teams, better horizon scanning, and stronger links between innovation leads, R&D, and operational managers.

The Bevan Commission also contributes thought leadership here, advocating for prudent innovation that is patient-led, scalable, and sustainable. Their emphasis on co-production and evaluation aligns closely with my practice (Howson; 2023). We need to assess not just what is new, but what is useful and implementable, particularly in under-resourced or rural settings.

The Collaborative Health Innovation framework in Fig 2. encapsulates the multi-dimensional reality described throughout this literature review. Sitting at the centre of its intersecting domains: strategic direction, workforce capability, infrastructure, and culture, is where my role as an Innovation Programme Manager is positioned. The literature affirms that innovation cannot thrive in isolation; it must be supported by coherent systems, shared purpose, and relational leadership (Greenhalgh et al., 2004; West et al., 2021). As someone translating policy into practice, I routinely navigate these intersections: enabling frontline staff, negotiating strategic alignment, and supporting scale-up in the face of limited time, capacity, or clarity.



Fig 2. Collaborative Health Innovation

The review highlighted a consistent theme: while national policy ambitions such as *Wales Innovates* and *A Healthier Wales* provide a bold vision, their success depends on how well they are operationalised. Sheikh et al. (2021) stress the importance of aligning digital strategy and workforce development, but often the implementation environment lacks the conditions for this alignment to take hold. The researchers experience echoes this, strategies frequently presume readiness that does not exist without cultural preparation, leadership visibility, and embedded support mechanisms. Without these, as Dixon-Woods et al. (2011) observed, innovation risks becoming a superficial or fragmented pursuit.

The literature also draws attention to workforce development as a critical enabler. Marjanovic et al. (2020) and Powell et al. (2012) argue for the creation of structured pathways, training, and mentorship to support innovation skills. This underpins this MSc project and informs the belief that innovation should be everyone's business, but only if we equip people accordingly. Greenhalgh's concept of absorptive capacity is especially relevant here: individuals and teams must be given the time, tools, and trust to engage meaningfully with change. Without this, policy remains abstract, and staff enthusiasm is lost to fatigue or uncertainty.

The cultural dimension cannot be overstated. As Scott et al. (2003) and Johnson et al. (2016) assert, organisational culture mediates not just attitudes to innovation but whether those ideas are voiced and acted on. The literature reinforces my own experience: that trust, safety, and shared leadership are the conditions under which staff creativity flourishes. Culture, then, is not an optional extra, it is a foundational mechanism.

This research and literature review collectively show that innovation is not a discrete function or one-off activity. It is a systemic capability that requires coherence between people, policy, and practice. Innovation, like any muscle, grows through deliberate use. For it to take root across NHS Wales, it must be supported consistently and meaningfully, not just in principle but in practice, from frontline teams to strategic leads. This research contributes to making that happen by surfacing not only what is missing but also what is possible when people are supported to lead change from wherever they are.

From the preceding discussions and areas of vagary in management practice, a research question emerged to focus and guide this study:

1. *What enables or inhibits a culture of innovation in the context of NHS Wales?*
 - a. Extends the work of Powell et al. (2012) by moving beyond implementation strategies to explore the cultural and contextual conditions that shape their success. It also builds on

Greenhalgh et al. (2004) by applying the concept of absorptive capacity specifically to the NHS Wales setting, examining how organisational readiness, leadership, and learning environments influence the adoption and sustainability of innovation.

2. What enables or inhibits a culture of innovation in the context of NHS Wales?

- a. To assist the reader, the researcher created a conceptual framework to show the features of innovation from the literature review and to enable a methodology to be designed.

2.1 Innovation in the Welsh NHS: A Conceptual Framework

The conceptual framework underpinning this research (fig.3) brings together national policy ambitions (such as A Healthier Wales, the Bevan Commission recommendations, and Wales Innovates) with operational realities. It considers how strategy, workforce engagement, competencies, networks, infrastructure, and funding interact to support innovation across the system. It also recognises the vital role of patient voice, public engagement, and cultural readiness, factors that are often less visible in high-level strategy but essential in practice.

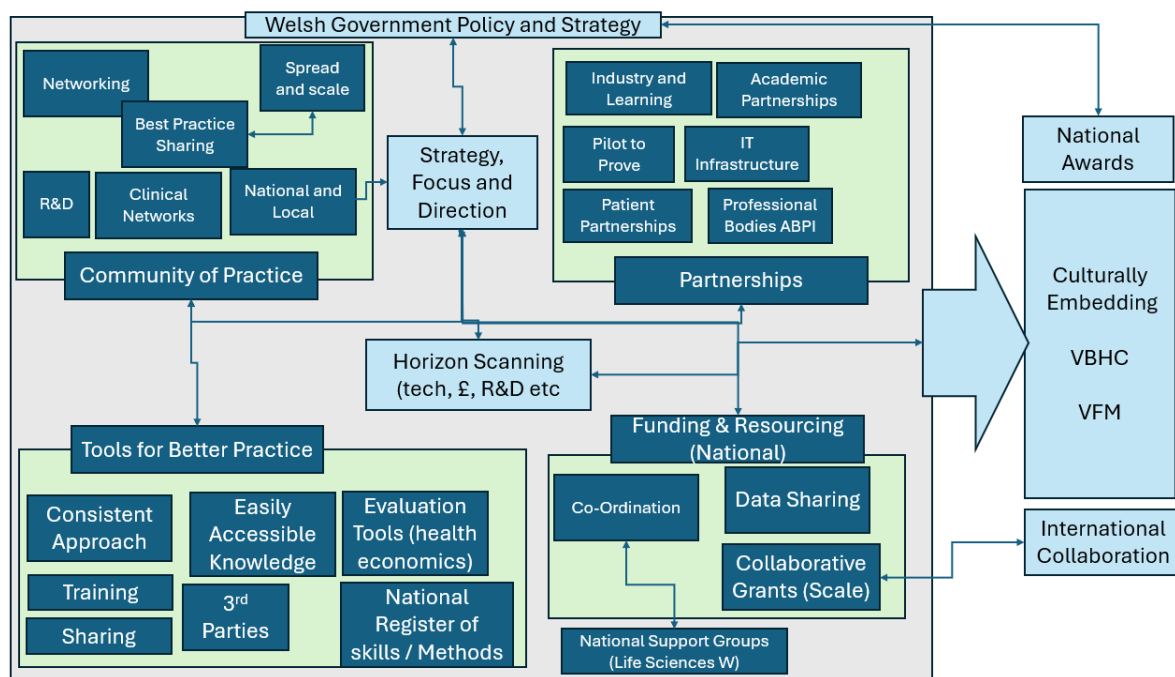


Fig 3. A Conceptual Framework, Source: The Researcher

3 Methodology and Research Design

This study was designed to be both context-rich and theory-building, acknowledging the layered complexity of innovation in healthcare systems, particularly within NHS Wales. The research explores how innovation is perceived, supported, and embedded across diverse organisational roles, focusing not only on the structural and strategic mechanisms but also on the human, cultural, and relational dimensions that enable innovation to thrive. The study adopts a pragmatic epistemology to understand innovation in its health and care context.

The methodology was designed to explore the lived experiences and social interactions of purposively selected management and executive level informants. This approach ensured a good insight into the thoughts and practices of 'system designers' and key persons who form the professional social network of innovation in NHS Wales. A phased mixed-methods approach was adopted involving the investigation of quantitative breadth (key members of the innovation population) and qualitative depth to detect nuances in the way in which innovation is evolving. The research design was iterative and responsive, enabling early findings to shape subsequent inquiry. The ultimate goal was to develop a contextualised understanding of innovation practice that could inform both local strategy and broader system-level learning.

3.1 Research Phases

The research was conducted in distinct but interconnected phases:

3.1.1 Literature Review

A key word search of established repositories (iFind, Google Scholar) generated the source for the literature review. Journal papers and grey literature was reviewed and internationally peer reviewed journals formed the basis of the literature. The literature review established the theoretical framework and policy context. It framed the research within three intersecting areas: national health strategy, innovation culture and competency, and innovation implementation. Key works included Greenhalgh et al. (2004), Powell et al. (2012), and West et al. (2021), among others. This review revealed gaps between national policy ambitions and frontline capability and informed the development of the conceptual framework underpinning the study.

3.1.2 Social Network Analysis (SNA)

This mapping of relational dynamics within the innovation ecosystem was employed to visualise and assess the innovation ecosystem within NHS Wales. The analysis identified NHS Innovation Leads as key connectors and highlighted both central actors (e.g., Welsh Government, Life Sciences Hub Wales) and peripheral ones (e.g., community organisations, public voice). SNA provided insight into information flow, power dynamics, and opportunities for more inclusive and integrated collaboration.

3.1.3 Questionnaire to Expert Informants

Purposely selected expert informants were selected for their diverse perspectives and strategic relevance and experience to the research question (persons identified in the previous phase). These included senior leaders from academia, NHS executive leadership, policymaking, clinical frontline, and innovation management, all with over 10 years of experience. The selection criteria included:

- Demonstrated leadership in health innovation
- Strategic position within the NHS or aligned sectors
- Ability to provide cross-system insight

The questionnaires included subjects concerning innovation training needs analysis, the current quality and availability of sources of training, the “needs” and preferences of the person and their employer for skills (covering voids) and the future plans for innovation training in current times. The questionnaire (administered electronically) employed broad questions, of a qualitative nature, and allowed for significant variety of response in the form of free text responses.

3.1.4 Thematic Analysis of Transcripts – Coding and synthesising insights.

The qualitative responses to the questionnaire were analysed using data displays and the thematic analysis advocated by Braun and Clarke (2006) and Miles, Huberman and Soldana (2016). Transcripts were coded inductively with themes that were then compared with the literature to create emergent field insights. The data displays allowed for pattern matching of common responses and outlier identification (innovation experience, perceptions of quality and availability, and strategic aspirations) across the expert sample. This visual and thematic synthesis enabled deeper understanding of shared and divergent viewpoints.

3.1.5 Gap Analysis

Gap analysis was used to compare current practice with the aspirations set out in national strategies such as *A Healthier Wales* and *Wales Innovates* and compare this with operational reality. This phase involved policy alignment checks, training matrix comparisons across NHS organisations, and review of innovation provision. The results revealed mismatches between policy ambition and operational readiness, especially regarding training access and leadership engagement

3.1.6 Ethics

The research complied fully with institutional ethical guidelines. Ethical approval was secured through Cardiff and Vale University Health Board's R&D Office and also Swansea University. Submission of the informants was obtained prior to questionnaire completion. The data was also anonymised and stored securely in accordance with GDPR and NHS information governance standards.

4 Field Research

4.1 Findings: Social network analysis

The Health Innovation Social Network map (Fig 4) developed by the researcher (from established literature and policy documents) provides a valuable lens through which to understand the complexity and interdependence of actors involved in fostering innovation across NHS Wales. At its centre are NHS Innovation Leads, who emerge as critical connectors within the system. Their relationships span national policy bodies, academic institutions, frontline clinicians, industry partners, and members of the public. This central positioning reflects their unique role in translating strategy into practice, facilitating collaboration, and sustaining innovation momentum. As such, their development, visibility, and leadership capacity are pivotal to system-wide transformation.

Health Innovation Social Network

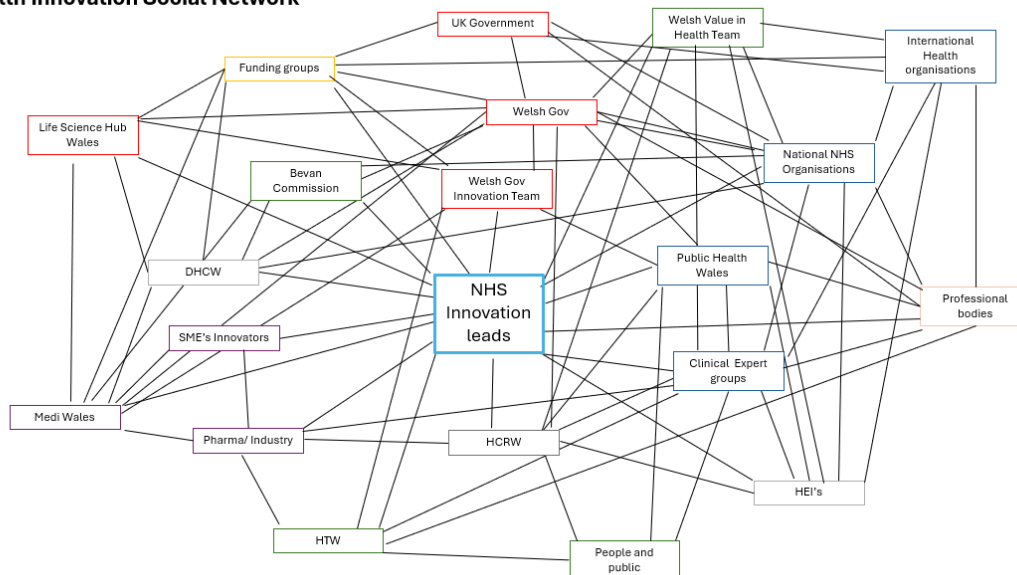


Fig 4. Social Network Analysis of NHS Wales Innovation Ecosystem. Source: The researcher

Table of SNA Organisations

Abbreviation / Organisation	Definition
SME	Small and Medium Enterprises
HEI	Higher Education Institutions
DHCW	Digital Health Care Wales
HCRW	Health and Care Research Wales
HTW	Health Technology Wales

The network appears highly interconnected and dependent, suggesting strong potential for information flow and cross-sector collaboration will result in increased effectiveness of innovation and knowledge dissemination. However, this density of connection does not necessarily equate to equity of influence. Certain groups, such as Welsh Government teams, funders, and health policy institutions like the Bevan Commission, feature prominently and are deeply embedded across the network (brokers). Their influence in shaping strategic direction and funding priorities is evident. In contrast, stakeholders such as the public, professional bodies, and some third-sector organisations appear more peripheral. While they are included within the system, their relationships seem less embedded, which risks marginalising their perspectives in the innovation process.

This unevenness points to a deeper challenge: while innovation ecosystems may appear inclusive on paper, in practice, the flow of influence, power, and trust is often unbalanced. Public and patient voices, for example, are rarely positioned to shape upstream decisions about innovation priorities or investments despite the current academic interest in coproduction and ‘voice’ of stakeholders (Baumann et al; 2021). Similarly, while academia and industry are present, there is limited evidence of consistent bidirectional engagement with operational teams or communities beyond small case experiments and cases (e.g. SBRI, KTP programmes). These gaps suggest that relational infrastructure, rather than formal structures alone, determines the inclusivity and effectiveness of the system.

The network also highlights opportunities for strategic bridging. Organisations like the Life Sciences Hub Wales, HCRW, and academic institutions are positioned to act as integrators across sectors and clusters of the network. Their ability to link research, funding, and real-world application makes them valuable conduits for embedding evidence-informed innovation. Yet their effectiveness depends on how intentionally these roles are supported, both structurally and culturally. Without mechanisms for coordination and shared learning, even the most well-connected nodes risk working in silos or outsourcing their training in innovation.

Overall, the social network analysis reinforces the need to invest not only in innovation capabilities but in the relationships that underpin cultural and system readiness. For innovation to move beyond isolated pilots and become embedded across the NHS, it must be supported by a dynamic, inclusive, and well-connected ecosystem. This requires strengthening underutilised links, elevating the strategic importance of the innovation community and engaging with frontline voices. Such a network would ensure that those at the centre of it (such as innovation leads), are empowered to foster trust, bridge silos, share best practice and lead change across the system.

4.2 Findings: Internal and external stakeholder analysis

Understanding the dynamics of stakeholder power and interest is essential when exploring how innovation culture is experienced, supported, and embedded across the NHS. Stakeholder mapping offers a structured way of visualising influence, engagement, and alignment across the system. In this research, two stakeholder matrices were created to support this analysis: Figure.5 for internal stakeholders within Cardiff and Vale University Health Board (CAV UHB) and Figure.6 for external stakeholders across the wider innovation ecosystem in Wales. Each map plots stakeholders according to their current perceived level of power (ability to make or influence decisions) and interest (active engagement in or commitment to innovation), alongside an aspirational ‘ideal state’ that reflects where those stakeholders might ideally be positioned to strengthen innovation culture and capability.

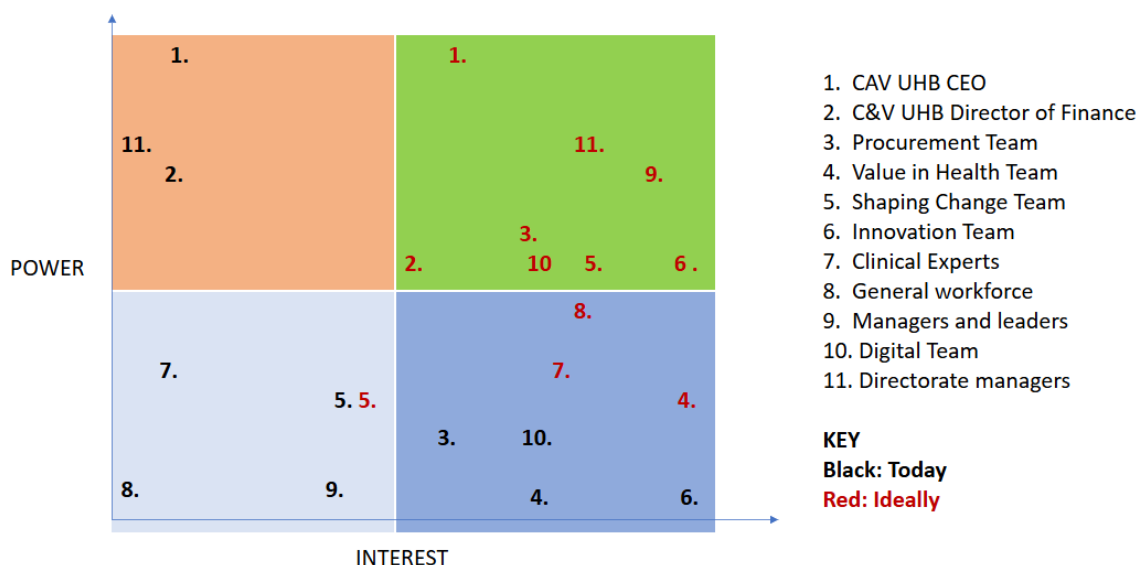


Fig 5 Internal Innovation stakeholder, Source: The Researcher

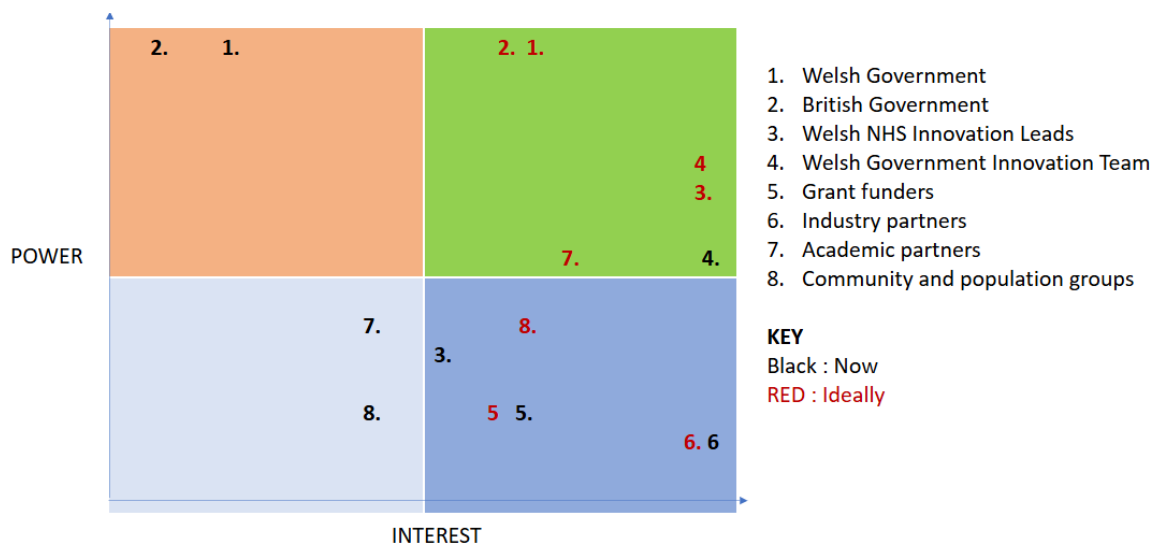


Fig 6. External Innovation Stakeholders, Source: The Researcher

The internal stakeholder matrix includes key groups such as the CAV UHB CEO, Director of Finance, the Innovation and Digital Teams, managers, workforce, and clinical experts. The analysis reveals a noteworthy pattern: some stakeholders with significant formal power (such as the CEO and Director of Finance) are not currently highly engaged in innovation activity, sitting in the high-power, low-interest quadrant. Meanwhile, others, such as the Innovation Team, Digital Team, and parts of the workforce, demonstrate strong enthusiasm and practical engagement but operate with less formal influence. This disconnect reflects a broader challenge in healthcare innovation as culture change often starts with those closest to the work but requires buy-in from those furthest from operational detail

The shift from the current to the ideal state in the internal stakeholder map visualises a desired cultural transformation within NHS Wales. In the ideal future, more stakeholders are positioned in the high-power, high-interest quadrant. Notably, the CEO, Director of Finance, Directorate Managers, and the Shaping Change Team are repositioned to become more engaged champions of innovation. This reflects a growing recognition that leadership support and visible endorsement are critical for embedding a culture of innovation. When leaders demonstrate genuine interest and commitment, they legitimise innovation efforts, enable responsible risk-taking, and signal that innovation is a shared organisational value rather than an isolated or elite activity. As West et al. (2021) argue, “innovation must become everyone’s responsibility, supported by compassionate leadership and a psychologically safe environment.” Similarly, Greenhalgh et al. (2004) highlight the importance of organisational culture and contextual fit, showing that innovation adoption depends on more than technical readiness, it requires relational trust and absorptive capacity. This research builds on their foundations by exploring how those cultural conditions can be operationalised in the specific context of NHS Wales, and how leadership behaviours, structural positioning, and stakeholder engagement shape the lived experience of innovation across the system.

Equally important is the supportive engagement of other teams such as procurement, the Value in Health team, and digital experts, toward a more integrated, strategic role in innovation. These stakeholders often influence whether innovations can be scaled, resourced, and sustained. By increasing their engagement and aligning innovation with their core functions, the health board can support a more coherent and efficient system for taking good ideas into practice (speed of adaption using innovation). Ultimately, this matrix offers a roadmap for relationship-building, alignment work, and cultural investment by clearly showing gaps and voids in the current innovation system at a local level.

The external stakeholder map reinforces and expands upon these themes. It includes actors such as the Welsh and UK Governments, Welsh NHS Innovation Leads, grant funders, industry and academic partners, and community groups. Similar to the internal mapping, there is a visible disparity between power and interest. Welsh Government and British Government are perceived to hold considerable influence over policy and funding but are currently less directly involved in frontline innovation engagement. Meanwhile, community and population groups, along with academic partners, are highly interested but often sit on the periphery of decision-making power.

The ideal-state map for external stakeholders envisions a more balanced, inclusive ecosystem to enable clear priorities to be translated into key system interventions (importance). Welsh Government and UK Government are positioned to not only drive policy but also co-create innovation strategies in closer, two-way partnerships with those delivering and experiencing services. Academic institutions and industry partners should also adopt a more central position, reflecting their vital role in supporting research, development, and evaluation (e.g. Tritech Wales). Most significantly, community and population groups are elevated in the ideal map to recognise their essential role in shaping meaningful, person-centred innovation (true Value Based Healthcare). This reflects a shift toward co-production, (see the Bevan Commission) where patients and the public are not only recipients of innovation but active contributors to its design and implementation.

In addition, these maps align with themes from the social network analysis. While the network map illustrated density and connectivity, the power-interest analysis adds a crucial layer of nuance: not all connections are equal, and not all influence is used to support innovation. A stakeholder may be connected but disengaged, or influential but risk averse. The maps also help highlight where leadership development, cultural alignment, and relational support are needed. For example, supporting senior leaders to build innovation literacy and establish more effective feedback loops between frontline teams and executive decision-makers to help shift stakeholders into a more empowered, engaged mode of operation.

In summary, stakeholder mapping in this research provides a strategic, visual method for diagnosing the cultural and relational landscape of innovation within the NHS. It highlights both the strengths of the current system and the tensions that must be addressed to support transformation. Innovation does not happen in a vacuum (Tidd & Bessant; 2021), it requires deliberate engagement, shared purpose, and the ability to align power with interest. These maps have repeated the key themes identified in the social network analysis.

One of the key dimensions of the innovation voids and the gap in current provision is the access to and quality of training for staff to enable them to engage productively with the NHS Wales innovation agenda. This subject was explored using the questionnaire administered to the expert informants and the results will now be shown as data displays.

4.3 Findings: Data display

Data Display 1 clearly shows the inclusion of highly experienced expert informants and an assurance that the results of this phase are of the highest quality for insights into the Welsh Innovation system from a range of stakeholders.

Data Display 1: Credibility of the informants

	Expert Informant					
Item	1	2	3	4	5	6
Expertise	Innovation	Academic	Policy	Clinical	Social Care	Industry
Years of Expertise	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years
Employer	2ndry care	HEI	Government	NHS	Social Care Wales	MediWales
Level of influence	Local/Sector Level	Sector /National policy level	National Policy level	Organisational level	Sector Level	Sector

Data Display 2 reveals answers to the availability of Innovation training.

	Expert Informant					
Item	1	2	3	4	5	6
Expertise	Innovation	Academic	Policy	Clinical	Social Care	Industry
Years of Expertise	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years

Innovation Academy: Innovation Management in Health and Social Care

Employer	2ndry care	HEI	Government	NHS	Social Care Wales	Medi Wales
Availability of training						
Introduction	None	None	None	Yes	None	None
Quality/Relevance	0	0	0	3	0	0
Intermediate	No	Yes	Yes	No	No	No
Quality / relevance	0	5	5	0	0	0
Advanced	No	Yes	Yes	No	No	No
Quality/ Relevance	0	5	5	0	0	0

(1 Low relevance -5 High relevance)

The findings from Data Display 2 reveal a clear discrepancy in the availability and perceived quality of innovation training across sectors, with implications for access to, equity and capacity building across NHS Wales. Introductory-level training is limited. Only the clinical stakeholder from the NHS reported access to such provision (that they had developed), while others, including policy, academic, industry, and social care informants, reported none. The researcher reflected that this likely reflects a lack of awareness or organisational readiness rather than a lack of existing options.

Intermediate and advanced innovation training is available and rated highly by academic and policy informants, who scored it 5 out of 5 for relevance. Although stakeholders from clinical, innovation, industry, and social care backgrounds did not report engaging with these programmes despite their general accessibility. Barriers such as cost, limited awareness, or a lack of organisational encouragement may be limiting uptake. The issue, therefore, is not the availability of training but ensuring equitable access and engagement across the system. This uneven participation contributes to a knowledge gap, where strategic and academic stakeholders benefit from well-established training pathways, while those delivering frontline services are less likely to be involved. As a result, innovation risks remaining a top-down initiative or disconnected with meaningful progress on a system-wide or local level (lack of capability).

Where accessed, the training is consistently seen as high quality. This highlights the need to prioritise better promotion and integration of existing programmes into staff development plans, rather than focusing on creating new content. Improving visibility and support for these learning opportunities would foster a more inclusive and confident innovation culture throughout health and care services and create a 'common language' of innovation.

Data Display 3: Views on What Innovation training support is needed across Health and Social Care Wales

	Expert Informant					
Item	1	2	3	4	5	6
Expertise	Innovation	Academic	Policy	Clinical	Social Care	Industry
Years of Expertise	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years
Employer	2ndry care	HEI	Government	NHS	Social Care Wales	Medi Wales
Innovation training support needed	1,3,4	2,4	2,3,4	1,2,3,	5	1

KEY:

3. Foundational understanding of health innovation
4. Structured progression and layered learning
5. Contextual, practical and evidence-based content
6. Strategic integration
7. Skills framework

The expert informants demonstrated broad agreement on the need for innovation training and support across the Welsh health and care system, though each sector emphasised different priorities. A **foundational understanding of health innovation** (Theme 1) was highlighted by innovation, clinical, and industry informants as critical for enabling wider engagement, particularly among junior staff and those not formally embedded in innovation roles. **Structured progression and layered learning** (Theme 2) were prioritised by academic, policy, and clinical informants. They advocated for clear, tiered training pathways that accommodate varying levels of expertise, from introductory awareness through to advanced, role-specific knowledge. **Contextual, practical, and evidence-based content** (Theme 3) was emphasised by policy, clinical, and innovation informants, who cautioned against generic or compliance-driven training. They stressed the importance of real-world applicability, particularly in areas such as procurement, governance, and evaluation. **Strategic integration** (Theme 4) was seen as essential by innovation, academic, and policy stakeholders. They called for training to be embedded in organisational systems, such as induction, workforce planning, and national innovation strategies, to ensure consistency and relevance. **Skills frameworks** (Theme 5) were identified as a priority by the social care informant, reflecting the need for structured capability development within that sector (an outlier).

Clinical stakeholders identified nearly all themes, indicating significant training and cultural support needs at the operational level. In contrast, industry and social care contributors raised more focused but equally relevant concerns. Overall, the findings underscore the need for a multi-level, contextually grounded, and strategically aligned approach to innovation training across NHS Wales.

Data Display 4: Additional support required to build a culture of innovation across Health and Social Care Wales

	Expert Informant					
Item	1	2	3	4	5	6
Expertise	Innovation	Academic	Policy	Clinical	Social Care	Industry
Years of Expertise	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years	10+ Years
Employer	2ndry care	HEI	Government	NHS	Social Care Wales	MediWales
Themes	1,2,3,4,5,6	1,2,3,5,6	1,2,3,4,6	1,2,3,4,5	1,4,5	1,3,6

Key

8. Perception of training as a Change tool
9. Ecosystem maturity and Fragmentation
10. Governance and framework needs
11. Emotional and psychological safety
12. Mentorship and support structures
13. Cross sector learning and exemplar sharing

Data Display 4 reveals six interrelated themes identified by expert informants as critical for fostering a culture of innovation across Health and Social Care in Wales. A shared recognition emerged that training alone is not enough; it must be reframed as a broader cultural lever (Theme 1), embedded within a mature and coherent innovation ecosystem (Theme 2). Governance and frameworks (Theme 3) were also widely emphasised, with stakeholders highlighting the need for clear structures around procurement, ethics, and evaluation to support safe and confident innovation.

Equally important were the relational and emotional components of innovation culture. Psychological safety (Theme 4) was seen as essential for encouraging staff to take risks and share new ideas without fear of rejection. Mentorship and support structures (Theme 5) were valued for helping individuals navigate challenges and translate training into practice. Finally, cross-sector learning and exemplar sharing (Theme 6) was viewed as a key mechanism for breaking down silos, spreading best practice, and building a shared sense of purpose. Together, these themes point to the need for a holistic, system-wide approach to innovation culture, grounded not only in skills, but in trust, support, and structural alignment.

5 Discussion: Through the Lens of TQM Guru Kano

Building on the themes identified through the social network and stakeholder power-interest analyses, it became clear that innovation engagement is shaped not only by structures and roles but also by how individual and group needs are understood and addressed. To explore this further, the KANO model (Table 6) was applied, by the researcher as an innovative and total quality means of framing the study's results, allowing a deeper analysis to of the layered motivations of key stakeholder groups and to examine what truly enables or inhibits a culture of innovation. The KANO model (Xu et al; 2009) offers a valuable framework for analysing how different stakeholders perceive and engage with innovation across the NHS. By categorising needs into basic, performance, and excitement dimensions, this model helps distinguish between foundational expectations, measurable outcomes, and aspirational motivators. In this research, the KANO model has been adapted to explore three key stakeholder groups: NHS workforce, NHS executives, and national policymakers. Mapping their needs reveals both shared themes and critical differences in what drives engagement with innovation and, importantly, what is required to embed a culture of innovation as part of routine practice.

Table 6. KANO Model, Source: The Researcher

Stakeholder	Basic need	Performance Need	Excitement need
NHS Workforce	Clear alignment of innovation with role, time and resources to engage in innovation. Visible leadership that listens and reflects on ideas	Culturally safe environment to share ideas. Training in innovation tools and methods, visible leadership and available mentorship in Innovation change methodology	Opportunities to lead or co-design innovations, career development through innovation, recognition and rewards. Sense of belonging and value.
NHS Executives	Leadership competency in change/innovation management. Transparency and accountability structures: Regulatory compliance, system-wide performance data, risk mitigation.	Demonstrable return on investment from innovation initiatives, strategically aligned with organisational priorities. Foster a culture of organisational learning and deliver measurable improvements in patient outcomes. Utilise real-time dashboards to track Research, Development & Innovation (RD&I) metrics. Strengthen cross-sector leadership capability through partnerships with academia and industry	National recognition as an innovative Health Board, driven by transformational leadership. Mutually rewarding partnerships/ collaborations. Clear metrics on transformational change impact in order to influence policy.
National Policy makers - GOV	Trust and accountability of local systems to deliver and report progress. Cost-effectiveness, system sustainability and consistency across ICS's	Scalable and replicable innovations,. Value driven NHS organisations with clear data-driven outcomes. Policies that support a system-wide innovation culture	Ambitious national health innovation missions that align with net zero goals, champion inclusion, and promote global equity. Position the NHS as a global leader in healthcare innovation, delivering improved population outcomes and serving as an international exemplar

At the level of basic needs, all stakeholder groups express requirements related to trust, alignment, and structural clarity. For the NHS workforce, basic needs include a clear alignment of innovation with their role, time and resources to engage, and visible leadership that listens and reflects on their ideas. These are non-negotiable prerequisites for engagement, when absent, frustration, disengagement, and scepticism around innovation efforts tend to follow. For NHS executives, the basic needs are more structural: leadership competency in change and innovation management, robust accountability frameworks, and system-level performance data. These reflect their responsibility for governance, oversight, and risk management. National policymakers, meanwhile, expect trust and accountability from local systems, along with cost-effectiveness and consistency across Integrated Care Systems (ICSs). Their basic needs speak to the integrity and reliability of the system at scale.

These foundational expectations frame the minimum standard stakeholders require to engage with innovation. Without them, engagement is unlikely to occur. However, fulfilling basic needs alone is insufficient to generate active involvement or enthusiasm. This is where the performance needs come into play.

Performance needs are those that stakeholders consciously evaluate, needs where the more they are fulfilled, the higher stakeholder satisfaction and engagement will be. For the NHS workforce, these include culturally safe environments to share ideas, training in innovation tools and methods, visible leadership, and mentorship in change methodology. These needs speak to capability and confidence. From a practice perspective, this aligns with the literature reviewed earlier, which highlights that even the most willing staff

often lack the skills, time, or structural support to move ideas forward. Meeting these needs helps to unlock latent potential across the workforce.

For NHS executives, performance needs focus on measurable return on investment (ROI) from innovation, alignment with organisational priorities, and demonstrable improvements in patient outcomes. Executives also value access to real-time dashboards to track Research, Development and Innovation (RD&I) metrics, and opportunities to strengthen leadership capability through academic and industry partnerships. These needs reflect their role as strategic leaders who must balance innovation with financial, operational, and reputational risk. Addressing these needs creates the conditions for innovation to be integrated into business-as-usual and evaluated on equal terms with other performance metrics.

Policymakers' performance needs include scalable and replicable innovations, value-driven NHS organisations with clear data-driven outcomes, and policies that support a system-wide innovation culture. These needs reflect the macro-level lens through which national policy is developed and monitored. Performance for this group is linked to demonstrable system impact, evidence that public investment in innovation delivers value, equity, and sustainability.

What distinguishes leading, engaged, and transformation-ready systems from others, however, is how well they meet or exceed the excitement needs of their stakeholders. These needs are often unspoken but, when met, generate high levels of motivation, loyalty, and creativity. For the NHS workforce, excitement needs include opportunities to lead or co-design innovations, career development through innovation, and a sense of belonging and value. These factors contribute to what West et al. (2021) describe as psychological safety and cultural readiness, conditions where innovation becomes not just a possibility but a source of professional pride and identity. Meeting these needs fosters an empowered workforce capable of generating, owning, and spreading change. Add quote from Micks paper

For NHS executives, excitement needs include national recognition as an innovative health board, transformational leadership, and mutually rewarding collaborations. Executives are often motivated by the opportunity to drive legacy-building change, influence policy, and position their organisation as a leader within and beyond Wales. When these needs are met, innovation moves from being a compliance activity to a reputational and strategic asset.

National policymakers, too, have excitement needs, even if they are rarely stated explicitly. These include seeing the NHS play a global leadership role in healthcare innovation, delivering population-level outcomes, and serving as an international exemplar. There is also a growing aspiration to align innovation with societal missions, such as net zero, inclusion, and digital transformation. Meeting these needs can help align national and local priorities, creating an enabling environment for policy innovation and long-term system transformation.

Taken together, this KANO analysis offers a powerful lens for understanding the motivational landscape of stakeholders involved in NHS innovation. It reveals that while all stakeholders share an interest in transformation, their motivations, expectations, and evaluation criteria differ. For culture change to take root, innovation strategies must be able to respond to this complexity. One-size-fits-all approaches are unlikely to succeed.

From a practical perspective, this model also provides guidance for stakeholder engagement. For example, staff engagement strategies should not only provide training (performance need) but also recognition and leadership pathways (excitement need). Executive buy-in should be supported with robust metrics and alignment tools (performance), alongside opportunities to shape national thinking (excitement). Policymakers, meanwhile, need evidence of system-wide return on investment (performance) but also stories and case studies that position Wales as an innovator on the global stage (excitement).

In conclusion, embedding a culture of innovation within the NHS requires more than technical tools or isolated initiatives. It requires an integrated, responsive approach that addresses basic expectations, delivers value, and inspires belief in what is possible. The KANO model helps to surface these dynamics and serves as a valuable tool in designing engagement, training, and leadership strategies that resonate across diverse stakeholder groups. By aligning with stakeholder needs at all levels, innovation can become not just a function within the NHS, but a shared value, identity, and system capability.

To provide a direct answer to the guiding research question:

What enables or inhibits a culture of innovation in the context of NHS Wales?

The study finds that a distributed and empowered approach to leadership, based on a proactive and future focussed vision of the utility of innovation for healthcare is needed and currently absent. This enabler would create a 'legitimation of innovation' at all levels of the organisation. Such leadership must also recognise that their community of stakeholders have different needs and expectations from innovation (as see in the data displays) and provision of training an ongoing access to knowledge must embrace such diversity of stakeholder. This study shows that there is also a maturity (personal and organisational) which must also be accounted for when training innovation and truly embedding it from recruitment and induction to leadership of major innovation-led transformation programmes. Within this cycle is a distinct need for psychological safety where staff can express fears and concerns as well as identify their own readiness to engage. These findings show the high importance of the following enablers for NHS Wales:

- Consistent Leadership to promote a narrative of innovation and change rather than a reactive firefighting approach to such change.
- Governance structures and clear processes
- Relationships that focus on coproduction of innovations with stakeholders and thus a need to ringfence time to build relationships as well as protected personal time for individuals to do so.
- Dissemination for success and continued learning (online Zoe) accessibility and a common way in Wales

6 Conclusions and Implications

The implication for stakeholder in table 7. summarises the specific needs, contributions, and system-level roles of each group, providing a clear framework to inform targeted engagement, training design, and policy alignment for embedding a culture of innovation across health and care.

Table 7: Implication for the stakeholders in this study, Source: The Researcher

Stakeholder Group	Key Implications	Overall, Role/Implication
Innovation Leads (Secondary Care)	Advocate for foundational understanding across roles; emphasise organisational maturity; call for governance, leadership support, and training integration; need safe spaces for testing ideas.	Drive local innovation but require systemic alignment, strong frameworks, and cultural permission to act.
Academic Stakeholders (HEIs, ILA)	Emphasise structured, tiered training and lifelong learning; advocate for evidence-based, co-produced materials; value cross-sector collaboration and case studies.	Key to curriculum development and evaluation, offering expertise in pedagogy, validation, and intersectoral learning.
Policy and Government Stakeholders (HTW, DHCW, Bevan Commission)	Stress integration of training into national frameworks; prioritise governance and adoption pathways; emphasise system-wide responsibility and ethical, evidence-based innovation.	Shape the regulatory and strategic context; ensure alignment, accountability, and long-term sustainability.
Clinical Stakeholders (Health Boards, Velindre)	Advocate for accessible, time-sensitive training; seek psychological safety and protected time; call for mentorship and real-world application.	Central to implementing innovation; require support to overcome systemic barriers and embed innovation in practice.
Social Care Stakeholders (Social Care Wales)	Highlight inclusion and access barriers; call for basic awareness and skills development; emphasise cultural and leadership recognition in social care.	Broaden the definition of innovation; stress equity of access, especially in non-medical health and care settings.
Industry Stakeholders (MediWales)	Stress understanding of adoption, procurement, and tech translation; emphasise learning from digital exemplars; highlight cultural and operational barriers to uptake.	Provide technological solutions; depend on NHS readiness for adoption and scaling of innovation.

Next steps could include a comparative review beyond Wales to explore global approaches, alongside a longitudinal study of stakeholder relationships over time. Further development of the innovation ecosystem should focus on sustained collaboration, with specific attention on how to meaningfully engage and involve industry partners in co-design and adoption processes. A good example of this is the **Endoscopy Challenge** (Barbu, 2024) delivered in partnership with the **Cardiff Capital Region (CCR)** and **Cardiff and Vale UHB**, which brought together NHS clinicians, industry partners, and academic innovators to tackle system-wide challenges collaboratively. This model of open innovation, grounded in real clinical need and supported by structured, cross-sector facilitation, demonstrates the potential for scaling co-designed solutions when the ecosystem is deliberately cultivated.

6.1 Final Words

This has been a very enjoyable and enlightening study which I hope will form the basis of the research of those who will take this work forward for the benefit of academia and the Welsh NHS and its patients.

Zoe Hilton, RN

August 2025

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What would an ADHD service in a prison provide: A Review of the Prevalence, Impact and Required Provision to Support Neurodiverse (ADHD) Prisoners.

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Abstract:

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental condition characterised by persistent inattention, hyperactivity, and impulsivity, with significant effects on emotional regulation, executive functioning, and decision-making. While ADHD affects approximately 2.5% of adults in the general population, prevalence is substantially higher in prison populations. Despite this elevated need, ADHD remains frequently underdiagnosed and undertreated in custodial settings, contributing to emotional dysregulation, impulsivity, aggression, self-harm, and poorer rehabilitation outcomes.

In Wales, ADHD healthcare provision is embedded within the Welsh Government's Mental Health and Wellbeing Strategy 2024–2034, which emphasises neurodiversity support and multi-agency collaboration. However, access to assessment is limited, with current average waiting times from GP referral to diagnosis exceeding 95 weeks. Within prisons, early identification and tailored management are critical but often restricted, generating disparities that affect both individual outcomes and institutional stability.

This study highlights the need for a dedicated ADHD service within Welsh prisons, incorporating early screening, formal assessment, evidence-based pharmacological and psychological interventions, structured routines, and staff training. Such an approach can enhance continuity of care, facilitate transitions to community services, reduce recidivism, and alleviate pressures on NHS and probation services. Moreover, addressing ADHD in custodial settings has broader societal implications, including improved public health, employability, and housing stability. Implementing structured ADHD services, alongside a coordinated All-Wales public health and criminal justice strategy, is therefore essential for promoting individual wellbeing, institutional stability, and long-term socio-economic benefits.

Keywords: ADHD; Prison Population; Neurodiversity; Mental Health Services; Early Screening and Intervention; Rehabilitation and Recidivism

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1 Introduction

Attention-Deficit/Hyperactivity Disorder (ADHD) is a neurodevelopmental condition characterised by persistent patterns of inattention, hyperactivity, and impulsivity. It significantly affects emotional regulation, decision-making, and executive functioning. While ADHD occurs in approximately 2.5% of the general adult population, its prevalence is markedly higher in criminal justice settings, particularly among prison populations. Despite this, ADHD remains frequently underdiagnosed and undertreated in custodial environments, exacerbating risks such as emotional dysregulation, self-harm, aggressive behaviours, and poor rehabilitation outcomes.

In Wales, healthcare provision for ADHD is recognised within the Welsh Government's Mental Health and Wellbeing Strategy 2024–2034, which emphasises the need for enhanced neurodiversity support and a collaborative, multi-agency approach to the diagnosis and management of neurodevelopmental conditions, (Welsh Government, 2024).

Community-based neurodiversity services typically begin with an initial GP consultation, acting as the primary gatekeeper for referrals to Primary or Secondary Mental Health Services. However, access remains limited; the average waiting time for ADHD assessment from initial GP referral is approximately 95.1 weeks, highlighting significant barriers to timely diagnosis and treatment, (Research Senedd Wales, 2024).

1.1 Prevalence of ADHD/Autism Assessment Requirements within Wales:

	February 2022	December 2023	Change	
Powys Teaching HB	194	728	275%	▲
Cardiff & Vale UHB	1,267	2,992	136%	▲
Cwm Taf Morgannwg UHB	1,187	2,624	121%	▲
Betsi Cadwaladr UHB	2,753	5,163	88%	▲
ALL WALES	9,014	16,812	87%	▲
Hywel Dda UHB	2,194	3,403	55%	▲
Swansea Bay UHB	803	1,099	37%	▲
Aneurin Bevan UHB	616	803	30%	▲

Figure 1: (Research Senedd Wales, 2024)

These delays are particularly concerning in the context of the prison system, where early identification and support are critical. Healthcare services in Welsh prisons commissioned by NHS Wales are designed to mirror those available in the community, (Welsh Assembly Government, 2025).

Nonetheless, individuals in custody often face reduced access to ADHD-related services, despite the higher incidence of need. This disparity further compounds the vulnerabilities of individuals with ADHD and can undermine both individual rehabilitation and institutional stability.

The introduction of an ADHD-focused service within the prison estate is intended to bridge this gap by addressing the complex and specific needs of neurodivergent individuals. Such interventions include early screening, formal assessment, and targeted management strategies, delivered through a whole-prison approach. Equipping staff with appropriate training and management frameworks is essential to promoting understanding, reducing behavioural incidents, and supporting prisoners in developing self-awareness and coping strategies.

Beyond the custodial environment, the benefits of structured ADHD care have broader implications. Establishing clear transition pathways from prison to community services can reduce recidivism, improve continuity of care, and alleviate pressures on overstretched NHS waiting lists. This paper argues that recognising and responding to ADHD within the criminal justice system is not only a matter of individual health and wellbeing but a critical component of effective public health, rehabilitation, and criminal justice reform.

2 Definition

To establish what constitutes effective service provision for individuals with ADHD in prison environments, it is first necessary to define the key terms and concepts central to this study. The following section outlines and explains these foundational concepts, thereby clarifying the context of service delivery within custodial settings and providing the conceptual basis for the subsequent research and analysis of ADHD.

2.1 ADHD (Attention-Deficit/Hyperactivity Disorder)

ADHD is a neurodevelopmental disorder characterised by persistent patterns of inattention, hyperactivity, and impulsivity that significantly interfere with an individual's daily functioning or developmental trajectory. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), symptoms must be present before the age of 12 and evident in two or more settings—such as at home, school, or work—to meet diagnostic criteria, (American Psychiatric Association, 2013).

In adult and incarcerated populations, ADHD may present differently compared to childhood cases. Common manifestations include impulsive behaviour, difficulty sustaining attention, poor emotional regulation, and an elevated risk of comorbid mental health conditions, such as anxiety, depression, and substance misuse disorders. Within prison populations, ADHD is frequently underdiagnosed and under-recognised, often overshadowed by behavioural issues and other psychiatric presentations. This diagnostic challenge complicates both the identification of affected individuals and the provision of appropriate, targeted support.

ADHD is a developmental disorder, presenting as inattentiveness, hyperactivity, and impulsiveness. Additionally expressing:
Carelessness and lack of diligence
Continually starting new tasks before finishing old ones
Poor organisational skills
Inability to focus or prioritise.
Continually losing or misplacing things
Forgetfulness
Restlessness and edginess
Difficulty keeping quiet and speaking out of turn.
Blurting out responses and often interrupting others
Mood swings, irritability, and a quick temper
Inability to deal with stress.
Extreme impatience
Risk taking in activities, often with little or no regard for personal safety or the safety of others – for example, driving dangerously.

Table 2(Authors Own)

2.2 Provision

For the purpose of this research, the term *provision* refers to the availability, accessibility, and delivery of support services, interventions, and resources designed to meet the needs of individuals with ADHD within the prison setting. This encompasses a range of components, including diagnostic assessment, clinical treatment (such as medication and psychological therapies), behavioural interventions, staff training and awareness, and the facilitation of consistent, tailored support throughout incarceration and during the transition into community-based services post-release.

2.3 ADHD Service

Within the prison context, An ADHD service refers to a structured, multidisciplinary approach to the identification, diagnosis, treatment, and ongoing management of ADHD within the prison environment. Such a service typically involves collaboration between healthcare professionals, psychologists, and prison staff to ensure comprehensive and continuous care. Core components may include routine screening procedures, formal diagnostic assessments, the development of individualised treatment plans, psychoeducational interventions, and access to therapeutic and rehabilitative support. The aim is to provide consistent, person-centred care that addresses both the clinical and behavioural aspects of ADHD during incarceration and supports continuity of care upon release.

2.4 Prison Setting

The term *prison setting* refers to secure correctional facilities in which individuals serve custodial sentences as part of the criminal justice system. These environments are characterised by stringent operational protocols, hierarchical organisational structures, and high levels of security.

2.5 Service Requirements / Needs

The term *service requirements* refer to the essential components, resources, and systemic conditions necessary to effectively support individuals with ADHD in a custodial environment. These requirements are typically identified through an assessment of existing service gaps, the complex and varied needs of the prison population, consultation with key stakeholders, and alignment with national health and criminal justice policies or guidelines. In this research, service requirements are examined within the context of a male-only Category B prison in Wales, providing a focused analysis of provision and practice in a high-security custodial setting.

3 Neurodiversity and the criminal justice system:

The concept of neurodiversity highlights the natural variation in human neurological development, encompassing conditions such as Autism Spectrum Disorder (ASD), dyslexia, and ADHD. Increasing attention has been paid to the implications of neurodiversity in institutional settings, particularly within the criminal justice system. ADHD is disproportionately represented among incarcerated populations, raising concerns about the adequacy of screening, support, and rehabilitative frameworks in custodial environments.

3.1 Prevalence:

Research consistently demonstrates that ADHD is significantly more prevalent in custodial settings than in the general population.

(Cocallis & Young, 2021) report that approximately **25% of adults in prison have a diagnosis of ADHD**, compared with **2.5% in the general population**.

This disparity highlights systemic gaps in early identification, support, and diversion pathways for neurodivergent individuals.

The overrepresentation of individuals with ADHD in prisons is partially attributed to core symptoms of the condition such as impulsivity, difficulty regulating emotions, and executive dysfunction, which can increase vulnerability to engaging in criminal behaviour.

Furthermore, individuals with ADHD may struggle to navigate the legal system, comply with court orders, or engage with rehabilitative processes, potentially leading to higher rates of reoffending.

3.2 Impact on Prison Regimes:

The presence of high numbers of individuals with ADHD presents multiple challenges for prison management and custodial care:

- **Behavioural Management:** ADHD-related behaviours, such as restlessness, non-compliance, or impulsive aggression may be misinterpreted as deliberate rule breaking rather than symptoms of neurodevelopmental differences. This can lead to disproportionate use of disciplinary measures, including segregation or restraint.
- **Resource Demand:** Prison officers, healthcare staff, and emergency services are often required to respond to crisis or escalating behaviour, which can necessitate hospitalisation or specialist care. These incidents are not only financially costly but may also be traumatic for staff and other prisoners.
- **Operational Strain:** The cumulative demands of managing neurodiverse prisoners can reduce the system's capacity for rehabilitation, development, and innovation. Limited resources are diverted towards crisis management rather than initiative-taking or preventative interventions.

3.3 ADHD and the Criminal Justice Process:

The relationship between ADHD and the criminal justice process extends beyond incarceration. From the point of arrest, individuals with ADHD are often disadvantaged by their difficulties in understanding complex legal proceedings, remembering key information, or following instructions.

3.4 Appropriate Adult Provision:

(Police and Criminal Evidence Act (PACE), 1984), mandates the presence of an Appropriate Adult during police interviews for vulnerable individuals, including those with cognitive impairments or mental health needs. For individuals with ADHD—particularly those with comorbidities or undiagnosed conditions—this provision is crucial in safeguarding their legal rights and ensuring just outcomes.

(Bradley K. J., 2009), commissioned by the UK government, addressed the systemic failings in how the criminal justice system responds to individuals with mental health conditions and learning disabilities. Among its recommendations were:

- Improved screening and assessment at every stage of the criminal justice pathway.
- Diversion into health and social care services wherever appropriate.
- Enhanced training for police officers, prison staff, and judiciary.

(Bradley K. J., 2009) findings remain relevant today, especially given the growing evidence base linking neurodevelopmental conditions such as ADHD to negative outcomes in the justice system.

The disproportionate prevalence of ADHD in the criminal justice system underscores a pressing need for systemic reform. By improving early identification, tailoring support interventions, and training staff to understand neurodivergent needs, the justice system can shift from a punitive model to one that supports rehabilitation and social reintegration. ADHD should be recognised not only as a health condition but as a factor that, if unaddressed, can contribute to a cycle of criminalisation and exclusion. A neurodiversity-informed approach is not only ethically sound—it is essential for an effective and humane justice system.

4 Literature – Identifying the Gap

Evidence suggests that the prevalence rate for Neurodiversity and specifically ADHD within a Prison environment is that of 25% of the occupants. (Roberts & Lawrence, 2024).

(Roberts & Lawrence, 2024) highlight within their recent research of ADHD Prisoners within a Male Category B Prison, that their experiences, consist of an unstable environment combined with a lack of resources, emphasising a need for strong Prisoner/Staff relationships acknowledging gaps in awareness and understanding of ADHD. It was the experience of the Prisoners involved that the medication provision was of a poorer quality, with limited to no conjunction with Psychoeducation.

The research itself identifies limitations in its method, where only 8 ADHD diagnosed individuals interviewed. Where from a qualitative perspective a reduced number of participants can limit outcomes. It is noted that the research focussed not just on one specific prison setting, but also on an individual prison wing. However,

the wing identified was that as a specialised area and therefore should have the provision to provide appropriate care. The outcomes of the questions posed are generally negative, questioning if clear communication of the issues and concerns of the service were discussed, if an understanding and a more positive view would have been presented? An example would be regarding the supply of voiced poor-quality ADHD medication, which due to an overall global limited supply, resulted in the need at a cheaper alternative may have been utilised. Within 2024 there was a Global challenge in supplying ADHD medication due to limited material availability, manufacturing, and distribution, (Oisin, 2024).

Healthcare provision within the Welsh Prison Service is commissioned by NHS Wales, endeavouring to mirroring services within the community sector (Welsh Assembly Government, 2025).

(Welsh Government, 2024), document strategies on the right to physical and mental health wellbeing as a fundamental right for everyone, inclusive of the justice system.

(Vaze, 2023) highlights the prison environment are not responsive to a prisoner needs, where from a prisoner experiencing ADHD, this can only be amplified, driving any sensory experience to levels of extreme levels of response. Whilst the prison regime offers a structure and predictability of regime, it is a one size fits all process, often within a confirmed space (Cell) for significant periods of time, offering implications on wellbeing, (Fryer, 1989). Contradicting the guidance in supporting the high prevalence of ADHD among prisoners, emphasising a requirement for structured service, crucial for improving rehabilitation and reducing reoffending (NICE, 2019).

Community Services provision for neurodiversity and found that demand for diagnostic assessments had outstripped the capacity of Neurodevelopmental Services, facing long waiting times (Research Senedd Wales, 2024).

Therefore, any mirroring of service remains negative from a consistent lack of provision and needs across all areas, inclusive of ongoing support, diagnosis, and treatment. <https://www.gov.wales/review-neurodevelopmental-services>

(NICE (National Institute of Clinical Excellence), 2019), offers further guidance on screening for neurodevelopmental disorders on admission to prison. Further recognising increased risk of suicide, self-harm, and violence.

ADHD has been evidenced to have links to the Criminal Justice System, where One in Four UK prisoners have ADHD, (Takeda, 2022). This prevalence among the Criminal Justice System stems from characteristic traits of ADHD of inattentive, hyperactive, and impulsive behaviors, (Cocallis & Young, 2021). Where the characteristics of the Neurodevelopmental disorder heighten criminal justice involvement, those with ADHD do not have a criminal gene, (Takeda, 2022).

The crimes related to the different ADHD presentations although not truly evident have shown correlation to crimes committed, such as the impulsivity relating to robbery, whilst those having inattentive ADHD, engage in premeditated crimes related to burglary or illicit substance, (Tully, 2022).

Conduct disorder frequently occurs as a comorbidities of ADHD, where evidence predicts a higher risk of offending, therefore questioning the relationship of ADHD alone as a true indication of Criminal activity, whilst also not all ADHD diagnosis are related to those of a criminal background (Cocallis & Young, 2021), although literature highlights associations with ADHD and Dissocial Personality Disorder later in life, (Sevecke, Kosson, & Krischer, 2009). Similarly, the prevalence of Psychiatric disorders including autism, psychosis and anxiety disorders connects with ADHD diagnosis (Takeda, 2022).

(Roberts & Lawrence, 2024), evidence comorbidity of the eight participants interviewed, consisting of Personality disorder, Autism, Schizophrenia, and potential other Learning Difficulties.

From the point of arrest, such traits may offer the requirement of an appropriate adult as part of home office guidance for a Vulnerable Person, applying to any person who, because of a mental health condition or mental disorder may have difficulty understanding or communicating effectively about the full implications for them of any procedures and processes, (Gov.uk, 2024).

(Gudjonsson, 2010), evidence the relationship of ADHD and associated false confessions multiply by three at times of Police interviews. Where the Coping Strategies of those with ADHD when presented with a stressful situation led to poor coping and subsequently avoid confrontation and promote avoidance, (Gudjonsson, Young, & Bramham, 2007)

For a person deemed vulnerable within the Criminal Justice System to require an appropriate adult at the point of arrest, why should this area of support cease? The diagnosis of Social or Mental Health difficulties does not change on entering a prison setting; therefore, a service of support should be evident.

ADHD and criminal activity should not absolve a person's responsibility and Criminal Justice Pathway, but identifying such traits and diagnosis should involve a specific pathway of care/rehabilitation, further promoting public protection.

The Effects of a Prison Environment on a Neurodivergent offers structure and routine, where consistency can promote compliance and understanding, (Murphy, 2005). However, the relationship between ADHD and impulsiveness often means actions associated with limited consequential thinking.

Extended periods of time within a cell can amplify the need for the Dopamine requirements of an ADHD presentation, (Bailey, Chitsabesan, & Tarbuck, 2017).

(Ward & Curran, 2021), links Self harming with ADHD, where this prevalence of emotional dysregulation is intensified within the Prison Setting and that of a confined environment. (Allely, 2014) Further highlights that the risks surrounding suicide are increased through the neurodiverse connection of ADHD and promotion of suicidal behavior,

The prison environment and regime can assist this action due to the lack of supervision, with prolonged periods of isolation. To effectively Manage neurodiverse ADHD prisoners, concerns remain for those undiagnosed, but even for those with a diagnosis, an emphasis on effective treatments and subsequently positive outcomes, research continues to remain limited on the true prevalence of ADHD within prisons, (Tully, 2022).

In comparison to that of Community Service and the prevalence of Neurodiversity, as part of a recognised diagnosis (NHS, 2025). Evidence of criminal-related presentations shows that ADHD provision is an ongoing need. Healthcare provision within the Welsh Prison Service is commissioned by NHS Wales, endeavouring to mirroring services within the community sector (Welsh Assembly Government, 2025).

(NICE (National Institute of Clinical Excellence), 2019) offers evidence base on the requirement for those with ADHD neurodiversity to access Psychological Interventions either independently or alongside medical treatment. Such pathways are only possible as part of a wider understanding and acknowledgement of need by all professionals and individual involved in the day-to-day contact in the prisoner's journey.

In reviewing the limited literature and research available considering the prison environment and neurodiversity, the comparison and prevalence of ADHD within the community can be seen as amplified to those within the prison setting. This prevalence in both areas of community and prison has limitations in service provision.

The supporting factors within a prison environment rely on the need for strong relationships between the Prisoner and those supporting (Prison Officers, Healthcare, etc.). A major factor in the care provision is the ability to recognise and understand the signs, symptoms, and treatment of ADHD, allowing for the medical and psychological model to work in parallel, clearly identifying the care pathway and management outcomes.

The NHS provision and the right to Physical and Mental Health Care does not cease at the gate to the prison environment, as a person's neurodiversity does not get taken away as part of a person's entrance to custody. The prison environment can however be conducive to positive interventions/outcomes, where the use of a structured regime assists in the expectation and understanding of the day-to-day role. Conversely, the prison setting also offers elevated levels of unpredictability due to fellow prisoners and their actions, security needs, the regime of staff and time of violent or emergency interventions.

A major factor or concern for an ADHD diverse individual within the prison setting is that of the risks posed, the links between intrusive thoughts and emotional regulation, experienced as apart of ADHD can lead to the actions of self-harm, suicide and violent outbursts, resulting in the need for further confinement and further emotional difficulties and expressions of need.

The Criminal Justice System itself acknowledges the need for an appropriate adult at the early stages of processing evidence and court Proceedings yet greatly reduces or ceases to exist at the point of incarceration, where for the Neurodiverse individual this then becomes a process of self-exploration, often expressing levels of poor coping.

This process of connecting Mental health needs and the Criminal Justice is already highlighted as an action by the Ministry of Justice stating, “it’s time for action on mental health in Prisons”, (Buckland, 2021). This is not a newly identified need, however, as the Bradley Report emphasised a need for radical change in the Criminal Justice System and the experience of Mental Health and Learning difficulties in 2009, (Bradley K. J., 2009). Although in defence of the report at that time Neurodiversity (ADHD, Autism) was not a recognised Mental Health qualifying condition until the change in the Mental health Act 2017, (NHS.UK, 2022). However, as the report was readdressed some Ten Years later, the inclusion of such criteria should have formed any further reform, (Bradley R. , 2019).

The literature review itself highlights a small part of a much larger need for Neurodiverse provision within the Criminal Justice process, proposing a clear structure of care pathways, that extend to the prevention of involvement in the Criminal Justice System, but also supporting those currently enclosed in this process and how the provision of care can be extended into the community and future prevention.

5 Research: Perspective/ Knowledge/Need

In understanding the perspective and knowledge of professionals regarding ADHD in a prison environment, a survey was conducted through group emails. The aim was to gain insight into the professional’s views on ADHD itself, but also on the current services provided within the identified Category B all-male prison located in Wales.

The survey focussed on those specifically involved in the care and regime of the prisoners i.e.:

- Healthcare Nurse and Health Care Support Workers (HCSW)
- Operational Staff (Prison Officers)
- Non- Operational Staff (Third Sector, Offender Management, Contracted Employers e.g. Education).

The focus was on how a prisoner diagnosed with ADHD is perceived, the impact of their condition on those around them, and its links to other factors such as self-harm and emotional behaviours.

This was further expanded into the understanding of existing pathways, service delivery, and the relationship with the duration of staff training and experience.

Ethical consent was not required. The Health Research Authority regarded the study as not needing a Research Ethics Committee review (NHS Health Research Authority, 2025).

Of the potential staff members (c600), Thirty surveys where completed. Of which, thirteen identified as Healthcare (NHS) employees, Eight as Non-Operational staff, where a further nine additional surveys were completed with no role identified. There were no known surveys completed by operational staff ([Table 1](#)).

Surveys completed	Health care	Non-Operational Staff	Operational Staff	Undefined
	13	8	0	9

Table 3 (Breakdown of survey responses)

Utilising Thematic Analysis, a qualitative method for identifying patterns within data, this approach interprets strengths and weaknesses in service delivery, thereby informing development and policy enhancement, (Braun & Clarke, 2006).

Areas highlighted were:

- Varied levels of training,
- Familiarity and connecting factors of ADHD within the professional forum and roles,
- Addressing how the needs of ADHD are identified and further resourced.

This process assisted in producing Three main themes:

14. Knowledge of ADHD
15. Links to Associated Behaviours
16. Resources/Training Needs

5.1 Knowledge of ADHD:

The findings indicate that overall familiarity with ADHD among both Health Care and Non-Operational staff is limited. Only two Health Care participants reported being extremely familiar with the condition, while the majority in both groups reported moderate or slight familiarity.

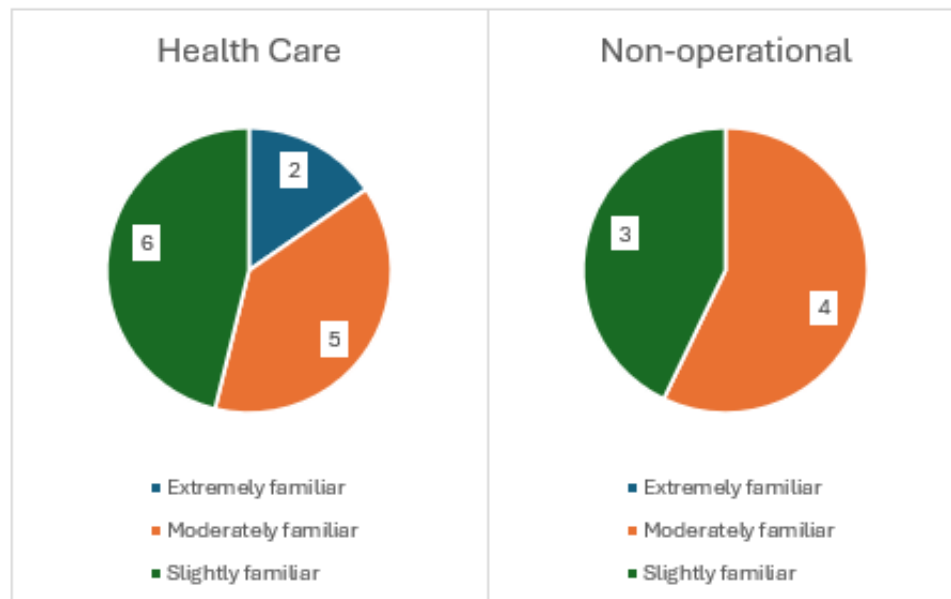


Figure 2 (Levels of knowledge of ADHD amongst respondents).

It is unclear within the survey whether the Health Care respondent is a Qualified Member of Staff (Nurse) or a Health Care Support worker (HCSW).

Those staff with moderate/slightly familiar knowledge have three years plus experience within the prison setting, yet no specific formal training of ADHD.

Of those who stated they had never been trained, 100% felt they had some level of familiarity with ADHD; 80% of these respondents had been in the role for more than three years.



Figure 3 (Number respondents with familiarity of ADHD).

Non-Operational respondents stated their levels of knowledge where a balance of a moderate and slightly familiar understanding, with five out of the eight respondents having never received training on ADHD.

Emphasising limitations on the current training process, be this from the initial stages of staff induction or as an ongoing annual training review. This knowledge is essential for gaining insight and understanding of ADHD and its implications to the prison environment, provision, and individual care.

One anonymous participant reported an extreme familiarity with ADHD but did not provide any details regarding their level of service involvement or training.

No operational staff formally completed the survey, and it remains unclear whether they were among the anonymous respondents. Given their primary role as a point of daily contact, their perspectives and understanding remain crucial to effective service provision and future development.

The data noted that Healthcare and Prison staff were able to envisage all the symptoms associated with ADHD, with only one response stating an identifiable symptom being impulsivity.

The open question of what the individual would do to improve the ADHD service for prisoners, stressed the importance that nurses be it Mental Health (RMN) or Learning Disability (RLD) receive training in Neurodiversity (ADHD), be this as part of their pre-registration training or in their qualified roles.

This could be further applied, to cover all areas of healthcare staff, offering training to HCSW and Allied Professionals (Occupational Therapy, Social Workers, Physiotherapy).

5.2 Links to Associated Behaviours:

Healthcare staff reported being very to somewhat aware of the connections between ADHD and issues such as self-harm, behavioural challenges, aggression, and criminal activity.

Among non-operational staff, two respondents reported being very aware of the connection between ADHD and criminal activity, while all other responses indicated a somewhat aware of the associated factors. No responses are noted from Blank roles.

When exploring knowledge of the connections between ADHD and related factors, an open-ended question might have offered clearer insights by allowing respondents to provide free-text answers instead of selecting from predefined options.

Both healthcare and non-operational staff reported being somewhat aware of the needs of prisoners exhibiting ADHD traits.

This indicates that although staff may identify behaviours associated with ADHD, there remains a gap in their understanding of how to appropriately manage and support individuals with these unique needs.

5.3 Resources/Provision

Of the healthcare participants, Ten have stated that they are not aware of the referral process for an ADHD assessment, where of the Non-operational staff, five state where not aware, where a further Two have stated an awareness.

The accessibility of ADHD services within the prison setting was further examined, eliciting a predominantly negative response. However, a limited number of participants in Healthcare and Non-Operational roles reported being somewhat aware of the service provision.

When asked whether the current provision meets the needs of prisoners with ADHD upon their initial entry into the prison, fourteen staff members responded negatively, comprising five from Non-Operational roles and nine from healthcare. In contrast, only six staff members, two Non-Operational and four Healthcare, indicated that the provision was adequate.

In exploring the participants views on resources for an ADHD service, the views expressed the requirement for a clear pathway for assessment, diagnosis, and treatment options. Inclusive of a training programme for Nursing to offer a process of screening and diagnosis. additionally, for there to be access to protected therapy for those prisoners to allow learning regarding their condition and future management.

Education emerged as a key component of resource provision, with participants asked whether the current service effectively educates prisoners in managing their ADHD symptoms during incarceration. With the exception of one healthcare participant, responses were unanimously negative.

Healthcare staff further emphasised the need for comprehensive training for all staff, as well as the introduction of Peer Mentor roles within prison wings. These roles could involve specifically trained prisoners offering one-to-one support, aligned to existing peer-led initiatives within the prison system.

Non-Operational staff similarly raised options of the need to Increase access to assessment, create activities and timetables to support those living with ADHD, to manage their symptoms more effectively within the custodial setting, and access to psychology / psychiatry.

Additionally, participants highlighted the importance of increasing access to physical activities that incorporate therapeutic elements aimed at addressing trauma or psychological histories potentially linked to ADHD and associated behaviours. There was also support for expanding the reach of ADHD-related provision through greater awareness among both staff and prisoners. Further developing purposeful activities and suitable employment opportunities, underpinned by a non-punitive approach to non-attendance, promoting engagement rather than discipline

6 Survey Review

The aim of the survey was to assess the understanding among professionals involved in the care of prisoners diagnosed with, or potentially showing signs of, ADHD. It also sought to explore connections between ADHD and factors such as self-harm, aggression, behavioural concerns, and involvement with the Criminal Justice System.

Among the thirty participants, three key themes emerged for improving ADHD provisions within the prison setting. Participants demonstrated a moderate level of familiarity with recognising ADHD, with the main symptoms clearly identified through tick-box responses. However, further insight into the understanding of ADHD and its associated symptoms might have been gained through open-ended questions, which could provide a more comprehensive picture of knowledge.

The connections between self-harm, behavioural concerns, and ADHD elicited a response of moderate awareness among staff. However, without a unanimous recognition of these links, this highlights a clear need for enhanced training. Such learning should enable staff to better understand the causes and motivations behind self-harm. Currently, when a prisoner self-harms, the standard procedure is to place them on an ACCT (Assessment, Care in Custody, and Teamwork) process. (Ministry of Justice, 2019).

The ACCT process is designed to keep prisoners safe by identifying and managing the risks of suicide and self-harm. It is managed through a multidisciplinary approach involving both prison and healthcare professionals, who collaborate to agree its implementation and the need for ongoing review. This process includes initiating a support plan and scheduling timed supervision interventions to ensure safety and effective risk management. However, a significant gap in the ACCT process is the lack of recognition for neurodiversity, including ADHD, and the limited understanding of underlying emotional difficulties associated with these conditions.

(Headley Ward & Curran, 2021), expresses that an adolescent placed within the prison setting, can instigate an increase in self-harm and suicidality driven by higher levels of ADHD symptoms and a combination of emotional dysregulation.

Knowledge regarding the links between ADHD and the Criminal Justice System appears to vary among participants, some demonstrating a degree of awareness of these associations.

It is important to emphasise that individuals with ADHD do not possess a ‘Criminal Gene’ and are no more likely to engage in criminal behaviour than others (Takeda, 2022).

ADHD has common co-morbidities, including conduct disorder and substance use. Where the element of **ADHD complicates and exacerbates their mental health**, (Vélez-Pastran, et al., 2022).

Staff knowledge regarding available resources and the referral process highlights a need for greater clarity about current provisions within the prison system. The prison service currently only responds to individuals entering with a confirmed ADHD diagnosis recognised through an appropriate external resource, i.e. NHS.

This response is based on a medical model, primarily involving the provision of medication through the GP service. There is no formalised referral pathway or neurodiversity service offering assessment or treatment beyond this medical framework.

Other service delivery options, including psychological support and ongoing staff training, are currently unavailable. However, among those who provided feedback, there was a clear consensus on the need for an enhanced ADHD service, encompassing awareness, wing-based support, established screening and diagnostic pathways.

A key limitation of this study is the lack of input from operational staff. Despite the survey being made available to all prison personnel, the reasons for their limited involvement remain unclear.

6.1 Implications for Practice

Including the perspectives of Operational Staff would have provided a clearer understanding of current knowledge about ADHD, its complexities, and the viewpoints of those responsible for responding to prisoners' needs and managing daily routines. This remains a crucial factor in assessing the effectiveness of ADHD service delivery.

Survey responses indicated a clear need for staff training, with particular emphasis on increasing awareness and understanding of how the physical environment can affect individuals with ADHD. Additionally, improving insight into a prisoner's presentation and responses to negative behaviours such as self-harm and aggression is essential. This is particularly important when managing prisoners on ACCTs, where understanding the underlying causes, including potential neurodiversity factors, is key.

Multi-disciplinary discussions should include the active involvement of the prisoner whenever possible. While this may not always be feasible during incidents, engaging the individual during calmer periods can facilitate a comprehensive approach. This approach not only aids in recognising ADHD presentations but also helps identify triggers and informs appropriate responses by all parties involved.

7 Discussion & Analysis

ADHD prevalence within prison populations is substantially higher than in the general public, with estimates suggesting that 25% of incarcerated individuals meet diagnostic criteria for the disorder, (Takeda, 2022).

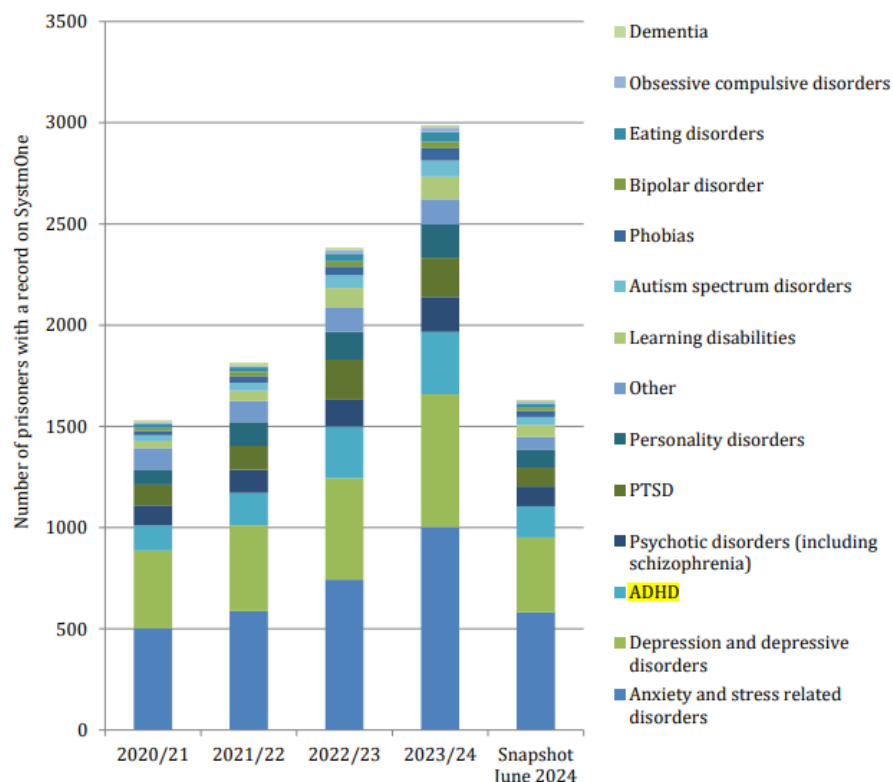


Figure 4 (Takeda, 2022)

Despite this elevated prevalence, ADHD remains frequently underdiagnosed and inadequately treated within correctional settings.

(Young S. , et al., 2018), emphasise that ADHD is a treatable neurodevelopmental condition. Where effective management typically involves a multimodal approach, combining pharmacological interventions and psychological therapies, offering significant benefits for individuals involved in the Criminal Justice System. However, environmental factors inherent to the prison setting present significant barriers to the identification and treatment of ADHD. These barriers include inadequacies in diagnostic pathways and a limited recognition of the well-established associations between ADHD, increased offending behaviour, and broader societal impacts.

Empirical evidence indicates that prisoners with ADHD exhibit higher incidences of verbal and physical aggression, property damage, self-injurious behaviour, and arson, (Young S. , Gudjonsson, Asherson, Theobald, & Oliver, 2009).

ADHD symptomatology, particularly emotional dysregulation and behavioural disinhibition is linked to increased management difficulties, including aggression, (Young S. , et al., 2014).

(Headley Ward & Curran, 2021), identify that adolescent prisoners with elevated ADHD symptomatology demonstrate heightened risks of self-harm and suicidality, further exacerbated by emotional dysregulation.

The complexity of ADHD in prison settings is intensified by frequent comorbidities such as Conduct Disorder and substance misuse, which compound mental health needs (Vélez-Pastran, et al., 2022).

7.1 Duty of Care and Policy Context

Existing literature and policy documents highlight the disparity between mental health needs and service provision within the Criminal Justice System, (Bradley R. , 2019).

(Welsh Assembly Government, 2025), acknowledge this gap, particularly in the context of Welsh prisons, calling for enhanced mental health services and support.

Despite these acknowledgments, neurodiverse populations, including those with ADHD remain underserved, with significant gaps in staff awareness, screening, diagnosis, and treatment modalities, (Young S. , et al., 2018).

7.2 Service Provision and Policy Challenges

The literature and recent survey findings collectively demonstrate the necessity for a formalised, comprehensive service model addressing ADHD diagnosis, treatment, and associated behavioural challenges within prisons.

Underdiagnosis persists, attributable to limited staff awareness and inadequate screening protocols, (Young S. , et al., 2018).

Policy frameworks must provide clear, evidence-informed guidance on ADHD assessment criteria, inclusion and exclusion parameters, and standardised care pathways (Takeda, 2022).

Effective service delivery requires coordinated efforts across healthcare providers, operational and non-operational prison staff, and environmental considerations. A robust referral and treatment pathway is essential to improve care quality, identifying and managing risks related to self-harm and aggression, potentially reducing recidivism. Expanding service awareness to encompass all prison staff may facilitate reductions in emotional dysregulation and associated adverse outcomes.

Multi-Disciplinary Teams interventions, including psychoeducation and cognitive-behavioural therapy (CBT), are integral to effective treatment. Although pharmacotherapy remains the recommended first-line treatment for adults with ADHD, inconsistent prescribing practices and limited longitudinal evidence of efficacy and safety present challenges (Tully, 2022).

7.3 Screening and Early Intervention

Identification of ADHD should commence at prison intake, with routine screening implemented through validated instruments such as the Adult ADHD Self-Report Scale (ASRS), (NICE (National Institute of Clinical Excellence), 2019).

Positive screening results warrant further comprehensive psychiatric evaluation to establish formal diagnoses and initiate appropriate management.

Early intervention strategies should include pharmacological treatment options alongside behavioural therapies. Psychoeducation empowers prisoners to understand ADHD's impact on impulse control, emotional regulation, and attentional capacities, fostering self-management skills. Therapeutic programs may incorporate structured daily planning, conflict resolution, social skills development, mindfulness, and relaxation techniques to reduce aggression and enhance focus.

7.4 Training and Staff Education

A pervasive deficit in ADHD related knowledge and training exists among prison staff, including healthcare professionals. Structured, ongoing education programs are imperative to enhance awareness, promote accurate identification, and support effective management strategies. Training must address the divergency of staff roles and interactions with prisoners, emphasising communication skills and recognition of emotional dysregulation.

Equally, educational initiatives should extend to prisoners, facilitating insight into their condition and its behavioural manifestations within the correctional context.

7.5 Impact: Rehabilitation and Recidivism

Prison settings have dual mandates of punishment and rehabilitation. Effective ADHD management within prisons may improve rehabilitative outcomes by reducing behavioural incidents and supporting psychological well-being, (HM Prison & Probation Service, 2021).

The NHS's involvement in prison healthcare enables continuity of care through established referral networks, though regional variability in community neurodiversity services poses challenges to post-release treatment continuity.

7.6 Transition and Reintegration

Pre-release planning must prioritise continuity of ADHD care, including medication access, healthcare provider linkage, and social support services. Employment programs tailored to individuals with ADHD and integration with addiction recovery and housing services are critical components of successful reintegration.

(Cocallis & Young, 2021), highlight that structured transition programs addressing ADHD specific needs contribute to reduced recidivism and associated societal costs.

7.7 Governance and Legal Framework

Effective governance structures are essential to ensure that ADHD services in prisons adhere to ethical, legal, and clinical standards. This includes compliance with Governmental Policy/Legislation, Human Rights Legislation, Healthcare Laws, the Mental Health Act, and the Equality Act. Safeguarding policies must be rigorously applied to protect vulnerable prisoners and ensure equitable access to care.

8 Service Efficiencies

8.1 Applying Lean Thinking and the Systems Approach

Implementing Lean methodologies, such as TIMWOOD and the KANO model, offers the potential to enhance ADHD service delivery in prisons by improving efficiency, reducing waste, and increasing effectiveness in addressing mental health needs and reducing re-offending.

(Womack & Jones, 2013), outline Lean Thinking is guided by five core principles: defining value from the service user's perspective, identifying, and eliminating waste in the value stream, enabling continuous flow, establishing a demand-driven pull system, and pursuing continuous improvement.

8.2 The Kano Model

Developed in the 1980s by Noriaki Kano, the Kano Model categorises service features based on their impact on user expectations and care quality. The following applies the model to a Prison Service.

1. Must-Have Features (Basic Needs)	Screening & Diagnosis Medication Access & Management. Basic Mental Health Support. Crisis Intervention Services. Coordination with External Providers. Evidence-Based Treatment Options Access to Resources
2. Performance Features (Linear Needs)	Individualised Treatment Plans. Training for Prison Staff on ADHD. Mental Health Check-Ins Group Therapy & Peer Support. Speed of Service
3. Delighters (Excitement Needs)	ADHD-Friendly Work & Education Programs. Telehealth for Specialised ADHD Care. Exercise & Diet Plans for ADHD Management. Sensory-Friendly Clinics.

Table 4 (Rodrigues de Vasconcelos, Correa De Carvalho, & Coutinho de Melo, 2022)

The Kano Model categorises service features into Basic (essential), Performance (incremental improvements), and Excitement (innovative enhancements), offering a structured framework for service development. In a prison care context, this model helps clarify service direction, roles, and resource allocation.

Applying the model enables:

Compliance with Essential Needs – Ensuring timely diagnosis and support.

- **Resource Optimisation** – Prioritising features that directly influence user satisfaction.
- **Innovation** – Encouraging the development of ADHD-friendly practices.
- **Simplicity** – Minimising unnecessary service complexity.

Focusing on performance needs supports improved routine, structure, and learning environments, key for individuals with ADHD. A user-centred approach acknowledges challenges such as impulsivity, emotional dysregulation, and difficulty maintaining routine.

Given the financial constraints within Prison and NHS services, the Kano Model offers a valuable tool for distinguishing essential from desirable features, supporting efficient resource use, where addressing ADHD symptoms through structured, person-centred support can reduce behavioural issues and enhance rehabilitation outcomes, delivering measurable improvements in care quality and user satisfaction.

8.3 TIMWOOD

Effective management and service development require evidence of service efficiency, provider performance, and outcomes. Lean methodologies, such as TIMWOOD, help identify inefficiencies (waste) and support streamlined, effective service delivery (Skhmo, 2017).

T - Transportation	Minimise the unnecessary movement of inmates to separate locations for ADHD services.

	Use in-cell therapy, digital consultations, or designated treatment hubs within the prison.
I - Inventory	Avoid overstocking ADHD medications while ensuring a reliable supply to prevent shortages. Keep only necessary therapy materials, minimizing wasted resources.
M - Motion	Ensure staff (e.g., psychiatrists, therapists, and correctional officers) operate in efficient, structured workflows. Reduce unnecessary movement by using digital records instead of paper-based systems.
W - Waiting	Reduce delays in ADHD diagnosis and treatment by streamlining the assessment process. Implement a fast-track system for high-risk inmates who need immediate support.
O - Overproduction	Focus on delivering necessary services rather than excessive paperwork or non-essential therapies. Tailor services to inmates' specific needs rather than a one-size-fits-all approach.
O - Overprocessing	Avoid redundant assessments or excessive bureaucracy in approving ADHD treatment. Ensure therapy sessions are structured, impactful, and not unnecessarily repetitive.
D - Defects	Reduce misdiagnoses by using standardized ADHD screening tools. Provide consistent training for staff to prevent errors in medication management and therapy.

Table 5 (Authors Own)

8.4 Failure Demand

Effective healthcare delivery in prisons relies on collaboration with custodial staff who manage daily operations and coordination. (Seddon, 2008), identifies systemic flaws in ADHD service provision, including reliance on officers to manage appointments, delays in assessments, missed follow-ups due to staffing pressures, and poor coordination requiring families to repeat information. These issues increase strain on services, frustrate patients, and lead to resource inefficiencies.

8.5 A Systems Thinking Approach

Lean approaches seek to address inefficiencies by designing services that "get it right the first time," thereby reducing waiting lists, improving assessments, and ensuring smoother transitions between stages of care. By minimising failure demand and waste, services become more responsive, person-centred, and sustainable.

8.6 Applying the 4 V's Improving Efficiency and Effectiveness - Prisoner/ADHD.

Volume (Number of ADHD Cases)	High prevalence of ADHD in prisons (estimated 25-40% of inmates). Efficient services require streamlined screening and diagnosis at entry. Effectiveness improves with scalable treatment programs (group therapy, medication management).
Variety (Different Needs of)	Prisoners with ADHD have diverse needs: medication, therapy, educational support, and behavioural interventions.

ADHD Prisoners)	Efficiency requires flexible, multi-disciplinary approaches tailored to different ADHD presentations (e.g., hyperactive vs. inattentive). Effectiveness improves when services are individualised but still standardised enough to be scalable.
Variation in Demand (Fluctuations in Service Needs)	New admissions, transfers, and releases create fluctuations in ADHD service demand. Efficient systems require adaptable staffing and resource allocation (e.g., telehealth services for continuity). Effectiveness improves with initiative-taking care coordination, ensuring uninterrupted treatment.
Visibility (Awareness and Accessibility of ADHD Services)	Many inmates and staff may not recognise ADHD symptoms or know about available services. Efficiency increases with better screening tools and staff training to identify ADHD early. Effectiveness improves when prisoners have clear access to treatment, reducing disciplinary issues and recidivism.

Table 6 (Dickinson, Peck, Durose, & Wade, 2010)

9 NEURODIVERSITY PROVISION: CONSISTANTCY

Prisoners with neurodiversity experience inconsistent care across the prison system, with variations influenced by prison category, internal policies, and available healthcare facilities. This highlights the need for a standardised approach to identification, assessment, and care pathways throughout the Criminal Justice System, (Criminal Justice Joint Inspection, 2021).

9.1 Rationale for Service Change

The introduction of an enhanced ADHD-focused service within the prison system is intended to address the specific needs of individuals exhibiting ADHD traits, with the goal of improving both individual outcomes and broader systemic challenges.

Firstly, the service aims to foster greater self-awareness and identity development among prisoners, which is critical for enabling individuals to understand and manage their condition effectively. Secondly, by providing prisoners with clearer insight and tailored strategies, the service seeks to support more effective management of behaviours commonly associated with ADHD, such as violence, aggression, and self-harm. These behaviours often exacerbate risk factors within custodial environments and undermine rehabilitation efforts. Finally, the service is designed to reduce the frequency and severity of such incidents, thereby decreasing the likelihood of recidivism and reducing the subsequent strain placed on community support services upon release. Collectively, these objectives contribute to enhanced rehabilitation outcomes and improved public safety.

9.2 Wing-Based Healthcare Model

Central to this reform is restructuring healthcare access by shifting from transporting prisoners to delivering healthcare directly to them. This approach enhances flexibility, reduces waiting times, and increases capacity for specialist interventions. Financially, it lowers operational costs and waste, allowing reinvestment into innovative care. To improve efficiency and reduce risks, a wing-based healthcare delivery model is recommended. Conducting assessments and interventions on wings or in cells would:

- Minimise prisoner and staff movement within the facility,
- Reduce delays and bottlenecks in healthcare access,
- Enable specialised staff to allocate resources more effectively,
- Enhance security by limiting prisoner congregation and movement, and
- Facilitate timely assessment and intervention for undiagnosed neurodiverse individuals.

9.3 Implementation Strategy

Table 7 (Authors Own)

Short Term	Medium Term	Long Term
Establishing the Service Stakeholder Engagement NHS Wales Prison Governors & Security Teams – Prison Healthcare Providers Community ADHD Services	Staffing Specialist Involvement Psychiatrist/Advanced Practitioner Mental Health Nurses Psychologists	Occupational & Educational Adjustments Structured Routines Education & Work Exercise & Mindfulness Programs
Referral and Screening Pathway Referral Sources Self-referral Prison Officers GPs & Mental Health Teams Court & Probation Services Screening Tools Adult ADHD Self-Report Scale (ASRS-5) – DIVA-5 (Diagnostic Interview for ADHD in Adults)	Treatment & Management Medication Supervised Long-Acting Formulations Psychological & Behavioural Support Cognitive Behavioural Therapy (CBT) Emotional Regulation Training Peer Support Groups	Staff Training & Awareness Training for Prison Officers & Staff Recognizing ADHD symptoms De-escalation Strategies – Reduce conflict situations. ADHD-Friendly Communication – Clear instructions, structured support. Multi-Disciplinary Team (MDT) Approach Psychiatrists & Mental Health Nurses Prison Officers & Support Workers Occupational Therapists

The service development should prioritise challenges and goals by their importance and feasibility, with areas requiring immediate attention and others suited to medium- or long-term planning (Table 7).

A combined focus on strategic planning and ongoing service review, supported by strong governance, will allow continuous quality improvements and adaptability to evolving needs.

10 Conclusion

10.1 Rationale for enhanced ADHD provision in the prison system

The high prevalence of ADHD within prison populations underscores the urgent need for a clearly defined, evidence-informed care pathway. Such a pathway should be initiated at the point of admission and maintained consistently throughout both short- and long-term custodial sentences, extending into the post-release period through coordinated community support.

An effective ADHD care pathway must include timely assessment, appropriate referral mechanisms, evidence-based treatment interventions, and ongoing service provision. Implementing this structured approach is critical for enhancing the quality and continuity of care, enabling early identification and management of behaviours that may pose a risk to the individual or others. Furthermore, addressing underlying neurodevelopmental needs has the potential to reduce recidivism by supporting behavioural change and improving post-release outcomes.

10.2 Whole-Prison Approach

To be effective, this service model must extend beyond individual clinical interventions and integrate with the wider prison system. This includes equipping frontline staff, particularly prison officers with knowledge and understanding of ADHD and associated behaviours. Increased awareness can reduce misinterpretations of emotional dysregulation and impulsivity, thereby decreasing reliance on physical interventions and mitigating incidents of self-harm or aggression. A multidisciplinary approach is essential, combining psychoeducation, cognitive behavioural therapy (CBT), and pharmacological treatment. Current clinical guidelines recommend medication as the first-line intervention for adults with ADHD, forming the backbone of therapeutic care within this model, (NICE (National Institute of Clinical Excellence), 2019).

11 Service Framework

Service development should be structured around three core categories:

1. Must-Have Features (Basic Needs)	Screening & Diagnosis Medication Access & Management. Basic Mental Health Support. Crisis Intervention Services. Coordination with External Providers. Evidence-Based Treatment Options Access to Resources
2. Performance Features (Linear Needs)	Individualised Treatment Plans. Training for Prison Staff on ADHD. Mental Health Check-Ins Group Therapy & Peer Support. Speed of Service
3. Delighters (Excitement Needs)	ADHD-Friendly Work & Education Programs. Telehealth for Specialised ADHD Care. Exercise & Diet Plans for ADHD Management. Sensory-Friendly Clinics.

Table 8 (Authors Own)

This framework provides a practical basis for service planning and prioritisation, particularly in resource-constrained environments. It also allows for efficient allocation by distinguishing between necessary baseline provision and aspirational service enhancements.

11.1 Service Planning and Resource Allocation

From this foundation, a coherent picture of the service can be developed, defining its strategic direction, the roles and responsibilities of clinical and non-clinical staff, and the overall scope of provision. Given budgetary constraints within both the prison and NHS systems, prioritising essential elements ensures the viability and sustainability of the service, while enabling future expansion aligned with demand and available funding.

Structured support for ADHD symptoms can significantly reduce behavioural incidents and disciplinary actions, fostering a safer prison environment. Recognising that individuals presenting with ADHD traits may have varying levels of need, staffing models must be flexible and responsive to ensure equitable access to appropriate interventions.

11.2 Broader Impact and Post-Release Continuity

Enhanced ADHD care in prisons offers benefits beyond diagnosis, including the identification of co-occurring neurodevelopmental conditions and reduction of psychological distress from unmet needs. This can help manage emotionally dysregulated behaviours—such as self-harm, aggression, and impulsivity—that often lead to serious incidents in custody and increased risk of reoffending.

An NHS-led model supports alignment with community care, enabling standardised, evidence-based assessments and timely care plans that aid continuity after release. While post-release access to services remains challenging, this should not deter investment in strong in-custody pathways. Early intervention and structured support in prison can lower risks associated with violence, emotional instability, and poor reintegration outcomes.

11.3 Monitoring, Evaluation, and Governance

Ongoing governance is essential to ensure the quality and effectiveness of ADHD service delivery within prisons. Regular audit cycles and outcome evaluations should be embedded within the service model to assess evolving needs, demonstrate impact, and ensure alignment with national standards in both health and justice sectors.

12 Expected Outcomes

12.1 Enhanced ADHD Care Pathways

Such an initiative would improve the identification, diagnosis, and management of ADHD within custodial settings, where individuals are frequently underdiagnosed or misdiagnosed, resulting in substantial unmet needs, (Underwood, Phillips, Von Dresner, & Kalb, 2011).

By facilitating earlier detection and implementing evidence-based treatment protocols, the programme aims to deliver consistent, person-centred care throughout custody and into community reintegration. Aligning custodial health services with national clinical guidelines will support improved clinical outcomes and reduce the long-term burden on forensic and community mental health services.

12.2 Improved Behavioural and Emotional Regulation

Research indicates that targeted, evidence-based interventions, particularly Multi-Disciplinary Team approaches that combine pharmacological and psychological treatments can significantly improve behavioural outcomes in individuals with ADHD, (Mohr-Jensen & Steinhausen, 2016). These include enhanced emotional self-regulation, reduced impulsivity, and greater engagement in therapeutic and rehabilitative programmes. Such improvements are critical in promoting desistance from offending, reducing risk behaviours, and supporting psychological wellbeing within custodial environments, (Young & Gudjonsson, Neuropsychological and Behavioural Correlates of ADHD in Offenders, 2006).

12.3 Reduction in Incidents of Violence and Self-Harm

Individuals with untreated ADHD are at increased risk of aggressive and self-injurious behaviours, often stemming from emotional dysregulation and poor impulse control (Young S. , et al., 2018).

Evidence suggests that improving staff awareness and implementing early, needs-led interventions can reduce the frequency and severity of such incidents in custodial settings. By equipping staff with a deeper understanding of ADHD and providing timely, individualised support, the programme aims to reduce crisis interventions, enhance staff–prisoner interactions, and foster a safer, more therapeutic custodial environment, (Young S. , et al., 2014).

12.4 System-Level and Societal Impact

Addressing ADHD within custodial populations holds significant potential to generate positive systemic outcomes, both during incarceration and post-release. Effective identification and management can reduce recidivism rates, alleviate pressure on community mental health and probation services, and support successful reintegration into society, (Ginsberg, Hirvikoski, & Lindefors, 2014).

Over the longer term, such interventions may contribute to improved public health, enhanced employment and housing stability, and reduced socio-economic costs associated with untreated neurodevelopmental disorders, (Suvarna, Kamath, & Young, 2020).

Table 9 (Authors Own)

Key Components:	Challenges and Considerations:
Implement standardized ADHD screening tools (e.g., ASRS, DIVA-5).	ADHD symptoms may be misinterpreted as behavioural problems.
Differentiate ADHD from co-occurring mental health conditions (e.g., PTSD, personality disorders).	Staff often have limited awareness and training on ADHD. Difficulty in accessing prisoners' previous medical records.
Train prison officers and healthcare staff to recognize ADHD symptoms.	Security concerns related to the use of stimulant medications.
Review medical history, self-reports, and supervise medication management (stimulant and non-stimulant).	Limited availability of therapy and structured support programs within prison.
Provide behavioural therapy, psychoeducation, and establish structured routines.	Develop personalised release plans that include ongoing ADHD treatment.
Introduce reasonable accommodations within the prison environment (e.g., flexible schedules, distraction-free spaces).	Establish connections with community ADHD services, ensuring continuity of prescriptions and access to support groups

Any prison- or health board-initiated ADHD service should aim to strengthen the identification, diagnosis, and management ADHD within custodial settings, addressing a critical gap in which individuals are frequently underdiagnosed or misdiagnosed. By embedding evidence-based, person-centred care aligned with national clinical guidelines, such initiatives have the potential to improve clinical outcomes during incarceration and support more effective reintegration into the community.

Targeted interventions that integrate both pharmacological and psychological treatments are expected to enhance emotional regulation, reduce impulsivity, and foster engagement in rehabilitation programmes. These behavioural improvements are central to reducing risk-taking behaviours, supporting desistance from offending, and promoting psychological wellbeing within prison populations.

At the operational level, services should prioritise the reduction of violence and self-harm by equipping custodial staff with enhanced knowledge of ADHD and by ensuring the provision of timely, individualised support. This approach has the potential to lower the frequency and severity of behavioural incidents, decrease reliance on crisis interventions, and foster a safer and more therapeutic custodial environment.

Nevertheless, there remains a pressing need for geographically informed research on neurodiversity, particularly in relation to custodial environments and their wider connections to local and national

communities. Such research is vital for clarifying the intersections of health and criminal justice provision and for advancing understanding of outcomes, patterns of service access, and the standardisation of care.

Findings from this research can inform the effective management of ADHD, contribute to reducing recidivism rates, alleviate pressures on community mental health and probation services, and generate broader societal benefits, including improved public health, employability, and housing stability. In this sense, the development of ADHD services within prisons may address both the immediate needs of custodial institutions and the longer-term public health and socio-economic challenges associated with untreated neurodevelopmental disorders.

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14 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Understanding and managing the balance of urgent and continuity of care demand: A General Practice perspective

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Abstract:

This study explores how General Practices within Hywel Dda University Health Board manage the competing demands of urgent and routine care. Post pandemic pressures, rising patient complexity and workforce shortages have intensified increasing service pressures. Using a mixed-methods approach, combining interviews and perceptual questionnaires, the study explores operational strategies, staff experiences and system-level influences. Findings reveal that while practices adopt flexible appointment systems and nurse-led chronic care clinics, urgent demand often disrupts routine care delivery, contributing to patient dissatisfaction and staff burnout. External factors such as delays in secondary care further intensify pressure on primary care. The research highlights the need for integrated service models, strategic investment in multidisciplinary teams and policy frameworks that support both urgent and preventive care. Recommendations aim to inform future policy and practice, promoting sustainable patient-centred access to General Medical Services.

Keywords: General Medical Services, Urgent Care, Routine Care, General Practice, Access, Primary Care, Chronic Conditions

List of Acronyms, Figures and Tables

List of Acronyms

Acronym	Definition
GMS	General Medical Services
HDUHB	Hywel Dda University Health Board
WG	Welsh Government
QIF	Quality Improvement Framework
NHS	National Health Service
FTE	Full Time Equivalent
VBHC	Value Based Health Care
GDPR	General Data Protection Regulation
MDT	Multi-disciplinary Team

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1 Introduction

The post pandemic demand for primary care services has risen greatly in quantity and variety of the help sought by patients. Despite their best efforts, General Practices continue to face relentless short-term service pressures with annual contractual negotiations, alongside long-term policy expectations to manage increasing demand as close to home as possible. This study explores how General Practices, within the Hywel Dda University Health Board region, manage to simultaneously balance the demand for routine care provision and simultaneously deliver services for patients requiring urgent care. The study focuses on the services and models in use, the experiences of both clinical and non-clinical staff working in practices and how they balance conflicting demands for access to GMS.

1.1 Background and Context

Access to GMS is a key priority for Welsh Government and all health boards. “A Healthier Wales” (WG, 2018) and “A Healthier Mid & West Wales” (H DUHB, 2025) set the national and local strategic direction to shift care from hospitals into Primary Care and Community settings, to invest in prevention and early intervention and to blur the boundaries by integrating health and social care services. GMS are commissioned through a contracting model which includes a Quality Improvement Framework. The QIF establishes Access Standards (WG, 2024) to GP services and uses standardisation to ensure consistency across all regional and national practices. Whilst some of the standards have since moved into core contracting arrangements, Access Standards (Appendix A) remain an optional element for GP Practices that supplement the GMS mandatory contractual requirements. These standards predate the pandemic which has fundamentally changed demand patterns for local providers. The Covid 19 Pandemic prompted drastic changes to how GMS services were provided and “overnight” Practices had to cease operating whilst all but urgent consultations were conducted remotely (Khan et al., 2020). During this period, there was a significant drop in patients with long term conditions accessing primary care services which, post-pandemic, left backlogs and more people presenting locally with exacerbated health conditions that had deteriorated whilst waiting for care (Osborne et al., 2025).

Since Covid, the number of face-to-face appointments provided has increased but some Practices have retained a mixed model of virtual and face to face appointments. Between January and March 2025, most attended appointments in GP Practices across Wales (64.2%) were for chronic, planned or non-acute reasons, while 35.8% of services were used to meet urgent or acute care reasons (WG, 2025). GPs in Wales continue to face increasing pressures relating to rising demand, workforce shortages and financial constraints (British Medical Association, 2023) which all effect access arrangements. A review of how practices satisfy contractual demands and the balance of such demand is timely and highly relevant for Wales and the nation’s goals (Table 1).

1.2 Research Aim and Objectives

To explore how General Practices manage and understand the balance of urgent and continuity of care demand. The research objectives are:

- To assess whether urgent care demand is impacting on General Practice’s ability to provide routine care and chronic conditions management for patients
- To highlight the challenges faced by GMS Contractors in meeting patient demand for Access and explore what strategies are utilised in General Practice to assist with the management of conflicting urgent and continuity of care demands
- To assess the impact of these strategies on patient satisfaction
- To develop a set of recommendations for policy and practice improvements.

Table 1: Key Policy Documents Outlining Improvement to Access in GMS

Policy Documentation	Publisher
Welsh Unified GMS Contract (Regulations) 2023/24	Welsh Government, (2023b)
GMS Contract Access Commitment 2024 to 2025	Welsh Government, (2024b)
Changes to GP Contract to Improve Appointment Access	Welsh Government, (2021)
Strategic Programme for Primary Care	Primary Care one, (2024)
Primary Care Model for Wales	Primary Care one, (2025)
Six Goals for Urgent & Emergency Care Programme	NHS Wales Performance and Improvement, (2024)
Health Education and Improvement Wales (HEIW) Strategic Workforce Plan for Primary Care	Health Education and Improvement Wales, (2024)
Digital and Data Strategy for Health & Social Care in Wales	Welsh Government, (2023a)
Digital Health Care Wales Organisational Strategy 2024-2030	Digital Health Care Wales, (2024)

(Source: The Researcher)

1.3 Motivation of the Researcher

The researcher is an experienced senior leader within Primary Care in HDUHB with a background of contract management and service development. Driven by a strong commitment to supporting localisation policies and general practice, she sought to explore how rising urgent care demand affects the delivery of routine care in GP practices and how this balance is managed operationally.

2 Literature review

2.1 Introduction

This literature review examines the existing research on access to GMS, with a focus on the often-competing demands of urgent and routine care. It explores whether the emphasis on meeting urgent care demand is affecting the delivery of routine care and chronic condition management, while also highlighting the current challenges faced by the GMS workforce.

A Healthier Wales (WG, 2018) outlines the strategic direction for NHS Wales. Along with the Primary Care Strategic Programme (Primary Care One, 2024) it sets out a vision for transformative care, emphasising prevention, early intervention and integrated care. It aims to reduce reliance on hospital-based services by transferring services to primary and community care providing care closer to home wherever possible. The strategy also acknowledges the growing complexity of patient needs and the need to develop new models of care that are digitally enabled and co-produced with patients.

Covid 19 saw a drastic change to the way in which patients accessed GMS services with the accelerated adoption of digital tools, almost overnight there was a switch from face-to-face appointments to digital triage and remote consultation (Greenhalgh et al., 2025; Peek et al., 2020; Eccles et al., 2024). Greenhalgh (2025)

found that whilst remote consultations improved urgent access, they often disrupted the continuity of routine care, particularly for patients with complex needs.

Access to GMS has not completely reverted to the pre-Covid way of working, what has emerged is a hybrid way of working which incorporates digital and face to face models (Johns et al., 2023). Within the new way of working balancing the demands of urgent and routine care within GMS remains an increasingly complex challenge, with rising demand, workforce pressures and digital transformation which all interconnects.

2.2 Urgent Primary Care

The term “urgent care” is ambiguous and is variably interpreted across stakeholders. Denniston & Jackson (2023) define it as care for acute, self-limiting conditions needing same or next-day attention, but not emergency-level intervention. Parkinson et al. (2020) introduce “urgent care sensitive conditions,” which require timely access to prevent deterioration and avoid emergency admissions. Wallace et al. (2021) argue that whilst there is literature available which discusses urgent care it is discussed in general terms and not specifically in relation to primary care or General Practice which poses a challenge to understanding how to manage and meet the balance of demand.

2.3 Policy Context

The Primary Care Model for Wales (2025) outlines plan to reform primary care through service redesign, workforce expansion, digital innovation and local planning. It aims to balance urgent and ongoing care by growing multidisciplinary teams to ease pressure on same-day appointments. However, delivering this vision remains challenging due to the disconnect between policy goals and the realities faced by frontline providers.

The NHS is experiencing growing pressure as it responds to the needs of an ageing population. Projections indicate that by 2031, individuals aged 60 and over will comprise 31% of the Welsh population, with those over 75 expected to account for 11.2% (Older People’s Commissioner for Wales, 2024). This demographic shift is expected to increase the number of patients with multiple long-term conditions (Brilleman et al., 2013), adding further strain to GMS. Combined with the ongoing recovery from COVID-19, this rising complexity is placing further pressure on already stretched healthcare resources (McCann, 2024).

These pressures have increased since the pandemic shift toward urgent, same day appointments. Studies suggest that urgent care is increasingly prioritised due to system pressures and that this shift may undermine continuity and routine care (Armitage, 2022; Fox et al., 2024; Audit Wales, 2025). This is difficult to determine as there is a lack of robust evaluation in relation to how access models affect the balance of care.

The Welsh Government’s Six Goals for Urgent and Emergency Care (2022) promote multidisciplinary working, digital triage and data-driven care. While it has led to the development of urgent care centres across Wales, these have not yet been established within HDUHB.

2.4 Access to General Medical Services

The Covid 19 pandemic disrupted routine care in GMS, there was a decline in the diagnosis of long-term conditions which has had lasting consequences for ongoing chronic disease management (Newbould, 2024; Osbourne et al., 2025 and Qi et al., 2023). This diagnostic gap has contributed to a growing backlog in the management of chronic conditions which has intensified the pressure on GMS to recover missed care. However, the need to manage urgent demand alongside this backlog presents a challenge to Practices.

Multiple factors affect access to GMS, these include patient expectations, access models, system design and workforce availability. A systematic scoping review by Newbould et al. (2024) found that most access systems, such as telephone triage and online booking are structured more to managing demand rather than enhancing patient experience, this is particularly evident amongst populations with limited digital access. The study highlights a tension between improving access and maintaining continuity of care.

Eccles et al. (2024) identifies two dominant strategies to improve access which are increasing appointment capacity and modifying patient pathways. Strategies to manage demand often prioritise efficiency over patient-centred care, unintentionally shifting focus toward urgent care at the expense of routine services. Whether through traditional booking, triage, or digital platforms, access systems shape how practices

allocate resources. When designed mainly for speed, these systems can disadvantage patients with complex needs and worsen health inequalities, particularly for those who are digitally excluded.

2.5 Workforce challenges

Workforce sustainability remains a critical challenge in general practice, particularly in the context of managing both urgent and routine care. The WG Workforce Report (2025b) and Audit Wales Report (2025) highlight that despite high levels of investment the NHS workforce in Wales is struggling to keep pace with rising service demands which are limiting the capacity of practices to deliver consistent chronic disease management, especially in rural and socioeconomically deprived areas. These pressures are compounded by an ageing GP workforce, ongoing recruitment and retention difficulties and rising levels of burnout and underemployment. Such constraints directly affect appointment availability and influence how care is prioritised, often forcing practices to focus on immediate demand at the expense of continuity and long-term condition management.

Based on the WG statistical report (2024a) Figure 1 shows that whilst the headcount of GPs in Practice has increased in the period December 2021 to September 2024, the FTE has remained static. 33% of this FTE workforce are aged 50 and over.



Figure 1: Fully Qualified GPs Headcount and FTE (WG, 2024a)

According to WG (2025), the number of GP practices in Wales fell from 516 in 2002 to 370 in 2025. Although not specific to Wales, the RCGP's Future of General Practice report (2021) highlights serious workforce shortages, particularly in rural and deprived areas. RCGP Wales further described General Practice as being in crisis in its response to the 2025 Senedd Inquiry (Royal College of General Practitioners Cymru, 2025).

2.6 Understanding and Managing Demand in General Practice

The national shortage of GPs has resulted in a mismatch between capacity and demand; this reduction means that there are fewer clinicians available to meet rising patient needs which causes tension between continuity and the push for rapid access.

Armitage (2022) and Audit Wales (2025) highlight a systemic shift toward urgent, same-day access, raising concerns that continuity is being sacrificed for speed and efficiency. Fox et al. (2024) and Chan et al. (2021) emphasise that continuity of care is vital for effective management of chronic conditions, yet it is increasingly disrupted by the pressures of urgent care demand and fragmented appointment systems. These disruptions can lead to poorer patient outcomes and reduced satisfaction. Both studies suggest that interventions such as assigning patients to named GPs and redesigning booking systems can help restore continuity and

improve the quality of care as well as being essential for improved long-term outcomes and patient satisfaction.

Without strategic oversight, access systems risk becoming reactive, responding to immediate pressures rather than long-term needs. Both Wallace et al. (2021) and Audit Wales (2025) stress the importance of integrated planning and evaluation frameworks that align urgent and routine care to ensure more sustainable service delivery.

Effective demand management in general practice requires data-led planning. Teo and Maddigan (2023), along with the WG (2025), advocate for the use of predictive analytics and standardised data to anticipate and manage fluctuations in demand. However, Greenhalgh et al. (2025) caution that local context and absorptive capacity are critical to success, noting that top-down digital mandates often fail when they overlook frontline realities. Teo and Maddigan (2023) and Wallace et al. (2021) highlight the critical role of forecasting tools and integrated data systems in enhancing both planning and evaluation processes. There is a growing consensus that real-time analytics and demand forecasting are essential to support decision-making in general practice.

Policy frameworks often assume that all GP practices work in the same way, but this doesn't reflect the realities of need-based care in Wales. Currie et al. (2024) reveal that funding is not equitably distributed, with practices in deprived areas receiving less per capita despite facing higher levels of health need. This imbalance limits their capacity to deliver routine and preventive care, forcing a shift toward prioritising urgent and acute cases, which can exacerbate existing health inequalities. These concerns are echoed by Mackenzie et al. (2025) and Osborne et al. (2025), who highlight how digital exclusion and rurality further compound access barriers.

2.7 Patient Satisfaction

Research shows that patients value continuity, holistic care and flexibility, even if it means waiting longer (Public Health Wales, 2024; Fox et al., 2024). However, Armitage (2022) critiques the post-COVID shift toward prioritising urgent appointments, questioning whether this approach aligns with patient preferences or broader system efficiency goals. Eccles et al. (2024) further argue that access systems designed for speed can compromise patient-centred care, especially when digital tools are added without full redesign. Whilst based on a study with English GP Practices, Turnbull et al. (2019) highlight how confusion between urgent and routine care can lead to inappropriate appointment use, underlining the need for clearer triage and better public understanding.

The Public Health Wales survey (2024) found that many people expect primary care to support not just medical issues, but also social needs like housing, food and finances. Over 80% supported GPs helping connect them to local services. However, GMS lacks the capacity to manage these wider issues alone, highlighting the need for joined-up, person-centred care. This also calls for better patient education and stronger links between GMS and community services to ensure social needs are addressed through integrated pathways, not solely by GPs.

2.8 VBHC and Its Relevance to Access within Primary Care

In health, value is the measured improvement in a patient's health outcomes for the cost of achieving that improvement (Porter & Teisberg, 2006).

Porter and Teisberg (2006) and Gray (2011) both champion a value-based approach to healthcare, which shifts the focus from the volume of services delivered to the outcomes achieved for patients. Their frameworks advocate for the efficient and equitable use of resources, ensuring they are allocated to maximise population health benefits while avoiding the overuse of low-value interventions and addressing areas of unmet need. In addition, they emphasise the importance of shared decision-making and population-level planning, offering a strategic foundation for enhancing both care delivery and resource management within general practice.

Gray's (2011) VBHC framework offers a compelling lens for improving the efficiency, equity, and effectiveness of general practice in Wales. His model emphasises the importance of delivering care that maximises benefit not only at the individual level but also across populations, aligning closely with the principles of Prudent Healthcare in NHS Wales:

The four prudent principles



Figure 2: Prudent Healthcare Principles (Source: Bevan Commission, 2015)

Managing urgent and routine care in general practice shouldn't be about how many appointments are available; it's about making sure that within these appointments every contact counts. Gray (2011) calls for "waste" reduction (anything that doesn't improve a patient's health) e.g. patients using urgent appointments for non-urgent issues and resources that are used inefficiently. Gray highlights the need for patient involvement in care decisions, supporting access systems that focus on what matters to patients. The VBHC model builds on this by suggesting access should be judged by health outcomes, not just by speed or volume of appointments.

2.9 Future Direction

Future policy should focus on developing best practices for appointment systems, workforce planning and resource allocation to support GMS. Greater use of Patient-Reported Outcome Measures (PROMs) and digital tools can help manage demand and improve care. Sharing effective ways to balance urgent and routine care will support more outcome-focused services across Wales.

Further research is needed to explore how predictive analytics and patient feedback can enhance responsiveness and service quality in primary care.

2.10 Conclusion

To conclude, balancing urgent and routine care in general practice is a complex and evolving issue with little literature currently available to support the matter, particularly in the Welsh context. Available literature highlights growing challenges (rising patient demand, staff shortages and the shift to digital access) which make it harder for practices to deliver both urgent and ongoing care effectively. While digital tools have improved access for some, they have also created barriers for others, especially those with long-term conditions or limited digital access. Many systems are built to be efficient, but they don't always focus on what patients need most. At the same time, staff shortages, especially in rural and disadvantaged areas, make it even harder for practices to provide enough care. Most existing studies focus on managing demand, but few explore how practices actually balance different types of care.

This research will not test a hypothesis but will instead build theory by exploring how GPs understand and manage this balance and how national guidance influences their activity. Using standard data alone may not give a full picture of how urgent care affects routine services. A more detailed and thoughtful approach is needed, one that considers both staff capacity and what matters to patients.

Following a comprehensive review of the literature, a conceptual framework has been developed to capture the key components influencing the balance between urgent and routine care within General Practice. This framework synthesises strategic, operational and contextual factors identified in the review, enabling a

structured interpretation of how general practice navigates competing demands and delivers responsive, patient-centred care.

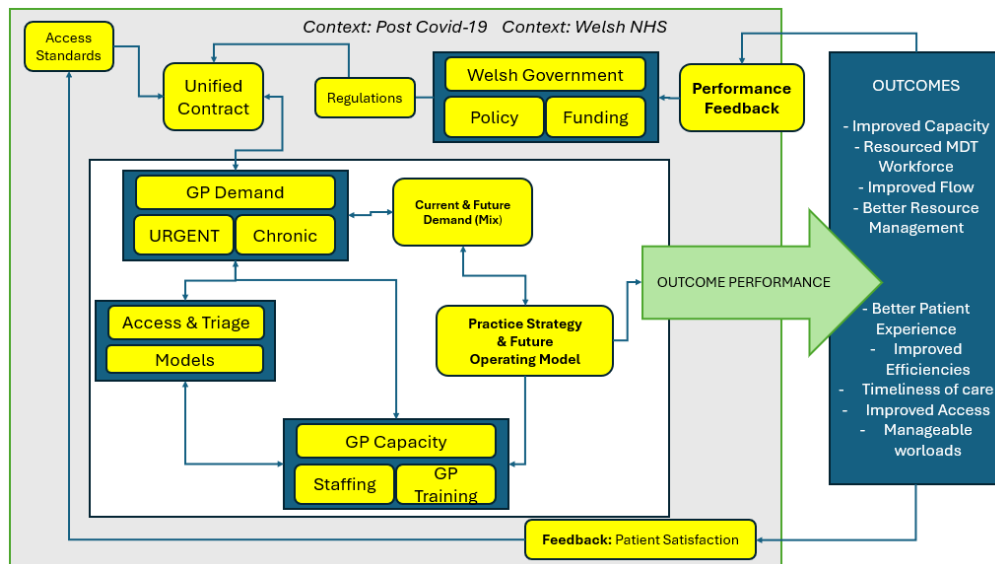


Figure 3: Conceptual Framework (Source: Developed by Researcher)

3 Methodology

3.1 Introduction

This chapter outlines the methodology governing this research project and seeks to capture contextual richness and professional experience through a pragmatic approach rather than positivistic methods. The design has been structured using the “Research Onion” Model (Saunders et al., 2019).

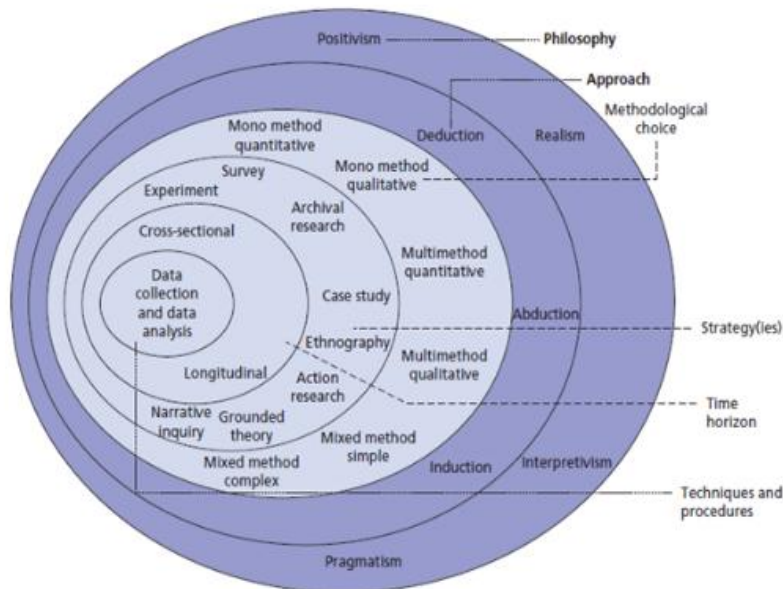


Figure 4: The Research Onion (Source: Saunders et al., 2019)

3.2 Research Design

A mixed-methods approach utilising qualitative and quantitative data was used to understand how General Practices manage the balance of urgent and continuity of care demands. This research has operational, strategic and clinical value.

3.3 Literature Review

To help shape the focus of the study and understand what is already known about the topic a review of existing literature was conducted. Searches were completed using online academic databases such as I-find and Google Scholar. Keywords included General Practice, urgent care, routine care, primary care, access and NHS Wales. These terms were combined using simple search techniques such as AND/OR to find the most relevant results. Articles were selected based on their relevance to GP Practice in Wales, especially those that focused on access to GMS. Most of the sources were from the last five years based on post covid articles although some other key sources were also included wherever useful. The selected articles were grouped into themes which helped inform the study design and support the choice of research methods. A conceptual framework was developed which was presented in Chapter 2.

3.4 Case Study Strategy

This study used a multiple case study design, focusing on several GP practices within the HDUHB area. Each practice was treated as an individual unit of analysis, allowing the research to explore organisational-level decision-making and models of service delivery. This approach supported the identification of both common strategies and local variations in how practices manage the balance between urgent and routine care.

The HDUHB area covers a quarter of the landmass of Wales, it is a predominantly rural area covering the three Counties of Carmarthenshire, Ceredigion & Pembrokeshire. Many GP Practices serve widely dispersed populations in rural communities.

There are 47 GP Practices within the HDUHB area with registered populations ranging from 2,617 to 22,440 (Stats Wales, 2025). The current registered population is 401,199. Figure 5 delineates the growth of the registered population within HDUHB General Practices since 2020.

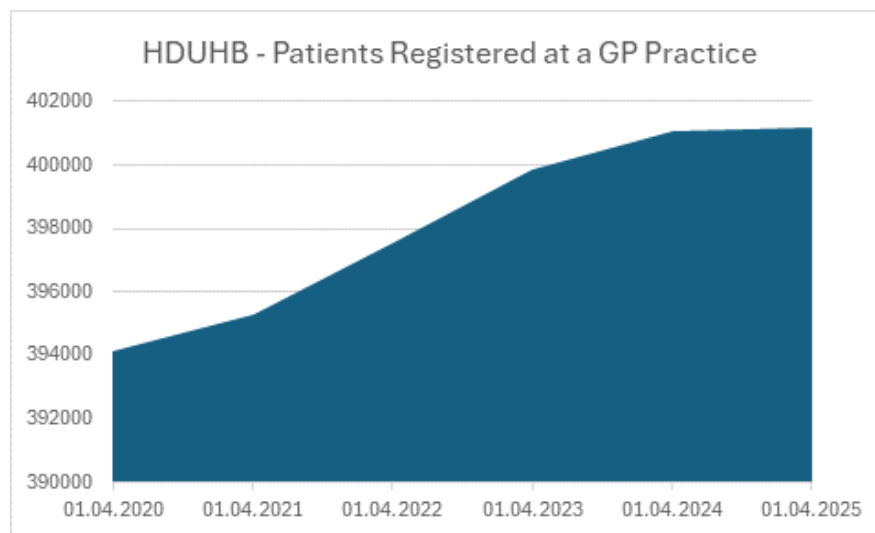


Figure 5: Patients Registered at a GP Practice within HDUHB (Source: Stats Wales, 2025)

The population within HDUHB is predicted to rise further to 425,000 by 2033. Alongside, there is an increasing aging population resulting in an increase in the number of patients living longer with multiple co-morbidities (HDUHB, 2020).

The Welsh Index of Multiple Deprivation ranks areas in Wales from the most deprived to the least deprived, within HDUHB GP Practices range from quintile 2 to 5. There are no GP Practices within quintile one, the most deprived areas:

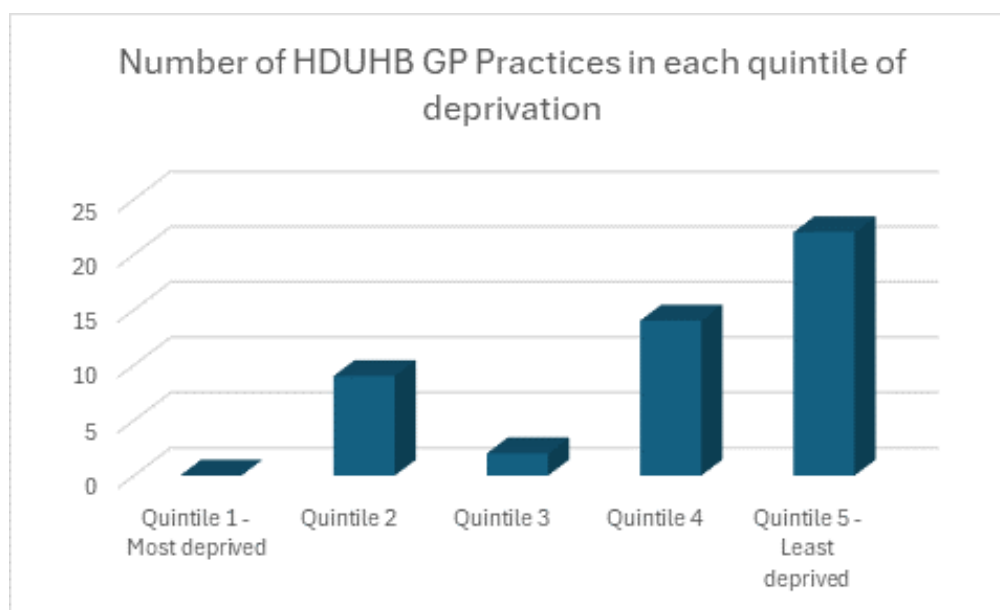


Figure 6: Patients Registered at a GP Practice within HDUHB (Source: Stats Wales, 2025a)

3.5 Data Collection Methods

To meet the research aims, a mixed methods approach was designed, combining semi-structured interviews and perceptual questionnaires. The interviews helped gather detailed insights into participants' experiences and allowed for the exploration of emerging themes. The questionnaire captured participants' views and beliefs on key issues in a more structured way. Using both methods provided a richer and holistic understanding of the case study. A copy of the interview questions and the perceptual questionnaire are included in Appendix B and C of this report.

3.6 Sampling Strategy

Sampling included clinicians and staff who worked in both independent GP Practices and Health Board Managed Practices within HDUHB.

Table 2: Sampling Strategy

	Semi Structured Interviews	Perceptual Questionnaire
Range of General Practice staff invited to participate	GPs, Practice Nurses, Non-Medical Prescribers, Practice Managers	GPs, Practice Nurses, Non-Medical Prescribers, Practice Managers, Administrative Staff
Method	Virtual interviews were undertaken via Microsoft Teams and recorded with transcription. Verbal consent was obtained at the start of each interview.	Microsoft Forms
Number of respondents	10	28

Fourteen staff members were invited to participate in semi-structured interviews. Ten participants took part (6 GPs, 1 Practice Based Pharmacist and 3 Practice Managers) including GP Practices from

Carmarthenshire, Ceredigion and Pembrokeshire. Two participants declined to participate due to workload pressures and two were non-responders.

The perceptual questionnaire was distributed to all 47 GP Practices via the Practice Manager email distribution process with a request to circulate to all staff members within Practice. All responses were anonymous.

This study did not focus on the age or gender of individual GPs or practice staff, the GP Practice itself was used as the unit of analysis, rather than individual staff members. All interview participants were senior staff with the ability to influence decision making and had a clear interest in how their practice managed the balance between urgent and routine care.

3.7 Limitations

- The study focusses on GP Practices within the HDUHB area only.
- There was no input to either the semi-structured interviews or the perceptual questionnaire from Practice Nurses, although it became apparent that their focus within Practice was predominantly chronic conditions management rather than urgent care.
- The short timescale of the project.

3.8 Analysis of the Data

Thematic analysis, following the approach outlined by Braun and Clarke (2006), was used to explore and interpret the qualitative data from interviews. Descriptive statistics were applied to summarise the responses from the questionnaire data. Triangulation of the interview findings with the survey results helped to validate and strengthen the overall conclusions.

3.9 Ethical considerations

A Participant Information Sheet (Appendix D) was shared via email with all interview participants prior to data collection. Informed consent was obtained from all participants, and anonymity and confidentiality were maintained throughout the study. Swansea University (Appendix E) granted ethical approval. All data has been stored securely and managed in accordance with GDPR requirements.

4 Findings

4.1 Introduction

This chapter presents the findings from the research exploring how General Practice understands and manages the balance between urgent and routine care. The results reflect both operational strategies and staff perspectives.

4.2 Perceptual Questionnaire

The Perceptual Questionnaire was produced using Microsoft Forms (Appendix C). The Questionnaire was distributed to all 47 GP Practices within HDUHB via email to the Practice Manager in each Practice with a request for it to be shared with all staffing groups. A total of 28 responses were received; all responses were anonymous.

In addition to Rickert Scale questions gaining perceptual data some general data was collected in relation to practice list size (Figure 7) and staffing groups (Figure 8):

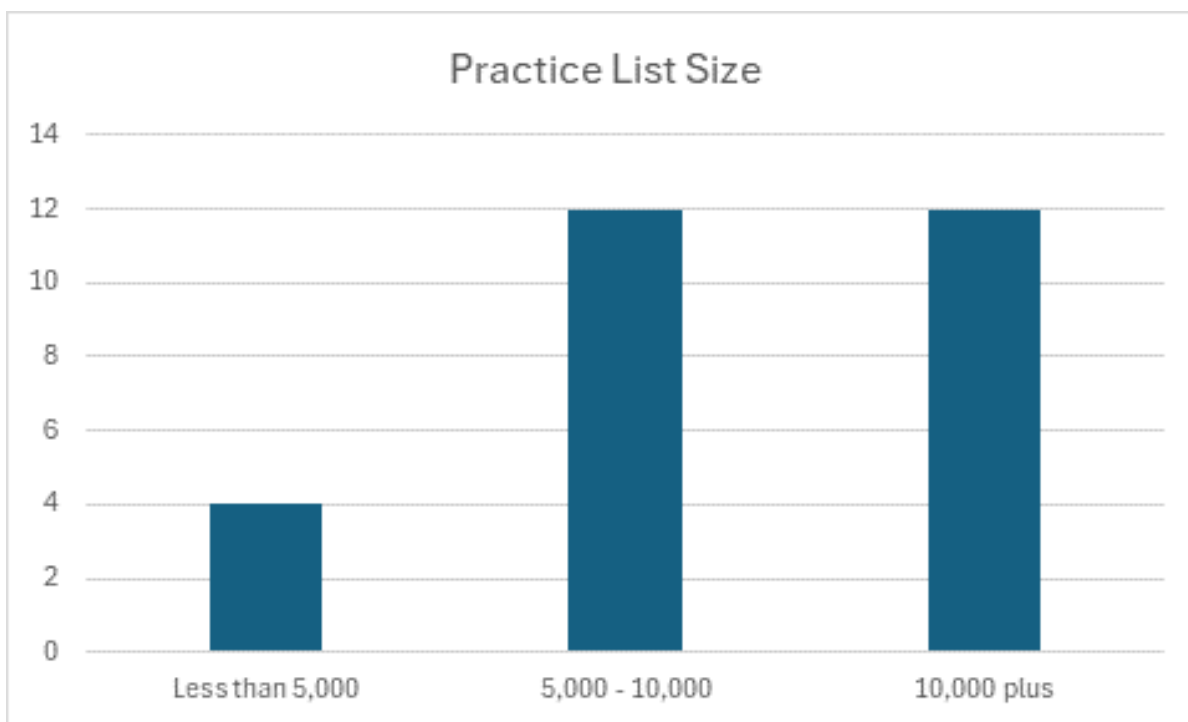


Figure 7: Practice List Size of respondents

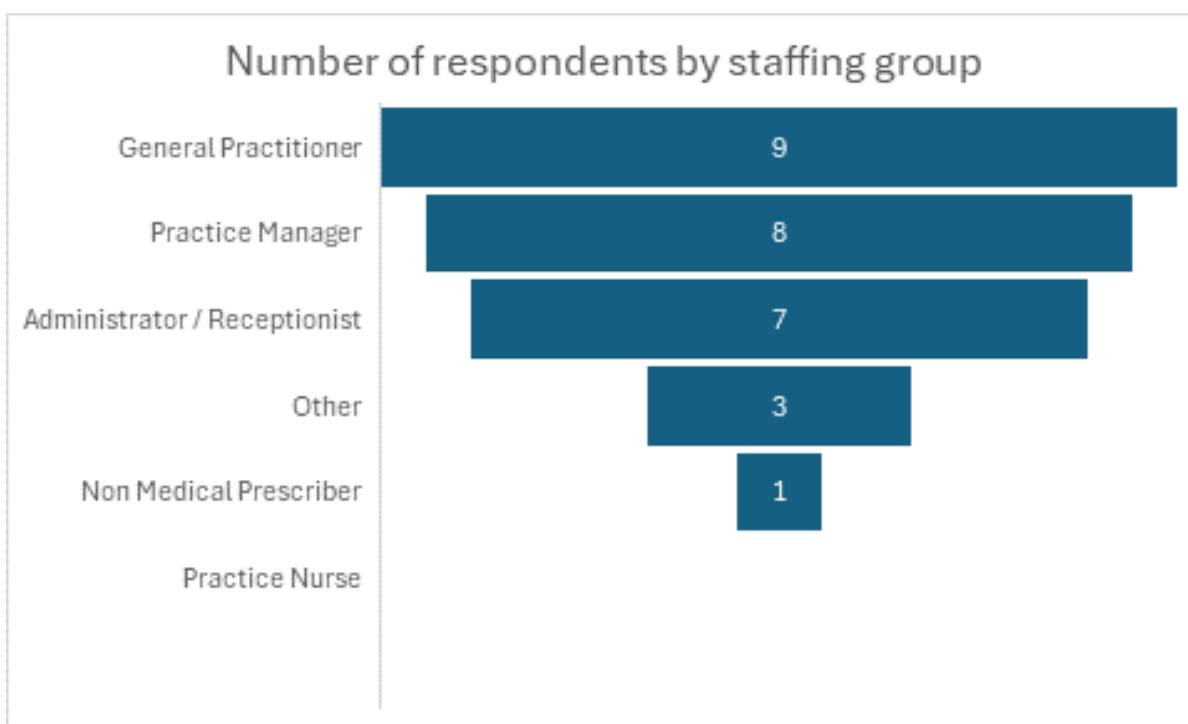


Figure 8: Number of respondents by staffing group

4.3 Perceptions of Demand and Capacity in General Practice

Figure 9 presents the results of General Practice staff perceptions with a focus on the balance between urgent and routine care. Respondents rated their level of agreement with a series of statements which explored the following:

- Perceived increases in demand for both urgent and routine care
- The extent to which urgent demand exceeds appointment availability
- The impact of urgent care on routine appointment scheduling and chronic condition management
- Adequacy of follow-up for patients with long-term conditions under current pressures
- Staffing sufficiency and overall capacity to meet patient demand

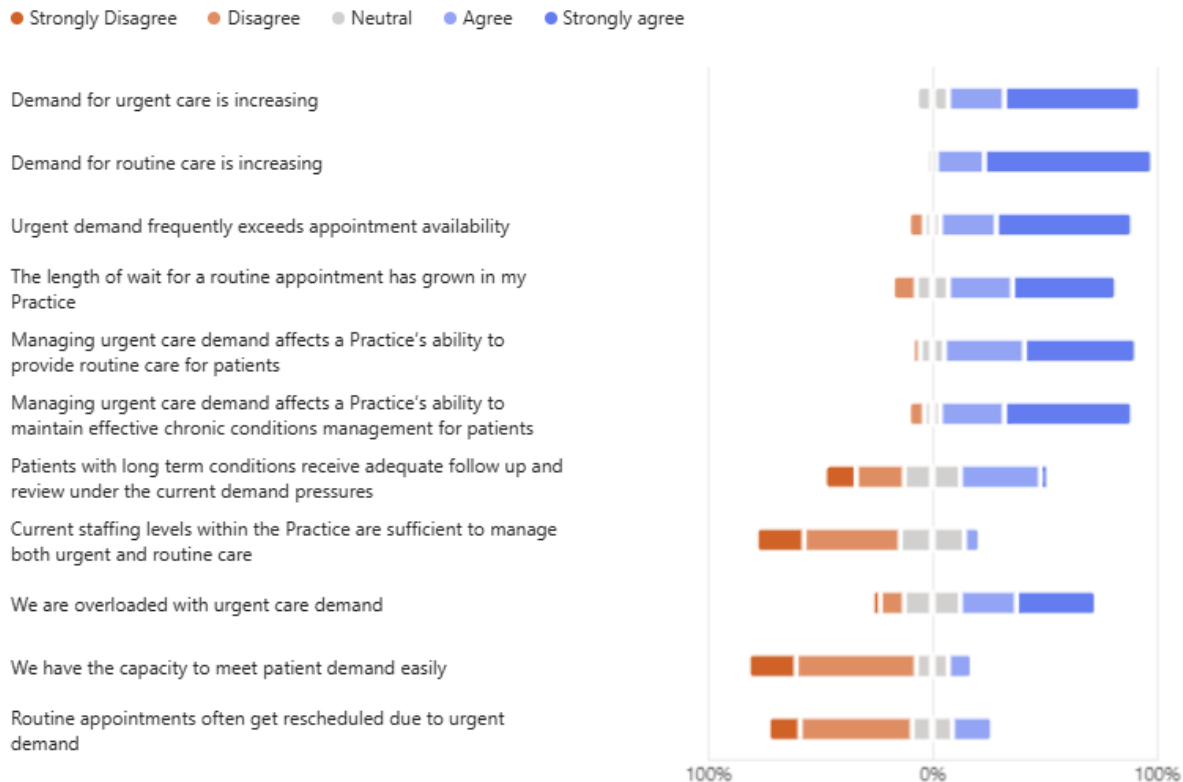


Figure 9: General Practice perception on Demand and Capacity in General Practice

Table 3: Key Themes in Connection with the Perceptions of Demand and Capacity in General Practice

Key area of focus	Key finding	Narrative Insight
Urgent Demand	85.7% of respondents agreed or strongly agreed that demand for urgent care is increasing.	Widespread perception of escalating urgent demand pressure
	96.4% of respondents agreed or strongly agreed that demand for routine care is increasing	Overwhelming agreement of the increasing pressure to meet ongoing patient needs – highlights the challenge of managing the balance of both urgent and routine care
	85.7% of respondents agreed or strongly agreed that urgent demand exceeds appointment availability	Mismatch between capacity and demand
	60.7% of respondents agreed or strongly agreed that the Practice was overloaded with urgent care demand	Identifies need for service redesign
	75% of respondents disagreed or strongly disagreed that there was capacity to meet patient demand easily	Existing model demonstrates weakness in the face of continuous demand
Routine Care	75% agreed or strongly agreed that the length of wait for a routine appointment has grown	Impact on patient experience / satisfaction
	85.7% of respondents agreed or strongly agreed that managing urgent demand affects a Practice's ability to provide routine care	Strong indication of urgent pressures impacting on routine care
	85.7% of respondents agreed or strongly agreed that managing urgent demand affects a Practices' ability to maintain effective chronic conditions management for patients	The ability to effectively manage chronic conditions may be compromised Potential consequence for population health outcomes
	39.3% of respondents agreed or strongly agreed that patients with long term conditions received adequate follow up and review under the current demand pressures but contrary to this 35.7% disagreed or strongly disagreed with this statement.	Divided view which may indicate variability across Practices
Staffing levels	7.1% of respondents agreed that current staffing levels within Practice were sufficient to manage both urgent and routine care demand.	Overwhelmingly low perception that the current workforce's is adequate to manage demand
Flow	64.3% of respondents disagreed or strongly disagreed that routine appointments often get rescheduled due to urgent demand.	Continuity of care for patients and effective appointment booking systems in place

4.4 Perceptions of System-Level Influences on General Practice

Figure 10 presents the results of General Practice staff perception on strategic developments and external drivers for change affecting GMS. Respondents rated their level of agreement with a series of statements which explored the following:

- Signposting to community pharmacy and its perceived effect on GMS demand
- Implementation of the Unified Contract Access Standards and its role in improving access and streamlining triage
- Strategic shifts from hospital to community care and their influence on general practice capacity
- Patient satisfaction, innovation needs and awareness of national resources such as the Health Equity and Inclusion Toolkit

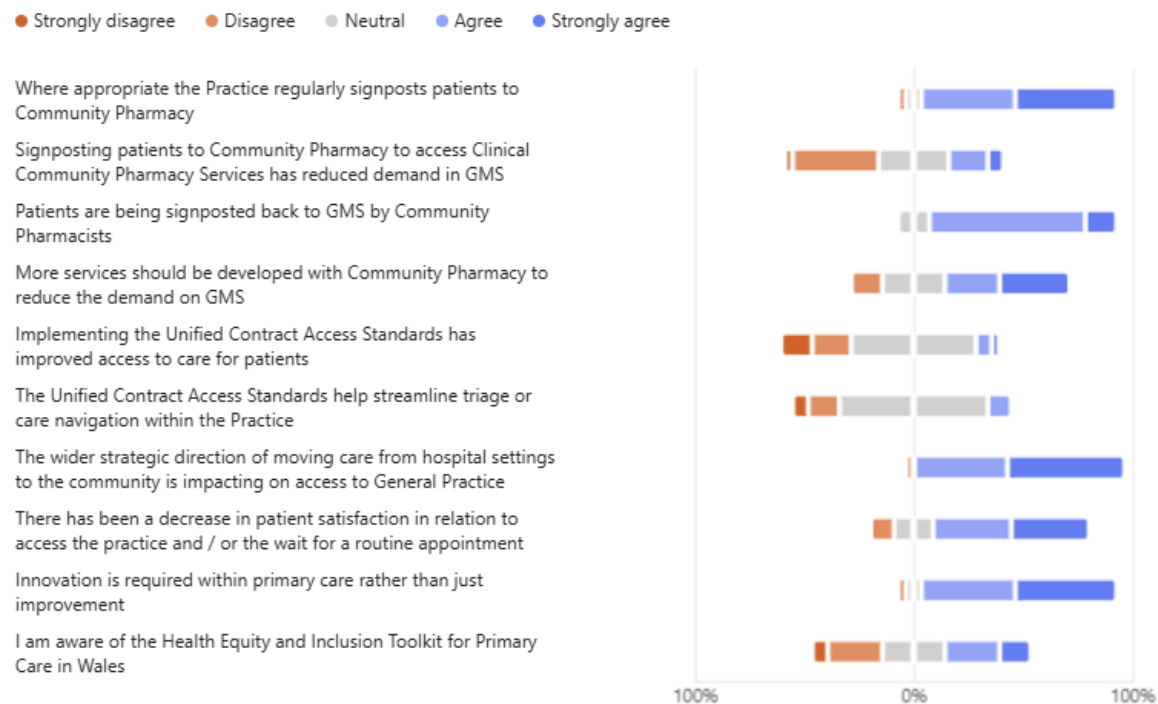


Figure 10: General Practice Perception of System-Level Influences

Table 4: Key Themes in connection with the Perceptions of System-Level Influences on General Practice

Key area of focus	Key finding	Narrative Insight
The Role of Community Pharmacy	89.3% of respondents agreed or strongly agreed that the Practice signposts patients to Community Pharmacy where appropriate	Indicates that care navigation is widely adopted
	42.9% of respondents disagreed or strongly disagreed that signposting to Community Pharmacy had reduced demand in GMS with only 25% of respondents agreeing or strongly agreeing that demand had been reduced.	Limited perceived effectiveness in alleviating demand in GMS
	85.7% of respondents agreed or strongly agreed that patients are being signposted back to GMS by Community Pharmacy	Further exploration required in relation to current pathways and integration of services
	57.1% of respondents agreed or strongly agreed that more services should be developed within Community Pharmacy to reduce demand on GMS	Support for expansion of pharmacy services
Access	10.7% of respondents agreed or strongly agreed that implementing the Unified Contract Access Standard has improved access to care for patients with 32.2% of respondents disagreeing or strongly disagreeing with this statement	Low perceived impact
	10.7% of respondents agreed that the Unified Contract Access Standards help streamline triage or care navigation within the Practice in comparison to 21.4% of respondents who disagreed or strongly disagreed with this statement	Contradicts earlier perception of wide adoption of care navigation within Practices
Patient Satisfaction	71.4% of respondents agreed or strongly agreed that there has been a decrease in patient satisfaction in relation to accessing the practice and / or the wait for a routine appointment	Declining satisfaction may lead to reduced trust in services, increased complaints and delay in accessing care
Service Transformation	96.5% of respondents agreed or strongly agreed that the wider strategic direction of moving care from hospital settings to the community is impacting on access to General Practice	Increased pressure on the current model of GMS Requires resource shift
	89.3% of respondents agreed or strongly agreed that innovation is required within primary care rather than just improvement	Indicates a strong appetite for change
	39.3% of respondents agreed or strongly agreed that they were aware of the Health Equity and Inclusion Toolkit for Primary Care in Wales. Contrary to this 32.1% of respondents disagreed or strongly disagreed that they were aware of the toolkit.	Highlights a gap in engagement with GMS

4.5 Priorities to Improve the Current System

Respondents were asked to identify three priorities they believed would improve the current system. Their responses offered a broad spectrum of qualitative insights, reflecting key concerns, needs and potential areas for improvement in GMS, particularly within the Welsh context. To facilitate content analysis and thematic organisation, responses were reviewed and grouped into overarching themes based on recurring topics:

Table 5: Key Priorities Identified and their Core Themes

Key Area of Focus	Core Theme
Workforce and staffing	There is a notable workforce shortage and an overdependence on a limited pool of staff, with repeated calls for increased recruitment of GPs, nurses, Pharmacists as well as administrative staff.
Secondary care	Frustration with ineffective communication and the inappropriate shifting of workload from secondary to primary care settings without resource.
Infrastructure, IT and Digital Systems	Outdated or poorly integrated systems, coupled with limited interoperability, hinder efficiency and lead to duplicated effort across services.
Funding and Investment	There is strong demand for increased funding to help GP practices run sustainably and support new ideas with the ability to apply flexibility to the use of funding allocations when innovating.
Patient Demand	Increasing patient demand, often inappropriate, is putting pressure on already limited GP appointment availability. There is a need for patient education on accessing services.
Public Perception	Public trust is declining with General Practice, partly due to negative media coverage and confusion around how care navigation works. National communication campaign required along with education on what the different roles can do.
Service Integration	There is strong support for offering more services locally through joined-up teams and better collaboration across healthcare roles.
Governance	General practice wants more involvement in decisions about planning, funding, and how they care for their patients

4.6 Interviews

Semi-structured interviews were held with ten participants; they were undertaken via Microsoft Teams and recorded for transcription purposes. In addition to gathering general data a total of 14 questions were explored (Appendix B).

General Data included the participants' role, length of service, the Practice list size and the role within their practice who undertook urgent appointments.

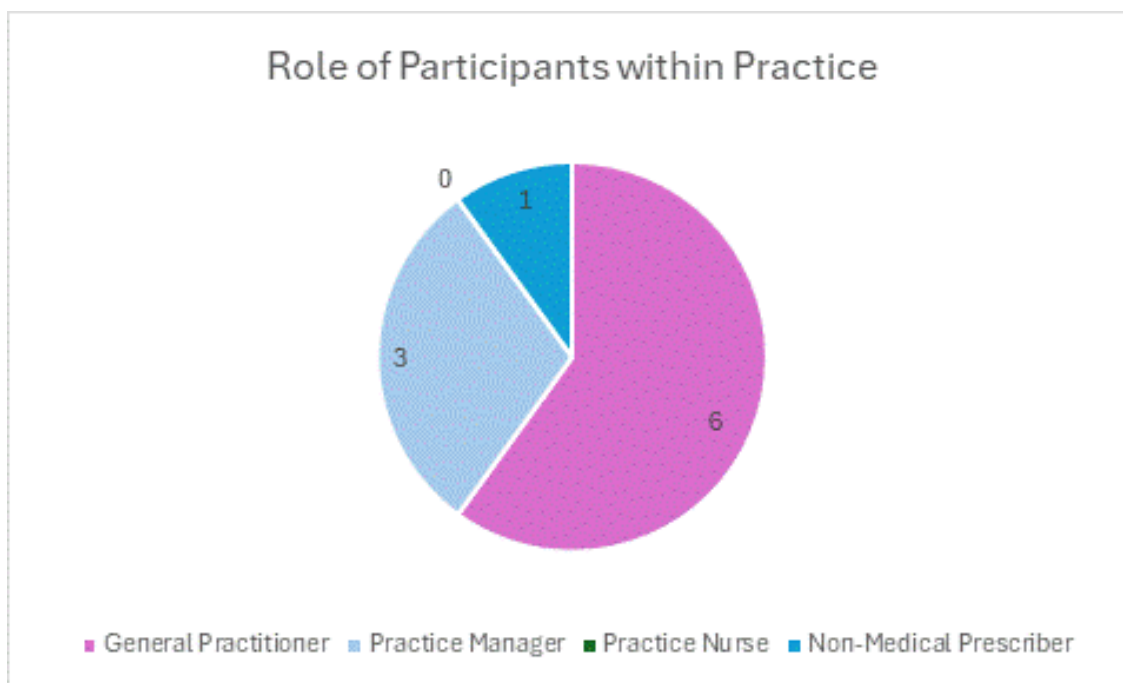


Figure 11: Role of Participants

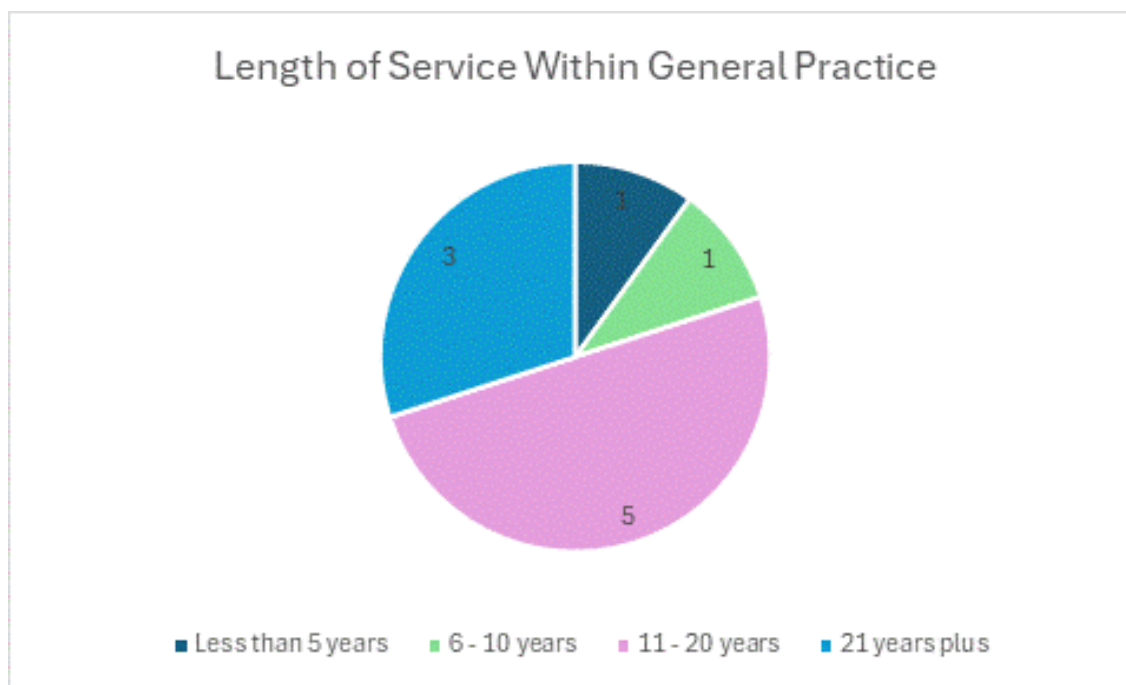


Figure 12: Length of Service within General Practice

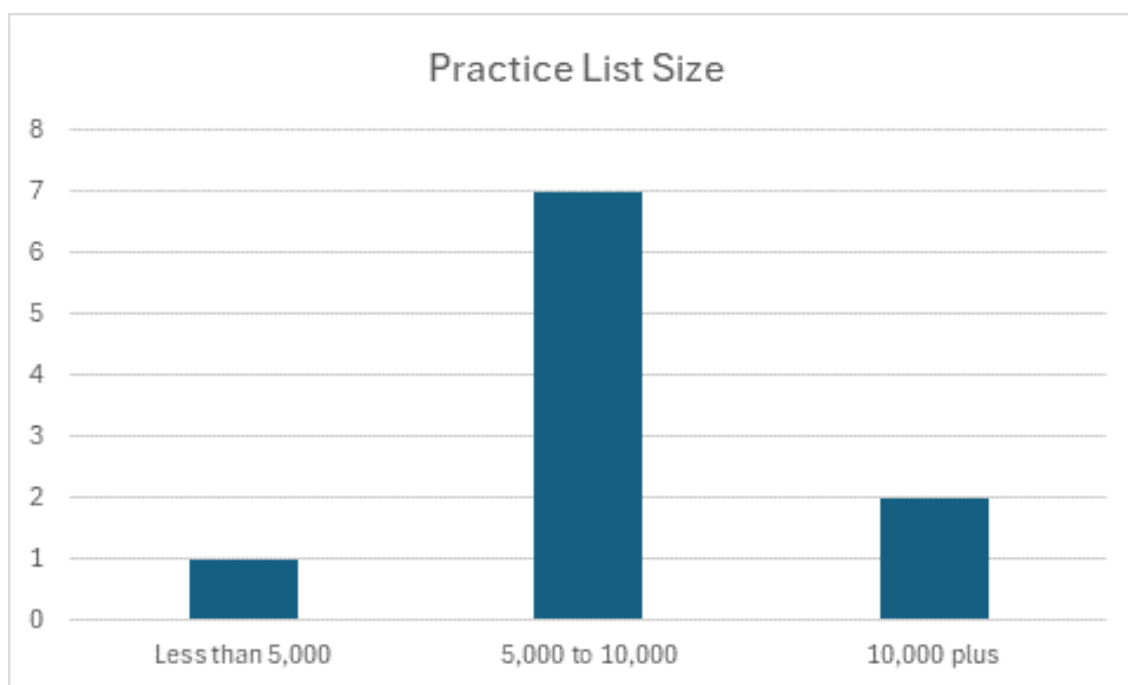


Figure 13: Practice List Size of Participants

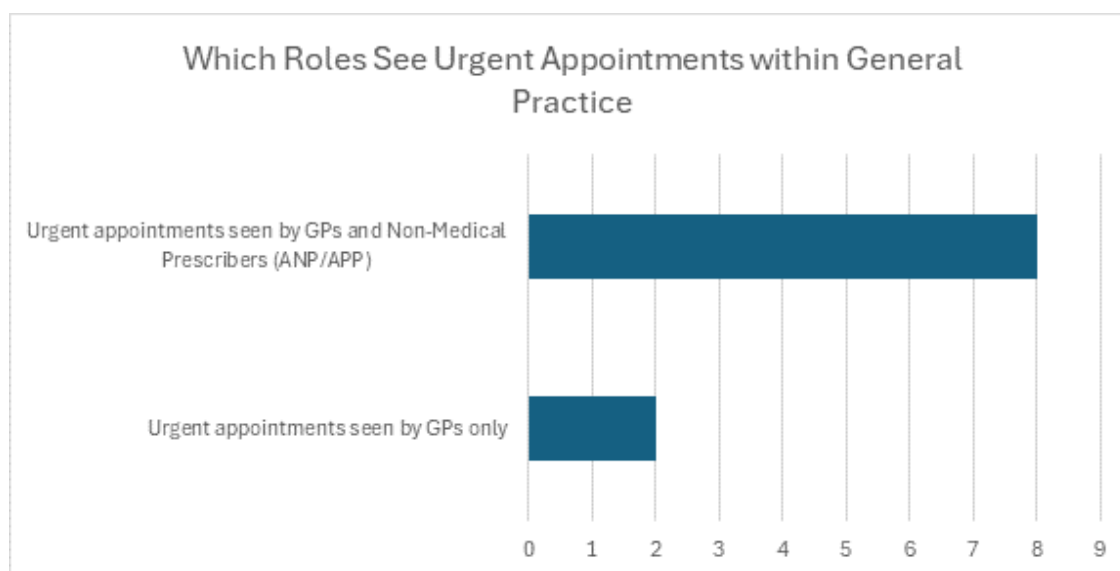


Figure 14: Roles Seeing Urgent Appointments by Practice

The interviews explored operational dynamics, perceptions and strategies related to the management of urgent and routine care. Participants shared insights into appointment systems, triage processes, staffing structures and the impact of urgent care demand on routine service provision. Thematic analysis was conducted to identify consistent patterns, key themes and reflective insights across participant responses. This approach provided a rich and layered understanding of how General Practice manage the often-complex interaction between responding to urgent patient needs and maintaining continuity in routine care delivery.

4.7 Question 1: How would you define urgent care?

Participants were asked how they would define the term urgent care and a number of core themes were observed within their responses.

Table 6: Theme of Participants Definition of Primary Care

Key Themes	Detail
Timescale	Five participants described urgent care to mean that the patient needs to be seen on the same day noting the issue is important and time-sensitive, but not life-threatening One participant suggested that the definition of urgent care required the patient need to be met within eight hours One participant defined it as a need that cannot wait more than a few days.
Emergency Care	Three participants distinguished urgent care from emergency care with urgent care being appropriate for GMS and emergency care appropriate for secondary care
Patient Perception	Three participants highlighted that the urgency of the need was often defined by the patient
Clinical Judgement	Three participants emphasised the criteria for urgency related to acute symptoms such as new onset or exacerbations
Access Pressures	One participant noted that challenges in accessing routine appointments might make patients describe their need as urgent when it is in fact not urgent

4.8 Question 2: Does your Practice have dedicated appointment slots for both urgent and routine care?

All participants confirmed that their Practice had dedicated urgent and routine appointments. The unanimous confirmation suggests that the use of dedicated appointment slots for urgent and routine care is a well-established operational standard within general practice settings.

4.9 Question 3: How long (in days) is the average wait for a routine appointment in your Practice?

The average wait is outlined in Figure 15:

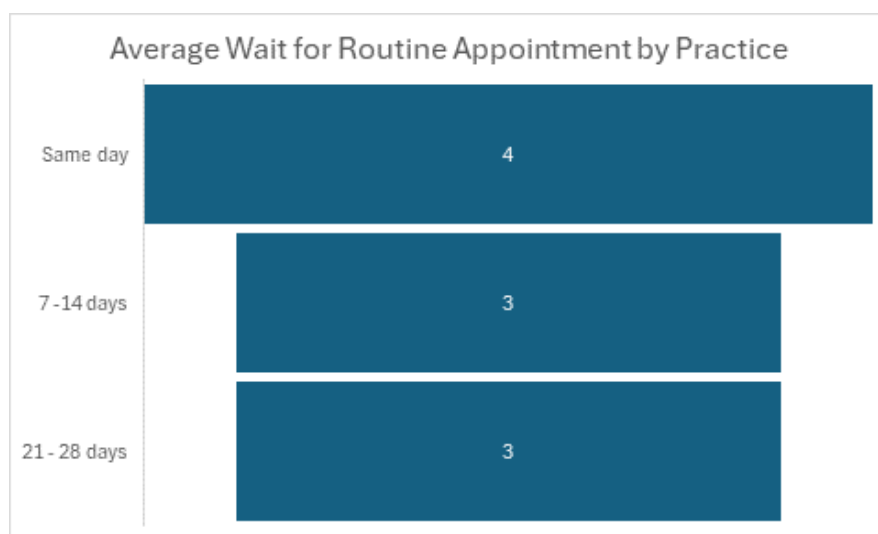


Figure 15: The Average Wait for a Routine Appointment in Days

4.10 Question 4: On average, what percentage of your weekly appointments are for urgent care in comparison to all appointments?

The percentage of appointments is outlined in Figure 16:

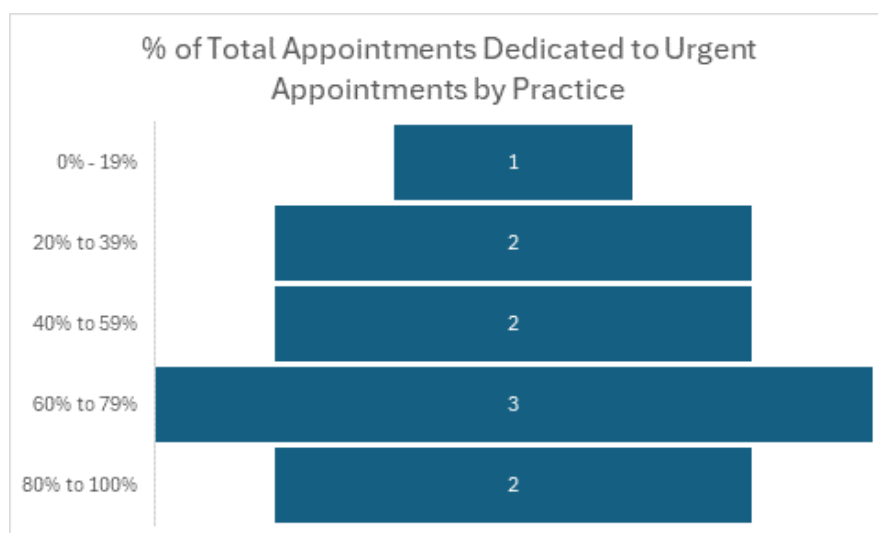


Figure 16: Percentage of Appointments Dedicated to Urgent Appointments as a Ratio of all Appointments

The variance in responses to this question illustrates significant disparity in the proportion of appointments allocated to urgent care across Practices. It highlights the potential differing levels of urgent demand experienced across practices and shows some are operating under considerable pressure to prioritise acute care needs.

4.11 Question 5: Does your Practice have a formal process in place for distinguishing between urgent and routine requests?

All participants reported having a process in place to differentiate between urgent and routine care requests.

4.12 Question 6: What triage methods do you use to manage incoming requests eg clinically led, reception led or digital?

An initial pre-recorded telephone message helps redirect emergency calls; the reception team consistently plays a central role in initial care navigation. The nature and complexity of these triage processes varied across practices. As outlined in Figure 17, several different routes to accessing urgent care were identified.

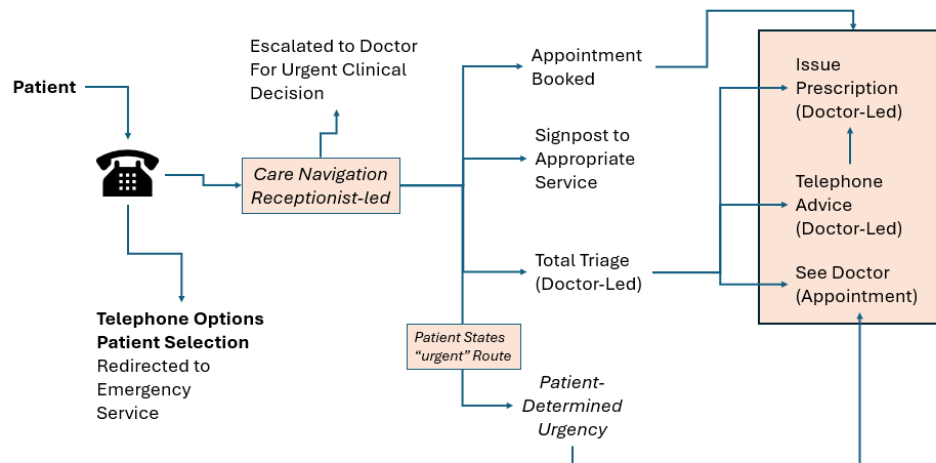


Figure 17: Routes to Accessing Urgent Care (Source: Developed by Researcher)

Some Practices have implemented formal protocols, policies and structured pathways, while others rely on more informal or reception-led approaches. Most practices described a multi-layered system involving telephone triage, reception input and clinical oversight when necessary. One practice stood out by describing a patient-led demand model with minimal filtering, highlighting inconsistencies in how triage is applied. There was little mention of digital triage.

4.13 Question 7: How do you prioritise care when urgent demand exceeds appointment availability?

Participants described a variety of strategies for prioritising care when urgent demand exceeded available appointments. Reception-led triage, care navigation and clearly defined escalation protocols were commonly used to manage this pressure. Several practices operated a “duty doctor” system, where all urgent cases were directed to the clinician on call for that day while others distributed urgent appointments across all clinicians working on a given day. In situations where urgent requests continued after all designated slots were filled, many practices relied on clinical triage to assess the need often resulting in additional urgent cases being added to already full schedules, intensifying clinician workload. One practice collaborated with NHS 111 for triage, and another highlighted the use of multi-disciplinary team (MDT) pilots to support demand. Two Practices stated that they very rarely experienced demand which outweighed their capacity.

To manage the ongoing tension between urgent and routine care, most practices adopted dynamic and flexible approaches, including continual adjustment of clinic schedules, rota flexibility and regular demand audits. Some participants acknowledged that these pressures sometimes led to delayed reviews and gaps in chronic disease management. Participants also noted the emotional and professional strain of absorbing all acute demand with staff feeling compelled to meet the demand with a sense of obligation which can contribute to increased vulnerability to stress and burnout.

4.14 Question 8: In what ways does managing urgent care demand impact on your practice’s ability to provide routine care?

Practices reported that urgent care demand consistently places a strain on their ability to deliver routine services but whilst many have strategically protected chronic disease management through nurse-led clinics, dedicated roles, structured pathways and digital information systems, GP capacity remains under

continuous pressure. Participants emphasised that proactive, preventive chronic disease care is not only good clinical practice but also a vital strategy for reducing future urgent demand. Delegation to nurses and pharmacists, supported by automation and digital tools (e.g., SMS, EMIS, practice websites) has helped streamline follow-ups and free-up clinical time. However, reliance on locums and limited prescribing capacity among nurses continue to disrupt continuity and long-term care.

Practices strongly emphasised the importance of preventative care and the need to prioritise it in future service development. This includes proactive planning and holistic annual reviews, supported by multidisciplinary team (MDT) involvement, to help reduce rising urgent care demand. Interviewees noted that strong chronic disease management lowers acute demand, reinforcing the need to protect time and resources for proactive prevention. Thorough annual reviews that address multiple health needs in one visit were seen as a way to reduce fragmented care and free up clinician time for urgent cases. However, concerns were raised that limited funding and a focus on urgent care can sideline routine and preventative work, weakening continuity and long-term patient relationships. While tools like “Patient Group Directions” and signposting help maintain preventative pathways, practices stressed the need for stronger system-wide support to safeguard proactive care and ensure a sustainable balance between urgent and routine services.

One theme that starkly emerged throughout the interviews was external pressures. External system pressures have significantly impacted access in primary care, with many practices reporting that a growing proportion of their workload stems from failures elsewhere in the healthcare system. Delays in secondary care, such as long waits for surgery, radiology, specialist referrals and mental health services have led to patients returning repeatedly to general practice, often with worsening conditions. This has created a cycle of “demand failure,” where unresolved issues in hospital or community services drive urgent presentations in primary care. Practices are still managing the fallout from COVID-19, including increased mental health needs and deferred care. These pressures not only strain capacity but also compromise the ability to deliver timely routine care, highlighting the urgent need for system-wide coordination, investment and reform to restore balance and sustainability in primary care access.

4.15 Question 9: Are you seeing a difference in the age profile or disease profile of patients requesting urgent appointments?

Responses to this question revealed mixed views on changes in the age and disease profile of patients requesting urgent appointments. Several participants noted a rise in urgent demand from younger patients, particularly children and late teens, often driven by infections, anxiety, or perceived urgency. Others observed an ageing demographic, with older patients presenting more frequently and with greater complexity, often requiring urgent care due to exacerbations of chronic conditions like heart failure or COPD. Mental health was consistently highlighted as a growing area of urgent need across all age groups. Some practices reported that task-shifting to allied health professionals (e.g., pharmacists, paramedics) helps manage simpler cases but leaves GPs handling increasingly complex presentations. Additionally, delays in secondary care and diagnostics were cited as contributing to repeat urgent visits and late-stage diagnoses. Overall, while some practices saw little change in health-seeking behaviour, many described a shift toward more complex, multi-morbid patients across both younger and older populations.

4.16 Question 10: Have you noticed any trends in patient outcomes or patient satisfaction related to delays in routine care due to urgent pressures?

Participants reported growing patient dissatisfaction linked to delays in routine care. Frustration among patients was commonly noted, particularly when routine appointments were cancelled at short notice (due to sickness) or subject to extended waiting times. In some cases, patients reclassified non-urgent concerns as urgent in order to access same-day care, placing further strain on triage systems. While patients may not always be aware of missed or delayed chronic disease reviews unless symptoms worsen, clinicians expressed concern over backlogs and the risk of delayed diagnoses, particularly for serious conditions masked as routine. A recurring theme which arose was the mismatch between patient and clinician perceptions of urgency, which can undermine triage systems. Additionally, participants highlighted that reduced continuity of care and limited access to preferred clinicians were key contributors to patient dissatisfaction.

4.17 Question 11: From your perspective, what are the most significant challenges in managing urgent care alongside all your other day to day responsibilities within Practice?

There was a strong consensus that managing urgent care demand places significant pressure on general practice operations, particularly in balancing routine care and maintaining continuity. Practice Managers face daily challenges in predicting demand, especially around unpredictable spikes such as post-bank holiday surges, which can lead to wasted routine capacity or overwhelmed staff. The importance of strategic planning, workforce mapping and team wide co-ordination to manage demand effectively was emphasised and it was highlighted that every role within Practice, from reception to clinical staff, plays a part in directing patients to the right care at the right time.

The absence of a clear definition of urgent care within primary care settings makes prioritisation challenging and contributes to emotional strain, particularly due to the risk of delayed diagnoses or missed serious conditions. Seasonal peaks, especially in winter, intensify acute demand and whilst Practices strive to maintain continuity through follow-up appointments and proactive planning urgent care can disrupt workflow and lead to missed tasks. Practices feel unable to turn patients away, especially in rural areas with limited alternatives, contributing to emotional and workload burdens. While some systems, like duty doctor models, help manage interruptions, there is a strong call for better support, clearer protocols and investment in continuity and planned care to reduce fragmentation and improve patient outcomes.

4.18 Question 12: What do you feel is the most significant risk in prioritising urgent care over routine care?

Many practices described the ongoing struggle to balance the growing demand for urgent care with the need to provide timely and effective routine care. The most significant concern raised was the loss of continuity, prevention and early intervention, core elements of high-quality general practice. Clinicians often face difficult decisions, especially when patients understate their symptoms and accept routine appointments, risking delayed diagnoses. On the other hand, frequent attenders may be overlooked until something serious emerges, placing emotional pressure on clinicians to make the right call. Views were mixed on service models like urgent care centres: while some felt they helped relieve pressure, others worried they fragmented care and weakened long-term patient relationships. Rising demand, an ageing population and increasingly complex health needs continue to stretch primary care, yet it was felt that funding has not kept pace, forcing difficult trade-offs. There was a strong call for greater investment to support both urgent and routine care. Prevention was widely recognised as key to reducing future urgent demand, but many felt it remains underfunded and deprioritised. Interviewees highlighted that proactive management, particularly for conditions like heart failure, can prevent hospital admissions and improve patient outcomes. While urgent appointments are sometimes used to opportunistically address preventative needs, this was seen as an unsustainable substitute for dedicated prevention work.

4.19 Question 13: What has worked well in your Practice to protect time for routine care or chronic conditions management?

Respondents consistently shared that a range of practical strategies have helped protect time for routine care and chronic condition management. All practices have set up dedicated clinics for conditions which were nurse led, these run alongside urgent care without disruption. Admin teams play a key role in identifying patients due for review through structured recall systems, though there's a shared view that automating these processes would improve efficiency. Expanding roles across the team, such as involving pharmacists and healthcare assistants, has helped spread the workload, supported by training and succession planning. Regular MDT meetings have also improved coordination and reduced the need for repeat appointments. While challenges remain, such as nurses not being able to prescribe, there's a strong belief that continued investment in staff development and digital tools is vital to keeping routine and chronic care running smoothly.

4.20 Question 14: Have you implemented any changes in the last 12 months which have helped maintain the balance between urgent and routine care?

Over the past 12 months, practices have implemented a range of operational and clinical changes to better balance urgent and routine care. These include redesigning clinic templates based on demand patterns,

increasing staffing ratios on high-pressure days (e.g., Mondays) and recruiting additional salaried GPs. The migration to EMIS for some Practices has enabled more flexible appointment management, including slow-release scheduling. Practices have also enhanced their rota systems to ensure a consistent mix of urgent, pre-bookable, and review appointments, supported by ongoing daily assessment and adjustment. Routine care has been protected through dedicated chronic disease clinics, holistic annual recall processes, and increased use of online booking to reduce phone traffic. For one Practice, a notable innovation has been the introduction of weekly MDT clinics for complex, high-risk patients, involving GPs, nurses, social services, and third-sector partners. These clinics streamline care coordination, reduce hospital admissions, and improve outcomes for patients with recurring or long-term needs.

5 Discussion

This chapter interprets the findings of the study with the key themes identified in the literature review in relation to the research aim which was to explore how General Practices manage and understand the balance of urgent care demand and the provision of continuity of care. The first three objectives of the research will be addressed in this chapter with the final objective being met in the conclusion and recommendation chapter.

5.1 Key Findings

A summary of the key findings is outlined below:

Table 7: Perceptions of Demand and Capacity in General Practice

Theme	Key Findings
Demand Trends	There is a clear and strong perception of increased demand for both urgent and routine care as well as urgent demand often exceeding appointment availability.
Impact on Routine Care	Routine appointments and chronic condition management are disrupted with follow-up appointments for long-term conditions occasionally being compromised under current service pressures.
Staffing & Capacity	Staff shortages and limited capacity hinder Practices ability to meet demand.

Table 8: System-Level Influences on General Practice

Theme	Key Findings
Community Pharmacy	Clear evidence of signposting of patients perceived to reduce GMS demand but this conflicts with the strong perception of patients being signposted back to GMS by Community Pharmacy.
Unified Access Standards	Low perceived impact on improving access and triage with General Practice.
Patient Satisfaction	Decline in patient satisfaction, increased complaints in relation to access and/or delayed access and a risk of reduced trust in General Practice.
Strategic Shifts	Hospital-to-community care transition is perceived to affect practice capacity increasing pressure within the current service model.

Table 9: Interview Insights and Operational Practices

Theme	Key Findings
Definition of Urgent Care	Varied definitions but common themes include the immediacy and risk of patient presentation.
Appointment Slots	All practices use dedicated slots for both urgent and routine care.
Wait Times	The waiting time ranged from same day to four weeks with longer waiting times occurring periodically, influenced by staffing and demand.
Urgent Appointment Ratio	There is a wide variation across practices in the percentage of total appointments dedicated to urgent care.
Triage Methods	These were mostly reception-led with clinical oversight but there was little dialogue in relation to digital use.
Prioritisation Strategies	These included duty doctor models, escalation protocols and MDT pilots with some similarities but also diversity between Practices.
Impact on Routine Care	Chronic disease management was undertaken mainly within nurse led clinics which were perceived to be protected from urgent care demand but follow-up in relation to acute escalation due to longer waits for access was perceived to impact on routine care.
Age/Disease Profile	Perceived rise in younger patient demand with mental health being a prominent factor alongside increasingly complex elderly care.
Patient Satisfaction	Perceived increase in complaints in relation to access as well as declining satisfaction due to longer waits in accessing GMS as well as there being a perceived mismatch between clinicians and patients in relation to their perception of clinical urgency.
Risks	There is a risk of loss of continuity and a real concern in relation to delayed diagnoses.
Protective Strategies	Nurse-led clinics operated through admin recall systems as well as MDT meetings.

These findings emphasise the significant operational challenges faced by General Practice in managing the dual demand of both urgent and routine care. The varied strategies adopted across practices demonstrates and highlights the importance of tailored approaches to managing access and highlights that “one size does not fit all”. A recurrent theme is the need for responsive systems that can adapt to fluctuating demand and evolving policy which is essential for sustaining service continuity and mitigating workforce strain. The research also reveals a critical need for sustained investment in chronic care infrastructure, workforce development and governance to safeguard routine and preventive care being compromised by acute pressures. Ultimately, these findings reflect an ongoing tension between meeting immediate patient needs and maintaining the high-quality, continuity and relationship-based aspects of General Practice

The findings also reveal that a substantial portion of urgent demand in General Practice is driven not by internal inefficiencies but by ongoing issues within secondary care such as long waiting times for procedures. Delays in hospital-based interventions have led to a growing burden on primary care, where practitioners are increasingly required to manage complex, chronic cases. This external bottleneck has played a part in reshaping the balance between urgent and routine care within primary care, creating hidden demand and contributing to patient dissatisfaction. The concept of “demand failure,” as described by

participants draws attention to the limitations of addressing capacity challenges solely within primary care. A joined-up approach across the whole healthcare system is needed to reduce this burden and improve access for the population.

5.2 Key Findings in Relation to the Literature Review

Table 10: Literature Review – Key Findings

Theme	Key Findings
Strategic Context	NHS Wales aims to shift care closer to home through prevention and integration through the development of primary and community care (A Healthier Wales, 2018; Primary Care Strategic Programme, 2024).
Urgent Care Definition & Challenges	Urgent care is variably defined; literature lacks specific definition regarding primary care which can complicate demand management (Denniston & Jackson, 2023; Wallace et al., 2021).
Policy v's Reality	Policy aims to balance urgent and routine care via the further development of MDTs, but implementation is hindered by workforce and system pressures (Primary Care Model for Wales, 2025).
Demographic Pressures	Ageing population and multimorbidity are increasing demand on GMS, especially post-COVID (Older People's Commissioner for Wales, 2024; Brilleman et al., 2013).
Access Models	Access systems often prioritise efficiency over patient experience, disadvantaging digitally excluded and complex patients (Newbould et al., 2024; Eccles et al., 2024).
Workforce Sustainability	The number of FTE GPs has remained static despite an increase in the headcount of GPs. This features alongside an ageing workforce and the risk of burnout, especially in rural/deprived areas (WG, 2024a; Audit Wales, 2025).
Demand Management	The shift toward urgent care undermines continuity for patients; strategic planning and data-led approaches are needed to balance routine and urgent care in unison (Armitage, 2022; Teo & Maddigan, 2023).
Health Inequalities	Funding disparities and digital exclusion exacerbate inequalities in access (Currie et al., 2024; Mackenzie et al., 2025).
Patient Preferences	Patients value continuity and holistic care over speed of access with current systems not necessarily aligning with these preferences (Public Health Wales, 2024; Fox et al., 2024).
Value-Based Healthcare (VBHC)	VBHC promotes outcome-focused care and the effective and efficient use of resources. It supports redesigning access systems to maximise patient benefit and eliminating waste (Porter & Teisberg, 2006; Gray, 2011).

The findings summarised in Table 11 reveal a complex interplay between strategic intent and operational reality in General Practice. While policy frameworks advocate for integrated, patient-centred care closer to home, implementation is challenged by workforce constraints, rising demand and inconsistent definitions of urgent care. Access models often prioritise speed over continuity, disadvantaging patients with complex needs or limited digital access. The shortage of GP workforce, coupled with demographic pressures and

funding disparities further complicates service delivery. Importantly, patient preferences consistently favour continuity and holistic care, suggesting a misalignment with current system design. VBHC offers a promising lens to redesign access systems with a focus on outcomes and resource efficiency which is critical to achieving a sustainable balance between urgent and routine care.

5.3 Findings in Relation to the Objectives of the Research

Table 11: Key Findings in Relation to the Objectives of the Research

Research Objectives	Key Findings
To assess whether urgent care demand is impacting on General Practice's ability to provide routine care and chronic conditions management for patients	The study provided compelling evidence that rising urgent care demand is placing sustained operational pressure on General Practice, consistently challenging its capacity to deliver routine care. While follow-up services are at times disrupted due to acute demand, continuity in chronic condition management has largely been protected through the implementation of nurse-led clinics enabling practices to maintain structured pathways for long-term care despite fluctuating pressures. The findings show that having specific service models and a mix of different staff roles assist GMS in ensuring the disruption to routine care is limited.
To highlight the challenges faced by GMS Contractors in meeting patient demand for access and explore what strategies are utilised in General Practice to assist with the management of conflicting urgent and continuity of care demands	The study identified a range of significant challenges facing GMS in their efforts to meet patient demand for access. These included workforce shortages, unpredictable surges in demand, staff burnout and the absence of a standardised definition for urgent care within the primary care setting. The findings emphasise the need for targeted investment in both workforce capacity and infrastructure to support sustainable service delivery. There are context-specific access models within Practices to enable them to manage the tension between urgent and routine care provision which highlights that 'one size does not fit all'. Moreover, the findings highlight the necessity for a whole-system collaboration to address external pressures and ensure that access models align with patient need and service continuity.
To assess the impact of these strategies on patient satisfaction	The study revealed a noticeable decline in reported patient satisfaction, accompanied by an increase in complaints related to access and waiting times for routine care. Current strategies within General Practice appear to be shaped primarily around managing internal capacity rather than aligning with patient expectations or experiences. A recurring theme was the mismatch between clinician and patient perceptions of clinical urgency. Clinicians expressed concern about the risks associated with the longer wait for routine appointment, particularly in relation to long-term health outcomes. The findings also suggest a growing need for patient education around appropriate service use, as a lack of understanding and trust is beginning to affect the patient-clinician relationship.

These findings provide a consistent theme; General Practice faces significant operational pressures in balancing urgent and routine care. All sources highlight the tension between strategic ambition and frontline realities, particularly in relation to workforce limitations, rising demand and fragmented access systems.

There is broad agreement on the need for responsive, adaptable models that reflect local context rather than a uniform approach. However, a key distinction lies in the origin of demand, while some findings focus on internal inefficiencies and system design, others point to external pressures, notably delays in secondary care as drivers of hidden demand in primary care. This divergence highlights the importance of whole-system collaboration and investment, not only in chronic care infrastructure and workforce development, but also in aligning policy with patient-centred outcomes. Ultimately, the findings reinforce that sustainable access requires both strategic oversight and operational flexibility to meet immediate needs without compromising continuity and quality.

5.4 Future Direction

When considering the strategic direction of primary care, it is essential to recognise that enhancing patient experience must be a core objective alongside service transformation. Improvements in care quality are intrinsically linked to reductions in overall healthcare costs, reinforcing the value of patient-centred approaches. Figure 18 illustrates the Sandcone Model which emphasises the importance of establishing a robust foundation with safety and staff morale at the forefront. In this context, safety must not be compromised in pursuit of efficiency or speed. Achieving high performance and fostering resilience within General Practice requires a deliberate focus on getting the fundamentals right thus ensuring that systems are safe, supportive and conducive to sustainable improvement.

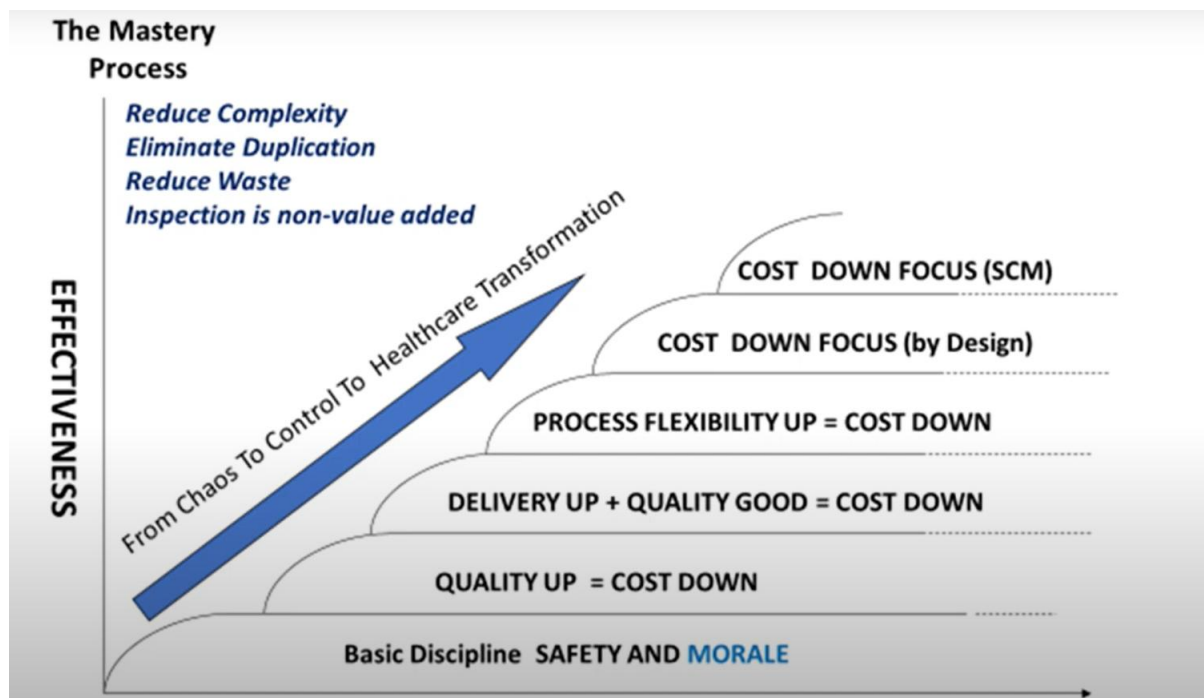


Figure 18: The Sandcone Model (Rich et al., 2004)

Service redesign must be informed by patient perspectives, ensuring that care aligns with what patient's value in a high-quality service. Figure 19 outlines the Kano Model (Kano et al., 1984) which provides a useful framework for distinguishing between basic expectations, performance requirements and features that excite, helping to prioritise improvements that enhance patient satisfaction.

KANO MODEL – Access to GMS		
Basic	Performance	Excitable
Safe service	Clear triage process directing patients to the appropriate care	Flexibility in appointment options
Clean environment	Continuity of care	Access to clinician of choice
Access to an appropriate clinicians	Access to a range of services including digital access	Good customer service with friendly staff
Access to urgent care when needed	Text reminders for appointments	Appointment as close to home as possible
Clear information on service availability and Practice opening times	Proactive chronic condition management	Patient satisfaction

Figure 19: Kano Model (Kano et al., 1984) (Source: The Researcher)

6 Conclusion and Recommendations

This concluding chapter summarises the study's key findings in relation to the research aim and objectives and provides recommendations to inform policy development and promote sustainable improvements in access and continuity of care.

6.1 Key Findings Relating to the Research Aim & Objectives

This study has highlighted the sustained pressure that urgent demand places on an already overstretched GMS, often at the expense of routine care delivery. Despite these challenges, practices have successfully safeguarded chronic condition management through nurse-led clinics and structured care pathways. However, the research has also revealed significant operational barriers, including workforce shortages, fluctuating demand and the absence of a clear definition for urgent primary care. Practices have in place a range of localised context-specific strategies highlighting that a uniform approach is not feasible for managing the often-complex interplay between urgent and routine care. These strategies tend to be shaped more by internal capacity than by patient expectations or experiences, contributing to declining satisfaction levels and rising complaints. A mismatch between clinician and patient perceptions of urgent further emphasises the need for improved patient education and stronger system-wide collaboration to support sustainable, patient-centred care.

The findings of this study highlight the need for structural reform, particularly in enhancing integration between primary and secondary care. Strategic investment in the development and expansion of MDTs is critical to safeguarding long-term care while strengthening the system's capacity to respond to increasing demand. Overall, the research highlights the importance of integrated service models, targeted workforce investment and enabling policy frameworks. Achieving a sustainable balance between urgent and routine care will require not only operational change within individual practices but also a broader transformation in how care is structured, resourced and delivered across the whole healthcare system.

6.2 Recommendations

The following recommendations outlined in Table 12 are intended to inform both policy and Practice-level improvements within GMS. They seek to address the operational challenges identified through this research and to support the delivery of sustainable, patient-centred care.

Table 12: Recommendations

1.	Investment in General Medical Services (GMS) should focus on strengthening workforce capacity to address GP shortages and reduce burnout. This can be achieved through targeted recruitment, retention strategies and the development of structured training pathways, particularly in rural and deprived areas. Consideration should also be given to commissioning frameworks beyond the traditional GMS Partnership model. Additionally, expanding and supporting MDT working is essential to manage complex cases and alleviate pressure on GPs. While acknowledging the limitations of the NHS's finite budget, achieving future strategic ambitions will require a reallocation of resources from secondary care to primary care as healthcare is moved to delivery closer to home.
2.	Strengthening investment in preventative care is essential. Proactive management of chronic conditions has been shown to reduce acute demand and improve patient outcomes. This reinforces the need for preventative strategies to be prioritised and embedded within future service planning and implementation.
3.	Strengthen collaboration and co-ordination across the healthcare system to reduce instances of "demand failure" and minimise avoidable urgent and routine presentations in GMS.
4.	Redesign access systems to better reflect patient needs by integrating approaches such as the Kano Model and Value-Based Health Care (VBHC). These frameworks help align service delivery with what patient's value most, while also promoting efficiency and reducing unnecessary or low-value interventions
5.	Launch national public education campaigns to improve patient understanding of the full range of services available through primary care, including those provided by professionals other than GPs. These campaigns should also clarify when and how to access urgent versus routine care, helping to rebuild trust and strengthen the patient-clinician relationship, particularly in cases where patients are signposted to alternative services or providers.
6.	Implement a proactive public relations strategy to engage with local communities, counter misinformation and address negative media coverage. This approach can help rebuild public confidence and promote a more accurate understanding of the role and value of General Practice services.
7.	Provide enhanced training and development opportunities for Practice Managers to support their role in managing complex demand forecasting and advancing MDT integration within General Practice.
8.	Develop and implement a nationally consistent definition of urgent primary care to support effective triage, prioritisation and service planning within GMS.
9.	Facilitate a national "think tank" forum involving GPs and Practice Managers to capture frontline insights and experiences, with the aim of informing and shaping future primary care policy development in relation to GMS access
10.	The challenge of balancing urgent and routine care demand remains complex and insufficiently explored within the Welsh context. There is a clear need for further research and the structured dissemination of best practice to support evidence-informed service planning and guide effective policy development.

6.3 Where next:

Whilst offering valuable insight into managing and understanding the balance of urgent and routine care from a General Practice perspective this study is not without limitations. A key constraint is its focus on a specific geographic region within Wales which may restrict the broader applicability of the results. To strengthen the evidence base future research should aim to replicate this study across other regions of Wales to explore consistency and broader relevance. Furthermore, comparing these findings with similar studies conducted in other countries could offer useful international perspectives and highlight contextual differences that may inform policy and practice.

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8 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

GP and Primary Care provision across rural Mid Wales – innovation in a time of crisis: A review of the current GP provision across Mid Wales (Ceredigion, north Powys and south Gwynedd), exploring best practice examples of alternative models of delivering primary care interventions in rural areas

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Abstract:

In 2023, Rural Health and Care Wales was tasked by its Stakeholder Group and the Mid Wales Joint Committee for Health and Care to consider the provision of GP and primary care services across Mid Wales, exploring whether the people living in this most rural region of Wales receive equitable and sustainable health services.

Initial exploratory research involved collaborative work with the SAIL data team at Swansea University and a seconded lecturer from the University of Otago in New Zealand to consider distance travelled and accessibility to GP surgeries for those living in the region, with an additional analysis of health factors provided on the rural population. Whilst this set a foundation for the more direct exploratory work with GPs and Primary Care providers, this paper reports on the main part of the research that considered current provision of GP / Primary Care across Mid Wales, the issues and challenges faced and examples of best practice solutions found in both practical application and from the literature.

The focus of this paper considers in more detail the actual provision of GP services across the region, looking at the work of Clusters and exploring models of best practice in the use of multi-disciplinary or multi-agency teams that are emerging to become leading community-based, effective models of healthcare delivery. It concludes with a set of recommendations that could be adopted in Mid Wales to further improve the provision of primary care across the region.

Keywords: Rural primary care, GP service provision, Healthcare accessibility, Multidisciplinary care models, Health service innovation, Mid Wales

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1 Introduction

In 2019, the United Nations estimated that about 3.4 billion people across the world lived in rural areas (United Nations, 2019), with, generally, rural residents having poorer health outcomes and higher mortality rates than people who live in more urban areas (World Health Organization, 2010). Counteracting this, it has been found that regions with stronger primary care services have improved health outcomes, lower costs and reduced inequity in health (Starfield et al., 2005); it can thus be deducted that it is critical for rural areas to have access to robust primary care services to counteract the disadvantageous impact of rural living. However, therein lies the dilemma, since rural areas have accelerated issues facing primary care, in particular in terms of traditional GP practices, where there are not only challenges in recruitment and retention, but also in terms of a patient demographic that is biased towards an elderly population with increasing, complex health needs and logistical issues in terms of lack of public transport and digital connectivity. To address these challenges, there needs to be a focus on improving healthcare accessibility and ensuring equitable quality of care, all the while prioritising a value-based, patient-centred approach.

Whilst health boards, GP practices and other primary care providers are, to an extent, masters of their own domain, albeit in the context of regional and national policy restrictions, this research is looking at the multiple issues that face primary care delivery in rural areas, specifically that of Mid Wales, through a regional lens.

A review of existing primary care services and, in particular, a focus on the issues facing general practice in Mid Wales as an entire region facing exacerbated issues based on its rurality and sparse population, was the driving force behind undertaken the research.

In order to contextualise the issue, it is worth undertaking an overview of Rural Health and Care Wales and its role in the health and care sector across Mid Wales, before then looking to define the Mid Wales region that is the focal point of this review.

1.1 Rural Health and Care Wales



Fig. 1: A map illustrating the geographical footprint of the Mid Wales region, noting sites of district and community hospitals, across the Mid Wales region served by RHCW (RHCW, 2018).

Rural Health and Care Wales (RHCW) is a collaboration between the three health boards that cover the most rural parts of Wales – Powys Teich Health Board (PTHB), Hywel Dda University Health Board (HDdUHB) and Betsi Cadwaladr University Health Board (BCUHB). Its prime focus is on undertaking

research into any potential health and /or care inequalities that may be faced by people living in rural areas of Wales, whilst also developing and piloting innovative ways of effectively delivering new health and care services in rural areas. It also hosts a popular international rural health and care conference and regular webinars, seeking to share innovative solutions to rural health and care issues and best practice.

The Mid Wales region, illustrated in the shaded section of the map in Fig.1., experienced a period of unrest around the years 2009-2014, with multiple public protests regarding the perceived potential closure or downgrading of Bronglais General Hospital, the only district hospital in a broad rural area covering the most sparsely populated parts of Wales. The different needs of rural communities and the cross-boundary challenges of this region suggested the need for a review of the health and social care systems in the region, with recognition given to the fact that the people of Mid Wales rightly demanded access to high quality, safe, sustainable and accessible health services.

As a result, the Welsh Government commissioned the Welsh Institute for Health and Social Care (University of South Wales) to explore the options for the provision of high quality and sustainable healthcare service in Mid Wales, leading to the publication of the Mid Wales Healthcare Study in September 2014 (Prof. Longley et al., 2014). The report concluded with twelve recommendations, the final one being that the three health boards covering the Mid Wales area, working with the local universities and other partners, should develop and support a “centre of excellence in rural healthcare”. The recommendation for this centre was that it should focus on “research, development and dissemination of evidence in health service research that addresses the particular challenges of Mid Wales” (Longley et al., 2014).

The Centre for Excellence in Rural Health and Social Care was thus formally launched by Professor Mark Drakeford AM, Minister for Health and Social Services at the time, on 24th March 2016, later to be renamed “**Rural Health and Care Wales**” in March 2017.

RHCW reports to a nominated Stakeholder Group that meets quarterly and consists of senior representatives from the 3 health boards, the local authorities of Ceredigion, Powys and Gwynedd, 5 Universities (UWTSD, Aberystwyth, Bangor, Swansea and Cardiff Universities), LLAIS, three Research Innovation and Improvement Hubs (West Wales, North Wales and Powys) and public and patient representatives from Ceredigion, Powys and Gwynedd.

RHCW strategically reports to the Mid Wales Joint Committee for Health and Care (MWJC), which approves the RHCW annual Work Programme and Budget and is kept regularly updated on the attainment of the RHCW Work Programme, which also has to align with the strategic priorities of the MWJC. The Chief Executives of the three health boards and local authorities across Mid Wales sit on the MWJC Board.

1.2 Defining Mid Wales

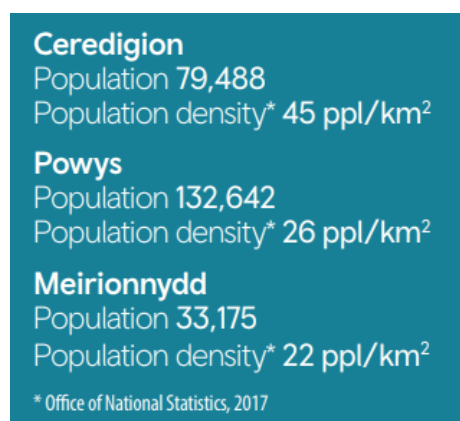


Fig. 2: Population and population density figures relating to the Mid Wales region served by RHCW (RHCW, 2018)

From the perspective of RHCW, the Mid Wales region is clearly defined, it being the area illustrated in Fig. 2 above, consisting of the county of Ceredigion, the north of Powys and the south of Gwynedd (Meirionnydd). These counties come under the auspices of three local authorities (Gwynedd, Ceredigion and Powys), who also provide care services as part of their portfolios of work, and are served by three health boards (PTHB, BCUHB and HDdUHB).

For the purpose of this report however, some analysis has taken place outside the traditional footprint of Mid Wales as defined above, primarily due to the way that primary care clusters have been organised.

1.3 Preliminary work: accessing Primary Care in rural Mid Wales

Preparatory work in considering the provision of GP and primary care services across Mid Wales initially commenced in 2024, looking at locale and accessibility of the GP practices. For this piece of work, which is reported here to provide context to the main research of this report, RHCW worked with the Administrative Data Research (ADR) Wales team at Swansea University, using the SAIL (Secure Anonymised Information Linkage) Databank. Most GP practices in Wales (84%) are signed up to the SAIL databank, enabling patient data to be anonymously collected and analysed for research purposes.

The research questions that were posed in this preliminary piece of work were:

17. Do individuals use their nearest GP surgeries in rural areas?
18. How far do people travel to attend their GP surgeries in rural areas?
19. How does this compare to distance travelled by patients to their GPs in more urban areas?

A secondary piece of work was also undertaken to obtain broad health profiles for patients living in rural Mid Wales and to then compare these to their urban counterparts. The purpose of this was to have foundational evidence that could potentially be used in the future to assess the impact of any interventions or changes to the provision of health and care services that might take place across the region.

Whilst an initial cohort of 21 Mid Wales GP practices were identified that were registered for data collection via SAIL, due to several factors, such as having branch practices with all data only collected at main practice, a resultant 15 Mid Wales GP practices were included in the final SAIL analysis.

Findings showed that 63% of rural Mid Wales patients registered at GP practices that were closest to their home, with the remaining 37% registered with GP practices further afield. This compared to 45% of urban patients that registered with their nearest GP. This relatively high percentage difference could be explained by the fact that transport links are poor in rural areas, plus the option of alternative GP practices is limited.

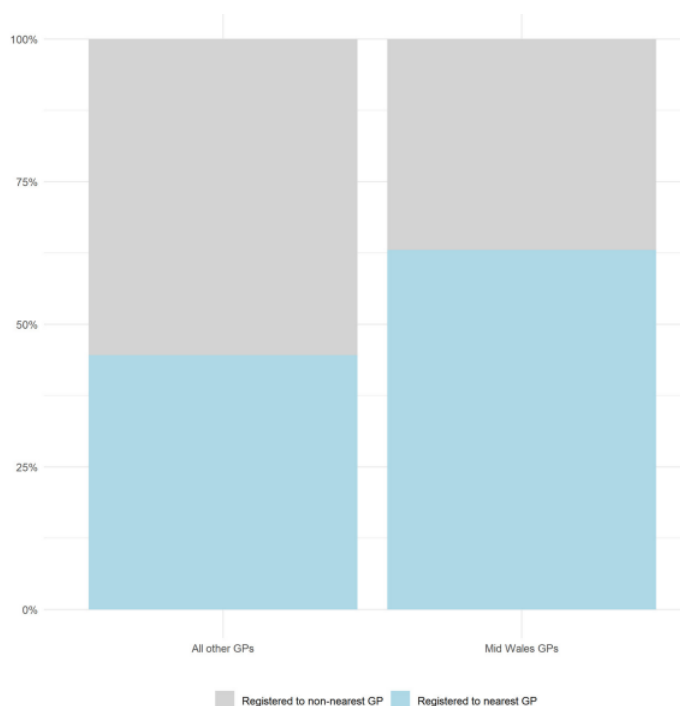


Fig.3: Percentage of individuals registered to nearest or more distant GP practices for rural Mid Wales vs urban patients (SAIL, 2024)

The other factor that was validated by this piece of work was that the distance rural patients travelled to their “nearest” GP (median of 6.3km) was further than that travelled by their urban counterparts (2.3km), confirming that accessibility is an issue in rural Mid Wales.

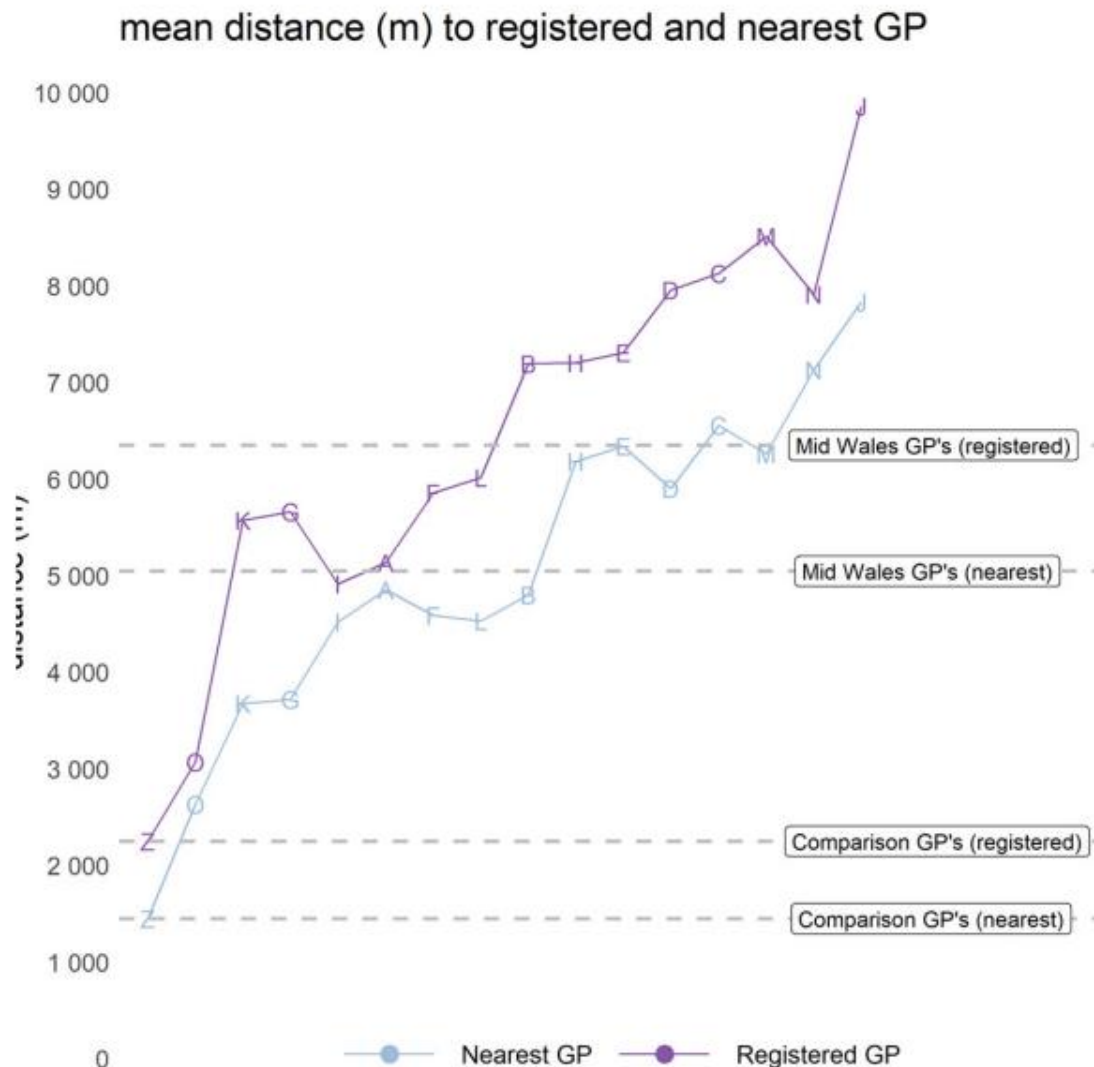


Fig.4: Mean distance to nearest and mean distance to registered GP for Mid Wales vs urban patients (SAIL, 2024)

The secondary health-related research also provided some quantitative outcomes relating to the demographic of GP patients in Mid Wales, with over a third of rural patients being aged 60 or more compared to around a quarter of patients being in this older age bracket in urban places, indicating that there may be more associated complex healthcare demands on primary care across the region.

The resulting outcomes showed that 82.5% of the Mid Wales patients were classed as fit, compared to 85.1% of urban patients, with more rural patients having slightly greater multi-morbidity health issues (29.3%) compared to their urban counterparts (28%). These statistics are only to be expected, based on the demographic profile of the Mid Wales region.

Some other interesting statistics emerged from this preliminary work, showing that fewer Mid Wales patients received medications relating to pain relief, infections and mental health (a drop of 2.6%, 3.4% and 4.3% respectively). Why this would be the case is yet to be fully investigated but it could be related to the inaccessibility of GP practices, or even the tendency for very rural patients to be late presenters of health issue symptoms.

Table 1: Health factors of the study group (Mid Wales patients) vs the comparison (urban patients in Wales) (SAIL, 2024)

Factor	Description	Study Group n (%)	Comparisons n (%)
Frailty	Fit	71,809 (83%)	833,498 (85%)
	Mild	11,275 (13%)	116,088 (12%)
	Moderate	3,171 (4%)	25,414 (3%)
	Severe	741 (1%)	4,652 (1%)
Multi-morbidity	At least 2 conditions	25,509 (29%)	274,358 (28%)
Desirable health	No adverse health events	42,493 (49%)	434,644 (44%)
	No emergency hospital admissions	77,136 (89%)	858,863 (88%)
	No ED attendance	71,087 (82%)	794,004 (81%)
	No pain relief GP medications	69,638 (80%)	757,731 (77%)
	No infection GP medications	66,316 (76%)	712,716 (73%)
	No mental health GP medications	72,988 (84%)	779,528 (80%)

Whilst some of the above findings were not unexpected, this was based on anecdotal evidence as opposed to robust statistical analysis, which this piece of work was able to provide. It could also be said that this preliminary piece of work may have given more rise to questions than answers, however it did paint a clear, quantified picture of GP patients specific to Mid Wales and thus set the context for further analysis of GP and Primary Care across the region.

This research has been written up for publication in the ADR Data Insight Journal, to be published in October 2025 (Assessing access to primary care in rural and urban Wales. Johnson, R., et al, 2025).

2 Identification of Project Requirements

The main thrust and intent of the research contained in this report is to further investigate how GP and primary care provision could be improved for the people of Mid Wales, with the information from section 1 of this report providing a comprehensive backdrop to the next phase of work.

Originating from the RHCW Work Programme in 2024/25 and currently also included for 2025/26, the overall research question posed to RHCW was as follows:

Complete research into the GP provision across Mid Wales, exploring best practice examples of alternative models of delivering primary care interventions in rural areas

In order to address the above, this report will focus on the following:

- A review of the strategic frameworks and policy guidelines in situ that impact the delivery of GP and primary care services in Wales
- A review of the GP and primary care provision across Mid Wales
- Case study analysis of two examples of best practice in the delivery of primary care services in Mid Wales
- A literature review of best practice in the delivery of primary care services in rural areas (international scope)

By undertaking the above, a comprehensive analysis of GP and primary care provision across Mid Wales will have been conducted, with knowledge garnered on how these services could be improved; gained

through looking at local examples of proven best practice and looking further afield at studies that advocate models of best practice from evidence gained through research and practical innovations.

2.1 Methodology and Relevance

The question posed in this report is a genuine piece of work that is being conducted on behalf of key stakeholders in the Mid Wales region. It has been requested in an attempt to address real-life issues that are impacting people who live in the most rural areas of Wales. The recommendations from this report, and other work that is and will be ongoing in exploring the complex health and care landscape of Wales, have the potential to be adopted and have an impact outcome. Findings will be reported to the RHCW Stakeholder Group and the MWJC, thus at chief executive level from a health board and local authority perspective, with the potential to thus have operational impact.

In undertaking the research required to address the GP and primary care issues raised, a mixed-method, pragmatic approach has been undertaken that combines both qualitative and quantitative methods of research, from a comprehensive desktop review of current policies and strategies that are in place to direct and frame the direction of travel in health and care, through to online questionnaires and one-to-one discussions with key players at the forefront of innovation in developing models of community-based integrated working at the coal face of delivery.

A pragmatist approach states that knowledge should be effective, insightful and emancipatory in its consequences, this being achieved by chartering a course that combines quantitative and qualitative tendencies in an attempt to create knowledge that spans epistemology, theory, data, analysis and ethics (Gillespie et al., 2024).

In order to explore the main issues facing GPs and primary care across the Mid Wales region, a multi-faceted approach was taken which consisted of:

- Desktop research
- Case study interviews
- Literature Review

3 Main Analysis

This section of the report will commence by considering the provision of primary care in Wales, looking in particular at the relatively new integrated care models that are being advocated by the Welsh Government (WG), as directed in the “A Healthier Wales” strategic document (WG, 2018, revised 2024). It is worth noting at this point that healthcare is a devolved power in Wales and comes under the jurisdiction of Senedd Cymru, to be implemented by the Welsh Government.

This section will then focus on the provision of GP practices in particular, since these are the lynchpins of primary care, investigating the issues and challenges faced and then looking at models of best practices involving GPs and the broader primary care teams.

A final part of this section of the report will consider the literature in terms of seeking examples of evidenced best practice in the delivery of GP and primary care services in rural areas.

3.1 Primary Care in Wales: a desktop review

The Welsh NHS Confederation (2025) defines primary care in Wales being “the first point of contact for healthcare” that operates through a network of interconnected services. 90% of individuals’ first point of contact is conducted through primary care services, mainly at a GP practice.

In addition to being a first point of contact, primary care services can assess and treat patients, refer them for specialist support, co-ordinate a care plan that can be cross-sectoral, and provide advice on prevention of ill health, early intervention and general wellbeing support.

Primary care is often described as an “anchor institution” that has both economic and social impact (Welsh NHS Confederation, 2025). Furthermore, Primary Care is touted to have an important role in reducing health inequalities, an important consideration when focussing on rural populations who often face inequitable access to healthcare services.

The primary care set up in Wales is underpinned by the Welsh Government's strategic document "A Healthier Wales: our Plan for Health and Social Care", which was originally published in 2018 before being updated in 2024. The call in the strategy is for the delivery of health and care services to move to community-based provision instead of focussing on traditional care locales such as hospitals. In addition, there is a focus on delivering health and care services in an integrated and co-productive manner, with support services between the health, care and third sectors to work seamlessly together to delivery the best care possible to patients.

The Welsh NHS Confederation identifies four keyways in which "A Healthier Wales" influences and drives primary care, as follows:

20. Primary Care Model for Wales (PCMW) – a place-based approach that is intended to provide sustainable and accessible primary and community care, with the emphasis on care closer to the home, using collaborative multi-professional teams
21. Strategic Programme for Primary Care (SPPC) – co-ordinating the implementation of the PCMW, with identified workstreams such as prevention, digital technology and workforce development
22. Focus on wellbeing and prevention – promoting good health and wellbeing, prioritising prevention of ill health and early intervention to prevent deterioration
23. Foster integration – holistic collaboration and integration of primary care, social care, community services and the third sector

This model of community-based, integrated care is highly appropriate for rural Mid Wales, which is served by just one district general hospital (Bronglais, based in Aberystwyth), supported by several small community hospitals, but has no major tertiary centre within an easily accessible distance, the nearest being a two to three hour drive away, depending on traffic and mode of transport.

3.1.1 Primary Care Model for Wales (PCMW)

The PCMW is delivered collectively by local health boards, primary care clusters and multi-professional teams. It advocates for community engagement and is intended to be a dynamic, organic process that is constantly monitored and evaluated, evolving to meet the every-changing needs of the people of Wales.

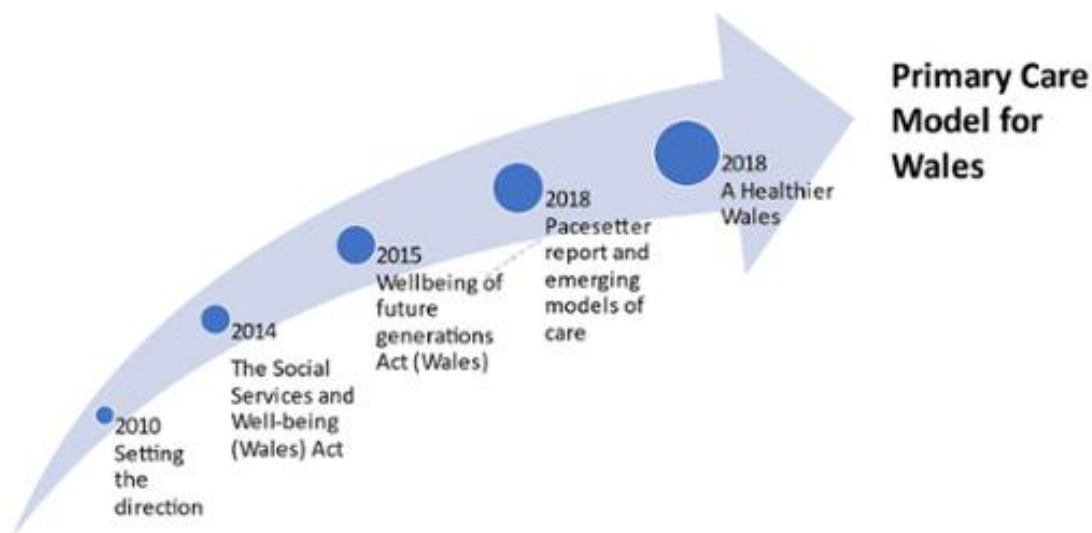


Fig.5: Evolution of the PCMW (WG, 2024)

The revised 2024 strategy (Healthier Wales, 2024) advocates for a new focus on prevention, in order to see a move away from healthcare as a means for treating ill health to health, care and wellbeing services that focus on prevention of ill health. There is also a move to make individuals more responsible for maintaining their own good health by recognising the need to take ownership of this as much as possible.

The actions agreed in the revised document advocate for measures that are preventative, person-centred, sustainable, equitable, of high quality and safe. The means to achieve this more holistic approach to healthcare should consider the following measures in particular:

- Use of Digital and Data
- Workforce
- Research, Development and Innovation
- Co-production and Partnership
- Integration

The PCMW was developed in 2019 and revised in 2021 to encompass a maturity matrix that articulated 13 outcomes to attain from its adoption, as illustrated in fig. 6.

Accelerated Cluster Development support is available to primary care clusters to help them achieve maturity through offering a peer review process, a self-reflection tool and key indicators to measure performance against.

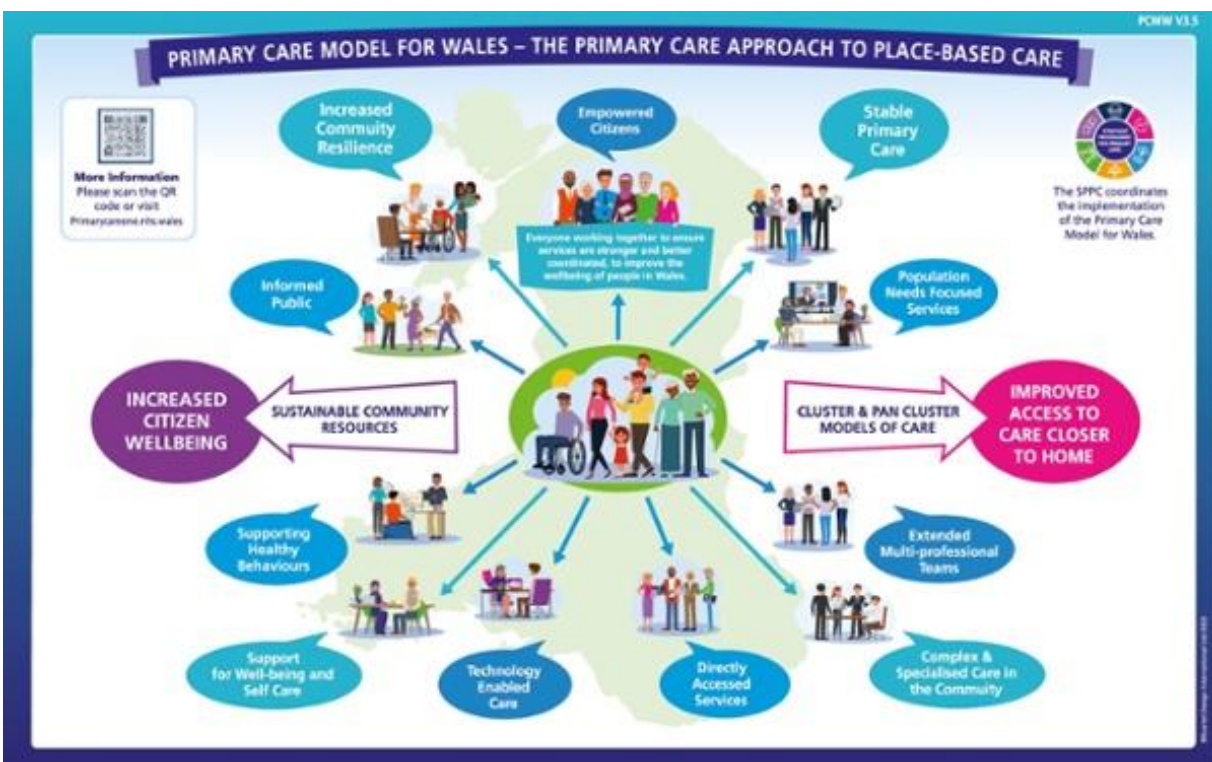


Fig.6: The Primary Care Model for Wales (WG, 2024)

PCMW | PRIMARY CARE MODEL FOR WALES

Describes how care will be delivered locally, now & in the future, as part of a whole system approach to deliver *A Healthier Wales*

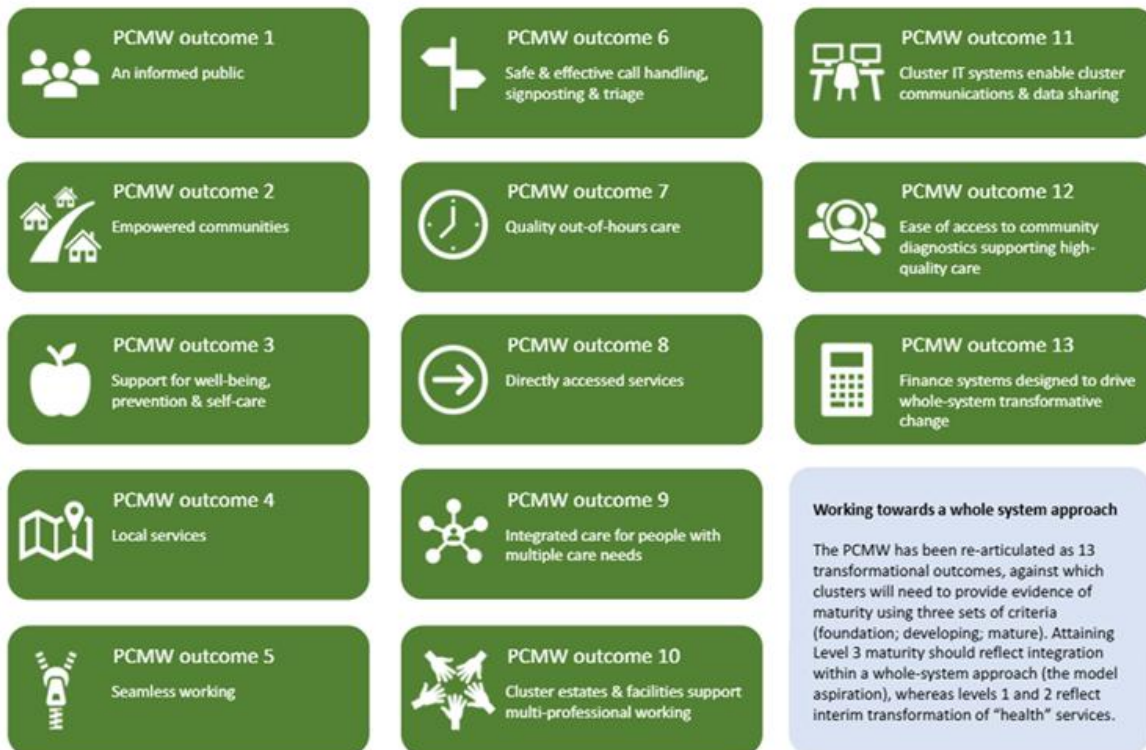


Fig., 7: Expected outcomes from the PCMW (WG, 2024)

With the PCMW advocating for adoption of a whole system approach to sustainable and accessible local health and wellbeing, collaboration and integrative working became essential in order to attain the desired outcomes. As such, the Welsh Government established Primary Care clusters across Wales, to work collaboratively to achieve the model outcomes.

3.1.2 Primary Care Clusters

There are 60 Primary Care Clusters in Wales (see fig.8), with 5 of these being in the defined Mid Wales region:

- Meirionnydd
- North Ceredigion
- Sout Ceredigion
- North Powys
- Mid Powys

Table 2: Population statistics relating to Mid Wales Primary Care Clusters.

Region	Cluster	No. Population	% Wales	% Mid Wales	% Health Board
Wales		3,299,182			
Mid Wales		208,614	6.32%		
BCUHB		715,055	21.67%		
	<i>Meirionnydd</i>	18,949	0.57%	9.08%	2.65%
PTHB		141,865	4.30%		
	<i>North Powys</i>	66,154	2.01%	31.71%	46.63%
	<i>Mid Powys</i>	30,143	0.91%	14.45%	21.25%
HDdUHB		400,799	12.15%		
	<i>North Ceredigion</i>	45,849	1.39%	21.98%	11.44%
	<i>South Ceredigion</i>	47,519	1.44%	22.78%	11.86%

Primary Care Clusters

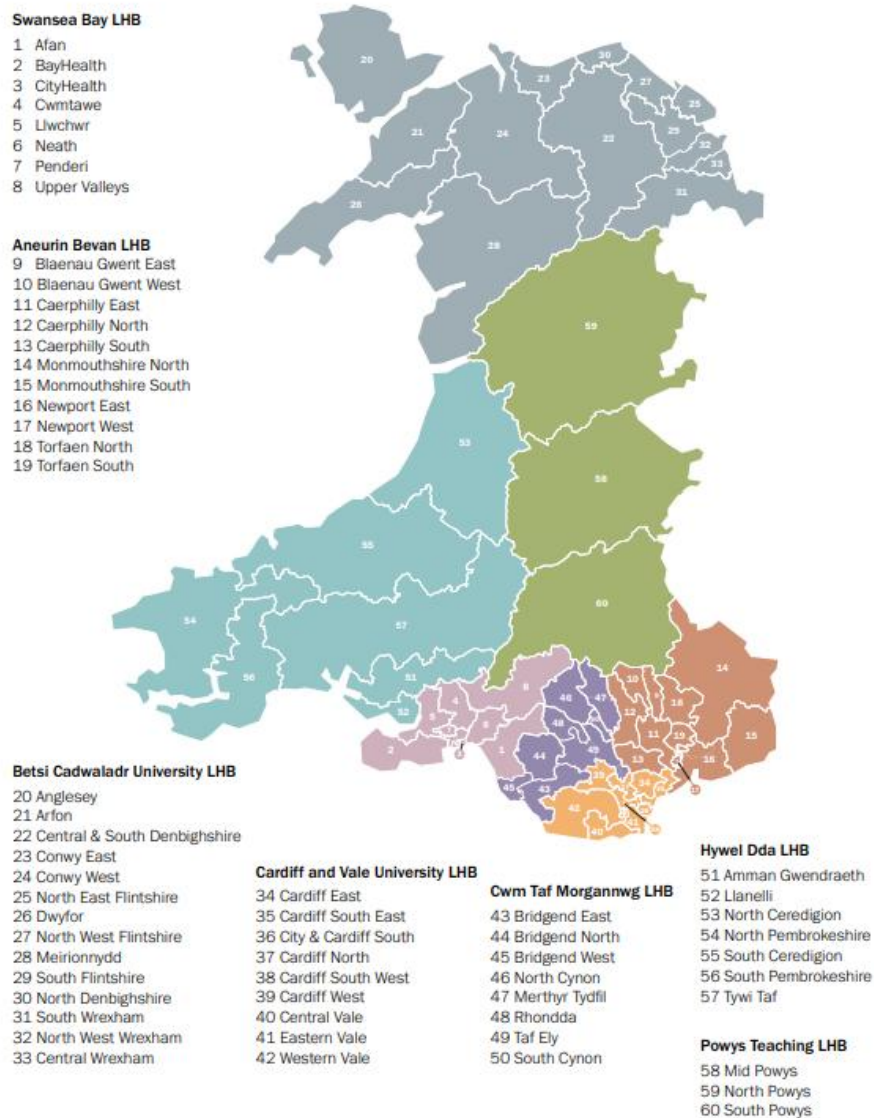


Fig.8: Primary Care Clusters in Wales (WG, 2025)

GP practices are pivotal to the primary care clusters and each GP practice in Wales is associated with a cluster. The membership of a cluster must consist of representatives from each of the GP practices within a defined primary care cluster area and must include as a minimum the Practice Manager and GP. Other community, primary care, social care and third sector colleagues may be co-opted or invited to join, such as voluntary organisations, community pharmacies, minor injury units, Public Health, optometry, dental, therapies etc.

From a Mid Wales perspective, the GP Practices registered to the relevant clusters are listed below:

Meirionnydd:

- Canolfan Iechyd Bala
- Minfor Barmouth
- Health Services Centre, Blaenau Ffestiniog
- Caerfynnon, Dolgellau
- Bron Meiron, Penrhyndeudraeth
- Health Centre, Pier Road, Tywyn

North Ceredigion:

- Borth Surgery
- Llanilar Health Centre
- Church Surgery, Aberystwyth
- Padarn Surgery, Aberystwyth
- Tanyfron Primary Care, Aberaeron
- Tregaron Surgery
- Ystwyth Primary Care Centre

South Ceredigion:

- Cardigan Health Centre
- Bro Pedr Medical Group
- Llynnyfran Surgery
- Meddygfa Emlyn
- The Surgery (New Quay)

North Powys:

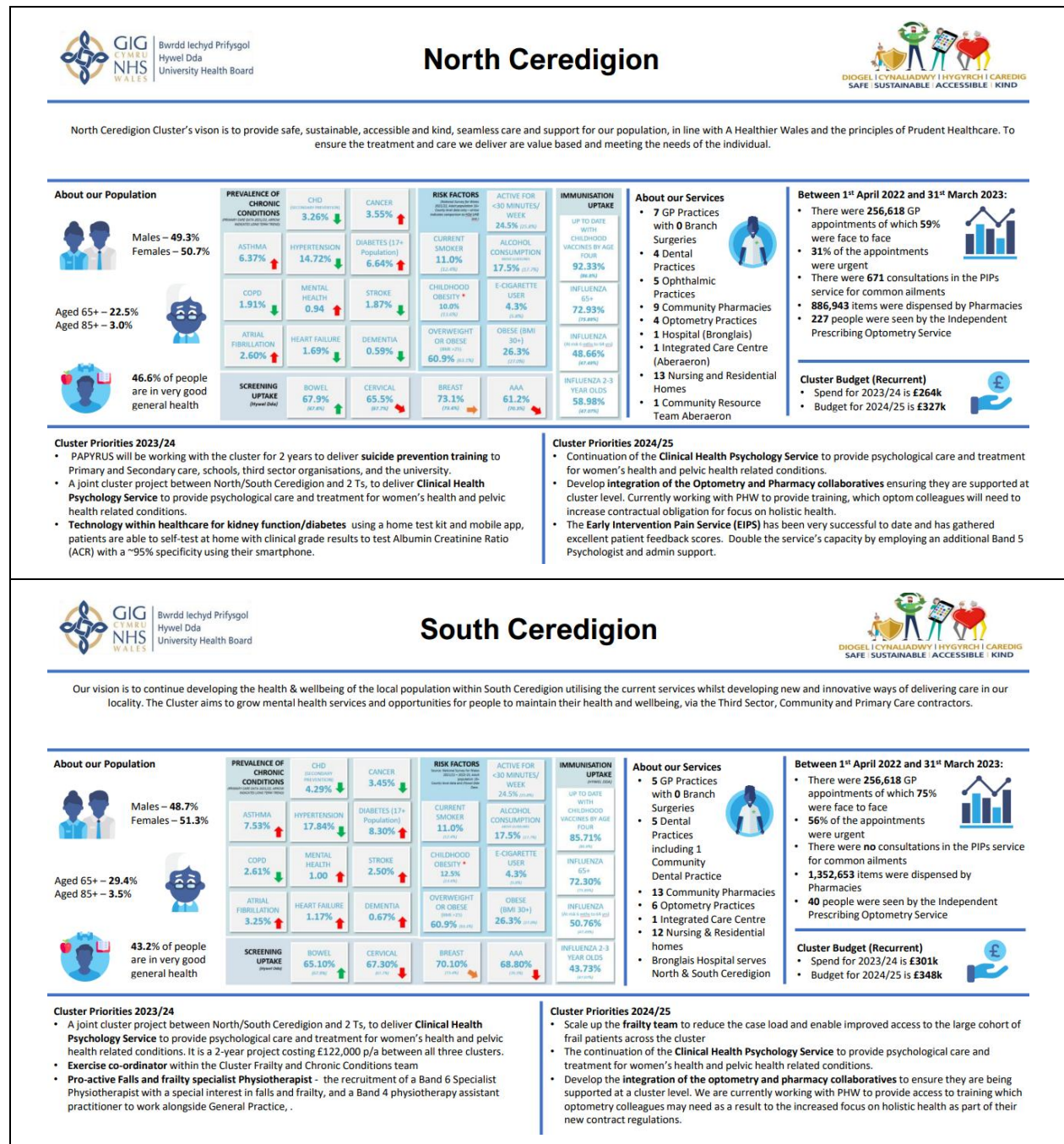
- Llanidloes Medical Practice
- Newtown Medical Practice
- Dyfi Valley
- Montgomery Medical Practice
- Welshpool Medical Practice
- Llanfair Caereinion Medical Practice
- Llanfyllin Medical Practice

Mid Powys:

- Builth Wells Medical Practice
- Knighton Medical Practice (Wylcwm Street)
- Llandrindod Wells Medical Practice
- Presteigne Medical Practice
- Rhayader Medical Practice

Innovation Academy: Innovation Management in Health and Social Care

Cluster Plans are produced, both retrospectively to qualify achievements and activities, and for forward planning.



Figs. 9 & 10: North and South Ceredigion Clusters achievements and vision (HDdUHB, 2025)

North Cluster Plan 2025-2026

Early help and prevention models of care – improving access to Primary Care, though First contact Practitioner services, Frailty service provision, Diabetes Prevention, General Practice Dermatology services.
Integrated joined up Care – which includes provision of care closer to home, the development of Frailty services across the Cluster teams, a community approach to the coordination and delivery of care for severely frail patients.
Workforce Futures - collaborating with Health and Care Academies for the provision of education, training, and development of the workforce, enabling alternative recruitment models and portfolio careers, facilitating stronger links with universities and expanding opportunities for greater rural placements.
Transforming in partnership – collaborating across Cluster and collaborative boundaries, to support innovation and improvement to models of care, through a multi professional approach to the provision of frailty services

Fig. 11: North Powys Cluster Plan for 2025-26 (PTHB, 2024)

Cluster Plan 2025-2026

Funding Project Title	New or Existing Project	Brief Project Description	Results/ benefits expected by end March 2026	Strategic Alignment: Ministerial Priorities	Project End Date
Digital & Patient Access	New (2024-25)	Developing alternative access to services utilising the use digital apps and software to support day to day service delivery & long-term condition management. Through using AccurX.	Improved alternative access to services for patients. Improved efficiencies with back-office functions.	Joined up Care / Transforming in partnership	Sept 2025
AHP Frailty Professionals	Existing (2023/24)	Multiprofessional AHP's supporting Frailty – within community, Meds Management, Home first, diabetic screening.	To support delivery of services to frail patients, completion of CGA's, CRT integration, falls prevention and early help and support.	Population health	March 2026
Pharmacy Professionals - Frailty	Existing (2024/25)	Focus on the management of medication for the most vulnerable and frail patients.	Improved pathways of care for patients, reduction in Medicines related admissions.	A healthier Wales	March 2027
Pre-Reg Optometrist	Existing (2022-23 plan)	Development of a new Optometry recruitment model for Powys.	Strengthening and attracting a new work force to Powys.	Supporting the health and care workforce	December 2026
Optometry Hypertension Pilot	Existing (2022-23 plan)	To establish the usefulness of a Hypertension service.	Reduce unnecessary referrals to general practice & reduce waiting time before systemic investigations.	A Healthier Wales	Spring 2025
CYP L2 weight Management	New (2024/25)	Supporting the development & delivery of tier 2/3 CYP weight management services.	Improve lifelong health through improved eating habits Increased confidence to increase activity levels/ habits through face-to-face family education.	Joined up Care / Transforming in partnership	Spring 2025
Virtual Ward Reporting Improvements	New (2024/25)	Develop a Pan Powys digital method of recording and reporting virtual ward activity.	Improved data capture and consistency of reporting across Powys, supporting development of a standard service.	Joined up Care / Transforming in partnership	April 2025

Fig. 12: Mid Powys Cluster Plan for 2025-26 (PTHB, 2024)

3.1.3 General Practice

In 2023-24, GPs in Wales received 29 million calls and attended 18million appointments (Primary Care Information Portal, DHCW, 2024). In February 2025, Wales' First Minister Eluned Morgan stated that there were 1.6 million GP appointments every month in Wales, equating to more than half of Wales' entire population seeing a doctor every month.

It is no secret that GP recruitment and retention is facing a national crisis, with insufficient numbers of GPs available to serve populations in need, particularly in light of ageing demographics with complex health needs. A vicious circle of this increased pressure on GPs leading to early retirements, part-time working and fewer people being attracted to the profession has created a perfect storm for primary care. All this without taking on board the impact of inadequate pay which has been at the forefront of a lot of media coverage, leading to strikes and an exodus from the medical profession.

The BMA (British Medical Association) Cymru Wales commenced a campaign in 2024 to “Save our Surgeries”, calling for a rescue package that would support GPs in Wales and their patients. The campaign highlighted four urgent actions that were needed:

1. Commit to Funding – touting an aspirational required 11% increase in funding needed by GPs within 5 years
2. Invest in the workforce – advocating for a national maximum standard of the number of patients that a GP should reasonably see in a day
3. Produce a workforce strategy – increasing the number of GPs that are trained, recruited and retained in Wales in order to match the OECD average number of GPs per 1,000 population (c.3.9 GPs per 1,000 population in March 2025, each GP in Wales had on average 2,239 patients (BMS, 2025))
4. Address staff wellbeing – focusing on improving the physical, mental and emotional well-being of the workforce

The four urgent actions that were advocated were based on analysis of trends impacting the delivery of primary care services over the previous 10-year period.

In light of escalating issues, on 10th July 2025, the Senedd's Health and Social Care Committee launched a major inquiry into the growing crisis facing General Practice (GP) services in Wales, with the aim of developing practical recommendations that could be adopted to address this and to ensure the future sustainability of an adequate primary care provision. Issues of particular concern relate to staff recruitment and retention, inadequate funding, an increased workload, leading to stress and pressure on staff, along with a growing negative narrative that has been detrimentally impacting the morale of staff and their relationship with patients.

In its written response to the inquiry, the Royal College of General Practitioners (RCGP) Cymru Wales likewise described general practice in Wales as being “in crisis” (2025), with the lack of a plan to create sustainable general practice services in Wales to patients. In its survey of members (GPs) in 2024, findings concluded that:

- 58% felt that their mental wellbeing had declined while working as a GP over the previous 12 months
- 37% felt they were unlikely to still be working as a GP in 5 years' time
- 64% noted that a reduction in their administrative workload would likely retain them as a GP for longer
- 83% felt patient safety was being compromised by excessive workload
- 57% stated that their practice required upgrading / work
- 65% felt they did not have enough time to adequately assess and treat their patients during appointments

(RCGP Cymru Wales, 2025)

In its response to the inquiry, LLAIS advocated more use of good practice examples from the Health Inclusion Programme Wales and highlighted areas of particular concern, such as:

- Effective management of patient demand
- Quality of Care
- Public trust in GP services

LLAIS' suggesting for improving general practice included improving access and equity, focussing on prevention and community-based care, rebuilding trust and engagement (LLAIS, 2025).

Despite its pivotal role in delivering first point of call services in the community, only a fifth of the total NHS spend is allocated to primary care (General Medical Services, Pharmaceutical Services, General Dental Services, optometry, prescribing and dispensing) (NHS Confederation, 2025), with a declining proportionate trend compared to secondary care funding witnessed over recent years (WG, 2023).

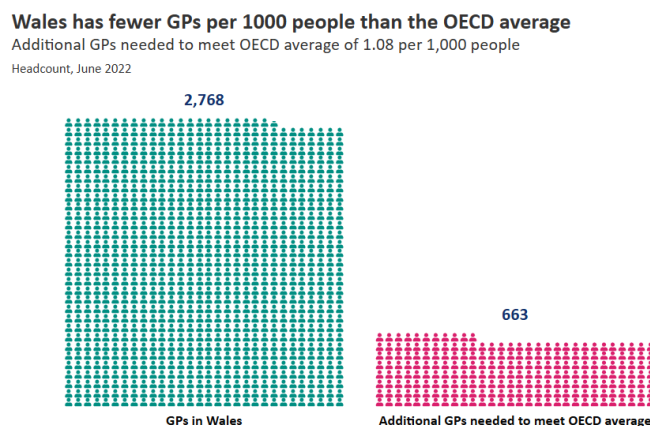


Fig.13: Wales GP numbers are falling significantly behind the OECD average (BMA, 2022)

Exasperating factors in Wales including the fact that Wales has less GPs per 1,000 of its population compared to other nations. In 2022, there were 0.87 GPs per 1,000 people in Wales, compared to an OECD average of 1.08 GPs per 1,000 population. The BMA (2022) reflected that Wales, at that point, required an additional 663 GPs to meet the OECD average, with number since then only getting worse and not better.

Most GP practices in Wales are run by independent partnerships of GPs who are contracted by their health board to provide services according to the General Medical Services (GMS) contract. The payment method can be complicated but is broadly based on the number of patients that are registered at a surgery ("the global sum"). There is a weighting attached to this payment that takes into consideration a number of factors such as age, rurality and gender. GP practices can also acquire additional income through the provision of other contracted services, such as vaccinations, or through offering training places to medical / healthcare students.

An illustrated summary of income and outcome, although not conclusive, is provided below:

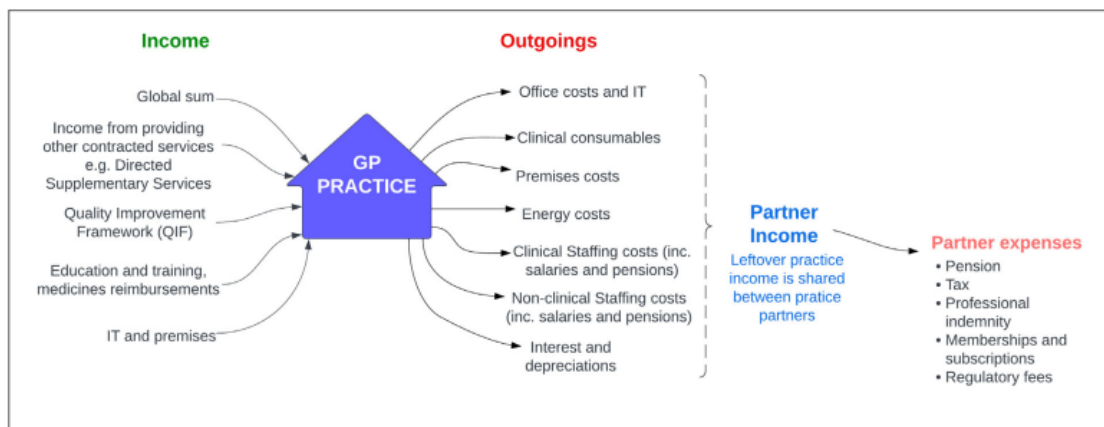


Fig.14: How GPs in Wales are funded (BMA Cymru Wales, 2023)

All the above paints a bleak photo for GP practice in Wales, with many vacancies leading to practice closures and increased stress and workload on the medical professionals that remain. This exact reason was why the work to explore primary care and GP provision in Mid Wales was raised by a retired GP to the RHCW Stakeholder Group and the led to inclusion as a major piece of work in the RHCW Work Programme.

3.2 Case Studies: Best practice

Two very successful case studies from Mid Wales have been included in this review as examples of best practice in the delivery of primary care services in rural areas. Both models are based in Ceredigion and focus on the provision of multi-agency teams (MATs) to better respond to patient needs. The two case studies are:

- Borth Integrated Health and Care Community Service
- Lampeter Multi-Agency Team

3.2.1 Borth Integrated Health and Care Community Service (BIHCCS)

The Borth Integrated Health and Care Community Service (IHCCS) built on a model of community care that had been initiated by the health board's county lead, having successfully bid for funding from the Bevan Commission to pilot an integrated, multi-agency primary care team in the coastal village of Borth, Ceredigion. A grant opened that enabled the piloting of this innovative model of care that could alleviate planned care in secondary care settings. The grant was being administered by the Bevan Commission and opened in 2021.

The local GP practice was the lead in the application, working closely with the health board (Hywel Dda University Health Board), the local authority (Ceredigion County Council) and third sector, community-led organisations, notably Borth Community Hub. The submission was successful in securing funding to pilot the model over a 12-month period.

The project commenced in 2021, with the funding primarily being used to pay the staff costs for a Clinical Community Co-ordinator (CCC). The CCC arranged and chaired weekly meetings that were attended by a range of primary care providers, also on occasion patients themselves. The meetings were kept to an hour long and proved invaluable in ensuring each patient under consideration was provided with the most appropriate, seamless care from all parties involved. Any member of the MAT could put forward patient cases for consideration, with the proviso that they were registered at the Borth GP practice.

Members of the MAT meeting

- Clinical Care Co-Ordinator (Chair)
- Administrator (Minute Taker)
- GP
- Borth Practice Nurse
- Community Pharmacist
- District Nursing Team
- Community Therapy Representation
- Community Dietician
- Older Person's Mental Health Team
- Bronglais Hospital Frailty Team
- Bronglais Hospital Flow Team
- Palliative Care Team
- Social Worker/Assistant
- Reablement
- Red Cross
- Community Connector/Carers Service
- Bronglais Hospital Frailty Team
- Bronglais Hospital Flow Team
- Borth Community Hub

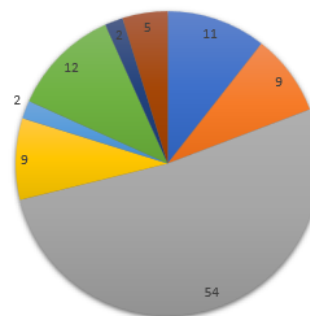


Fig. 15: Members of the Borth MAT meeting (BIHCCS, 2024)

The weekly patient case discussions focussed on complex cases that required multi-faceted support and frequent attenders (at the GP practice). This grew to also include patients that were admitted to hospital, who were then reviewed at the weekly MAT meeting to ensure packages of care were in place to enable timely discharge and prevent what is commonly known as “bed blocking”.

Number of Patients Discussed and Referral Source

➤ Total Number of Patients	104
➤ Patients not in hospital	50
➤ Primary Care	9
➤ Hospital out-patient referrals	5
➤ Palliative Care	12
➤ Referrals to Porth Gofal	9
➤ Frail elderly in person	11
➤ Mental Health	2
➤ Cartref Tregerddan	6
➤ Patients admitted to hospital	54



■ Frailty ■ Porth Gofal ■ In-patient ■ Primary care
■ Mental Health ■ Palliative ■ Cartref Tregerddan ■ Out-patient Referral



Fig. 16: Number of Patients Discussed and Referral Source, BIHCCS, 2024

Effect on GP Appointments– Frailty

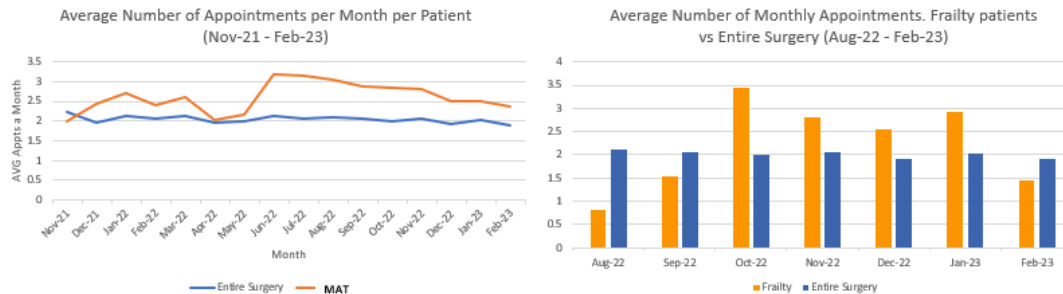


Fig. 17: Effect on GP Appointments – Frailty, BIHCCS, 2024

As the project was funded for 12 months, it had robust monitoring and evaluation systems in place from the onset and it was able to demonstrate considerable savings to the health board by obviating the need for patients to remain in hospital situations for longer than absolutely necessary, whilst also putting in place integrated care packages that prevented health deterioration in the most vulnerable patients and enabled independent living for as long as possible.

Effect on Length of Stay Borth Surgery

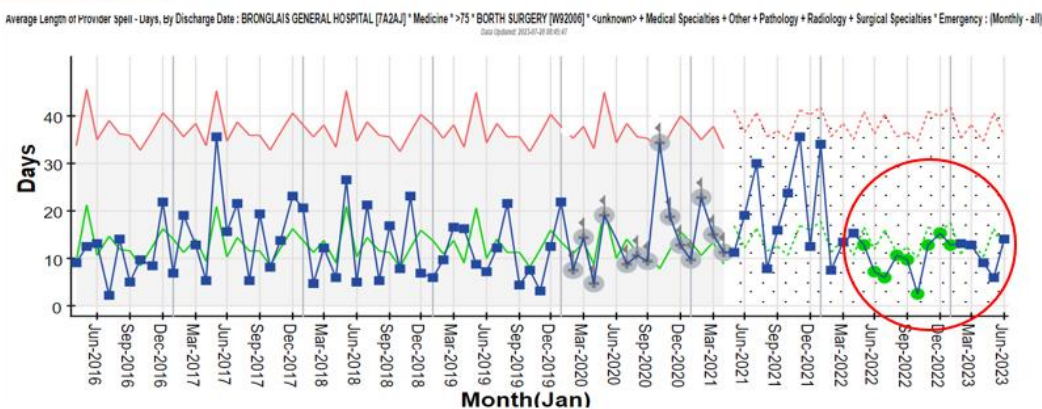


Fig. 18: Effect on length of stay, BIHCCS, 2024

The project was recognised as an example of best practice in the delivery of primary care in a community setting and was made a Bevan Exemplar. The format was rolled out to another GP practice in the north Ceredigion cluster (Llanilar), due to its success and patient experience benefits.

Borth Surgery - Bed Days Saved

	Total Number of Bed Days	Total Number of Patients
June 21 – Feb 22	1881	133
June 22 – Feb 23	1328	173

Total number of bed days saved due to reduction in length of stay – 553

Fig. 19: Hospital bed days saved, BIHCCS, 2024

Resources

Area	Cost per day / attendance
Fully absorbed cost – BGH general medical bed	£1,094
“Releasable” resource cost – BGH gen medical bed	£640
BGH ED attendance average cost	£314

Likely reduction in resource usage for IP spells is around £579k (fully absorbed) / £340k (releasable)

Likely increase in ED attendance resource cost is £38k

Project cost £60k

Net overall effect is therefore resource releasing – approx. £250k net benefit

Fig. 20: Financial calculations showing benefits of operating the model, BIHCCS, 2024

When the initial grant funding from the Bevan Commission expired, the GP practice continued to fund the post of the essential CCC who was viewed as pivotal to the success of the initiative for a further two years. Unfortunately, after the lead GP retired and the CCC moved to a new role, the project floundered and is no longer running, despite its success. Lack of additional funding for the CCC was a factor in preventing continuation, as the cost savings generated for the health board from the intervention were not recognised financially and thus the financial cost had to be borne by the GP practice.

Having discussed the project with its GP lead, key findings were the critical role that the CCC played in drawing all participants together and setting up the MAT weekly meetings, also in monitoring progress and outcomes. In this instance, the CCC was employed by the GP practice, albeit the role was grant funded for the first 12 month.

Key enablers to the project were listed as:

- The clinical care co-ordinator
- Relationships, trust and a “can do” attitude
- Keeping a focus on person-centred care
- Building on and establishing new networks

Barriers that were faced during the project roll out included:

- Organisational culture
- Bureaucratic referral processes
- Silo working across organisations
- Resource deficits / service gaps
- IT systems and difficulty in sharing data
- Funding silos

3.2.2 Lampeter Multi Agency Team

Following on from the success of the project in Borth, the GP practice in Lampeter (south Ceredigion cluster) was keen to try to emulate the model for the benefit of the GP practice's patients. The Lampeter GP practice was multi-site (one in Lampeter and another over the county border in Carmarthenshire, still in the Hywel Dda UHB footprint). It is a large practice with around 12,500 patients.

The funding to develop and deliver a similar model of multi-agency team working at Lampeter was provided through the Regional Integration Fund for West Wales (RIF), with a Clinical Care Co-ordinator appointed to orchestrate the work, albeit the employed post was direct with the health board this time and not the GP practice.

The Lampeter MAT project commenced in July 2024 and is therefore relatively new in terms of monitoring and evaluation outputs, however it is deemed to be great success in terms of patient support and ensuring that people are able to live good lives in their own homes, in their own community, for as long as possible.

Similar to Borth, the Lampeter model has weekly MAT meetings, whereby patient cases are collaboratively discussed with representatives from the health board, local authority, third sector and other partners. A particular success of the Lampeter project has been strong integration with the health board's frailty team, which was touted as an example of best practice that would benefit other models in the future.

All partners joining the MAT in Lampeter are required to sign a confidentiality clause and any information shared electronically is strictly password protected, with actions from the meetings entered against that patient's record at the GP practice.

On discussing the difference between being a GP practice employed CCC and a health board employed CCC, it was agreed that the preferred model would be to be employed directly by the GP practice. Should facilities allow, it would also be preferable for the CCC to be based at the GP practice.

Due to the success of the Lampeter MAT in terms of better patient outcomes, better delivery of integrated care and improved communication between multi-agency and multi-disciplinary teams, plans are afoot to develop a plan that would see the adoption of similar MATs / models of care across the county of Ceredigion, with further reach possible in the future.

During the interview process with the CCC, one of the most important aspects for driving this relatively new model of care forward in communities was deemed to be the person in the pivotal leadership role of CCC. Ideally, the person should be experienced and embedded in the community and have excellent knowledge of local networks and organisations. As is often the case in situations of successful adoption of new processes and change, it is critical to have that one person with the passion, energy, motivation and leadership skills to drive a new initiative to a successful outcome (Fullan, 2004; Garrin, 2014).

One of the barriers to adoption of the MAT model was perceived to be the long-term commitment needed to fully engage those that are sceptical of new initiatives and the possible short-term lifespan of innovative processes enabled by grant funding. Some incidents of apathy towards engagement with the MAT process were witnessed however this was far surpassed by the enthusiasm and engagement of the majority of partners in the MAT who could quickly see the benefits that integrated working brought to patients.

A final comment made by the CCC during the interview process related to ensuring that patients are kept central to all decisions, with the welfare of the patient always at the heart of all decisions.

3.3 In search of best practice: a Literature Review

Undertaking a literature review is traditionally viewed as being for the purpose of identifying gaps in knowledge that the creation of new knowledge can fill. Literature reviews have been said to provide a basis for knowledge development and can create guidelines for policy and practice, engendering new ideas that give direction for future development (Snyder, 2019). The process of undertaking a literature review synthesizes previous research and creates a firm foundation for advancing knowledge and facilitating theory and development (Webster & Watson, 2002).

Additionally, from a pracademic aspect, undertaking a thorough scoping of existing literature can be viewed as an essential starting point for seeking models of best practice that have been tested and evaluated. The principles that underlie this pragmatic approach to inquiry have three key components – 1) an emphasis on actionable knowledge, 2) recognition of the interconnectedness between experience, knowing and acting, and 3) inquiry as an experiential process – have been applied in undertaking this research (Kelly & Cordeiro, 2020).

Adopting this pragmatic approach to seeking examples of best practice in the delivery of GP and primary care services in rural areas, a review of the literature from an international perspective was undertaken in an attempt to garner knowledge and inform our own how enquiry, learning from examples of best practice that could potentially be adopted in Mid Wales.

The biggest challenge facing primary care in rural areas identified in the literature was found to be the recruitment and retention of primary care physicians (GPs). As this too is the main issue impacting Mid Wales at present, it was decided to focus on this aspect of primary care and seek means to improve sustainable recruitment and retention of a GP workforce.

Ashgari et al., (2019) undertook a systematic review of reviews on the recruitment and retention of rural family physicians, concluding that the three most cited categories of concern relate to the three distinct phases of a family physician's life – pre-medical school, medical school and post-medical school. Ashgari et al. advocated that in order to increase the number of physicians who opt to work in rural or remote areas, strategies should be developed that encompass all three phases. The categories with most influence over the recruitment and retention of rural physicians identified by Ashgari were personal factors, training factors and practices factors and included exposure to rural placements at all stages of the lifespan of being a GP, from having a rural background or connection to a rural community or having rural partner, attending training in a rural setting etc.

Marchand and Peckham (2017) likewise undertook a systematic review of the literature to seek to understand the issues underpinning GP recruitment and retention as far back as 2017. Their findings supported these findings in asserting that early exposure to primary care practice was important, as was subspecialisation, portfolio careers and job satisfaction. Also, retention was found to be positively impacted by subspecialisation and portfolio careers. The study also found that whilst low pay might be a cause of dissatisfaction increases in income would not compensate for workload pressure etc (Marchand and Peckham, 2016).

An Australian study concluded that GPs with rural backgrounds or rural experience that was gained during undergraduate or postgraduate medical training were more likely to practise in rural areas (Ogden et al., 2020). The study noted the need to inform government-led initiatives to support an adequate rural GP workforce. Ogden et al., (2020) concluded that GPs with rural backgrounds or that gained rural experience during undergraduate or postgraduate education were most like to enter and remain in rural practice, thus further supporting the need to recruit locally for rural communities.

Having undertaken a comprehensive review of 372 papers, published between 1996 and 2022, that related to the improvement of rural primary care, Aubrey-Basler et al. (2024) advocated adoption of a multifaceted approach when seeking to improve the provision of primary care services and resultant health outcomes for those living in rural and remote communities.

Abelsen et al (2020) recognised the need to create a stable, remote rural workforce, this being essential to ensure rural populations are adequately served by the profession and have equitable provision of care. The comprehensive study that they conducted took place over a seven-year period, covering five countries (Sweden, Norway, Canada, Iceland and Scotland), combining literature reviews, practical experience and national countries to come up with a framework to healthcare organisations to achieve a stable, remote

rural workforce. The framework that they advocate consists of 9 strategic elements that are grouped into three main tasks – plan, recruit and retain.

Abelsen et al. concluded that the framework could be implemented in any rural location, offering a holistic, integrated set up interventions that would lead to better recruitment and retention of an essential rural healthcare workforce.

The three priorities touted include:

1. Make inter-sectoral investment in training and career promotion – recruit local people and develop cultural relevance of the services provided.
2. Create a desirable workplace – a cohesive team and supportive management, a safe and well-equipped clinical work environment, with digital connectivity
3. Create and incentivize a pool of transient workers who are committed to the region – temporary workers will always be required to cover leave / maternity etc.



Fig. 21: A Framework for Remote, Rural Workforce Stability (Abelsen et al, 2020)

Abelsen et al. (2020) also outlined five conditions that are required for the framework to be successful:

1. recognition of unique rural and remote issues
2. active community participation
3. targeted investments and dedicated resources
4. an annual cycle of recruitment and retention activities and
5. continuously monitoring and evaluation for ongoing improvement. Furthermore, the three key priorities (Plan, Recruit, Retain) have 9 strategic elements, which are illustrated in Fig. 21.

4 Conclusion

The Bevan Commission's report into The Foundations for the Future Model of Health and Care in Wales (2024) sought to establish an agenda that would result in a sustainable, high quality, equitable health and care service in Wales that was resilient and resourceful. The report's main findings outlined four foundations that were needed to achieve this, noting that health is everyone's responsibility:

- Resilient and Resourceful People and Communities

- Prudent, Integrated and Equally Well Care
- Sustainable Workforce, Services and Systems
- Dynamic, Innovative and Transformational Culture

The rural populations of Mid Wales are facing increasing pressure in accessing an adequate GP and primary care provision and do face inequitable access from that perspective. Additional work and resources need to be provided to our rural populations in Wales who are disadvantaged in multiple ways when it comes to the provision of healthcare.

Not only is this inequity witnessed by patients, but healthcare professionals also working in rural areas of Wales likewise face additional hardship, with less supportive resources (including workforce provision) and supportive infrastructure. The WG visionary model of community care is ideally suited for rural areas of Wales, where strong communities thrive. However, specific measures need to be put in place to address challenges facing rural populations, with all public services needing to be viewed through a rural as much as an urban lens.

Returning to the scope of this report, the provision of resilient, sustainable GP and primary care services are critical for those living rurally who might not be able to easily access secondary healthcare services. When considering recommendations that can be taken from the investigations and research undertaken, it is worth noting that they have been formulated with a regional perspective in mind. Whilst each GP practice, cluster, health board and local authority will have their own plans of action and certain level of autonomy, the findings of this report are intended as to be presented as collective recommendations for Mid Wales in its entirety.

4.1 Recommendations:

1. The recruitment and retention of GPs and an adequate primary care workforce must be a key priority to:
 - continue with longitudinal placements of medical students in training (e.g. CARER scheme at Cardiff University; RHiME at Swansea University) to embed rural exposure
 - work with the Graduate Entry to Medicine and widening participation programmes to encourage local people to apply to study for medicine
 - improve the provision of local training – could there be a medical school in Mid Wales? CPD options – regional programmes?
 - develop a Rural Specialism in Medicine that meets the specific needs of Mid Wales (akin to Australia's new Rural Generalist qualification)
 - encourage medical students and newly qualified healthcare professionals to embed in rural communities through a mentoring / befriending scheme
 - create more flexible work opportunities across the region e.g. work across health boards, job experience days etc.
 - consider shared roles for GPs across the region, building resilience into provision
2. Greater cross-region pollination of cases of best practice and shared learning should be encouraged to:
 - roll out the MAT model across the region, noting the importance of the CCC appointment
 - embed integrated community work in the rural model of delivery by creating community hubs for multi-disciplinary and multi-agency teams
 - allow for innovation and build confidence in new processes (risk / trust)
 - set up annual regional cluster meetings
 - actively build connections and integrate primary care with secondary care to improve communications and relationships

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Can ARQ be SMART: Overcoming barriers to poverty through innovation and transformation in Pakistan's third sector.

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Abstract:

Addressing poverty, safeguarding vulnerability, and improving wellbeing require innovative and system aware approaches within health, social care, and the third sector, particularly in low- and middle-income contexts. This report examines the Arshad Qazi Foundation as a live case study to explore whether a small, lean organisation can deliver meaningful and sustainable impact through innovation and transformation in Pakistan's third sector. Drawing on mixed methods, including literature review, stakeholder surveys, interviews, document analysis, and field observations, the study analyses how innovation management tools and principles were applied across community led projects. These include food welfare, women focused income generation through Project Satrangi, education initiatives, animal welfare, and environmental action. Frameworks such as prudent health care, coproduction, the Plan Do Study Act cycle, Kano analysis, PESTLE analysis, and social networking are used to examine barriers related to trust, corruption, funding, gender inequality, digital exclusion, and governance complexity. Findings demonstrate that while resource constraints and socio-cultural barriers remain significant, adaptive leadership, community engagement, and continuous learning enable small organisations to operate as effective innovation platforms. The report highlights how aligning social innovation with wellbeing, safeguarding, and system resilience can strengthen health and social care outcomes. It offers practical insights for policymakers, practitioners, and innovation leaders seeking to leverage grassroots models to deliver inclusive, scalable, and sustainable change.

Keywords: Social Innovation and Poverty Alleviation, Third Sector Transformation, Community Led Innovation, Sustainable Wellbeing Systems.

Definitions Table

ARQ	Arshad Qazi Foundation
Satragi	Translates to 'Seven colours' in Urdu and Persian, as in the colours of the rainbow
PESTLE Analysis	Tool used to understand political, environmental, social, technological, legal and economical barriers that ARQ Foundation faced
Fishbone	Tool used for problem solving
KANO	Tool developed by Noriaki Kano used to understand stages, what would generate ultimate service and customer excitement.
Social Networking	Management Concepts
PDSA	Quality Management System tools, Plan, Do, Study, Act cycle
Push and Pull	Management Concepts
CSR	Corporate Social Responsibility

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1 Introduction

1.1 Background and Introduction

The ARQ Foundation was established as a not-for-profit organisation (NFP) with a personal duty to influence change and safeguard the most vulnerable in society.

With its core value, *“to provide and to protect”*, the Foundation formed its mission to break the cycle of abuse which is often fuelled by desperation, hunger, and extreme poverty. Recognising the need for solutions, the Foundation launched a series of projects and established a dedicated team on the ground. This report aims to evaluate the Foundation’s journey, the strategies it applied to be different, innovative and disruptive in its approach and behaviour.

What began as a simple vision to inspire change and give back to society was met with significant challenges. Fuelled by widespread fears of corruption and scepticism in Pakistan certainly dampened the momentum and enthusiasm behind the foundation’s efforts to achieve in its ambitions. Geographical distances between the think tank based in United Kingdom and flag ship operations based in Pakistan further hampered the project in its day-to-day development. Low levels of education within the team, mass poverty, illiteracy, lack of funding, coupled with unreliable internet and electricity networks, contributed to the frustrations of running simple day-to-day operational tasks effectively and efficiently.

During the launch of its initial projects, another challenge became evident; ARQ Foundation was operating within a highly saturated market, competing against 100,000 to 150,000 voluntary organisations (Maclean et al., 2021) within Pakistan. Whilst these organisations were all tackling poverty, they were also working in silos and essentially, competing for the same funding resources, from the same circle of donors. This impacted ARQ’s ability to attract and secure the much-needed funding it required to gain pace in its operations.

The ARQ Foundation was established in May 2024, to address safeguarding and end poverty through creating self-sustaining business cycles, Project ARQ ‘Satrangi’, which means 7 colours, was launched, based on the Avon model. This will also form the case study in this report.

Through groundwork and observation, it was clear however, that other areas needed urgent focus and action, this included tackling environmental issues, launching educational programs and animal protection. The remit was vast. With these findings, ARQ Foundation would need to broaden its horizons and have a strategic plan, if it was to make its project impactful and sustainable.

This report seeks to examine ARQ Foundation’s journey and seeks to answer two key questions: Can ARQ be SMART’ in its ambitions to influence change, and can it be innovative and transformative in its approach.

The report is structured to first provide context on the Foundation followed by an analysis of existing challenges, identification of market gaps, and recommendations for strategic, transformative approaches to enhance ARQ’s impact.

1.2 Project Requirements

Organisational purpose of ARQ Foundation was to be effective, disruptive and lean as an organisation. The intention was to remain small unlike large, well-established charities that operate within the principals of bureaucratic establishments (Max Weber, 1921). This reason for this was to remain agile, as an organisation and pass on 100% of the funding directly on to its beneficiaries.

By remaining a small and lean organisation, operating with limited resources but adopting a holistic, community-driven, and sustainable model, this project contests the idea that scale alone guarantees impact. In doing so, it provides fresh insight into the potential of disruptive, grassroots models can deliver transformation effectively and efficiently.

The ARQ Foundation was established with the vision of tackling poverty, reducing vulnerability, and safeguarding communities through innovative, community-led pilot projects. However, as the foundation’s work has progressed through fieldwork and ongoing dialogue with local communities, other priority areas emerged where the needs were greater: animal welfare, community education and environmental sustainability. These additional requirements extended its application in practical and relevant ways, reinforcing the foundation’s motto, *‘Provide and Protect’*, therefore extending the protection for animals, environments, and therefore future generations.

1.3 Challenges

ARQ Foundation faced several challenges which were met during its journey. Lack of donations limited its speed and growth, these were compounded by issues of trust, transparency, and widespread fears of corruption and terrorism (Lewis, 2010). Barriers such as illiteracy, cultural and religious, and gender discrimination, further limited community participation and project reach (Nicholls, 2006). The organisation contended with daily digital connectivity problems and language barriers which added to the frustrations.

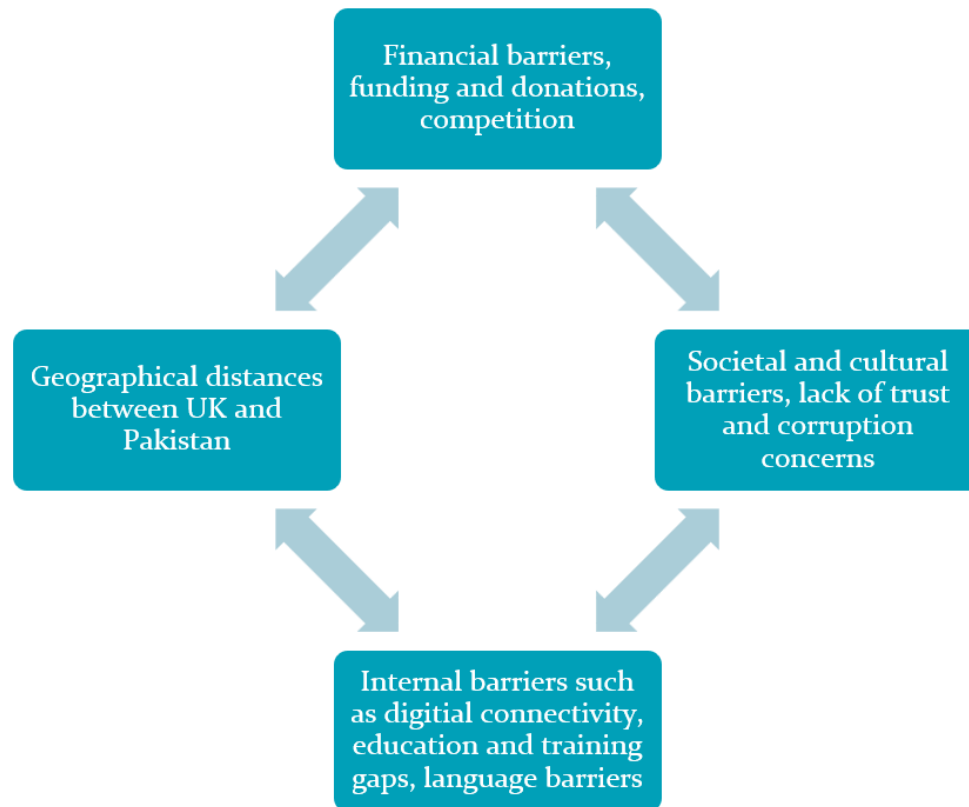


Fig 1. Authors own illustration – challenges that ARQ Foundation faced

1.4 Why this project matters?

The project matters for two main reasons. First of all, ARQ Foundation was set up in the memory of the authors eldest brother, Dr Arshad Qazi. A UK trained Paediatrician. He was the main inspiration and influence as a child growing up in the 80's. Dr Qazi developed Edhi Welfare when it was at its grass roots. Edhi Welfare now, is one of the most reputable and successful welfare organisations that exist in Pakistan and worldwide today. Examples of original innovation within the third sector took place when Dr Qazi launched check points based on the 'McDonalds' take away model and applied this within the Punjab region. These points were situated a mile apart to i) host baby cots – preventing baby abandonment, and ii) host fleet of ambulances for emergency services. He was particularly devoted to children with special needs, launched orphanages and collaborated with hospitals. Dr Qazi lost his life tragically in Islamabad fourteen years ago (Dawn, 2011).

The second reason, why this projects matters is that the research holds clear potential and valuable insights. It demonstrates how lean organisational structures can be effective and efficient in contrast to larger bureaucratic structures. It strives for social networking and collaboration between various sectors across the world, to work in conjunction with each other - with the single vision which benefit communities and environment alike. It seeks to apply principals of innovation and organisational theories within the third sector at an international level – offering ARQ Foundation as a 'live' case study.

The Innovation triangle has been used here as a tool to illustrate ARQ Foundations initial vision. In further sections the triangle will be used to demonstrate how this vision has evolved and where ARQ Foundation aims to be in the future.

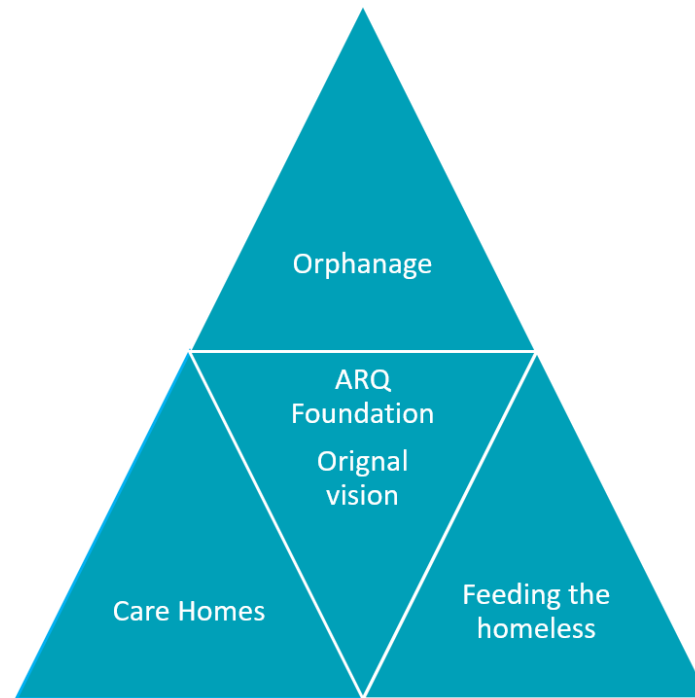


Fig 2. Authors own illustration – Innovation triangle – vision at initial stages of the Foundation

2 Literature Review

In Pakistan, the Third Sector comprises of charities, voluntary organisations and non-governmental organisations otherwise known as NGOs. This review critically examines the third sector through key themes: competition and fragmentation, Large NGOs v Small NGO's, CSR and innovation and trust and corruption within this sector.

The diagram (3) below illustrates types of organisations within the third sector



Fig 3. Types of organisations within the third sector

2.1 Competition and Fragmentation

It became clear that ARQ Foundation was competing against 100,000 to 150,000 voluntary organisations within Pakistan (Maclean et al., 2021). Whilst these organisations were all tackling poverty, they were often working in silos and essentially competing for the same funding resources and from the same circle of donors. This impacted ARQ's ability in quickly securing the funding it required to gain its operations to where it was most needed. In context to Pakistan, there is no state welfare or national health service such as that in the UK, the third sector plays a critical role in addressing social and economic gaps left by the state. Provisions for the population are broken and public trust in institutions is weak, with NGOs often acting as the primary providers of education, healthcare, and social protection (Lewis, 2010). However, the sector is far from uniform. It is characterised by competition, fragmentation, and varying levels of effectiveness, with organisations ranging from large international actors to small, grassroots initiatives (Khan, M. S. M., Harvey, C., Price, M., & Maclean, M. (2023a).

For ARQ Foundation, efforts to remain 'different' within a traditional non developed country was challenging. It needed to remain focused on being innovative, lean and disruptive and for this - it created its own business models working on the principals of prudent health care, as opposed to replicating existing models and ideologies.

2.2 Large v Small NGO

The literature further highlights the distinction between large, established NGOs and smaller, lean organisations. Larger charities typically structured as bureaucratic structures (Max Weber, 1921) with higher overheads and layers of administration, whereas smaller, community-led organisations can be more agile and responsive, though they often struggle to secure sufficient funding and recognition (Banks & Hulme, 2012).

These insights directly inform ARQ's strategy to remain lean and disruptive, as evidenced in survey responses from operational, which emphasised the importance of flexibility and rapid decision-making that achieved meaningful impactful.

ARQ's agility and innovation is evident through the Satrangi Model which where principles of prudence were applied, and in doing so, by listening to its stakeholders, it created a business model that supported livelihoods.

Furthermore, ARQ remained prudent by avoiding waste and using its funds innovatively. Example in ways the Foundation avoided large costs

- Investing in projects and not in infrastructure, therefore avoiding high building costs
- Seeking out and securing wholesale food contracts prior to seasonal inflation.
- Securing competitive rates for garments from other areas such as Lahore and Karachi.

2.2.1 Impact of food welfare programme

Basic foods such rice, flour and oils were sourced prior to seasonal price inflation. Food parcels were provided for 500 families at a cost of £60 per box feeding a family of six. In comparison, the same parcels were being advertised by competitors at £100 per box for the same ratio with less items within the package. We added value by providing washing materials and deserts, to promote wellbeing during festive periods (price comparisons were taken directly from established charities who were offering same packages at the same period May 2025). We were successful as we provided more food parcels (to over 500 people) at less costs (£60 for a family of 6) and provided added value in comparison to competitors. We were prudent in our packaging, avoided waste in transportation of goods and materials were packaged and delivered efficiently by team of paid and unpaid members. Scientific management (Frederick W Taylor) techniques were applied in the preparation of food boxes.

2.3 Corporate Social Responsibility (CSR), innovation and sustainability

These emerge as key themes. The literature identifies social enterprise models, innovative funding mechanisms, and sustainable practices as essential for ensuring long-term viability in the voluntary sector ARQ's adoption of community-led pilot projects, as observed in the surveys and business cycle analysis, reflects these principles, demonstrating a conscious effort to innovate within resource constraints and create enduring impact.

To ensure methodological rigour, a systematic literature review (SLR) was conducted, and academic databases were searched however, relevance in context of this report were limited.

2.4 Trust and corruption

The theoretical reviews include barriers to humanitarian work (Banks & Hulme, 2012), and recurring issues of trust and corruption (Lewis, 2010) and safeguarding were highlighted. Report by Transparency International (2022) highlights this and the lack of donor confidence consequently, financial mismanagement and failures in the system have led to mistrust from the public.

ARQ has encountered first hand scepticism from local communities in the UK regarding fears of corruption in Pakistan. This scepticism dampened initial enthusiasm. However, trust has been built over time visible delivery of impactful projects, transparency and accountability of donations. Projects such as food provision,

business cycles, and most recently (September 2025) the launch of educational project, gained the most credibility and accolade since 2024.

2.5 Summary

Literature review highlights challenges of competition in a saturated market, it illustrates issues of trust, corruption and sustainability. Whilst there is the understanding that innovative ideas are required, it was observed that these were few and far between. Majority literature reviews focussed on innovation largely within medicine and healthcare sectors and there are limited or no reviews on smaller hybrid NGO's which ARQ Foundation presents.

Trust, corruption and safeguarding damages community confidence as mechanisms are weak and lack accountability (Transparency International 2022). These theories and perspectives are important to ARQ Foundation as a model that demonstrates how small, grass root organisations can be innovative, and overcome challenges identified in this report.

ARQ Foundation has filled a gap by offering a case study of how small lean organisations can innovate, be prudent and continue to evolve along with the changing political, geographical and environmental landscape that affects the under classes in Pakistan.

3 Methodology – questions and surveys

ARQ Foundation and the projects that it initiated have been used as a case study for this report. Mixed methods have been used, combining qualitative and quantitative elements to ensure depth and breadth of findings and understanding. Project Satrangi (which was modelled on the Avon approach), has been incorporated into the study, as its outcome offers valuable insights and informs ARQ Foundation's future direction.

Sample questions were sent to ARQ's direct team, board members, the CEO and founder, as well as beneficiaries and wider stakeholders—currently around 25 active participants across various projects that impacted over 150 families. The research will draw on existing theories while allowing space for new methods to emerge as ARQ continues to evolve. To generate robust and meaningful results, the design will integrate interviews, surveys, impact assessments, benchmarking against similar organisations, document review, and participant feedback from those directly engaged with ARQ's activities.

3.1 ARQ Structure

ARQ operate as a lean structure which enables principals of prudence. Governance and accountability are ensured through its Board, who are experts in their fields and offer expert advice. The project is operated by the team of employed and volunteers who work in Rawalpindi, administrative and accountants are hired as required which also keeps the costs low whilst ensuring accurate record keeping.

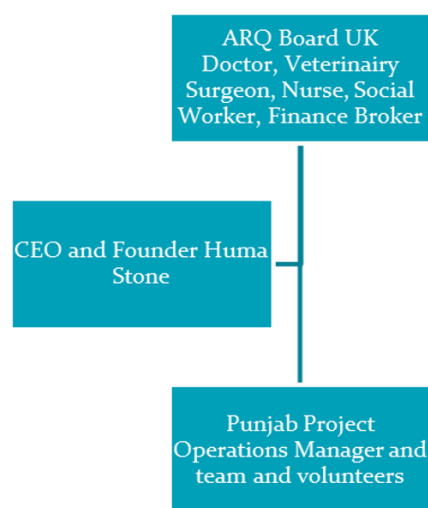


Fig 4. Author's own illustration – Lean ARQ Structure

3.2 ARQ Foundation adopted principals of Prudent Health Care.

The table below outlines how these principals were applied across the pilot project.

Principles	• Application to ARQ
Co-production	• Application to ARQ • Involved 17 local women in consultation for Project Satrangi programme
Need	• Families were triaged through gound assessments to prioritise families with the greatest needs
Necessity	• 'Do only what was needed' - Focused on avoidance of waste and financial costs
Evidence	• Used Avon-style business cycle to generate income and support tailoring inititaitves

Fig 5. Arthurs own illustration- using principals of Prudent Health Care

The key milestones of this project will follow a clear sequence: initial research and literature review, data collection, analysis, and the formulation of conclusions and recommendations.

Planned visits to Pakistan were undertaken In December 2024 and May 2025. This was to engage directly with stakeholders and beneficiaries, visiting sites where projects were initiated and gaining valuable feedback that was important for learnings and reflection but also for future direction. The visits enabled governance and accountability of the project delivery and finances by the CEO and founder of the organisation.

The research design draws primarily on existing theories of organisational behaviour, social innovation, and third-sector governance. However, given the changing landscape and nature of the project, ARQ Foundation has to evolve and remain flexible in its practice and operations.

To generate robust evidence, data was collected using semi-structured interviews, surveys, document reviews, and benchmarking against similar organisations. Interviews with board members and partners will explore themes of funding, trust, governance, and operational barriers. Surveys and interviews with beneficiaries were assessed on perceptions of transparency, service impact, and socio-economic change, with particular attention to issues of illiteracy, digital exclusion, and safeguarding. Impact assessments and participant feedback was held with the view to gain further insight into the foundation's effectiveness and sustainability.

The methodology was structured so that research objectives were explicitly mapped against participant groups and tools. For example, the objective of exploring trust and transparency will be addressed through board and partner interviews on governance processes, alongside beneficiary surveys on perceptions of fairness and accountability. Similarly, the objective of understanding local socio-economic barriers were supported by both beneficiary narratives and leadership reflections. This structured mapping triangulated across groups, enhancing the credibility and validity of findings.

3.3 Project Satrangi – Measuring impact

To measure impact, a series of questions, interviews and focus groups were held. Questions were circulated through email and through WhatsApp, within the group of stakeholders (see table below). Data was collected through responses and feedback, interview and focus group was also undertaken during the period of 21/08/2025 - 28/08/25. Meeting was held over teams with groups of women who used the business cycle. Questions were designed with holistic ariel view, incorporating all stakeholders, donors, voluntary workers and employees and board members. Results of these questions are in the following section.

Objective	Group	Data Collections	Questions
Explore trust and transparency	Board Members, CEO, Team Leader	Interviews	How does ARQ ensure transparency and accountability in decision-making and resource allocation?
Assess perceptions of corruptions	Beneficiaries	Surveys and focus group	Do you feel ARQ is open and fair in how it supports the community? Why/why not?
Identify funding challenges	Board and partners	Interviews	What are the main barriers to securing long-term funding for ARQ's activities?
Understand barriers	Beneficiaries and stake holders	Interviews	What barriers affect your ability to fully benefit from ARQ's projects (e.g., education, transport, digital access)?
Operational challenges	ARQ Staff and volunteers	Survey and impact assessment	What challenges do you face in delivering ARQ's services (e.g., skills, training, connectivity)?
Bench Marking against similar	Partners and other sources	Document review	How does ARQ's approach differ from larger NGOs working in similar spaces?
Assess perceived value and impact	Active participants	Survey and feedback	How has ARQ made a difference in your life, family, or community?

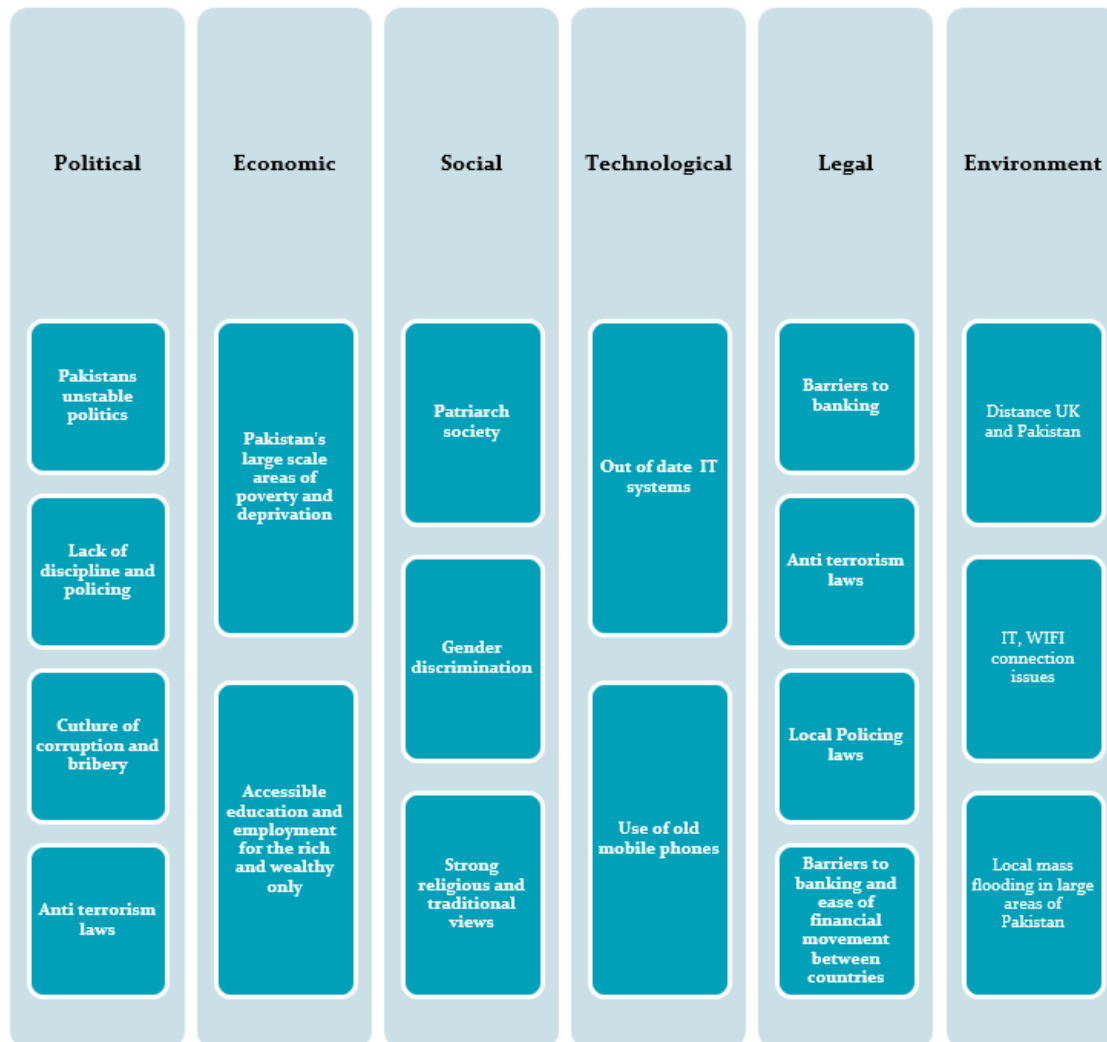
Fig 6. Arthurs own illustration - sample questions circulated to stakeholders



Fig 7. Arthurs own illustration - Data collection tailored to ARQ Foundations projects

4 Findings and Results

Series of frame works have been used in this section to draw out factors such as the PESTLE analysis, which illustrates how external pressures such as political economic, social, technological, legal and environments which have influenced and impacted ARQ's journey. Fishbone Diagram, KANO model, PDSA and Social Networking diagram are also included in this section which are illustrated with narratives alongside. Analysis and findings have been taken from ARQ Foundation's journey (as it has been used as a case study) and through observations and feedback from stakeholders.



8. PESTLE analysis – barriers and influences that ARQ faced

PESTLE analysis has been used to illustrates the barriers that ARQ experienced through its one-year journey, these are detailed below:

Political: Fears of interference from local political organisations, including corruption and outdated government systems created barriers for ARQ Foundation. Changing political landscape created fears within communities in the UK which influenced whom they donated to. Fears of terrorism and banking restrictions were impacted by this view also. For ARQ Foundation, this meant difficulties in obtaining funds as a result of political instability and weak governance. This also meant that ARQ Foundation was initially unable to register itself as social enterprise and relied on registering as a not-for-profit organisation in the UK which does not have tax benefits in comparison to the way charities are registered.

Economic: Rising costs and inflations due to seasonal demands challenged ARQ Foundations projects such as the Food Distribution and ARQ Satrangi where use of wholesale goods were required and vital to

the program. ARQ Foundation was competing (Maclean et al., 2021) with 100,000-150,000 NGOs in Pakistan which meant limited access to funds were available.

Social: Religious and Cultural ideologies created restrictions for women particular as they were limited to access opportunities available to them through ARQ Foundation's projects. Lack of education, training and awareness limited ARQ Satrangi projects development. Sceptism and negative perceptions about Pakistan from UK based communities hampered funds and development. Data does suggest however, that projects where ARQ Foundation were visible, had created trust and respect over time and this is notable as families have come forward for education requests for their daughters aged 15.

Technology: Electricity outage and internet connectivity made it difficult for ARQ Foundation to communicate day to day projects. Out of date IT programmes has reinforced the need for investment within the team.

Environment: Lack of waste management, climate change and current floodings has impacted local economy, the local infrastructure and impacted inflation as basic food, rice and cotton have been destroyed. For ARQ, this has

identified gap that requires exploring. Interview data and feedback revealed that communities valued initiatives that linked livelihood and sustainability. ARQ Foundation will be planting 500 trees in the month of October 2025 as part of this initiative.

Legal: Pakistan in particular has complex registration processes. This is further skewed by corruption from government officials. For ARQ Foundation, this was a challenge particularly at entry level. ARQ Foundation lean size meant navigating these frameworks lengthy.

4.1 Root Causes of abuse:

Here the fishbone analysis below has been used to understand root causes of what leads to 'abuse and harm' of the most vulnerable. This was important for ARQ Foundation as this helps forms ARQ Foundations future direction. The diagram below shows multiple factors within Pakistan's economic and political structure, to traditional, cultural and gender issues that contributes towards abuse harm and abuse.

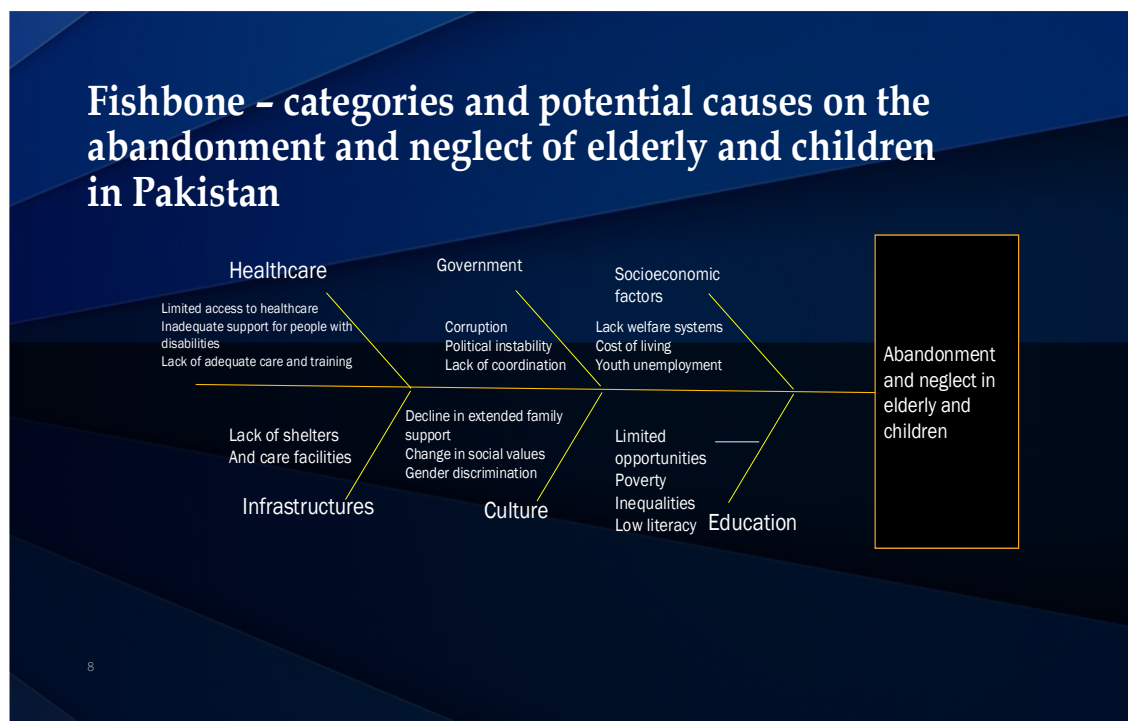


Fig 9.Fishbone – root cause analysis on what causes abuse and harm

The root cause has enabled ARQ Foundation to understand and plan for future programmes. In that, it has established that to break the cycle of abuse, it is important to provide education and train children whilst

they are young, it is important also to provide programmes that deliver messages and behaviours towards the benefits of recycling and animal welfare for example.

4.2 KANO Model,

(Noriaki Kano) used to illustrate the development and visions of ARQ Foundation.

KANO model has been applied to ARQ Foundations activities. This has helped demonstrate what baseline activities are required for the beneficiaries on the ground, who are the most underprivileged in society. For them, basic food and shelter are necessities for survival. Performance needs such as skills training for single women to sustain small businesses, not only generates income through which basic needs can be met for them and their families. Excitement factors such as animal welfare, environmental programmes and schooling, were not part of the initial plan, however, these projects have largely enhanced loyalty and trust. This analysis has suggested that ARQ must remain flexible and deliver programmes that will maintain its presence and resilience in the market, however, ARQ must balance this with a strategy that ensures its long-term development with capacity to innovate and become a market leader over time.

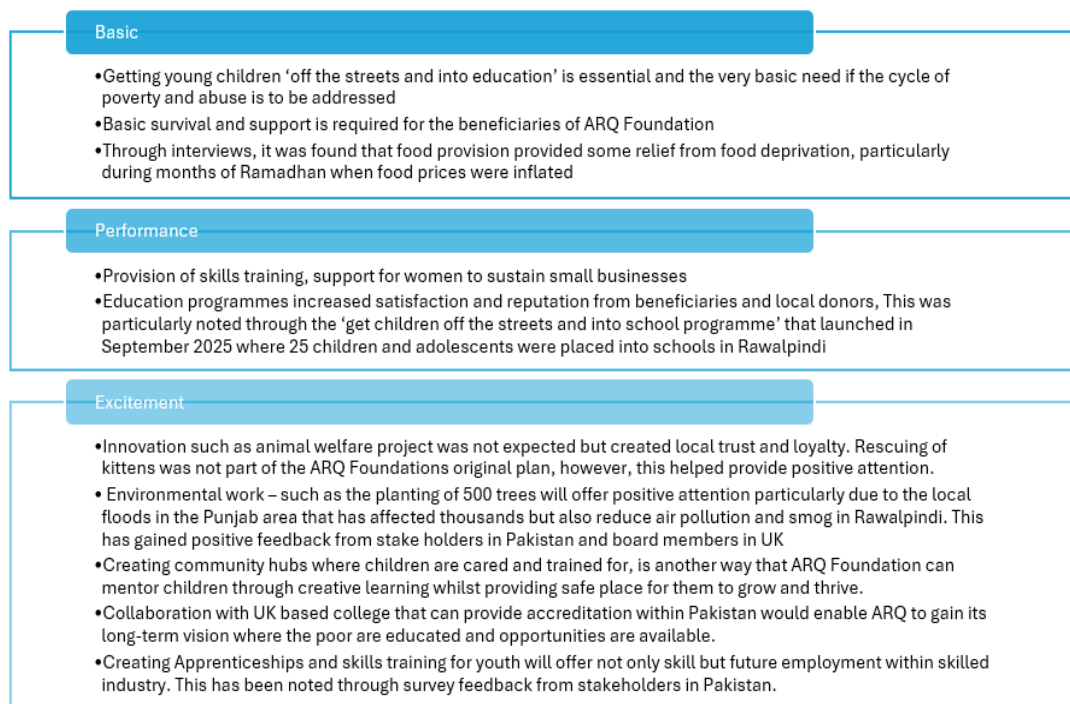


Fig 10. Authors own illustration of KANO Model

4.3 PDSA Cycle

In the context of ARQ Foundation's Satrangi model, the PDSA cycle was chosen, as opposed to other frameworks such as the McKinsey's 7S model. This is because the 'Plan Do Study Act' provides a continuous evaluation and an improvement cycle, that fits with ARQ Foundations small and disruptive identity. The cycle is further described below:

Plan: ARQ identified the need to create a solution for single women that was beyond short term temporary measures such as providing food aid. The ides of the Satrangi project was developed through consultation with 17 women in January 2025, who asked for ARQ Foundation to help. These women were single women with families who had no means of income. The plan to create the Satrangi model provided these women with source of income selling clothes and women's sanitary items through door to door selling. This reduced dependency on donations and handouts.

Do: The pilot was launched with a small group of women trained in sales and in tailoring. Materials were sourced from wholesale markets in Lahore and Karachi at cost price. Items were then brought to Rawalpindi where they were packed and divided amongst women ready for sales on a profit-sharing basis. Local

advertising was sourced along with social media adverts and posters. Shop was also rented as a storage and tailoring unit for face-to-face sales.

Study: Impact was assessed through weekly meeting and reporting. Beneficiaries and the ARQ Team provided sales figures and profit impact including challenges that they were facing. ARQ observed that some women had sales potential and made profits. This was due to their social networking and circle of friends, whilst some women struggled, and one lady did not return goods.

Act: Lessons were learnt, and the model was adjusted. Better, cheaper garments were sourced, prices were adjusted and a support group established. The women fed back that they preferred income-based sales as opposed to commission based, they also feedback the need for more variety in dresses due to demands. New products were launched as a result and sales mentoring group was set up as a support group to train women in sales techniques.



Fig 11. Authors own illustration - Plan Do Study Act

4.4 Social Networking

Networking has been critical in the success of ARQ Foundations' growth, sustainability and success. This has enabled collaboration, sharing of knowledge, access to information and building new partnerships, which have been extremely important factor for the organisations growth and development within the third sector. By collaborating with local leaders, business and international partners, ARQ is able to extend its networks across the world, giving it reaches, visibility and credibility. For example, Councillor Frank Marsh from Hertfordshire has been a key social connector. In that he has introduced ARQ Foundation to Oaklands college in relation to running accredited programs for the youth. Whilst the project will run in Pakistan, this will further extend to 6th Formers in the UK where ARQ can be used as a business project or fashion show with recycling as a theme which will help with UK based qualifications.

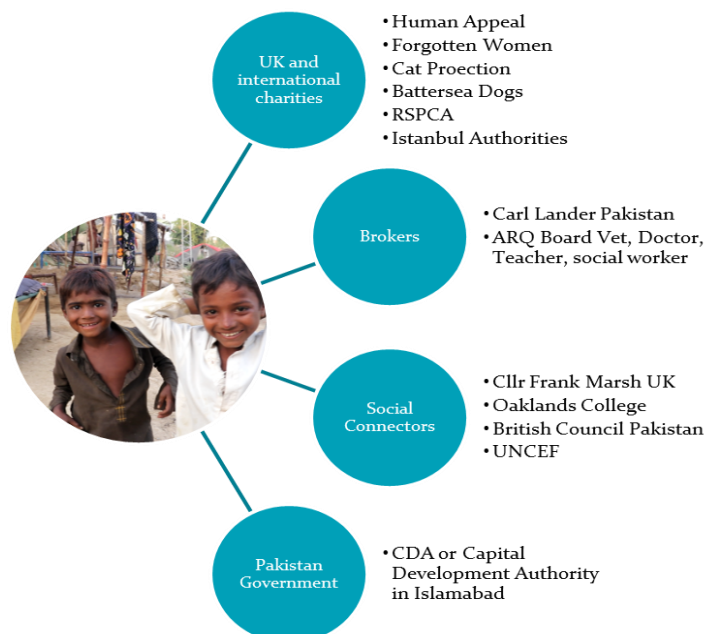


Fig 12. Authors own illustration social networking

4.5 Case study - Project Satrangi AVON model

Background: The project began in January of 2025 with the 17 women who came forwards to participate in business cycle. The project was co-designed through consultation with the group. This was to ensure that the project was meaningful and reflected their needs. All of these women were single and supporting their families without reliable source of income or support from families. These women lived in inadequate conditions, often in one room and faced the daily threat of homelessness and hunger.

Challenge: One participant described working three jobs, including night shifts at a local orphanage as a cleaning assistant. She would often sleep on the floor of the orphanage as she could not afford the cost of the bus fares to return home to her children daily. This illustrates stark urgency and desperation of these women who were trying to survive and had no options. These women did not have any formal or informal education and could not read or write.

Co-production: The project was designed based on feedback and consultation. The ladies shared that it was often difficult for women to buy personal clothing, underwear and female sanitary ware from shops, as most of the shops had male shop assistants serving and selling female clothing. These women did not feel comfortable and were often embarrassed. This was due to cultural of male dominance and matriarch society. The project was therefore developed for women, to sell merchandise to other women within their homes – the Avon model formed the basis of a ‘women-led microenterprise’.

Outcomes: below are the results of the findings that describe how the participants performed and challenges that they faced.

Total number of female participants – 17

Feedback	Number of women	Outcome and insights
Preferred regular income as opposed to commission based earnings	5	Regular income provided stability and security. Commission and share of profits was used as a motivational tool. This did not work well in this situation due to poverty levels but also lack of understanding in the benefits of potential earnings. There was lack of problem-solving attitudes and desperation took precedence.
Interested in expansions into other sites	3	Ambitions to grow and reach income potential.
Requested more variety in garments	5	Product range impacted on sales potential and meet customer demands and choice
Discontinued sales but requested free food donations	9	Preference over provisions of help from ARQ Foundation. This is due to multiple reasons, lack of motivation and wellbeing, lack of understanding on creativity and problem solving, but majority of the women had given up and accepted their way of life.
Requested products for beauty salon	1	This reflected individuals’ skills and interest.

SWOT Analysis has been used to understand the project's strengths, weaknesses, opportunities and threats. This will provide an objective assessment and guidance for the future

Strengths: The project engaged 17 female participants. The project was co-designed through feedback and consultation with this group and team on the ground. Some women were keen to expand their potential within their surrounding areas and felt 'safe' and confident to share their views.

Weaknesses: 5 women preferred a fixed income as opposed to commission based model. There were limitations on the variety of products which were due to lack of funds. There was a skills mismatch due to 1 participant's preference to work in beauty salon. 9 women dropped out suggesting that either the model was not sustainable or that the participants lacked training and understanding of commissioning opportunities or sales tactics.

Opportunities: Diversify in market and in product range. Build local relationships with local market traders. Offer training and mentoring program to single women who have no education. Open Community hubs and well-being support clubs.

Threats: Cost of living and extreme poverty make the model less attractive to those who are desperate. Competition from high street traders offer more variety. Reliance and offer of free donations offers easier options for women within this group. Risk of disengagement with the participants who have seen returns insufficient for their time and efforts.

Data collection from all stakeholders for the project was carried out between 21st and 28th August 2025. This was undertaken through a series of interviews, focus groups and questions that were circulated to the participants in UK and Pakistan. Following responses were obtained from 15:

Objective	Group	Questions	Responses
Explore trust and transparency	Board Members, CEO, Team Leader	How does ARQ ensure transparency and accountability in decision-making and resource allocation?	10 responses scored 5/5, 1 feedback suggested for the team to grow and have more managers to support.
Assess perceptions of corruptions	Beneficiaries	Do you feel ARQ is open and fair in how it supports the community? Why and why not?	10 responses yes, it was open and fair and it did support the community by taking action and providing basic needs and identifying those who needed it most.
Identify funding challenges	Board and partners	What are the main barriers to securing long-term funding for ARQ's activities?	15 responses. Competition. Too many donors support their own family or friend causes. Political and media influences such as war in Gaza which is attracting majority of donations from UK.
Understand barriers	Beneficiaries and stake holders	What barriers affect your ability to fully benefit from ARQ's projects (e.g., education, transport, digital access)?	15 responses 15 - IT, connectivity issues. 1 – Transport 2 – Female working in male environment
Operational challenges	ARQ Staff and volunteers	What challenges do you face in delivering ARQ's services (e.g., skills, training, connectivity)?	15 responses

			15 - basic survival needs take priority over training and education opportunities 10 - Funds, weather, WIFI connections issues, old IT equipment
Bench Marking against similar	Partners and other sources	How does ARQ's approach differ from larger NGOs working in similar spaces?	Lean structure, no office or high street presence. Pros - Donation not absorbed in administration and used for beneficiaries. Cons – the need visual presence within the community
Assess perceived value and impact	Active participants	How has ARQ made a difference in your life, family, or community?	ARQ Satrangi shop – Tailor who was a recovering drug addict, has regular work and continuous income. He evaded homelessness for his wife and family and now has a new place. He has currently requested a pay rise! Stitching around 5-7 dresses per day. He also has an apprentice. New social media team based in Pakistan has been hired, they will write contents, attend all events, promote awareness on all platforms and upgrade the current webpage. Original website designer was UK based and expensive to continue along with language barriers with Pakistan team.

5 Conclusions – what we found

The report asks the question as to whether 'ARQ can be Smart? 'And whether it can overcome barriers to poverty through innovation and transformation within the third sector. The evidence we found was that ARQ Foundation successfully and flexibly navigated its way with limited funds and resources, whilst being prudent and lean throughout its journey and working within a complex and competitive market – this enforces a positive conclusion that ARQ can 'indeed' be smart.

Through its projects ARQ Foundation benefited local communities, offered opportunities, personal development whilst maintaining its momentum and journey. It has demonstrated agility and innovation through its Project Satrangi, tailoring shop, food distribution cycles, human and saved 20 abandoned kittens that were left in bags to die. ARQ demonstrated how it focused on providing immediate relief and building pathways for a stronger resilient future.

Despite financial barriers, cultural constraints, negative perceptions and donor scepticism – the foundation showed its determination to succeed, by pursuing its goals, it being agile and adapting to local pressures and strategizing to address immediate and urgent social issues in Pakistan.

The systematic literature review has shown that in Pakistan, there are high number of charities and welfare organisations all competing for the same resources. Large established organisations exist and are extremely 'donation' rich, however, there is lack of trust in these organisations in how these funds are used and absorbed in administration and in high infrastructure. In addition to this, we found that larger organisations

were not close to the community and therefore missing key needs of the section of the community that are missed.

Small organisations may lack resilience but offer agility and in contrast, hold proximity to communities – seeking out families who are ‘hard to reach’ and those who are not asking for help. ARQ Foundation has illustrated this by being able to engage the hard-to-reach communities, in particular women, by co-producing projects and providing them with opportunities.

There are other barriers such as high levels of illiteracy, gender discrimination and cultural constraints that further restricts women from education and employments. ARQ Foundation has employed women as volunteers, social media and translator. The 17 women were engaged to work on the Satrangi project.

In conclusion to this, ARQ can be SMART if it continues in its mission to strengthen its core values ‘to provide and protect. In doing so, it needs to reinforce trust in donors through transparent reporting and accountability, it needs to sustain a holistic approach and vision. Its lean structure and disruptive approach illustrate how small grass root NGOs can innovate, safeguard and protect the most vulnerable in highly complex and restrictive environment.

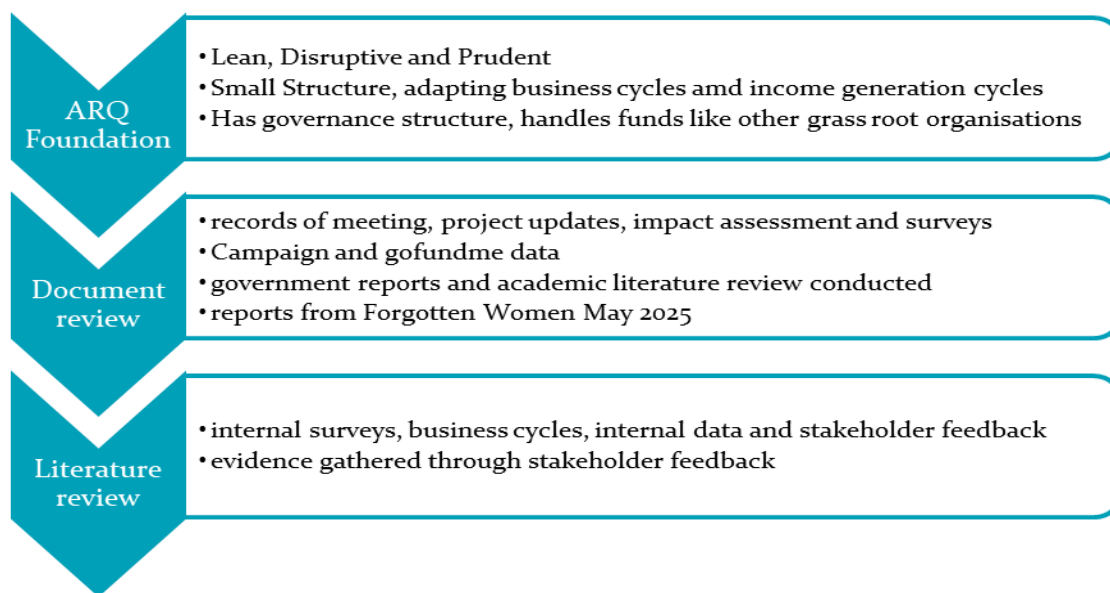


Fig 13: Authors own illustration – summary of insights

6 Recommendations – next steps

Based on the findings of this case study, ARQ Foundation has identified its future direction and next steps. It will adopt a holistic approach which will strengthen the foundation basis and make it resilient for the long-term future.

- To strengthen trust in its donor and UK based stakeholders, ARQ should provide impact reports and financial reports. Free networks can be used such as social media and WhatsApp group. The website development should include real-time updates of the projects. This will build trust and transparency in an environment which is fueled with skepticism and cynicism.
- To create its own income generating model that feeds the foundation's educational programs without reliance on donors for funds. This will alleviate the continuous unpredictability of income stream. Examples:
 - In relation to Satrangi project to work in collaboration with local traders.
 - Set up 'fee-paying schools which will generate income that will be ploughed into the schools run by the Foundation. Options appraisal and cost analysis is in progress September 2025.
- Strengthening the foundation by succession planning.
- Increase credibility by social networking, developing relationships and local government and other NGOs.

- Partner with local business promoting CSR, animal welfare and environmental protection.
- Embed the 'plan do act review' model. This will ensure that ARQ innovates and evolves continually.
- Influence poverty alleviation and embrace advocacy roles at a universal level to influence wider audiences around the world
- ARQ to use its research as evidence to open debates that will shape the future in relation to poverty reduction, safeguarding, animal welfare, CSR in Pakistan, UK, Canada and USA.
- ARQ is also able to evidence that it has been able to be impactful by being a lean and disruptive model, ARQ will be able to shape the practices beyond its own project.

Recommendations	Invest in formal and informal training programmes

	Train staff and volunteers, focus on safeguarding, recycling and skills training

	Succession planning

	Skills transfer and mentoring

	Publish annual impact report

	Share real time project updates with donor and the communities

	Collaborate with businesses in Pakistan

	Develop and harness relationships with government bodies in Pakistan

	Partner with animal welfare and education organisations

	Embed continuous cycle of improvement and innovations

	Use ARQ Foundations evidence to influence and advocate for social, environmental reforms and safeguarding and CSR policies

6.1 Discussions – what this means

The findings confirm that ARQ can be SMART, particularly when examined against the environment that it was operating in. Interviews, focus group, questions and surveys revealed barriers to financial sustainability, donor trust and corruption in Pakistan. Yet despite this, ARQ Foundation projects, such as business cycle, food distributions, animal welfare program and the more recent education program - delivered immediate relief, wellbeing and hope. These programs-built pathway towards education and employment and therefore – long term resilience for the poor.

The push and pull analysis show ARQ's journey that has been shaped by pressures, such as corruption, skepticism and poverty, but gained opportunities through its prudent and lean approach. This included women's enterprise model and social networking that created opportunities for innovation and business. The Foundations' ability to balance and navigate flexibly has shown its strength and determines future trajectory.

The evidence suggests that ARQ can be smart if it continues to overcome these barriers, diversifies, reinforces collaboration through networking and continues to be prudent and innovative, with its holistic and hybrid vision.

ARQ Foundation has been lean, disruptive and prudent. It operated within a small hierarchical structure. The Foundation was able to apply innovative solutions to problems that have had a positive impact on lives. Data and project updates exist including financial information.

ARQ Foundation sought feedback from Forgotten Women in May 2025 (small charity working on women's business cycles) in relation to their findings and insights. They reported that all their projects in similar underdeveloped countries as Bangladesh were successful however, the business cycles in Pakistan had failed.

Push and Pull analysis is being used here to demonstrate ARQ Foundations direction of travel. However, through examination and due to the changing environment, a 'hybrid' push and pull model will be more appropriate.

Push In Pakistan, there are many limitations and barriers, with the absence of welfare and health programs, widespread poverty and weak governance, this 'pushed' ARQ Foundation into adopting lean model. Through the one-year case study and research, it is clear that to break the cycle of poverty, that ultimately leads to harm and abuse, it is important to provide 'education but with a difference', in that, mentoring is needed to change behaviors. In addition to this, it is important to point out that 'schooling alone' does not provide solution to poverty if there are no job opportunities after schooling ends. Innovation triangle has been used further below to illustrate the future ambitions of the organisation.

Pull: ARQ Foundation has had to find opportunities that inspired its innovation and projects such as Satrangi business model. Through its inception, ARQ Foundation operated through demand and needs of its beneficiaries. This may need to continue of it is to navigate through pressures in Pakistan and internally.

Together through the 'push and pull' mechanism, ARQ has evolved and shaped through constraints and opportunities. This ability to balance and respond to these changing dynamics will make ARQ Foundation SMART and sustainable organisation.

Finally, in the wider context of Pakistan – some key questions are raised: that despite the presence of 150,000 charities, poverty levels remain high, with reports of entire families taking their lives as a desperate 'means to an end' from poverty and deprivation (reports from local newspaper and Edhi Welfare 20024 and 2025) see appendix.

Observations during field visits in May 2025, revealed untapped mass recycling opportunities, where streets were filled with plastic waste, yet NGO's and the Government, have either failed to achieve in its objections or struggled to implement any sustainable solutions within Pakistan.

This observation promotes the idea and need, of a 'hybrid ARQ' push-pull approach, that combines lean operations with innovation, for example, where formal education is combined with mentoring hubs filled with creative and critical thinking that reinforces positivity in young primary school children, to create apprenticeship schemes within skilled labour for example: car mechanics, electricians, builders and plumber that creates certified and reputable schemes the youth. Together with these findings. illustrate how grassroots organisations can disrupt the cycle of poverty. By continuing to preserve and apply meaningful applications, it can disrupt and deliver change that Pakistan and countries like Pakistan need.

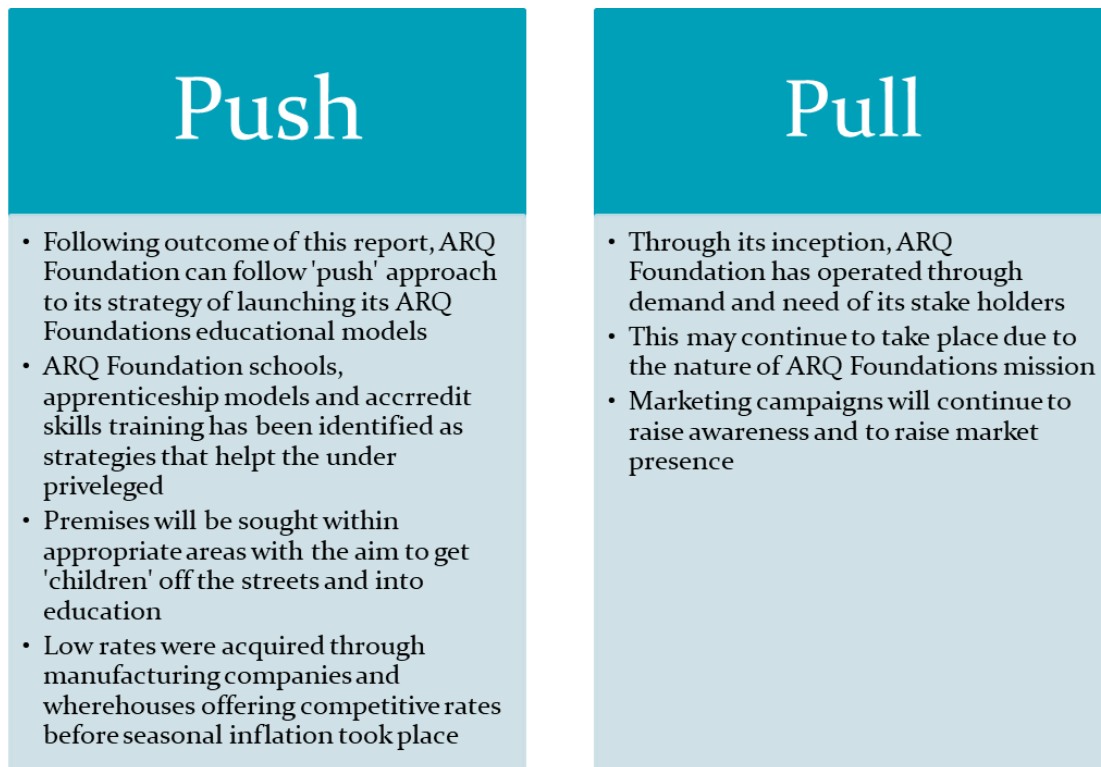


Fig 14: Authors own illustration Push and Pull

6.1.1 Innovation Triangle

The Innovation Triangle has been used to show the stages and development of the project since its inception. The last triangle shows the future ambitions. Root cause analysis, and the studies presented through research in this report, informs ARQ Foundation that education, mentoring programs and skills training, is what 'breaks the cycle' of poverty at its core. This in turn shifts the mindsets of causing harm to the most vulnerable. There are reports that highlight the direct connection between emotional tormenting of animals and deprivation (Chan, H. C., & Wong, R. W. Y. (2023)).

The third triangle illustrates and focuses primarily on education. The project began in September 2025 with school placements for 20 children, with another 40 on the waiting list and where community elders from the outskirts of Rawalpindi have appealed to ARQ Foundation for schools to be considered in their area. The Fourth stand alone, innovation triangle shows the long-term ambitions of ARQ Foundation. This is followed by the short-, medium- and long-term strategy showing how this will be achieved, and lastly Hoshin Kanri's 'Policy deployment matrix' has been used to show how ARQ's strategies and goals will drive the school's project.

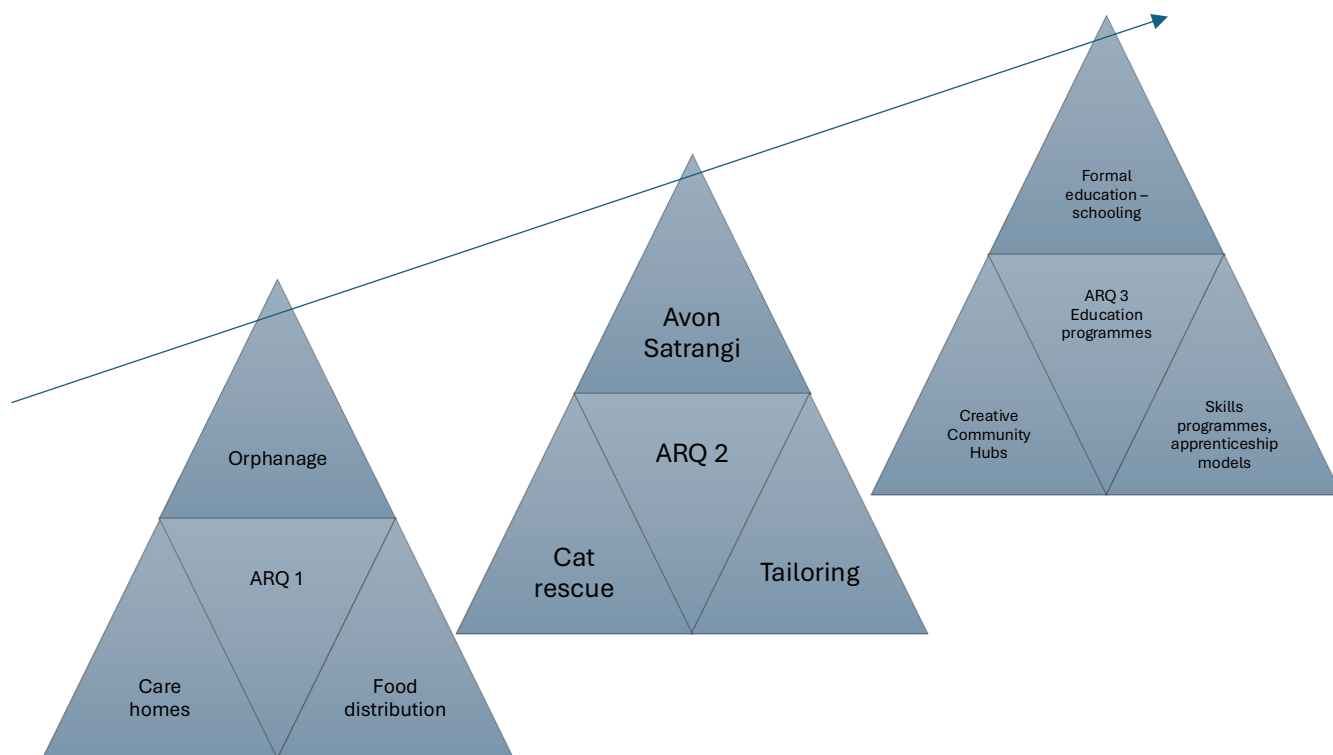


Fig 15: Authors own illustration – Innovation Triangle

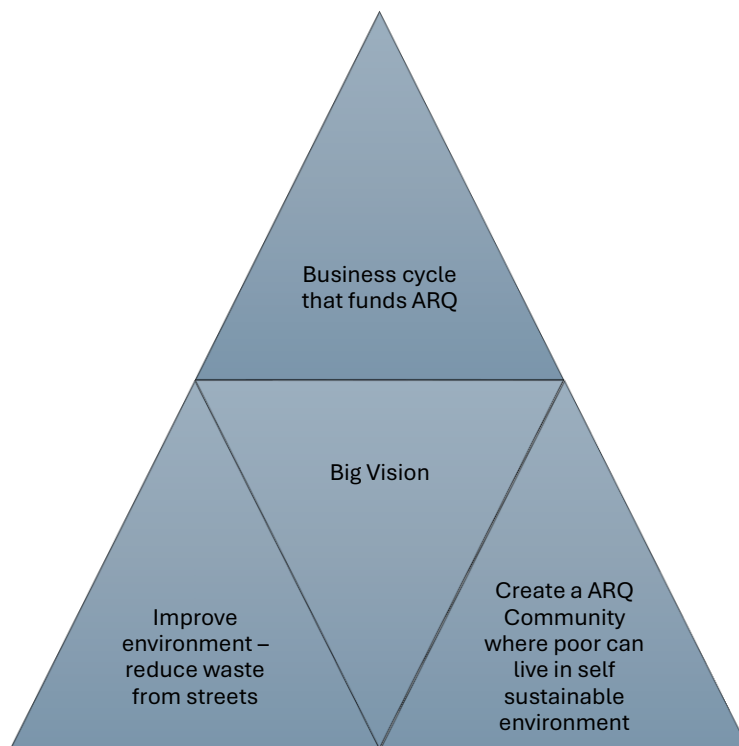


Fig 16: Authors own illustration of the big vision

6.1.2 Strategy

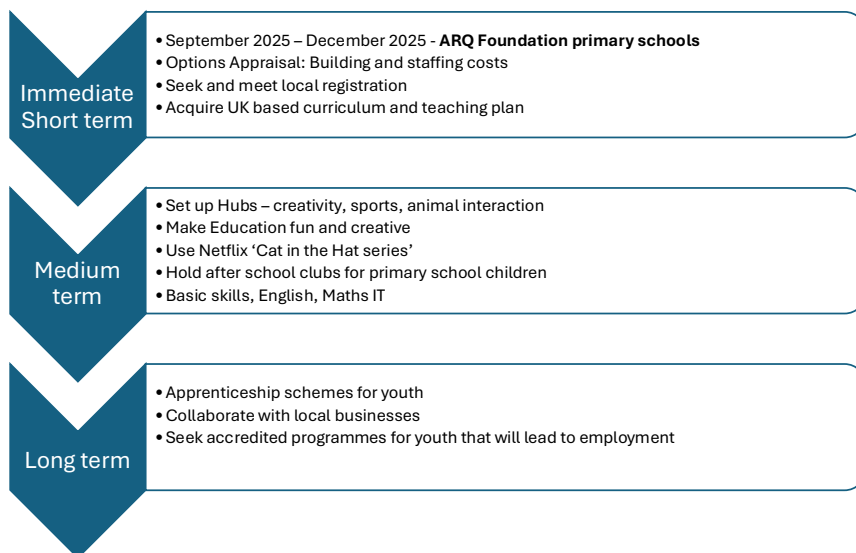


Fig 17: Authors own illustration of strategy

				Activities - place advert				
				Activities - contact local estate agents and Look at land for hubs and pop up schooling				
				Gather prices for building rent, land rent and purchase cost				
				Activities options appraisal, registration process, resources required				
Themes - Staffing	Themes -Identify 3 key locations	Themes Cost - by December 2025	Themes - Get children off streets and into school project in Rawalpindi		Targets - Open school by May 2026	Prices available - October 2025	Identify key sites to open schools - By May 2026	Recruitment staff
				Outcomes - Provide schooling for 400 primary school children				
				Outcomes - Financial site for planning				
				Outcomes - Facilities preparation				
				Outcome - ARQ Staff Induction				

Fig 18: Authors own illustration of policy deployment matrix

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8 Appendices

Appendices can be found in the following page:

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Optimising Multidisciplinary Team Meetings in Welsh Cancer Care: Exploring AI-Driven Innovations

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Abstract:

Multidisciplinary Team Meetings (MDTMs) play a central role in patient cancer care in Wales. Concerns, however, are being raised about their safety and efficiency due to increasing demand, administrative pressures and inconsistent processes. Artificial Intelligence (AI) has been proposed as a tool to enhance workflow, triaging processes and decision-making but there is limited knowledge about the readiness of Welsh healthcare systems to adopt such innovations.

This research examines the ethical and practical integration of AI into cancer MDTMs across NHS Wales using a mixed-methods approach. This approach combines the findings from surveys conducted with MDTM members and interviews with strategic and policy stakeholders across Wales. These findings reveal operational challenges, including patient rollover, inadequate pre-meeting triage, fragmented IT systems and insufficient time for thorough patient case discussions. Despite these issues, there is cautious optimism about the potential benefits of AI.

Both the MDTM members and strategic participants identified the need for trust, robust governance, interoperability and training to support the adoption of AI. The research also highlights contrasts between ambitions of national policymakers and the realities of frontline operational pressures, emphasising the need for a dual-level strategy that combines central coordination with local preparedness and delivery.

This study provides new insights into the barriers and enablers of AI adoption within Welsh cancer services and offers evidence-based recommendations for safe, ethical and effective implementation.

Keywords: Artificial Intelligence (AI), Cancer, Multidisciplinary Team Meetings (MDTMs), NHS Wales, Digital Health, Governance, Innovation Adoption

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1 Introduction

1.1 Background to Cancer MDTMs in Wales

Cancer services in Wales face significant challenges and operating pressures. Each year, approximately 19,800 individuals are diagnosed with cancer and approximately 9,100 individuals die from the disease (Wales, 2017). Projections indicate that cancer incidence will rise over the next decade due to an ageing population and modifiable risk factors. Despite improvements in survival rates, Wales still lags behind other UK nations and many European countries (Public Health Wales, 2024).

Timely access to diagnosis and treatment is key to improving outcomes. In 2023, 9,600+ Welsh patients waited longer than the 62-day target to begin cancer treatment suggesting severe pathway delays (*Cancer Waiting Times Stagnant for Another Year*, 2025).

Multidisciplinary Teams (MDTs) play a central role in delivering timely, coordinated and high-quality cancer care in the UK. MDTMs were first formalised through the Calman-Hine report (Office & Gymreig, 1995) and later embedded in the NHS Cancer Plan (House of Commons - Science and Technology - First Report, 2020) across NHS England with similar plans for all home nations. MDT meetings (MDTMs) ensure input from a range of clinical specialists to decide patient diagnosis, staging and treatment in a timely manner. In Wales, over 100 MDTMs support the cancer care pathways for tumour groups and meet weekly to review cancer cases at every stage of treatment. However, MDTMs face increasing strain due to rising cancer incidence, staffing pressures and growing administrative burden. They are also time-consuming, manually intensive and variable in function. Challenges include duplication of case reviews, volume of patients to be discussed, inconsistent attendance, poor documentation and lack of protected time for preparation. These issues can ironically delay decision-making and contribute to burnout among clinical staff. The modernisation of MDTM element of the cancer pathway is urgently needed and aligns strategically with national cancer recovery priorities.

1.2 NHS Policy and Innovation Context

The NHS Wales Cancer Recovery Programme (2022–2025) was launched in response to COVID-19 service disruptions. It highlighted the optimisation of Cancer MDTMs as a national priority. Simultaneously, the Welsh Government sought to accelerate digital transformation of NHS Wales services (see Digital and Data Strategy for Health and Social Care in Wales (Welsh Government, 2023)), including the formation of the Strategic Artificial Intelligence Advisory Group and the Welsh Government Office for AI (Welsh Government, 2025). Both frameworks encourage the ethical exploration and deployment of Artificial Intelligence (AI) tools in clinical pathways. They also signal a cultural shift toward embedding AI as part of routine service transformation, placing greater emphasis on evidence-based innovation, transparency, sustainability and value for patients.

This project aligns with a range of Welsh national strategies aimed at digital transformation, improved efficiency and better cancer outcomes. The key areas of alignment are summarised in Table 1.

Table 1 : Strategy alignment with MDTM AI (Authors Own)

Policy / Strategy	Alignment with MDTM AI Project
Digital and Data Strategy for Health and Social Care in Wales (2023)	Supports digital maturity, infrastructure and interoperability needed for AI deployment. (Welsh Government, 2023)
Strategic AI Advisory Group and WG Office for AI (2025)	Provides policy leadership and ethical frameworks for the use of AI in clinical care across NHS Wales. (Welsh Government, 2023),
MDT charter (2024)	Sets out standards for effective multidisciplinary team working; MDTM AI supports these by improving information accessibility, reducing administrative burden and enabling timelier, evidence-based decision-making. (NHS Wales Cancer Network, 2024)
Cancer Improvement Plan	Identifies optimising MDTM processes as a priority for improving cancer outcomes; MDTM AI directly supports this through enhanced triage, case prioritisation and efficient meeting management. (NHS Wales Cancer Network, 2023)

A Cancer Research Strategy for Wales (2022)	Encourages embedding innovation and research within clinical workflows; MDTM AI can facilitate research participation by identifying eligible patients and streamlining data capture during MDTM discussions. (HCRW, 2022)
Well-being of Future Generations (Wales) Act (2015)	Encourages long-term thinking, sustainability and prevention; supports equity and improved outcomes. (Welsh Government, 2015)
A Healthier Wales (2018)	Focus on digital integration, innovation and system-wide transformation; supports proactive care. (Welsh Government, 2018)
Value-Based Healthcare for Wales	MDTM AI tools help optimise resource use, reduce waste and enhance outcomes meaningful to patients. (NHS Wales, n.d.)
Ministry Advisory Group (MAG) Report (2025)	Promotes productivity, efficient decision-making and better use of workforce which are core aims of MDTM AI use. (Ministerial Advisory Group, 2025)
Tackling Cancer Initiative (2024)	Identifies AI and innovation as levers to improve cancer care quality and equity. (<i>Cancer: Improving Outcomes in Wales Life Sciences</i> , 2025)

In this policy context, Cancer MDTMs are increasingly recognised as promising methods for clinical innovation, the application of assistive AI for triaging, reduced duplication, streamlined documentation and facilitating clinical trial matching. Despite this pivotal role, little is currently known about the readiness of Welsh cancer MDTMs to adopt AI tools or the perspectives of frontline staff and strategic stakeholders.

1.3 Relevance of AI in MDTM Contexts

AI has demonstrated promising results in several NHS case studies. At Guy's and St Thomas' NHS Foundation Trust an AI-supported MDTM triaging system reduced meeting time by deprioritising routine cases (Khattak et al., 2025). Other applications, including automating radiology/pathology reports or extracting data from electronic records, are growing in maturity. AI in MDTM settings does present implementation challenges, like clinical safety (often termed “*safety-netting*”), transparency, professional autonomy and governance. To succeed, AI must complement team dynamics, ensuring it is technically viable, clinically accepted and ethically governed.

1.4 Research Rationale: A Dual Perspective

This research project was designed in direct response to the evolving demands facing cancer services (MDMT) and its use of AI in Wales. The researcher has a professional interest in innovation and service transformation and holds a professional role within the NHS Wales Cancer Recovery Programme so knows well the operational pressures and strategic goals and upholds a research-informed approach to evaluating digital innovation. This research aims to generate new insights into the practical realities of NHS service delivery using AI-driven MDTs.

1.5 Research Aims and Objectives

This research explores the ethical and effective integration of AI into Welsh cancer MDTMs by evaluating the “*current state*” of readiness within NHS Wales, to understand staff perceptions and identify enablers and barriers to adoption. The specific objectives are to:

- Assess attitudes towards AI among MDTM members and strategy leads
- Identify perceived barriers and opportunities across operational, technical and cultural areas
- Compare perspectives between clinical and policy roles
- Provide practical, evidence-based recommendations for the safe and ethical implementation of AI into Welsh cancer MDTMs.

1.6 About the Researcher

As a Business Change Manager working within the NHS Wales Cancer Recovery Programme, the researcher has access to Health Board Operational Cancer Service Teams and associated governance groups across Wales. Her role allows unique engagement (clinical staff and strategy teams) in a way that supports co-production and authenticity. Ethical approval for this research has been granted by the relevant academic committees.

1.7 Chapter Summary

This introduction has set out the rationale for exploring AI in cancer MDTMs and has highlighted the relevance of AI innovation for timely service provision. The next section will localise these service issues within the broader body of academic and grey literature.

This report follows a structure of this introduction leading to the positioning of the study within the existing published and grey literature. The research methodology is then presented and defended before sensitising the reader to the contingencies of the chosen NHS Wales case study. The data collection, research results and discussion of the findings are then undertaken before the report is concluded.

2 Literature Review

2.1 Introduction

AI are being increasingly integrated into healthcare provision (Ali et al., 2024; Prades et al., 2022). Rising cancer incidences and MDTM workloads should make these technologies promising solutions for enhancing efficiency, supporting decision-making and optimising patient outcomes. This subject is new and few previous studies exist, so the intention of this study is to improve academic understanding and professional practice.

2.2 Definitions Table

Key terms and acronyms used throughout this study are defined in Table 2 to support clarity for academic, clinical and lay readers.

Table 2: Definitions and Acronyms (Authors Own).

Term / Acronym	Definition (with reference)
AI (Artificial Intelligence)	Computer systems that perform tasks requiring human-like intelligence, like recognising patterns or supporting decision-making (Ali et al., 2024).
Algorithm	A set of rules or steps a computer follows to solve a problem or make a decision (Hao et al., 2025).
CDSS (Clinical Decision Support System)	Digital tools that help clinicians make evidence-based care decisions, often by highlighting risks or suggesting options (Martin et al., 2023).
Dol (Diffusion of Innovation)	A theory explaining how new ideas and technologies spread across groups or organisations (Greenhalgh et al., 2017).
EHR (Electronic Health Record)	A digital version of a patient's medical history that can be shared between healthcare providers (Morley et al., 2025).
Explainable AI (XAI)	AI systems are designed so that humans can understand how they make decisions (Wang et al., 2023).
GDPR (General Data Protection Regulation)	EU/UK legislation that governs how organisations collect, use and protect personal data, including patient records (ICO, 2024).
GMC (General Medical Council)	UK regulator that sets professional standards and oversees medical practice (GMC, 2024).
Governance	Systems, policies and rules that ensure healthcare decisions are safe, ethical and accountable (Greenhalgh et al., 2017).
Human-in-the-loop	An AI design approach where human oversight is required for reviewing, validating, or overruling algorithm outputs, ensuring accountability and safety in decision-making (Shneiderman, 2022).
Interoperability	The ability of different IT systems to share and use information effectively across organisations (Ali et al., 2024).
LLM (Large Language Model)	Advanced AI trained on huge amounts of text to generate human-like responses, (Hao et al., 2025).
Machine Learning (ML)	A type of AI where algorithms learn from data to improve predictions over time without being directly programmed (Khanbhai et al., 2024).

MDT (Multidisciplinary Team)	A group of doctors, nurses and specialists from different areas who work together on patient care (NHS Wales Cancer Network, 2024).
MDTM (Multidisciplinary Team Meeting)	Regular meetings where MDTs review patient cases and agree on treatment plans (NHS Wales Cancer Network, 2024).
MDT Charter	National Welsh standards that set rules for how MDTs should function, covering preparation, participation and governance (NHS Wales Cancer Network, 2024).
Medico-legal accountability	The legal and professional responsibility clinicians hold for patient outcomes, even when AI is used (GMC, 2024).
MHRA (Medicines & Healthcare products Regulatory Agency)	UK regulator for medicines, medical devices and digital health tools (Raleigh, 2025).
NASSS Framework	A model describing why digital health technologies are adopted, abandoned, or sustained (Greenhalgh et al., 2017).
NHS AI Lab	A UK initiative supporting the safe, ethical and effective use of AI in healthcare (NHS England, 2025).
NICE (National Institute for Health & Care Excellence)	UK body that develops evidence-based health guidance and standards (NICE, 2024).
NLP (Natural Language Processing)	AI methods that allow computers to understand and process human language, e.g., scanning doctors' notes for details (Ali et al., 2024).
RCT (Randomised Controlled Trial)	A study where participants are randomly assigned to groups to test whether a treatment works (Hariton & Locascio, 2018)
Sociotechnical	An approach that recognises the interdependence between people (social systems) and technology (technical systems), emphasising that successful adoption depends on both working in alignment (Greenhalgh et al., 2017).
SPSS (Statistical Package for the Social Sciences)	Widely used software for statistical analysis of survey and research data (Williams, 2025)
Stakeholder	Any individual or group affected by, or with influence over, AI in healthcare (Greenhalgh et al., 2017).

2.3 AI in Healthcare: Applications, Ethics and Risks

AI technologies, including machine learning (ML), natural language processing (NLP) and clinical decision support systems (CDSS), are increasingly integrated into healthcare to assist in clinical decision making. These tools aim to enhance data extraction, case triaging and decision consistency. Table 3 summarises key AI studies relevant to MDTM contexts, highlighting their applications, findings and methodological maturity, relevance to this research.

Table 3: AI Applications in Cancer MDTMs: Key Studies and Findings (Authors Own).

Study	AI Study	Use Case	Findings		Context
Ali et al., 2024	NLP-based tool	Automated MDTM prep in skin cancer MDTMs	Improved efficiency and case review accuracy	Early phase feasibility study	UK (Wales)
Martin et al., 2023	Watson for Oncology	CDSS for triaging breast cancer cases	92% concordance post-localisation; 40% could be safely triaged	Early phase feasibility study	UK
Khanbhai et al., 2024	Expert System vs ML (Deontics vs Watson)	Breast cancer MDTM decision support	Expert systems achieved 98.8% accuracy vs ML's 78.8%	Comparative study	UK
Hao et al., 2025	Large Language Models (LLMs)	Systematic review in oncology decision-making	LLMs support MDTs but with safety/accuracy limitations	Systematic review	International

Lukac et al., 2023	ChatGPT – which is a LLM (pilot study)	Support for breast cancer MDTM decisions	Reasonable alignment; limited in complex scenarios	Pilot Study	Germany
Hendriks, 2023	Multiple (PhD thesis)	Data-driven decision tools for oncology MDTMs	Emphasised co-creation, structured data use, improved transparency	Academic thesis (case studies)	Netherlands
He, 2024	Structured workflow tools	MDTM preparation /documentation	Proformas reduced time and improved standardisation	Quality improvement study	International
Khattak et al., 2025	AI triaging tool	Prostate Prioritisation in MDTMs	Decreased time and discussion and increased throughput	Implementation case study	UK

Ethical and practical concerns exist around data privacy and the security of patient data. Concerns also exist about algorithmic bias, occurring when models are trained on limited or non-representative datasets, that potentially could result in inequitable care and perpetuating systematic bias within healthcare (Wang et al., 2023). Fears that AI systems lack explainability, functioning as ‘black boxes’ with opaque decision logic, has heightened clinician mistrust given their accountability for the service provided.

To support the safe adoption of explainable AI (XAI) and “*human-in-the-loop*” systems, retention of clinical oversight and the “*final say*” on any treatment decision is recommended (RCR, 2025). Regulatory frameworks, like the General Medical Council (GMC) and Medicines and Healthcare products Regulatory Agency (MHRA), stress the need for transparency, clinical validation and a strong governance process (General Medical Council, 2024), (Raleigh, 2025).

The application of AI for Cancer Services and MDTMs is an ideal context to study how ethical standards, clinician engagement and evidence-based decisions ensure safe and equitable care.

2.4 MDTM Functioning: Decision-Making, Workflow and Accountability

MDTM members are essential in cancer care and include representatives from oncology, radiology, pathology, surgery and nursing to determine the most suitable patient-treatment pathway (Figure 1). The purpose of these meetings is to ensure that clinical decisions are based on evidence, are holistic in approach and prioritise the needs of the patient. Increasing patient volumes and resource constraints are putting significant strain on cancer services including MDTMs (Taylor et al., 2010; Hoinville et al., 2019). In England a survey of over 1,200 MDTM members revealed (Hoinville et al., 2019):

- 72% lacked sufficient time to discuss all cases, especially those needing complex decisions.
- 41% reported frequent absences of key team members, resulting in fragmented perspectives and delayed decisions.

NHS England data shows cancer referrals rose by 157% from 2009 to 2022, further straining MDTM capacity (Department of Health & Social Care, 2025).

The rise in demand reveals MDTM infrastructure issues. The current workflow (see Figure 1), involves referral, data collation, case preparation, discussion and follow-up which relies on MDT coordinators to manually gather and clinical records from unlinked specialist systems. This is labour-intensive process wastes staff time and increases the risk of missing or inconsistent data. Another study found 10% of MDTM cases proceed with incomplete clinical information, affecting the quality and safety of decision-making (Taylor et al., 2010). AI tools have been explored to enhance decision consistency in MDTMs and studies suggest that LLMs could help identify treatment options, summarise case data and generate evidence-informed recommendations (Hao et al., 2025; Lukac et al., 2023). Administrative MDTM inefficiencies have direct implications for patient care, potentially delaying treatment initiation or leading to suboptimal clinical recommendations.

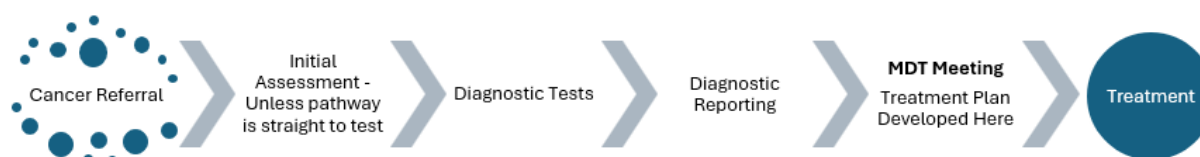


Figure 1 – High Level Cancer Pathway to First Treatment (Authors Own)

Digital tools (including proformas, integrated imaging platforms and automated summaries) have shown promise in addressing some of these issues (He, 2024). Over the last few years AI-enabled systems have been trialled to streamline workflows by automating routine data collation and recommending treatment options. These tools can help triage straightforward cases via protocolised pathways, allowing MDTMs to focus discussion on complex scenarios (Martin, et al., 2023), (Khanbhai et al., 2024). However, automation comes with concerns around clinical accountability. As decision-making becomes partly algorithmic, maintaining clear audit trails and clinician oversight becomes essential to uphold professional and legal responsibilities.

2.5 Barriers and Enablers to Digital Adoption

Despite the promise of healthcare AI and digital technologies, several barriers continue to hinder widespread adoption in MDTM settings. The main challenges are technical limitations, due to the outdated standalone legacy NHS electronic health record (EHR) systems that are unable to talk to each other, resulting in fragmented data, the duplication of efforts and often manual data entry (Morley et al., 2025). This issue is especially problematic in cancer care, where patient information is held across pathology, radiology, and clinical systems.

Cultural resistance is another key barrier, research indicates that many clinicians have concerns about job displacement, reduced autonomy and an overreliance on algorithms that may lack contextual understanding and fail to address patient's needs (Wang et al., 2023), (Giebel et al., 2024). A survey of European oncologists found that trust in AI recommendations is low when explanations of findings are not provided. This emphasises the importance of transparent decision-making logic (Giebel et al., 2024). These concerns are compounded by limited digital literacy in parts of the NHS workforce and a lack of training on emerging technologies. The Non-adoption, Abandonment, and Challenges to Scale-up, Spread and Sustainability (NASSS) framework (2025) highlights how factors like organisational readiness, workflow misalignment and user resistance can derail digital health projects if not proactively managed (Greenhalgh et al., 2017; Shin et al., 2025).

Successful implementation case studies reveal clear enablers including strong clinical leadership, ongoing stakeholder engagement and service co-design with end users have proven critical for uptake (El-Kassas & Abdelkader, 2024). Embedding digital tools into existing clinical pathways, rather than introducing them as parallel systems, aids integration and usability (Ng, 2025) whilst initiatives like the NHS AI Lab (NHS England, 2025) and the NHS Cancer Programme Innovation Open Call Applicant Guidance (SBRI Healthcare, 2023) provide frameworks, funding and technical support to drive such responsible innovation.

These themes are summarised in Table 4 which contrasts key enablers and inhibitors to digital adoption in MDTM settings. This illustrates how technical, organisational and cultural factors interact, emphasising that successful implementation depends not only on technological readiness, but also on clinician engagement and system-level alignment.

Table 4: Thematic Map: Enablers vs. Inhibitors of AI Adoption in MDTMs (Authors Own).

Enablers	Inhibitors
Leadership support	Clinical scepticism
Training and digital literacy	Poor interoperability
User- catered design	Data silos
Clinical workflow integration	Lack of transparency
Interoperable systems	Change fatigue
National policy	Ethical concerns

2.6 Safety Netting in Clinical Decisions

The integration of AI into clinical decision-making introduces both benefits and risks. While AI can aid earlier diagnoses and more consistent treatment recommendations, there is growing concern around over-reliance, diagnostic “complacency”, loss of clinical skills and lack of explainability. These risks have created ‘*safety netting*’ practices, this is where AI generated recommendations are subject to clinician review and validation (Imison, 2019; WHO, 2021). This is especially relevant in high-risk cancer care, where nuanced judgment and patient specific context remain critical.

One proposed solution is the use of fast and frugal decision trees, structured triage models that support safe and efficient workflows without fully replacing human decision-making (McKinney, 2020). To ensure accountability, AI tools provide transparency and explanations for their decisions and regulatory standards increasingly demand validation protocols, traceable audit trails and “*human in the loop*” systems. The “human in the loop” approach is supported by regulatory and professional bodies and involves using AI as a clinical tool rather than replacing clinical expertise (RCR, 2025).

To ensure accountability and transparency, AI systems must also provide audit trails and accessible rationale for their outputs. The NICE Evidence Standards Framework for Digital Health Technologies (2022) outlines essential criteria for clinical validation, including usability testing, real-world evaluation and post-deployment monitoring. The MHRA’s Software and AI as a Medical Device Change Programme (2023) also emphasises the need for explainability and risk stratification.

Embedding safety netting practices into implementation strategies is essential not just for compliance but for building long-term trust among clinicians and patients alike.

2.7 Research Gaps: MDT-Focused AI Evaluation, the Welsh Context and Ethical Considerations

Despite the growing interest in AI within cancer MDTMs, there is a limited number of real-world evaluations, both in terms of their popularity and scope. Existing literature mainly consists of retrospective analyses or early feasibility studies, often lacking robust outcome measures and long-term assessments (Khanbhai et al., 2024; Hendriks et al., 2023), additionally many are conducted in tertiary academic centers or outside the UK, reducing their relevance to NHS Wales settings (see table 3). Notably, there is an evidence gap relevant to the Welsh healthcare context, with only one study interview-based research project conducted in Wales (Ali et al., 2024). Similar studies from England also vary in terms of digital maturity, clinical workflows and workforce readiness across regions, often differing from the larger, better-resourced systems in England.

Ethical considerations in existing studies are underrepresented, as technical and clinical aspects dominate attention, which creates a lack of research on issues like informed patient consent, data governance frameworks and the liability implications related to the use of AI tools in cancer MDTMs and other related contexts.

To advance the field, future research must evaluate AI-supported MDTM tools for various tumour groups and healthcare settings in Wales. This includes assessing AI integration within established cancer MDTM structures in Wales, identifying barriers and facilitators to adoption and understanding how such tools impact team dynamics and patient outcomes, as well as shared decision-making and informed patient consent.

Finally, implementation science approaches need tailoring to the Welsh context that involve co-design with clinicians, patients and digital leads. This ensures clinical validity, local acceptability, sustainability, scalability, health economic evaluations and equity impact assessments to support national investment decisions and guide the ethical use of AI in cancer care.

2.8 Theoretical Frameworks: Innovation Diffusion and Human Factors

Understanding the implementation of AI in healthcare requires a sociotechnical perspective technological and human factors.

The Diffusion of Innovation (DoI) model (Hendriks, 2024) identifies key determinants of adoption, these include perceived advantage, compatibility with existing practices, simplicity of use, trialability and observable outcomes. For AI tools to be embraced in MDTM settings, they must offer clear clinical value, integrate seamlessly with current workflows and be usable with minimal disruption. Early adopters, often

respected clinicians or MDT leads, can significantly influence wider team adoption through advocacy and role modelling.

In addition, Human Factors Theory emphasises the importance of designing technologies that support user needs, cognitive load and team communication (Wang et al., 2023). In MDTMs, critical decisions occur under time pressure. Poor system design, like cluttered interfaces or excessive alerts, can cause frustration and diminished clinical trust. These issues, often referred to as alert fatigue or workflow mismatch, have been shown to reduce the effectiveness of digital tools in real world settings (Greenhalgh et al., 2017). Therefore, successful AI adoption requires a sociotechnical perspective to ensure the technical robustness of tools and their “*fitness for purpose*” in the human, organisational and cultural contexts into which they are deployed.

2.9 Conceptual Framework

Figure 2 provides the conceptual framework of this study and links teamwork, triage, governance and AI effectiveness as optimising enablers for Welsh cancer MDTMs.

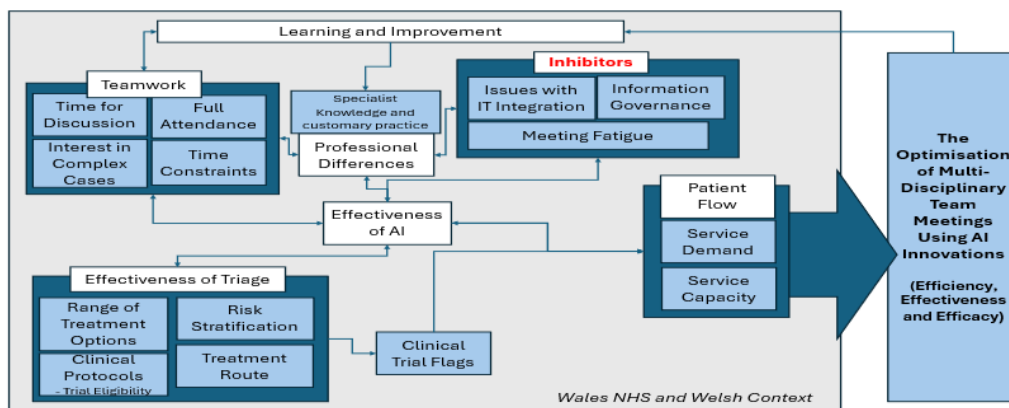


Figure 2: Conceptual Framework of AI Adoption in Welsh MDTs (Authors Own).

2.10 Chapter Summary

This review reveals significant opportunities to enhance MDTM effectiveness for cancer care. However, ethical concerns as well as operational and workforce readiness must be addressed. Lessons from NHS England and international case studies highlight the importance of implementation strategy, clinical co-design and continuous evaluation. Future research should focus on real world impact in varied MDTM settings, especially within Wales. Attention to clinician engagement, interoperability and accountability will be essential to ensuring AI-driven systems support rather than complicate decision making in complex care pathways. A new approach to theory building is needed.

3 Methodological Approach

3.1 Introduction to Methodology

This chapter outlines the methodological approach that underpins this study, it explains and justifies the chosen research philosophy, approach, design and methods chosen to explore the adoption of AI within cancer MDTMs in Wales. Additionally, the chapter addresses ethical safeguards, data analysis and limitations.

3.2 The Research Onion Framework

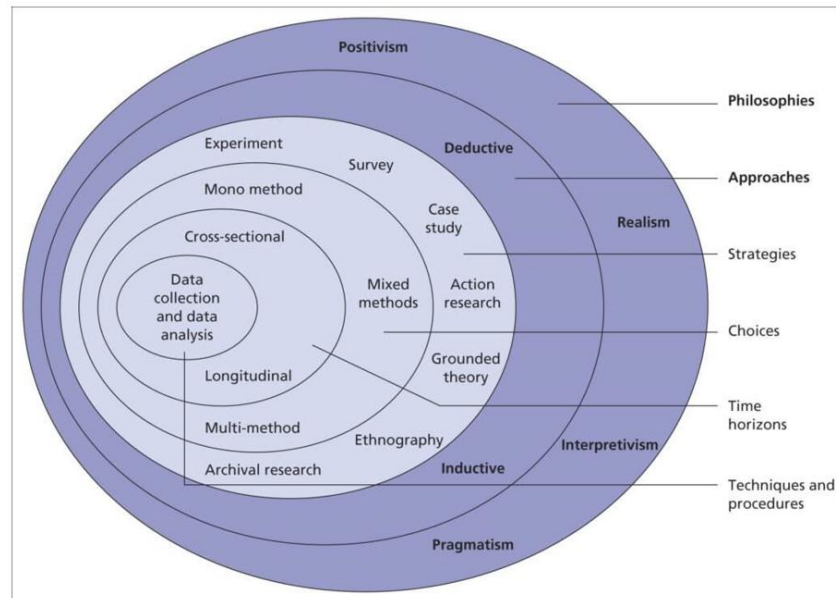


Figure3: The Sanders Research Onion, adapted from Saunders et al.'s (2019).

The methodological decisions in this study were guided by Saunders et al.'s (2019) Research Onion (Figure 3), which provides a structured model for designing research. Each layer of the framework, from philosophy through to data collection and analysis, was systematically applied to this project.

3.3 The Research Onion Framework in Practice

Table 5 outlines the specific "onion layers" selected for this study, along with clear reasoning, relevance and justification. This demonstrates the alignment between philosophical stance, methodological design and practical research execution.

Table 5: Research Onion – Reasoning, Relevance and Justification (Authors Own)

Layer	Selection	Define Reasoning	Explain Relevance	Justify Why Chosen Over Other Options
Philosophy	Pragmatism	Pragmatism emphasises practical consequences and focuses on "what works" in addressing research problems (Saunders et al., 2019).	Suitable for applied healthcare research, as it supports integrating quantitative and qualitative data to generate solutions (Creswell & Plano Clark, 2018).	Preferred over positivism or interpretivism because it provides flexibility to combine methods and address complex, real-world contexts (Feilzer, 2010).
Research Approach	Abductive	Abductive reasoning iterates between theory and data to build the most plausible explanations (Timmermans & Tavory, 2012).	Relevant for AI in MDTs, as it links adoption frameworks and NHS policy with empirical survey and interview findings.	More appropriate than deduction (testing fixed hypotheses) or induction (theory-building only) because it allows flexibility and adaptation to emerging evidence (Saunders et al., 2019).
Research Design	Mixed Methods	Mixed methods combine quantitative and qualitative approaches in a single study (Johnson et al., 2007).	Relevant to capture both measurable trends (survey) and in-depth perspectives (interviews).	Chosen over single-method designs, as triangulation enhances validity and provides a richer, more balanced understanding

				(Creswell & Plano Clark, 2018).
Research Strategy	Case Study	Case studies provide detailed exploration of a bounded context (Warren & Bell, 2022).	Relevant for examining AI adoption within Welsh cancer MDTMs as a single, defined system.	Preferred over experimental or purely survey strategies, as it allows depth and contextual insight while maintaining practical applicability (Stake, 1995).
Time Horizon	Cross-Sectional	A cross-sectional study collects data at a single point in time (Bryman, 2016).	Relevant for capturing current perspectives within a defined three-month period.	Chosen over longitudinal studies due to time/resource constraints, while still providing timely insights into readiness and perceptions (Saunders et al., 2019).
Techniques & Procedures	Data Collection & Analysis	Combined surveys and interviews, analysed using descriptive statistics (SPSS) and thematic coding (Braun & Clarke, 2006).	Relevant for addressing both broad patterns and nuanced insights across clinical and policy stakeholders.	Chosen over single-method data collection, as integrating multiple approaches supports triangulation and aligns with pragmatic philosophy (Creswell & Plano Clark, 2018).

3.4 Data Collection Methods

This study employed three complementary data collection methods: a baseline survey, a main MDTM clinician survey and semi-structured interviews. The baseline survey was part of the case study design, used to establish a contextual understanding of digital maturity and readiness for AI in MDTs. The main survey captured wider perspectives from MDTM clinicians across Wales (see Appendix 5). Semi-structured interviews then provided in-depth insights from strategic/policy stakeholders (see appendix 6). This multi-method approach ensured alignment with the research aims balancing breadth, depth and contextual grounding (Creswell & Plano Clark, 2018). A summary of these methods is presented in Table 6.

Table 6: Summary of Data Collection Methods and Rationale (Authors Own)

Method	Purpose	Target Group	Rationale
Baseline Survey (Case Study)	Establish contextual understanding of digital maturity, system use and readiness for AI.	Key MDTM representatives during the initial case study phase.	Provided baseline evidence to shape subsequent data collection and analysis within the case study.
Main Survey	Capture quantitative data on MDTM members' experiences, perceptions and readiness for AI.	MDTM clinicians across roles, tumour sites and Health Boards in Wales.	Provided breadth of data and measurable trends to address research aims on current practices and attitudes.
Interviews	Gather qualitative insights into barriers, opportunities and strategic considerations for AI adoption.	Strategic and policy stakeholders.	Provided depth and context, allowing exploration of nuanced perspectives beyond survey responses.

3.5 Surveys

Details of both the baseline survey and the main MDTM clinician survey, including distribution and participants, are summarised in Table 7. These surveys together provided both a baseline context for the case study and quantitative breadth across MDTM roles.

Table 7: Survey Overviews (Authors Own)

Aspect	Baseline Survey	Main MDTM Clinician Survey
Timeline	Conducted prior to main study (Dec 2024 – March 2025).	Conducted over 4 week period (e.g. June / July 2025).

Distribution	Via Cancer Managers to MDTM coordinators and leads, as part of the case study scoping.	Circulated via Cancer Network channels and email invitations.
Response Rate	103 responses out of 113 asked (91%)	10 responses out of 30 invited (30%).
Participant Groups	MDT Leads and Coordinators across the Big 5 Cancer Sites in Wales	10 MDTM members across varied roles: oncologists, surgeons, pathologists, radiologists, specialist nurses, MDT coordinators, MDT leads, cancer managers, Macmillan nurses, research radiographer.
Platform	Online survey tool (Teams - Forms).	Online survey tool (e.g., Teams - Forms).

3.6 Interviews

An overview of the interview participants, roles, sampling rationale and groupings is provided in Table 8. The interviews offered qualitative depth, complementing the survey data by exploring nuanced perspectives from strategic stakeholders.

Table 8: Interview Overview (Authors Own)

Interview Group	Roles Included	Sampling Rationale	Sample Size
Strategic Policy Stakeholders	NHS innovation lead, NHS Digital lead, Welsh Government officials, NHS senior managers/executives, NHS clinical leads, research senior managers	Sampling to include individuals with policy, strategic and operational oversight.	12

The data collected aligns with the pragmatic philosophy, combining baseline data, survey responses and interview insights, this has allowed us to gain a deeper understanding and contextual relevance. The baseline survey established readiness for the case study, while the main survey provided quantitative breadth and the interviews offered qualitative depth. Together, these methods align with a mixed methods design and strengthen the triangulation of findings.

3.7 Ethical Considerations

This study was approved by the Swansea University Research Ethics Committee (REC) and conducted in line with institutional and UK General Data Protection Regulation (GDPR) requirements. The baseline questionnaire formed part of the ongoing programme of work within the NHS Wales Cancer Recovery Programme. As this survey was embedded in existing service evaluation, information sheets were not distributed; however, ethical approval was still obtained, and data was anonymised prior to analysis.

All participants for the main survey and interviews were provided with information sheets outlining the study aims, the voluntary nature of participation and their right to withdraw at any point without consequence. For surveys, implied consent was obtained through completion and for interviews, verbal agreement was obtained.

The surveys were completed anonymously, and the interview data were anonymised during transcription and stored securely on encrypted Public Health Wales servers. The process is overseen by their Data Protection Officer (DPO). A summary of safeguards and data management processes is presented in Tables 9 and 10, with full supporting documents in the appendix.

Table 9: Consent and Ethical Safeguards (Authors Own)

Safeguard	Description
Informed Consent	For the baseline questionnaire, no information sheets were distributed as it formed part of the Cancer Recovery Programme's service evaluation, though REC approval was in place. For the main survey, consent was implied through completion; for interviews, consent was given verbally after reviewing information sheets. (See Appendix 1)
Right to Withdraw	Participants could stop the survey or withdraw from interviews at any time without explanation or penalty.
Confidentiality	Data were anonymised at transcription; identifiers removed to protect participant identity.

GDPR Compliance	Data collection and processing adhered to UK GDPR standards, overseen by Swansea University's Data Protection Officer (DPO). (See Appendix 2)
Ethical Approval	Approved by Swansea University Research Ethics Committee (REC). (See Appendix 3)

Table 10: Data Storage, Anonymisation and Retention (Authors Own)

Process	Details
Data Location	Encrypted servers hosted by Public Health Wales, with restricted access to the research team.
Format	Survey responses stored in password-protected files; interview transcripts stored as anonymised Word documents.
Anonymisation & Pseudonymisation	Personal identifiers removed during transcription; any quotations used in reporting were pseudonymised.
Retention Period	Data retained securely for no longer than is necessary in line with Swansea University policy. (See Appendix 4)
Destruction Policy	Data permanently deleted from Public Health Wales servers following the retention period.
Oversight	Swansea University's Data Protection Officer (DPO) monitored GDPR compliance and secure handling of participant data.

3.8 Limitations and Strengths of Methodology

The main methodological limitations of this study, alongside the mitigation strategies applied, reflecting the pragmatic, mixed-methods approach, these are summarised in Table 11.

Table 11: Methodological Limitations and Mitigations (Authors Own)

Limitation	Description	Mitigation Strategy
Scope	Focused on MDTMs in Wales; findings may not fully reflect other settings.	Framed as an in-depth case study to provide transferable lessons (Warren & Bell, 2022)
Timing	Cross-sectional design limited to a three-month data collection period.	Captured a timely snapshot aligned with NHS policy cycles; triangulated with interviews for depth.
Sample Size	Small participant numbers (surveys and interviews) reduced statistical power.	Purposive sampling ensured diversity of roles; qualitative data enriched breadth of insights.
Generalisability	Case study approach limits external validity beyond the immediate setting.	Mixed-methods design strengthened internal validity; findings contextualised against wider literature.
Bias	Risk of non-response and selection bias in survey and interview participation.	Used multiple recruitment channels and snowball sampling to broaden participation (Creswell & Plano Clark, 2018).

While limitations remain, these mitigations strengthened the credibility of the findings within the case study context and alignment with the study's pragmatic philosophy. To balance these challenges, the methodological strengths of the study are summarised in Table 12.

Table 12: Methodological Strengths (Authors Own)

Strength	Description	Contribution to Study
Mixed-Methods Design	Combined quantitative surveys with qualitative interviews.	Enhanced validity through triangulation; balanced breadth with depth of insights (Creswell & Plano Clark, 2018).
Case Study Focus	NHS Wales MDTMs treated as a bounded system.	Allowed rich contextual analysis, directly relevant to policy and practice (Warren & Bell, 2022)
Pragmatic Philoophy	Emphasis on "what works" in applied settings.	Enabled methodological flexibility and focus on actionable findings.

Purposive Sampling	Ensured diverse roles (clinicians, managers, policymakers) were represented.	Increased relevance and applicability across MDTM settings.
Ethical Safeguards	Swansea University REC approval, GDPR compliance, anonymisation and DPO oversight.	Protected participants and reinforced the trustworthiness of findings.

3.9 Chapter Summary

This chapter outlined the study's pragmatic, abductive, mixed-methods design, combining surveys, interviews and a case study strategy. Ethical safeguards and data management processes were detailed alongside limitations and strengths. Triangulation and purposive sampling enhanced validity, while ethical approval and GDPR compliance ensured rigour and trustworthiness throughout the research process.

4 Case Study

4.1 Defining the Client and Context

This case study examines on the cancer MDTMs across NHS Wales, incorporating insights from the NHS Wales National Cancer Team. MDTMs are critical forums where clinical specialists collaboratively agree on diagnosis and treatment plans for patients.

Recent pressures, including pandemic backlogs, rising incidence rates and staffing constraints, have significantly affected MDTM operations. The NHS Wales Cancer Recovery Programme (2022–2025) identifies MDTM reform as a strategic priority, recognising that modernisation is essential to improve efficiency, reduce delays and safeguard clinical quality.

4.2 Service Pressures and Operational Challenges

Across Wales, approximately 19,800 people are diagnosed with cancer annually and most cases are reviewed within one of over 100 tumour-specific MDTMs held weekly. While the MDTM model has improved coordination and quality of care (Taylor et al., 2010), the current system remains labour-intensive and reliant on fragmented, manual workflows.

Surveys and audits consistently highlight inconsistencies in MDTM operations, concerns include inconsistent documentation, limited IT support, poor system integration across diagnostics and repetitive or unstructured discussions (Hoinville et al., 2019; Taylor et al., 2010). Survey data from this study reinforce these findings: MDT coordinators frequently report pressure to manually compile information from siloed systems, like radiology, pathology and clinical notes, under tight deadlines, increasing the risk of delays and omissions.

The Welsh Cancer Network MDT Charter, introduced in 2020, aims to promote consistent and high-quality practice by setting clear standards for structure, participation and governance. It emphasises principles like timely preparation, equitable input and accurate documentation. However, baseline evidence from this study suggests variable awareness and inconsistent uptake of the Charter's recommendations across tumour sites.

4.3 Baseline Survey Overview

To assess digital readiness and MDTM functioning, in early 2025, surveys were disseminated across MDTMs covering five major tumour types, which are breast, colorectal, gynaecology, skin and urology. Over 100 responses were received, representing input from at least one respondent in every Welsh MDT. Survey participants included MDT leads, coordinators and regular clinical attendees, with strong representation across health boards (Figure 4) across health boards (Figure 4).

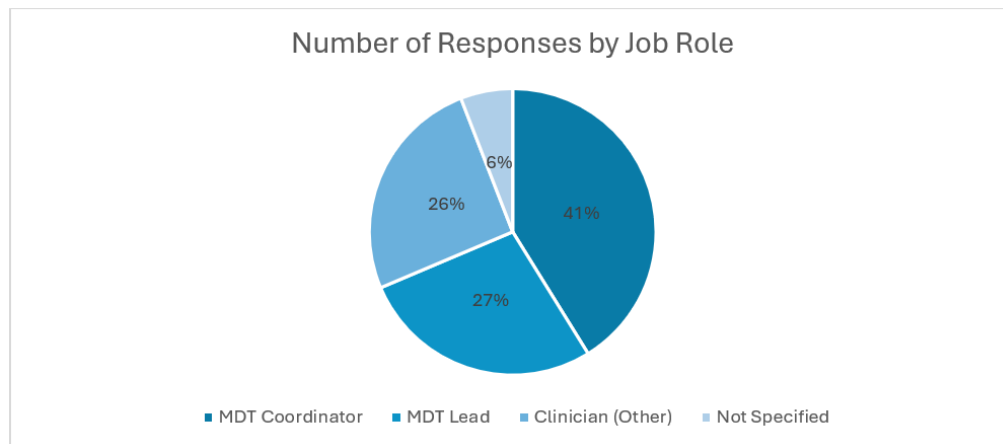


Figure 4: Survey Respondents by Role (Authors Own)

4.4 Key Findings: Function, Pressure and Safety

Across all tumour sites, MDTs are facing significant structural and workload-related challenges:

Table13: Summary of Key Metrics (Authors Own)

Question	Key Metrix	
Average running length of an MDTM	1.89 hours	With 18% report that they overrun by at least an hour
Average number of patients discussed per meeting	27.4 patients	With the Breast MDTM discussing on average 40
Estimated time per patient	4.21 minutes	With the Breast MDTM only spending 3.30 minutes per patient
% feel MDTM has sufficient time to discuss all listed patients thoroughly	71.57%	The 28.43% that did not feel there was sufficient time, mainly coming from the clinical workforce
% reporting patient rollover	78.43%	With one Health Board's Urology MDTM rolling on average 18 patients

These figures indicate a strained system, with nearly half of MDTs reporting insufficient time to thoroughly discuss all listed patients, raising concerns about diagnostic accuracy, shared decision-making and governance.

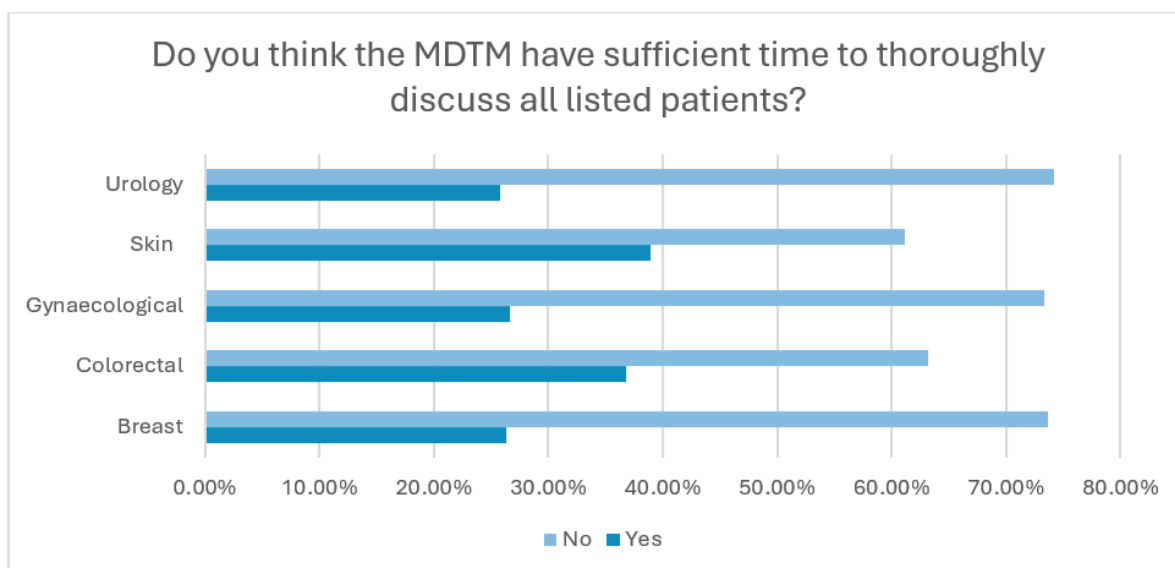


Figure 5: Do you think the MDTM have sufficient time to discuss all listed patients thoroughly? (Authors Own)

This table highlights variation in perceived adequacy of discussion time across tumour groups. While most breast and skin MDTM respondents felt discussions were sufficient, nearly half of urology and colorectal respondents disagreed, reflecting growing pressure in high volume sites.

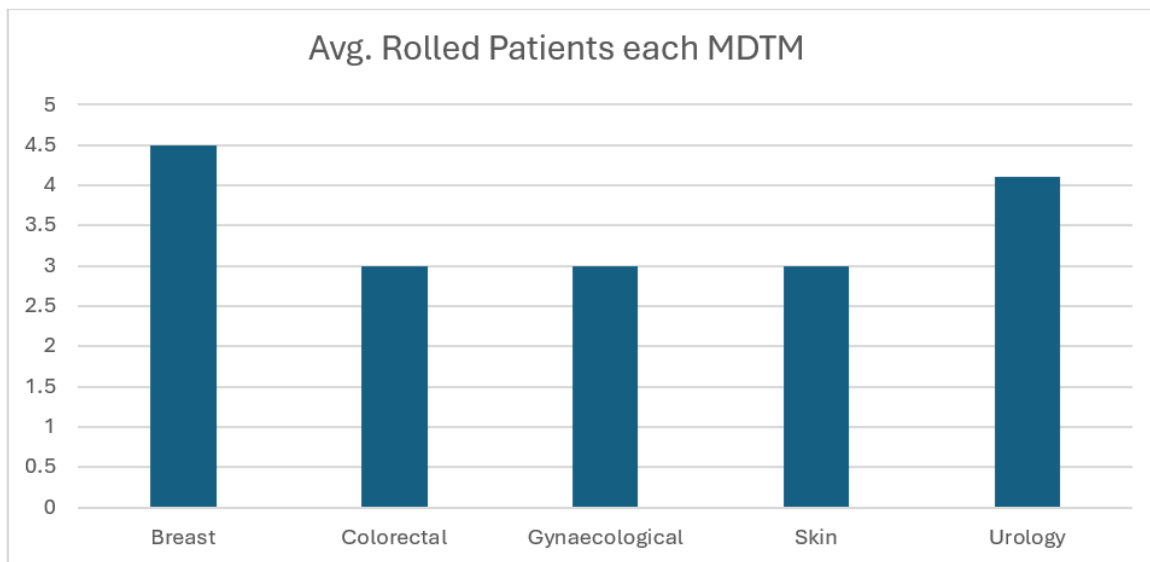


Figure 6: Average Number of Patients Rolled per MDTM (Authors Own)

The graph shows that patient “rollover” is a frequent issue, particularly in breast and urology MDTMs, where over four patients on average are carried forward to future meetings. This raises concerns about clinical delays and continuity of care.

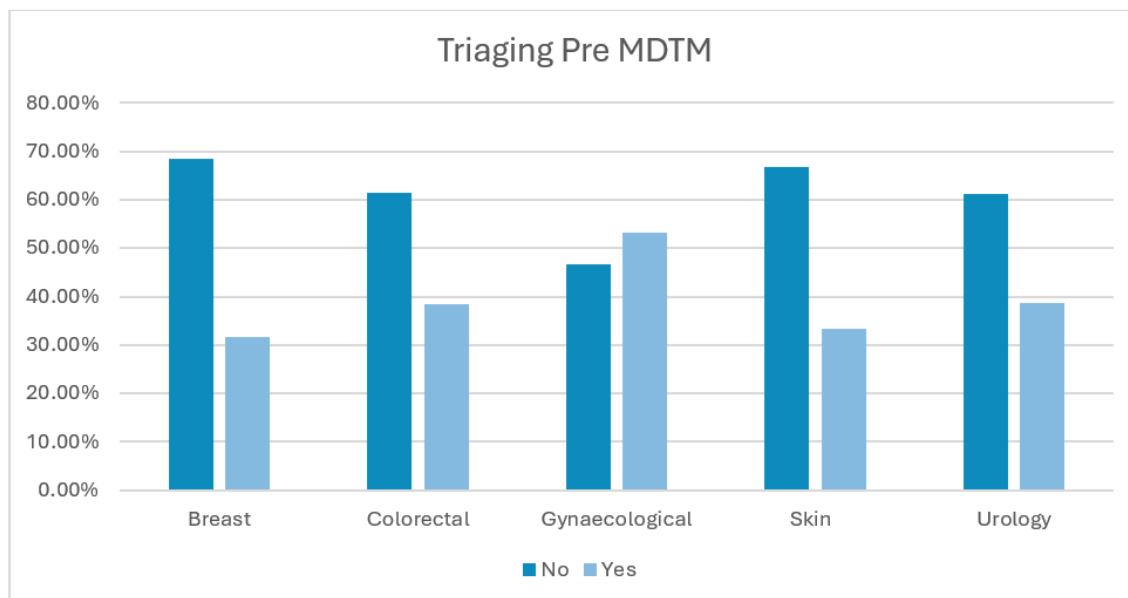


Figure 7: Triaging Pre MDTM (Authors Own)

Just 38.5% of MDTs reported that their patient lists are triaged prior to circulation, meaning unnecessary or inappropriate cases are removed in advance. This lack of pre-meeting triage, particularly common in colorectal and urology MDTs, contributes to inflated caseloads and meeting overruns, reducing time available for complex case discussions.

Qualitative responses also highlighted concerns, including:

- Repetitive discussions for low-risk patients

- Overdependence on key individuals for data preparation
- Delays caused by disconnected diagnostic systems
- Rushed discussions toward the end of meetings

4.5 Barriers to Efficient MDTM Operation

Survey respondents ranked several persistent barriers:

- Incomplete or late clinical information
- Lack of full multidisciplinary representation
- Communication breakdowns
- Poor meeting structure or chairing
- Outdated or non-integrated IT platforms

These barriers contribute directly to reduced decision quality, clinician burnout and treatment delays.

4.6 Awareness and Implementation of the MDT Charter

The Welsh Cancer Network MDT Charter is a national framework, despite this awareness of it remains limited. Only 53% of respondents reported being familiar with the Charter and just 37% indicated that they actively apply its principles and 13.7% "partly" follow it.

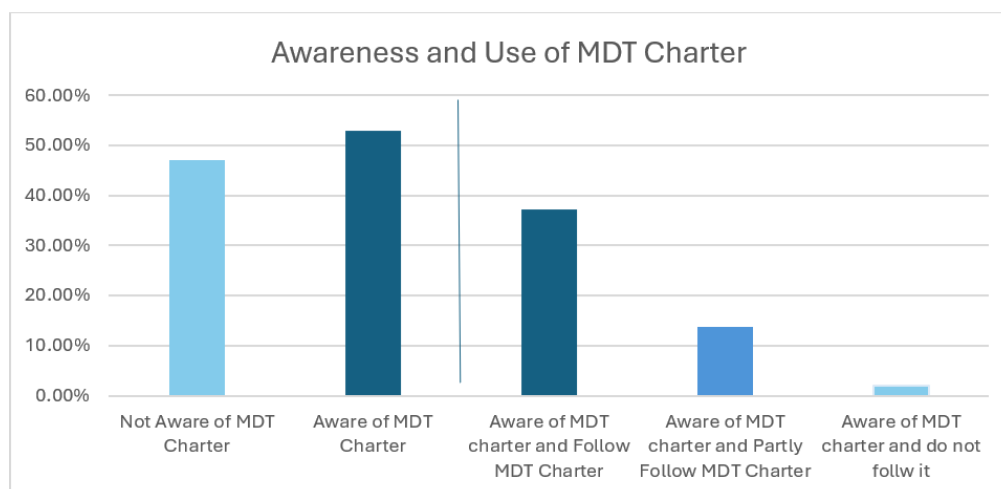


Figure 8: Awareness and Use of MDTM Charter (Authors Own)

This gap between policy and practice highlights challenges in implementing national standards locally. The Charter's emphasis on equality, preparation and continuous improvement presents a clear opportunity to better promote and embed its use within MDTM reform.

4.7 Policy Alignment and Real-World Relevance

The study directly supports several strategic priorities in Wales, including:

Table 14: Policy Alignment and Real-World Relevance (Authors Own)

Policy/strategy	Support
Cancer Recovery Plan (2022–2025):	MDTM reform to reduce delays
Digital and Data Strategy for Health and Social Care (2023):	AI integration
Value-Based Health and Care:	Efficiency, outcomes and resource optimisation
Well-being of Future Generations Act (2015):	Long-term planning and equity

By offering baseline insights across cancer sites, this research helps identify where investment in digital tools, training and governance can make the most impact.

4.8 Chapter Summary

This case study offers a snapshot of MDTM functioning across Wales's five most common cancer types. It reveals high patient loads, compressed meeting schedules and safety concerns arising from overrun meetings and delayed discussions. Although familiarity with national standards like the MDT Charter is limited, there is a strong appetite for reform. These findings highlight a clear real-world need and strategic opportunity for the digital transformation of cancer MDTMs in Wales.

5 Data Collection and Analysis

5.1 Introduction to Analysis and Comparative Perspectives

The previous case study section outlined the operational context, pressures, constraints and strategic drivers influence cancer MDTMs in Wales. Building on from this foundation, this section presents a thematic analysis of qualitative surveys and interviews conducted with two distinct participant groups: frontline MDTM members and strategic/policy stakeholders.

By exploring both perspectives provides a holistic view of AI readiness, highlighting how operational realities and system level ambitions align or diverge. The analysis identifies shared priorities, including trust, governance and workflow improvement, but also revealing differences shaped by the daily clinical experience compared to strategic oversight. These insights offer an in-depth understanding of the barriers, enablers and opportunities for aligning AI adoption with national cancer and digital transformation strategies.

5.2 Overview of Respondents – Quantitative Results

The study engaged 22 participants across two stakeholder groups: 10 frontline MDTM members and 12 strategic and policy stakeholders. MDTM participants represented a variety of roles, including clinical leads, coordinators, pathologists, radiologists, specialist nurses, oncologists, surgeons and research radiologists. They came from different tumour-specific MDTMs across Welsh Health Boards, ensuring a geographically and operationally diverse sample.

MDTM Members Interviewed



Figure 9: MDTM Members Interviewed (Authors Own)

Strategic and policy stakeholders brought expertise from research, digital leadership, innovation, academia, Welsh Government, senior NHS management and clinical leadership roles. This group provided system-level perspectives on governance, strategy and digital transformation. Together, these respondents offered a balanced view of frontline operational realities and strategic ambitions for AI adoption in Welsh cancer MDTMs.

Strategic and Policy Stakeholder

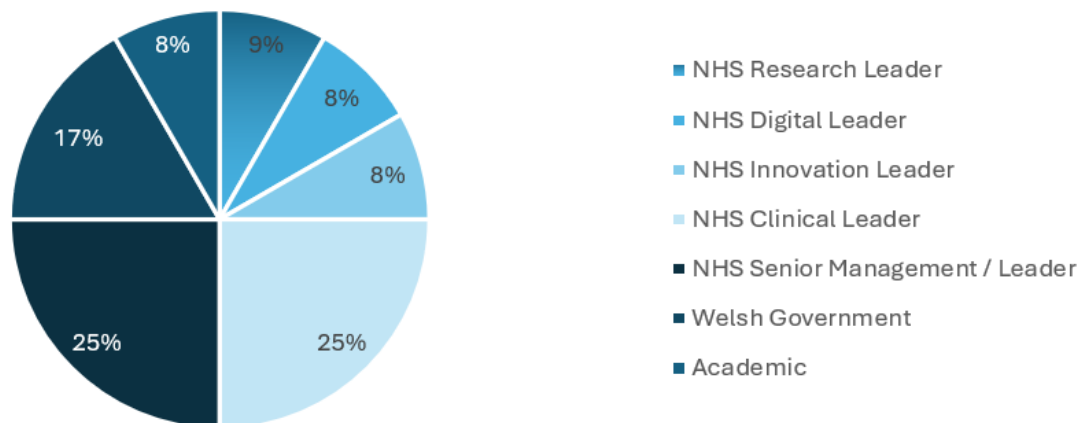


Figure 10: Strategic and Policy Stakeholder (Authors Own)

5.3 Qualitative Results – Clinical Stakeholders

Thematic analysis of interviews with MDTM members revealed a combination of operational challenges, cultural attitudes and practical considerations shaping perceptions of AI adoption. While all participants expressed cautious optimism about AI's potential to improve workflow efficiency, particularly through automating preparation, triage, support with diagnostic imaging and data collation, concerns remained about reliability, governance and medico-legal accountability. Trust emerged as a central theme, with participants agreeing AI must function as a supportive tool and not replace clinical judgment. Additionally, they highlighted ongoing challenges with variation in MDTM practices and a fragmented data system. Time pressures, cultural resistance among some colleagues and uncertainty over responsibility in the event of AI errors further reinforced the need for phased, well governed implementation strategies.

The interview findings from MDTM members are summarised in Table 15, which presents the key themes, their descriptions and illustrative quotes that reflect the range of perspectives on AI readiness, adoption barriers and potential benefits within cancer MDTMs.

Table 15 - Interview Insights from MDTM Stakeholders (Authors Own)

Theme	Description	Illustrative Quote
Trust in AI	Concerns about AI reliability, accuracy and its role in decision-making.	"I'd worry if a machine made the decision without human oversight."
Workflow Efficiency	AI as a potential tool to streamline preparation and triage.	"Even just pulling together the info before the MDTM would be a huge time-saver."
Safety-Netting	Importance of maintaining human oversight and cross-checking AI suggestions.	"There always needs to be a safety net if it gets something wrong."
Data Integration	Frustrations about current fragmentation across systems (radiology, pathology, etc.).	"We're pulling data from four systems manually. It's not safe or efficient."
Cultural Barriers	Some resistance from staff around digital transformation or perceived threats.	"Some of the team are suspicious of anything that sounds too 'techie'."
Training and Support	Desire for hands-on training and clear protocols for using AI.	"We'd need proper guidance and someone to walk us through how it fits with what we do."
Variation in Practice	Recognition that MDTMs vary widely in how they're run.	"Every MDTM does things differently, so a one-size-fits-all tool would be tough."
Perceived Value	Balanced optimism and caution; AI seen as potentially helpful but not mature.	"It's promising, but I haven't seen anything yet that feels ready for real clinical use."

5.4 Qualitative Results – Strategic and Policy Stakeholders

Interviews with strategic and policy stakeholders generated a rich set of perspectives on AI in cancer MDTMs, spanning governance, operational readiness, public trust and integration within national digital strategies. Analysis identified seven overarching themes: AI Potential and Opportunities, Trust and Safety-Netting, Barriers to AI, Strategic Priorities and Considerations, Digital Infrastructure, Public and Patient Trust and Engagement and Governance and Accountability. Each theme contains sub-themes that provide additional detail, reflecting the diverse priorities and perspectives of this group.

Table 16 summarises these main themes alongside their associated sub-themes, providing a framework for the more detailed thematic exploration that follows in the subsequent subsections.

Table 16: Main Themes and Sub-Themes – Strategic and Policy Stakeholders (Authors Own)

Main Theme	Sub-Themes
AI Potential and Opportunities	AI potential in MDTMs; Standardisation and safety; Realistic but cautious; Strategic integration
Trust and Safety-Netting	Clinician trust; Explainability and transparency; Supportive AI role; Public engagement
Barriers to AI	Operational barriers; Technical/infrastructure readiness; Cultural resistance; Ethical and governance uncertainty; Foundational readiness and support structures
Strategic Priorities and Considerations	Diagnostic speed and backlog reduction; Data integration and interoperability; National coordination; AI as an enabler, not a goal; Purpose-driven change
Digital Infrastructure	Pockets of readiness; System fragmentation; Data architecture limitations; Varying awareness
Public and Patient Trust and Engagement	Communication and transparency; Addressing misinformation; Proportional disclosure; Engagement methods
Governance and Accountability	National oversight and governance; Legal and ethical frameworks; Infrastructure for accountability; Safety and assurance processes; Responsibility and risk escalation
National Coordination	Centralised strategy; Shared infrastructure; Accountability and oversight; Learning and evaluation; Strategic scale up

5.5 Theme: AI Potential and Opportunities

Table 17: Strategic and Policy Stakeholder Insights on AI Potential and Opportunities (Authors Own)

Theme	Description	Illustrative Quote
AI Potential in MDTs	Most participants see clear potential for AI to support MDTM efficiency, particularly through automating data summarisation, improving risk stratification and surfacing relevant trial options.	“AI has clear potential to automate data summarisation, standardise case review and Flag trial eligibility”. NHS Innovation Leader
Standardisation & Safety	AI could help reduce variation in decision-making and flag high-risk cases earlier in the pathway, improving patient safety.	“AI could... flag high-risk individuals earlier in their care journey and prioritise urgent referrals.” NHS Clinical Leader
Realistic but Cautious	Some participants supported AI in principle but emphasised that it must remain a supportive tool—not a replacement for clinicians—and should be phased in carefully.	“AI will play a role in all these areas but must be implemented with clinical leadership.” NHS Clinical Leader
Strategic Integration	Several noted that AI’s success depends on integration into broader digital strategy and system-wide planning.	“From my perspective, AI’s success will rely on system-wide readiness and leadership from DHCW or P&I.” NHS Senior Management

As shown in Table 17, stakeholders consistently highlighted the potential of AI to enhance MDTM efficiency, particularly through automating data preparation, standardising documentation and improving case triage. Nine out of twelve participants recognised these opportunities, often linking them to productivity gains and more focused use of clinical time. There were also several cautions raised, the biggest of which was that AI

should remain a supportive tool rather than replace clinicians, with phased implementation seen as essential. Additionally, Welsh Government representatives stressed the importance of scalability and aligning innovation tightly with clinical priorities, warning against “AI as a shiny distraction” and Senior NHS leaders reinforced the need for national coordination and piloting within high-volume pathways to maximise system wide benefit.

5.6 Theme: Trust & Safety-Netting

Table 18: Strategic and Policy Stakeholder Insights on Trust & Safety-Netting (Authors Own)

Sub-Theme	Description	Illustrative Quote
Importance of Clinician Trust	Universally acknowledged as essential for AI adoption; trust must be earned through performance and transparency	“They are absolutely critical. No matter how sophisticated the tool is, if clinicians don’t trust it, it won’t be used.” NHS Innovation Leader
Explainability and transparency	Stakeholders stressed that transparency and interpretability are vital for clinician confidence	“Very important. Clinician confidence and trust will hinge on understanding how AI arrives at a decision.” NHS Digital Leader
Supportive Role of AI	AI should assist, not replace, clinicians to maintain safety and trust	“These are critical. AI should be a supportive tool, not a replacement for clinical expertise.” NHS Clinical Leader
Public Engagement	Several stressed the need for patient/public understanding to ensure safety-netting is inclusive	“Do feel there has to be widespread communication with patients. We underestimate how people respond to technology.” NHS Senior Management

As shown in Table 18, trust and safety-netting emerged as an almost universal priority for stakeholders, with eleven out of twelve participants describing safety-netting as “critical” or “non-negotiable” for successful adoption of AI in MDTMs. Clinician trust was considered a prerequisite rather than an outcome, dependent on performance, transparency and clear accountability structures. The ability to explain the finding from AI was highlighted as key to building trust, emphasising the importance of transparency in decision making processes. Clinical Leaders emphasised that AI should remain a supportive tool, safeguarding autonomy and with human oversight. Welsh Government representatives and NHS Senior Management stressed the importance of wider public confidence and national guidance on safety assurance. A unique perspective suggested that the size of Wales could enable a more centralised and phased approach.

5.7 Theme: Barriers to AI

Table 19: Strategic and Policy Stakeholder Insights on Barriers to AI (Authors Own)

Sub Theme	Description	Illustrative Quote
Operational Barriers	Time and capacity of staff; fragmented or inadequate IT systems	“Time and capacity of staff. Integration with systems is very fragmented.” NHS Clinical Leader
Technical and Infrastructure	Lack of interoperability, outdated systems, insufficient digital readiness	“We do not understand complexity of our systems and don’t have a stable approach.” NHS Digital Leader
Cultural Resistance	Fear of replacement, scepticism toward non-human decision-making	“There is a fear that AI will take jobs away. There is also the mistrust of AI replacing clinical thinking.” NHS Clinical Leader
Ethical & Governance uncertainty	Uncertainty around legal accountability, data privacy and clarity of standards	“The legislation needs to be there and this should be reviewed across countries, not per organisation.” NHS Clinical Leader
Foundational Readiness & Support Structures	Emphasises the need for infrastructure, specialist expertise and organisational assurance before AI can be safely adopted.	“We need the foundations in place first... trusted AI units... Without that, AI feels experimental and risky.” NHS Senior Management

As shown in Table 19, stakeholders identified multiple barriers to AI adoption, with ten of twelve participants citing significant concerns.

The immediate obstacle is operational readiness, including limited staff capacity and fragmented IT systems. Technical challenges like poor interoperability and outdated infrastructure are significant barriers to digital maturity and AI reliability. There is also cultural resistance, particularly among clinical leaders concerned about deskilling and algorithmic mistrust. Ethical and governance uncertainties regarding data protection and legal accountability are also constraints, emphasising the need for clear national standards. NHS Senior Management emphasised the need for foundational readiness and trusted assurance structures before implementation. The NHS Innovation Leader proposed establishing a national “AI Assurance Body” for safe oversight across Wales.

5.8 Theme: Strategic Priorities & Considerations

Table 20: Strategic and Policy Stakeholder Insights on Strategic Priorities & Considerations (Authors Own)

Sub-Theme	Description	Illustrative Quote
Diagnostic Speed & Backlogs	Many emphasised improving diagnosis speed, capacity and waiting times	“Improve speed of diagnosis, prevention, treatment access... reduce inequalities.” NHS Research Leader
Data Integration & Interoperability	Seamless system connection is seen as critical to innovation	“Digital architecture to enable data sharing and intelligent systems for diagnosis.” NHS Digital Leader
National Coordination	Strategic cohesion across Wales was frequently cited as essential	“There has to be improvement in diagnostic, triage and treatment – driven centrally.” NHS Clinical Leader
AI as an Enabler, Not a Goal	Some see AI as a tool within broader transformation, not the main focus.	“It’s about embedding intelligent tools <i>within</i> system change, not just adding them.” Welsh Government
Purpose-Driven Change	Argues for system transformation with purpose, rather than adopting innovation for its own sake.	“It’s about transformation, not just innovation for its own sake.” NHS Senior Management

As shown in Table 20, stakeholders strongly emphasised diagnostic timeliness and national coordination as top priorities, with ten of twelve participants highlighting these issues. Faster diagnosis, greater capacity and reduced backlogs were viewed as central to equity in cancer care. Data integration and flow are essential for AI to be deployed, with the NHS Digital Leader suggesting the need for an interoperable system to support innovation. Many described AI as an enabler, emphasising the need to align adoption with wider system transformation. Welsh Government and NHS Senior Management referred to central dashboards, policy clarity and consistent pathways, whilst academics emphasised the importance of early evaluation. Concerns were also raised about the absence of clear AI health policies, with 50% of participants noting that uncertainty around governance itself constitutes a strategic barrier.

5.9 Theme: Digital Infrastructure

Table 21: Strategic and Policy Stakeholder Insights on Digital Infrastructure (Authors Own)

Sub-Theme	Description	Illustrative Quote
Pockets of Readiness	Some respondents noted areas of progress (e.g. pathology or radiology) but limited consistency	“There are areas of strength... but it’s fragmented and unscalable currently and requires investment.” NHS Innovation Leader
System Fragmentation	Most flagged a lack of integration across platforms and regions	“We understand the complexity of the system and the lack of integration is a major blocker.” NHS Digital Leader
Data Architecture limitations	Lack of core infrastructure (e.g. data flow, standards, platforms) seen as fundamental barrier	“We don’t yet have the data pipelines to support intelligent systems.” Academic
Varying Awareness	Some senior leaders unsure of system maturity or delegated digital readiness to others	“I can’t speak definitively... but I know there’s a lot of variation.” NHS Senior Management

As shown in Table 21, stakeholders described Wales digital infrastructure as fragmented and underprepared, with ten of twelve highlighting readiness as only partial. While some pockets of progress were acknowledged with AI where flagged, like in pathology and radiology, the lack of interoperability across platforms and health boards was considered a major obstacle. The academic and NHS Digital Leader pointed to missing data pipelines and core standards as fundamental barriers to scaling AI, with several stakeholders admitting uncertainty about digital maturity. Welsh Government representatives and NHS Senior Management representatives agreed that although foundational capabilities exist, significant investment and national coordination are still required before AI can be reliably embedded into MDTM workflows.

5.10 Theme: Public / Patient Trust and Engagement

Table 22: Strategic and Policy Stakeholder Insights on Public / Patient Trust & Engagement (Authors Own)

Sub Theme	Description	Illustrative Quote
Communication & Transparency	Broad agreement that public engagement should be proactive, clear and ongoing.	"Engagement must be proactive and ongoing. Clear communication about what AI does and doesn't do, how it protects privacy and its role in supporting not replacing clinicians is vital." NHS Digital Leader
Misinformation & Overpromise	Concerns about unrealistic expectations or misunderstanding among the public.	"Never underestimate the lack of public understanding about new technologies" NHS Innovation Leader
Proportional Disclosure	Some advocated for minimal disclosure, suggesting too much info could alarm the public.	"Communication should be minimal but clear, emphasising benefits rather than mechanisms." NHS Clinical Leader
Engagement Methods	Several suggested formal methods like focus groups, research panels, or citizen juries.	"Through research and public dialogue methods." NHS Research Leader

As shown in Table 22, most stakeholders agreed that proactive public engagement is essential for building trust, with nine out of twelve participants emphasised the importance of transparent communication regarding privacy and safety regarding the role of AI. Welsh Government representatives called for national communication frameworks and investment in digital literacy, while NHS Senior Management highlighted the need for practical and balanced messaging concerning risks.

Not all participants supported detailed patient engagement/co-design of services. Two stakeholders argued that excessive disclosure could confuse and alarm patients and the public, preferring a more minimal, benefit focused approach. Differing opinions emerged, with the innovation leader warning about the potential for public misunderstanding. At the same time, an academic participant claimed that public engagement is unnecessary as long as clinicians remain central to the process: "If there's a human in the loop, it's a tool like any other. We don't need public involvement every time we change systems internally." These differences highlight a consensus on the need for transparency, but significant divisions regarding the extent of engagement, highlighting public trust as a contentious issue in AI adoption.

5.11 Theme: Governance & Accountability

Table 23: Strategic and Policy Stakeholder Insights on Governance & Accountability (Authors Own)

Sub Theme	Description	Illustrative Quote
National Oversight & Governance	Emphasis on the need for centralised or national-level AI assurance, governance and coordination	"We need: national oversight for AI assurance... possibly through a Welsh AI Evaluation Unit." NHS Innovation Leader
Legal and Ethical Frameworks	Importance of legislative and ethical backing to underpin accountability	"The legislation needs to be there and this should be set in statute." NHS Clinical Leader
Infrastructure for Accountability	Systems and teams (e.g., IT governance boards) needed to manage responsibility	"National IT governance teams... need clear pathways of responsibility." NHS Clinical Leader

Safety & Assurance Processes	Patient safety, clinical validation and transparency as critical governance principles	"Patient safety should be the number one factor in how governance is set up." NHS Senior Management
Responsibility and Risk Escalation	Stresses the importance of clearly defined responsibilities and escalation pathways when AI is in use.	"There has to be clarity over responsibility and escalation" NHS Senior Management

As shown in Table 23, governance and accountability were highlighted as non-negotiable foundations for AI adoption, with nine of twelve participants calling for formalised structures. National oversight, including proposals for a national AI Test Bed and Welsh AI Evaluation Unit to coordinate assurance and consistency across health boards, were seen as priority. Clinical leaders and NHS Senior Management emphasised the need to ensure accountability through statutory backing, transparent safety processes and clear escalation pathways. Welsh Government participants reinforced the need for centralised models, suggesting DHCW or NHS Wales National Cancer Team as potential leads. Just under half of participants stressed the inefficiency of duplicating information governance and Data Protection Impact Assessment processes across individual health boards, advocating for national "Once for Wales" frameworks. Overall, participants agreed that without clarity on risk, responsibility and assurance, AI implementation in MDTMs would lack legitimacy and sustainability.

5.12 Theme: National Coordination

Table 24: Strategic and Policy Stakeholder Insights on National Coordination (Authors Own)

Sub Theme	Description	Illustrative Quote
Centralised Strategy	Strong consensus on the need for an all-Wales strategic framework to ensure alignment and efficiency	"We need a national plan so we're not reinventing the wheel in every health board." Welsh Government
Shared Infrastructure	Calls for shared digital tools, platforms and standards across the system	"Interoperability should not be optional – we need shared systems nationally." NHS Digital Leader
Accountability & Oversight	Emphasis on national governance structures to track progress and hold stakeholders accountable	"Who's checking that AI tools or data systems are being implemented well? That's a gap." NHS Senior Management
Learning & Evaluation	Some advocated for Wales-wide evaluation frameworks and shared learning loops	"There should be a common learning framework and evaluation model across regions." Academic
Strategic Scale-Up	Warns against isolated pilots and calls for early planning for national rollout	"There are risks in too many local pilots... we need to think about implementation at scale from the outset." NHS Senior Management

As shown in Table 24, national coordination was described as essential for effective AI adoption, with ten of twelve participants calling for system wide strategies. The NHS Digital Leader and NHS Senior Management emphasised the importance of shared platforms, interoperability and governance as foundations to ensure efficiency and accountability. Welsh Government representatives emphasised the importance of a centralised plan and alignment with broader policy goals. While clinical leaders supported coordination, they cautioned that centralised models must respect local workflows and clinical realities. The Academic emphasised the value of a national "learning health system," embedding evaluation and adaptation across regions. Several participants also warned against fragmented pilots, stressing that early planning for scale up is vital if AI is to deliver consistent, equitable impact across NHS Wales.

5.13 Synthesis of Strategic Stakeholder Perspectives

The analysis of strategic and policy stakeholders' responses presented a coherent yet complex vision for the role of AI in cancer MDTMs. It highlighted strong optimism for its potential alongside concerns about trust, governance, accountability and system readiness. They emphasised the need for national coordination and shared infrastructure, advocating for centralised oversight, interoperable systems, and evaluation frameworks to ensure equitable AI implementation. Challenges like cultural resistance, workforce pressures, lack of national governance, limited funding and low levels of digital maturity complicate the adoption of AI technologies. Engaging the public and patients emerged as essential, but opinions differ on

its significance. Successful integration of AI requires not only technological investment but also a coordinated approach to governance, accountability and cultural change. It is vital to align national strategies, clinical leadership, frontline practices and public engagement.

5.14 Bringing Together Strategic and Clinical Perspectives

When viewed together, the perspectives of strategic stakeholders and MDTM members highlight both alignment and divergence in the readiness for AI adoption. Both groups recognised the potential of AI to streamline Cancer MDTMs by supporting data preparation and risk stratification, as well as improving consistency in MDTM decision-making. However, while strategic leaders emphasised governance, accountability and coordinated infrastructure, the MDTM members focused on immediate operational challenges, including time pressures, fragmented systems and the need for training and trust. Strategic stakeholders see AI adoption as a key element of a broader digital transformation initiative, whilst MDTM members display cautious optimism, influenced by practical realities. These differing perspectives indicate that successful AI integration requires, linking policy ambitions with the everyday experiences of MDTM members, ensuring strategies are rooted in clinical practice. Table 25 summarises this alignment and divergence.

Table 25: Comparison of Strategic Stakeholder and MDTM Member Perspectives on AI in MDTMs (Authors Own)

Area	Strategic Stakeholders	MDTM Members
AI Potential	See AI as an enabler of system-wide efficiency, consistency and innovation.	Optimistic about efficiency gains in preparation, triage and documentation but cautious about maturity.
Governance & Accountability	Emphasise national oversight, legal frameworks and centralised assurance mechanisms.	Concerned about responsibility and medico-legal risk if AI is wrong; want clarity at team level.
Infrastructure & Systems	Call for interoperable, shared platforms across Wales and coordinated investment.	Highlight frustrations with fragmented systems and immediate data integration problems.
Trust & Safety	Stress transparency, explainability and public trust as prerequisites for adoption.	Emphasise need for human oversight, safety-netting and reassurance that AI won't replace clinicians.
Barriers	Identify cultural resistance, workforce pressures and lack of national strategy as key challenges.	Point to heavy workloads, limited capacity and inconsistent MDTM practices as barriers to change.
Implementation Priorities	Advocate national coordination, scalability and alignment with broader digital policy.	Seek practical supports like training, clear protocols and tools adaptable to local MDTM variation.

5.15 Chapter Summary

This chapter explored AI adoption in cancer MDTMs from the strategic stakeholders and frontline MDTM members viewpoints. Strategic Stakeholders highlighted governance, national coordination, infrastructure and public trust as critical enablers, while MDTM members focused on time pressures, system fragmentation, training and the need for human oversight. Both groups recognised AI's potential to streamline MDTMs through efficiencies in data preparation, standardised decision-making and supported risk stratification. Together, the findings suggest that bridging national strategy with local practice will be essential to ensure safe, trusted and effective AI integration.

6 Discussion

6.1 Introduction

This chapter discusses the findings of the study in relation to the research question: *How can AI be ethically and effectively integrated into cancer MDTM in Wales?* The purpose is to interpret the results, highlight points of convergence and divergence with existing literature and consider the implications for clinical practice, governance and policy.

The discussion will cover:

- Integration of findings with literature
- Comparison of perspectives between clinicians and strategic stakeholders
- Theoretical contributions
- Practical implications
- Study limitations

6.2 Integration of Key Findings with Existing Literature

The integration of findings from this study with existing evidence is summarised in Table 26. The table captures four central themes: trust and safety-netting, workflow efficiency and data integration, governance and accountability, situating them against both participant evidence and the wider literature.

Table 26: Integration of Key Findings with Existing Literature (Authors Own)

Theme	Key Finding from This Study	Supporting Evidence (Survey/Interview Data)	Alignment / Contrast with Literature	Implications for Welsh MDTMs
Trust & Safety-Netting	Clinicians stressed AI must support, not replace, decisions; medico-legal accountability is unclear.	Quotes: "I'd worry if a machine made the decision without human oversight." Strategic stakeholders described safety-netting as "non-negotiable."	Aligns with Khattak et al. (2025) and Hao et al. (2025) on "human-in-the-loop." Contrasts with early pilots (Lukac et al., 2023) that underplayed accountability.	Explainable AI and clear escalation protocols are essential. Safety-netting should be built into system design and national guidance.
Workflow Efficiency & Data Integration	AI is seen as valuable for automating preparation, triage and collation across fragmented systems.	Survey: Only 38.5% reported pre-meeting triage; 78% reported patient rollover.	Consistent with Taylor et al. (2010) and He (2024) on inefficiencies. Ali et al. (2024) highlight poor Welsh interoperability.	AI should integrate into MDTM workflows to reduce caseload, not add new tasks. Investment in interoperability is critical.
Governance & Accountability	Strategic stakeholders emphasised national oversight; clinicians wanted clarity at team level.	Quote: "There has to be clarity over responsibility and escalation."	Supports NASSS (Greenhalgh et al., 2017) and NHS AI Lab (2025) on central assurance. Adds nuance by showing dual needs: system-level AND team-level clarity.	Develop "Once for Wales" governance models, while giving MDTMs clear protocols for local accountability.
Barriers	Time, cultural resistance and poor IT infrastructure.	Survey: 28% reported insufficient time for patient discussion; interviews flagged scepticism among staff.	Mirrors Greenhalgh et al. (2017) and Wang et al. (2023) on adoption barriers.	Training, workload relief and trust-building are essential preconditions for AI use.
Enablers	Leadership, training and co-design are valued by both clinical and strategic groups.	Quote: "We'd need proper guidance and someone to walk us through how it fits."	Consistent with El-Kassas & Abdelkader (2024); Ng (2025).	Co-design with MDT leads and clear training programmes will encourage uptake and sustainability.

Clinicians and strategic stakeholders shared the same primary concerns of trust and safety-netting, emphasising the importance that AI act as a supportive tool under clinical oversight rather than replacing clinicians. This approach, known as the "*human-in-the-loop*" method, is consistent with NHS case cited in the literature review (Khattak et al., 2025; Hao et al., 2025). In contrast, some pilot studies have downplayed

medico-legal accountability, regarding who is legally and professionally responsible if an AI-generated recommendation is incorrect (Lukac et al., 2023). Therefore, it's essential to incorporate clear escalation protocols along with explainability of AI results into the adoption strategies for MDTM.

Workflow pressures and fragmented data systems were also a dominant theme; survey results indicated insufficient triage, high rates of patient rollover amongst other inefficiencies, mirroring accounts of inefficiencies in MDTM processes within the existing literature (Taylor et al., 2010; He, 2024). Welsh evidence (Ali et al., 2024) reinforces the importance of interoperability, underscoring the need for AI tools that integrate seamlessly into existing workflows rather than adding parallel processes.

Governance and accountability were seen from two perspectives: strategic leaders emphasised national oversight, while MDTM members wanted clarity of responsibility within meetings. This supports broader frameworks like NASSS (Greenhalgh et al., 2017) and NHS AI Lab guidance (2025), while adding nuance specific to Wales.

Finally, the barriers and enablers identified closely reflect international findings, with strong leadership, training and co-design emphasised as critical to overcoming scepticism and technical limitations (El-Kassas & Abdelkader, 2024). Collectively, these findings confirm much of the existing literature while adding a Wales-specific perspective on interoperability, governance and workforce readiness.

6.3 Alignment and Divergence Between Stakeholder Groups

The perspectives of strategic stakeholders and MDTM members revealed areas of both consensus and divergence (Table 27). Both groups acknowledged the potential of AI to improve MDTM efficiency, particularly through streamlining preparation and triage. In spite of this, strategic stakeholders viewed AI as a system-wide enabler of innovation and productivity, while clinicians expressed cautious optimism and focused mainly on immediate operational pressures.

Table 27: Comparison of Strategic Stakeholder and MDTM Member Perspectives on AI in MDTMs (Authors Own)

Area	Strategic Stakeholders	MDTM Members	Alignment / Divergence
AI Potential	Viewed as an enabler of efficiency, consistency and innovation across the system.	Cautious optimism, mainly focused on preparation, triage and documentation.	Alignment on potential, divergence on scope and maturity.
Governance & Accountability	Emphasised national oversight, legal frameworks and formal assurance.	Concerned about who is responsible within the MDTM if AI is wrong.	Aligned on the need for clarity; diverge on the level (system vs team).
Infrastructure & Systems	Called for interoperable, shared platforms and coordinated investment.	Expressed frustration with fragmented systems and immediate data problems.	Alignment on the barrier, divergence in timescale and framing.
Trust & Safety	Stressed transparency, explainability and public engagement.	Prioritised human oversight and safety-netting during meetings.	Alignment on trust as critical, divergence on emphasis (public vs clinician focus).
Implementation Priorities	Advocated national coordination and policy alignment.	Wanted practical support: training, protocols, adaptability for local variation.	Alignment on the need for change, divergence on how to deliver it.

Governance and accountability were a further area of shared concern. Strategic participants emphasised the importance of national oversight, consistent frameworks and legal clarity, whereas MDTM members highlighted responsibility within the meeting itself, asking who would be accountable if an AI suggestion proved incorrect. This divergence reflects different vantage points: system leaders consider overarching policy frameworks, while clinicians are concerned with day-to-day medico-legal responsibility.

Infrastructure and system fragmentation were identified by both groups as significant barriers. While strategic stakeholders discussed long-term interoperability goals and coordinated

investment, clinicians emphasised the day-to-day frustrations of juggling multiple unlinked systems. Trust was also universally seen as critical, though strategic leaders stressed the importance of explainability and public confidence, while MDTM members emphasised human oversight and safety-netting.

These differences are visually summarised in the Matrix of Perspectives (Figure 11), which maps stakeholders along two dimensions: strategic–clinical and caution–optimism. Strategic leaders cluster towards the more optimistic and system-oriented end, while MDTM members are positioned towards caution and immediate operational concerns. For implementation, this suggests that national frameworks must be balanced with local training, protocols and support to ensure frontline teams can adopt AI safely and effectively.

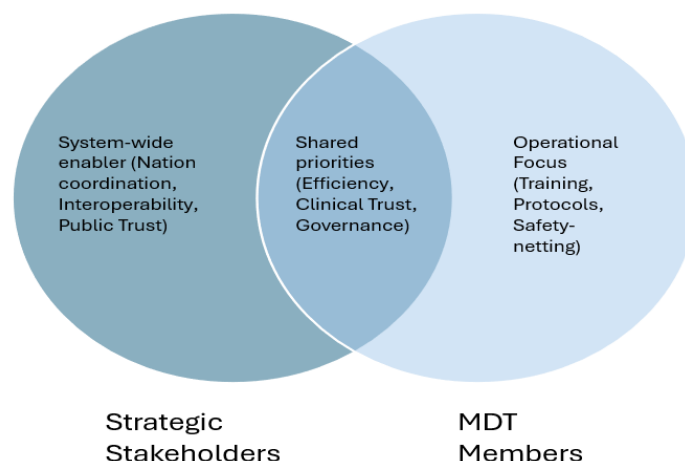


Figure 11 – Alignment and Divergence: Strategic Stakeholders Vs MDT Members (Authors Own)

6.4 Contribution to Theory

This study contributes to theory by extending both DoI and Human Factors perspectives. Within DoI, findings highlight the importance of visible early adopters in MDTs. Clinicians emphasised the need to see trusted colleagues successfully using AI before they would engage themselves, reinforcing Rogers’ notion of observability but applying it specifically to team-based decision-making in cancer care.

From a Human Factors perspective, participants repeatedly stressed that AI must reduce, rather than increase, the cognitive burden of MDTM. Poorly integrated systems risk distraction and duplication, while well designed tools could streamline preparation and triage, freeing clinicians to focus on patient-centred discussion.

Table 28: Contribution to Diffusion of Innovation and Human Factors Theory (Authors Own)

Theory	Traditional Focus	Extension from This Study
Diffusion of Innovation	Adoption influenced by relative advantage, compatibility, complexity, trialability, observability.	Observability is particularly critical in MDTs: visible early adopters (trusted peers) drive team confidence and willingness to engage.
Human Factors	Technology should fit human capabilities and reduce error.	AI design must reduce cognitive burden in MDTs by integrating data, avoiding duplication and supporting—not replacing—human decision-making.

Table 28 summarises how these theories are extended by the study, while Figure 12 presents a conceptual model of AI adoption in Welsh MDTMs, integrating trust, workflow efficiency, governance, training and national policy as mutually reinforcing dimensions.

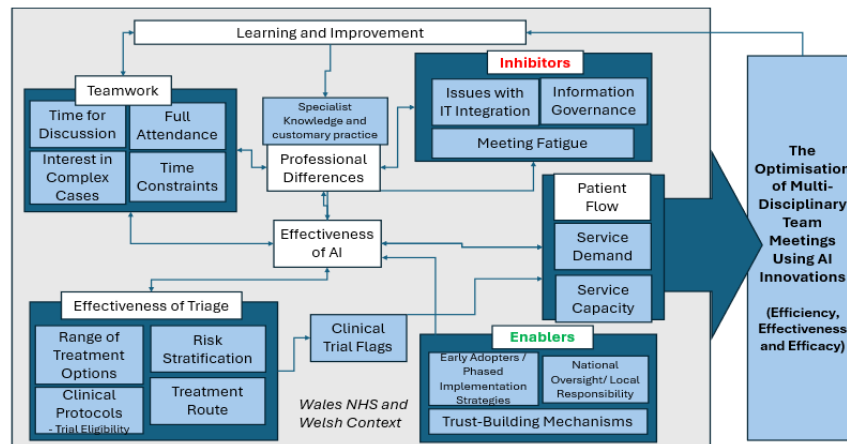


Figure 12: Refined Conceptual Framework of AI Adoption in Welsh MDTs (Authors Own)

The conceptual framework introduced in Chapter 2.9 (Figure 3) outlined how teamwork, triage, governance and AI effectiveness interact to optimise MDTM. The findings of this study refine the framework by emphasising the importance of visible early adopters, the need for AI to reduce rather than increase cognitive burden and the dual-level nature of governance (national oversight alongside local responsibility). These findings suggest that while the framework remains valid, amendments are needed to place a greater emphasis on trust-building mechanisms, interoperability and phased implementation strategies (Figure 12).

6.5 Practical Implications

The findings of this study carry several practical implications for policymakers, MDTM members and patients/public. For NHS Wales, the most important priority needs to be national coordination. Both strategic and clinical stakeholders stressed the need for a centralised approach to AI adoption with NHS Wales, which is supported by an evaluation body capable of reviewing tools for safety, effectiveness and equity before implementation. Additionally, investing in interoperability is crucial; without interconnected data systems, AI could create more complications instead of streamlining processes (NHS AI Lab, 2025).

For MDTM members, the evidence highlights the importance of training, protocols and phased pilots. Participants emphasised that confidence and trust would only develop through hands-on experience and visible early adopters. Pilot projects, co-designed with MDT leads, would provide opportunities for testing workflows while ensuring appropriate safety-netting measures are in place (Greenhalgh et al., 2017).

Effective communication is crucial for both patients and the wider public. Strategic stakeholders emphasised the importance of transparency in securing public trust, while clinicians focused on reassuring patients that AI supports them, not replaces their medical expertise. Public engagement campaigns, alongside clear communication across cancer care pathways, are crucial for success (NICE, 2024).

These implications highlight the need for a dual-level strategy, with national frameworks and investment that run in parallel with local training and protocol development, ensuring that policy ambition is matched by frontline readiness and patient confidence.

Table 29 summarises the practical implications of this study across key stakeholder groups. By linking supporting evidence to concrete actions, priorities and expected impacts, the table highlights how national coordination, local readiness, public trust, governance clarity and technical design must align to enable successful AI adoption (NHS AI Lab, 2025; Greenhalgh et al., 2017).

Table 29: Practical Implications and Recommendations (Authors Own)

Stakeholder Group	Supporting Evidence	Actions Needed	Implementation Priority	Expected Impact
NHS Wales	Strategic stakeholders emphasised "Once for Wales" oversight and	Establish a national AI evaluation body; coordinate frameworks; invest in interoperability.	High – national leadership is essential before local rollouts.	Safe, consistent adoption; reduced duplication; system-wide efficiency.

	the need for linked data platforms.			
MDTs	Survey: 78% reported patient rollover; interviews highlighted limited triage and need for training.	Provide structured training; co-design local protocols; run phased pilots.	High – frontline engagement is a prerequisite for adoption.	Increased confidence; reduced workload; strengthened safety-netting.
Patients & Public	Stakeholders stressed the risk of mistrust if AI is seen as “replacing” clinicians.	Develop communication campaigns; emphasise human oversight; integrate AI into patient information materials.	Medium – builds trust alongside clinical readiness.	Greater acceptance, reassurance of ethical use and enhanced patient experience.
Policy & Governance Bodies	Both groups flagged medico-legal uncertainty; clinicians asked, “Who is accountable if AI is wrong?”	Create clear accountability guidance; align governance with UK regulators (MHRA, NICE).	High – clarity needed to protect both patients and professionals.	Reduced legal ambiguity; stronger clinician trust; smoother adoption.
Technology Developers	Clinicians reported frustration with fragmented IT systems and cognitive overload.	Ensure systems reduce cognitive burden, achieve interoperability and embed explainability.	Medium – co-development critical but dependent on NHS procurement.	Usable, trusted systems that fit MDTM workflow; minimised disruption.

These implications are further illustrated in a SIPOC analysis of MDTD workflows (Figure 13), which maps where AI could add value, particularly at the input and process stages, reinforcing the need for coordinated national frameworks and local readiness.

SIPOC ANALYSIS	Category	Description
	Suppliers (S)	- Referring clinicians - Pathology & radiology departments - Hospital administrative teams - Clinical trial Research Nurses - IT & data teams (EHR systems)
	Inputs (I)	- Patient referrals (suspected/diagnosed cancer cases) – MDT List - Medical history & patient records - Radiology reports (CT, MRI, PET scans) - Pathology results (biopsy, molecular testing) - NHS clinical guidelines & protocols
	Process (P)	Patient referral received Case preparation (collating records, scans, lab results) MDT meeting discussion (reviewing cases, clinical decisions made) Treatment planning (decision recorded, next steps assigned) Communication (decisions sent to referring clinician & patient)
	Outputs (O)	- Multidisciplinary clinical decisions - Agreed treatment plan (surgery, chemo, radiotherapy, etc.) - Referral to clinical trials - Follow-up scheduling - Audit & compliance reporting
	Customers (C)	- Patients & families - Referring clinicians - NHS cancer care teams - Clinical research teams (trial coordinators) - NHS management & policymakers

Source: Author's own adapted from SIPOC ANALYSIS (Crosby & Deiting, 1980)

Figure 13: SIPOC Analysis of Cancer MDTM Workflow with AI Touchpoints (Authors Own)

6.6 Limitations and Future Research

The main limitations of the study, the effects on the findings and opportunities for future research are summarised in Table 30. The small cross-sectional sample limits the generalizability of the results. Future research should aim to include a wider range of stakeholders, evaluate specific AI tools and utilise

longitudinal and economic approaches to strengthen the evidence surrounding the adoption of AI in Cancer MDTM.

Table 30: Study Limitations and Directions for Future Research (Authors Own)

Area	Limitation	Impact on Findings	Future Research Opportunity	Suggested Approach
Sample Size & Scope	Relatively small sample, limited to Welsh MDTs.	Limits generalisability across wider UK or international contexts.	Larger, multi-site studies to capture diverse MDTM settings.	National survey of MDTs; comparative research across devolved nations.
Study Design	Cross-sectional approach.	Provides only a snapshot, missing change over time.	Longitudinal research to track evolving attitudes and adoption.	Mixed-method cohort studies; repeat surveys over multiple years.
Stakeholder Coverage	Focused on clinicians and strategic leaders, with minimal patient/public input.	Risk of overlooking patient trust and acceptability factors.	Greater inclusion of patients and the public in AI adoption research.	Co-design workshops; citizen juries; patient surveys.
Economic Evaluation	Did not assess cost-effectiveness or resource allocation.	Unclear whether AI improves efficiency or creates hidden costs.	Health economics studies on cost-benefit and resource impact.	Cost-effectiveness modelling; pilot studies with economic evaluation.
Technology Focus	Research considered AI in general terms, not specific tools.	Limits the ability to evaluate the practical feasibility of existing systems.	Comparative studies of specific AI applications in MDTs.	Pilot evaluations of industry-developed and in-house AI solutions.

6.7 Chapter Summary

This chapter has interpreted the study's findings in relation to existing literature, highlighting areas of shared similarities and divergence across stakeholder groups. Key Themes include: trust, workflow integration, governance and adoption barriers, with theoretical contributions linked to DoI and Human Factors perspectives. Practical implications were outlined for policymakers, MDTM members and patients/public, supported by tables and models. Limitations were acknowledged and directions for future research were identified.

7 Conclusion

This study set out to explore how AI could be ethically and effectively integrated into cancer MDTMs in NHS Wales. The research addressed four questions: how AI can be adapted for MDTM use, what needs exist, stakeholder perceptions of AI and how it can be used to support decision making. This chapter concludes the dissertation by summarising key findings, outlining theoretical contributions, setting out practical recommendations, acknowledging limitations and highlighting areas for future research.

7.1 Summary of Key Findings

The findings reveal a strong consensus on the importance of human oversight, opportunities for AI to support workflow and tensions in governance. There are also barriers, like IT systems and culture, balanced by enablers like training and co-design. These themes are summarised in Table 31, which highlights the evidence base and implications.

Table 31: Summary of Key Findings (Authors Own)

Theme	Key Finding	Evidence (Survey/Interview)	Implication

Trust & Safety	Human oversight critical; medico-legal concerns.	Quotes, survey caution.	Explainability and clear accountability are needed.
Workflow	AI is seen as useful in preparation and triage.	78% reported rollover; poor triage.	Integration is required to reduce the workload.
Governance	Dual focus: national oversight vs local responsibility.	Strategic vs clinical perspectives.	National + local frameworks essential.
Barriers/Enablers	Barriers: time, culture, IT; Enablers: training, co-design.	Survey + interview evidence.	Leadership and training are key to adoption.

7.2 Contribution to Knowledge

This study contributes to theory by extending DoI and Human Factors perspectives while offering Wales specific insights, emphasising the role of visible early adopters in MDTMs, the importance of reducing cognitive burden and the need for national coordination to address interoperability and governance gaps, as summarised in Table 32.

Table 32: Contribution to Knowledge (Authors Own)

Area	Previous Literature	Contribution of This Study
Diffusion of Innovation	Observability often underexplored.	Highlights role of visible early adopters in MDTMs.
Human Factors	AI should fit human capabilities.	Evidence shows AI must reduce MDTM cognitive burden.
Welsh Context	Limited evidence on AI in MDTs.	Adds empirical insights on interoperability and governance gaps.

7.3 Practical Recommendations

The results from the analysis, backed up by the existing literature, point to practical recommendations for policymakers, MDTM members, patients and regulators. National coordination, interoperability investment, training and clear governance structures are essential. Additionally, robust communication strategies are crucial in building public trust. Table 33 outlines specific recommendations and expected outcomes for each stakeholder group.

Table 33: Practical Recommendations by Stakeholder (Authors Own)

Stakeholder	Recommendation	Expected Outcome
NHS Wales P&I	Establish AI evaluation body; invest in interoperability.	Safe, consistent adoption.
MDTM Members	Training, phased pilots and co-design protocols.	Increased trust and efficiency.
Patients/Public	Communication campaigns on AI role.	Improved acceptance and reassurance.
Policymakers	Clarify medico-legal responsibility.	Reduced ambiguity, higher clinician confidence.

7.4 Limitations and Future Research

This study provides valuable insights, but it has limitations in its scope and design. Any future research should expand coverage, assess long term impacts, include patient perspectives and incorporate economic analysis. Table 34 summarises these limitations and suggests directions for further inquiry.

Table 34: Limitations and Future Research (Authors Own)

Limitation	Impact	Future Research
Small sample	Limited generalisability.	Multi-site national study.
Cross-sectional design	No changes over time.	Longitudinal follow-up.
Patient voices absent	Misses public trust dimension.	Include patient/public involvement.
No cost analysis	Unclear economic impact.	Health economics studies.

7.5 Final Reflections

This study demonstrates that while AI holds considerable promise for enhancing efficiency in Welsh cancer MDTMs, its success will depend on careful attention to trust, governance and workflow integration. By connecting concerns from frontline clinicians with broader strategic viewpoints, the study emphasises the necessity for a dual-level approach: national coordination combined with local preparedness. Although this research has a limited scope, it offers new theoretical insights and practical recommendations that can guide future pilot projects. If ethically applied, AI could streamline MDTMs and improve outcomes. AI could transform cancer MDTMs by reducing the administrative burdens, enabling more focused discussions and supporting better patient outcomes. These findings provide a foundation for NHS Wales to lead the way in cancer care by developing safe, innovative pathways incorporating AI enabled decision support.

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9 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

What are the inhibitors and the enablers of an efficient and effective referral pathway into the Level 2 Weight Management Service: A Welsh Perspective

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Abstract:

Obesity remains a pressing public health challenge in Wales, placing growing demand on weight management services. The Level 2 Weight Management Service (L2 WMS), which provides community interventions, has been hindered by rectifiable systematic inefficiencies and limitations such as high referral failure rates, and administrative shortcomings. This study explores the inhibitors and enablers of an effective referral pathway into L2 WMS, drawing on qualitative interviews with booking staff, service deliverers, referrers, and service leads across NHS Wales. Findings reveal that key enablers include clear patient understanding and expectation management, accessibility, hybrid booking systems, and ongoing promotion of services. On the contrary, insufficient staffing, disengaged patients referred on their behalf, reliance on paper-based systems, and poor service awareness act as major inhibitors. The study highlights the importance of lean management principles including eliminating waste, streamlining referral processes, and prioritising patient engagement to redesign pathways that are both efficient and patient-centred. Recommendations include adopting hybrid digital/non-digital systems, strengthening communication, and co-producing pathway design with patients to ensure sustainable improvements in service delivery.

Keywords: Obesity, Referral pathway, Weight management, Lean management, NHS Wales, Level 2, Self-referral, Service design.

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1 Introduction

1.1 Background And Context

In 2018, the Welsh Government launched their strategy and vision for health and social care, *A Healthier Wales*. This long-term plan looks at managing current and future demands by moving away from hospital-based care and treatment to instead focussing predominantly on well-being and prevention to align more with prudent healthcare philosophies. To help realise *A Healthier Wales*, particularly the prevention and early intervention objectives outlined within, the Welsh Government launched *Healthy Weight: Healthy Wales* in 2019 focussing on targeting obesity through prevention and reduction. This 10-year strategy is made possible by the 2021 *All Wales Weight Management Pathway* which underpins the planning, commissioning and delivery of weight management services for the adult population of Wales, replacing the 2010 *All Wales Obesity Pathway* from which the 4 tiers (levels) (WG, 2021) of intervention were established as per table 1.

Table 1. Adult Weight Management Pathway Levels

Level 1	Community based prevention and early intervention
Level 2	Community and primary care weight management services
Level 3	Specialist multi-disciplinary team weight management services
Level 4	Specialist medical and surgical service

1.2 Level 2 Weight Management provision in Wales

To meet the requirements of the 2021 *All Wales Weight Management Pathway*, the Level 2 service should have multiple components in that there is a diversity of offerings addressing diet, physical activity, and behaviour change. Despite being outlined in 2010, by 2019 only two health boards offered a multicomponent Level 2 service: Aneurin Bevan University Health Board (ABUHB) and Cardiff and Vale University Health Board (C&VUHB). A report reviewing services provided to support individuals manage their weight by Health Boards in Wales was undertaken by Public Health Wales (PHW) in 2019 which found an unacceptable variability in provision of Level 2 services across Wales, with Powys Teaching Health Board (PTHB) only offering weight management services through generic dietetic outpatient appointments, and other health boards offering either only local services or services for adults on particular pathways e.g. orthopaedics (Bird et al., 2021). As of 2025, whilst Swansea Bay University health board do offer a weight management intervention at Level 2 of the All-Wales Weight Management Pathway, it is not multicomponent (SBUHB, n.d.). PTHB (PTHB, n.d.) and Cwm Taf Morgannwg University Health Board (CTMUHB) (LS Hub Wales, 2023) now offer a multi-component Level 2 service, but the remaining health boards still do not.

1.3 Obesity in Wales

For 2022/23, the National Survey for Wales showed that the adult obesity rate was estimated to be 25%, however, analysis by Nesta suggests this has been significantly underestimated due to the self-reporting nature of the survey data and that the true figure is likely 34%, an increase of 2% from the previous year (Bone, 2024). Worryingly, the 2023-24 Child Measurement Programme results show that the proportion of overweight children or with obesity was 13.7% and 11.8% respectively (PHW, 2025) which is cause for concern for future populations as reflected in Public Health Wales's 2050 estimation of the cost of the obesity to NHS Wales of £465m, up from £73m today (WP, 2024).

1.4 Lean Management in referral pathway design

Efficient and patient-centred referral pathways are critical for delivering high-quality healthcare services, particularly in areas such as weight management, where demand continues to grow. In Wales, the Level 2 Weight Management Service (L2 WMS) faces challenges related to administrative complications, inappropriate referrals, and variable patient engagement which highlights the need for systematic improvement. Lean management principles (Womack et al., 1990) originally developed in the manufacturing sector through the Toyota Production System (TPS) (Ohno, 1988) provide a structured framework to address these challenges by focusing on the elimination of waste (muda). Muda is categorised into 7 wastes:

1. Overproduction
2. Waiting
3. Transport
4. Overprocessing
5. Inventory
6. Motion
7. Defects

The TPS goes further, seeking continuous improvement (kaizen) (Imai, 1986) with the goal of ensuring that every step adds value whilst working with limited resources.

1.5 Personal motivation of the researcher

The researcher is the clinical lead for the Level 2 Weight Management Service within Powys Teaching Health Board whose role includes service development and improvement. During his time in the role, the significant percentage of referrals into the service that did not make it to the initial appointment raises concerns around the waste involved and thus raises questions around the effectiveness and efficiency of the referral process. From this, there is an identified need to improve this, especially in response to an increase in demand of weight management services vs capacity and thus increasing waiting times.

1.6 Objectives of the research

- To explore the views, perspectives, and insights of different NHS Wales stakeholder groups to understand what they consider to be inhibitors and enablers of an effective and efficient referral pathway into the Level 2 Weight Management Service in Wales.
- To demonstrate the importance and impact of an improved self-referral form in improving the efficiency and effectiveness of a referral pathway.
- To use the findings of the research to shape future Level 2 Weight Management Service referral pathway design with a lean focus using the philosophy of the Toyota Production System prioritising continuous improvement and eliminating waste.
- To highlight the need for integrating patient views, perspectives, and insights in influencing Level 2 weight management referral pathway design.

1.7 Conclusion and research project expectations

This chapter has set the context for this research by outlining current national strategy in response to a changing society in which service demands are only expected to increase in line with current forecasts. Chapter 2 will explore the research and information presently available, with chapter 3 delving into the research methods. Chapter 4 will present the findings of the qualitative research carried out, and chapter 5 will discuss the relevance and applicability of the findings. This research project will conclude with recommendations for future research including how lean principles can be applied to the L2 WMS referral pathway, outlining a phased approach that balances immediate operational improvements with long-term structural transformation to enhance efficiency, accessibility, and patient engagement.

2 Literature Review

2.1 Introduction

In response to growing demand and an unprecedented strain on the system, it is necessary for NHS Wales to continually strive to innovate, enhance efficiency, and adapt to evolving healthcare needs (Morgan, 2023). Pathway improvement and reducing waste is essential for addressing the significant challenges facing health and care services and for developing more prudent and sustainable services.

2.2 Definitions

Berwick and Hackbarth (2012) broadly define waste in healthcare as "any activity that doesn't add value to patient care." The Bevan Commission expands on this definition, framing waste as anything that fails to deliver value to patients and the wider public, aligning with the principles of Prudent Healthcare. Within the

NHS and social care sectors, waste manifests in numerous forms, shaped by differing practices, interventions, and areas of focus. Some forms of waste are visible and measurable for example, missed appointments, unnecessary or duplicative administrative tasks, and inefficient use of energy and resources. This is expanded further by identifying that inappropriate referrals to services can cause anxiety for patients and take up appointments that could otherwise be used by patients in greater need. Addressing these requires systemic changes, including streamlined processes, better resource allocation, and adoption of proven management strategies such as Lean Management.

2.3 Themes

This literature review will explore current research and findings on the key inhibitors and enablers affecting existing referral pathways within the NHS, identifying and establishing common themes to inform future service improvements and policy development.

2.3.1 Inappropriate referrals

One study acknowledged that many patients referred by their GP into their respective service did not meet the eligibility criteria and so their aim was to prevent unnecessary referrals into their service and improve acceptance rate. They looked to achieve this by adding a bridge point between primary care and secondary care; a 'Hub'. After consultation with their GP a patient may be referred directly to the Hub to be assessed as to whether they are suitable for receiving support from Hub staff. People can also self-refer themselves to the Hub or be referred by other agencies (e.g. referral by the police or a social worker). This is similar to PTHB's weight management services using the 'single point of access' in which GPs can refer weight management patients without the need to specify which service the patient requires using Welsh Clinical Portal, and thus their appropriateness for either Level 2 or Level 3 can be triaged by colleagues from both Level 2 & Level 3 at that point. This study found that the Hub led to 51.72% less assessments per month in their service compared without the Hub (Healey et al., 2021).

NHS Digital advise that clinicians should give feedback to referrers who are referring inappropriately and should consider redirecting patients into more suitable services as necessary, but that in any case the effect of a declined referral on the patient should always be taken into consideration (NHS Digital, 2024).

2.3.2 Incomplete referrals

One study found that 69.3% of GPs believed that they usually included the relevant clinical details in referral letters whereas only 34.8% of consultants said that they received what they were looking for. Despite this, it was recognised that there was space for improved communication to improve the effectiveness of primary care-secondary care referrals, with a recognised need for an increase in feedback between these sectors to improve the quality of referrals (Tobin-Schnittger et al., 2017).

2.3.3 Meeting patient expectations

Patient experience is recognised as an important measure in any referral pathway, not just quantitative measures and outcomes. This includes clear communication at every stage of the patient journey as outlined by Marsh & Proctor (2020) who from 130 patient interviewed identified 'the patient journey must be consistent and clear' as one of the 6 common themes of what matters most to patients. This is supported by the research of Nepal et al. (2020) whose study of 45 patients and 6 focus groups found that patients valued clear and accurate communication around waiting times and any relevant delays in their care as one of their 4 expectations of healthcare.

NHS Digital advises that clinicians should seek feedback from patients on their experiences in the referral process (NHS Digital, 2024).

2.3.4 Ease of referral

Referral processes that have too many steps or lengthy is identified as an inhibitor to an effective referral pathway. This is supported by the report from Wickware (2021) in which pharmacy staff have had negative experiences with a particular referral system that can reportedly take up to 10 minutes to complete and submit a referral resulting in staff averse to making the referral. This administrative burden can create staff dissatisfaction as well as negatively impact patient outcomes.

2.3.5 Failed to respond to booking invite letter

Patients not responding to their invite letter can be one of the most significant wastages in a referral pathway. This may occur for various reasons, such as patients feeling the appointment is no longer necessary or simply forgetting to respond within the required timeframe. Whilst in some cases this may reflect personal choice, evidence suggests factors outside of patient control also play a role. One survey found that one in five patients received their appointment invitation only after the scheduled appointment date, highlighting failures in administrative processes (Cream et al., 2025). Sallis et al. (2019) found that including information in the appointment invite letter pertaining to the benefits to health from attending as well as NHS budgetary information resulted in an improvement in uptake. It may be important to be cautious as to the information included in appointment letters however, as Ewbank et al. (2021) reports that some patients feel that automated warnings about costs of missed appointments lack empathy and thus may erode patient NHS satisfaction.

2.3.6 Self-referral vs healthcare professional referral

Primary care is typically the gateway into secondary care and specialist services (Ibrahim et al., 2025) and so the option of self-referring is seen as a way to improve accessibility whilst also attracting more motivated patients given the need to find the self-referral form and spend their own time completing it (Hoffmann et al., 2019). This autonomy is thought to improve both engagement and outcomes as patients feel ready and confident in their decision to seek support, thus strengthening adherence to any care plans or interventions (Bjarke et al., 2024). Despite the increasing trend towards self-referral access in healthcare services, these pathways are found to increase health inequalities with health literacy, gender, ethnicity, age, and socioeconomic background all identified as factors that influence a patient's likeliness to self-refer rather than use their GP (Harvey-Sullivan et al., 2024).

2.3.7 Quality Of Admin

Administrative processes in the NHS such as phone calls, letters, booking systems, and other communications are the backbone of the delivery of the NHS, however, (Ewbank et al., 2021) identifies that this often falls short of meeting user needs, going on further to identify that high-quality administration can enhance patient experience, reduce health inequalities, support better care delivery. Despite this, it appears to be low on the priority list for policymakers and leaders. Research by Gomez-Cano et al. (2019) found that care administration and care coordination were the strongest predictors of overall patient satisfaction. However, numerous studies and patient reports highlight persistent frustrations: unanswered calls, engaged phone lines, and the time and financial burden of repeatedly trying to contact services (Brookes & Baker, 2017). Some patients expressed dissatisfaction not only with booking and attending appointments but also with follow-up processes such as receiving discharge letters. This lack of quality in administrative processes is seen to damage patient confidence in their overall quality of care (Brunton-Douglas et al., 2023).

2.4 Summary

This review highlights several key factors affecting the efficiency of NHS referral pathways. Inappropriate and incomplete referrals are common, often resulting in failure demand and delays in care. Communication breakdowns between primary and secondary care are common, particularly around the quality of referrals leading to frustration among clinicians and is again failure demand. Patients also report dissatisfaction when communication is unclear or delayed, especially regarding waiting times. Complex and time-consuming referral systems can discourage staff from making referrals whilst poor administrative processes such as unanswered calls and delayed letters undermine patient confidence. Overall, these inhibitors contribute to an avoidable strain on services and highlight the urgent need for more streamlined, user-centred referral pathways.

3 Research Methodology and Design

3.1 Introduction

This study adopts a pragmatist research paradigm valuing the insight and perspective of stakeholders of the Level 2 Weight Management Service with the intention of applying these insights outside of this research to improve referral practices into the Level 2 WMS in Wales.

3.2 Literature Review

The completed literature review used terms, as per table 2, aligned with the research question which in turn lead to more specific searching of terms as themes were identified. Whilst weight management referral pathways are the focus of the research question, the literature review includes research about referral pathways NHS wide due to the applicability of patients from service to service.

Table 2. Literature review – activity and purpose

Activity	Purpose
Literature Search Terms	Referral pathway: patient, weight management, NHS, effective and efficient, inappropriate referrals, incomplete referrals, patients not responding to appointment letters, poor admin, meeting patient expectations
Repositories used	Google Scholar, ScienceDirect,
Search Criteria	Review articles, research articles, and reports, since 2017

3.3 Interviews

Through qualitative semi-structured interviews, this study aims to gather subjective yet practice-informed viewpoints. Semi-structured interviews were chosen as the preferred method of gathering data due to its blend of open-ended questions prepared in advance (Leavy, 2020), as opposed to structured interviews which would restrict the range of data collected.

The interviews consisted of 8 questions in total (*Appendix B*) with scope for additional supporting questions as necessary.

3.4 Participant Selection

The participants for this research were selected via stratified purposive sampling with the inclusion criteria that they have involvement at any stage of the referral process into the Level 2 Weight Management Service. This approach was chosen due to the need for in-depth insights from specific individuals whilst also ensuring diversity in the sample by recruiting participants from various areas of the health board across the banding. It is acknowledged that purposive sampling relies on researcher judgment which can introduce bias into the selection process and is limited to the researcher's connections. To help mitigate this, the researcher looked to incorporate snowball sampling by encouraging existing participants to consider any other potential participants for this research that they feel would be appropriate.

Identified potential interviewees were e-mailed inviting them to partake in the interview with a brief explanation as to what the research entailed, and also why they were selected. In addition, the participant information sheet was attached (appendix a) within the e-mail for a more comprehensive explanation of the research project.

Hennink & Kaiser (2022) state that new themes rarely emerge beyond 12 interviews, and as such, 12 interviews is the desired target in which data saturation is achieved. From this, a total of 12 participants were interviewed consisting of physiotherapists, psychologists, psychology assistants, dietetic assistant practitioners, weight management clinical leads, and administrative staff. This incorporates a wide range of professionals spanning referrers, service providers, service developers, and booking staff, therefore, viewpoints and insights from all stages of the referral process are represented which increases the validity and generalisability of the data collected whilst reducing bias. It is also noted that diversity in the sample is essential should the research be used to influence processes that impact service users (Willis et al., 2021), which is the intended outcome of this research, improving the Level 2 WMS referral pathway.

3.5 Analysis Of Data

The interviews were transcribed using otter.ai from which themes could be identified using an adaptation of Braun & Clarke's (2006) thematic analysis. Themes have not been coded, but the same steps of searching for themes that accurately represent the data and then defining them were taken. The themes were then compared and contrasted against the existing literature to either validate the findings or provide a new perspective, contributing to, or challenging existing literature. Any differences may be explored as to why whilst also highlighting implications for potential future research.

3.6 Ethical Considerations

Research ethical approval for the research study was acquired through Swansea University School of Management Research Ethics Board in July 2025. Interviews were conducted in compliance with the guidelines provided by Research Ethics Board.

4 Findings

4.1 Introduction

The purpose of this chapter is to introduce and explore the findings of this research.

4.2 Interview stakeholder groups

There were 4 different stakeholder groups interviewed with 12 total interviews conducted. The 4 stakeholder groups purposively sampled, and the reasoning is seen in table 3.

Table 3. Stakeholder groups

Stakeholder group	Profession	Reasoning
Booking staff	Service advisor	Involved in the booking of patients into weight management services and thus their experiences of patients entering the referral pathway
	Support assistant	
	Team leader	
Service deliverers	Dietetic assistant practitioner	Delivering the initial consultation appointment and thus their experiences meeting patients as soon as they leave the referral pathway
	Dietetic assistant practitioner	
Referring staff	Physiotherapist	Those making referrals into the service and thus their experiences from a healthcare professional's perspective
	Psychologist	
	Consultant Physiotherapist	
	Consultant Psychologist	
Wales weight management service leads	Cwm Taf Morgannwg University Health Board	Those that can and do oversee and implement changes to their referral pathway
	Hywel Dda University Health Board	
	Betsi Cadwaladr University Health Board	

4.3 Key enablers

The 3 most common themes from each stakeholder group for the first question in the interview in table 4 in order of frequency. These were not all of the key enablers mentioned, but only the most frequent and relevant.

Table 4. What do you consider to be the three key enablers of a successful Level 2 Weight Management Service referral pathway, explaining your reasons for choosing these enablers?

Stakeholder group	Themes	Quotes
Booking staff	Meeting patient expectations/understanding the service	<i>"The patients being fully aware of what to expect, what the service is, why they're being referred."</i> <i>"I think a lot of patients were expecting something from the service that actually the service doesn't offer. So, they were putting in the referral, sitting on the waiting list for however long and then thinking that they were going to get the weight loss injection or something like that out of that service."</i> <i>"That's another question that we get quite a lot from service users, what's involved?"</i>
	Managed waiting times	<i>"When you want to lose weight, you're motivated now, aren't you, you don't want to be waiting X amount of weeks. You set yourself up to go and then we're saying you maybe can't do that now there's a waiting list."</i>
		<i>"With the amount of referrals that we've got on the waiting list, and with only having two clinicians actually carrying out the appointments. You know, the waiting list is not going to come down a great deal."</i>
	Efficient and effective booking system	<i>"Since we've been doing the partial booking, I do feel that's been a lot more beneficial. Before it was contacting every patient which takes a lot of time trying to get through to patients on the phone whereas sending out the partial booking letter, it's putting the ball in their court to contact us for an appointment."</i>
Service deliverers	Meeting patient expectations/understanding the service	<i>"The amount of patients that are referred mostly by GPs that don't even know what the referral is for. A patient will be like I don't know why I'm here, what I'm here for. They don't know what to expect from the referral and what it's about. So yeah, I think communication between the referrer to our service and the patient."</i> <i>"Having suitable information accessible for patients or healthcare professionals to access at their own time, so they can understand what the service offers."</i>
	Effective referral form	<i>"The referral needs to be easily accessible for patients, easy to read, easy to understand, probably not too lengthy, but also paper based, if people would like to do it that way as well. It would be the same for healthcare professionals or GPs. They want it to be nice and smooth, quick, easy, understandable. Don't want lots of lengthy questions. They just want it nice and quick and concise."</i>
	Promotion of the service	<i>"Not everyone has the time to learn about everything new happening. So advertising, I think, can bring that. People are like, oh, this new service, what does it offer? I think advertisement can really help people to understand that we can actually put you into a more specific service for your needs."</i>

Referring staff	Accessibility	<i>"We need to ensure that the services that we deliver have the least resistance to having access to it."</i> <i>"It needs to be something that you don't have to go searching for. It needs to be on the existing systems. It needs to be as straightforward."</i> <i>"Really clear ways on where you can access it whether that be paper form, online form. Really clear questions if it was a self-referral, just to kind of limit any additional queries going back to admin."</i> <i>"I would say the easier you make it. Giving options of how to contact to access the service and so on, in terms of phone calls, email, WhatsApp, numbers, multiple forms of access into the service."</i>
	Meeting patient expectations/understanding the service	<i>"Clear guidelines on what would be accepted from the referral because it limits the amount of time people would have to go back and forth. So, I guess it's limiting the admin burden and time wasting."</i> <i>"The referrers knowing the service so they can talk to patients about it accurately, so you're not then getting inappropriate referrals en masse because the referrers aren't well informed."</i>
	Communication around waiting	<i>"A clear time frame on how long the referral would take, to know how quickly they will be seen."</i>
Wales weight management service leads	Accessibility	<i>"On my phone, if I can tap in and book directly onto whatever service I want to book onto at that time, then that's convenient to me without having to phone up a service to wait to speak to the right person and then they're only open between whatever hours. It's just going to be easier if I can just do it myself."</i> <i>"Able to access the service easily. You don't want any barriers to access if they're having to go through other services."</i> <i>"Accessible to people that they can find it easily, so that by searching, they can find it."</i>
	Meeting patient expectations/understanding the service	<i>"To understand what the offer is and whether that will fit into my lifestyle. If there's a group going on, is it in the evenings when I can attend, or is it going to be only running when I'm supposed to be at work and it's really tricky to get time off, or is there something that I can access that's going to be led by me so I can just log in when I want to do it at my own pace."</i> <i>"People can find information easily and are aware of information about eligibility. Yeah, who is eligible and who isn't? And what is available and what isn't."</i>

		<i>"It is important to make sure that you're providing enough information about the service to manage their expectations because patients referring into a weight management service may assume they're going to go down the pathway of being able to receive weight loss medications, etc, and it's important to make it clear from the outset what is offered in each part of the service."</i>
	Option of selfreferral	<i>"If I'm motivated in that time period, I want to be able to go ahead and refer myself to the services that are available. I don't want to have to think do I need to make an appointment with my GP who then has to refer me to the service?"</i> <i>Being able to being able to refer myself means that I can do it at the time that I want to do it."</i> <i>"Self-referral is useful, because the patient is the expert on themselves and then to be successful, it's making sure that you've got all the information that you need regarding them to be able to triage them properly and match them into the interventions within the service, and also where needed. You know, able to signpost them elsewhere."</i>

4.4 Key inhibitors

The 3 most common themes from each stakeholder group for the second question in the interview in table 5 in order of frequency. These were not all of the key inhibitors mentioned, but only the most frequent and relevant.

Table 5. What do you consider to be the three key inhibitors of a successful Level 2 Weight Management Service referral pathway, explaining your reasons for choosing these enablers?

Stakeholder group	Themes	Quotes
Booking staff	Poor staffing/capacity	<i>"I'd love to have another practitioner doing the level two weight management, with the amount of referrals that we've got, the waiting list is not going to come down a great deal unless we do have somebody else who can offer those appointments."</i> <i>"The team feels a little bit over stretched."</i>
	Lack of face-toface offering	<i>"We seem to have an increase in patients referring into the service who are not English speaking. The language barrier on a virtual video call can sometimes be quite difficult. Also, the older generation who do want a face-toface appointment, or patients with learning difficulties or something like that."</i> <i>"I think the lack of being able to offer face to face appointments puts barriers up for people. Also, learning difficulties and the older generation that actually want to show what's wrong with them rather than talk about what's wrong with them."</i>
	Different/multiple systems	<i>"It's crazy, it's duplication now, it's doubling our work. I think time as well, right? That would impact your resources if you cut down the amount of time you're checking both systems, etc."</i>

Service deliverers	Poor staffing/capacity	<i>"There's just two of us doing our role at the moment having those initial appointments with patients. This is having a big effect on waiting times and you know, a lot can change from referral to initial appointment, so they may not be ready. Things may have changed. They may have then sought out private medication."</i> <i>"Understanding the referral numbers and the reports coming through to then allocate staffing levels appropriately in terms of the data."</i>
	Patients referred on behalf of	<i>"The amount of patients that are referred mostly by GP that don't even know what the referral is for. A patient will be like, I don't know why I'm here, what I'm here for. They don't know what to expect from the referral and what it's about. If they've self-referred, then they're more likely to engage and show commitment."</i>
	Not meeting patient expectations	<i>"They're looking for something that we don't offer. Having the information so that they know exactly what is offered - probably confusion around what the service offers. If it's not clear what we offer or what the level two service offers, people might get confused. Patients wanting one to one, not groups."</i>
Referring staff	Poor service awareness	<i>"I'm aware that when we're referring, you've got to know it's there to start off with and there are so many different services you could refer to, it's very easy</i>
		<i>to forget about something, so making sure it's on the top of someone's mind when someone walks in with a weight management issue."</i> <i>"If you're not advertising what level 2 does then it's putting a real barrier there for people to be able to access it."</i>
	Bureaucracy and bloating	<i>We've got too many people managing these systems, so there is even more chance of error."</i> <i>"If you had multiple people triaging a referral, that wouldn't necessarily be the most efficient use of time and obviously delays the referral being processed. It also creates the opportunity for things to go missing."</i>
	Complicated and lengthy referral forms	<i>"If you have to fill a form in that requires you to go and look for lots of information and it takes you a long time to do that, then that's too many hoops. If there's lots of hoops you've got to go through, then people are unlikely to put the effort in."</i>
Wales weight management service leads	Reliance on paper	<i>"We send our offers out on paper, and people then must phone up to respond and get booked on and then they get a confirmation letter. I just want it on my phone. I just want to drop it into my calendar with the details. And then, I'll remember that I have an appointment in on Tuesday. We can't do away with paper based because we know that some people don't have or can't use technology, but there are hybrid options available."</i>

		<i>"Postal communication is an inhibitor, definitely, and people aren't used to that. They're used to getting something on their phone and being able to access something easily. If they could book online, that would probably improve uptake as they're annoyed because they've tried to phone but they can't get through so we make it really difficult for people when we should be making it easier."</i>
	Patients referred on behalf of	<i>"This idea that the healthcare professional has to make the referral just opens the door to much more of the non-activated patients ending up in the service. We don't want to be putting more work on primary care, because you're conscious of their workload."</i> <i>"We get a lot of referrals from GPs or secondary care requesting medications for patients who aren't eligible, and then we have to reply to them and reject the referral to say, we don't offer them. And then the GP or secondary care come back and say 'Well, can you offer them something else?' So then, so that's a lot of inefficiency. We did wonder whether patients were being referred without knowing they were being referred, because about 50% of patients referred to us never respond. Okay, yeah, so we're processing a huge number of referrals for people who don't engage."</i>
	Digital access only	<i>"We can't exclude the people who are not necessarily digitally enabled, like poorly designed digital things that keeps logging you out and you've got to put in your email address and then verify your identity and click all the squares that have got traffic lights."</i>

4.5 Ensuring key enablers are in place

Participants were asked how they believed that their suggested enablers could be put into practice.

4.5.1 Meeting patient expectations/understanding the service

"It's good education around what the service involves and what the patient can expect with referrers, such as GP practices, gyms, nurse specialists, and when they're self-referring. Including promotion of the service, which has happened on social media. It's also educating on what the service doesn't involve but also making patients aware that there is a waiting list at the moment and what they can do in the meantime. We've got a link that I used to give out when I was booking appointments, Healthy Weight, Healthy You."

4.5.2 Managed waiting times

"I know this is budget dependent, but making sure that the service is adequately resourced which would in turn reduce the waiting list potentially."

4.5.3 Efficient and effective booking system

"I think since the partial booking has gone in place, that has improved things loads. With cancellations I always try my best to fill them, even if it is just with a follow up appointment, to utilise those free appointments as best I can, so that we don't have too many appointments going free if you get what I mean. With the partial booking, it clearly states on the letters that they receive that if we do not hear from them, we will be discharging you. So they are fully aware that that's what the procedure is."

4.5.4 Effective referral form

"That's recently changed, hasn't it, and I think that's been very beneficial to the service, because I think a lot of patients were expecting something from the service that actually the service doesn't offer so they were putting in the referral, sitting on the waiting list for however long, and then at point of contact, then they weren't happy that they'd been sat there for however long, and then me offering them an appointment, and then them thinking that they were going to get the weight loss injection or something like that out of that service. But actually that's not the case. I think it's got more in depth questions and to sort of to rule out a lot of referrals at that beginning process, I think has been very beneficial, so people are more aware of what the service is actually offering them at that first point."

4.5.5 Promotion of the service

"Regular, routine advertising, both using sort of internal advertising systems within the health board, which we have done, and any updates if things are changing in the service. I think it's good for staff and members of the public to be aware of. Make sure you have a routine which we do, advertising system and updates when necessary."

4.5.6 Accessibility

"Health professionals in primary care prefer a single point of access so they don't have to say if a patient wants this, I refer them there. If a patient wants that, I refer them there. They want to just say it's weight management and refer them to this place, right then that's dealt with."

4.5.7 Communication around waiting times

"I know for some services that at the point of referral when we're putting it on the system they get an acknowledgement letter to say we've received it, and then we'll be in touch in due course to offer them an appointment. I don't know whether that would be beneficial for the level two to advise that yes, we've received their referral and we will be in touch in, you know, just give them a rough example of the wait time, just so that they're fully aware."

4.5.8 Self-referral

"We have a self-referral form which patients fill in that have got the necessary information that we need. I think that a triage algorithm would be amazing, but we don't have one. A process that would automatically triage patients to the right programme for them. There'd always be some who needed to be triaged to clinician decision but there would be some people who could be very quickly triaged to the right service for them. That would save a lot of time."

4.6 Ensuring key inhibitors are negated

Participants were asked how they believed that their suggested inhibitors could be put into overcome or minimised.

4.6.1 Poor staffing/capacity

"I suppose it's just making sure that we always have data and reports that we can actually feedback and say like, this is the numbers that we have coming through. This is how many we can actually see, even people who are not attending their appointments, people who are, you know, either can't attend, or DNA'ing. You know, having all that data I think is really important, because it does show within what we're doing, how much we are offering. If the money's not there to have additional staff to cope with the waiting list, then looking at ways in which you can get that list down without putting more pressure and workload on existing staff."

4.6.2 Lack of face-to-face offering

"That's going to be linked in with staffing. I know it's a difficult one because you do struggle to get rooms for the face to face appointments. I think if we're a bit more flexible with our appointments, maybe we could have a clinic day where people actually come in, and better flexibility with working hours. People could even come in for an evening appointment. I know that's a bit sort of out there,

but you do hear about people actually going to see consultants, and they have appointments at seven o'clock at night. So, if they can do it, they must be working that system somehow."

4.6.3 Different/multiple systems

"It's all linked to systems and maybe simplifying the pathway, so, I don't know, maybe amalgamating things. So, I mean, that's the key, isn't it? If you had one system. The first step would be automating the system as much as possible, and that comes down to having systems that talk to each other."

4.6.4 Patients referred on behalf of

"It would probably be feedback to that referrer and just saying, like, 'this is what we're looking for, this is what we offer. This is not what we offer'. Or if you're unsure, ask."

4.6.5 Not meeting patient expectations

"It's making sure that whatever is their source referral, that the information needs to be available to them. I think the most important place to put the information is on the site where they're referring because they need to be able to make the decision there and then, if that's what they want. It's making them aware of what the service actually provides. So it needs to be at the point of referral, doesn't it, or whether there's any way of communicating that via kind of social media as well. Possibly, this is what we offer within our level two or level three."

4.6.6 Poor service awareness

"I think maybe that that would be a key area to look at, where maybe some sessions are held either in GP surgeries or with GPs to explain actually how the service works, and then when the GP knows exactly what it's all about, they're not giving wrong expectations to a patient."

4.6.7 Bureaucracy and bloating

"Doing an evaluation on the service and looking at whether each step is warranted, or is there something that can be made simpler within those steps?"

4.6.8 Complicated and lengthy referral forms

"They don't want something lengthy with lots of boxes to fill in and to tick, boxes to tick. We want it to be concise but also informative enough that people are going into the correct service so people aren't being missed and going into services that might not be suitable as such."

4.6.9 Reliance on paper

"There was this trial a couple of years ago where the appointment letters were being, sent to patients via something like a portal, and then they could click, they could ask for it to be in a letter form, or else, just have it electronically."

4.6.10 Digital only access

"I need to be able to speak to someone if I can't do it myself. I can phone up and say, yep, that one that you're running on Tuesday at nine o'clock. Yeah, go ahead and book me on."

4.7 Powys Teaching Health Board's Level 2 Weight Management Service data

In addition to the main research and findings, data has been collected between April – August 2025 from PTHB's L2 WMS to help contribute to the research question and provide context and justification. This data was gathered by the author of this research project in the workplace.

From April 2024 to March 2025, PTHB's L2 WMS received 520 referrals in which 172 did not make it to the first appointment, broken down in figure 1. This is 33.1%, or 1 in 3 of all referrals.

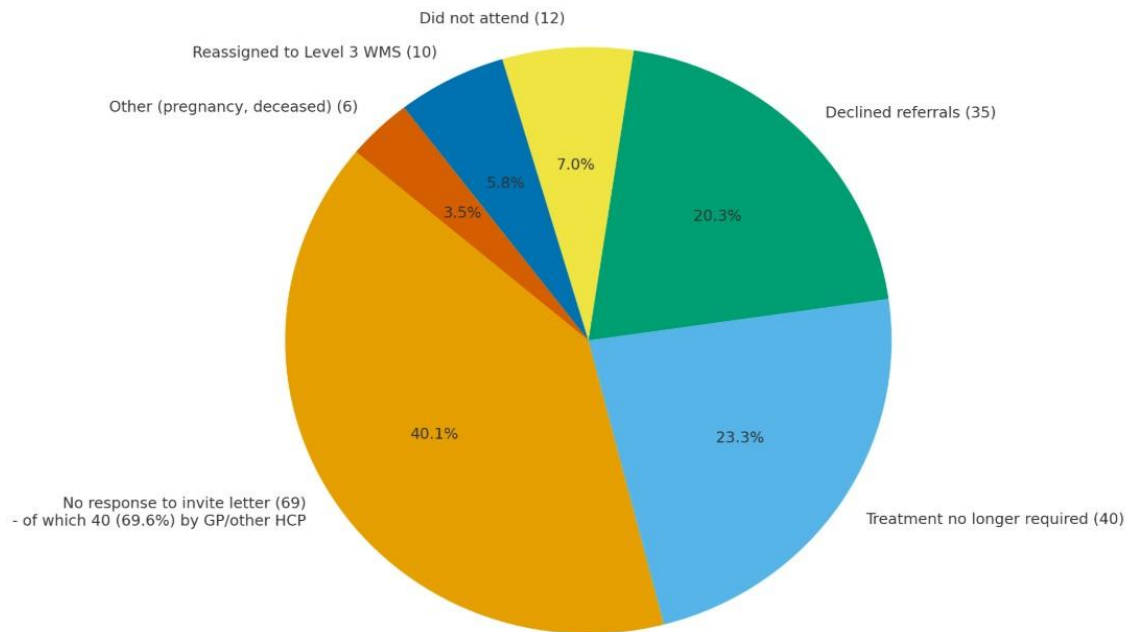


Figure 1. Breakdown of the 172 PTHB L2 WMS patients who did not reach their first appointment (Apr 24 – Mar -25)

Of the 69 referrals that did not respond to their appointment invite letter, 40 (69.6%) were referrals made on the patient's behalf, as opposed to self-referrals.

The high rate of appointments not making it to the first appointment is failure demand and thus considered to be preventable, in turn easing pressures on various stages of the patient pathway right through from the patient seeking weight management support through to triage and the patient being invited to an appointment.

Whilst the exact reasons of the significant appointment failure rate are unclear given that Patient Reported Experience Measures (PREM) data for this is lacking, potential reasons proposed include:

- a changing of motivation or priority in patient's lives across the course of the long waiting period and thus invite letters are ignored
- patients unaware they were referred and were not expecting the appointment invite
- unclear expectations of the service - patients may not understand what the service can or cannot do for them and feel uninspired to accept the appointment
- patients may be unable to attend if sessions clash with work or life responsibilities • patients may in fact never receive their appointment letter through administrative errors
- patients may intend to book the appointment but simply forget.

4.7.1 Change in Powys Teaching Health Board's Level 2 Weight Management Service's self-referral form

In response to the above figures in 2.3.11, PTHB's L2 WMS's self-referral form was improved in March 2025 with the aim of improving the effectiveness and efficiency of the referral pathway. The following changes were made:

- Clearly outlined the programmes available within the L2 WMS at the start of the form
- Clearly outlined that the service does not offer weight management medication, and where to access it
- Clearly outlined that the service is delivered by Dietetic Assistant Practitioners and not Dietitians.
- Deliberately designed to filter inappropriate referrals by asking key eligibility and screening questions so that patients effectively self-triage, informing them of their suitability based on their answers and signposting them elsewhere as necessary

- Integrated pre-questionnaire to improve uptake of PROM data
- Blanket communication with GPs and other referrers to encourage self-referral as the preferred gateway into the service when reasonable and appropriate.

Although data is limited thus far, it is trending in the intended direction, as per table 6, which demonstrates an overall reduction in total referrals and thus total accepted, reducing future waiting lists, but has shown an increase in referral decline rate which has not reduced inappropriate referrals.

Table 6. Year on year referral triage data for PTHB's L2 WMS

24-25	Total Referrals	Declined	Decline rate	Total Accepted
April	27	0	0%	27
May	34	0	0%	34
June	42	0	0%	42
July	44	5	11.36%	39
August	41	4	9.75%	37
25-26	Total Referrals	Declined	Decline rate	Total Accepted
April	41	3	7.32%	38
May	39	6	15.38%	33
June	33	2	6.06%	31
July	36	3	8.33%	33
August	25	0	0%	25

4.7.2 Demand amplification mapping

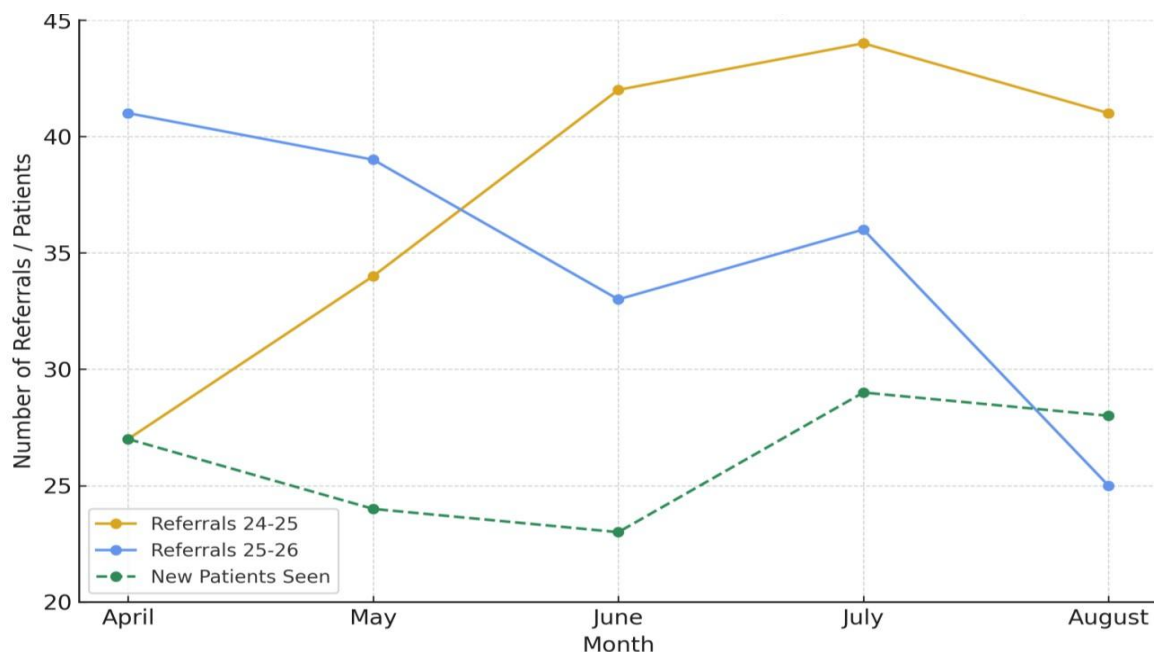


Figure 2. Year on year total incoming referrals vs new patients seen in PTHB's L2 WMS (24-25 vs 25-26)

To help understand the waste of waiting within the L2 WMS as per the TPS, demand amplification mapping from the 7 value stream mapping tools (Hines & Rich, 1997) can be used as per figure 2. Overall, total referrals fell by 14 (-7.4%), however, referrals declined increased by 5 (56%). Given that the total referrals are trending downwards in table 6, it is thought that this is attributed to the delay between communicating

the changes with GP practices and GP practices updating their webpages to the new self-referral form. With now greater clarity around what the service does and does not offer, this may be influencing decision making in accessing the service or signposting to the service. Given the change in the pathway design between years, it is difficult to compare trends in how demand changes month to month. If patterns in monthly demand could be demonstrated, then the service could make adjustments as necessary, such as taking on additional clinics in particular months etc.

At current trends of new patients seen vs total incoming referrals, it is likely that waiting lists will continue to grow as demand outstrips capacity, even despite August's data as this is expected to be an anomaly. Despite this, as previously mentioned, the data does suggest that total incoming referrals are trending downwards.

4.8 Summary

This chapter presents the findings of this research including interviews with four stakeholder groups involved in the L2 WMS referral pathway and data from PTHB. The relevance of these key enablers and inhibitors identified will be explored in the discussion chapter next.

5 Discussion

5.1 Introduction

This chapter will explore how the findings compare and contrast to both the existing literature and the objectives of the research, as well incorporating relevant models.

5.2 Key Findings

The key findings are shown below in table 7:

Table 7. A summary of the key findings

Category	Key Points
Enablers	- Clear patient understanding and expectation management. - Accessible, concise referral forms (including self-referral). - Efficient booking systems with hybrid (digital + paper) access. - Ongoing promotion and awareness of the service. - Managed waiting times with adequate resources and communication.
Inhibitors	- Insufficient staffing and service capacity. - Patients referred without being engaged. - Administrative complexity (lengthy forms, duplicated systems, reliance on paper). - Mismatch between service offer and patient expectations. - Poor service awareness among referrers. - Digital-only access excluding some patients.
Proposed Solutions	- Automate and simplify referral and triage processes. - Maintain hybrid digital/non-digital access. - Use data to guide workforce planning and resources. - Educate patients and referrers on service scope and expectations. - Streamline systems to remove duplication and waste.

5.3 Findings in contrast to the existing literature

The literature review emphasises the quality of incoming referrals and administrative shortcomings such as inappropriate or incomplete referrals, patients not responding to booking letters, and a high proportion of referrals failing to reach the first appointment, shifting the focus of failure onto the referrer or the patient

themselves, rather than the service. Efficiency and effectiveness is identified as a problem of referral quality and administrative process. Studies frequently highlight inappropriate referrals that fail eligibility criteria (Healey et al., 2021), disparity between perceived referral information quality (Tobin-Schnittger et al., 2017), and patient non-responsiveness to appointment letters as a form of wasted resource. Administrative weaknesses such as lengthy referral processes (Wickware, 2021) and poor communication systems (Brookes & Baker, 2017; Brunton-Douglas et al., 2023) are depicted as undermining efficiency and patient satisfaction. The literature suggests that improving the accuracy of referrals and the technical quality of administration would remove much of the failure demand.

In contrast, the findings from this research from interviews with booking staff, service deliverers, referring clinicians, and weight management service leads, point to broader systemic and structural barriers. Some of the most frequently cited inhibitors were insufficient staffing and capacity, lack of face-to-face options for patients who require them, duplication caused by multiple IT systems, and overly bureaucratic processes, including long referral forms or paper-based correspondence. These are issues of resource allocation and service design, rather than simply errors in individual referral decisions. They indicate that even if every referral were appropriate and complete, the pathway would remain constrained by fundamental operational limits.

Furthermore, whilst the literature mentions meeting patient expectations in the context of understanding waiting times and thus a relatively minor factor, stakeholder evidence assigns greater value and importance to it, with it mentioned by every single stakeholder group, sometimes as the theme with the greatest frequency of mention. The findings from the interviews highlight that patients frequently arrive at services unclear about why they were referred, what the service offers, or how long they will have to wait. This confusion is particularly prevalent when patients are referred on their behalf by clinicians, a referral gateway with notably low engagement and attendance rates. Stakeholders consistently emphasised the need for clear service information, promotion and awareness campaigns, and transparent eligibility criteria, enabling both patients and referrers alike to make informed decisions. This reflects a shift from blaming individual “inappropriate referrals” to recognising that poor communication and service visibility drive inappropriate demand in the first place.

Another area of contrast is self-referral. The literature acknowledges its value for improving access but warns of risks to equity, noting that patients with higher health literacy or socioeconomic advantage are more likely to self-refer (Harvey-Sullivan et al., 2024). In practice, however, stakeholders in this study viewed self-referral as an enabler, producing more motivated patients and reducing the administrative inefficiency associated with processing large numbers of referrals for disengaged patients. This suggests that the equity concerns raised in the literature, while valid, may be outweighed by the engagement benefits when self-referral is combined with clear triage processes and multiple routes of access (digital, paper, telephone).

Administrative processes were another area of contrasting difference. The literature identifies poor-quality administration as a generic weakness in the NHS (Ewbank et al., 2021), whereas the findings provide highlight that the reliance on paper letters delays booking whilst digital-only systems exclude less digitally literate patients. Furthermore, admin staff that need to navigate multiple systems can experience duplication and error. Reinforcing the need for multiple routes of access as above, stakeholders advocated for hybrid and flexible systems that allow both digital booking and traditional channels to reduce barriers and improve patient flow.

Overall, the findings challenge the literature’s input-focused narrative. Instead of seeing inefficiency as a matter of “fixing referrers” (to make referrals appropriate, complete, and timely), the research highlights the need to redesign the referral pathway as a whole by improving service capacity, aligning referral routes with patient preferences, simplifying access, and strengthening patient-facing communication from the outset. This perspective moves beyond managing demand at the bottleneck of incoming referrals, to instead creating a system capable of absorbing demand more efficiently and effectively by looking at the wider environment in which the referral pathway sits.

5.4 Findings in relation to the objectives of the research

This research aimed to explore stakeholder perspectives on the Level 2 Weight Management Service referral pathway in NHS Wales, focusing on four objectives: identifying enablers and inhibitors, demonstrating the impact of an improved self-referral form, shaping pathway redesign using lean principles, and highlighting the need to integrate patient perspectives.

Findings show strong alignment with these objectives. Stakeholders not only consistently identified clear enablers but also repeated themes across the stakeholder groups such as managing patient expectations, and accessibility. They also identified clear inhibitors with again repeating themes across the groups including poor staffing capacity, patients referred on behalf of, and administrative difficulties. These insights directly address the first objective by providing a detailed understanding of what supports or hinders pathway effectiveness.

The second objective is also well supported. Stakeholders repeatedly call for a concise, accessible referral form that is clear, quick, and not overly bureaucratic. Some stakeholders noted that the recently improved self-referral form within PTHB already benefits triage and expectation management whilst reducing inappropriate referrals. Self-referral was also explicitly praised as allowing motivated patients to engage at the right time, with suggestions for adding a triage algorithm to streamline matching patients to services. This objective is further supported by the data from section 2.3.12.

The third objective, to guide pathway redesign using lean principles, is reinforced by evidence of waste in current systems such as manual, paper-based processes slowing booking and response times, high nonengagement rates, and patients' expectations either leading to additional queries or using appointment slots only to find out the service doesn't offer what they want. Suggested potential lean improvements included automation of booking and triage to reduce administrative burden, better use of data for staffing and resource planning to minimise bottlenecks, and hybrid communication options (digital + phone + paper) to reduce access barriers without excluding anyone.

Finally, whilst patient voices were not captured directly, the findings indirectly validate this objective by showing that stakeholders believe patient experiences and feelings are at the forefront of the service on offer and as such strongly supports the argument for including patient voices in pathway design via coproduction.

5.5 Conclusion

In summary, the findings strongly meet the research objectives, providing clear evidence to inform a more efficient, patient-centred, and lean referral pathway for Level 2 Weight Management Services in Wales.

6 Conclusions & Recommendations

6.1 Key Findings

The key findings are shown below in table 8.

Table 8. Key findings of the study

Self-referral improves efficiency and engagement	A concise, well-designed referral form filters out unsuitable referrals, attracts motivated patients, and reduces administrative burden
Operational constraints limit effectiveness	Insufficient staffing, duplicated IT systems, and reliance on paper slow down pathways, regardless of referral quality
Hybrid and streamlined processes are essential	Flexible booking methods (digital, paper, phone) and simplified systems ensure equitable access
Managing expectations drives better outcomes	Patients and referrers often misunderstand what the Level 2 Weight Management Service offers, leading to inappropriate referrals, disengagement, and dissatisfaction for staff, patients, and referrers alike. Proactive education, promotion, and transparent eligibility criteria help inform decision making.

6.2 Reflections

This research project highlighted many difficulties associated with qualitative research.

6.2.1 GP recruitment difficulties

Gaining access to respondents was easier than anticipated due to networking and existing connections, however, it was intended to include a greater variety of the 'referring staff' stakeholder group, particularly GPs, however, efforts to recruit GPs into this stakeholder group was unsuccessful despite multiple (6-7) emailed. This was disappointing given their significant role as a gateway into the service, particularly for less digitally enabled patients, and it was thought that perhaps the GP stakeholder group would be interested in helping to shape the Level 2 WMS referral pathway in light of inappropriate or incomplete referrals, however, given workload pressures it is understandable that they could not engage.

6.2.2 Inappropriate answers

Despite attempts to focus participants on referral pathways using a verbal pre-interview context (Appendix C), some responses related more broadly to the service, reducing validity. While variation is expected in qualitative research, the interview technique could be improved to clarify scope without leading participants. Striking this balance is difficult as the pre-interview reading itself may have already introduced bias.

6.2.3 Inhibitors as opposites of enablers

Participants often described inhibitors simply as the reverse of enablers. For example, "meeting patient expectations" was cited as an enabler, followed by "not meeting expectations" as an inhibitor. Later interviews attempted to redirect this repetition, but doing so risked leading participants and reduced consistency across interviews.

6.2.4 Overlapping themes

It was expected that identifying themes would be straightforward as participants were asked to name three enablers and inhibitors. However, answers often contained sub-themes. For example, "meeting patient expectations" frequently overlapped with communication (with referrers, patients, or within the service) and promotion. This revealed the subjectivity of thematic analysis, which relied heavily on the researcher's interpretation and judgment.

6.3 Future Research

For those considering building upon this research, there are a few recommendations identified which would add significant value.

6.3.1 Lack of patient perspective

This research focused entirely on the views and experiences of NHS staff and not patients. This is a significant shortcoming of this research as the views and experiences of patients in designing and shaping the Level 2 WMS referral pathway are just as important if not more important than those of the staff facilitating the service given that they are the ones experiencing the referral pathway. This completely disregards the emphasis towards co-production in the NHS. It would be extremely helpful to understand what they consider to be most important to them, and any negatives or weaknesses they encountered, particularly around their expectations and how satisfied they are by the time they reach their initial appointment. This is particularly pertinent given the shift towards self-referral and their experiences completing the form as well as the period of limbo between self-referring and being seen.

6.3.2 Selection bias and lack of generalisability

Besides the weight management service leads which spanned multiple health boards, the majority of the interviews were conducted on Powys Teaching Health Board colleagues only which limits the generalisability and validity of the findings. It is suggested that the views and experiences of administrative staff, service deliverers, and referring staff from across Wales are captured, and perhaps consideration of any other stakeholders not represented in this research.

6.4 Recommendations

This phased action plan balances short-term fixes with deeper, sustainable transformation. By applying lean management principles such as eliminating waste, streamlining flow, standardising processes, and fostering a culture of continuous improvement, the L2 WMS referral pathway can become more efficient, patient-

centred, and resilient. Such a redesign not only enhances service quality and access but also ensures that scarce NHS resources are used optimally to meet growing demand.

6.4.1 Short-term (0-6 months)

These short-term priorities have been highlighted due to being considered relatively easy and quick to implement whilst being low-cost. 0-6 months is selected because whilst these could be implemented quickly in practice, bureaucracy may stifle implementation, with meetings regarding changes being held and various departments liaised with in order to action them. This applies to medium and long-term also.

Firstly, there should be a focus on eliminating communication gaps and administrative inefficiencies that act as immediate sources of waste, or muda. Priority should be given to ensure that patients and referrers alike clearly understand what the service does and does not offer. GPs should receive regular updates distributed potentially via e-mail or otherwise, as well as potentially identifying a list of regular referrers to include them in the mailing list. For patients, clear information should be accessible via the service's webpage, social media channels, and also working with GP practices to advertise on site in waiting areas etc. Whilst this may increase uptake through awareness, it is an opportunity to improve understanding of the service. Furthermore, self-referral should be promoted as the preferred route where appropriate to improve engagement and validity, and timely feedback to referrers should be actioned when referrals are declined which will help improve the quality of non-self-referrals.

6.4.2 Medium-term (6-18 months)

These actions are considered medium-term as they are considered to require and involve more planning and coordination that will call upon new systems and technologies.

In the medium term, greater systemic integration and pathway redesign are required. Referral and booking processes should be automated where possible, with AI used in triage to make decisions on referrals and document effortlessly to reduce administrative burden on staff, with human auditing as necessary. Administrative reliability must also be addressed by ensuring booking letters, calls, and emails are delivered promptly and by using confirmation messages such as SMS reminders to reduce missed appointments. To avoid excluding patients who lack digital access or skills, hybrid access methods must be maintained, allowing patients to book or confirm appointments online, by phone, or on paper. Referral and attendance data should be analysed regularly to identify demand trends and inform workforce planning, enabling resources to be allocated more effectively.

6.4.3 Long-term (18-36 months)

The long-term priorities are selected due to their requirement for cultural adaptation and large-scale overhauls which are expected to take years to fully implement and demonstrate the impact of.

In the longer term, service transformation will require investment and cultural change. Continuous improvement, or kaizen, must be cultivated through regular service evaluation and structured feedback loops involving both staff and patients, ensuring the pathway evolves in response to changing demand and a changing environment. Duplicate administrative tasks must be reduced by amalgamating IT systems, and the workforce should be expanded with appointment flexibility in mind by offering evening appointments and greater choice around face-to-face sessions to expand accessibility. Co-production with patients should be embedded, with advisory groups consulted to test pathway changes and ensure services reflect real patient needs and preferences. As part of capturing PREMs to understand patient experiences within the referral pathway, it is recommended that Level 2 weight management services across Wales begin collecting data on why patients do not make it to their first appointment whether that be not attending their appointment, not responding to their invite letter, advising treatment no longer required, or otherwise. It is recommended that this data is shared nationally to inform future Level 2 pathway development across Wales.

6.5 Conclusion

Improving referral pathways into the Level 2 Weight Management Service (L2 WMS) is essential to meeting rising demand and reducing avoidable strain on NHS Wales. This research has provided valuable insights into staff perspectives on the Level 2 Weight Management Service (L2 WMS) referral pathway, revealing both practical challenges and methodological limitations. Whilst existing literature often attributes inefficiencies to inappropriate or incomplete referrals, stakeholder perspectives in this study point to deeper systemic barriers, including limited staffing capacity, duplicated IT systems, reliance on paper-based

communication, and mismatches between service offers and patient expectations. At the same time, clear communication, concise and accessible self-referral processes, hybrid booking systems, and active promotion emerged as critical enablers of improvement.

By applying lean management principles, referral pathways can be redesigned to reduce waste, streamline processes, and strengthen patient engagement. This research therefore shifts the focus from “fixing referrals” to rethinking the system itself, highlighting the need for holistic, patient-centred redesign, and given that the limitations of this research include difficulties engaging GPs, scope restricted largely to PTHB, and the absence of the patient voice, it is emphasized that there is a need for broader representation and co-production in future research.

Ultimately, the sustainability of L2 WMS in Wales will depend on balancing efficiency with inclusivity. Embedding hybrid systems, expanding workforce capacity, and investing in patient education will be critical to delivering equitable and effective services that align with national health strategy.

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8 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Can the use of immersive technology support healthcare practitioners in increasing the awareness and confidence of vaccinations?

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Abstract:

This research explores the potential of immersive technologies to support healthcare practitioners in increasing confidence and awareness of vaccinations. Despite global progress in disease prevention, vaccine uptake remains a concern due to barriers such as accessibility, literacy, and complacency. The study aligns with Welsh Government strategies and the National Immunisation Framework (NIF), aiming to deliver equitable, digitally enabled public health interventions.

A comprehensive literature review and mixed-method research (questionnaire and interviews) were conducted to assess immersive technologies effectiveness in healthcare education and public engagement. Findings indicate immersive technology enhances learning, retention, and emotional engagement, particularly among younger populations. However, challenges such as digital poverty, infrastructure limitations, and lack of training persist. The study introduces theoretical models including Constructivist Learning Theory, Technology Acceptance Model (TAM/i-TAM), and the Stimulus-Organism-Response (SOR) framework to underpin immersive technology adoption.

The research concludes that while immersive technology is not a standalone solution, it holds transformative potential when integrated with supportive policies, stakeholder collaboration, and inclusive design. Recommendations include strategic planning using frameworks to guide implementation and evaluation.

Keywords: Immersive technology, public health, healthcare practitioner, vaccinations, education, confidence, awareness

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List of abbreviations

XR	Extended Reality (Immersive Technology)	PHW	Public Health Wales
VR	Virtual Reality	WHO	World Health Organisation
AR	Augmented Reality	MSc	Masters in science
MR	Mixed Reality	RCT	Randomised Control Trial
WG	Welsh Government	NASSS Framework	Non-adoption, Abandonment, Scale-up, Source, Sustainability
NIF	National Immunisation Framework	ROAMEF Model	Rationale, Objectives, Appraisal, Monitoring, Evaluation, Feedback

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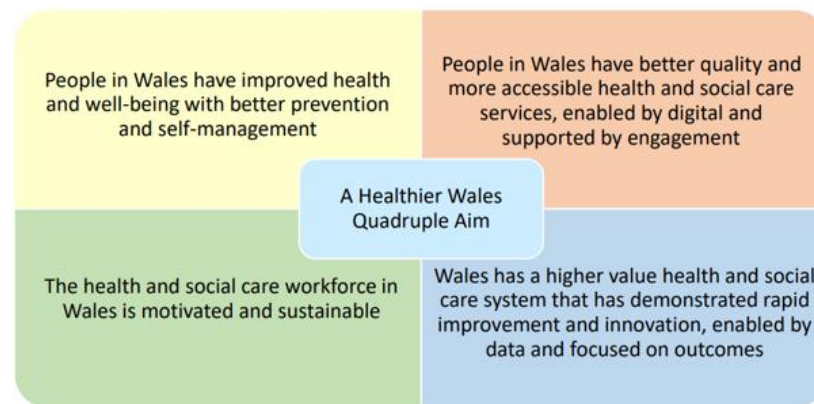
1 Introduction

Despite significant global achievements in eradicating some communicable diseases, vaccination remains a challenge. Reported barriers to poor vaccination rates are accessibility, a lack of awareness and confidence in vaccinations, and a level of complacency with a low-risk outlook towards some diseases (WHO, 2019; Ekezie et al, 2022).

Immunisation and vaccinations are a Welsh Government Health Protection Cell focus, outlined in both Welsh Government's policies,' the NHS Wales Performance Framework and the National Immunisation Framework (NIF). Policies with visions in protective and preventative healthcare.

The policies are based on the Healthier Wales Quadruple Aim (figure 1), based on four key areas.

Figure 1 - A Healthier Wales Quadruple Aim (WG, 2022).



Improvement in receiving and delivering vaccinations is particularly highlighted in aim 1, with aim 2 focusing on increasing access, enabled by digital support and engagement. Driving further research on immersive technology supporting healthcare practitioners in increasing confidence and awareness of vaccinations.

Table 1 - National Immunisation Framework (NIF) six priorities (WG, 2022; Authors Own, 2025).

Vaccine Equity	Vaccination equity is at the core of Wales's vaccination approach. Built on the principle that 'nobody should be left behind', ensuring that everyone should have fair access and fair opportunity to vaccinations.
Digitally enabled vaccination	Digital technology has an important part to play in delivering high quality health and social care services and supporting people to live well. Digital solutions can improve patient experience, but we must be mindful of ensuring inclusion and accessibility for all.
Eligibility	Vaccination and immunisation deployment in Wales is in line with their advice and guidance after consideration and acceptance by the Minister for Health and Social Services in Wales. There needs to be assurance of accurate recording and monitoring of eligibility criteria both nationally and locally to meet the need of the population.
Public vaccination literacy	Everyone in Wales should be given the ability to recognise the importance of vaccination and have fair access to materials and resources that support them in making an informed choice. Communications strategies should be informed by insights and reflect the views of the population, especially adaption of support vaccination programmes through in informing and raising awareness amongst under-served and vulnerable groups.
Deployment	Given the variation in vaccines and eligible groups, flexible and tailored deployment options support operational delivery. Enabling effective decision making and providing a person centred, accessible model, to specific communities, groups and individuals who would benefit from adaptability and approach.
Governance	Clear governance arrangements are required to underpin our future vaccination arrangements, supported by a robust performance management framework and clear commissioning and reporting arrangements.

The NIF Framework embodies and delivers on the 'A Healthier Wales Quadruple Aim', drawing on the strategic context from WG's vision for immunisation services across Wales. Outlining clear aspirations, acknowledging fair and just vaccination considerations, and delivering an equitable service. Each of the six priorities (table1) highlight opportunities where digitally enabled service design and delivery, which includes innovative solutions can positively influence equality and equity. Reducing inequities through tailored vaccine education and awareness, improving vaccine literacy and deliver inclusive and tailored interventions based on population needs.

1.1 Introduction to vaccinations

"Vaccination is a simple, safe, and effective way of protecting you against harmful diseases before you encounter them. It uses your body's natural defences to build resistance to specific infections and makes your immune system stronger." (WHO, 2025)

For centuries, humans have researched and developed methods of protection from diseases, with vaccinations reported as having saved more lives than any other form of medical intervention in history. The WHO are experts in global public health and strongly recognise the successes and importance of vaccinations reducing the risk and burden of disease. Preventing more than 20 life-threatening diseases, since the first vaccine, Smallpox, was developed in the 15th Century. Evidence demonstrate that vaccination programmes create a level of immunisation that annually prevents 3.5 million to 5 million deaths from diseases like diphtheria, tetanus, pertussis, influenza, and measles (WHO, 2025).

In Wales, PHW monitors vaccine uptake and the WHO sets a target of 95% vaccine coverage, however, rarely is this achieved (PHW, 2025). Research concludes that vaccinations determine health and care-related gains (reducing burden of diseases and improved care), improve social responsibility, enables healthier and prosperous societies, saves lives, and is economically and socially beneficial (WFPHA, 2021). This highlights the focus that optimising vaccine uptake is crucial, especially in an age of growing antimicrobial resistance and global travel (WG, 2023; Andre et al, 2008).

However, since the COVID-19 Pandemic, Vaccine Confidence Project (London School of Hygiene and Tropical Medicine) reported that globally, confidence in vaccines has dropped. With UK adults' level of trust and belief in vaccinations reducing from 90% in 2018 to 70% in 2023 (Reed, 2025). The NIF further concluded that harms from COVID-19 have not affected people in Wales equally, with vaccine acceptance being a societal challenge (WG, 2022).

1.2 Introduction to immersive technology

"Immersive technologies create distinct experiences by merging the physical world with a digital or simulated reality. Augmented Reality (AR) and Virtual Reality (VR) are two principal types of immersive technologies." (Santos et al, 2022)

Immersive technology, also referred to as Extended Reality (XR) is the term referring to digital systems that produce or improve sensory experiences, achieved by the process of creating a simulated environment, fully engaging the user, audibly and visually. Creating real-time feedback and stimulation of multiple senses, by adapting user experience based on need, abilities, and desires. Over recent years, XR has been used and is impactful in clinical education, which also reveals potential usability across wider healthcare and education (Santos, 2022; Doerner et al, 2022; Rauschnabel et al, 2022).

XR in education has proven effective by increasing literacy provisions (Kee et al, 2024), with three different components providing varied deliverability (table2), with the spectrum (figure2) highlighting the linking of two worlds (physical and virtual) of XR.

Table 2 - Immersive Technology terms and descriptions (Rauschnabel et al, 2022).

Term	Description
Virtual Reality (VR)	A completely digital environment, often using headsets and sometimes controllers.
Augmented Reality (AR)	Overlays digital content onto the real world.
Mixed Reality (MR)	An integration of the real and virtual world, that interacts in real time.

Figure 2 - The spectrum of Immersive Technology (Extended Reality / XR) (Singh, 2023)



The first 360-degree art appeared as a panoramic mural in the 19th Century, and an American pioneer, Morton Leonard Heilig, created the Sensorama in 1962. A mechanical device that provided a multi-sensory experience by engaging multiple senses to create an immersive VR experience (Lum et al, 2021).

XR is known for the flexibility (imaginative environments) and adaptability (sensitivity to individual input), and in most recent decades, advances in technological development and social trends have aided in its exponential growth, with Spallazzo et al (2022) identifying six key elements (table3) where experience of XR can impact on public health and research, and relevant for training and simulation (vaccine delivery, emergency response), patient education (understanding disease progression) and data visualisation (epidemiological trends in 3D environments).

Table 3 - Six elements of immersive experience (Spallazzo et al, 2022)

Presence	Feeling physically or psychologically “inside” the environment
Cognitive and Emotional Engagement	Mental and emotional involvement
Sensory Involvement	Alignment of real and virtual sensory inputs
Embodiment	Active participation and control within the environment
Isolation	Detachment from the real world to enhance focus
Interactivity	The ability to manipulate or respond to the environment.

1.3 Key strategic documents

Table 4 - Strategic documents and/or materials directly related to Vaccinations and Immersive Technology

Domain	Document / Initiative	Lead Organisation	Focus Areas
Immunisation	National Immunisation Framework for Wales (2022)	Welsh Government	Equity, digital enablement, governance
Immunisation	Public Vaccination Literacy Strategy (2023)	Public Health Wales	Public engagement, co-production
Digital Health	Digital and Data Strategy for Health and Social Care in Wales (2023)	Welsh Government	AI, precision medicine, digital transformation
Digital Health	DHCW Organisational Strategy 2024–2030	Digital Health and Care Wales	Innovation, infrastructure, inclusion
Digital Health	Digital Technology and Health Hub	Public Health Wales	Digital engagement, transformation
Digital Health	All Wales Simulation-Based Education and Training Strategy' 2022 - 2027	Health Education and Improvement Wales (HEIW)	Digital transformation, simulation training, healthcare training
Immersive Tech	XR Guidance in education for children	Hwb (Welsh Government)	Safe use of XR in learning environments
Cross-sector Digital	Digital Strategy for Wales (2021)	Welsh Government	Public service transformation, innovation

Table 5 - Links to Strategic documents and/or materials directly related to Vaccinations and Immersive Technology

Links
https://www.gov.wales/sites/default/files/publications/2022-10/national-immunisation-framework-for-wales.pdf
https://phw.nhs.wales/topics/immunisation-and-vaccines/fair-access-to-vaccination-in-wales/public-vaccination-literacy-strategy-vaccination-programme-wales-pdf/
https://www.gov.wales/digital-and-data-strategy-health-and-social-care-wales-html
https://dhcw.nhs.wales/files/dhcw-strategies-and-frameworks/digital-health-and-care-wales-organisational-strategy-2024-2030/
https://phw.nhs.wales/topics/digital-technology-and-health/
https://heiw.nhs.wales/files/all-wales-simulation-strategy-mg-draft-6pdf/
https://hwb.gov.wales/keeping-safe-online/social-media-gaming-and-apps/guidance-on-extended-reality-technology/
https://www.gov.wales/digital-strategy-wales

2 Rationale

Digital solutions is rapidly expanding, with more industries, including healthcare, utilising digital platforms and provisions to address population health needs. The potential for XR as an educational tool by creating a closely imitating real-world setting needs to be further assessed in the field of vaccinations. Focusing on the ability to support vaccine education by shifting negative or poor attitudes and beliefs, creating alternative public health delivery (Pennisi et al, 2024; Hargreaves, 2022).

2.1 Aim of the research

The research aim is to assess and conclude if XR has the potential to support healthcare practitioners in increasing confidence and awareness of vaccinations.

2.2 Objectives

- Present comprehensive findings through an extensive literature review from studies that have focused on the use of XR within healthcare and/or education.
- Highlight opportunities and barriers of XR.
- Provide quantitative and qualitative findings, with insight from professionals working in or support the health and care sector through interviews and a questionnaire.
- Conclude and reveal if XR has the potential in supporting vaccination campaigns and interventions, with recommendations on further planning and progression for adoption if effective.

2.3 Personal motivation of the researcher

The researcher has several years of experience working in public health, developing, and delivering services that target reducing health inequalities and inequities. Enthusiastic about service innovation and transformation, providing efficient and effective public health interventions.

Currently, the researcher is a Senior Principal Public Health Practitioner, leading on vaccine equity for the Swansea Bay University Health Board Immunisation Team, and through regular stakeholder engagements and evaluating local vaccination programmes, the researcher has identified a potential for exploring XR within vaccination education interventions.

3 Literature Review

3.1 Introduction

Systematic and scoping reviews, experimental studies and conceptual analysis articles were studied and analysed. Providing insight and knowledge to support with answering the research question. Discovering the integration and impact of XR within healthcare education and public health was the focus. The review investigated commonalities and differences across key categories, aiming to assess current knowledge, identify gaps, and inform XR development in vaccinations.

3.2 Findings

With decades of XR being used in healthcare, XR within public health education, especially vaccination programmes are irregular. Studies predominantly found VR being the highest reported XR used in healthcare (Santos et al, 2022). providing a sense of presence and awareness on the topic (Nowak et al, 2020; Khan et al, 2024). Multiple reports stated that XR can address vaccination hesitancy and challenges, which are created by apathy and complacency. With reviews in health promotion demonstrating that immersive gamification improved vaccine knowledge and motivation in 80% of studies, with interactive video-based health promotion demonstrating positive effects on attitude (64%), intention (55.17%), and behaviour (52.63%) (Bas-Sarmiento et al, 2025; Xiao et al, 2024).

A study demonstrated the benefit of VR by improving perception and beliefs of 18–49-year-olds with the flu vaccine, highlighting change in behaviour. The study also acknowledged the improvement in healthcare practitioners' communication skills and their ability to support with reducing participants vaccine hesitancy (Nowak et al, 2020).

A review by Chang et al (2022) highlighted a randomised controlled trial (RCT) that used VR to support a vaccination intervention, in a paediatric setting, as a distraction technique tool, by alleviating pain and anxiety in children aged 4-10. Results demonstrated that children's fear score was significantly reduced in the intervention group compared to a control group. Similarly, the anxiety of the parents also decreased in the intervention as an indirect effect.

Asadzadeh et al (2021) reported that AR was effective during the COVID-19 pandemic, in the form of storytelling and virtual training. The evidence indicates that both VR and AR have the potential to support communication and education of practitioners, with Ropponen et al (2025) and Wen et al (2024) further concluding evidence in reduced stress and anxiety of healthcare students using XR, creating safe and non-judgmental training environments that are non-judgmental. Ropponen et al (2025) added that the reviews acknowledged an increase in learners' self-confidence and satisfaction, developing psychomotor and psychosocial skills, enhancing learning satisfaction. The literature highlights that naturally motivated individuals have increased learning outcomes, displaying improved retention in short and long-term memory (Poupard et al, 2024). Liu et al (2023) agreed, stating a review of 12 RCT, with 1167 healthcare students, demonstrated findings of enhanced theoretical knowledge, practical skills and again knowledge retention when using XR. However, no statistically significant impact was observed on the enhancement of critical thinking skills.

Huang et al (2022) reported that one of the main advantages of AR and VR is their ability to stimulate motivation for learning, fostering curiosity-driven learning behaviour. However, Poupard et al (2024) found that outcomes were mixed, depending on how educational instructions were communicated to users. Such inconsistencies could be attributed to limitations in current empirical studies, with small sample sizes and inconsistent use of standardised measures.

Lee et al (2022) proposed that XR can support public health education, preparing practitioners with real world complex scenarios that require public engagement, investigative skills and critical decision making. XR can supplement traditional classroom instructions, providing an immersive, participatory training environment, which raises confidence and awareness in public health. Building competency in public health functions (Nowak et al, 2020; Asadzadeh et al, 2021).

Real et al (2023) supports this statement, concluding that educational impact by XR increased retention and empathy. Nelson et al (2025) and Lee et al (2022) further added that XR promotes long-term retention, enjoyment, and deeper learning due to its immersive nature and active participation. Since users tend to

lose self-awareness while interacting in virtual worlds, immersion facilitates a richer learning experience, captivating learners' interest, creating a cognitive impact (Mohsen et al, 2023).

In relation to adaptability of XR, it has potential for working with multiple demographics. Most children and adolescents today have grown up with digital devices (commonly labelled as digital natives). Regular use of digital technology in daily life from an early age creates familiarity. An important predictor in acceptance of technology, and in relation to prevention, studies have conducted effective use of XR in children and teenagers, however, research is often limited to applications in clinical settings, neglecting public health perspectives (Tomczyk et al (2024).

Boxall et al (2025) found that younger second-generation adults with bilingual/multilingual language skills demonstrate greater levels of confidence in engaging with a variety of digital technology, attributing this to their experiences in the educational system and contemporary social interactions. Reflecting greater sharing across multi-cultural communities, where they act as language and digital mediators for older generations.

3.2.1 Theoretical frameworks and models

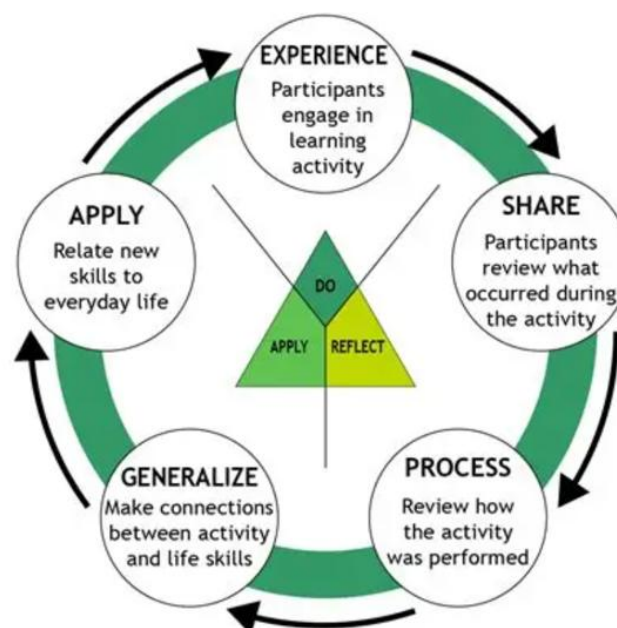
There were several theoretical frameworks and models analysed in the literature. Models such as the Health Belief Model (HBM), Social Cognitive Theory (SCT), Transtheoretical Model (TTM), and Theory of Self-Efficacy were found to improve understanding of behaviour change (Montagni et al, 2020; Xiao et al, 2024).

O'Connor et al (2022) added that theories assist optimal learning experiences in healthcare practitioners and students using XR.

Qu et al (2022) and Khan et al (2024) highlighted a common theory behind technology teaching methods, the Constructivist Learning Theory. Influential in supporting experiential learner-centred approaches, enhancing interaction of blended real and virtual environments. A theory focusing on human interaction when shifting from traditional to immersive, interactive, and remote healthcare (Bohm et al 2025). Additionally, learners construct knowledge through active engagement and reflection (Chang, 2022; Gasmí et al, 2022; Khan et al, 2024; Mathew et al, 2021).

Sinha (2023) reviewed the potential of expanding our understanding by enabling seamless avatar-based interaction between users in both real and virtual contexts. Highlighting the development of the Constructivist Learning Theory adapting on the Kolb's Learning Cycle's four stages; experience (feeling), reflection (watching), conceptualisation (thinking) and experimentation (doing), with learners entering any stage of the cycle and moving through each segment continuously, building experience and expanding knowledge and skills.

Figure 3 - Experimental Learning Model (University of Wisconsin-Madison, 2025)



Though, Sinha (2023) noted a requirement for an adaptation to the Kolb Learning Cycle, by adding an important section, share. The interactions between learners, the value of co-creation, and the theory of community enquiry, reinforces the importance of how individuals learn and share their experiences, perspectives, and insights. Encouraging motivation to actively participate in the learning process (figure3).

Research indicates that when participants share learning of simulation participation, their sense of presence significantly enhances (Sinha, 2023; Prieto et al, 2022; Braud et al, 2022). Creating findings, progression through collaboration (Chang et al, 2022) and social interaction, which is somewhat absent from 2-D technologies (Braud et al, 2022)

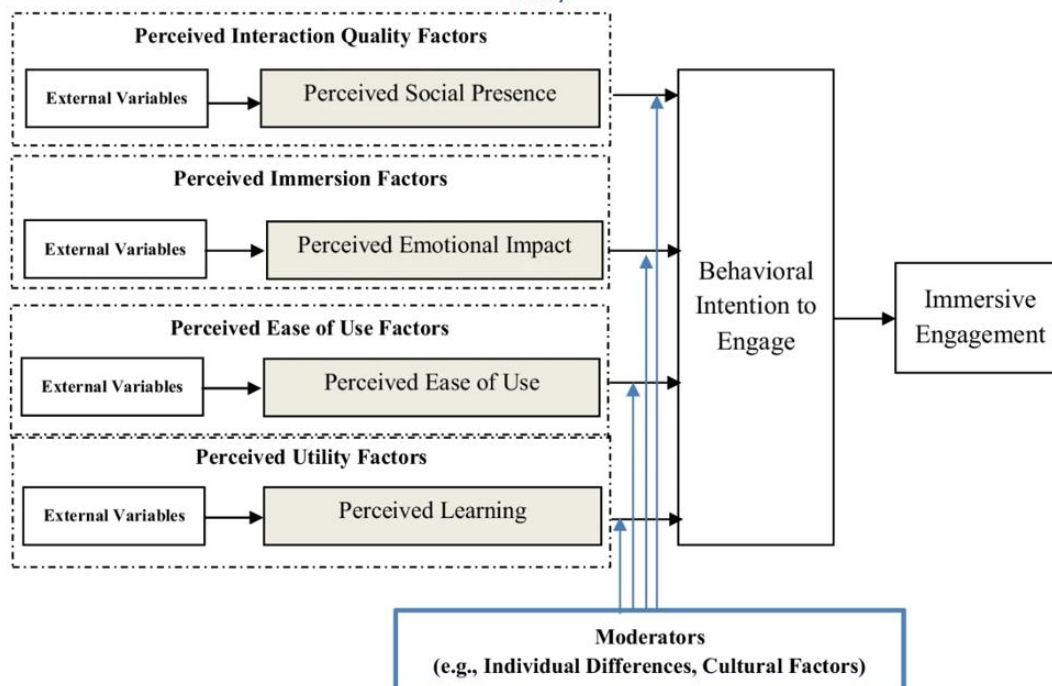
The other commonly reported model is Technology Acceptance Model (TAM). A model that focuses on users accepting innovative technology, emphasising the perceived usefulness and ease of use as key factors in their acceptance. The Theory of Self-Efficacy embedded within the TAM highlights the importance of individuals' belief in their ability to successfully engage with and use technology, influencing motivation and performance. However, despite growing interest in XR, a lack of comprehensive evidence on their impact beyond knowledge and skills, particularly regarding the overall development of attitudes, confidence, and satisfaction from the public is lacking (Rapponen et al, 2025; Asadzadeh et al, 2021; Ishaq et al, 2021).

Some research highlights how particular demographics such as age or ethnicity can lead to mixed engagement with digital technology, revealing complex factors such as social and professional roles, life transitions, and firsthand experiences influencing engagement outcomes (Boxall et al, 2025).

In understanding factors that shape user intentions, strategies should be developed by promoting acceptance and adoption across diverse populations. An adapted TAM model was created based on that requirement. A new model, called i-TAM (immersive Technology Acceptance Model) (figure4), enables research into factors of perceived social presence, perceived emotional impact, perceived ease of use, and perceived learning impact on behavioural intention to engage. All impacting on immersive engagement (Nilashi et al, 2024).

Nishali et al (2024) further highlighted a study that examined the impacts of experience on the relationships between each of the i-TAM factors, with findings concluding a significant impact of behavioural intention to engage on the sense of immersive engagement. The cause behind this connection aligns with common sense reasoning, as individuals expressing a greater intention to use XR are predictably more motivated to explore and interact with it.

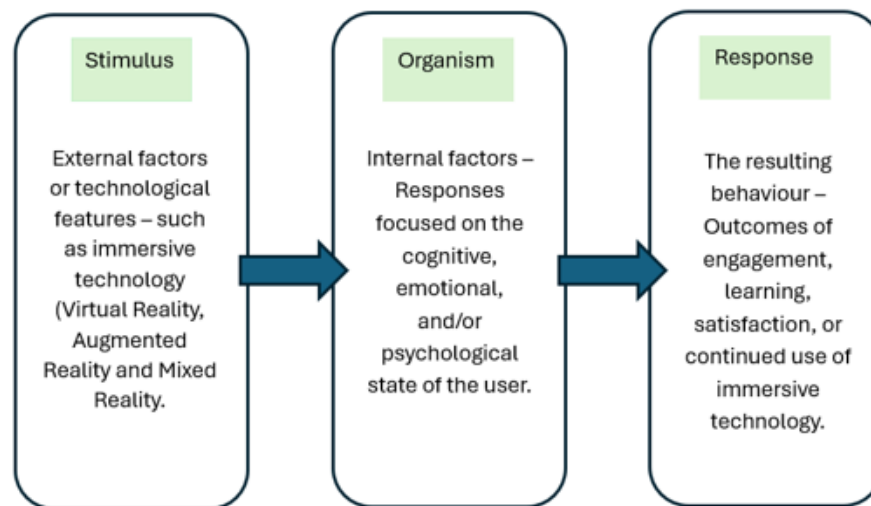
Figure 4 – (i-TAM) Immersive Technology Acceptance Model (Nilashi et al, 2024; adapted from Davis, 1989)



A study analysing over two decades of research within XR confirmed the key theories highlighted, Constructivist, and TAM are vital, however a third framework which evidence concludes as being important though most studies reviewed did not explore, was the Stimulus-Organism-Response (SOR) framework (figure5). A psychological model, often used to study how individuals react to immersive environments and technology adoption (Logeswaran et al, 2021; Mohsen et al, 2023).

Within educational studies in XR, researchers use the SOR Framework to increase understanding of users' emotional and cognitive state, and the impact and influence the internal factors have, such as engagement, retention of knowledge or skill acquisition. A XR immunisation programme (Stimulus) could motivate a level of realism or a sense of presence (Organism), which lead to improvement of confidence and awareness in real-world vaccination interventions (Response) (Mohsen et al, 2023).

Figure 5 – SOR Framework (Authors own, 2025)



3.2.2 Limitations and challenges

Cost and poor digital infrastructure limit the acceptance, accessibility, and development of XR across healthcare education. Followed by limited access to immersive products and accessories (Pears et al, 2020; Iqbal et al, 2024; Khan et al 2024; Santos et al, 2022). Mathew et al (2021) and Xiao et al (2024) acknowledged the lack of standardised measures, limited validation data, combined with predominantly short-term focus, impact adoption and scale in healthcare.

Chang et al (2022) agrees, stating that the cost-effectiveness of applying XR in healthcare has not been fully examined, with Santos et al (2022) stating that VR is more expensive than AR in education. However, the economic savings to society and disability-adjusted life years across the population through a preventative public health approach should not be overlooked when discussing XR (Chang et al, 2022; Panickar et al, 2023; Logeswaran et al, 2021). Though, some risks are highlighted, such as reported side effects of dizziness, nausea, and eye strain in VR. Followed by sensory overload with intensive use (Gasmi et al 2022; Udoudom et al 2024).

The current underdeveloped infrastructure could possibly account for the slow development of XR in healthcare education. Concerns mentioned are faulty technology, undesirability, and less meaningful content available for public health education. Combining high technical and maintenance requirements potentially increasing digital inequality, excluding areas with lower financial resources (Nelson et al, 2025; Asadzadeh et al, 2021; Tomczyk et al, 2024).

Saleem et al (2023) highlighted, limitations create inequity through digital divides, especially in vulnerable and underserved populations. Shifting from traditional to interactive methods create challenges with accessibility and literacy, lacking inclusivity in design and infrastructure investment. (Real et al, 2023; Panickar et al, 2023; Ajegbile et al, 2024).

Boxall et al (2025) highlighted that socioeconomic status and accessibility needs were strong influences in people's digital experience. With more affluent areas, having lower health inequalities and increased

affordability in acquiring digital devices, creating greater access and use. Additionally, participants experiencing economic constraints often relied solely on smartphones, paired with lack of software access or available mobile data. In healthcare, professional roles which transitions between digital and non-digital tasks, noted that digital literacy and poor confidence was seen as a strong influence on falling engagement with digital methods.

Lee et al (2022) states that despite the promises of XR, several limitations like implementation issues, poor training provisions, and a lack of institutional support, require time and investment before XR can be adopted into public health education. With economic healthcare pressures leading to hesitation in investment and costs would not only include maintenance, but also the educational material fees, unless organisations have their own XR design and programming team (Lee et al, 2022).

3.2.3 Implications for practice, policy, and research

In practice, XR should be integrated into public health education curriculum, especially the gamification abilities in enhancing engagement in children and adolescents (Real et al 2023; Panickar et al 2023). Though, developing policies are difficult based on lack of standardisation and empirical data (Iqbal et al, 2024; Mathew et al, 2021). Requiring further investment in infrastructure and research with longitudinal studies.

Updating policies is essential, especially with GDPR requiring greater developer accountability, and data security becoming an increasingly pressing political issue. Santos et al (2022) reported that XR developers are aiming to address privacy concerns. Reducing the volume of information gathered and increasing data protection. The focus going forward for developers is giving more control to the user over their data.

Panickar et al (2023) reported that delivering XR in public health education can develop critical competencies and skills needed in public health roles, such as simulating disease outbreak investigations, crisis response and an increased awareness of preventative measures. However, McGivney (2025) added that studies suggest a complex relationship between the design of interactivity within learning environments, especially with VR. Observing the impact of a learner increasing their experience and abilities can be challenging. Requiring an understanding of the influence of immersive learning and an agreed formalisation of standards and learning frameworks.

A qualitative study uncovered how overlapping demographics, cultural, and social factors can shape engagement with digital research methods. Intersectionality is a concept used to understand how various aspects of a person's identity—such as race, gender, class, sexuality, and disability, can interact and overlap to shape their experience. Highlighting how multiple social categories, such as gender, socioeconomic status, and race, interact and form distinct social experiences (Sinha 2023).

Figure 6 – Wheel of digital engagement methods in health (Boxall et al, 2025)



In the context of researching digital engagement methods, Boxall et al (2025) concluded that digital engagement is shaped by multi-layered and complex interdependent factors (figure 6), forming distinction between high and non-engagement. Findings show that research in digital engagement is not based on isolated and superficial characteristics (e.g., age, gender, ethnicity), but more on the overlapping factors on people's engagement abilities, with power and privileges shaping engagement opportunities. Usually factored by social position, through those that have access to resources and whose voices are heard in our society.

Boxall et al (2025) further highlights that implementing digital methods into health research without careful policy consideration and best practice guidance represents a pivotal moment that could lead to further exclusion of the most marginalised communities.

Sinha (2023) further adds that an immersive environment gives opportunities to engage and provide provisions of learning to individuals with special needs or social interaction challenges, by developing their interpersonal skills. Allowing individuals to communicate and develop skills in a secure environment, without being overwhelmed. Enhancing the quality of learning for people who struggle with mobility or anxiety, aiming to reduce inequalities of underserved and vulnerable groups (Sinha, 2023; Zhang et al, 2023).

Shin (2022) stated that developing the practice of competency in leadership, communication, listening, and empathy is hard to achieve and measure for organisations. Though, immersing learners in real world settings develop skills, especially in scenarios relating to difficult conversations or interventions.

3.2.4 Opportunities for future development

Studies described initial development of XR but had limitations on greater information relating to efficacy or effectiveness, implementation, adoption, or maintenance within public health. Therefore, discussing the potential of XR in relation to public health is important, with XR prevention methods embedded in strategy and policies, providing a range of preventive actions that combine both environmental and behavioural actions, though evidence-based practice is required (Tomczyk et al, 2024).

XR can provide a platform to study the behaviour of healthcare providers in a controlled virtual environment, such as training in infection prevention (Asadzadeh et al, 2021), and Rapponen et al (2025) added that more research is needed on the development of attitudes, critical thinking, and decision-making skills, as well as team interaction and communication of healthcare practitioners.

Lee et al (2022) concluded that educational reform is required to better prepare public health students and healthcare practitioners when encountering real world situations, especially on prevention.

3.2.5 Literature review conclusion

The reviewed literature demonstrates a growing consensus on the transformative potential of XR in public health education, with all articles concluding significant opportunities for novel methods in using XR, especially MR (combining both VR and AR simultaneity) to improve engagement in public health education.

Common themes include enhanced learner engagement, simulation-based training, and improved communication strategies. However, despite promising findings, limitations persist. Theoretical frameworks such as Constructivist Learning Theory, behavioural change models, and technology acceptance theories underpin many of the studies. Though future research should focus on long-term impact, equity in access, and empirical validation.

While XR have various drawbacks such as issues related to the complexity of technology. The benefits outweigh the disadvantages, justifying their application in both healthcare practitioner and public learning and interaction.

Despite the noted challenges, XR is a disruptive technology, with potential to fundamentally transform public health education. Further studies into how XR can be designed and deployed for maximum reach and effectiveness can benefit the spread and acceptance of XR in healthcare. XR provides an immersive and simulated approach toward student education, increasing participatory techniques, leading to generations of highly competent public health professionals.

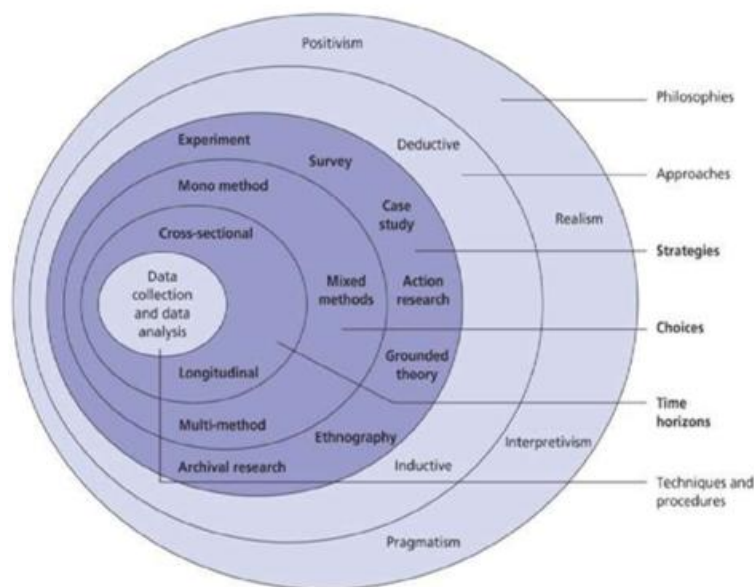
4 Methodology

4.1 Introduction and purpose

The study aims to answer the research question, following the Research Onion method (figure 7). The study is a mixed philosophical approach, both pragmatic and interpretive. Pragmatism enables integration of the literature review and study based on ‘what will work best’ within healthcare delivery of XR. An interpretive approach includes the subjective, where the focus is on the importance of understanding the reality of using XR, actioned from individuals’ thoughts and views, relaying the world through their eyes.

The study is inductive, as current awareness and evidence does not provide us with how healthcare practitioners will react when using XR in public health education, therefore, by looking at literature review and the data, a report based on the findings not on a hypothesis can be built. By focusing on multiple peer-reviewed literature and conducting a mixed method study (semi-structured interviews and perceptual questionnaire).

Figure 7 – The Research Onion (Saunders et al, 2016)



4.2 Literature review

The articles in the literature review were chosen by a detailed search strategy, focusing on key words, relevance, and timeline (table 6).

Table 6 - Literature review scope and outcome

Purpose	Activity
Databases	Scopus, PubMed, Google Scholar and Web of Science
Keywords	"Immersive technology" + "public health" + "healthcare" + "education" + "vaccinations"
Inclusion	Peer-reviewed articles Publications from 2020 English Language
Exclusion	Grey literature Specific clinical/operative immersive tech articles Publications pre-2020
Outcome: 39 peer-reviewed articles	

4.3 Perceptual Questionnaire

The questionnaire (Appendix A) aided in gathering several important findings. A questionnaire provided both qualitative and quantitative insight, enabling a greater number of responses to support the study. Further details provided below (table 7).

Table 7 – Perceptual questionnaire methods

Activity	Outcome
Selection	Individuals were invited to answer the questionnaire based on their expertise to ensure a well-informed perspective on the subject, with representation from multiple organisations that directly support with engagement and/or delivery of vaccinations, public health and/or digital education across Wales.
Distribution	The questionnaire was circulated through e-mails and uploaded onto the researchers LinkedIn page. E-mails were distributed across multiple contacts across NHS Wales, public sector bodies and contacts within public health/ vaccinations environments. Researcher also enquired that where possible, the questionnaire to be forwarded on to relevant contacts.
Design	The questionnaire consisted of 17 questions. 3 questions based on the participants background to identify the reach of the questionnaire and their role, providing relevance on topic discussed. The remaining 14 questions were formalised based on the findings of the literature review. At the beginning of the questionnaire, a brief statement on what immersive technology is, and the various types of immersive technologies was included to support with raising awareness of the topic, increasing the ability of the responder to complete the questionnaire based on their background and views, providing greater relevance and focused responses. The questionnaire included open and closed questions, with questions based on rating and Likert scale to support with producing both qualitative and quantitative responses.
Format	Questionnaire was created through Microsoft Office Forms and access enabled for anyone with a Microsoft account to complete. Increasing the opportunity for a wider reach and receive responses -from all sectors (Primary, Secondary, Third and Private Sectors). The timeline for responses before the closing of the questionnaire was four weeks.

4.4 Interviews

The interviews gathered insight from a wide range of individuals, providing dialogue and offered rich and detailed responses to the questions asked (Appendix B). Further details provided below (table 8).

Table 8 – Interview methods

Activity	Outcome
Selection	The interviewees in the study were selected based on their expertise to ensure a well-informed perspective on the subject, with representation from multiple organisations that directly support; engagement and/or delivery of vaccinations, public health and/or digital educational across Wales. Some of the interviewees were known to the researcher through the public health environment, though strict formal structures were adhered to, reducing bias and maintaining standards and professionalism across all interviews.
Distribution	An e-mail was sent to individuals based on their roles and relevance on the research topic, with an invitation to be interviewed as part of the research project. Further invitations were sent to individuals outside of NHS Wales organisations via the researchers LinkedIn page.
Design	The interview consisted of 13 questions, formalised based on the findings of the literature review. The questions were sent to each interviewee, 24 hours before their interview. Informing the purpose of interview and providing opportunity for interviewee to prepare. In addition, a brief statement of what immersive technology is and the various types of immersive technologies was included in the circulated questions to support interviewees with awareness of the topic, supporting an opportunity in increasing dialogue and views during the interview.
Format	Interviews were between 30-45 minutes. Conducted over Microsoft Teams and recorded and transcribed with the permission of the interviewee.

4.5 Ethical consideration

Ethical approval for the research was acquired through the Swansea University School of Management Research Ethics Committee. The committee approved the research ethics application on the 29th of March 2025. Research Ethics Approval Number: 1 2025 13147 12426

4.6 Analysis of the data

Table 9 – Data Analysis

Data Source	Data analysis
Questionnaire	The responses were gathered and coded based on themes. Thematic analysis of the coded findings was undertaken, presented by graphs and data sets (Pie Charts, Likert Scale, Rating scale and Bar charts), including additional narrative providing information based on highest scoring of responses/views and significance to the evidence found in the literature review.
Interviews	Each transcript was reviewed and coded into themes based on the significance of the interviewee responses. Each response to the questions was summarised, providing further narrative in concluding the relevance to the research, and compared with both the findings from the questionnaire and literature review (including pie charts and bar graphs). Thematic analysis of commonly reported findings was undertaken and presented in the report.
Overview	The literature review and access to the questionnaire were not limited to Wales, though the interviews were solely represented from organisations in Wales. Analysis and combining of both the interviews and questionnaire offered a comprehensive conclusion to the findings, providing a greater understanding of the research topic, while strengthening the weight of the study's purpose and conclusions.

Based on the findings of responses from the interviews and questionnaire, the researcher was able to identify key themes, commonalities, and differences (table 9).

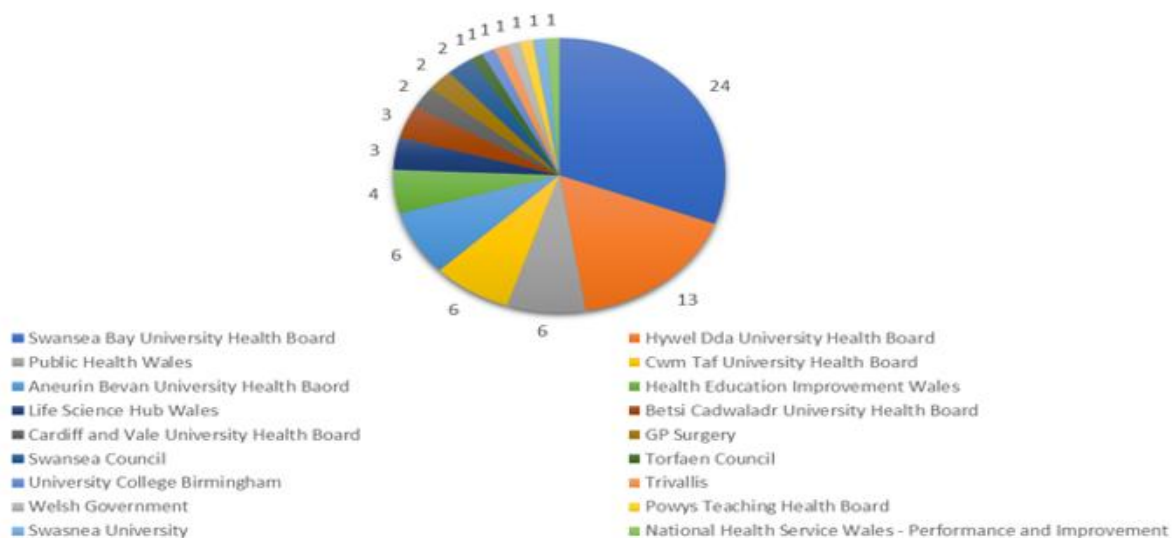
5 Findings

The following section includes findings from both the questionnaire and the interviews. The findings will focus on providing both quantitative and qualitative data against the set questions.

5.1 Questionnaire analysis

The questionnaire was completed by 78 participants (figure 8), of which, Swansea Bay University Health Board had the highest number (30.8%), with a wide range of responses from multiple sectors across Wales. Out of the 78 who participated, 63 (80%) directly deliver or are engaged/support vaccination programmes in their current roles.

Figure 8 – Questionnaire Response Breakdown



5.1.1 Awareness of Immersive Technology and each component

As highlighted in the methodology, the questionnaire included a brief statement on what XR is and each of the components of XR. To better understand the knowledge of the participants, they were asked to assess their awareness of XR prior to reading the statement. The overall majority, 46 of the 78 participants (60%) did know what XR was (figure 9).

Further assessment was completed through asking their awareness of any of the XR components, such as VR, AR, and MR prior to the questionnaire, and 67 (86%) out of 78 reported they had heard (figure 10).

Figure 9 – Awareness of Immersive Technology (XR)?

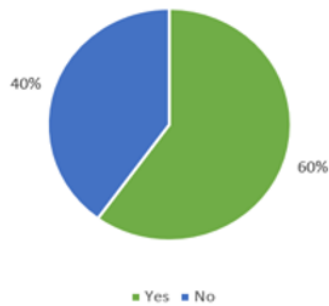
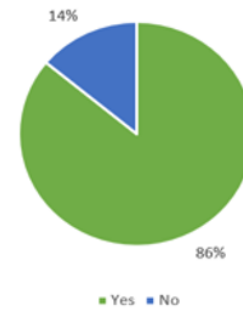


Figure 10 – Awareness of the XR components: VR, AR or MR



5.1.2 The use of Immersive Technology in their current role

Compared to the total number of responses that were aware of XR, only 10 (13%) (figure 11) reported that they currently use XR technologies in their roles. With clinical education and staff development (60% and 50% respectively) the highest reported areas (figure 12). For the 5 that reported other, career promotion sessions, virtual focus group feedback sessions, play therapies in pediatric services and student education in simulation departments were reported.

Figure 11 – Use of Immersive Technology in current role

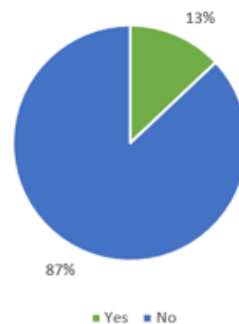


Figure 12 – Reported use of Immersive Technology in current role



5.1.3 The potential use of immersive technology in supporting healthcare practitioners

The potential use of XR in supporting healthcare practitioners with vaccination programmes/campaigns, was asked by the researcher, creating comparison with the literature review findings. The Likert Scale (figure 13) demonstrates that across each of the seven focused themes, 'agree' was the overall highest response (52% of the responses). The highest individual response was that 56% (n=44) agreed that XR had the potential to support healthcare practitioners with retaining public health information.

The highest response of the combined agree and strongly agree results was the potential of XR in supporting healthcare practitioners in increasing awareness of vaccinations, with 75% strongly agreeing or agreeing (21% and 54% respectively), however, the ability to increase confidence in vaccinations was reported lower in comparison to the strongly agree response, with the ability to increase confidence 12% lower than the ability to increase awareness.

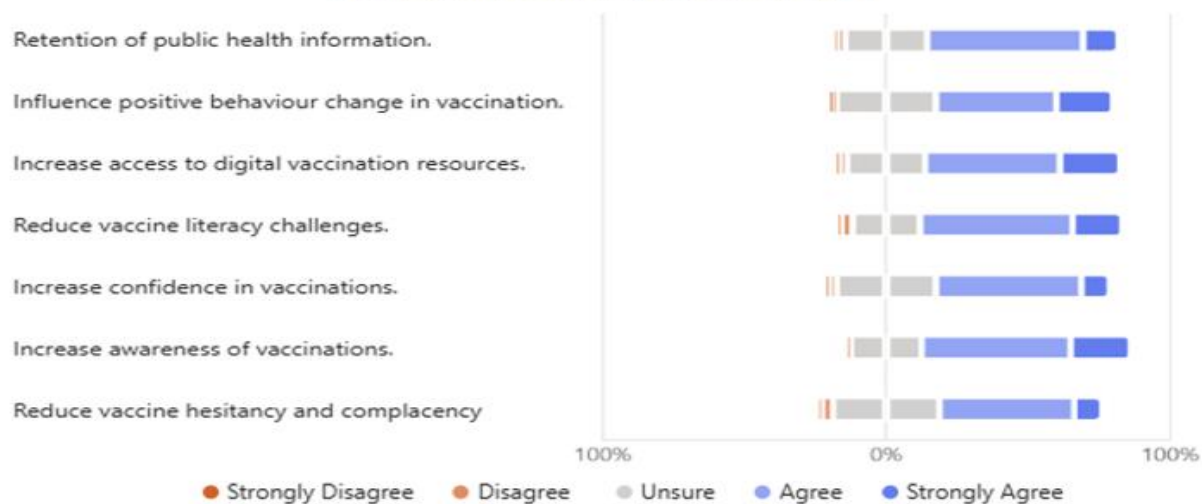
The highest reported level of uncertainty and disagreement was for the potential of XR in reducing hesitancy and complacency in vaccinations (30 reported being unsure and 3 disagreed).

Further details on the percentage responses to each of the seven focused areas from strongly disagree to strongly agree are highlighted below (table 10), with evidence highlighting that overall, only 17% disagreed across all focused themed areas, with 0% strongly disagreeing.

Table 10 – Likert scale percentage rating for each area from strongly disagree to strongly agree on potential to support healthcare practitioners

	Retention of public health information	Influence positive behaviour change in vaccinations	Increase access to digital vaccination resources	Reduce vaccine literacy challenges	Increase confidence in vaccinations	Increase awareness of vaccinations	Reduce vaccine hesitancy and complacency
Strongly Disagree							
Disagree	3%	1%	2%	4%	3%		4%
Unsure	29%	36%	28%	24%	36%	25%	38%
Agree	56%	44%	49%	55%	52%	54%	49%
Strongly Agree	11%	19%	21%	17%	9%	21%	9%

Figure 13 – Likert Scale rating on potential use of immersive technology supporting healthcare practitioners with vaccination programmes/campaigns



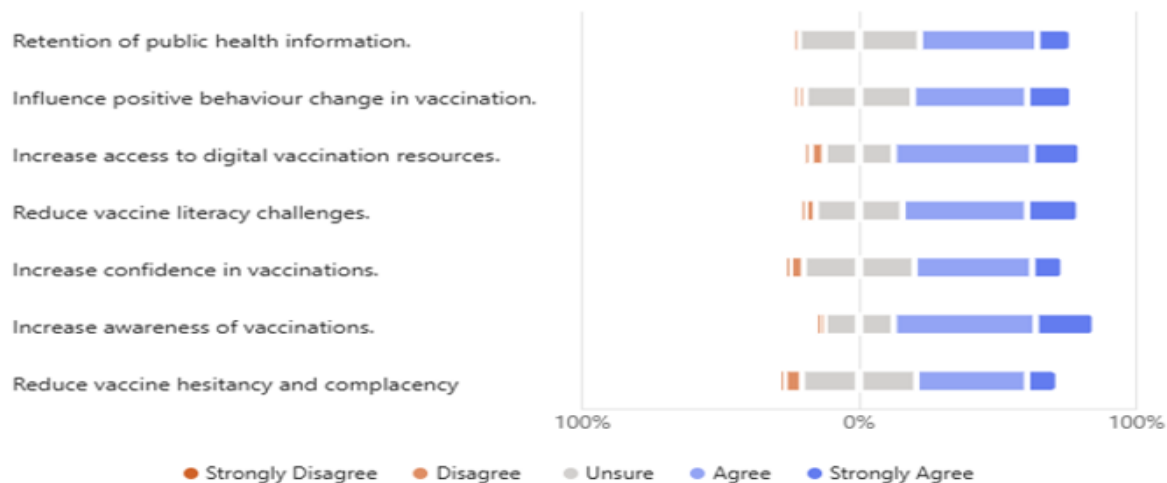
5.1.4 The potential use of immersive technology in supporting the public

Based on further findings in the literature review of the potential impact on the public, the researcher asked any healthcare practitioners completing the questionnaire for their opinion on the potential use of XR in supporting the public. The Likert Scale (figure 14) demonstrates comparable to the previous section, agree was the greatest response on the scale, with an average of 46% across the seven focused themes.

Similarly to the impact on healthcare practitioners, the highest response of strongly agreeing and agreeing from healthcare practitioners view on the impact on the public was the ability of XR in supporting increasing the awareness of vaccinations, with an average of 73% (21% strongly agree and 52% agree).

However, again comparable to the previous question. There was a significant difference between reporting the potential impact on increasing confidence compared to increasing awareness, with 10% of the participants strongly agreeing on increasing confidence. 11% lower than those that strongly agree with the potential increase in awareness.

Figure 14 – Likert Scale rating from healthcare practitioners' views on the potential use of immersive technology supporting the public with vaccination programmes/campaigns



Continuing, with increasing confidence, this theme was also the highest reported on the scale for response of uncertainty or disagreeing in XR having the potential to increase confidence in the public on vaccinations. With a combined rate of 49% (53% unsure and 6% disagree).

Further details on the percentage responses to each of the seven focused areas from strongly disagree to strongly agree are highlighted below (table 11), with the data highlighting that 25% (n=32) disagreeing. 8% higher than the view on XR impact on healthcare practitioners across all focused themed areas, with 1% strongly disagreeing on XR having the potential to increase access to digital vaccination resources.

Table 11 – Likert Scale percentage rating for each area from strongly disagree to strongly agree from healthcare practitioners' opinion on the impact to the public

	Retention of public health information	Influence positive behaviour change in vaccinations	Increase access to digital vaccination resources	Reduce vaccine literacy challenges	Increase confidence in vaccinations	Increase awareness of vaccinations	Reduce vaccine hesitancy and complacency
Strongly Disagree			1%				
Disagree		3%	5%	4%	5%	2%	6%
Unsure	45%	40%	26%	32%	41%	26%	42%
Agree	43%	42%	51%	46%	44%	52%	41%
Strongly Agree	12%	15%	17%	18%	10%	21%	11%

5.1.5 Accessibility of digital technologies in rural and underserved communities, and individuals with protected characteristics

The researcher asked for respondents to rate their view on current accessibility to digital technologies in underserved and rural communities, and for individuals with protected characteristics. The rating was a scale from 1 (very poor) to 5 (excellent). The overall response from the 78 participants was that accessibility to digital technologies for those at risk or underserved was on average poor, with a rating of 2.10 out of 5 (figure 15). The rating of 2 had the highest response from 40 (51% participants).

Figure 15 – Rating score of accessibility to digital technologies across rural and underserved communities, and individuals with protected characteristics

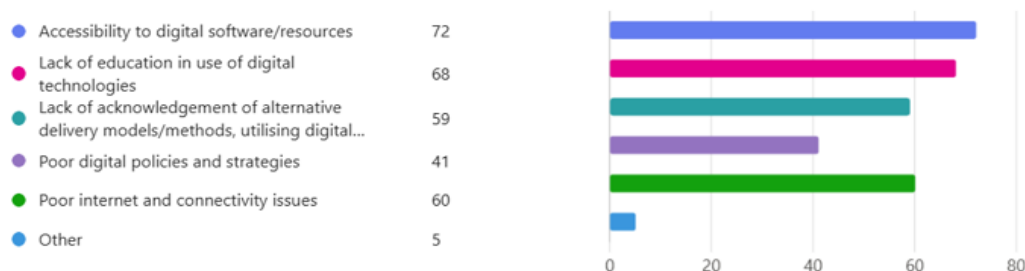


5.1.6 Barriers to implementing digital technologies in current healthcare organisations

The literature review highlighted several barriers in implementing digital technologies in the current healthcare infrastructure. These were themed together and provided the barriers in the question. Healthcare practitioners highlighted what barriers they currently see in implementing a digital infrastructure for XR across healthcare organisations (figure 16). The highest reported barrier by 72 (92%) of participants was accessibility to digital software or resources. This is followed by a lack of education in the use of digital technologies from 68 participants (87%).

The five participants who selected 'other', reported that funding, a lack of healthcare innovation, poor digital literacy, language barriers, and capacity for staff to learn and deliver were key barriers.

Figure 16 – Barriers in implementing a digital system/infrastructure for immersive technology across current healthcare organisations



5.1.7 Confidence and abilities in using immersive technology

The researcher asked healthcare practitioners participating who deliver or support vaccination campaigns, to rate their confidence in using XR if given the opportunity (figure 17). The rating scaled 1 (very poor) to 5 (excellent), and the overall rate from 63 responses was 2.64 (average rating). With only 4% rating their confidence and ability as excellent, compared to 11 (an increase of 7%) rating their confidence and ability as very poor. The highest reported rating was average, with a total of 30% (n=9).

Further information was provided by the healthcare practitioners based on their responses to their chosen rating. 54 participants (86%) provided a response (some provided multiple answers in their response), with responses summarised below (table 12).

Figure 17 – Healthcare practitioners rating in their confidence and ability in using immersive technology to increase awareness and confidence in vaccinations



Table 12 – Healthcare practitioners' response to their reasoning for the chosen rating

Summarised theme	Description	Approx count
Lack of training and education material.	Several responses highlighted a need for further education/training to support with increasing confidence and abilities in using immersive technology.	50% (27 responses) highlighted this reason for their chosen rating.
Limited or no experience and knowledge.	Limited to no exposure and lack of knowledge in immersive technology was commonly reported in the responses.	33% (18 responses) highlighted this reason for their chosen rating.
Multiple barriers impacting confidence.	Several responses highlighted, focused on a combined lack of standardisation, guidance and technical limitations (both material and user limitations).	22% (12 responses) highlighted this reason for their chosen rating.
Concerns in delivering across rural and older adults' population.	Poor accessibility and understating of digital technology, especially in older adults. Poor internet connections driving a lack of confidence in delivering immersive technology.	17% (9 responses) highlighted this reason for their chosen rating.
Increase confidence with established support.	A belief in being adaptable and having the confidence to deliver immersive technology vaccination programmes, when support and correct guidance is provided.	50% (28 responses) highlighted this reason for their chosen rating.
Previous experiences of immersive technology.	Some scoring related to already a level of confidence from previous use of immersive tech, either in work or socially.	11% (6 responses) highlighted this reason for their chosen rating.
A positive outlook on adoption and innovation.	A genuine interest from some in relation to their scoring, based on enthusiasm for opportunities to deliver innovative vaccination programmes through immersive technology.	39% (21 responses) highlighted this reason for their chosen rating.

5.1.8 Key words reflecting opportunities and barriers in using immersive technology to increase confidence and awareness of vaccinations

Healthcare practitioners were asked for two key words that reflected their views of both opportunities and barriers on the use of immersive technology to support with increasing confidence and awareness of vaccinations.

The two highest reported key words (out of a total of 31 different words) for the opportunity of using immersive technology in increasing confidence and awareness on vaccinations (figure 18) were 'Exciting and Innovative' (22 and 20 responses respectively). The two highest reported key words (out of a total of 28 different words) as barriers for using immersive technology in increasing vaccination confidence and awareness on vaccinations (figure 19) were 'Accessibility and Cost' (20 and 18 respectively).

Figure 18 – Two key words from healthcare practitioners based on their view of the opportunities with immersive technology

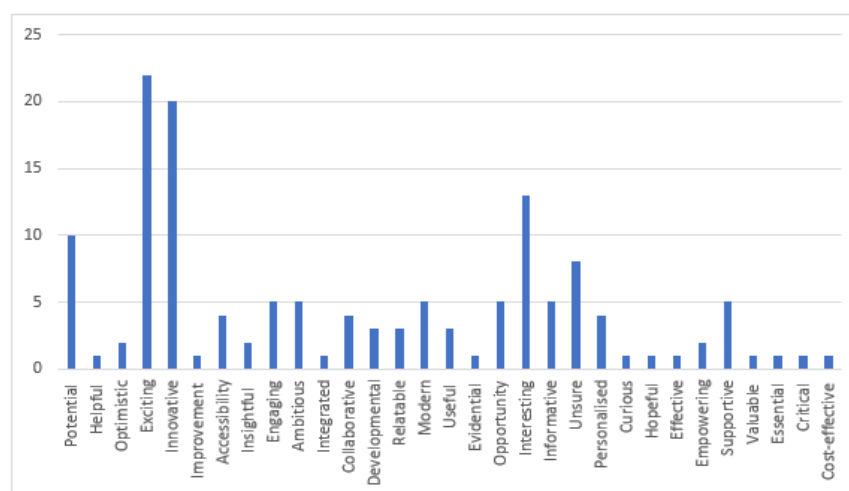
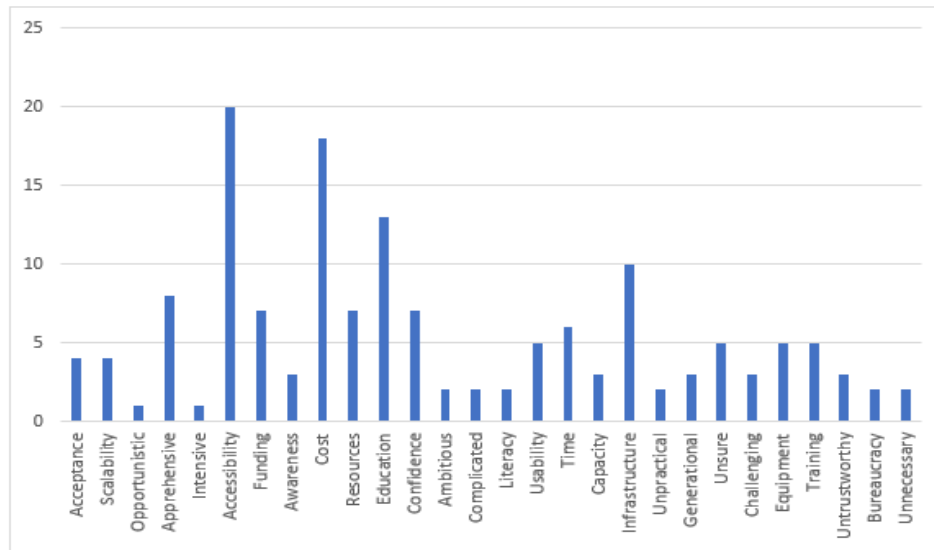


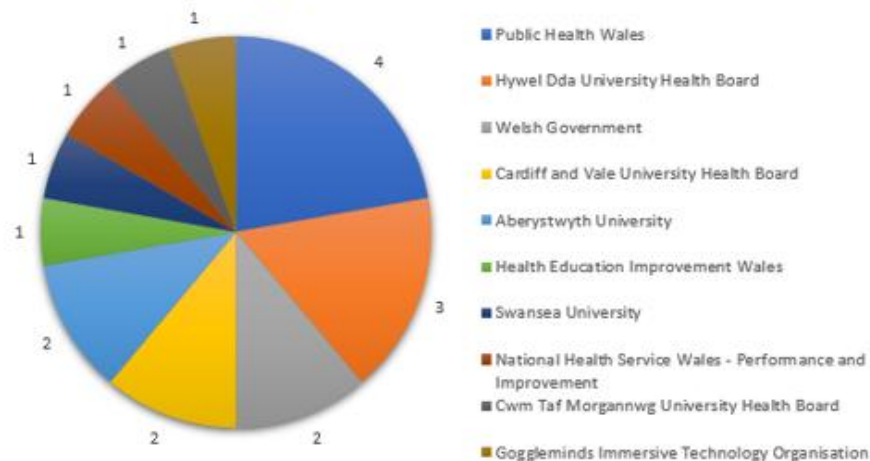
Figure 19 – Two key words from healthcare practitioners based on their view of the barriers with immersive technology



5.2 Interview analysis

18 accepted the invitation to be interviewed, from 10 different organisations (figure 20). The with highest number of interviewees were from Public Health Wales (22%), with 72% (n=13) of the interviewees delivering or supporting vaccination programmes in their current roles, and the 3 interviewees from universities, deliver XR in their healthcare and clinical education simulation departments.

Figure 20 – Interview breakdown



5.2.1 Awareness of Immersive Technology and components

As highlighted in the methodology, the interview questions included a brief statement on XR and each component of XR. To understand the knowledge of the interviewees, all 18 were asked on their awareness of XR prior to the statement. The outcome was 8 (44%) of the interviewees were aware of XR (figure 21).

They were also asked if they had heard of any of the XR components, such as VR, AR and MR prior to the questionnaire, and the 8 were aware of all 3 components, 28% (n=5) were aware of both AR and VR, similarly, 5 (28%) interviewees were aware of only VR. figure 22).

Figure 21 – Awareness of immersive technology (XR)?

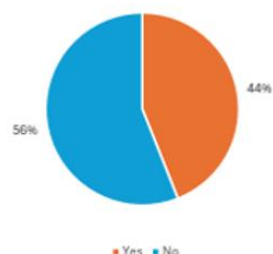
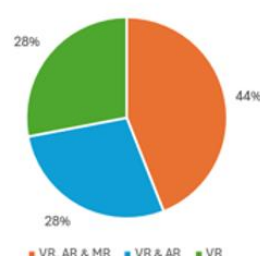


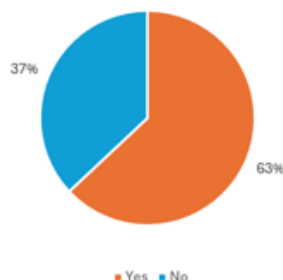
Figure 22 – Awareness of the XR components: VR, AR or MR



5.2.2 The use of immersive technology in their current role

From the 8 that reported they were aware of XR, 5 (63%) of the interviewees use XR within their current role (figure 23), though, none of the 5 currently deliver or support vaccination programmes. The reported use of XR technologies highlighted that 5 of the interviewees deliver simulation immersive clinical and healthcare education, but not public health vaccination education.

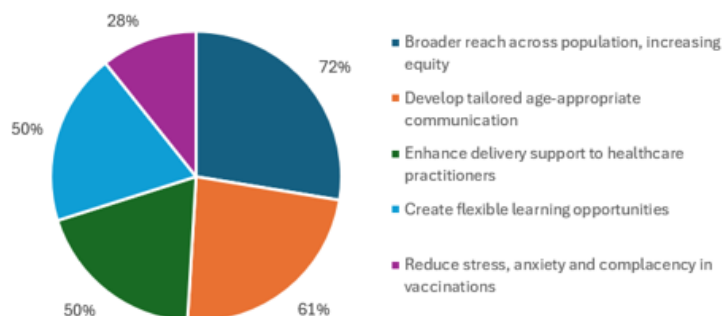
Figure 23 – Use of Immersive Technology in current role



5.2.3 The potential use of immersive technology in supporting healthcare practitioners raise public health awareness and education compared to traditional methods

Several responses from the interviewees highlighted their reflection of how immersive technology could potentially support healthcare practitioners in increasing awareness and education of vaccinations compared to current and traditional methods (figure 24). 72% (n=13) reported that it would broaden the reach across different populations, increasing equity, and 11 interviewees (61%) stated that it creates the ability to develop and deliver age-appropriate communication, with 50% (n=9) reflecting that it would enhance support and create greater learning opportunities for both the practitioners and public. Finally, 5 (28%) reported they see potential in immersive technology reducing stress, anxiety, and complacency in vaccinations.

Figure 24 – Potential of immersive technology in supporting healthcare practitioners compared to traditional methods



Further views on the potential of immersive technology are highlighted below (table 13).

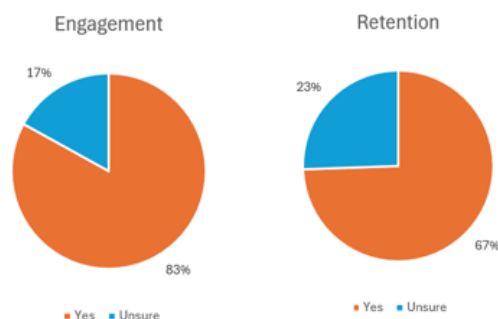
Table 13 – Insight. Potential of immersive technology in supporting healthcare practitioners compared to traditional methods

Summarised theme	Interviewee insight
Broader reach across population	Expands reach beyond traditional method, especially effective with children and young people through familiar digital formats, though care needed as some interviewees highlighted the risk of not being inclusive for all the population. Requiring a comprehensive programme that develops and adapts communication, especially with diverse groups that have lower vaccination uptake rates.
Age-appropriate communication	A unique opportunity to modernise public health education and be part of a broader communication strategy. Digital tools are scalable and can be made accessible, perfect for modern public health strategies, if the governance and systems are developed effectively and efficiently. Provides potential for alternative forms of communicating, compared with leaflets/posters, especially for younger or low-literacy audiences. However, this was reflected based on availability and accessibility to technology.
Enhanced healthcare practitioner support	Can help address declining vaccine uptake rates by making messages more engaging and relatable. Creating bite-sized learning sessions, tailored to the audiences' needs and simultaneously support greater delivery opportunities for healthcare practitioners. Offers experiential, interactive environments that deepen understanding, and supports with improving healthcare practitioners' communication and engagement.
Create learning opportunities	Creating a safe, low-pressure environment for exploring health topics. Proven to improve knowledge retention and reduce anxiety. Healthcare organisations must adapt to avoid falling behind, building on digital momentum from the pandemic. Though, some interviewees reported that inconsistent and inaccurate content may lead to misinformation, requiring careful consideration.
Reduce complacency, stress and anxiety	It was reported that immersive technology has proven to increase trust and reduce anxiety in other healthcare immersive programmes. This was reported as trust being built through relatable and realistic scenarios. Some interviewees stated that immersive experiences foster emotional engagement, improving comprehension, which is somewhat missing in current methods, though dependency on technology can create an over resilience and some reported they awareness in prolonged use of immersive technology could cause some physical discomfort (eye strain, motion sickness).

5.2.4 Potential of immersive technology supporting healthcare practitioners in enhancing public engagement and retention of public health information

Overall, there was a reflection that both engagement (figure25) and retention (figure26) had the potential to enhance public health information through XR. With 83% (n=15) and 67% (n=12) of interviewees stating that they did see potential in supporting with engagement and retention (respectively). Although none of the interviewees responded with a 'no', 3 interviewees (17%) reported they felt they were currently unsure that immersive technology would enhance engagement, and 4 interviewees (23%) were unsure if it could enhance retention of information.

Figure 25 & 26 – Potential of immersive technology in supporting healthcare practitioners in enhancing public engagement and retention of public health information



The reason for being 'unsure' instead of a 'no' response, was a current lack of understanding in the true impact without it being fully explored within public health education, a risk of excluding certain demographics and poor digital structures that fail to deliver on supporting greater retention. Further insight from interviewees into both engagement and retention is highlighted below (table 14).

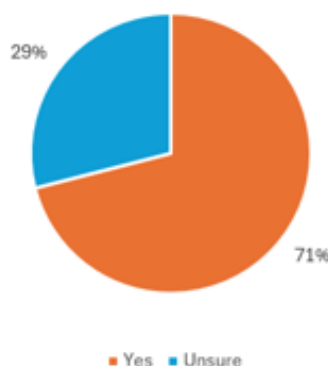
Table 14 – Insight. Potential of immersive technology in supporting healthcare practitioners in enhancing public engagement and retention of public health information

Summarised theme	Interviewee insight
Increase healthcare practitioners' ability to enhance public engagement	Interviewees started that they feel immersive technology can enhance public engagement, especially younger audiences in how they interact with digital platforms daily. Though it can risk excluding older generations and this would require adaptation and further time and capacity to support certain demographics. Gamified and interactive formats were reported as particularly effective for motivating participation and capturing attention, but the effectiveness in engaging depends on the quality of content and delivery. Enhancing communication and training with immersive technology for healthcare professionals while they are learning and studying is an opportunity to improve their engagement and communication skills.
Increasing retention of public health information	Immersive experiences were reported as a strong opportunity to significantly improve retention of public health information and already proven effective in other healthcare areas. Though to be effective, there is a requirement to integrate with existing systems and workflows, involving collaboration and governance. Experiential learning helps users absorb and recall complex health information more effectively, and immersive technology has the provision to do so. However, there were risks stated in relation to the scalability of such a programme while also being inclusive. Current structures were highlighted as insufficient for this wider delivery within public health. The effectiveness on retention of information depends on tailored audience-specific content and a thoughtful planning and design process.

5.2.5 Immersive technology influencing on behaviour change in vaccination

When asked on their view if XR could support behaviour change in vaccination programmes, 13 of the interviewees (71%) reported that it did have the potential to influence behaviour change, though similarly to the previous question, none of the interviewees expressed their opinion as a no, that it would not change behaviour. 29% (n=5) reported they felt unsure (figure 27).

Figure 27 – Potential of immersive technology influencing on behaviour change



They expressed seeing the potential, though poor knowledge, and a resistant population, combined with poor digital health strategies that do not include behaviour change theories and models reflected their unsure response (table 15).

Table 15 – Insight. Potential of immersive technology influencing on behaviour change in vaccination

Summarised theme	Interviewee insight
The ability of immersive technology in influencing behaviour change	Immersive technology is consistently described as a tool that can support with increasing visibility of the risks to health from poor lifestyle choices, while encouraging behaviours that are preventative and increase the ability to challenges misinformation of vaccinations. It was highlighted several times that immersive technology can positively impact behaviour by motivating and supporting emotional engagements and reflections on vaccinations. Enabling an emotional connection and supports users to relate the risks and impacts on some of their health decisions. Especially effective for children and young people through gamified formats. However, several interviewees highlighted their views or risks leading to their response of uncertainty from a lack of clarity on the direct/or full potential of immersive technology within public health. Some risks highlighted were that effective behaviour change requires more than just technology, requiring a broader strategy. Further risks reported was the barrier of immersive technology programme not reaching individuals that are more resistant to vaccinations (e.g., anti-vaccine individuals). Where apathy may be harder to overcome than misinformation and even with early adopters of a vaccine immersive technology programme, it may not represent the broader population.

5.2.6 Barriers in implementing new digital programmes in the current healthcare system

All 18 of the interviewees reported that the current healthcare system has or creates barriers with implementing new digital programmes (figure 28).

Figure 28 – Barriers in implementing new digital programmes in the current healthcare system



Commonly reported barriers were digital poverty, digital capacity and confidence in both healthcare practitioners and public, poor infrastructure and funding. Further insight into the commonly reported barriers is summarised below (table 16).

Table 16 – Insight. Barriers in implementing new digital programmes in the current healthcare system

Summarised theme	Interviewee insight
Digital poverty	Digital poverty is a significant threat in implementing new digital technology. Limiting the reach and access to digital provisions and resources delivered by healthcare practitioners. Reducing the ability to effectively engage with the public, increasing the risk of excluding groups due to digital literacy or poor accessibility.
Capacity and confidence	Capacity and confidence in both healthcare practitioners and the public impacts on digital development and delivery. Reporting time constraints, a lack of training and fear of technology as key barriers. Including a resistance to change in healthcare practitioner significantly reported as detrimental, particularly among older aged healthcare practitioners or those unfamiliar with using technology.
Infrastructure and IT Systems	Current digital infrastructure and IT Systems were reported as barriers, with poor connectivity, and outdated software highlighted as key issues. Further reported barriers were incompatible software that limits the ability for some healthcare practitioners, especially those working remotely across multiple locations having limited access and an inability to use software within venues/departments across organisations.
Funding and Governance	Funding and sustainability were mentioned as barriers. With costs of digital devices, limited budgets across healthcare organisations, and a lack of innovative focus, with poor long-term investment creating reduced potential outcomes in immersive technology. Further reports mentioned an inability to create or agree governance structures, and a level of ownership was also a barrier. Requiring further clarification on roles and responsibilities between healthcare practitioners and the relevant departments and organisations required to deliver immersive technology vaccination programmes.

5.2.7 Barriers in accessing digital technology across diverse and underserved communities

17 of the interviewees (94%) recognised that there were barriers in accessing digital technology across diverse and underserved communities (figure 29). With one interviewee reported that they were unsure from experience within their specific role, they seen significant increase in provisions of digital technology and accessories across underserved communities, through government funded schemes.

Figure 29 – Accessibility of digital technology across diverse and underserved communities



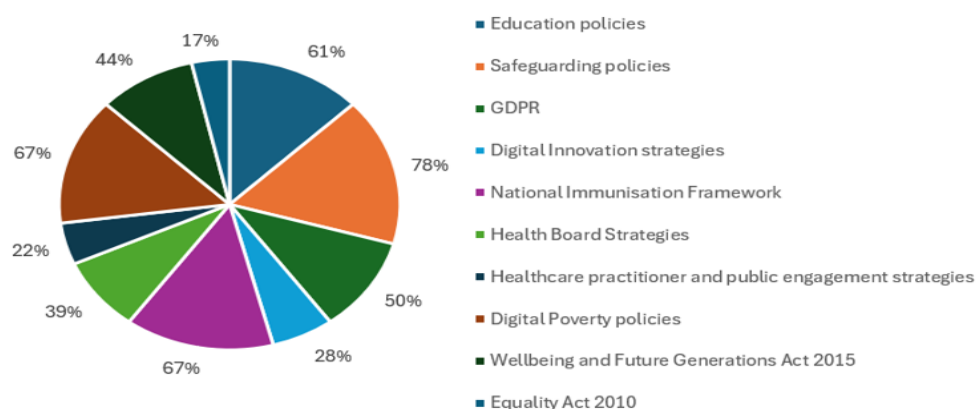
Further insight from the interviewees into highlighting barriers are summarised below (table 17).

Table 17 – Insight. Accessibility of digital technologies across diverse and underserved communities

Summarised theme	Interviewee insight
Digital poverty	Digital poverty was strongly highlighted through barriers in immersive technology across diverse and deprived communities. With stronger views on limitations in accessibility of devices, data, and the availability of the internet being key reported barriers.
Infrastructure gaps	Interviewees reported that gaps in current infrastructure in their view are worse across certain demographics and geographical areas. Poor broadband and outdated digital systems, and a lack of foundational digital tools drive digital divide and a reluctance to engage, with practitioners and the public. In addition, the unavailability and poor suitability of locations across rural and underserved communities was also highlighted as a barrier. Decreasing the ability to deliver immersive technology in suitable venues. This was highlighted as an area to focus investment, stating that success depends on using community hubs and mobile formats to reach excluded groups.
Community specific challenges	Community specific challenges such as interventions and programme engagement from diverse and specific demographic groups (i.e. Gypsy traveller communities, individuals with learning disabilities, older adults) face unique barriers. Resulting in inconsistent progress, buy-in and reluctantly to change or acceptance of a different method of engaging and delivering. Literacy and competency were also reported in the interviews, with barriers reflected among both healthcare practitioners and the public, described as a greater challenge in more rural and deprived areas. Many interviewees stated that improving access must include supporting structures for both sensory impaired and diverse learning styles.

5.2.8 Awareness of policies and strategies required to facilitate immersive technology adoption in public health education

When questioned, the interviewees mentioned ten separate policies and strategies that they believe would be important to include in the development and planning on implementing an immersive technology programme for vaccination (figure 30). There were three policies and one framework that were reported by several interviewees, with a combined total of 68% (12 interviewees highlighting all 4). Safeguarding policy was the highest reported policy, reported by 78% (n=14) of interviewees, followed by National Immunisation Framework (the Welsh Government Immunisation Strategy) and Digital Poverty policies, both reported by 67% (n=14) of the interviewees and 11 interviewees (61%) highlighted that education policies were very important.

Figure 30 – Policies and strategies required to facilitate immersive technology adoption in public health education


Further insight from interviewees that elaborated on their highlighted policies and strategies are summarised below (table 18).

Table 18 – Insight. Policies and strategies required to facilitate immersive technology adoption in public health education

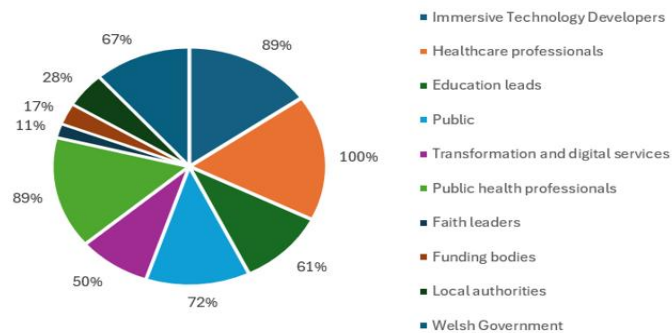
Summarised theme	Interviewee insight
Education and training	Interviewees stated that policies and strategies that support education and training, guide how both the public and healthcare practitioners can be impacted by improving confidence and awareness of vaccinations. Through a structure support system that enables learning and development across multiple organisations. With one interviewee reporting that it is vital for a programme such as immersive technology within public health education to align with key strategies within the education system. Highlighting the need to integrate immersive technology within existing frameworks like the Welsh Curriculum.
Safeguarding	Safeguarding policy was strongly reported as a key policy to ensure the use of digital technology is safe for vulnerable groups, including children. They also highlighted the benefit of the policy in guiding the ethical protection of vulnerable individuals within a digital environment. This ensures that immersive technologies are used responsibly, with informed consent and ethical considerations, especially within healthcare settings.
GDPR	GDPR was also mentioned several times, with interviewees stating that confidentiality must be adhered to. Governing how personal data is handled, especially in digital learning platforms. They ensure privacy and consent are respected of those participating in immersive technology interventions.
Digital inclusion and poverty	Digital poverty policies were highly reported which included digital inclusion strategies as part of the digital poverty policy. With interviewees strongly emphasising the aim of reducing inequalities in access to digital tools and internet connectivity. Ensuring all users can benefit from immersive health education. Promoting the development of user-friendly, accessible digital services. Guiding how immersive tools should be designed to meet diverse user needs. With a few interviewees reporting that designing digital services effectively for users enables developing effective digital service standards and guiding user-centred design. Though one interviewee mentioned that this depends on how the immersive technology platforms are built. Pointing to the importance of thoughtful design to avoid risks for vulnerable users.
Public health and engagement	Several policies and strategies were highlighted within the public health environment, such as, Public Health Education strategies, Population Health Strategy, WFGA (Well-being of Future Generations Act). With interviewees highlighting that these focus on engaging the public in health promotion and disease prevention, aligning immersive technology with broader health goals. One interviewee mentioned that by creating a supportive and non-judgmental space, it develops and provides a safe learning environment. Enabling greater engagement and outcomes.

5.2.9 Key collaborations for successful implementation of immersive technology in public health

There were 10 collaborators regularly reported in the interviews as essential in supporting the implementation of XR programme in public health. With some collaborators such as the Welsh Government generalised as a collaborator that covered multiple organisations that are part of the Welsh Government Directorates.

100% of the interviewees deemed that healthcare professionals are a vital collaborator in developing an immersive public health programme. Followed by both immersive technology developers and public health professionals, each highlighted by 89% (n=16) of the interviewees. The public as end users was mentioned by 13 interviewees (72%) as essential collaborators (figure 31).

Figure 31 – Collaborations for successful implementation of immersive technology in public health



Detailed insight from the interviewees based on key collaborators is highlighted below (table 19).

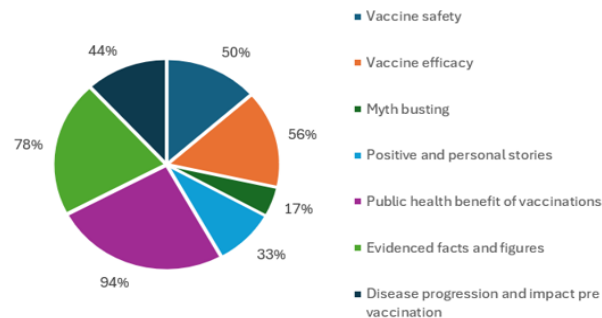
Table 19 – Insight. Collaborations for successful implementation of immersive technology in public health

Summarised theme	Interviewee insight
Importance of stakeholder collaboration	Insight during the interviews highlighted that successful implementation of an immersive technology programme within public health education requires input from a wide range of stakeholders. It was reported several times that this would require collaboration to ensure that the programme is accurate, sensitive, accessible and tailored to both practitioners and public needs. One interviewee highlighted that in developing such a programme requires a three-pronged approach of collaboration, which refers to partnership between industry, academia, and healthcare professionals. Another interviewee reported that there is a requirement highlight the value of utilising established networks to support innovation.
Identified stakeholders and internal groups	Several stakeholders were mentioned during the interviews, and within education leads there were further details reported as to focus on primary, secondary and university education leads with engagement required with local authorities in embedding a programme within the curriculum. Interviewees also highlighted within Welsh Government, specific organisations such as Digital Health Care Wales, Health Education Improvement Wales and Wales Life Sciences Hub, are vital in establishing and embedding immersive technology within healthcare for public health. Developing innovation within this field. Interviewees also highlighted that coordination of a programme requires specific input and support across health boards and digital transformation teams. While leveraging existing structures and innovation hubs supports efficient delivery and integration of new technologies. With one interviewee highlighting that stakeholder mapping is a strategic step in identifying and engaging with all relevant contributors.
User-centred design	Developing a programme based on input from users is vital, both with healthcare practitioners and the public. Co-production is essential to ensure relevance and inclusivity, as involving the public and practitioners supports with tailoring content that is relevant with real-world needs and likings, improving engagement and effectiveness. One interviewee reported that by having a user-centred approach, this ensures the technology is practical, engaging, and effective for the intended audience.
Role of academia and research	Within discussion on education, the role of academic institutions contributing to the programme through expertise in training and evaluation was noted several times. Several interviewees that currently work in simulated education departments highlight the opportunity to utilise their knowledge and expertise to increase development and adaptability of the programme. Utilising their learning to support healthcare practitioners in demonstrating the potential of immersive technology in healthcare education.

5.2.10 Key messages and information required to be implemented into an immersive technology vaccination programme

To provide an effective and successful programme, the interviewees were asked to highlight what key messages and information was required to implement a successful immersive programme in public health vaccine. Information and key messages that highlighted the public health benefit of vaccinations was reported by 94% (n=17) of the interviewees (figure 32).

Figure 32 – Key messages/information to be included in an immersive technology programme on vaccinations



Followed by 14 interviewees (78%) acknowledging that having a successful programme, evidenced facts and figures on vaccinations are important. With messages on vaccine efficacy and safety also mentioned as required within an immersive programme (56% and 50% respectively). Further insight from interviewees has been summarised across specific themes below (table 20).

Table 20 – Insight. Key messages/information to be included in an immersive technology programme on vaccinations

Summarised theme	Interviewee insight
Safety, efficacy and evidence	It was reported by many interviewees that messages on vaccine safety and efficacy should be highlighted, with clear educational and research information supporting the messages.
Countering misinformation	The focus on addressing myths and misinformation is essential. Interviewees highlighted that an immersive technology public health education programme should include guidance on identifying unreliable sources and promote trusted, evidence-based information.
Emphasising public and personal benefits	There was a strong emphasis on the importance that the messages should highlight both individual protection and community protection (herd immunity). It was reported that through sharing of parents, grandparents or guardian's stories, it creates impact of diseases on communities, building emotional connection and trust. Insight reported several times was immersive technology's advantage as a visual aid, and if delivered correctly, can enhance understanding and retention. Showing disease progression, digitalised vaccine action in the body, and real-life symptoms (e.g., rashes) makes the information more relatable and impactful.
Tailored messaging for diverse audiences	It was highlighted that education should be adapted for different age groups and learning styles. Reported by a few interviewees was their experience of young people preferring simple, benefit-focused messaging. Where older or hesitant individuals may need reassurance and clear facts. It was also highlighted that information should be displayed in user friendly layout, making it more accessible for all users and being culturally sensitive.
Support for healthcare practitioners	To have effective messages, support is initially required enabling practitioners to have accessible and consistent digital resources, that can support answering vaccine-related questions. One interviewee reported that by providing clear, aligned messaging, this builds confidence in both practitioners and the public.
Behaviour changes and emotional engagement	Behaviour change was highlighted strongly in the interviews. Stating that by having content that is emotionally engaging, this can influence attitudes and encourage uptake. One interviewee highlighting that using behaviour change techniques and storytelling helps win hearts and minds, especially when paired with key facts and figures. Utilising the COM-B model creates the chance for capability, opportunity and motivation, which then creates the platforms to impact on behaviour change.

5.2.11 Key words reflecting opportunities and barriers in using immersive technology to increase confidence and awareness of vaccinations

The final part of the interview was asking each interviewee for two key words that reflected their views of both opportunities and barriers on the use of XR to support with increasing confidence and awareness of vaccinations.

The two highest reported key words (out of a total of 14 different words) for the opportunity of using XR in increasing confidence and awareness on vaccinations (figure 34) were 'Innovation and Engaging' (8 and 6 responses, respectively). The two highest reported key words (out of a total of 12 different words) as barriers for using XR in increasing vaccination confidence and awareness on vaccinations (figure 35) were 'Accessibility and Cost' (8 and 7 responses, respectively).

Figure 34 – Two key words from interviewees based on their view of the opportunities with immersive technology

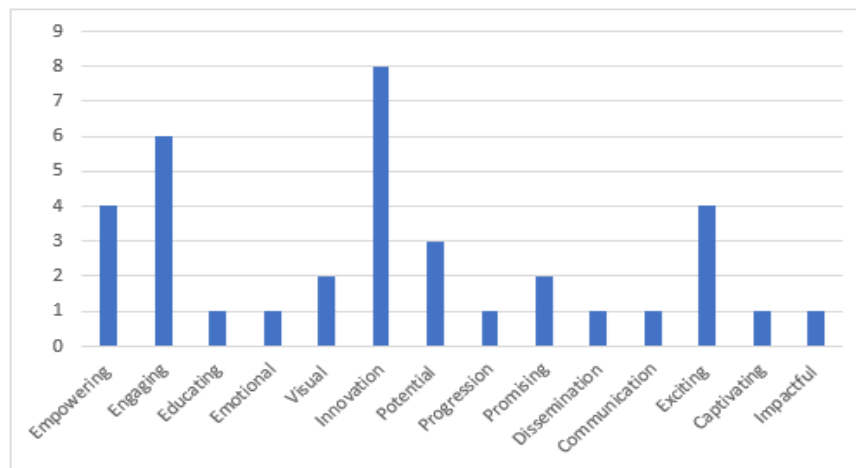
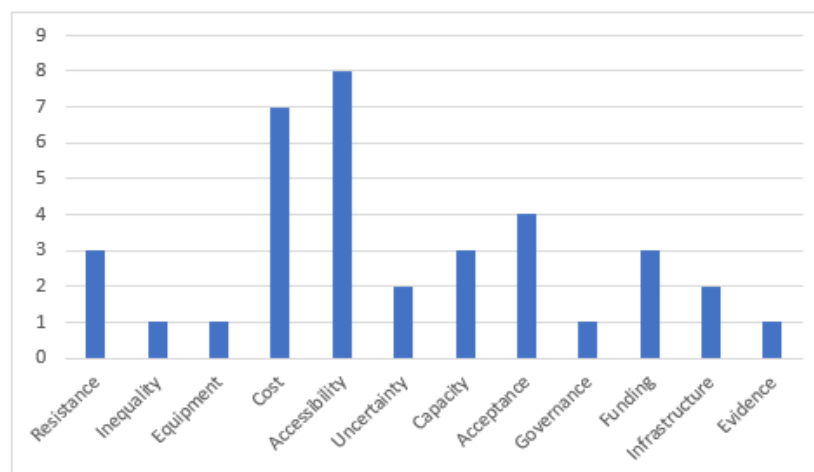


Figure 35 – Two key words from interviewees based on their view of the barriers with immersive technology



5.3 Semi-structured study conclusion

Overall, the awareness and support for XR is high and both the questionnaire and interviews offer compelling evidence that XR holds significant potential to support healthcare practitioners in increasing awareness in vaccinations. However, the potential for increasing confidence was lower, indicating a gap in trust or readiness.

Both sets of findings highlighted how XR has greater potential in younger audiences and supported the ability of XR for strengthening engagement and retention. Though barriers such as digital poverty, infrastructure, and training are consistently reported across both data sources. Further details on the overall insight are highlighted below (table 22).

Table 22 – Insight. Overall conclusion from both interviews and questionnaire

Summarised Theme	Overall insight
Current use and potential use	While 57% of the overall participants were aware of immersive technology, the current utilisation in study participants' roles remains limited (17% of the participants, 13% from questionnaire and 4% from interviews) were not involved in vaccination programmes. This highlights a disconnect between awareness and actual incorporation. Though, despite low current usage, both groups expressed optimism about XR's future role in education, staff development, and public engagement.
Barriers to Implementation	Both the questionnaire and interviews highlight significant differences in perceived effectiveness, current usage, and barriers to implementation. With accessibility and cost the most frequently cited barriers in both study methods. With accessibility highlighted by 28 participants (29%) and cost by 25 participants (29%), out of 40 individual reported key words as barriers. Further barriers highlighted in both were digital poverty, infrastructure gaps, and funding limitations which were seen as major obstacles, particularly in rural and underserved communities, with 92% of the questionnaire responses stating that they feel a lack of access to digital resources is the main barrier, with 100% interviewees also citing systemic barriers in current infrastructure. A lack of training (50%) and limited experience (33%) with immersive technology were reported by questionnaire respondents as reasons for low confidence. Interviewees echoed this, citing the need for education policies, safeguarding, and digital inclusion strategies to support adoption.
Participant Perspectives	Both groups agreed on the potential to increase awareness, and overall, 67% of the responders strongly agree/agree that immersive technology has the potential to support both increasing retention of information and impacting on behaviour change. In addition, both study methods concluded that innovation was one of the highest reported key words in the opportunity of immersive technology. Out of 45 individual words, 29% of the participants stated innovation. 50% (47 participants) felt that with adequate support and training, immersive technology could increase their confidence and learning.

6 Discussion

This research set out to explore whether XR can support healthcare practitioners in increasing confidence and awareness of vaccinations. The literature review and findings from both the questionnaire and interviews provide a comprehensive and valuable perspective on this question.

The literature review highlighted XR's potential in healthcare education, particularly in enhancing engagement, knowledge retention, and communication, with studies such as Nowak et al (2020) and Bas-Sarmiento et al (2025) demonstrating XR's ability to improve vaccine-related beliefs and motivation, especially through gamified and interactive formats. These statements were echoed in the findings from the questionnaire and interviews.

In addition, the literature highlighted the importance of Constructivist Learning Theory, Technology Acceptance Models (TAM/i-TAM), and behavioural change frameworks. These theoretical models were reflected in the findings, particularly when emphasising the potential for experiential learning, emotional engagement, and developing a user-centred design.

A key insight from both the literature and findings is the difference between awareness and confidence. This mirrored the findings in the literature review of XR's impact on attitudes and self-efficacy is less established and requires further exploration. Leading to both the literature and the findings identifying accessibility, cost, and digital literacy as leading barriers. These were the most frequently cited concerns in participants responses, which are consistent with studies by Saleem et al (2023) and Boxall et al (2025), which warned of digital exclusion and the risk of widening inequalities.

While there are noted potential, the findings highlighted the requirement for policy alignment, training, and infrastructure investment, reinforcing the literature's call for systemic support. These create opportunities to

develop XR in public health education, with interviewees and literature sources underlining XR's adaptability for diverse audiences.

7 Conclusion

The research has successfully addressed its aims of assessing the potential of XR in supporting healthcare practitioners in increasing confidence and awareness of vaccinations. Furthermore, the objectives were met by providing a comprehensive literature review producing detailed insight into current knowledge and theoretical models.

Identification of opportunities and barriers through mixed-method research were explored, analysed, and concluded. Providing insightful comparison between literature and the study's findings, resulting in clear recommendations for future development and planning.

The study highlights XR's potential if content is considerably developed and deployed. Then vaccination education and engagement can be transformational, and the right investment, governance, and collaboration can facilitate bridging gaps in vaccine confidence and awareness, contributing to more equitable and effective public health outcomes.

XR offers innovative, engaging, and scalable solutions for public health education, especially when co-designed with users and aligned with policy frameworks, and future research should prioritise solutions that align with evolving healthcare needs and the requirement for supportive documents (both quantitative and qualitative) to be peer reviewed that have rich and beneficial findings on this specific topic.

To realise its full potential, healthcare systems must address digital inequalities, invest in training, and foster collaborative partnerships across public health, education, and technology sectors. With the right policies, governance, and user-centred design, XR could become a transformative tool in public health vaccination programmes.

7.1 Recommendations and next steps

Based on the findings from the study, the following recommendations are proposed to support the effective integration of XR in vaccination programmes and public health education. Below is a driver diagram that focuses on developing a programme based on four primary drivers that drive scope and development of the secondary drivers. These drivers provide a focus and highlight key recommendations and requirements as the next steps in developing the programme (figure 36).

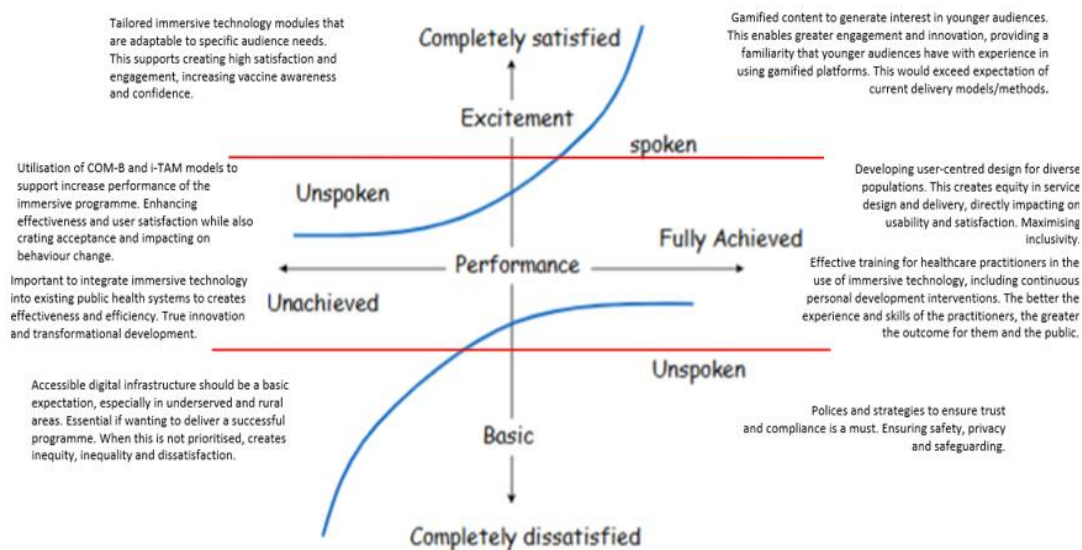
Figure 36 – Driver diagram for next steps based on study outcomes and conclusion (Authors own, 2025)



Further understanding and acknowledgment of the drivers, using the KANO Model (figure 37), enables grouping key processes/expectations (both in healthcare practitioners and the public), based on three categories (Basic, Performance and Excitement). These provide developers the ability to prioritise and drive

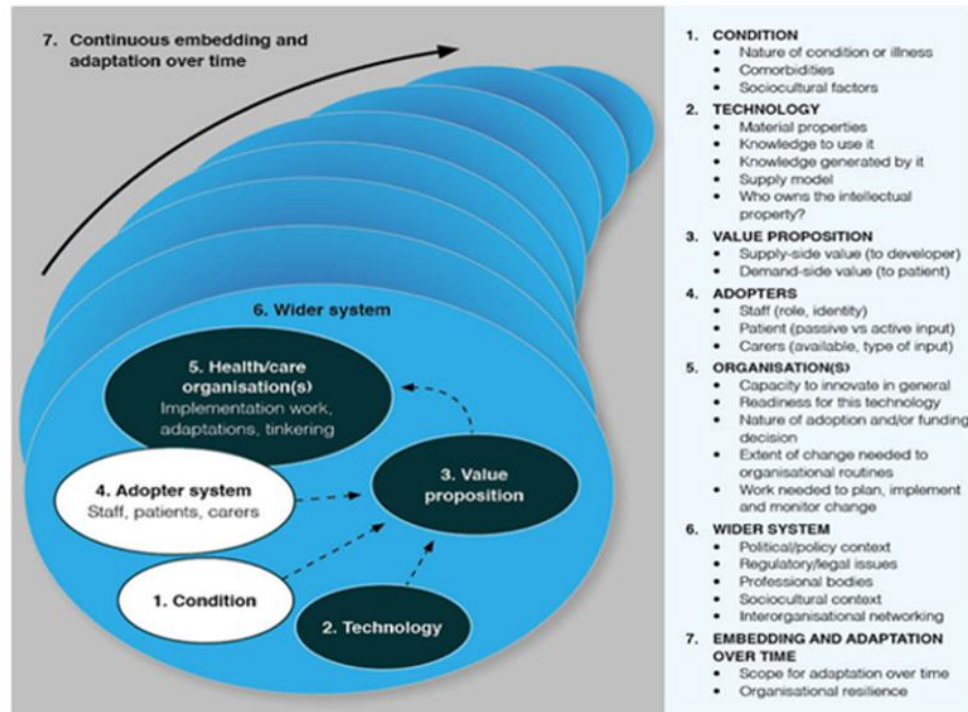
impact satisfaction, ensuring the must haves (basic), deliver effective and efficient interventions (performance) and provide additional innovative methods (excitement), increase buy-in and acceptance.

Figure 37 – KANO Model: Basic, Performance and Excitement (Authors own 2025; Watchinger, 2023)



To support adoption and implementation of XR, stakeholders require a framework to support their planning. The NASSS framework (figure 38) focuses on challenges, moving from a small test project to mainstream. Fundamental for successful implementation of innovative technology within healthcare.

Figure 38 – NASSS Framework (Greenlagh et al, 2019)



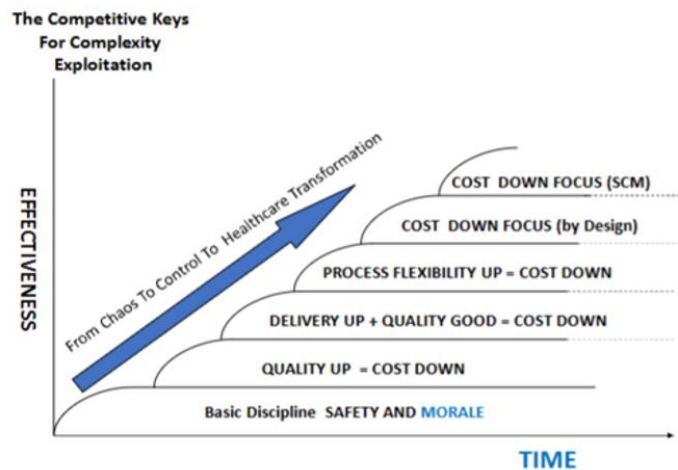
To develop on the secondary drivers (driver diagram), following the frameworks pathway of seven interacting domains, can successfully influence adoption of technology through reflecting on a process where complexity is continuously managed.

Implementing innovative technologies in health and social care is historically challenging, with demands for policies to rapidly scale up innovative technologies. The framework assists decision making, highlighting implementation and service design opportunities, and improving organisational acceptance.

A successful programme rests on the confidence, trust and agreement of the healthcare practitioners delivering an XR programme. The Sandcone model (figure 39), provides us with a 'Mastery Process', highlighting how each step is a critical section as part of an entire process, in ensuring achievement towards effective service delivery, with a model logic that must not be broken.

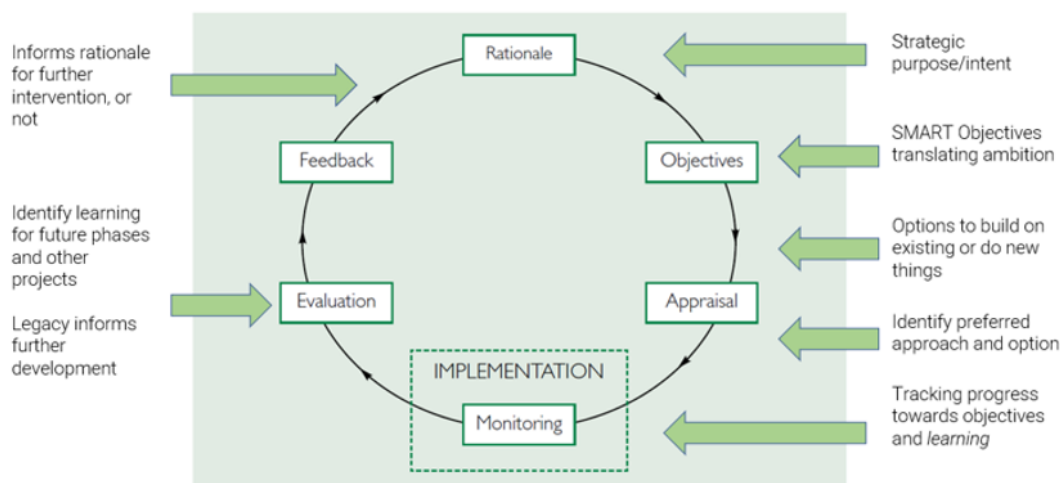
The important focus is to ensure that practitioners are happy and feel safe, with a sense of fulfilment in their roles, and will strive to deliver the best service possible to make a difference. A key factor when looking at developing and engaging with key stakeholders on new and innovative delivery methods, where change can be a barrier and create disengagement.

Figure 39 – Sandcone model (Rich et al, 2004)



Finally, to enhance support and engagement from all stakeholders in the adoption of the XR programme. The ROAMEF model (figure 40) identifies and demonstrates the stages through a continuous cyclical process. Successful innovation is established through repetition and developing and maintaining a cycle in combination with other highlighted and discussed models. It supports early planning for evaluation and embedding SMART objectives, logic models, and theories of change. Providing the opportunities for successful and desirable outcomes for all, including the two most important stakeholders, the healthcare practitioner (deliverer) and the public (end user).

Figure 40 – ROAMEF Model (HMT, 2018)



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9 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Exploring the dynamics of the Welsh Health Hack and its' contribution to Innovation.

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Abstract:

This study explores the Welsh Health Hack (WHH) as a time-compressed, collaborative innovation methodology designed to address persistent challenges in health and social care across Wales. Using a qualitative case study approach, it examines participant experiences, motivations, and outcomes from WHH events held between 2017 and 2022. Drawing on interviews, observations, and literature, the research highlights WHH's role in fostering rapid prototyping, cross-sector networking, and early-stage innovation. While participants reported strong support for the method's value in generating patient-centred solutions and sector visibility, barriers such as limited post-event support, funding transparency, and organisational constraints were identified. The study develops a conceptual framework to map WHH's innovation process and proposes strategic improvements to enhance sustainability and scalability. Findings contribute to understanding how hack-based models can be integrated into national innovation ecosystems and inform future research, policy, and practice. This is the first study of its kind in Wales and offers a foundation for advancing agile, inclusive innovation in public services.

Keywords: Welsh Health Hack, Health and care innovation, Time-compressed innovation, Hackathon methodology, NHS Wales, Innovation ecosystem, Rapid prototyping, Cross-sector collaboration, Patient-centred innovation, Public sector innovation, Agile development, Innovation sustainability, Stakeholder engagement, Innovation funding, Healthcare transformation

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1 Introduction

1.1 Background and Context

The Welsh NHS faces persistent challenges from an ageing population, increasing demand, workforce shortages, and underperformance in key service areas (Dixon-Woods et al., 2024). Despite numerous improvement initiatives, including digital transformation efforts, change has fallen short of transforming performance (Barnes, 2025).

The Ministerial Advisory Group NHS Wales Performance and Productivity review highlights that patients in Wales are at heightened risk of harm due to systemic inefficiencies in key service areas including planned care, diagnostics, cancer services, and emergency care (Ministerial Advisory Group, 2025). The report shows Wales lags many European countries in health outcomes, access, and population health indicators. Acknowledging some success in implementing improvement strategies, these have largely focused on incremental changes rather than transformative solutions.

The Improvement Cymru Strategy (2021-2026) recognises that traditional models of improvement – primarily focused on frontline services – are no longer sufficient for addressing contemporary challenges. The strategy calls for a new system-wide approach that emphasises collaboration across organisational boundaries, regional integration, and building sustainable capability. This includes a shift towards population health, prevention and reducing harm, which requires transformative innovation rather than incremental change.

Health hack initiatives represent a promising avenue for addressing these entrenched challenges and is the focus of this study. By fostering collaboration, creativity, and rapid iteration, these approaches can help strengthen health and social care delivery in Wales to better meet the needs of both patients and professionals.

1.2 Drive for Innovation in Wales

Table 1 outlines the key strategic policies and strategies which outlines the drive for innovation in Wales by addressing key population health and wellbeing challenges. Initiatives such as health hacks support the delivery of these strategic ambitions through:

- Collaboration with communities, health care, and public bodies for innovative solutions.
- Encouraging long term health benefits and reduce health care costs.
- Stimulating new ideas and approaches in health and wellbeing.
- Improving health outcomes through innovative practices.
- Bridging the gap between research and practical application.
- Increasing public involvement in health research, ensuring relevance and impact.

Table 1 Innovation Strategic Context

Title	Year	Publisher	Ambitions
Welsh Government Innovation Delivery Plan	2023	Welsh Government	Collaborative working across the innovation ecosystem Translational research and real-world impact Geographic and demographic equality A thriving innovation culture
Well-being of Future Generations (Wales) Act	2015	Welsh Government	Long-term thinking Prevention Integration Collaboration Involvement

Health and Care Research Wales Plan (2022–2025)	2023	Health and Care Research Wales	Patient and public involvement Rapid translation of research into practice Support for innovation and improvement in health and care services

These initiatives harness and strengthen the Welsh innovation ecosystem and foster collaborative innovation in life sciences (Welsh Government Innovation Delivery Plan, 2023; James and Davies, 2024). The reports highlighted the importance of a robust national research and evidence base, along with inclusive stakeholder engagement, real-world relevance, and the alignment of innovation efforts with population health priorities. Central to their analysis is the concept of push-pull innovation processes where innovation is driven by evidence (push) and by policy/service needs (pull). Figure 1 shows the actors which contribute to the innovation ecosystem and demonstrates how initiatives (e.g. Welsh HH) provide platforms which facilitate translation of strategic ambitions into practical, community-based innovation.

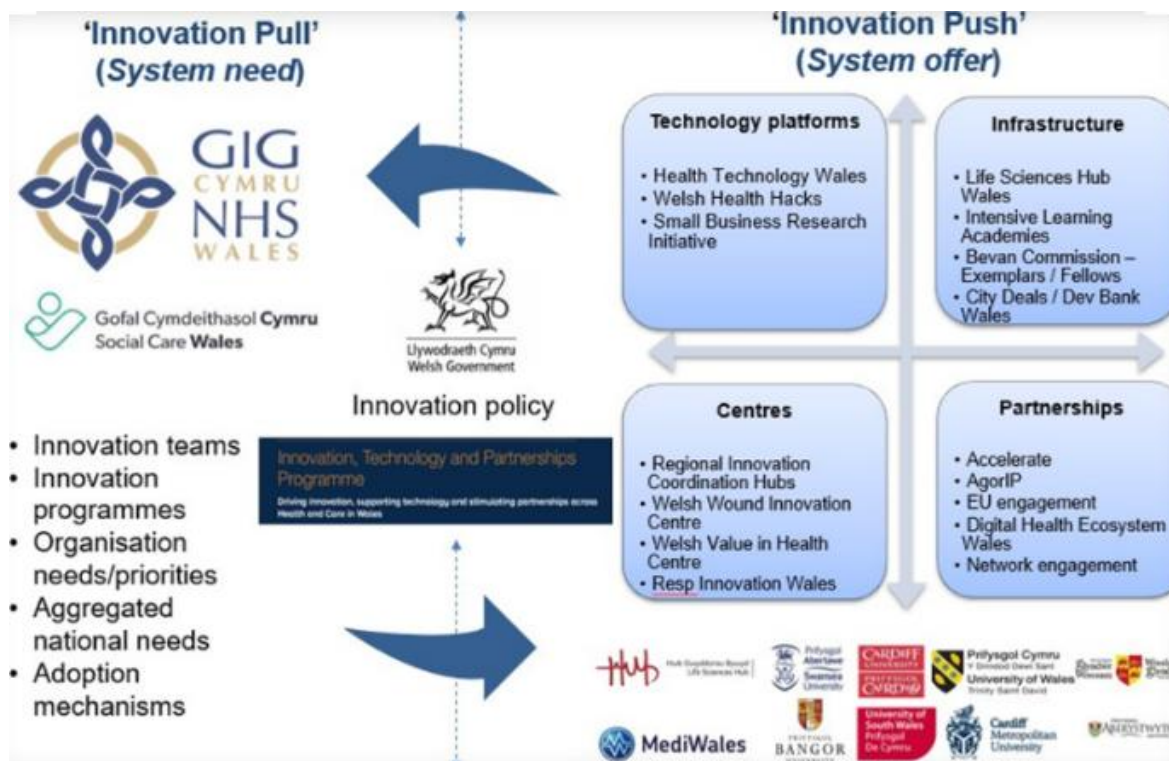


Figure 1 Welsh Innovation Ecosystem ‘push’ and ‘pull’ organisations. (James and Davies, 2024)

1.3 Personal Drive for Innovation

The researcher is responsible for planning and delivering regional programmes aimed at improving population outcomes in Southwest Wales, covering service transformation, research and innovation, workforce and education. She understands the barriers and enablers of innovation through the development of an AI tool in skin cancer for patient self-management and earlier diagnosis. The researcher was personally motivated as she collaborates with multiple stakeholders across different organisational boundaries, and enjoys understanding varying perspectives, views, and finding common ground to collectively deliver organisational purpose.

1.4 Research Question and Objectives

The research aims to explore the health hack methodology and to capture the perceptions of participants to:

- Assess utility from multi-stakeholder perspectives.
- Evaluate the hack's impact on innovation success and product/service launches.

- Capture participant experiences over the 2-day session.
- Examine the funding process and innovation selection.
- The economic benefits of the innovations.
- Observe the process as it happens.

1.5 Chapter Summary

The introduction of the research outlines the persistent challenges of the Wales health and social care system, demonstrating the need for transformative innovation over traditional incremental models of change. It highlights the potential of health hacks to address these challenges through collaboration and rapid innovation – which aligns with strategic direction. This sets the context for exploring the Welsh health hack's contribution to innovation in Wales. The subsequent sections will outline the existing literature, research methodology, findings, discussion and conclusions of this research.

2 Literature Review

2.1 Definitions of innovation

Innovation is a multifaceted concept with several different purposes and definitions (Schumpeter, 1934). Taylor (2017) defines innovation as the implementation of new or significantly improved products, processes, marketing methods or organisational practice. Todorov et al. (2024) expands on this definition, adding that innovation is a measurable, multidimensional construct with economic and societal impacts. Taylor (2017) synthesised multiple definitions to provide a composite view, proposing that innovation involves creativity, implementation and value creation. However, Tidd & Bessant (2021) offer a strategic definition, postulating that innovation is a strategic tool for competitive advantage. Mathias et al., (2024) categorised innovation into types – product, process, market, organisational, technological, incremental and disruptive – and levels – individual, organisational, and systemic. They highlight the critical role of innovation as a driver of economic and social development, which is reliant on complex interrelations and integrations between innovation types and levels. While useful, innovation typologies do not capture the full complexity of the innovation process within the real world.

Definitions for concepts and terms within the Literature Review are defined in Table 2.

Table 2 Definitions

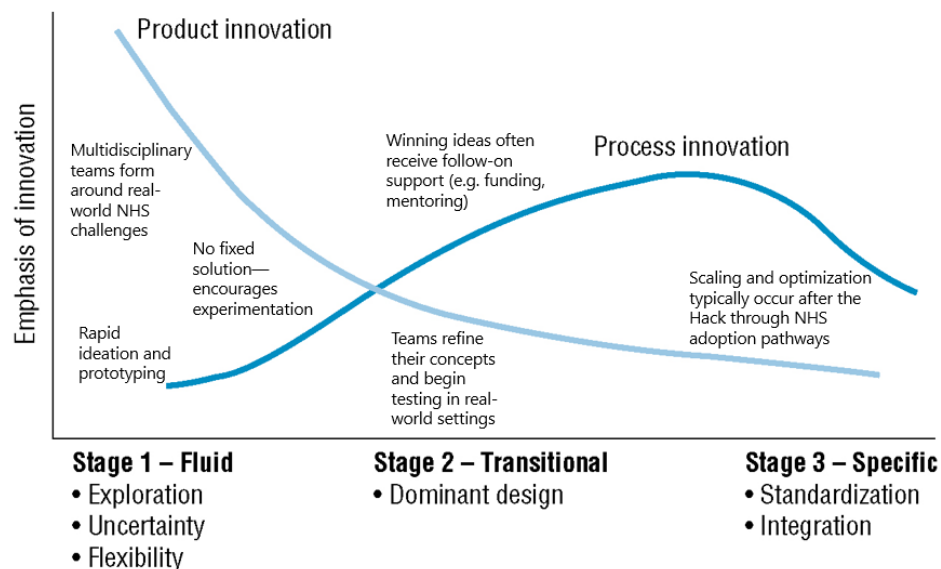
Term	Definition	Acronym	Reference
Incremental innovation	Small, continuous improvements made to existing products, services, or processes	II	Kim et al. (2019)
Disruptive innovation	Innovations that create new markets by introducing simpler, more affordable, or more convenient products or services, often displacing established market leaders over time.	DI	Martínez-Vergara & Vallis-Pasola (2020)
Artificial Intelligence	Systems that display intelligent behaviour by analysing their environment and taking actions (with some degree of autonomy) to achieve specific goals.	AI	Sheikh et al. (2023)
Innovation Ecosystem	Evolving set of actors, activities, artifacts, institutions, and relationships (including both complementary and competitive elements) that influence the innovation performance of individuals or organisations.	IE	Granstrand & Holgersson (2020)
Welsh Health Hack	Time-bound, collaborative event where participants from diverse backgrounds (e.g. healthcare, technology, design, and business) form interdisciplinary teams to develop innovative solutions to health-related challenges.	WHH	Medina Angarita & Nolte (2020)
Welsh Government	The devolved government for Wales, responsible for health, education, and economic development, established under the Government of Wales Act 2006.	WG	Welsh Government (2021)

Technology Readiness Level	A scale from 1 to 9 used to assess the maturity of a technology, from basic principles (TRL 1) to full deployment (TRL 9).	TRL	UKRI (2022)
Intellectual Property Rights	Legal rights that protect innovations, enabling their commercialisation and strategic use.	IPR	Georgiou et al. (2025)
European Innovation Scoreboard	An EU benchmarking tool that evaluates innovation performance across member states using over 30 indicators.	EIS	Hollanders (2023)
Global Innovation Index	A global ranking system developed by WIPO that measures countries' innovation capabilities and outcomes.	GII	Hollanders (2023)
Time To Market	The time it takes for an innovation to move from concept to market availability.	TTM	Rejon-Parrilla et al. (2022)

2.2 Innovation process

Within healthcare, the innovation process encompasses various stages including ideation, development, validation, implementation and scaling. Holden et al (2021) propose an agile innovation which is a customer-centred innovation process for complex adaptive systems which can be adopted in health care. The process involves eight steps: (1) confirm demand; (2) study the problem; (3) scan for solutions; (4)

plan for evaluation and termination; (5) ideate and select; (6) run innovation development sprints; (7) validate solutions; and (8) package for launch. HH support several steps including ideating and selecting (step 5) and running innovation development sprints (step 6), as it facilitates generation of ideas, solutions and decision-making as well as rapid prototyping whereby teams collaborating intensively over short cycle sprints to produce working solutions, test them with users and obtain feedback to guide the next sprint.



Source: Adapted from Abernathy and Utterback's (1975) innovation lifecycle

Figure 2 Innovation Lifecycle

Abernathy and Utterback's (1975) innovation lifecycle support Holden et al (2021) Agile Innovation process and Figure 2 shows how the Welsh HH model can act as a catalyst for the fluid phase of innovation where creativity, user-driven design, multidisciplinary collaboration, and rapid prototyping are key. It also initiates the transitional phase but depends on broader infrastructure from the Welsh IE to carry innovations through to maturity within the specific phase.

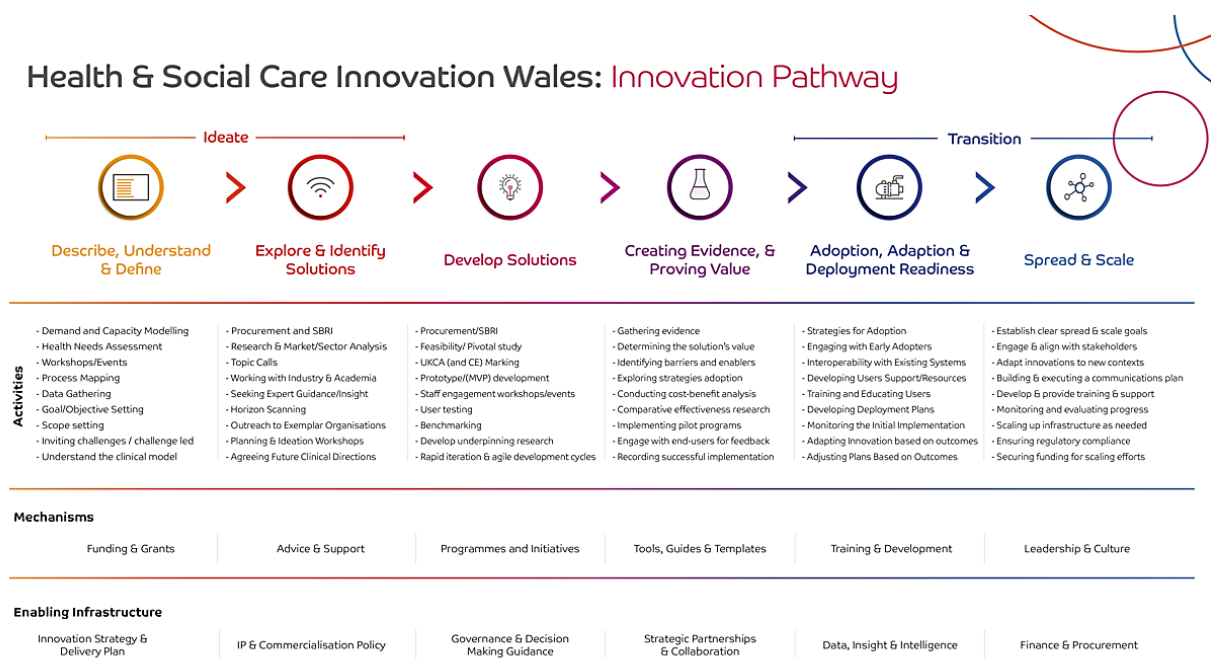


Figure 3 Health and Social Care Innovation Wales National Innovation Pathway (Charles, 2003)

Figure 3 outlines six stages of the Health and Social Care Innovation Wales Pathway. The Welsh HH supports the early stages—ideation, planning, and prototyping—by bringing together teams to rapidly develop ideas. However, it depends on the wider Welsh IE, including NHS Wales and funding bodies, to support later stages such as implementation and scaling, which corresponds with the later stages of Abernathy and Utterback's (1975) innovation lifecycle. Moreira et al (2024) examined the role of innovation capabilities such as absorptive capacity and dynamic capabilities as enablers of the innovation process. They argue that mentorship and sponsorship are key to provide credibility and guidance to support the innovation process. These relationships help innovators navigate NHS procurement and clinical validation processes, which are often barriers to adoption within the later stages of the process. Formalisation of innovation processes can enhance alignment and efficiency; however, excessive bureaucracy may hinder creativity and responsiveness. Eckert and Hüsigg (2021) found that AI and digital tools are increasingly used to streamline innovation management, helping organisations maintain agility within structured environments.

2.3 Measuring successful innovation

Sinha (2024) highlights how IE in healthcare is shaped by digital transformation and stakeholder integration, while accommodating regulatory complexity and patient-centred design. A strong innovation culture is foundational to successful innovation. James and Davies (2024) agree that successful innovation in health and social care depends on the coherence of the wider IE. Their findings stress the importance of aligning research, policy, and practice through collaborative infrastructure and propose the concept of the push-pull innovation nexus. This highlights how innovation thrives when both scientific discovery and service demand are synchronised and reinforces the view that long-term successful innovation is contingent on sustained support from national strategies, funding mechanisms and institutional partnerships. Research offers several methods for measuring success factors which contribute to innovation. Hollanders (2023) critically evaluated the EIS and GII, highlighting that while they are widely used benchmarking tools, they face limitations in capturing qualitative dimensions and regional nuances of innovation. Hollanders argued for more context-sensitive and outcome focused indicators, particularly at regional levels. This aligns with Paulden's economic approach of using cost-effectiveness and net benefit metrics to evaluate successful innovation. Both researchers advocate for more meaningful impact-orientated measures to reflect real-world value and performance. Madden et al (2024) conducted a systematic review to assess the impact of healthcare innovation on measurable outcomes. They identified key metrics for measuring innovation success including clinical impact (e.g. improved patient outcomes), adoption rates (e.g. NHS uptake), commercialisation (e.g. TRL progression, IPR generation), and sustainability (e.g. funding continuity). This aligns with WG's use of value-based healthcare metrics (including improved patient outcomes, patient

experience, and resource efficiency) to measure the impact of innovation activity outlined within its' Innovation Delivery Plan (2023).

2.4 Pressures of innovating (Time to Market)

Innovating within healthcare can provide many challenges to ensure an innovation can progress from ideation to market, before success and impact is realised. Even evidence-based innovations face slow adoption due to entrenched resistance to change, fragmented infrastructure, and risk-averse culture. Greenhalgh and Papoutsi (2019) highlight that scaling up innovation within the NHS is difficult as it requires technical implementation, cultural change, resource reallocation and staff engagement. The researchers argue that while many innovations are piloted successfully, they often fail to scale due to lack of infrastructure, funding or leadership support. Lennox et al. (2020) supported these findings, emphasising the need for sustained provision such as structured follow-up, without which, promising ideas often fail to scale. Their scoping review found that mentoring, funding pathways, and institutional sponsorship are essential to ensure innovations are embedded into practice.

During the COVID-19 pandemic, digital innovation was accelerated, however, it exposed the fragility of innovation pipelines. Puthenpurakal (2024) argue that the NHS is under pressure to modernise through digital tools and AI while managing significant backlogs and workforce constraints. This dual pressure creates urgency but also limits capacity for experimentation. To improve experimental capacity, Marcel et al. (2025) highlight the importance of access to domain experts and early-stage funding. They critique the limitations of the traditional TRL framework and propose an expanded model that includes commercialisation and societal readiness. Their findings reinforce the need for support to bridge the “*valley of death*” between innovation development and adoption and to improve TTM with accelerators providing expertise for time compressed innovation.

2.5 Forms of time compressed innovation

Time compressed innovation accelerates the process by reducing the time required for ideation, development and validation (Kagan et al, 2021). This approach uses different forms including hackathons (short collaborative events), innovation sprints (structured time-bound workshops), accelerators (intensive cohort-based programmes which compress product development and business planning), agile development cycles (used to deliver incremental innovation quickly), and rapid prototyping (fast design/iteration of an innovation) (Kagan et al, 2021). Sirén et al (2020) terms such innovation as “*polychronicity*” when multiple innovations are conducted simultaneously and found a U-shaped relationship between innovation polychronicity and an organisation’s performance – suggesting that both low and high levels of time-bound innovation are beneficial. They argue that temporal resource allocation is critical and Song et al (2023) found a J-shaped relationship between time pressure and innovation performance suggesting moderate pressure enhances creativity, while excessive pressure hinders it. All authors highlight temporal design within innovation initiatives and synchronicity for higher performance.

2.6 Origins of The Welsh Health Hack

The WHH (launched in 2017 by Life Sciences Hub Wales, the Bevan Commission, Swansea University and NHS Wales) represents a collaborative of both in-person and online events (Life Sciences Hub Wales, 2022). It began as a two-day event pairing NHS staff, university academics, and industry partners to co-create innovative solutions to address real-world clinical and operational challenges, through a structured yet flexible environment (supported by WG innovation funding and aligned with national health and care priorities) to foster agile, cross-sector innovation in public services (Welsh Government, 2023). The WHH facilitated clinicians who could pitch problems and work with academia and industry to develop rapid prototypes, crowdsource ideas, share development risks and rewards, and offer a pipeline for further innovation. SimplyDo provided an IT platform to facilitate digital engagement and collate submissions in similar form to the hackathon format of Massachusetts Institute of Technology’s (MIT) Hacking Medicine platform (Gubin et al., 2017).

2.7 Effectiveness of The Welsh Health Hack

The WHH is an effective means of fostering rapid, collaborative healthcare innovation (Life Sciences Hub Wales, 2019). The 2-day WHH event (2019) “*Winners*” was a digital app for post-breast surgery physiotherapy yielding greater patient care and NHS cost savings and a user-centric approach to the practical solution. The WHH was widely endorsed by ministers and industry leaders as a powerful platform

for healthcare innovation in Wales (M-SParc, 2022). Eluned Morgan, then Minister for Health and Social Care stated that *“The solutions developed... will further help us in our path to Covid-19 recovery by solving real world health challenges.”* (M-Sparc, 2022).

A case study of the virtual WHH (Hwb Menter, 2020) outlined key lessons including the importance of inclusive marketing, managing participant expectations, and creating a positive, engaging atmosphere. Also, ensuring participants feel valued (even if they don't win) is essential to sustain motivation and future involvement. Post-event follow up was also identified as critical. Tools like Simply Do helped maintain momentum by connecting challenges, ideas, and innovators. Key outcomes included:

- 297 users and 60+ organisations participated
- 57 challenges created; 37 accepted; 5 winners
- 93% of respondents said they would use WHH again
- 78% agreed their organisations should use more WHH events
- 3 winning teams represented different health boards

Despite these sources offering useful insights into the WHH's effectiveness, they lack an objectivity over a longitudinal period and demonstration of real-world impact.

2.8 The Welsh Health Hack as a healthcare innovation method

Gubin et al (2017) examined the MIT Hacking medicine model, on which the WHH is modelled, and found a systems approach to healthcare innovation where participants were guided through four stages: identification, description, alteration and implementation (Figure 4). This process ensured solutions were grounded in real clinical needs and stakeholder perspectives.



Figure 4 Phases of the MIT Hacking Medicine Hackathon Model Using a Systems Approach (Gubin et al, 2017)

Identification ensures an understanding of stakeholder roles, incentives and pain points. Description helps teams to uncover leverage points for intervention and ensures solutions are grounded in real-world complexity. Alteration focus is on modifying existing systems to improve outcomes without adding unnecessary complexity. Implementation involves teams presenting a clear summary of their challenge, stakeholder analysis, and solution along with a plan for implementation and scaling. Panel evaluation based on feasibility and systems-level impact.

Gubin et al (2017) found the MIT Hacking Medicine Model was an effective healthcare innovation model that time-compresses for rapid ideation and prototyping through interdisciplinary teams of clinicians, engineers, and business experts. The model has resulted in the creation of 15+ startups, raised over £100m in funding and is an educational platform for scalable healthcare solutions (WHH is a UK-based adaptation). Similarly, Olson et al (2017) found that healthcare hackathons led to consistent output with respect to medical technology innovation, including clinical trials, business plan development, securing investment capital/funding and new company formation.

2.9 The Gap

The WHH is a promising solution for clinical innovators (Life Sciences Hub Wales, 2019), aligning with national strategies (M-SParc, 2022), and fostering early-stage innovation (Hwb Menter, 2020) but it lacks:

- Longitudinal studies on the sustainability and scalability of innovations.
- Comparative evaluations with other hackathon models (e.g. MIT Hacking Medicine)
- Explore the value and relevance of the hack from the perspectives of diverse stakeholders.
- Assess the hack's contribution to successful innovation outcomes, including the launch of new products or services within the context of the Welsh EI.
- Document participant motivation, experiences and insights gathered during the two-day event.
- Investigate how funding decisions were made and how innovations were selected for support.

Eke and Shuib (2024) argue that long-term evaluation is essential to build trust in innovation, particularly within healthcare. Without robust evidence of sustained impact, stakeholders remain hesitant to invest or adopt new solutions. Trust requires transparency, ongoing validation, and inclusive stakeholder engagement which should be embedded in ongoing post-event follow up and evaluation. Palmer, (2014) and Sastry & Penn, (2015) argue that health hackathons enthusiasm, rarely leads to sustainable innovation for factors that cannot be adequately addressed in 48 hours. Olson et al., (2017) propose hackathons hinder meaningful progress by fostering an “*artificial vacuum*” distanced from real world contexts, which raises the question, **do hackathons truly deliver substantive and lasting outcomes?** A conceptual framework (Figure 5) was developed, based on key concepts and themes arising from review of existing literature and policies on the WHH as a healthcare innovation model.

2.10 Chapter Summary

Existing literature highlights that innovation in healthcare is a complex, multi-stage process broadly involving ideation, development, validation, implementation and scaling. Key themes include the importance of a strong IE, time-compressed innovation methods, and structured support mechanisms. The WHH is presented as a promising healthcare innovation model, inspired by the MIT Hacking Medicine model. However, significant gaps remain in existing literature including long-term evaluation and understanding its' value and impact from a multi-stakeholder perspective, which are essential for building trust and demonstrating sustained impact.

2.11 Conceptual framework

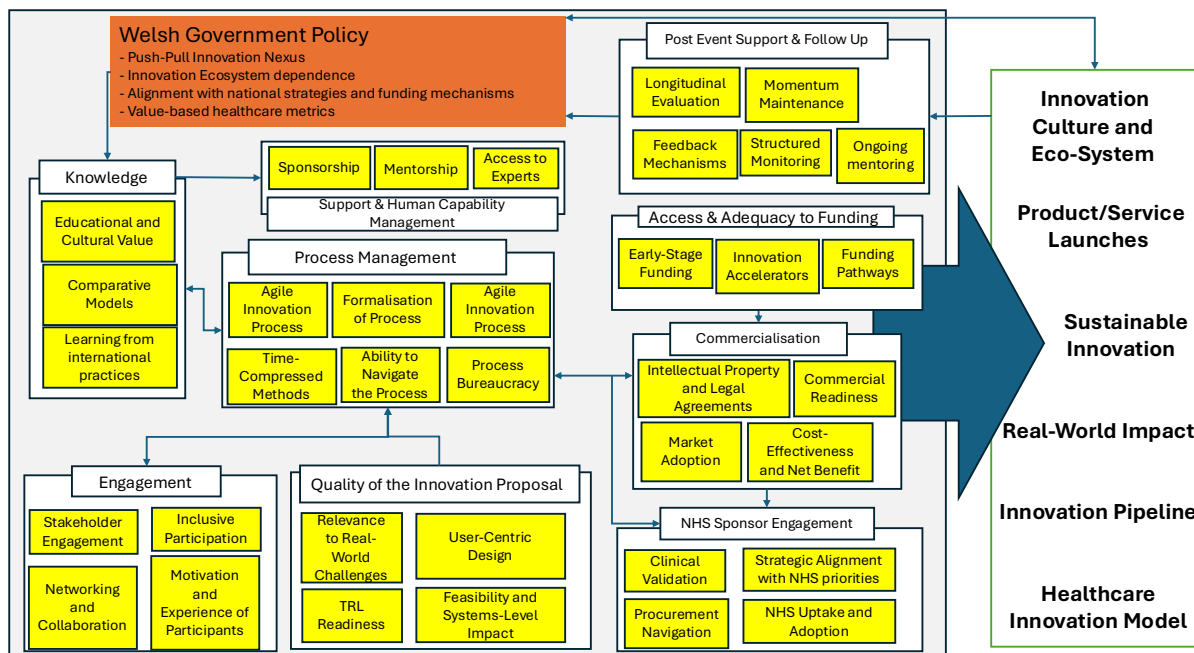


Figure 5 Conceptual Framework of the WHH based on Existing Literature (Source: Author's own)

3 Research Methods

The methodological foundation of this research begins with a literature review guided by defined search parameters then details the research design using Saunders et al. (2019) “Research Onion”, justifying a qualitative case study strategy, and the use of observations and interviews. It concludes with an overview of the data analysis process, research limitations, ethical considerations, and the generalisability of findings.

3.1 Literature Review

A comprehensive literature review was undertaken to understand existing knowledge, strategic context, and current gaps in knowledge of HH within a Welsh EI background. The literature review was guided by the search parameters and inclusion criteria outlined in table 3.

Table 3 Literature Review Parameters and Criteria

Parameters	Inclusion Criteria
Language of publication	English
Subject area	Innovation, hackathons, health and social care, Welsh Government
Business sector	Healthcare, business management, public sector
Geographical area	Global, UK, Wales
Publication period	Last 11 years
Literature Type	Peer-reviewed journals, textbooks, government policies and strategies, news media
Repositories	Swansea University iFind, Google Scholar, Scopus
Key search terms	Health hackathon, rapid innovation, innovation in healthcare, innovation ecosystem, rapid prototyping, innovation processes, commercialisation, mentorship in innovation

3.2 Research Onion and theory building

The research onion by Saunders et al (2019) was used as a framework to identify the most appropriate research methodology. The research onion is designed to guide researchers through the process of developing a research methodology. It consists of six layers, each representing a different stage of the research process: research philosophy, research approach, research strategy, choices, time horizon, and techniques and procedures. By peeling back each layer, researchers can systematically make decisions from high-level philosophical considerations to practical, tactical choices, ensuring a comprehensive and coherent research design.

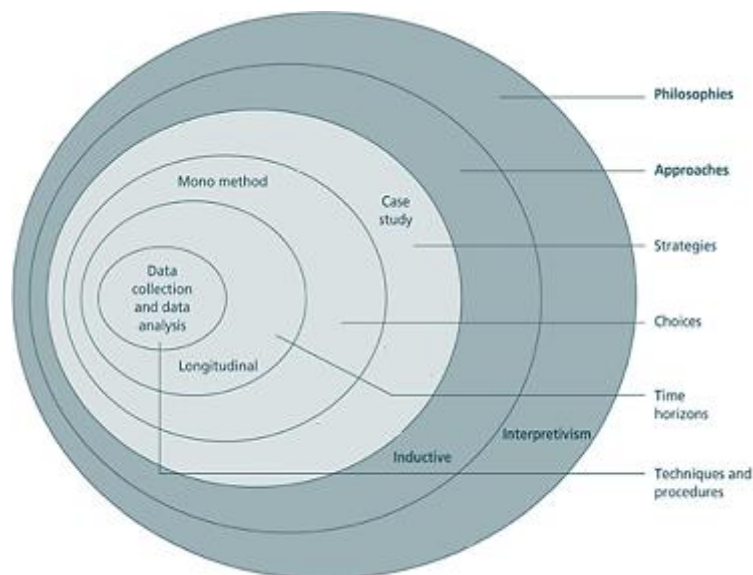


Figure 6 Research Onion adapted from (Saunders et al, 2019)

Since the WHH has not been thoroughly explored, a theory-building and context-specific approach is required. An interpretivist approach was chosen as it focuses on the subjective meanings and experiences of participants (Pervin & Mokhtar, 2022). This is crucial for understanding the personal motivations, experiences, and perceptions of those involved in the WHH. The methods are well-suited for exploring the complex social dynamics and interactions that occur during the WHH (Pervin & Mokhtar, 2022) and how collaboration between healthcare professionals, industry, and academia influences innovation. It also acknowledges the importance of context in shaping social phenomena. By applying the framework of the research onion along with the interpretivist philosophy, it was decided to include an inductive approach, case study strategy, qualitative choices, and longitudinal time horizon.

3.3 Case study approach

The research employs a qualitative case study to explore the WHH which enables in-depth analysis within a *real-life* context of policy, practice and innovation (Yin, 2014). The interpretivist paradigm supports the collation of rich, qualitative data from interviews, literature review, and participant reflections. Case studies have proven effective in capturing the dynamics of innovation hackathons, including team collaboration, user engagement and iterative design (Kagan et al., 2021). They are also well-suited to evaluating co-design initiatives in complex systems (Papoutsi et al., 2020). This approach allows for a holistic understanding of WHH and contributes to theory-building around healthcare innovation.

3.4 Observations of the Welsh Health Hack

Observations of the WHH captured the contextual richness and nuanced dynamics of events as both practical interventions and a strategic tool. This allows the exploration of participant motivations, the influence of organisational structures, and the emergent outcomes of collaborative innovation to be detected.

3.5 Interviews

Semi-structured interviews were employed (see Table 4).

Table 4 Interview Methods

Participant Selection	Purposeful sampling of individuals involved in Welsh Health Hacks between 2017–2022, including NHS and social care winners, industry partners, WHH organisers, contributors and panel members.
Interview Length	30–60 minutes per interview, depending on participant availability and depth of engagement.
Question Types	Semi-structured questions combining open-ended prompts, Likert scale prompts, and follow-ups to explore motivations, experiences, and perceived outcomes.
Interview Themes	- Innovation motivation, enablers and barriers - Role of collaboration and mentorship - Strategic alignment with NHS Wales goals - Post-hack impact and sustainability
Recording Method	Interviews took place via MS Teams. Audio-recorded with participant consent; transcribed verbatim for thematic analysis via MS Teams.

Interview questions were developed to capture first-hand *lived experiences* of WHH participants and perceived enablers and barriers to innovation (see Appendix 2). Interviews took place in 2022 and 2024 allowing progress to be tracked and monitoring impact of innovation over time.

3.6 Data Analysis

After analysing the interview responses (developing initial themes), the researcher used pattern matching to compare the emergent themes with expected patterns from the conceptual framework and review of

existing literature thereby improving internal validity (Yin, 2014). Matches between observed and expected patterns will strengthen findings, while unexpected themes can signal new insights or requirement to refine the model. In parallel, special attention is given to outliers – participant responses that deviate from the dominant themes. Instead of dismissing these, the research will examine why they differ. Investigating such deviant cases can reveal unique barriers or alternative perspectives on the WHH, ensuring that exceptions are understood rather than overlooked. Including these negative cases adds rigour and nuance to the analysis by broadening the understanding beyond the most common patterns.

Table 5 Data Analysis

Display Type	Application in WHH Research
Thematic Matrix	Rows = themes (e.g. collaboration, barriers); Columns = participants/number of responses
Pattern Matching	Compares expected themes (from literature) with observed themes in WHH interviews.
Outliers	Captures deviant responses that challenge or expand dominant themes.
Conceptual Frameworks	Visualises relationships between themes (e.g. how mentorship influences sustainability).

To support both pattern matching and outlier analysis, the research used visual data displays such as matrices and tables outlined within Table 5 (Miles et al., 2014). For example, a pattern-matching matrix aligns expected themes with actual interview findings to highlight where they coincide or diverge, and an outlier table documents any unique responses alongside possible explanations. These tools help systematically compare data across interviews, making it easier to spot patterns and anomalies and to draw coherent conclusions.

3.7 Research limitations

The following research limitations were considered:

- Welsh health and care innovation context, with limited comparisons to similar public sector organisations.
- While some innovations progressed to funding, there was no systematic mechanism to track the long-term journey of all projects. This limits the ability to assess the full innovation pipeline or return on investment.
- Some comparative literature used in the review (e.g. international studies) may not fully translate to the Welsh context due to differences in funding structures, healthcare systems, and IE.
- As interviews were conducted by researchers familiar with the WHH context, there is a risk that tone, phrasing, or expectations may have influenced participant responses.
- Thematic analysis relies on researcher interpretation, while systematic, is inherently subjective. This may affect how themes are identified and prioritised.
- While longitudinal insights are valuable, they are also vulnerable to participant attrition, memory bias, and shifting organisational contexts, which can complicate comparisons over time.

3.8 Ethical Approval

Ethical approval was approved by Swansea University Humanities and Social Sciences Ethics Committee (see Appendix 1) based on:

- Informed participant consent obtained
- Voluntary participation and option to withdraw at any stage
- Anonymity – informant data was coded to remove identification
- Provide a safe environment for participants to talk freely and honestly without fear of personal or professional repercussions, and,
- Data was stored manually and adhered to data protocol of 1 year following project completion

3.9 Generalisation

While the WHH research offers valuable insights into innovation practices within Welsh healthcare, its' generalisability is inherently limited by its' case study design. As such, the findings are context-specific, shaped by the structure of the Welsh health and care system, regional policy frameworks, and the unique collaborative culture of the Welsh IE.

3.10 Chapter Summary

The research design and methodology underpinning the research represents a qualitative case study, supported by observational insights and semi-structured interviews. Thematic analysis was used to perform data analysis.

4 Case Study: Welsh Health Hack

4.1 Background and Purpose

The WHH, which ran between 2017 and 2022, is a cross-sector innovation event designed to solve real-world health and care challenges (M-SParc, 2022). It brought together NHS and social care staff, academics, and industry to co-develop solutions. NHS Wales includes seven local health boards and three NHS trusts. WHH aligns with NHS Wales' goals under the Well-being of Future Generations (Wales) Act (2015) promoting integrated and person-centred care. SBUHB and HDdUHB actively contributed challenges and collaborated on solutions (Life Sciences Hub Wales, 2019). Social Care Wales supported WHH's expansion into social care. The Bevan Commission co-founded the WHH and served as judges and advisors, ensuring the WHH aligned with national innovation priorities (Life Sciences Hub Wales, 2022).

A Regional Collaboration for Health (ARCH) is a partnership between SBUHB and HDdUHB and Swansea University. It focuses on service transformation, workforce development and research and innovation. ARCH helped design and deliver the WHH and led the first Social Care Hack, whilst managing stakeholder coordination and funding (ARCH, 2022).

As leaders in academic expertise, research capacity, and student engagement, Swansea and Cardiff Universities were key WHH partners (Life Sciences Hub Wales, 2022). Swansea University's Senior Leadership Development Programme has been integrated into WHH activities, with students leading change projects that deliver tangible benefits (ARCH, 2023).

WHH connected SMEs and digital health companies with NHS and academic partners. These collaborations led to prototypes and pilots. Industry benefited from funding access and commercialisation opportunities, strengthening the regional life sciences sector and Welsh IE (Hwb Menter, 2020).

Table 6 provides a SIPOC analysis (Scholtes, 1994), which outlines the WHH innovation process by identifying its key components: Suppliers (e.g. clinicians, patients, academic and industry partners), Inputs (challenges, insights, funding, tech), Process (problem identification, team formation, idea development, pitching, support), Outputs (solutions, prototypes, collaborations), and Customers (patients, healthcare providers, NHS Wales). This framework clarifies process boundaries and supports shared understanding among stakeholders.

Figure 7 uses the swim lane model (Grönroos, 2001) to visually map the WHH process by assigning roles and responsibilities across distinct lanes. It outlines the journey from challenge identification to solution development, with lanes representing contributors such as organisers, panel members and advisors. Activities span from idea submission and team formation to pitching and post-event support. The model highlights how different stakeholders contribute at each stage, offering a clear view of collaboration and workflow within the innovation pathway.

4.2 WHH Process Analyses

Table 6 Suppliers, Inputs, Processes, Outputs, and Customers (SIPOC) Analysis (Source: Author's own adapted from the SIPOC analysis a visual representation of Deming's System Model (Scholtes, 1994))

Category	Organisation	Function
Suppliers	- Welsh Government	Sponsorship, funding, collaboration with public, private, and third sectors.
	- NHS Wales Innovation Leads	Publicity, facilitation, ongoing support for successful projects, securing in-organization support for unsuccessful projects.
	- ARCH	Health hack design and oversight, partner and collaborator coordination, project management, publicity, due diligence, and funding distribution.
	- Life Sciences Hub Wales	Publicity, project management, venue and catering, ongoing support for successful projects, facilitation at health hack events.
	- Bevan Commission	Project management, publicity, ongoing support via Exemplar programs, facilitation at health hack events.
	- Swansea University	Project management, funding distribution.
	- MediWales	Publicity, industry engagement, event management, facilitation at health hack events.
	- Simply Do	Digital platform for submitting challenges and pre-event engagement online.
	- Health Technology Wales	Publicity, due diligence, intelligence.
	- M-SParc	Publicity, event management, project management, evaluation, facilitation at health hack events.
Inputs	- NWIS (now DHCW)	Publicity, technical input and expertise at health hack events.
	- Regional Innovation Coordination (RIC) Hubs	Publicity, facilitation at health hack events.
	- Small Business Research Initiative (SBRI)	Publicity, participation at health hack events.
	- Digital Health Ecosystem Wales (DHEW)	Publicity, participation at health hack events.
	- Funding	
Processes	- Venue and catering	
	- Publicity	
	- Digital platform	
	- Technical input and expertise	
Outputs	- Submissions	
	- Project Development: Progress and impact from supported health hack projects.	
	- NHS Staff	Opportunity to work with industry and university staff to develop technology solutions.
Customers	- Industry Staff	Collaboration with NHS and university staff to develop innovative products.
	- University Staff	Participation in developing technology solutions and collaborating with NHS and industry staff

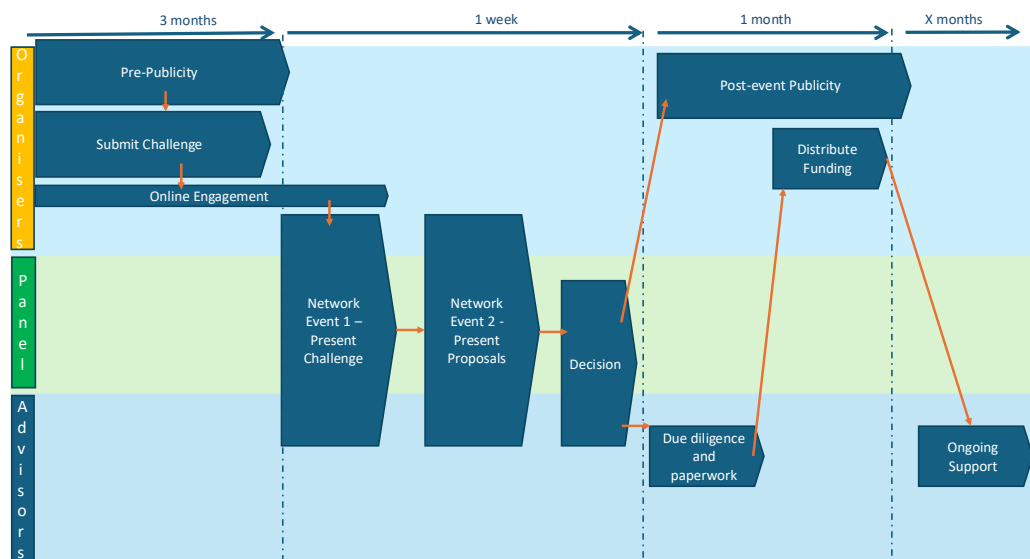


Figure 7 WHH Process (Source: Author's own adapted from Swim Lane Diagram (Grönroos (2001))

The SIPOC analysis offers a high-level overview of the WHH process by defining its boundaries and key components, while the swim lane diagram focuses on visualising the sequence of activities and the roles responsible for each step of the WHH process.

4.3 Chapter Summary

The case study of the WHH was considered an effective case through which to address the challenges of this form of innovation and offered unrestricted access to participants.

5 Findings

5.1 Introduction

This section presents the thematic analysis of interviews conducted with WHH participants between 2017 and 2022. The findings are presented from the perspective of participant type (NHS and Social Care

Winners, Industry and Other) to gain a deeper understanding of stakeholder perspectives and experiences. Themes were derived inductively and are supported by illustrative quotes.

5.2 Participants

A total of 45 participants were interviewed. Twenty-six participants were NHS and Social Care winners of the WHH events, 13 were industry participants collaborating with NHS and Social Care winners, and 6 were WHH organisers, sponsors or panel members.

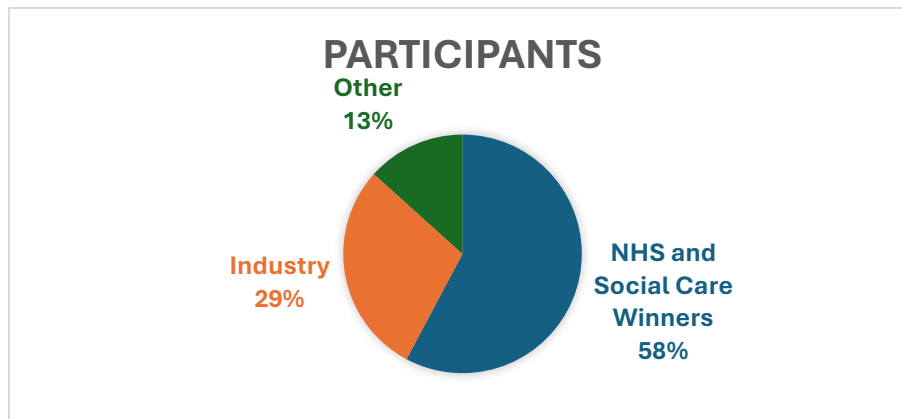


Figure 8 Participant Demographics (Author's own)

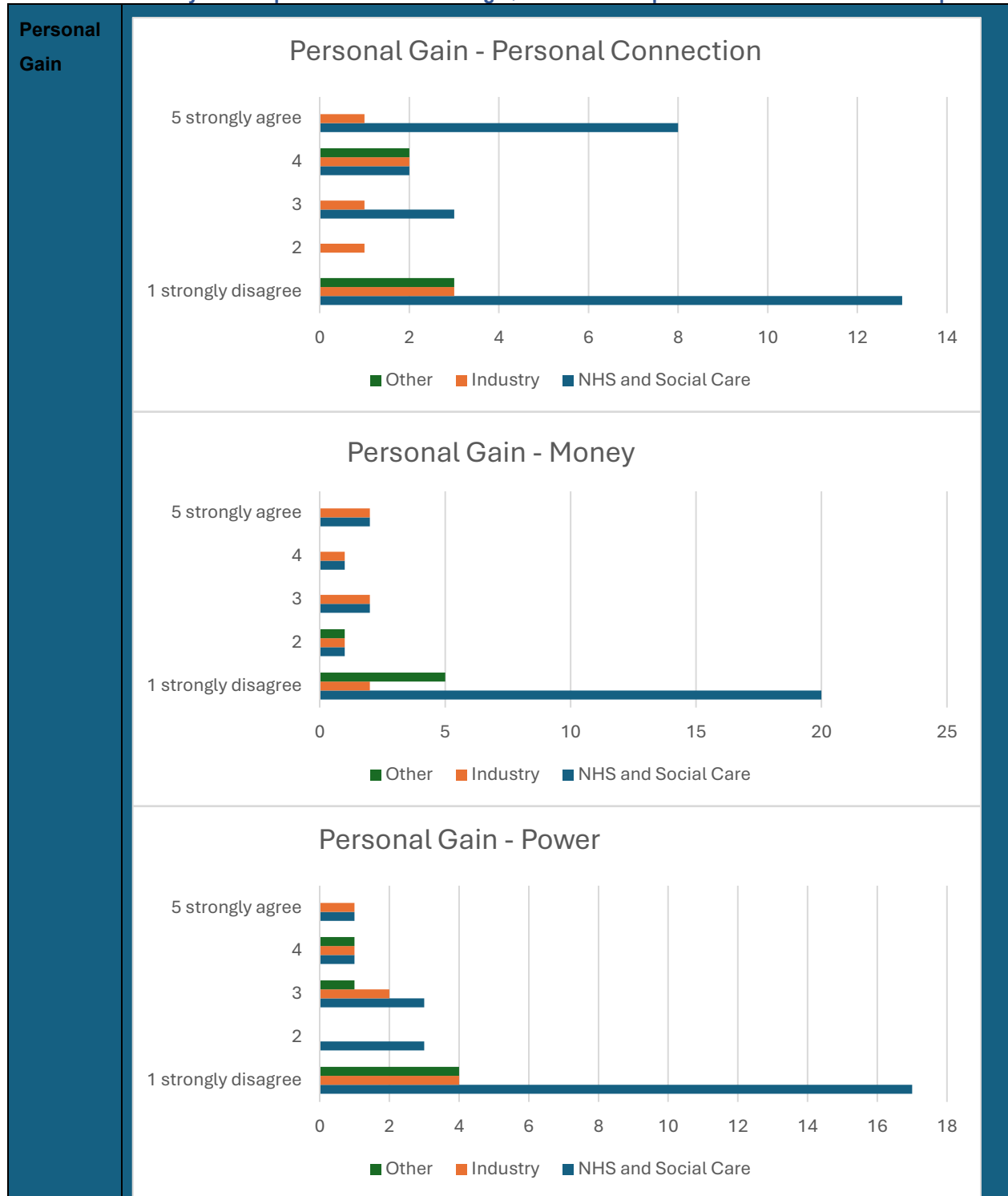
5.3 Motivation to Participate

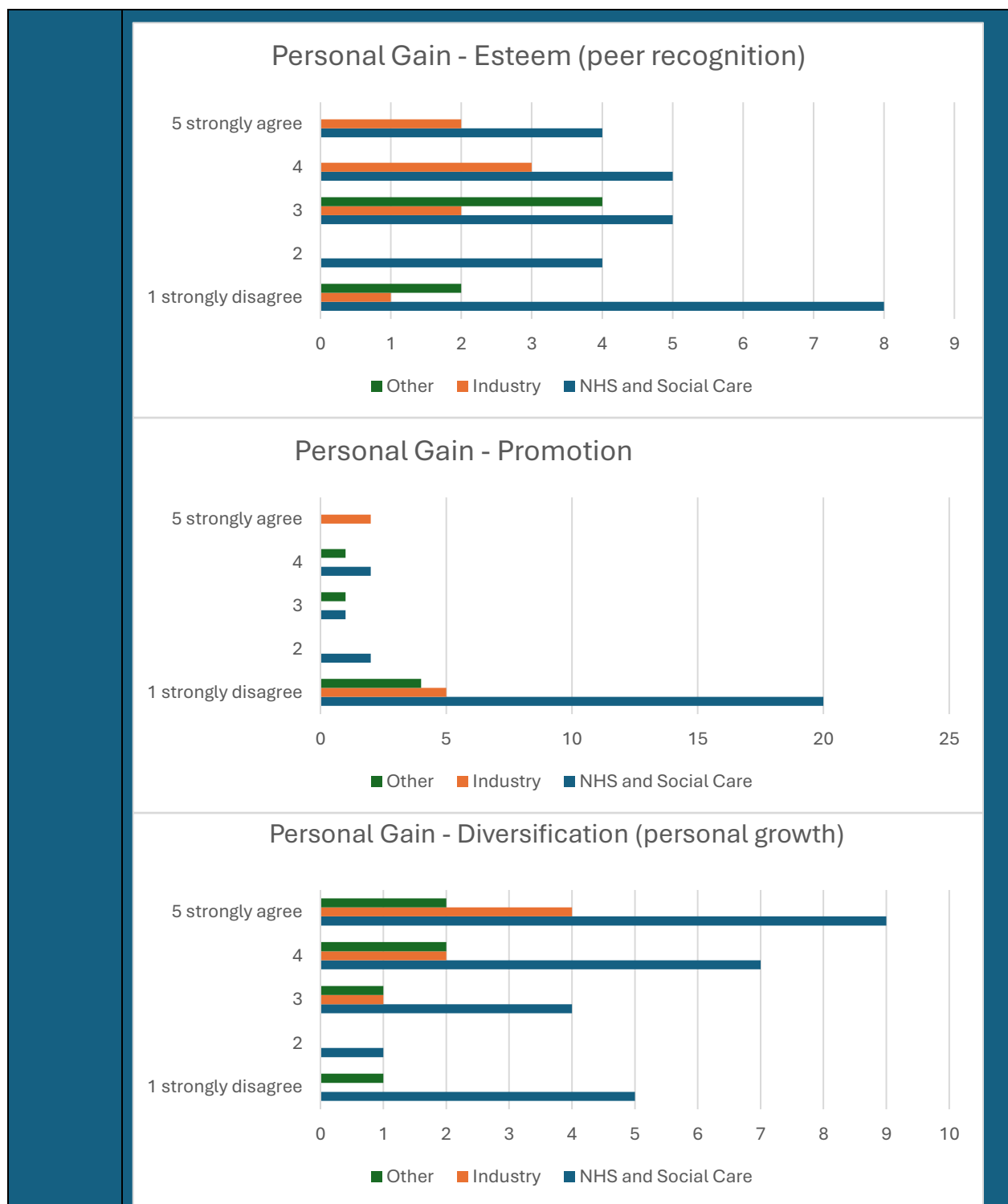
Table 7 Summary of Qualitative Responses for Motivation to Participate

Question	NHS and Social Care Winners		Industry		Other	
	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents
1. Motivation to Participate <i>Tell me about your motivation for taking part in the Hack</i>	22 Desire to improve patient care/outcomes, service innovation, access to support, funding, collaboration, professional growth and networking, alignment with broader health/social missions	4 Exploration without prior knowledge, personal/emotional catalyst	12 Desire to collaborate with NHS, product/technology development and testing, funding access and process structure, multiple hack engagement and system level strategy	1 Spontaneous involvement	5 Professional commitment to innovation and transformation, facilitation and support of others' innovation, interest in systemic disruption and innovation models	1 Scepticism/critical reflection on value, preference for virtual hacks
Quotes	<i>"To improve patient care through an innovative project, gaining funding and expertise through the Health Hack."</i>		<i>"Got sucked into NHS way of thinking."</i>		<i>"Previously an academic, wanted the real world experience of technology transfer."</i>	

Table 7 shows that NHS and Social Care winners were primarily driven by opportunities for patient impact and professional development, industry participants emphasised collaboration and market access, while organisers and panel members were motivated by fostering innovation and partnership across sectors.

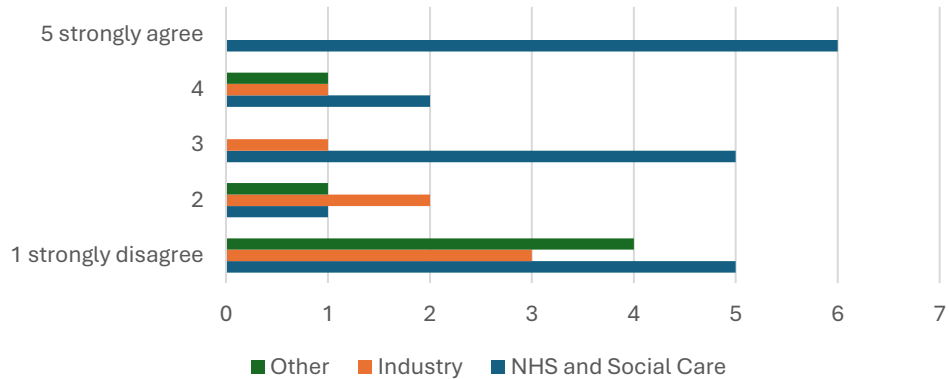
Table 8 Summary of Grouped Bar Charts showing Quantitative Responses for Motivation to Participate



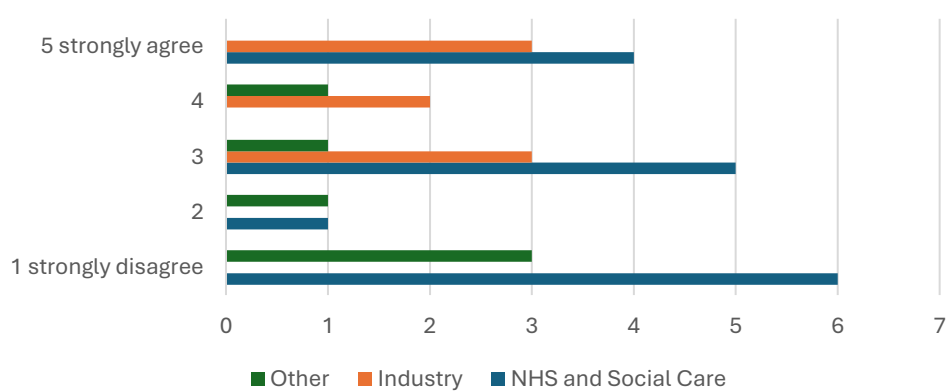


Organisational Gain

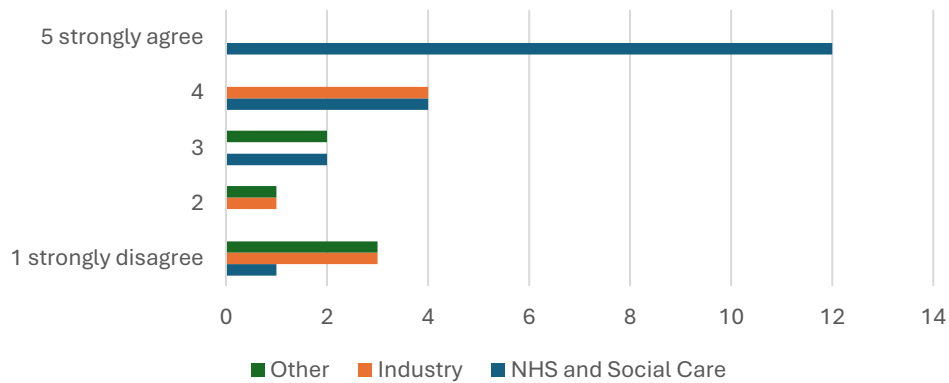
Organisational Gain - Saving money

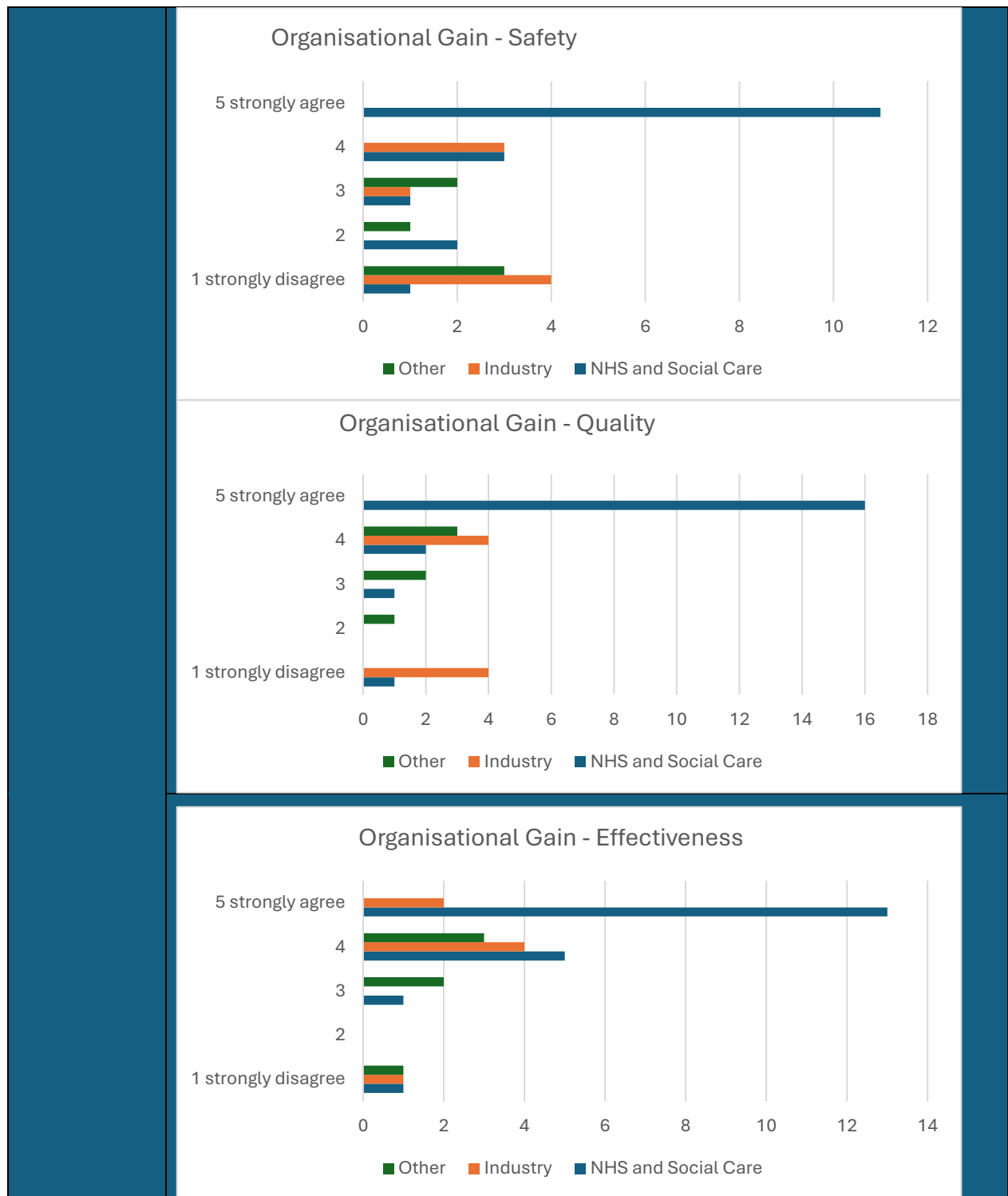


Organisational Gain - Gaining money (commercial)



Organisational Gain - Efficiency





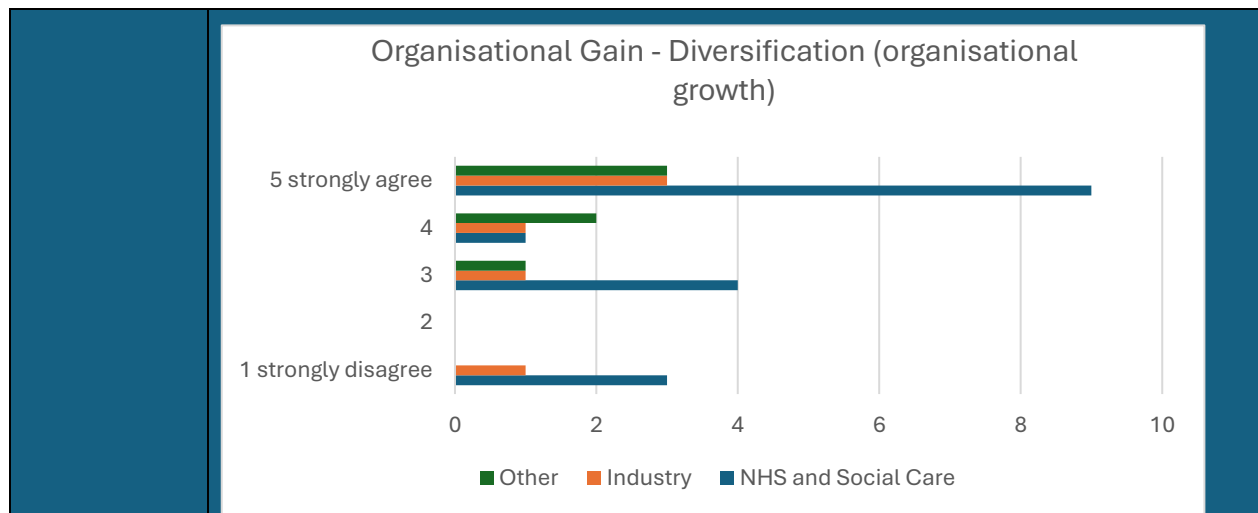


Table 8 demonstrates that participant groups varied in their motivations to participate in WHH. NHS and Social Care winners were largely motivated by patient and professional gains, industry participants prioritised organisational and commercialisation, while organisers focused on organisational growth and effectiveness.

5.4 WHH Expectations

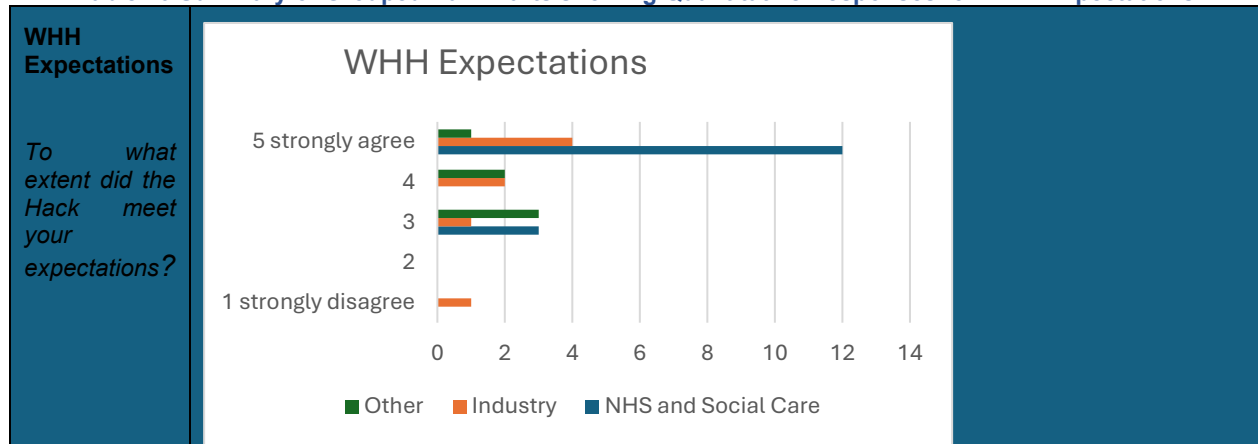
Table 9 Summary of Qualitative Responses for WHH Expectations

Questions	NHS and Social Care Winners		Industry		Other	
	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents
2. Expectations of the Hack <i>What expectations did you have of the Hack?</i>	24 Entered with low or no expectations, curiosity and openness to innovation, interest in developing/testing ideas	2 Negative application platform experience, opportunity framing	12 Expectation to Collaborate on Real Clinical Problems, Expected Facilitation and Acceleration of Project Work	1 Low expectation s/ awareness	5 Curiosity and learning-focused engagement, supportive/facilitat or role, platform for engagement and relationship building	1 Strategic promotion/ visibility goals
3. Meeting Expectations <i>To what extent did the Hack meet your expectations?</i>	24 Funding expectations met/exceeded, lack of post-hack follow up/ support, straightforward process	2 Negative personal experience/ emotional discomfort, concerns about robustness of awarding process	12 Exceeded expectations, enabled research/ engagement opportunities	1 Lack of expected formal support post-hack	5 No clear evidence of impact	1 Raised awareness and demand for additional hacks

Quotes	<i>"Suggestion from the programme that there would be a degree of support afterwards which didn't materialise."</i>	<i>"The benefit of enabling wider research and contact almost slowed things down with so many interested parties."</i>	<i>"hasn't seen the impact of developed services or projects."</i>

Table 9 shows that participant groups differed in their expectations of the hack, with NHS and Social Care winners seeking patient impact, industry aiming for commercial opportunities, and organisers prioritising partnership; overall, most groups reported that their expectations were substantially met through their participation. However, Other participants felt the WHH had no clear evidence or impact. Outliers within NHS and Social Care and Industry had negative WHH experiences.

Table 10 Summary of Grouped Bar Charts showing Quantitative Responses for WHH Expectations



While the grouped bar chart in Table 10 highlights varied levels of expectations being met among participant groups, the qualitative responses in Table 9 reveal nuanced emotional and practical impacts—ranging from negative experiences and concerns to clear evidence of exceeded expectations and increased demand for future engagement.

5.5 WHH Challenges and Proposed Solutions

Table 11 Summary of Qualitative Responses for WHH Challenges and Proposed Solutions

Question s	NHS and Social Care Winners		Industry		Other	
	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents
4. Challenges Addressed <i>Tell me about the challenge or opportunity you thought the Hack could help you resolve?</i>	24 Improving patient self-management and communications, bridging gaps in healthcare pathways, data management and workflow efficiency, developing technology solutions with industry	2 Sustainability and reuse of equipment, overcoming IP and commercialisation barriers	Not asked	Not asked	Not asked	Not asked

5. Proposed Solutions <i>What was your perceived solution to the challenge or opportunity?</i>	23 Digital tools for self-management and patient empowerment, tech-enabled service improvements, reuse/sustainability/cost-saving innovations	3 Biometric/sens or technologies, advanced risk stratification for early diagnosis, failed collaboration with industry partner	12 Self-management and patient empowerment, community-centered support, real-time health data sharing, reuse/extension of previous hack idea	1 National scale/policy influence	4 Empowering patients/staff through digital tools, Service enhancement, clinical data monitoring/analytics, pandemic/crisis response	2 Admin-only role, transfer of legacy software
Quotes	<i>"Enables patient to take greater responsibility for condition through self management"</i>		<i>"utilise the capabilities we already had to apply them to this field"</i>		<i>"App was designed to provide information, tools and signposting to services"</i>	

Table 11 outlines that descriptions of the challenges addressed were elicited exclusively from NHS and Social Care staff, as these participants had direct experience with health system issues. All groups contributed to the discussion of proposed solutions, which generally reflected their respective priorities. NHS and Social Care focused on patient outcomes, industry favoured innovation and scalability, and organisers emphasised collaboration. Notably, outliers in each group sometimes diverged sharply from their group's prevailing perspectives, particularly in expressing barriers or challenges to development.

5.6 Progress and Implementation

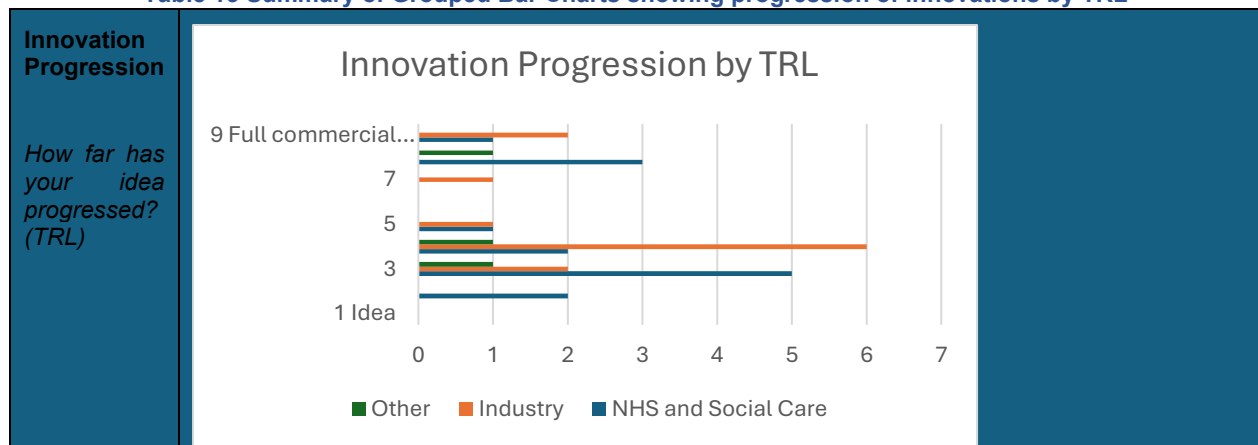
Table 12 Summary of Qualitative Responses for Progress and Implementation

Questions	NHS and Social Care Winners		Industry		Other	
	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents
6. Progress and Implementation <i>How far has your idea progressed?</i> <i>Is the technology available and being used and if so, is there evidence to show benefits so far?</i>	23 Prototype developed, partial implementation, stalled or abandoned due to system barriers, advanced development/near launch/in pilot use, commercial exploration/funding acquisition, evaluation phase/proof of concept testing	3 Idea existed prior to hack, project ended due to funding withdrawal, bureaucratic/legal barrier	12 Technology evolved beyond initial purpose, progression from prototype to pilot, commercial validation and funding wins, integration with wider service platforms, cross-sector	1 Not yet tested/piloted	6 Strategic and organisational success, transition and leadership change disrupted progress, virtual delivery platform adoption	0

			collaboration and system integration			
Quotes	"Prototype developed, collected evidence to demonstrate that audit tool works, has been trialled and tested."		"created a prototype during the project, we have since gone on to win an Innovate UK Precision Medicine competition"		"it has been successful by developing brand awareness resulting in more Hacks."	

Table 12 demonstrates that across the groups, NHS and Social Care winners showed steady advancement toward development and deployment, while industry participants moved quickly into testing and scaling; other participants mostly remained at earlier stages due to barriers. Notably, outliers from every group either accelerated to full implementation or faced unique obstacles that stalled progress.

Table 13 Summary of Grouped Bar Charts showing progression of innovations by TRL



In addition, respondents were asked 'How far has your idea progressed?' and interpret their progress in context of the Technology Readiness Level (TRL) scale in Figure 9.



Figure 9 Technology Readiness Level (TRL) UKRI (2022)

Table 13 shows that overall, NHS and Social Care winners demonstrated steady progress through development stages, industry participants advanced rapidly to testing and scaling, while other participants generally remained at earlier readiness levels due to persistent barriers, aligning with qualitative responses in Table 12.

5.7 Post-Hack Experiences

Table 14 Summary of Qualitative Responses for Post-Hack Experiences

Questions	NHS and Social Care Winners		Industry		Other	
	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents
7. Post-Hack Experience <i>Tell me about your post event experiences of developing the Hack. What went well? What didn't?</i> • Support from Hack Partners (Bevan Commission, LSH Wales, Innovation Leads, AgorIP, Accelerate, MSParc), Academic Partners • NHS Partner collaboration • Organisation / Team engagement and support	24 Lack of structured post-hack support, difficulty navigating NHS bureaucracy, importance of individual persistence and self-funded work, desire for assigned mentors/peer support networks, helpful support from individuals or local health board teams	2 Expanded networks despite project hurdles, project success despite difficulties with diverse stakeholder management and lack of dedicated project management	12 Strong post-hack support from individuals and institutions, value of external partnerships to build sustainable models, NHS constraints (capacity, information governance, NHS sponsorship), interoperability and integration through connected services	1 WHH created major long-term project and organisational success	5 Limited progress post-hack, challenges with organisational structures and support, positive individual/team experiences, need for better follow up systems and longer-term support	1 Project regression of technology readiness
8. Perceived Benefits <i>Were there benefits from your participation in the Hack?</i>	24 Personal/professional development, new networks and relationships, project momentum and follow on funding, improved understanding of system challenges, service improvement and patient benefit potential	2 No obvious benefits	10 Creation of new business streams/ diversification, product commercialisation, industry-NHS collaboration, IP generation/ competitive advantage, validation/ seed funding/ enabling follow on investment	3 Insight into NHS governance, connected services concept development	4 New partnerships / collaborations/ networks, business development and commercial growth, innovation/IP creation and understanding, real-world	2 No obvious benefits

					application and experience	
9. Recommendation for Future Hacks <i>I will recommend taking part in future Hack events to colleagues</i>	24 Positive recommendations with caveats, need for better preparation and understanding of process, value of connections, networking and challenge	2 Would not recommend, preference for in-person events only	13 Strong recommendation to participate, importance of preparation and partner alignment	0	6 Selective suitability	0
Quotes	<i>"Hack was a great process but needed seamless facilitation from the organisation"</i>		<i>"encourage them to identify partners (health care providers) in advance and work with them to define pitch and communication from Hack of these requirements"</i>		<i>"Not for everyone - tailored for certain types of people"</i>	

Table 14 shows that in terms of post-WHH experiences, NHS and Social Care winners steadily advanced their innovations despite lack of structured support post-hack. Industry moved quickly to testing and scaling along with strong support, while other participants often stalled at early stages due to resource or organisational barriers. Outliers either achieved rapid implementation or faced unique setbacks.

In relation to perceived benefits of the WHH, NHS and Social Care winners gained innovation capacity, visibility, and networks, while industry participants valued rapid prototyping and real-world piloting. Other participants appreciated exposure and learning, though sometimes felt limited by slow progress. Outliers experienced either exceptional gains, experiences external disruptions or little benefit.

With regards to recommending colleagues to participate in future WHH, all respondent groups had positive recommendations, with caveats of improving participant preparation, process clarity, and partner alignment. Some participants suggest the format would suit some and not others, while outliers include a preference for in-person events only.

Table 15 Summary of Grouped Bar Charts showing recommendation to participate in future WHH

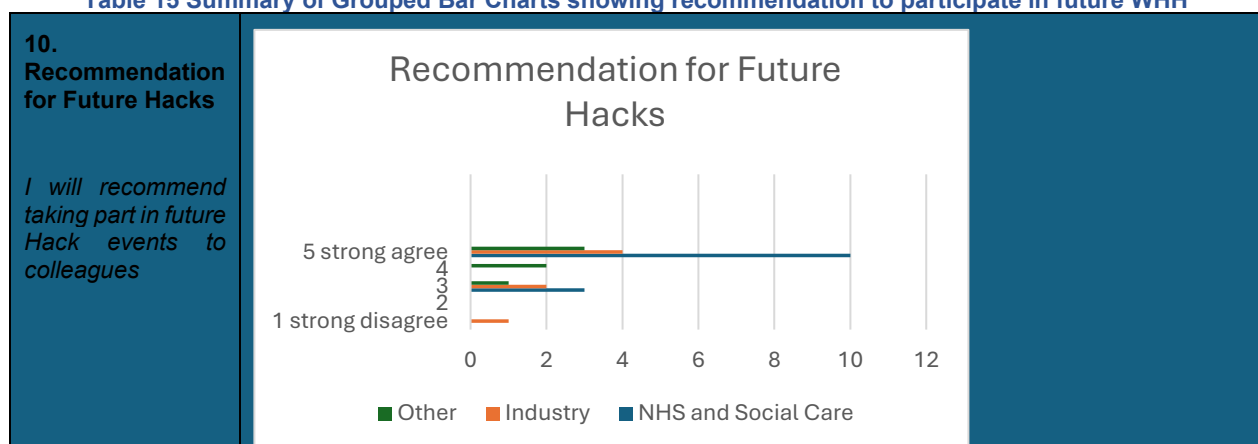


Table 15 supports the qualitative responses in Table 14 showing that most participant groups expressed a positive inclination to recommend future WHH participation to colleagues, though NHS and Social Care winners and industry participants showed particularly strong recommendations, while other participants displayed more selective support.

5.8 WHH Strengths and Weaknesses

Table 16 Summary of Qualitative Responses for WHH Strengths and Weaknesses

Questions	NHS and Social Care Winners		Industry		Other	
	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents	Thematic Analysis of Responses and no. of respondents	Outliers and no. of respondents
11. WHH Strengths <i>What are the strengths of the Hack?</i>	24 Access to funding, cross-sector collaboration, networking and relationship building, innovation enablement, initial mentoring and support	2 Strengths diminished by lack of organisation al/ procurement buy-in	10 Networking and relationship building, simple/ enjoyable process, funding availability, real-world clinical relevance, understanding NHS	3 Engaging/ memorable format, improvement by offering commercial/ IP/ legal support	4 Platform for new ideas, cross-disciplinary collaboration, funding and support for commercialisation, networking and community building, educational and skill development	2 Unconventional driver for innovation, promotes culture of healthy critique to ideas
12. WHH Weaknesses <i>What are the weaknesses of the Hack?</i>	23 Time burden, lack of follow-up support, unclear processes/ bureaucracy, insufficient pre-hack communication/ clarity, lack of organisational sponsorship/support, uncomfortable format, insufficient funding	3 Disconnecti on with rest of Wales (inability to scale), lack of IP support, too many pitches diluted quality	13 Lack of organisational support/ legal processes, lack of robust process to vet projects beforehand, need for clearer guidance and criteria, need for commercialisation guidance	0	5 WHH organisation time-consuming, process needs to be tightened, need for ongoing support and guidance, selective suitability, limited value/impact	1 Misalignmen t between WHH themes and real-world/ patient relevance
Quotes	“weaknesses/challenges: BEURACRACY/PROCESSES (in big bold red writing!)”		“more proactive support from the beginning and throughout would have been great.”		“Getting diverse people together with requisite value adding competence”	

Table 16 highlights that most participant groups identified notable strengths in the WHH, such as enhanced innovation capacity, increased visibility, valuable networking opportunities, and the ability to rapidly prototype and pilot solutions in real-world settings. However, weaknesses across groups included insufficient structured support following the event, resource constraints, organisational barriers, and slow progress for some participants. Outlier responses highlighted either exceptional acceleration and successful implementation or, conversely, unique challenges. These included external disruptions or limited personal benefit that were not commonly experienced by the majority.

5.9 WHH Impact

Table 17 Summary of Grouped Bar Charts showing WHH Impact

13. The Hack method generates greater innovation in Welsh health and care

Greater innovation in Welsh health and care

This horizontal bar chart displays the number of responses for three groups across five levels of agreement. The x-axis represents the count from 0 to 12. The y-axis lists the agreement levels from '1 strong disagree' to '5 strong agree'. The legend indicates: Other (green), Industry (orange), and NHS and Social Care (blue).

Agreement Level	Other	Industry	NHS and Social Care
5 strong agree	3	5	10
4	2	0	1
3	1	1	3
2	0	0	0
1 strong disagree	0	0	0

14. The Hack methodology adds value to Innovation in Health in Wales

Adds value to innovation in Health in Wales

This horizontal bar chart displays the number of responses for three groups across five levels of agreement. The x-axis represents the count from 0 to 12. The y-axis lists the agreement levels from '1 strong disagree' to '5 strong agree'. The legend indicates: Other (green), Industry (orange), and NHS and Social Care (blue).

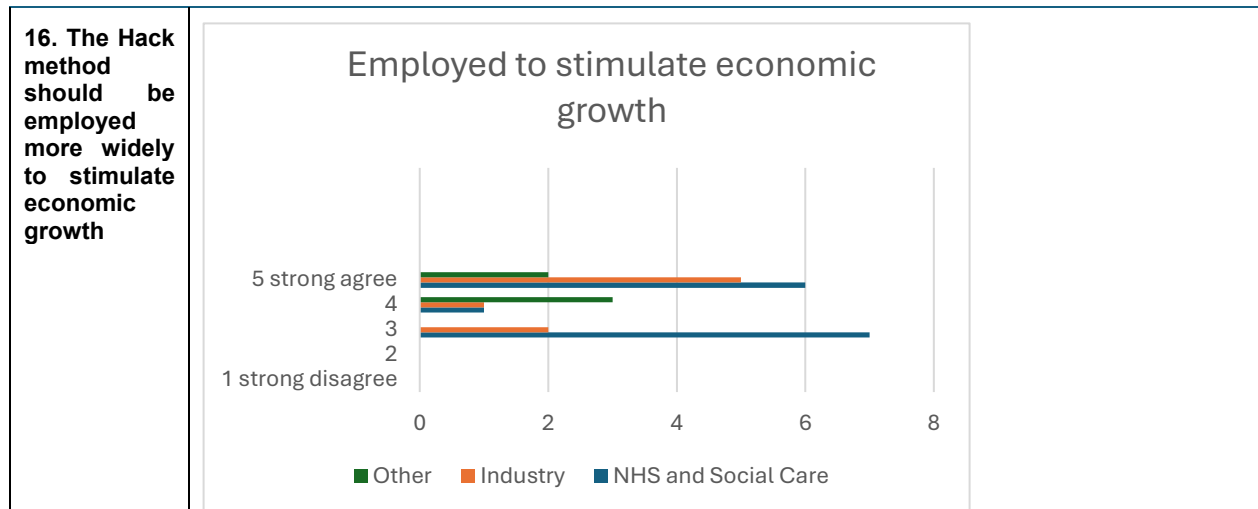
Agreement Level	Other	Industry	NHS and Social Care
5 strong agree	3	5	11
4	2	0	0
3	0	3	3
2	0	0	0
1 strong disagree	0	0	0

15. The Hack method should be employed more widely to stimulate innovation

Employed to stimulate innovation

This horizontal bar chart displays the number of responses for three groups across five levels of agreement. The x-axis represents the count from 0 to 6. The y-axis lists the agreement levels from '1 strong disagree' to '5 strong agree'. The legend indicates: Other (green), Industry (orange), and NHS and Social Care (blue).

Agreement Level	Other	Industry	NHS and Social Care
5 strong agree	2	4	5
4	3	1	4
3	0	2	5
2	0	0	0
1 strong disagree	0	1	0



For the statement that the hack method generates greater innovation in Welsh health and care, all groups generally agreed. Though NHS and Social Care winners expressed stronger consensus than others.

Regarding the view that the hack methodology adds value to innovation in health in Wales, most groups reported positive agreement. Again, with NHS and Social Care winners providing strong endorsement.

When asked if the hack method should be employed more widely to stimulate innovation, responses were favourable across groups. This indicated broad support for expansion.

On the question of using the hack method more widely to stimulate economic growth, agreement was positive but slightly more mixed. This suggested some groups were more cautious about its economic impact than others.

5.10 Chapter Summary

This chapter summarises WHH participant interviews, highlighting strong consensus across stakeholder groups that the WHH method substantially advances innovation in Welsh health and care. NHS and Social Care winners expressed especially strong support. Most agreed that the WHH approach adds value to innovation, citing benefits such as increased capacity for problem-solving, improved networking and collaboration, rapid prototyping, and greater sector visibility.

Key strengths included the event's ability to facilitate creative solutions and cross-sector partnerships. However, some challenges persist: limited post-event support and resources, organisational barriers, and variable outcomes among teams. Although most participants recognised the WHH's innovation value, opinions on its economic impact were mixed, with some calling for more evidence of long-term impact.

Overall, the findings confirm the WHH's essential role in fostering health and care innovation in Wales. For future success, continued follow-up support, appropriate resource allocation, and long-term evaluations will be crucial.

6 Discussion

6.1 Introduction

This chapter will discuss the results presented in the Findings chapter by drawing connections to the existing literature, theoretical frameworks, and the wider context of innovation in NHS Wales and beyond. The findings will be critically analysed, considered for their implications for various stakeholders within the Welsh IE, and reflect on how they contribute to bridging gaps identified in the research questions. This discussion aims to provide deeper insights, highlight the significance of the study, and set the stage for the conclusions and recommendations that follow.

6.2 Key Findings

The key findings are highlighted in Table 18.

Table 18 Summary of Key Findings (Source: Author's own)

Participants were motivated to participate by opportunities for patient impact and professional development, collaboration and market access, and fostering innovation and partnership across sectors.
WHH expectations included pursuing patient impact, commercial opportunities, and prioritising partnership; overall, most groups reported that their expectations were substantially met through their participation.
WHH innovations focused on patient outcomes, scalability, and collaboration.
Progress and implementation of WHH innovations showed varying levels of development: NHS and Social Care winners showed steady advancement toward development and deployment; industry participants moved quickly into testing and scaling; other participants mostly remained at earlier stages due to barriers.
In terms of post-WHH experiences, NHS and Social Care winners steadily advanced their innovations despite lack of structured support post-hack; Industry moved quickly to testing and scaling along with strong support; other participants often stalled at early stages due to resource or organisational barriers.
In relation to perceived benefits of the WHH, NHS and Social Care winners gained innovation capacity, visibility, and networks; industry participants valued rapid prototyping and real-world piloting; other participants appreciated exposure and learning, though sometimes felt limited by slow progress.
With regards to recommending colleagues to participate in future WHH, all respondent groups had positive recommendations, with caveats of improving participant preparation, process clarity, and partner alignment.
Most participant groups identified notable strengths in the WHH, such as enhanced innovation capacity, increased visibility, valuable networking opportunities, and the ability to rapidly prototype and pilot solutions in real-world settings.
WHH weaknesses included insufficient structured support following the event, resource constraints, organisational barriers, and slow progress for some participants.
Participants supported the view that the WHH method generates greater innovation in Welsh health and Care, adds value to innovation, and should be employed more widely to stimulate innovation.
Responses were mixed in terms of the WHH method should be employed more widely to stimulate economic growth.

6.3 Findings in Relation to Review of Literature

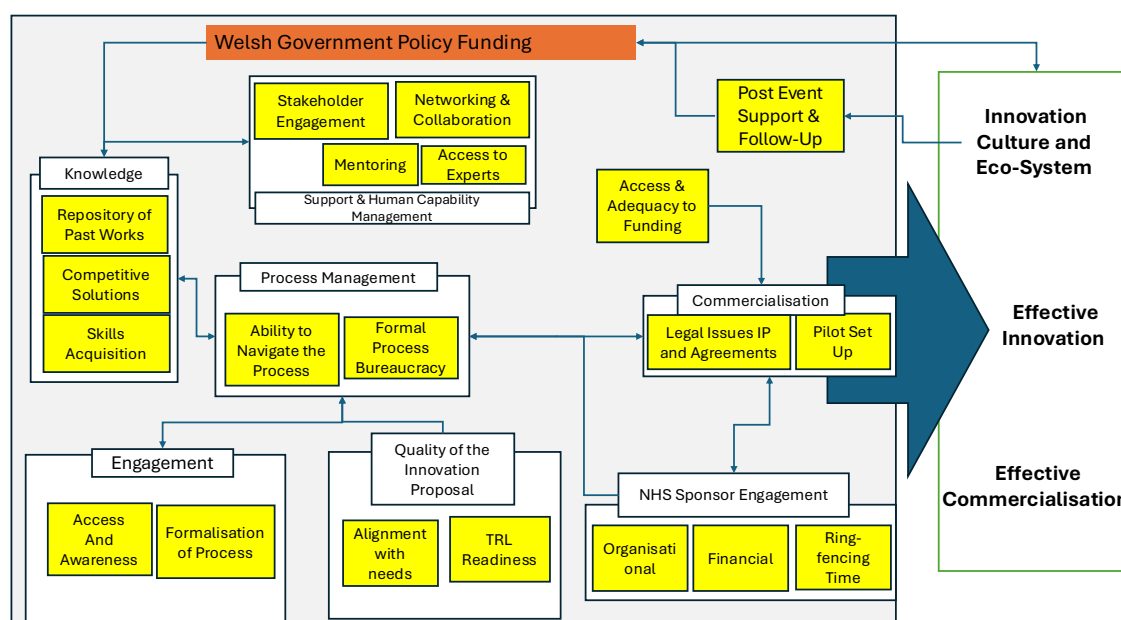


Figure 10 Conceptual Framework of the WHH based on interview findings (Source: Author's own)

A conceptual framework (Figure 10) was developed, based on key concepts and themes arising from WHH interview findings. This conceptual framework was compared to the conceptual framework in Figure 5 (key concepts and themes arising from review of existing literature and policies on the WHH as a healthcare innovation model). A comparison of both conceptual frameworks is summarised in Table 19.

Table 19 Summary of Key Findings in relation to Review of Literature

Strong Support	Partial or Conditional Support	Gaps or Divergence
Stakeholder Engagement and Networking and Collaboration repeatedly mentioned across all participant groups (aligns with the <i>Engagement</i> and <i>Support</i> concepts). Access to Experts, Mentorship, and Sponsorship were seen as WHH strengths, though the lack of structured follow-up was raised as a limitation, partially supporting the <i>Post Event Support & Follow Up</i> concept. TRL Readiness was referenced in direct alignment with TRL discussions in findings. Access & Adequacy to Funding was widely discussed as both a motivator and a barrier depending on timing and scale (confirmed by participant insights). Commercialisation Pathways such as IP, pilot setups, and early-stage proof-of-concept stages were consistently part of both frameworks. NHS Sponsor Engagement, including the need for alignment with NHS priorities, procurement navigation, and organisational support, was frequently cited, especially in accounts of barriers.	Post Event Support & Follow-Up was a key concept in both frameworks and recognised by participants but largely critiqued as insufficient or inconsistent. Process Management themes such as "ability to navigate" and "formalisation" were confirmed by respondents — but bureaucratic frustration was a repeated challenge, revealing a tension between ideal process models and lived experience. Commercial Readiness and Market Adoption were aspirations for many participants, but not all had reached that stage, suggesting conceptual alignment but varied real-world execution.	Educational and Cultural Value, Comparative Models, and Learning from International Practices were not prominent in participant responses. Structured Monitoring, Ongoing Mentoring, and Longitudinal Evaluation were more aspirational in the framework but not evidenced as fully realised in the findings. However, the format of interviews had a longitudinal element. Cost-Effectiveness and Net Benefit, although essential in literature and policy terms, was not widely discussed by participants, suggesting either low visibility or a later-stage concern not yet reached. User-Centric Design and Feasibility/System-Level Impact were alluded to but not consistently framed in these terms by participants, showing some gap between practical language and academic models.

6.4 Findings in Relation to Research Objectives

Key findings in relation to the research objectives are outlined in Table 20.

Table 20 Summary of Key Findings in Relation to Research Objectives

Research Objectives	Findings
Longitudinal studies on the sustainability and scalability of innovations.	Evidence from follow up interviews with participants highlights varied innovation progress, from pilot stage to commercialisation, indicating potential sustainability but limitations in scalability due to post-hack support gaps. This reveals insight into long-term innovation trajectories within the NHS context and the role of support infrastructure in sustaining innovation.
Comparative evaluations with other hackathon models (e.g. MIT Hacking Medicine)	Unlike the MIT Hacking Medicine model, which reported higher commercialisation rates and startup formation in private healthcare contexts such as the U.S. and India (Olsen et al., 2017), the WHH model (adapted from the MIT model) demonstrated greater emphasis on patient-centered service innovation and collaborative public sector outcomes, reflecting the distinctive priorities and structural realities of the NHS.
Explore the value and relevance of the hack from the perspectives of diverse stakeholders.	Diverse stakeholder insights of the WHH were recorded (NHS and Social Care winners, Industry, and organisers/panel members/sponsors). All groups agreed that the WHH fostered innovation, though benefits and challenges varied. The majority reported a lack of post-event support and several other recommendations. This demonstrates how different stakeholder groups perceive innovation value, highlighting the role of collaboration and system integration in health and care innovation.
Assess the WHH's contribution to successful innovation outcomes, including the launch of new products or services within the context of the Welsh EI.	WHH interview findings revealed real-world implementation, IP generation, product development, and early-stage trials. This demonstrates that the WHH contributes to product/service innovation in health and care. This confirms WHH's role in accelerating innovations towards real-world adoption, providing examples of value-based outcomes, network building and sector impact within the Welsh EI.
Document participant motivation, experiences and insights gathered during the two-day event.	Participant motivations ranged from seeking patient impact (NHS and Social Care Winners) to commercial opportunity (Industry). Experiences highlighted the value of networking, rapid prototyping, and cross-sector collaboration, along with highlighting systemic barriers. This expands understanding of the WHH process from participant viewpoint, emphasising the cultural, relational and capability-building contributions to the Welsh EI.
Investigate how funding decisions were made and how innovations were selected for support.	Funding decisions were perceived as straightforward, however, respondents reported caution over a lack of transparency post-event. While seed funding supported early-stage ideas, some felt the funding was insufficient, and others were required to seek additional funds for second stage development and beyond. Some participants noted inconsistent follow-up and unclear selection criteria. This suggests the importance of enhanced awareness of transparent funding and selection mechanisms in accelerating equitable innovation support, as well as more structured monitoring of how funding was utilised.

6.5 Systems Approach to WHH Review

A systems approach was applied utilising key models and frameworks to identify issues and root causes within the current WHH process based on participant experiences. Strategic recommendations were developed to address issues informed by participant insights.

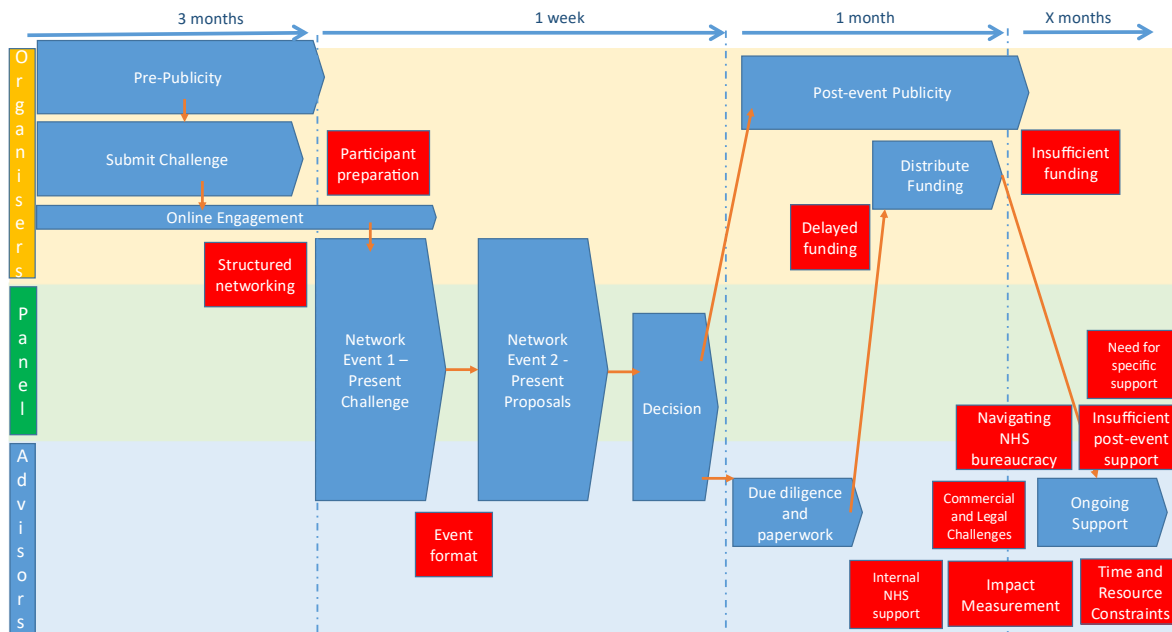


Figure 11 WHH Process and identified issues (Source: Author's own adapted from Swim Lane Diagram (Grönroos (2001))

Figure 11 shows an adaptation of the swim lane model (Grönroos, 2001) which visually represents a process into separate lanes to define roles, responsibilities, and identify inefficiencies within an operational process. Figure 11 reveals the WHH process (blue boxes) from pre-publicity to ongoing support, highlighting issues (red boxes) within the process reported by WHH participants. Figure 11 demonstrates that most issues fall into ongoing support at the end of the process and relate to several barriers to innovation experienced by participants including navigating NHS bureaucracy, commercial and legal challenges, time and resource constraints, and recommendations including increased need for specific support, internal NHS support, impact measurement and timely distribution of sufficient funding. This also supports concepts and themes arising from existing literature highlighted in Figure 5. Figure 11 also suggests that panel and advisory roles could do more to provide ongoing support to participants.

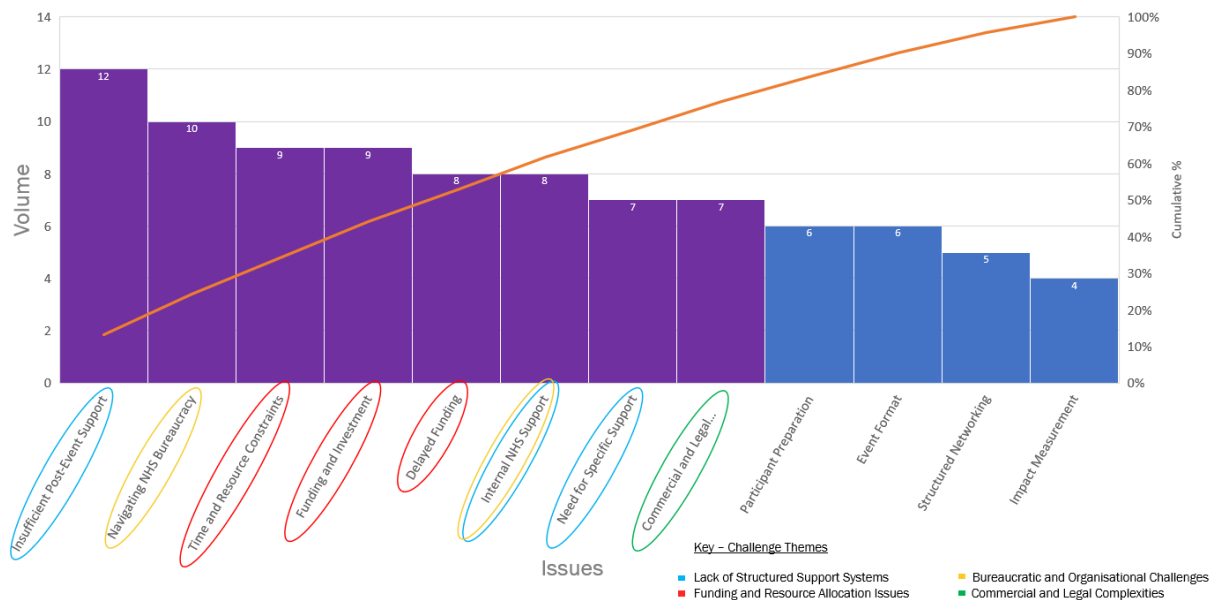


Figure 12 WHH Pareto Analysis (Source: Author's own adapted from the Pareto Chart (Pareto, 1964))

Figure 12 depicts an adaptation of the Pareto Chart (Pareto, 1964) which is a tool used to identify and prioritise the most significant factors contributing to a problem. The chart is based on the Pareto principle, whereby approximately 80% of the effects come from 20% of the causes. WHH participant responses were used to calculate the Pareto principle. This method ensures that efforts can be focused on areas that will have the greatest impact by highlighting the most significant issues. Figure 12 supports the issues highlighted in Figure 11, as it demonstrates that the most significant issues within the WHH process includes Navigating NHS Bureacracy, Time and Resource Constraints, Delayed Funding, Commercial and Legal Challenges which are critical issues requiring solutions in order to improve Post-Event Support, Internal NHS Support and Specific Support for participants. The chart shows that significant factors range from Insufficient Post-Event Support (highest) to Impact Measurement (lowest). The first eight issues within the chart make up 80% of the volume of issues. As these represent several issues contributing to the overall 80%, they have been categorised by challenge themes (displayed in Figure 12 Key) in order to devise high impact improvement strategies. These are further explored in Table 21.

Table 21 WHH Improvement Strategies (Author's Own)

Challenges	Issues	Needs	Potential Solutions
Lack of Structured Support Systems	Insufficient Post-Event Support Need for Specific Support Internal NHS Support	A comprehensive support system that includes follow-up, mentorship, and targeted assistance in areas such as project management, procurement, finance, IP, and legal matters	Establish an NHS Wales Innovation Adoption Programme/Accelerator at an All-Wales level spanning across Health and Social Care, Industry, Academia and Welsh Government.
Funding and Resource Allocation Issues	Funding and Investment Delayed Funding Time and Resource Constraints	Efficient funding processes, timely disbursement of funds, and proper resource allocation to ensure participants do not have to use their own time and resources.	Develop Standard Operating Procedure (SOP) to map and improve the funding distribution process. Workforce & Organisational Development initiatives to include protected time for innovation and research within job plans.
Bureaucratic and Organisational Challenges	Navigating NHS Bureaucracy Internal NHS Support	Simplifying internal NHS processes, improving communication and coordination, and providing better organisational support for project implementation.	Work with different NHS departments to develop SOPs to show different NHS internal governance and organisational support processes.
Commercial and Legal Complexities	Commercial and Legal Challenges	Streamlined commercial agreements and legal processes, along with clear guidelines and support for navigating these complexities.	Develop an NHS Wales Commercialisation Strategy to provide a clear and standardised framework for navigating commercial and legal challenges.

The Pareto Diagram in Figure 12 identified the most significant issues affecting the WHH model. The improvement strategies shown in Table 21 takes these key issues and outlines specific strategies to address them. By focusing on the most critical problems highlighted in Figure 12, the improvement strategies ensures that efforts are directed towards areas that will have the greatest impact on WHH model delivery and innovation development success. The participant needs (informed by participant insights) shape improvement strategies by ensuring that the solutions are aligned with the key issues identified. For example, the need for efficient funding processes drives the strategy of developing SOPs to map and improve funding distribution processes. By addressing these needs, improvement strategies can improve capabilities within the WHH model to improve sustainability and scalability of innovation in Welsh health and social care.

6.6 Chapter Summary

This chapter discusses implications of participant experiences and key findings from the study, highlighting strong support for the WHH method in driving health and care innovation in Wales. It connects these findings to the existing literature and research objectives, noting the method's strengths in fostering collaboration, rapid prototyping, and sector visibility. Persistent challenges include limited post-event support, bureaucratic barriers, and mixed views on economic impact. Analysis of issues within current processes and root causes have led to development of strategic recommendations. These focus on enhancing ongoing support, streamlining funding, and building stronger infrastructure to sustain and scale innovation.

7 Conclusion

7.1 Purpose

This chapter aims to synthesise the study's key findings, reflecting on its' contributions and limitations, providing multi-stakeholder implications, and areas for further research to advance the understanding of the WHH as a health and care innovation methodology.

7.2 Key Findings

Key findings of the study:

- Follow-up interviews showed innovation progress ranging from pilot stages to commercialisation, indicating sustainability potential but limited scalability due to lack of post-hack support.
- Findings provide insight into long-term innovation pathways within the NHS and Social Care, along with the importance of support infrastructure in sustaining progress.
- Compared to the MIT Hacking Medicine model (more commercial outcomes in the U.S. and India), the WHH focused more on patient-centered service innovation and public sector collaboration, reflecting NHS and Social Care priorities.
- Stakeholders (NHS, Social Care, industry, organisers/sponsors) agreed WHH fostered innovation, though experiences and challenges varied.
- Common concerns included lack of post-event support and the need for clearer funding processes and follow-up mechanisms.
- WHH outcomes included real-world implementation, IP generation, product development, and early-stage trials, supporting its role in driving health and care innovation.
- Participants valued networking, rapid prototyping, and cross-sector collaboration. Motivations ranged from patient impact (NHS and Social Care) to commercial gains (industry).
- WHH contributed to cultural, relational, and capability-building within the Welsh EI.
- Funding was seen as initially accessible but lacked transparency post-event. Some participants found the support insufficient and had to seek further funding independently.
- Concerns were raised about inconsistent follow-up and unclear selection criteria, highlighting a need for improved transparency in funding, selection mechanisms, and structured monitoring of funding utilisation to ensure equitable innovation development.

7.3 Reflections

Upon reflection of the research journey, this experience has been insightful from a personal, organisational, and academia perspective producing key insights into methods to improve innovation in health and care. These include:

- Qualitative interview approach was a significant strength, offering rich, nuanced insights into stakeholder experiences and perceptions of the WHH. However, the depth of data generated through semi-structured interviews also presented a challenge, particularly in the time-intensive process of analysing large transcripts and identifying thematic patterns.
- Inability to fully assess the economic impact and return on investment of the WHH, due to the absence of systematic tracking mechanisms and longitudinal health economic data.
- Attributing innovation success directly to the WHH proved difficult. Outcomes were often influenced by broader systemic factors and post-event support structures.

These reflections underscore the importance of robust evaluation frameworks and sustained infrastructure to better capture long-term innovation value and impact. Furthermore, these insights have informed and strengthened the design and delivery of the ARCH Innovation Forum, a regional platform for supporting innovation in Southwest Wales.

7.4 Implications

The research findings have several implications for different stakeholders.

7.4.1 WHH Organisers

- WHH is a successful platform for cross-sector collaboration and rapid prototyping, however, focus should be on improving post-event support and sustainability.
- Respondents highlight need for clearer communication, streamlined processes, and better guidance on funding, IP, and commercialisation.
- Structured monitoring, follow-up systems, and impact tracking should be implemented to enhance WHH long-term value
- Opportunity to refine WHH format to better suit diverse participant needs, including tailored support for different innovation readiness levels and expanding access across Wales.

7.4.2 NHS Wales

- The WHH demonstrates a viable model for accelerating patient-centered innovation, however, NHS Wales must address systemic barriers such as bureaucracy, sponsorship, procurement complexity, and lack of post-event support.
- NHS Wales should consider embedding innovation pathways into mainstream service transformation initiatives with dedicated time to pursue innovation in job planning.

7.4.3 Social Care Wales

- WHH has shown potential in bridging gaps between health and social care, particularly in developing digital tools for patient empowerment and service delivery.
- Social Care Wales can leverage WHH-based innovation to co-design solutions with staff but must invest in capacity-building and ensure alignment with broader policy goals.

7.4.4 Industry

- Industry participation benefited from rapid prototyping, NHS and Social Care collaboration, and access to funding. However, faced challenges in navigating NHS bureaucracy and commercialisation pathways.
- There is a clear opportunity for industry to leverage their expertise to co-develop scalable solutions with public sector partners, provided clearer guidance and legal/IP support is available.
- Strengthening partnerships with NHS and academia can enhance innovation readiness and market adoption – providing commercial and patient impact opportunities.

7.4.5 Academia

- Universities played a pivotal role in WHH delivery, offering research capacity, student engagement and leadership development.
- Findings highlight a need to embed real-world innovation experiences into teaching of innovation, using WHH-style formats to teach agile development, stakeholder engagement, and systems thinking.
- Universities should also support longitudinal research and evaluation of innovation outcomes, contributing to the evidence base of WHH methodologies particularly within a public sector context.

7.4.6 Welsh Government

- WHH aligns with strategic ambitions outlined in the WG Innovation Delivery Plan (2023) and Well-being of Future Generations (Wales) Act (2015), however, gaps in post-event support and economic impact monitoring must be addressed.
- Policy framework should incentivise cross-sector collaboration and provide infrastructure for sustained innovation development.

7.4.7 Welsh IE

- The WHH methodology has strengthened the Welsh EI by fostering interdisciplinary collaboration, however, its long-term impact depends on improved coordination and stakeholder alignment.

- The Welsh IE must evolve to support and navigate innovations through all stages – from ideation to commercialisation – by integrating accelerators, mentorship, adopt and spread expertise and evaluation metrics.
- A systems approach is needed to address root causes of innovation barriers and to ensure equitable access to innovation opportunities across Wales.

7.5 Future Research

The findings of this study lay the foundations for potential future research to explore aspects of the WHH methodology and its wider implications, including:

- A longitudinal study could track the journey of WHH innovations over 5-10 years to evaluate sustainability, scalability, and return on investment within Welsh health and care.
- A comparative international study could examine the WHH against other models such as MIT Hacking Medicine and Japan's Total Quality Management (TQM) approach to identify cultural and structural influences on innovation outcomes.
- A dual case study could explore the lived experiences of two WHH innovators, one whose project succeeded and one whose project stalled, to uncover critical enablers and barriers to innovation adoption and impact.
- Evaluating the effectiveness of the ARCH Innovation Forum as a regional innovation accelerator, including its' impact on stakeholder engagement, innovation outcomes and service transformation.

7.6 Concluding Remarks

This study marks a foundational exploration of the WHH, the first of its kind in Wales, as a transformative innovation methodology in health and care. By capturing multi-stakeholder experiences and identifying systemic enablers and barriers, it reveals the WHH's potential to catalyse collaborative and patient-centered solutions. While the model demonstrates clear value, long term impact is dependent on sustained support, transparent funding, and strategic integration into the wider Welsh IE.

The insights gained have directly informed the design and delivery of the ARCH Innovation Forum, ensuring it is grounded in evidence, experience, and reflective practice. It now serves as a regional mechanism to operationalise innovation policy, support innovators, and strengthen the Welsh IE.

These findings offer a springboard for future research and policy development. Thus, positioning the WHH as a vital tool in NHS and Social Care Wales' journey towards agile, inclusive, and scalable innovation.

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9 Appendices

Appendices can be found in the following page:

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Which resources could be invested in to divert demand from Adult Services' front door in Swansea?

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Abstract:

This research examines which resources could be invested in to divert demand from the front door of Adult Services in Swansea, in response to a change in demographics and funding pressures. Through a mixed-methods approach, this study evaluates the effectiveness of the Community Wellbeing Officer role which has been introduced to provide early help and preventative support in the community for individuals where their needs do not meet statutory thresholds. Analysis of quantitative data and qualitative case studies from January to June 2025 demonstrates that 75% of individuals supported by the Community Wellbeing Officers did not require further statutory intervention, with most needs met through community-based services. The research identifies the value of a coordinated approach and highlights the importance of robust community resources. However, challenges were identified in terms of sustainability, funding, and service capacity of these community services. Recommendations include expanding the Community Wellbeing Officer team, clarifying roles within an expanded and robust early help model, and considering commissioning key community services to ensure stability. The findings provide an evidence base for Swansea Council to further develop cost-effective, preventative strategies that promote independence and reduce long-term demand on Adult Services ensuring individuals can live well for longer in their own communities as well as alleviating the financial pressures on the Council.

Keywords: Community, Early Help, Prevention, Adult Social Care

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1 Introduction

In recent years, there has been a change in demographics of the people living in Wales which has also been reflected in the Swansea Local Authority area. The Older People's Commissioner published a report in 2023 reflecting on the ageing population in Wales. This report stated the estimated number of people aged over 60 in the UK is 866,444 with an expectation that this will rise by 30% by 2026 (Older People's Commissioner, 2023). Looking specifically at Swansea's population, as of 2023 it was reported to be approximately 246,700. During the national census in 2011 it was documented that 42,776 individuals living in Swansea were aged 65 and over out of a total of 239,023. This equates to people aged 65 and over representing approximately 18% of the population. When the census was refreshed in 2021 this figure was 48,876, an increase of 14% (StatsWales, 2021) out of a total of 238,500. In 2021, individuals aged 65 and over represented approximately 20.5% of the total population. These figures reflect a population that is both growing and ageing and according to the Population Assessment developed in 2022 there has also been an increase in co-morbidities with a particular increase in people living longer with more complex needs (West Glamorgan, 2022).

In line with national trends, it is likely there has been an increase in demand for Adult Social Services at least in part due to this ageing population. The Common Access Point (CAP) i.e. the front door for Adult Social Care currently, as of data from 24/25, received 3,099 social care referrals annually, with approximately 40% requiring ongoing support. This is in contrast to 23/24 where 2,991 social care referrals were received. This is an increase of 3.6% in a single year (Swansea Council, 2025).

Furthermore, the implementation of austerity by the British Government (beginning in 2010) has resulted in funding cuts for Welsh Government and subsequently for Health and Social Care. Most recently, for 24/25 the Welsh Government received a real terms reduction in funding estimated to be £1.3bn (Welsh Government, 2024). Additionally, since the funding related to responding to the coronavirus pandemic came to an end and budgets returned to more regular levels in 23/24 (Welsh Government, 2023) it has been reported that Social Services departments across Wales have forecast a shortfall of £646m over the next three years if the level of services provided remain the same (BBC News, 2024).

Due to this change in landscape, it is necessary to consider a change in approach from a social care perspective to ensure support will be available to those that do require Adult Services resources.

1.1 The legislative landscape

The key legislation that dictates the way in which Adult Social Care is delivered in Wales is the Social Services & Wellbeing (Wales) Act (2014). This cornerstone legislation was introduced in 2014 and implemented in Wales in 2016. There are four essential principles of this Act:



Figure 1. Four principles of the SSWBA.

A key theme that runs throughout the Act is a distinct focus on voice, choice and control for an individual, and their carers, when identifying their intended outcomes. It also moves professionals towards a strength-based approach for individuals seeking support and as stated in the four essential principles, there is a critical focus on the importance of prevention. This includes supporting individuals earlier in their journeys, not necessarily via statutory services, to support them to live independently and to live well for as long as possible in their own communities. Transparently, from a Social Care perspective one of the aims of this approach is also to reduce long-term costs for social care as demand increases on the system.

Additionally, the Well-being of Future Generations (Wales) Act (2015) is also a key piece of legislation in Wales to take into consideration when developing services for the future. The Act outlines seven connected well-being goals for Wales which can be seen in the diagram below:



Figure 2. Seven well-being goals for Wales.

While all well-being goals are critical for a healthy, equitable and thriving Wales, the most relevant to this report are the objectives to achieve 'A Healthier Wales' and 'A Resilient Wales'.

In order to achieve 'A Healthier Wales', there are a number of factors to consider. Most prominently, the link between Social Care and Health is interdependent with each sector's direction of travel and has a significant impact on each other. One of the intentions via various Public Health messaging including the standalone policy document 'A Healthier Wales' (NHS Wales, 2024) and 'Prevention-Based Health and Care' (Public Health Wales, n.d.) is to increase the preventative and early-help activities delivered by the Health Board, in part to reduce the demand on the organisation and also to empower individuals to live as independently as possible. These objectives align closely with those of the Social Services & Wellbeing Act.

'A Healthier Wales' sets out a long-term future vision of a 'whole system approach to health and social care' focusing on health, wellbeing and preventing illness. One of the success factors that NHS Wales identified through developing these policy documents is an increase in the number of people taking actions to prevent requiring support from health boards. Further, in the event where support is required the intention is to provide support to individuals and their families so there is an increase in people self-serving and identifying solutions themselves rather than via a statutory service. This approach also reflects the intentions in the Social Services & Wellbeing Act.

With the distinct focus on prevention in these pieces of legislation and policy across Health and Social Care, the similarities are undeniable and, on the surface, it does present that the intentions and objectives throughout are consistent. However, it is important to note it has been found by a number of research papers that the definition of prevention is being interpreted differently nationally (Curry, 2006; Marczak et al., 2019 as cited in Verity et al., 2020; Tew et al., 2023) along with the parameters of what activities are encompassed as prevention activities.

This may make it difficult to evaluate the effectiveness of the implementation of increasing the level of preventative activity and also makes it difficult to compare performance between Local Authority areas and Health Boards. This is compounded by the difficulty in measuring preventative outcomes (Godfrey, 2001)

with the issue in most cases needing to measure something that hasn't happened. While initially acknowledged here, these potential issues will be further explored throughout the report.

1.2 How this research will be approached

This introduction has set the scene for potentially the need for a significant change in service delivery in Adult Services within Swansea Council and has provided the context for a required shift from statutory services e.g. domiciliary care to an increased focus on early help and preventative interventions in order to divert demand from Social Services' front door. To consider this in more depth, the remainder of this research paper will be structured as follows:

- A review of the existing literature in this area of interest
- Highlighting the research question and the gap this research aims to address
- Putting forward the chosen research methodologies
- Presenting the data of the chosen research methodologies
- Putting the findings from this research into the context of the existing literature
- Conclude with key findings and recommendations for next steps

2 Literature Review

The literature across this subject covers a range of preventative approaches that support individuals at different points of their pathway through their experience with health and social care services.

Considering literature that focused on models that could divert / delay the need for managed care Tew et al. (2023) outlined the three types of prevention i.e. primary, secondary and tertiary. These are defined by Tew et al. as:

8. Primary "activity to address the circumstances or conditions in which a problem might otherwise occur. This may be universal or targeted towards potentially at-risk groups."
9. Secondary "early support to resolve issues at the point when the first signs of a problem start to emerge, so as to minimise longer term adverse impact."
10. Tertiary prevention "activity to enable recovery of capability and/or to minimise chances of recurrence of a problem."

When reviewing information on prevention and early help models, a significant proportion of the literature focused on supporting individuals being discharged from hospital following an acute event and receiving a range of time-limited supported services to allow these individuals to return to the level of independence they felt before this event. Considering this in the context of the three tiers of prevention above, this type of intervention would be categorised as 'Tertiary / Downstream Prevention'. This is outside of the scope of this research and is not included in this literature review. Instead, focus has been given on research that explored the need to support individuals living in the community who had not experienced an acute event and what models have been considered to support individuals to age well. These would be categorised as primary and secondary activities.

Returning to Tew et al., they also highlighted the issue of not having an agreed overarching definition or model for prevention which has provided issues in England with progressing practically. In their research there did seem to be significant prevention activities taking place although not consistently categorised or performance monitored. Linked to this there did seem to be confusion about what prevention activities could be i.e. whether they could be activities the Local Authority could 'do to' citizens such as provide support with Assistive Technology or whether these solutions could be further upstream, empowering citizens to find solutions themselves. Finally, one of the main drivers fed back from Local Authorities was the financial pressures being experienced and the acknowledgement that a change in approach is needed at a macro level to meet the current and future demands.

Looking at activity that has already taken place in Wales, Read et al. (2024) explored how preventative social care and community development are being interpreted and implemented across Wales in four Local Authority areas, particularly in relation to older people. Read et al. supported the findings of Tew et al. and found the term prevention to be vague and interpreted differently. They also found the impact of this is inconsistent implementation leading to reduced effectiveness of preventative models. Further, the focus of

prevention was, as expected, found to be via community development with a wide range of activities including micro-enterprises, community connectors and social prescribers. However, they found that these activities can sometimes be deprioritised due to financial constraints and the difficulty in measuring activity that hasn't happened, a theme that is found when considering the legislative landscape and available literature.

Conversely, Verity et al., (2024) noted that in diverse global contexts, preventive approaches to ageing increasingly emphasise the values of independence, interdependence, ageing in place, and the development of resilient, resource-oriented communities. Verity et al. considered some of the approaches that have been used around the world. Something to note is that there are a huge variety of activities that different countries have employed which could be explored further. They also noted the impact of neo-liberalism on societies and interestingly related this back to Wales' implementation of the Social Services and Wellbeing Act. They found that contrary to the Act's intention to promote communities, the concept of having voice, choice and control have strengthened individual wants and needs rather than that of communities. This finding fundamentally contradicts the notion of the importance of communities in ageing well and is a perspective to be mindful of when implementing a preventative and early help model within the context of this key legislation.

Looking to Canada for specific examples of early help and prevention that have been implemented, Mansel et al., (2024) explored the use of an assessment tool called the Healthy Aging Asset Index (HAAI) to guide social prescriptions for older adults based on the determinants of healthy ageing. The tool was developed with the objective to shift care from clinical settings to the community and move support up-stream. The tool consists of seven domains which aims to identify strengths (and weaknesses) in order to identify relevant support for individuals. The study found that individuals wellbeing was improved across a number of the domains including safety, physical environment and social engagement. However, one of the main issues was the capacity of staff to carry out this work and to have staff in post that understood the available community resources.

Continuing to explore early help and preventative models that have been implemented, the Social Hub model developed in Tampere, Finland (Rantala., 2024), is a social innovation aimed at enhancing the wellbeing and social inclusion of older adults via a range of free services local to suburban neighbourhoods. These services include counselling, group activities and social spaces. Qualitative interviews were conducted to complete this research using the HDLB (Having-Doing-Loving-Being) model and found the Social Hubs enable continued engagement in hobbies and group activities in-person local to individual's communities. They foster meaningful social connections and reduce loneliness. Crucially, the hubs promote autonomy allowing older adults to choose how and when they participate and empower older adults to maintain their own physical and mental health and was generally considered, from feedback gathered from the individuals that have accessed the social hub, a success.

As part of ongoing research into various models, Headley (2001) conducted a meta-analysis of community-based prevention and early intervention approaches in a study completed over two decades ago in Australia. One of the domains they considered included community wellbeing and examined how these models contributed to building stronger communities and improving social outcomes. The analysis found that community-based programmes promote resilience, reduce dependency and, where successful, are cost-effective providing support for the approach.

Looking to the United Kingdom and where a preventative and early help approach has been implemented, back in 2006 the Partnerships for Older People Projects (Popp) initiatives was established via £60m of funding from the Department of Health (Department of Health (DOH), 2010). The initiative's aim was to develop services for older people to promote their health, wellbeing and independence and prevent or delay the need for an increase in managed care e.g. domiciliary care and respite or residential care. This initiative ran for 3 years to 2009 with 29 councils in England involved. Of the projects that were set up by Local Authorities 66% were directed at reducing social isolation or promoting healthy living. Supported by the third sector an additional 530 projects were commissioned focusing on activities even further 'upstream' the care continuum. Overall, 81% respondents agreed they had experienced improvements in their quality of life and wellbeing. While there was a hugely broad offer of support for older people through these various projects, the greatest improvements (12%) were reported where individuals had received practical help. While this could impact quality of life from a physical perspective, this support being provided could also have an impact on an individual's feelings of stress and anxiety. While difficult to measure, it was concluded that there was a high probability that the programme was cost-effective particularly in comparison to managed

care. The programme did face difficulty in maintaining the various programmes as decommissioning managed care services would be required to fund these services to continue.

Considering a practical solution to providing an increase in early-help and preventative services, Zhang et al., (2025) reviewed the effectiveness of transitioning to a digital front door to encourage individuals to self-serve to meet their care and support needs. This research focused on English Local Authorities and found that adoption of a digital front door was limited (approximately 20% of Local Authorities participating) however where this was an available option, it did likely help individuals with lower care needs access services. The research also found that individuals with higher needs bypassed this step and contacted professionals directly. This approach could be utilised hand-in-hand with the agreed early help and preventative model for Swansea Council.

Further examples were provided by Frost et al. (2024) who mapped and analysed recent innovations in health and social care for older people in Northeast England and Southeast Scotland. Looking at the study's findings, the majority of the innovations were system-level rather than focusing on individuals' ability to improve their own quality of life, although most of the innovations were community-based. Of the innovations that focused on individuals, these were primarily spearheaded by third sector colleagues. However, they did find that individuals facing digital exclusion, particularly in deprived communities, were at risk of being left behind which would need to be a consideration of any digital innovations. To note, 7% of adults in Wales are not online. However, for older adults this percentage is significantly higher with only 41% of people over 75 having basic digital skills (Digital Communities Wales, n.d.).

There is also evidence that implementing preventative and early help models can delay the need for statutory support services. Lee et al., (2020) carried out a meta-analysis to better understand these opportunities. There were mixed findings across a wide range of different models evaluated globally however success in delaying the need for managed care was found where a dementia care integration model was implemented and where preventive home visits were carried out in Denmark. The findings in this meta-analysis suggested that early intervention can work if targeted at the right time and with the right population.

A key component of the prevention and early help models globally is the creation and embedding of the Local Area Coordinator (LAC) model initially in Australia in the 1980s (Lunt et al., 2021). Subsequently, this model was adopted in Swansea in 2015 (Swansea Council, n.d.). There are three levels of support that LAC provides which are:

11. Signposting and information
12. Long-term relationship-based support
13. Support for community organisations and initiatives

Local Area Coordination supports individuals to pursue their vision of a 'good life' through an initial strengths-based conversation that contributes to a plan that outlines how their 'good life' will be achieved (Bainbridge & Lunt, 2021). Unlike other supportive services provided by Local Authorities, there is no formal referral mechanism with individuals able to reach out to their Local Area Coordinator directly to request this type of support. A further contrast to other support services provided by the Local Authority is that Local Area Coordinators do not provide services directly themselves and their involvement has no time limitation (Lunt et al., 2021). However, according to Lunt et al., (2021) due to this lack of eligibility criteria and timeframe for involvement, this has led to different set-ups across geographical areas leading to some implementation challenges particularly in providing a consistent approach that is true to the original model.

According to Lunt et al. (2021) and Thiery et al. (2023) as with other preventive models while gains are observed and reported there can be issues with evaluating the success of Local Area Coordination at a community level with much of the success stories focusing on individual case studies. Mason et al. (2021), in addition to echoing these findings, also concluded that LAC will only succeed if it works well and complements other services. It is critical for Local Authorities, partners and citizens to understand what LAC does and does not do so that roles across the early help and prevention space are not duplicated. This will be critical when dovetailing this approach with the Community Wellbeing Officer model as part of developing a holistic Adult Services Early Help model. Better understanding the model implemented in Swansea and its success is critical in developing the current early help and prevention offer and where gaps may continue to exist.

Further exploring alternative approaches to delivering and / or bolstering an early help and preventative model, Technology Enabled-Care (TEC), also known as Assistive Technology, is prevalent in the research. The potential of this is seemingly infinite and could be considered as a standalone research project. Aligning with the scope of this research, Yusif et al., (2016) considered how Assistive Technology could support older people remain independent for longer without the need for domiciliary or residential care and also considered the barriers to maximising the opportunities. Some of the opportunities included providing individuals with a greater feeling of safety by using e.g. emergency alarms, supporting individuals to manage their own health e.g. by using wearable health trackers and support to stay connected e.g. via smart home technology such as smart speakers. However, the barriers to uptake included concerns about privacy, usability and cost. To note, this study was conducted in 2016 and therefore with the speed of the development of TEC there are even more opportunities to utilise a range of technologies to support individuals. TEC could be a preventative and early help model in itself but specifically relevant for this research could also support some of the other approaches discussed in this paper and is prudent to consider where it could be utilised, possibly as part of a holistic plan.

Reflecting on the literature review as a whole, there are a wide range of opportunities to explore to implement an early help and prevention model. These include:

- A focus on primary and secondary prevention activities
- Community based support, ideally with services local to communities
- Cost effectiveness and sustainability for preventive and early help approaches
- Tools like the Healthy Aging Asset Index (Canada) can help tailor support to individual strengths and needs
- Bolster early help and prevention models with existing LAC and TEC provision
- Inclusion of the third sector in development and implementation

Considering the literature reviewed as a whole, the limitations of early help and prevention can be summarised as follows:

- Difficult to agree a single definition of early help and prevention and the parameters of the services they encompass
- Difficult to measure the success of activity that doesn't happen due to early help and prevention
- Funding issues due to increase in population and demand for managed care services. As a result, historically challenges have been faced to adjust budgets in response to current demand, particularly while adopting a proactive early help and prevention model that is closely tied to the organisation's structure and the primary services it is designed to deliver.

3 Current situation in Adult Services, Swansea Council

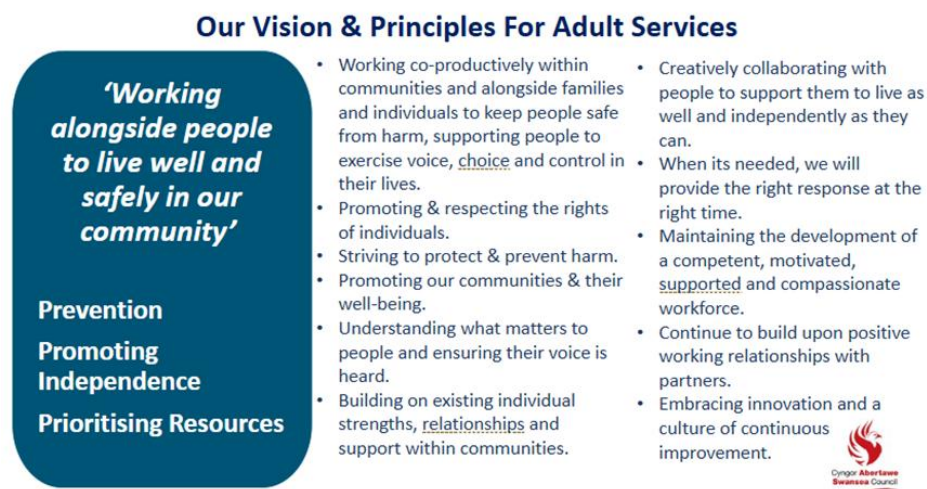


Figure 3. Adult Services Vision & Principles.

Adult Services has combined the priorities in Swansea Council's Corporate Plan (Swansea Council, 2025), Adult Services Service Plan and Adult Services Transformation Programme to create a single plan in the form of its Target Operating Model (TOM) (Swansea Council, 2025). The Vision & Principles for Adult Services for 25/26 that have been translated into this TOM can be seen in the Figure 3.

Combining this vision with the three key objectives from the Adult Services Service Plan of:

- Prevention
- Promoting Independence and
- Prioritising Resources

This has led to the development of the TOM which outlines how Adult Services will achieve their vision.



Figure 4. Adult Services Target Operating Model.

This model has been translated into specific objectives and targets to attain this vision. Regarding early help and prevention these are:

- Continue to build our preventative and early help offer for adult services
- Shift focus and resource from response to prevention and early help
- Robust data, systems and processes which support our vision. (Swansea Council, 2025)

Over the last 10 years, Swansea Council has already begun to invest resources into early help and prevention services. For example, the reablement services supports over 1,200 people annually. This is both via the community reablement service that supports individuals in their own homes and the residential reablement offer that supports people in a residential setting. Both of these offers are time-limited for up to 6 weeks and supports individuals regain independence after an acute episode such as illness or hospitalisation. Further, Swansea Council's investment in Collaborative Communication for social care teams to support staff to move away from process-driven interactions to having strengths-based empowering conversations (Social Care Wales, n.d.) is also a key cornerstone of Adult Services' shift to prioritising early help and intervention. This approach has also been disseminated to the Common Access Point and the Access & Information Assistants that handle the incoming calls.

However, from the demographic pressures and the financial restraints indications are that a further step is required to implement an early help and preventative model further upstream. Reviewing the current status of Adult Services is critical to confirm this is the landscape which can be found briefly below.

4 Findings from Performance & Finance Monitoring report (June, 2025)

Reviewing the performance data for Adult Services at the time of conducting this research study (Swansea Council, 2025), the drivers for transformation change can already be observed. For example, in June 2025:

- the Adult Services front door answered 1,205 calls and 753 calls were abandoned. This equates to 38.4% of calls being abandoned although some of the abandoned calls may be made by the same individuals
- 50% of all calls were closed with information or advice, 50% were referred on for further support
- 429 individuals were waiting for a social care assessment
- 3,457 individuals have a Care & Support Plan i.e. have eligible care and support needs to receive services via Swansea Council
- 98 carers were waiting for a Carers Assessment

4.1 The landscape for change - development of an Early Help Model for Adult Social Care

The Common Access Point (CAP) i.e. the front door for new enquiries to Adult Services is staffed by the CAP Early Help Team. This team is primarily staffed by Access & Information (A&I) Assistants who have proactive strengths-based conversations with those that contact the department to establish their reason for doing so. In the context of the demand coming through the front door including the number of abandoned calls, the current 'as-is' process was mapped using Swimlane Mapping (Rummler & Brache, 2013).

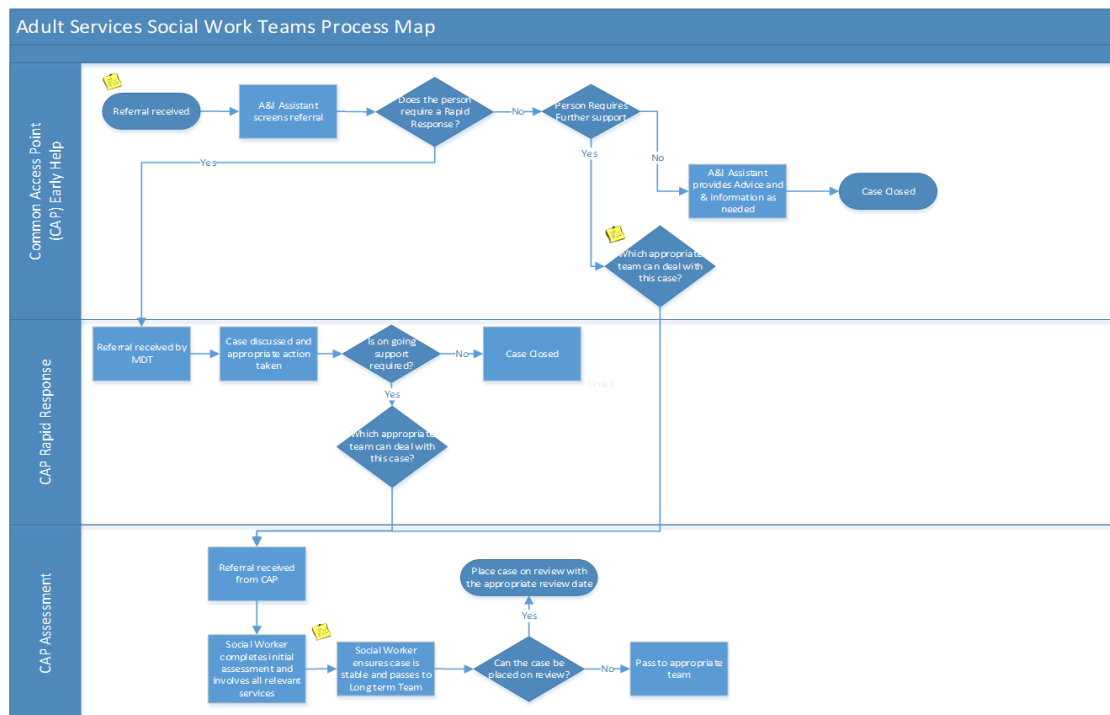


Figure 5. 'As-is' Process for CAP Early Help.

As can be seen in the above, the role of the A&Is is essentially a triage system which could result in the following outcomes:

- Signposting e.g. if an individual called for the number for the Carers Centre
- Provided information, advice and assistance e.g. establishing what support the caller could need and providing information for them to receive this
- Referred on for a social work assessment to either the CAP Rapid Response or CAP Assessment Teams, depending on the urgency.

However, as reflected in the performance and demographics data above we are not currently meeting the demand coming into the system.

To better understand the issues a Root Cause Analysis using the 5 Whys (Serrat, 2017) method has been undertaken.

Table 1: Root cause analysis using the 5 WHYS.

WHY have we got a problem with demand at our front door?	
1.	We cannot meet the demand at the front door – in terms of phone calls and throughput to Social Work Teams. WHY?
2.	Phone calls are received for huge range of queries with many deemed eligible for an initial Social Work Assessment. WHY?
3.	A significant proportion of individuals require more support than signposting from the A&Is and the only option for referring on is the CAP Initial Assessment Team. WHY?
4.	There is no alternative. WHY?
5.	We have not commissioned / accommodated an alternative in our CAP Early Help organisational structure.

Building on the 5 Whys, a Fishbone Diagram has also been utilised (Ishikawa & Loftus, 1990) to better understand the current issues with capacity within the CAP Early Help Team which can be seen below.

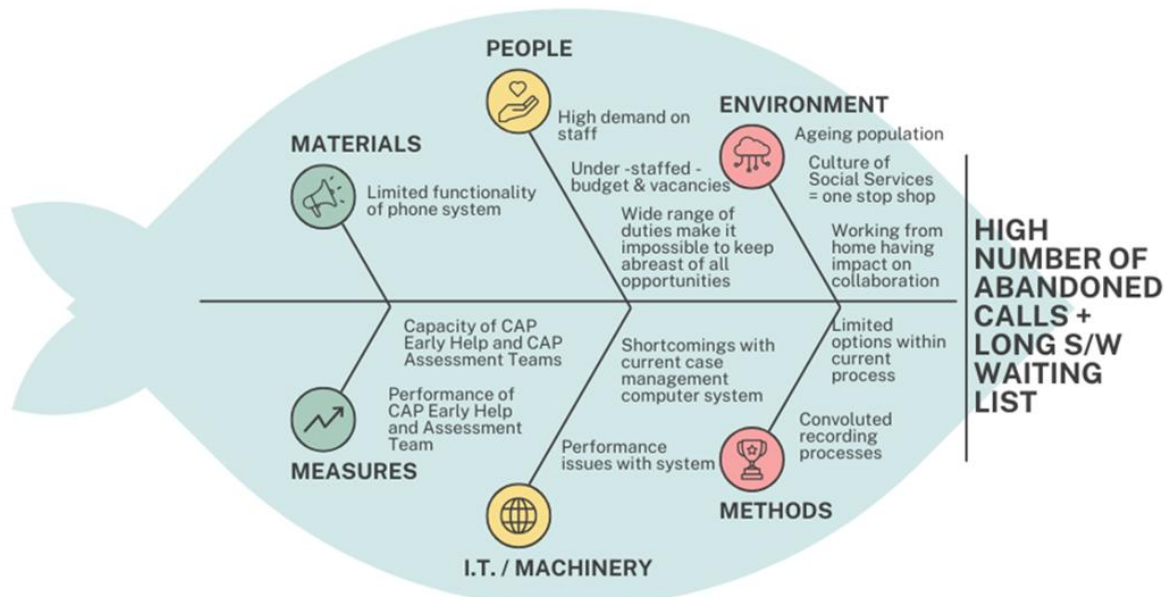


Figure 6: Fishbone Diagram of 'As-Is' CAP Early Help.

In response to the capacity issues and the findings using the above tools it was agreed that CAP Early Help should offer an alternative to the tools the A&Is had access to. Therefore, in 2024 Swansea Council commissioned Swansea Council for Voluntary Services (SCVS), the umbrella organisation for voluntary activity across Swansea, to deliver an early help offer for individuals that contact the Adult Services Common Access Point. SCVS were identified specifically because of their expertise in the local community of Swansea and were commissioned to employ 1 x FTE Community Wellbeing Officer. Approximately £50k pa of Early Help and Prevention core Swansea Council monies was ringfenced to test the concept. It was agreed that the post will support individuals that have contacted Adult Services and present as needing additional support but do not present as meeting the threshold for statutory services. The support from the Community Wellbeing Officers can be accessed via referral from the A&I Officers. The decision to refer is made using the A&Is experience, knowledge and following strength-based conversations with individuals contacting the department and not via an eligibility criterion.

The Community Wellbeing Officers will explore community services to support individuals, make referrals to other services, make warm introductions and act as a coordinator to other community-based care and support with the intention to divert and delay demand from social care and to support individuals to live independently in their own communities for longer. The post will also support unpaid carers and family members. Overall, the intention is to better manage demand for Social Services within the current budget pressures and future projected demand.

The Swimlane Mapping tool was once again utilised to map out what this process would look like which can be seen in **Figure 7**.

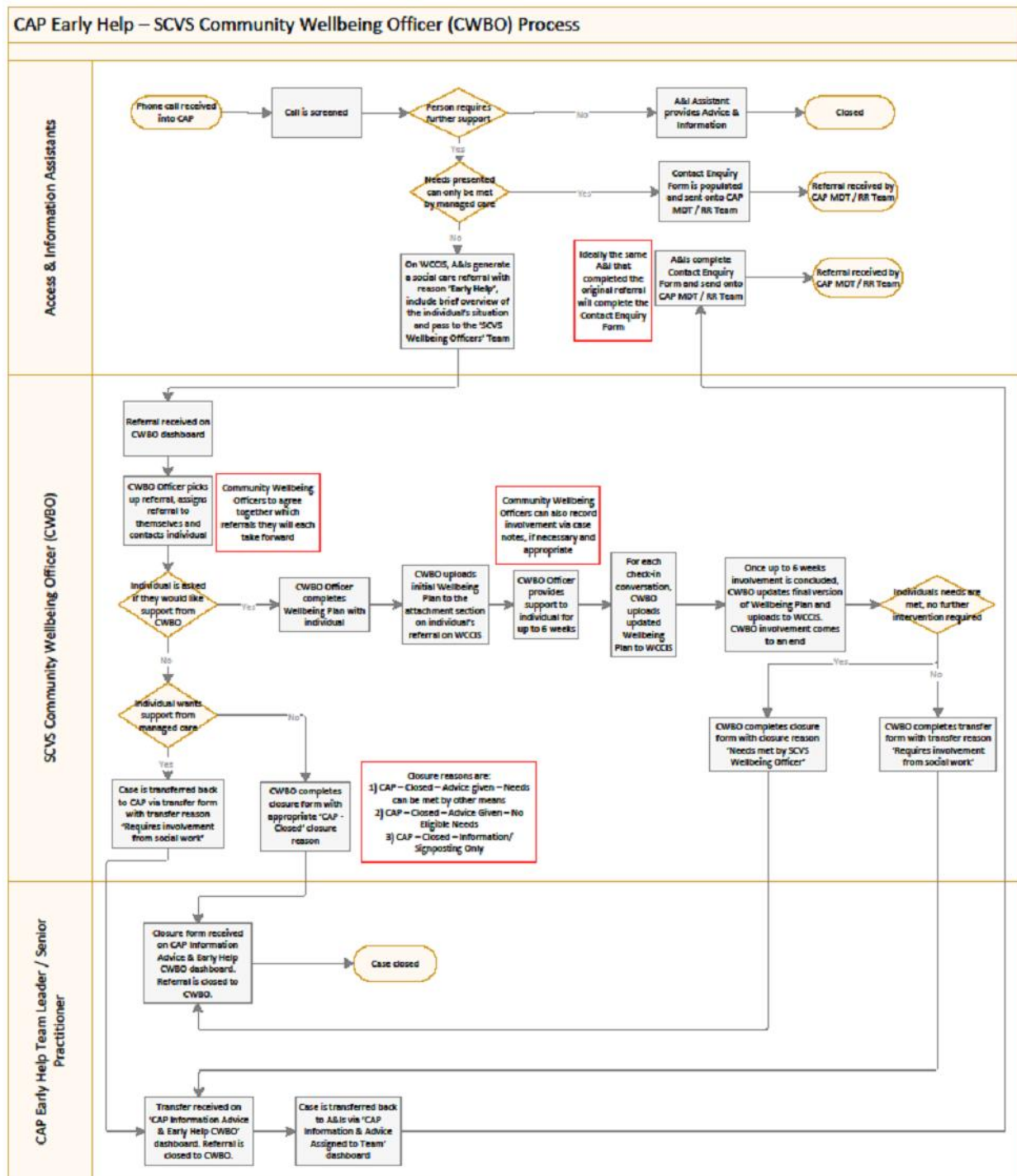


Figure 7: 'To-Be' CAP Early Help process.

This approach commenced from 6th January 2025. The intended outcomes of this approach are detailed in the table below:

Table 2: Intended outcomes of the 'To-Be' process for CAP Early help.

Short-term (within 1 year)	Medium-term (1-3 years)	Long-term (5 years plus)
Pilot approach with SCVS partners over course of 15 months to demonstrate proof of concept Divert or delay individuals from requiring managed care While facilitating access to available community support Opportunity for A&I Assistants to develop their early help and prevention knowledge further to signpost and close an increased number of referrals at first contact. Opportunity for Initial Assessment Social Work Team to manage down their waiting list Target = 80% of phone calls closed in CAP Early Help Target = Pilot pays for itself in terms of cost avoidance	If short-term goals are met, invest in Early Help and Prevention model by expanding Community Wellbeing Officer Team Increase in number of people that can be diverted and delayed from managed care at the front door Expansion of team would also allow referrals from community social work teams to de-escalate from managed care Opportunity to reduce managed care package or remove altogether Amend existing job descriptions of staff working for Adult Services to support Early Help model by disinvesting in managed care posts Target = Team pays for itself in terms of cost avoidance and cost reduction	Ideally, the Early Help and Prevention support will be embedded as an offer before contacting Social Services Long-term the aspiration could be to commission SCVS to deliver this offer directly Potential flip the current offer and have a Swansea Council member of staff located within SCVS to support where managed care may be required. This would have impact on number of phone calls received into CAP Early Help Would require huge culture shift from today – as people still contact Social Services when they're not sure who else to call If pursued, may require rebranding Common Access Point

4.2 Reason for this research

The researcher currently works as a Project Manager in the Adult Services department of Swansea Council's Social Services. The researcher's role is to contribute, shape and implement change projects that deliver the agreed objectives in the department's Transformation Programme that supports delivery of the wider Council's strategic vision.

The alignment of developing an Early Help and Prevention model in Adult Services with all three of these objectives was the motivation for the researcher to focus on this area and ascertain what could be developed further to bolster this progress.

This research will aim to understand if the above 'to-be' proposal is a robust alternative for Social Services to divert demand from Social Services and specifically to focus on the gaps that may be identified as part of the Community Wellbeing Officer role that could support individuals in living more independently for longer and diverting demand from statutory support Adult Services. The research objectives will be to ascertain:

- How effective is the Community Wellbeing Officer post in diverting demand from Adult Services' front door and Adult Services' social work teams?
- Has the work been carried out by the Community Wellbeing Officer post identified any gaps in services available to people in the community?
- If yes, are there any services that could be commissioned by Swansea Council to bolster their early help and prevention model in Adult Services?
- How could this impact translate in terms of supporting individuals living in the community?

4.3 Relevance and Value to the Organisation and next steps for this project

As a result of answering these objectives, the intention is that the Council will have an evidence base for next steps in terms of developing, implementing and bolstering an early help and prevention model in the most cost efficient and effective way possible.

5 Methodologies

The methodology identified as appropriate for this research is a mixed-methods model. Heyvaert et al. (2013) defines this as “A mixed methods approach combining qualitative and quantitative research elements is used to integrate these qualitative and quantitative research findings within a single systematic review.”

This research will utilise primary data i.e. information collected by a researcher to address a specific issue or problem (The Open University, n.d.) and secondary data i.e. this refers to a data source that is already in existence and is being used either for a purpose for which it was not originally intended or by someone other than the researcher who collected the original data (Salkind, 2010).

5.1 The data that will be collated will be:

5.1.1 Secondary data

- Quantitative data from the activities carried out by the Community Wellbeing Officers between the dates of January 2025 and June 2025
- Qualitative data from anonymised case studies of individuals that the Community Wellbeing Officers have worked with between the dates of January 2025 and June 2025

5.1.2 Primary data

- Review of individual Wellbeing Plans to gain an understanding of unmet need in relation to services requested / required in the community.

Ethical approval for this data can be found at **Appendix A**.

5.2 Key Performance Indicators

To explore the success of the Community Wellbeing Officer role in developing an early help and prevention offer, the key performance indicators that will be analysed will be:

Table 3: KPIs of implementation of Community Wellbeing Officer role.

• Number of referrals received (total between January and June 2025 and broken down by month)
• Individuals open to a Community Wellbeing Officer (total between January and June 2025 and broken down by month)
• Number of wellbeing plans recorded (total between January and June 2025 and broken down by month)
• Number of individuals that the Community Wellbeing Officers worked with that were transferred back to Social Services (total between January and June 2025 and broken down by month)
• Number of individuals that the Community Wellbeing Officers worked with that were closed to CAP Early Help (total between January and June 2025 and broken down by month)
• Outcomes of the interventions of the Community Wellbeing Officers (total between January and June 2025 and broken down by month)
• Organisations the Community Wellbeing Officers referred onto (total between January and June 2025 and broken down by month)
• Case studies of individuals that the Community Wellbeing Officers have supported

5.2.1 Data and Findings from above KPIs

From December 2024 when the new model was communicated to CAP Early Help staff to June 2025, 128 referrals were made by the A&I Assistants to the Community Wellbeing Officers.

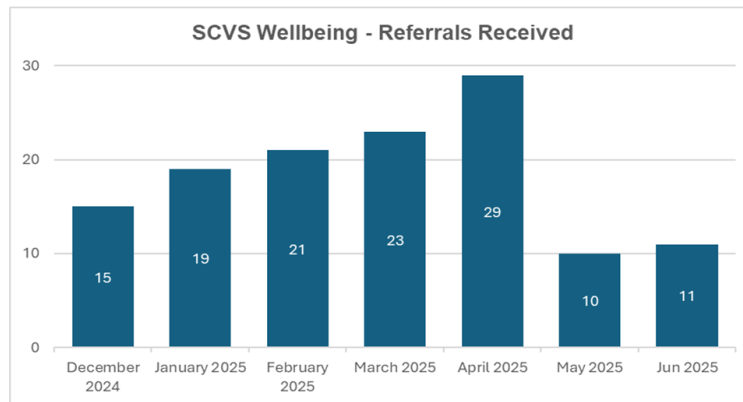


Figure 8: Community Wellbeing Officers Referrals Received.

There were a wide range of reasons for referring to the Community Wellbeing Officers. The majority needed practical help (40%) followed by support with social activities / getting out (23%) and help with finances (16%). The type of practical support individuals requested help with included food shopping, cleaning, laundry, changing beds and making meals.

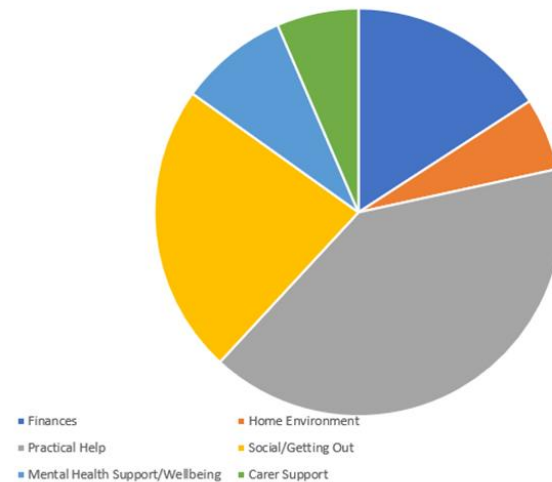


Figure 9: Main reason for referral to Community Wellbeing Officers.

Across this period there was an average of 56 individuals open to the Community Wellbeing Officers at any one time.

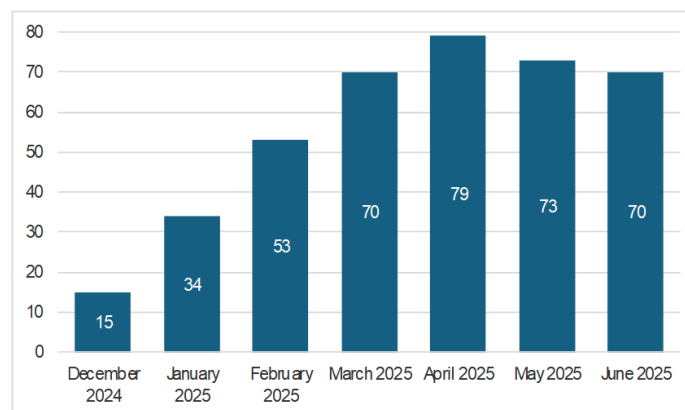


Figure 10: Individuals open to a Community Wellbeing Officer.

There were 77 Wellbeing Plans recorded for individuals by the Community Wellbeing Officers within the date period. Of these, 71 were initial Wellbeing Plans and 6 were updated Wellbeing Plans.

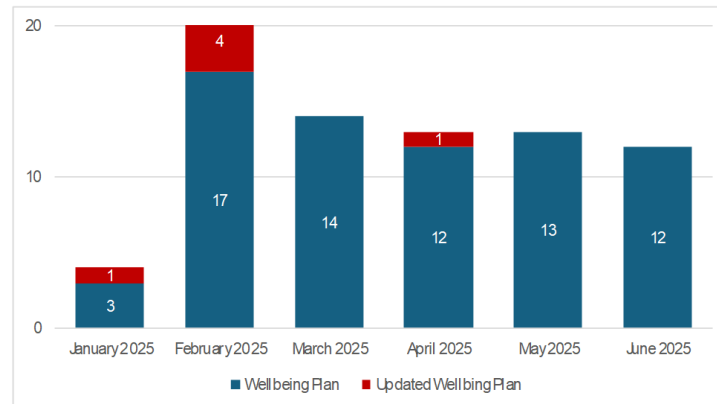


Figure 11: Number of Wellbeing Plans completed.

Subsequent to the Community Wellbeing Officer intervention, of the 85 individuals they worked with (not all consented to / required the completion of a Wellbeing Plan) 64 were closed to Social Services and 21 were transferred back to CAP Early Help for further assessment. This equates to 75% of individuals not requiring additional provision once they had received advice, guidance and support from the Community Wellbeing Officers.

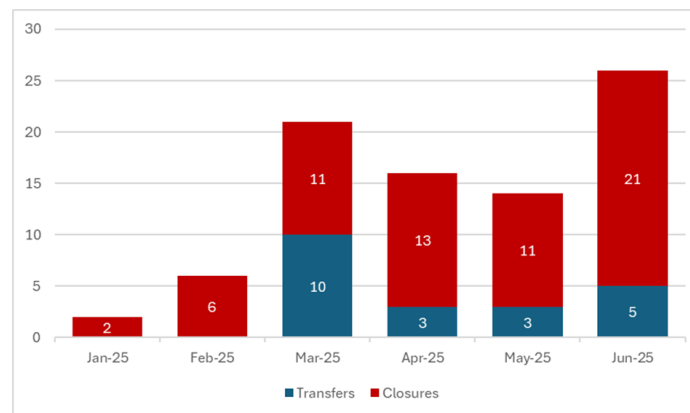


Figure 12: Number of referrals closed and number of referrals transferred back to Social Services.

Of the referrals that were transferred back to Social Services:

- **12** were referred back to Social Services for a Social Work assessment as needs were higher than anticipated or became higher whilst open to the Community Wellbeing Team
- **1** was referred to Occupational Therapy
- **1** was referred to the Community Equipment Store
- **4** individuals did not engage with Community Wellbeing
- **2** individuals had passed away before the Wellbeing Assessment could be completed or whilst open to Community Wellbeing.

It would be beneficial to understand the ongoing journey of the 12 individuals that were transferred back to Social Services however the outcomes and implications of this are outside the parameters of this study.

There were a range of support options identified that individuals were referred to. Looking at the top two reasons individuals were referred to the Community Wellbeing Service, for practical support the majority of individuals were referred to the Microenterprise Directory supported by SCVS (49%) followed by Community Transport (33%).

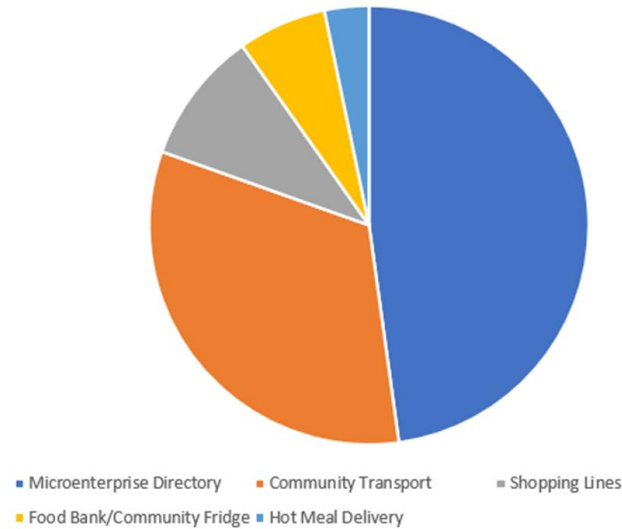


Figure 13: Organisations referred onto by Community Wellbeing Officers.

The second most requested service was for support with social groups and activities. There are a wide range of community services already in existence that were referred to during this period. The most popular links were made to the Friendship Café via Goleudy (19%) and Involve Befriending via SCVS (12%). However as can be seen in the chart below there were 23 different services referred to.

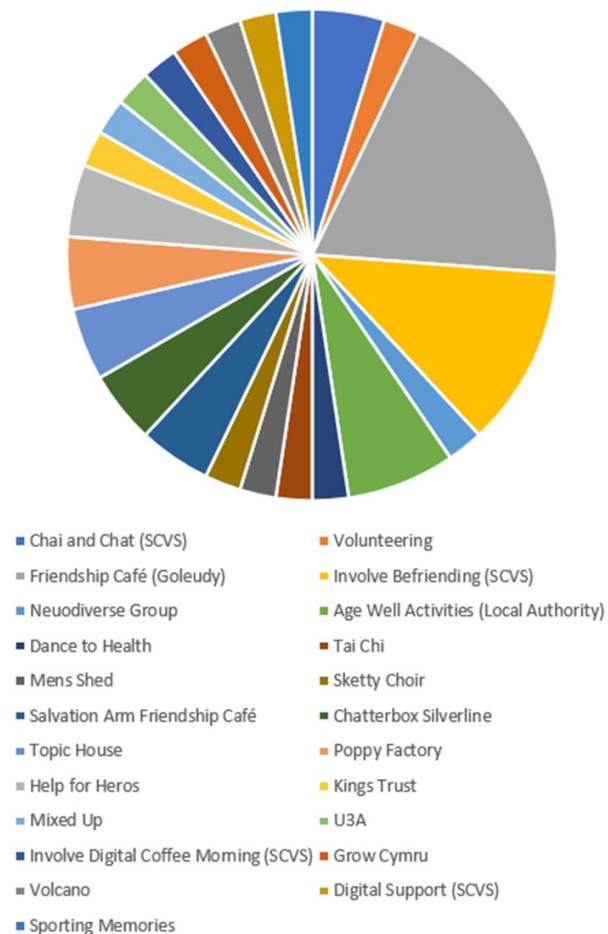


Figure 14: Social Groups and Activities referred to by Community Wellbeing Officers.

When looking at the referrals to community services made to support individuals with finance queries, there are a wide range of organisations available in the community. The services most frequently referred to are Citizen's Advice (26%), Advice Link Cymru (22%) and Age Cymru (15%) as well as a number of others.

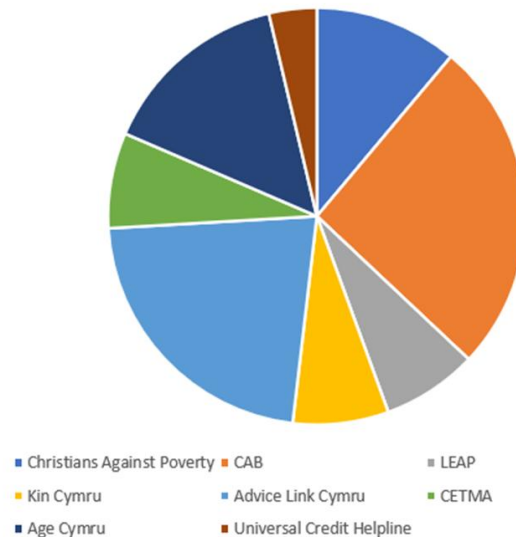


Figure 15: Financial Support Organisations referred to by Community Wellbeing Officers.

Case studies were also reviewed to better understand the value of the Community Wellbeing Officer role. The breadth of support was further reflected in these case studies which demonstrate individuals being supported with a number of domains in their lives. There were a number of case studies reviewed where receiving support with one pressing issue e.g. medication pick-up/delivery, community transport or cleanliness of the home, resulted in significant alleviation of pressure on an individual or a family. Examples of these case studies can be found at **Appendix C**.

5.3 Unmet Needs

To better understand the unmet needs identified by Community Wellbeing Officers, the initial Individual Wellbeing Plans were reviewed as part of this research to assess where current community offers may be lacking. The initial finding from this review was that the Community Wellbeing Officers identified a community service that almost everyone referred to the service could benefit from. Of the Wellbeing Plans that were reviewed, only one individual reported that they did not feel there was any support that was discussed that would benefit them.

When reviewing the individual Wellbeing Plans, despite the wide range of needs individuals presented with there was potential support options available from a wide range of organisations (as referenced above) for the vast majority of issues. There were not an obvious gap or gaps in provision in the community that resulted in individuals having to be referred for a Social Care Assessment where Early Help and Preventative services would have sufficed if they had been available. One of the key observations of reviewing the plans was that it did appear to be highly advantageous to have one person coordinating access to a range of different community support options. The knowledge and experience enabled more seamless navigation of services and ensure support was tailored to individual needs taking a holistic approach.

When reviewing the plans the following general observations were made:

- A number of individuals did not want to discuss their finances. The discussion of money continues to be a deeply personal topic, and many people are deeply private about their circumstances.
- It appears from the Wellbeing Plans that some individuals may choose not to engage with support services. This could lead to a diminished quality of life but also increase the risk of reaching crisis point in the future.
- Despite the Community Wellbeing Officer's best efforts to encourage, some individuals appear to be unable to broaden their perspectives and explore opportunities beyond their immediate

environment sometimes making it difficult to identify and provide support options that could enhance their quality of life.

- There were a number of people having their quality of life impacted due to being on the waiting list for a procedure that will be provided by the NHS.
- There were a number of people that were not using the internet or relying on others to complete any and all online tasks on their behalf. As the world migrates increasingly online this may become an even greater barrier. It was noted that digital inclusion support is available if individuals would like to improve their skills, however some individuals expressed they did not need to improve their digital skills either because they didn't think it would be beneficial or because someone in their lives could undertake digital tasks on their behalf.
- Some support identified was time-limited and/or only available because of temporary / time-limited funding opportunities. This is clearly not a robust system. Examples of the type of support that fell into this category included deep cleaning as a result of hoarding.

It would seem that the support services that were most popular for individuals, which is supported by the quantitative analysis above, were:

- Community transport,
- Assistance with cleaning,
- Assistance with shopping,
- Assistance with preparing meals, and
- Assistance with dressing.

While the Community Wellbeing Officers are able to provide a referral to Community Transport and information on the Swansea Microenterprise Directory, there is a cost to individuals for these services. Further research could explore the capacity of these services and whether the Council could support in ensuring whether this will be ample as awareness of the directory increases.

13.6 The final observation from reviewing the assessments is the possibility of the questions improving the focus on strengths. While it is not possible from this research to know the actual questions asked of the individuals during the assessment conversations, the wording in the assessment document does currently include some questions that are deficiency based. A blank version of this template that provides an overview of the questions can be found in Appendix B.

The above observations could be the subject of future research to better understand the extent to determine their validity and potential impact if accurate.

5.4 Individuals returning to Social Services

Continuing the review of the period between January and June 2025, the final data set examined focused on individuals who had worked with a Community Wellbeing Officer to develop an Individual Wellbeing Plan, were subsequently closed to the department, and then re-presented at the front door within the same timeframe. There were 5 individuals that re-presented to the front door after receiving a Wellbeing Plan and being closed to the CAP Early Help Team and therefore to Adult Social Care. On average, there were 45 days between closure by the Community Wellbeing Officer and the individual re-presenting at the front door. The mode length of time was 63 days, and the median was 63 which indicates that the average may have been brought down by a single individual.

When exploring the reasons for re-presenting by reviewing the individuals Wellbeing Plans and the new referral received, 60% appeared to be initially closed due to non-engagement and/or unresolved contact issues, before returning with the same or similar concerns. The remaining 40% re-presented due to signs of decline in existing health issues since the Community Wellbeing Officers were involved.

The delay of 63 days as a median number of individuals returning (while the majority did not return) is not insignificant and the reasons for returning were not due to services being unavailable in the system when they were first allocated a Community Wellbeing Officer. The reason for return was either due to the requirement for support with their mental health or a decline in existing issues that were previously being managed.

6 How this research fits into the context of the literature reviewed

Cross-referencing the above with the literature review, the findings of implementing this model align with previous key findings. For example:

- Previous research found support with practical tasks was valuable for individuals which was reiterated by the information shared in the Wellbeing Plans
- Previous research found difficulties with maintaining funding for specific programmes. While the Community Wellbeing Officer posts are funded from core funding, support services referred to by the Community Wellbeing Officers may encounter this issue
- Previous research identified the importance of the third sector in developing and maintaining an early help model, an approach which has been taken in Swansea. How the third sector can embed closer with Swansea Council and its partners in this model could be explored further.
- Previous research outlined the use of a non-statutory assessment to ascertain an individual's needs. While using a different tool, the approach detailed in the previous research does partially reflect the aims and outcomes of the use of a similar document to a Wellbeing Plan.
- Previous research considered the effectiveness of LAC. How this links to the Community Wellbeing Officer approach ensuring distinct roles and responsibilities will need to be explored.

7 Key Findings & Conclusion

There is undeniably a role for the Community Wellbeing Officers in the CAP Early Help model which is reflected in the demand from the referrals from the A&Is and the significant number of individuals that are closed following involvement with the Community Wellbeing Officers. Credit must be given to the strengths-based conversations the A&Is have with individuals at the front door too, in order to identify appropriate referrals to ensure this pathway is successful.

There are significant resources available in the community that can support individuals to delay or divert the requirement for a Social Care Assessment.

This is emphasized by the low number of individuals that have re-presented at the front door within the time frame reviewed in this research paper.

The role of an individual staff member coordinating both provision of information and referral to a range of services has been found to be valuable.

However, while it can be acknowledged that there are significant opportunities for a variety of different support opportunities in the community, a lot of these are grant funded, time limited funded or relying on volunteers to be delivered.

There are not any clear gaps in the provision in the community, however there are potential capacity and funding issues for available services, and some available services have a fee attached to them which may be problematic for some members of the public. Some opportunities are also only available to some individuals who are in 'the right place at the right time' and are not consistently accessible.

8 Recommendations

Looking at the findings above, it does seem it would be prudent to expand the Community Wellbeing Officer Team to provide not only additional capacity but also widening the remit of the role. For example, this could include providing an opportunity to work with Social Work Teams to de-escalate care and support plans and utilise additional resource to research support options that become available in the community.

Agree distinct roles and responsibilities for the different roles in a holistic early help and prevention model including those of the A&Is, Local Area Coordinators and Community Wellbeing Officers.

As part of the roles & responsibilities, ensure a clear definition is agreed upon for early help and preventive services which can be shared across the department and with partners. This will also support with accurate performance monitoring going forward across the early help and prevention model.

Due to the variable nature of some of the services that are supporting individuals in the community, it could be prudent to consider commissioning some of these services, so they are not reliant on time-limited funding

/ volunteers etc. For example, this could include Community Transport, support from Micro-enterprises and assistance with deep cleaning / support with hoarding. More data would need to be collected.

Subsequently to 17.4, work closely with the Adult Services Commissioning Team to establish contracts to provide the Community Wellbeing Officer Team with opportunities to access early help and prevention support to prevent an individual's circumstances escalating and diverting the requirement for statutory services.

Explore further the potential to shift from the current funding arrangements to divert funding upstream to support the aforementioned strategic priorities and strengthen the early help and preventative model, potentially expanding the team further with the possibility of additional roles.

9 Potential future research

Gather qualitative feedback from individuals that are involved / have been involved with the Community Wellbeing Officers to devise a Wellbeing Plan after their involvement is closed to better understand the short, mid and long-term impact of the intervention. This feedback can also support with better understanding any gaps in support that people advise may have benefited them.

It would be beneficial to understand the outcomes relating to the individuals that were originally referred to the Community Wellbeing Officers and were referred back to Social Services to receive a social work assessment. This could provide us with additional data regarding the needs the Community Wellbeing Officers felt they could not meet and whether these are something that could be categorised as early help and intervention or whether statutory social care e.g. domiciliary care, was needed.

Better understand the reason that individuals that re-present at the Common Access Point after being supported and closed by the Community Wellbeing Officers. By understanding the reasons for re-presenting, this will support the Local Authority in better understanding if there are any services that need to be developed to maintain individuals' independence. Continuing to monitor the length of time between calls to the front door will also better understand the impact of the Community Wellbeing Team i.e. the length of time the need for support was diverted and / or delayed providing us with quantifiable evidence of the success of the project.

Thinking long-term, if any services are commissioned by the Local Authority in response to the findings in this research paper, it would be advantageous to ensure agreed performance metrics are developed to measure the impact of these.

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11 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Improving Flow of the Reablement Service: South Wales Case Study

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Abstract:

This dissertation investigates the operational effectiveness and staff experiences within a Reablement Service in South Wales, delivered in alignment with the Discharge to Recover then Assess (D2RA) model. The study addresses systemic challenges in patient discharge and community-based recovery, with a particular focus on shift patterns, digital integration, and the equitable allocation of care tasks. Using a mixed-methods case study approach, the research combines qualitative data from semi-structured staff interviews and open-ended survey responses with quantitative analysis of service metrics and Likert-scale feedback.

Thematic analysis revealed key operational barriers, including inadequate call durations, unrealistic travel times, and inconsistent rota planning, all of which impact staff wellbeing and service quality. These findings informed a series of practical recommendations, such as the implementation of “Ladder Planning,” improved digital coordination, and enhanced continuity of care. Comparative examples from other UK and international reablement services were used to contextualise and validate the proposed changes.

The study concludes that embedding staff feedback into service design is essential for delivering person-centred, efficient, and sustainable care. The findings contribute to the broader policy goals of A Healthier Wales and offer a replicable framework for other local authorities seeking to improve reablement outcomes through co-production, digital innovation, and workforce resilience.

Keywords: Reablement, Patient flow, D2RA, Service improvement, Workforce wellbeing, Digital integration.

Table of Abbreviations

Abbreviation	Full Form
ADL	Activities of Daily Living
AI	Artificial Intelligence
GDPR	General Data Protection Regulation
NHS	National Health Service
UK	United Kingdom

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1 Introduction

This dissertation examines the operational effectiveness of a Reablement Service in South Wales, aligned with the Discharge to Recover then Assess (D2RA) model. Using a mixed-methods case study approach, it explores how service design, shift patterns, and digital integration affect staff wellbeing and patient outcomes. Thematic and quantitative analyses identified key barriers to efficient care delivery, including unrealistic call durations, poor rota planning, and fragmented communication. Staff feedback highlighted the need for more equitable workload distribution and improved digital coordination. The findings contribute to the goals of A Healthier Wales, offering a replicable framework for improving reablement services through co-production, digital innovation, and workforce resilience. Recommendations include adopting “Ladder Planning” for dynamic shift allocation, enhancing digital tools, and promoting continuity of care. These are supported by comparative insights from other UK and international reablement models.

2 SBAR

2.1 Situation

Delays in patient discharge within the health and social care system in South Wales are causing inefficiencies, increased costs, and negative patient outcomes. The Reablement Service, aligned with the Discharge to Recover then Assess (D2RA) model, aims to address these issues by supporting timely discharge and recovery in the community.

2.2 Background

The literature reveals a gap in community-led discharge interventions, with most research focused on hospital-based processes. The study uses a mixed-methods case study approach, guided by the research onion framework, to explore staff experiences and service performance. It combines qualitative interviews, staff surveys, and secondary data analysis to understand barriers and enablers of patient flow.

2.3 Assessment

Findings highlight:

- The importance of integrated care pathways and digital tools.
- Staff challenges related to workload, coordination, and communication.
- Positive outcomes from the Reablement Service, including reduced long-term care dependency.
- A need for improved digital integration, inter-agency collaboration, and staff support.

2.4 Recommendations

The study has generated new recommendations for improvement which include:

- Enhance digital integration with shared care records.
- Strengthen inter-agency coordination through co-location and regular meetings.
- Tailor shift patterns to staff needs to reduce burnout.
- Expand training in reablement principles.
- Standardise outcome reporting across authorities.
- Scale best practices across regions.
- Explore long-term impacts of reablement on readmissions.
- Incorporate patient experience metrics into service evaluation.

The previous sections have outlined a summary of this research; the next sections will add more detail to the research design and process.

3 The Research Study: The Key Problem with delivering care closer to home

The current health and social care system frequently experiences delays in patient discharge, creating significant bottlenecks in patient flow. These delays are often the result of fragmented communication, slow system responses, and a lack of integrated care pathways. The consequences are far-reaching: patients may suffer harm due to deconditioning, loss of independence, or prolonged hospital stays, while staff face increased workloads, operational inefficiencies, and emotional strain from managing avoidable delays NHS Wales (2023). These issues also carry financial implications, as delayed discharges contribute to increased healthcare costs and inefficient use of resources. The Welsh Government's long-term vision, outlined in A Healthier Wales, calls for a whole-system approach that integrates health and social care to deliver seamless, person-centered services (Welsh Government, 2018). The Discharge to Recover then Assess (D2RA) model supports this vision by enabling timely discharge and reablement in the community, reducing unnecessary hospital stays and promoting recovery in familiar environments.

4 Literature Review

A traditional literature review was conducted using Swansea University repositories and involved key search terms used to find relevant journal articles that were published in international peer reviewed journals and grey literature.

The literature review is focused on identifying existing models and challenges related to patient flow within community healthcare settings. While much of the existing research emphasises hospital-based discharge processes, there is a notable gap in studies addressing community-led interventions such as the Reablement Service.

Key themes emerging from literature include the importance of integrated care pathways, timely communication between services, and the role of digital tools in streamlining transitions. Additionally, patient experience is increasingly recognised as a critical outcome, with studies highlighting the need for safe, timely, and person-centered care environments to support effective transitions. Gleeson et al. (2016), for instance, identify three key pillars of patient experience, communication, emotional support, and continuity of care as essential to satisfaction across the continuum of care. This is echoed by Adams et al. (2024), who further emphasise these pillars as foundational drivers for improving healthcare quality and patient-centered outcomes.

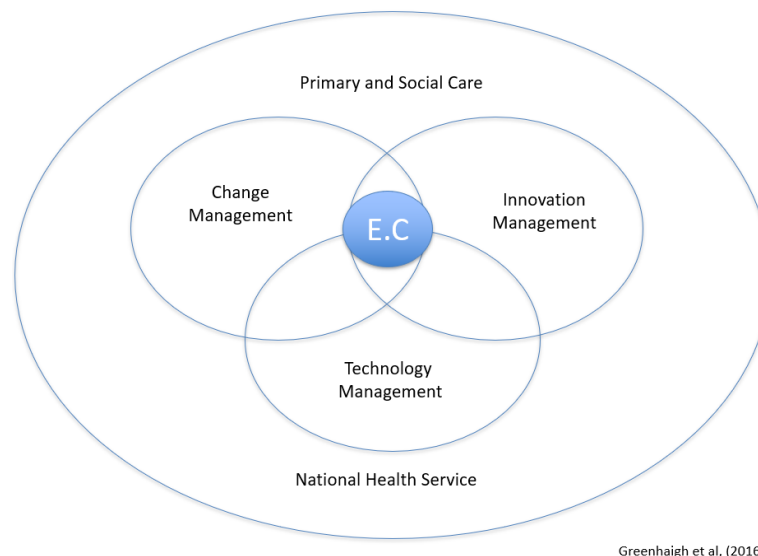


Figure 1: The Literature Review.

While much of the literature supports the effectiveness of reablement services in improving patient outcomes, there is variation in how these outcomes are achieved and measured. Unlike Buma et al. (2022), who found that reablement consistently improves daily functioning and reduces long-term care dependency

across diverse settings, other studies suggest that these benefits are not universally experienced. Tuntland et al. (2015) argue that the success of reablement is often contingent on local implementation factors, such as staff training, interdisciplinary collaboration, and the availability of community resources. These findings are consistent with the current study, which observed strong outcomes in one local authority but noted a lack of comparable data elsewhere, limiting the ability to generalise results. Similarly, while Gleeson et al. (2016) emphasise the importance of communication and continuity, Aspinall et al. (2016) critique the lack of standardised metrics for evaluating these dimensions in community settings. This underscores the need for more robust, transferable evaluation frameworks, an area this study contributes to by recommending standardised outcome tracking and the inclusion of patient experience metrics.

In contrast to the predominantly elderly-focused reablement models discussed by Buma et al. (2022), Seberg and Eriksson (2018) explored reablement in mental health care, emphasising the role of occupational therapists in promoting recovery through everyday activities. Their findings suggest that reablement can be adapted beyond physical rehabilitation to support psychological well-being, highlighting the flexibility and broader applicability of the model. This contrasts with more traditional frameworks that narrowly define reablement within physical health domains.

Additionally, a comparative study by Langeland et al. (2016) found that while reablement significantly improved outcomes for elderly individuals, its effectiveness varied for people with intellectual disabilities. This supports the argument that reablement outcomes are not universally consistent and must be tailored to the specific needs and contexts of different populations. These findings reinforce the current study's emphasis on localised implementation and the need for adaptable, person-centered approaches. As a result of the literature review a gap was detected and framed using the following research question:

How can co-ordination of the Reablement process enable more efficient service delivery?

4.1 Research Strategy and Methodology

The research onion, developed by Saunders et al., provides a structured framework for designing research. It consists of six layers:

Research Philosophy: the overarching belief system (e.g., positivism, interpretivism – understanding staff experiences and perspectives, pragmatism: combining qualitative and quantitative methods for practical outcomes).

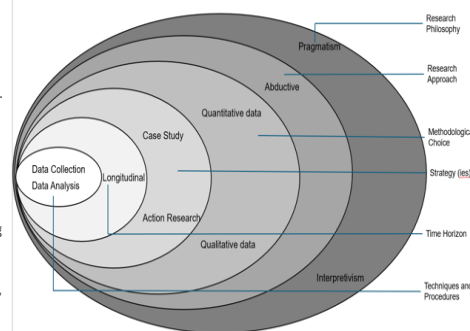
Approach to Theory Development: deductive or inductive reasoning. Abductive reasoning involves moving between theory and data to refine understanding.

Methodological Choice: qualitative, quantitative, or mixed methods. This study uses mixed methods, including semi-structured interviews, staff surveys, and secondary analysis.

Strategy: A case study focused on a Reablement Service in South Wales as a bounded system.

Time Horizon: Cross-sectional with longitudinal elements, capturing current practices and historical data trends.

Techniques and Procedures: Data collection and analysis methods, including a narrative literature review to identify gaps and inform tool design. Semi-structured interviews to explore bottlenecks, coordination, and innovations, staff surveys with Likert scale questions on efficiency, communication, and improvement, and secondary data analysis for referral-to-discharge times and service metrics.



Source: Saunders (2019, p.130)

Figure 2: The Research Onion (Saunders et al., 2019)

This study adopted the Research Onion model developed by Saunders et al. (2019) to guide the design and implementation of its methodology. The model provides a structured, layered approach to research design, ensuring that each decision, from philosophical stance to data collection techniques, is aligned with the study's aims and context. The following section outlines how each layer of the Research Onion was applied in this case study of a Reablement Service in South Wales.

The outermost layer of the Research Onion concerns the philosophical stance underpinning the research. This study adopted a pragmatic philosophy, which prioritises practical outcomes and values both objective and subjective knowledge. Pragmatism was particularly appropriate given the study's aim to generate actionable insights for improving patient flow and staff experience. It allowed for the integration of positivist elements, such as structured survey data and service metrics, with interpretivist elements, including staff narratives and thematic analysis. This pluralistic approach ensured that the research remained grounded in real-world practice while maintaining methodological rigour. An abductive approach was employed, allowing the study to move iteratively between theory and data. This approach supported the identification of emerging themes from qualitative data while also testing these against existing literature and policy frameworks. Abduction was particularly useful in refining the research questions and recommendations as new insights emerged during data collection and analysis.

The study utilised a mixed-methods design, combining qualitative and quantitative data to provide a comprehensive understanding of the Reablement Service. This included semi-structured interviews, open- and closed-ended staff surveys, and secondary analysis of service performance data. The mixed-methods approach was chosen to enhance the validity and depth of the findings through triangulation, allowing the study to cross-verify insights from different data sources. It also enabled the research to capture both the measurable outcomes of service delivery and the lived experiences of staff, which are often overlooked in purely quantitative studies. This methodological choice was particularly well-suited to the complex, multidisciplinary nature of reablement services, where both operational metrics and human factors are critical to understanding performance.

A case study strategy was selected to explore the Reablement Service within its specific operational and policy context. This strategy facilitated an in-depth examination of the service's structure, challenges, and innovations, and was well-suited to the study's focus on local implementation of national models such as Discharge to Recover then Assess (D2RA). The case study approach also allowed for the integration of multiple data sources, supporting a holistic understanding of the service.

The research adopted a cross-sectional time horizon, collecting data at a single point in time. While this limited the ability to assess long-term outcomes, it provided a valuable snapshot of current operational dynamics and staff experiences. Future longitudinal studies could build on this foundation to explore sustained impacts and the evolution of service improvements over time.

At the core of the Research Onion are the specific techniques and procedures used for data collection and analysis. This study employed:

- Semi-structured interviews to gather rich, contextual insights from staff.
- Surveys with both Likert-scale and open-ended questions to quantify perceptions and identify recurring themes.
- Secondary data analysis of referral-to-discharge times and reablement outcomes to assess service performance.

These methods were selected to align with the pragmatic philosophy and to ensure a holistic understanding of the service.

4.1.1 Informant Selection and Sampling Limitations

A purposive sampling strategy was used to select participants, including frontline staff, managers, administrative personnel, and potentially patients or carers. This approach aimed to capture a diverse range of perspectives on patient flow and service delivery. The sampling strategy was consistent with the study's pragmatic and interpretivist orientation, ensuring that the data reflected both operational realities and human experiences.

However, purposive sampling also introduces certain limitations. Because participants were selected based on their roles and relevance to the research topic, the sample may not fully represent the broader workforce or service user population. There is also a risk of selection bias, as those more engaged or vocal may have been more likely to participate. While the sample provided valuable insights, the findings should be interpreted with caution and not assumed to be universally generalisable. Future research could address this limitation by incorporating randomised or stratified sampling across multiple sites to enhance representativeness.

4.1.2 Ethical Considerations

Ethical integrity was central to the research design. The following measures were implemented:

- Informed consent was obtained from all participants.
- Anonymity and confidentiality were strictly maintained throughout the study.
- Data storage complied with General Data Protection Regulation (GDPR) standards.
- Ethical approval was sought from a relevant ethics committee prior to data collection.

These safeguards ensured that participants were protected and that the research adhered to professional and legal standards.

4.1.3 Limitation: Incorporating the Patient and Carer Perspective

Although this study did not directly collect data from patients or carers, their experiences remain central to understanding the full impact of reablement services. Staff narratives frequently referenced the emotional and practical consequences of delayed discharges on service users, including increased anxiety, loss of independence, and frustration with fragmented care. These second-hand insights suggest that patient experiences are deeply intertwined with system performance and should be considered a vital component of service evaluation. Based on staff observations, it is reasonable to theorise that patients and carers might highlight several recurring themes if consulted directly. These could include:

- A desire for continuity of care, with fewer changes in support workers.
- Concerns about rushed visits, particularly when call durations are too short to meet their needs.
- Frustration with inconsistent communication, especially during transitions between hospital and home.
- Appreciation for compassionate, person-centred support, when it is delivered consistently.

To capture these insights more systematically, the use of Patient-Reported Experience Measures (PREMs) is strongly recommended. PREMs provide structured feedback on how patients perceive their care, including aspects such as dignity, communication, responsiveness, and emotional support. Incorporating PREMs into routine service evaluation would offer a more balanced view of performance, complementing staff feedback and operational metrics. This aligns with national policy priorities, such as *A Healthier Wales*, which emphasise co-production and user involvement in service design.

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5 Field Research

The next section will present the findings of the field research.

5.1 Citizen Empowerment

A core principle of reablement is the empowerment of individuals to regain control over their daily lives and reduce reliance on long-term care. This approach aligns closely with the person-centred ethos of *A Healthier Wales*, which advocates for services that are co-produced with users and tailored to individual goals. Empowerment in reablement is not simply about delivering care, it is about enabling people to do more for themselves, fostering confidence, autonomy, and resilience.

Through goal setting, collaborative care planning, and consistent support, service users are encouraged to participate actively in their recovery journey. This can lead to improved self-efficacy and a greater sense of dignity, particularly for those transitioning from hospital to home. Staff play a crucial role in facilitating this empowerment by adopting enabling rather than doing approaches, and by recognising the unique strengths and preferences of each individual.

The integration of Patient-Reported Experience Measures (PREMs) further supports empowerment by giving service users a structured voice in evaluating their care. When used effectively, PREMs can highlight areas where individuals feel disempowered or unsupported, guiding service improvements that are responsive to lived experience. Embedding empowerment into reablement practice is essential for achieving sustainable, person-centred outcomes.

5.1.1 Field Work Assessment: Digital Integration and Communication

The study found that fragmented communication and limited digital integration were key barriers to efficient patient flow. Staff reported that the lack of shared digital care records hindered coordination between health and social care teams. Comparative analysis with other local authorities revealed that services with integrated digital platforms experienced smoother transitions and fewer delays.

5.1.2 Field work: Workforce Structure and Shift Patterns

The Reablement Service operates on a 7-day schedule with two main shifts. While this model supports continuity of care, staff feedback highlighted concerns about workload, burnout, and limited flexibility. Survey data indicated a strong preference for more tailored shift patterns and increased team support.

5.1.3 Field work: Inter-Agency Collaboration

Effective collaboration between agencies was found to be inconsistent. While some teams benefited from co-location and regular multidisciplinary meetings, others experienced siloed working practices. This variation impacted the speed and quality of discharge planning and reablement delivery.

5.1.4 Field work: Outcome Metrics and Service Performance

Quantitative data showed that 352 out of 417 reablement packages resulted in mitigated support needs—an 84% success rate. This exceeds the Welsh national average of 71%, suggesting strong local operational practices and effective staff engagement. These outcomes also imply significant cost savings. If each successful reablement case reduces hospital stay by just three days, the estimated savings could exceed £415,000. However, the absence of comparable data from other authorities limits broader conclusions. To address this, future evaluations should adopt standardised outcome definitions and reporting frameworks. This would enable benchmarking, support evidence-based policy, and facilitate the scaling of successful interventions.

5.1.5 Field Work: Access

The next section presents the history of the Reablement Service:

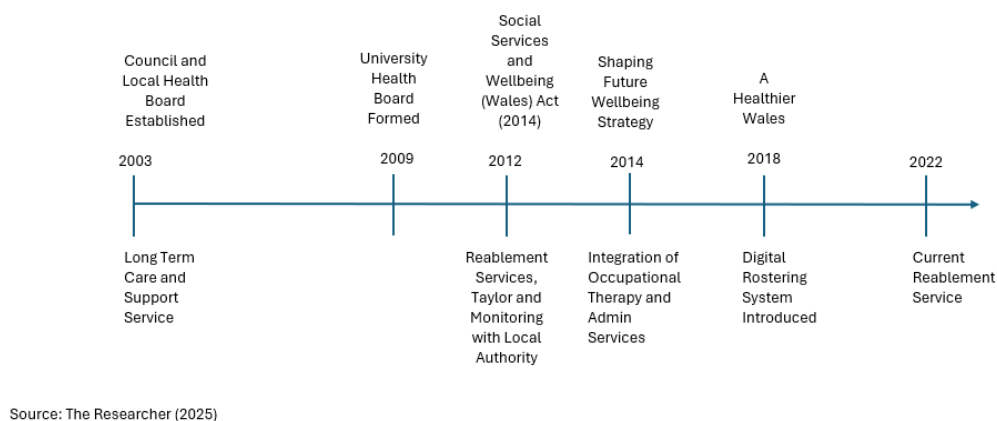


Figure 3. History of the Reablement Service

This diagram illustrates the evolution of the Reablement Service over the past two decades, highlighting its gradual integration within the broader context of evolving Welsh political and policy developments during this period.

5.1.6 Field Work: Structure and type of Service

The Reablement Service operates as a high-volume, low-variety model, delivering face-to-face care to individuals within their own homes. While the range of health conditions supported is broad, the service delivery remains consistent in its structure and approach. Demand for the service can fluctuate, requiring adaptability in scheduling and resource allocation. The multidisciplinary team, comprising healthcare professionals and social care practitioners, collaborates to deliver personalised care packages. This integrated approach promotes independence and supports individual choice, aligning with the principles of person-centered care and community-based rehabilitation.

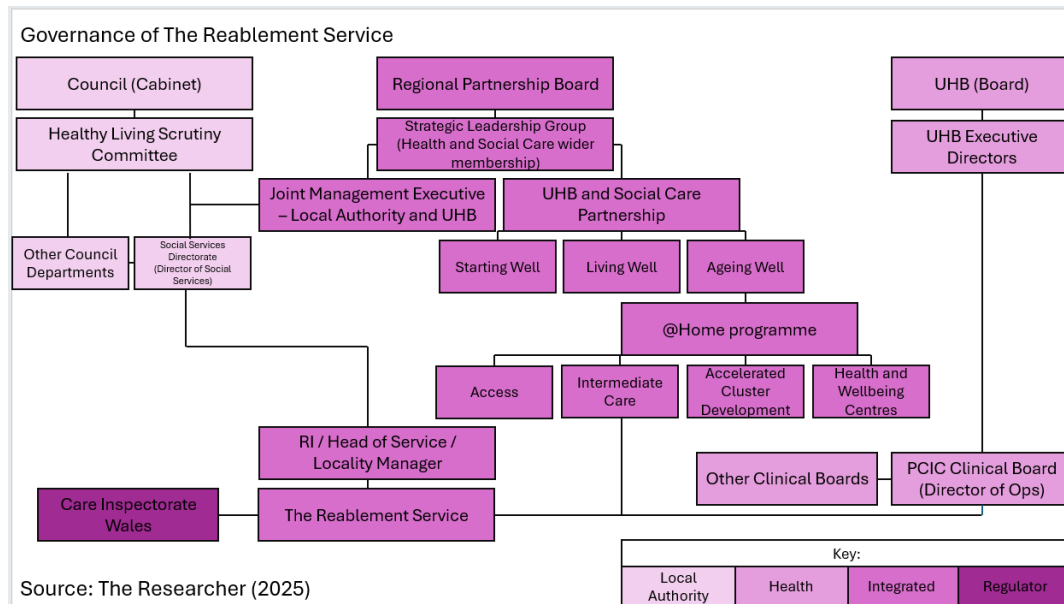


Figure 4. Governance of the Reablement Service

The service is structured hierarchically, characterised by defined lines of authority, spans of control, and adherence to standard operating procedures that guide operational consistency and accountability.

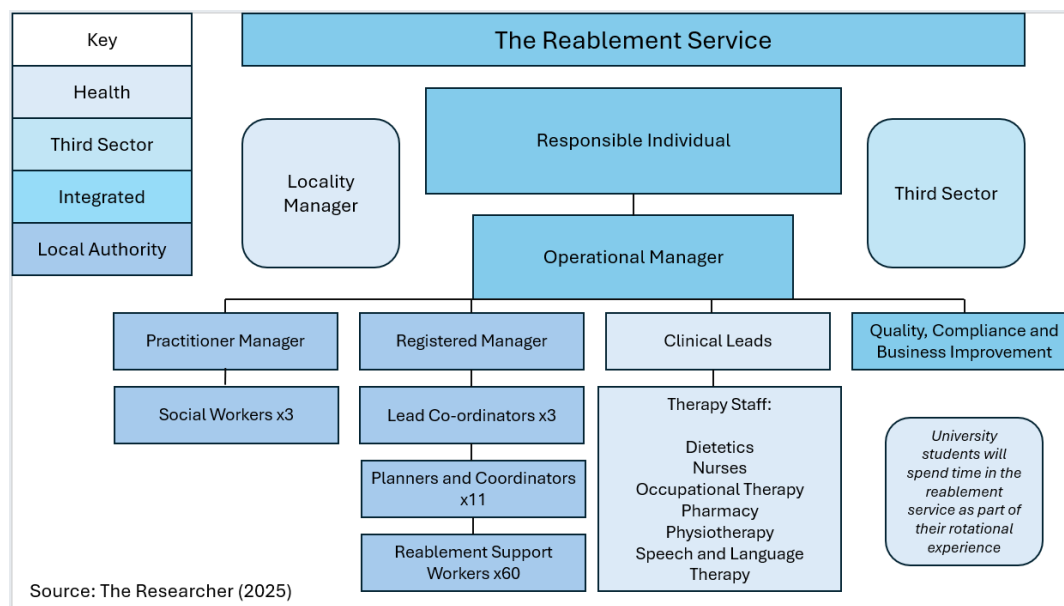


Figure 5. Structure and Type of Service (Hierarchal Model)

The service is required to monitor its performance using outcome measures, as mandated by the Welsh Government, the local authority, and the health board.



Figure 6. Performance Monitoring Framework

5.1.7 Field Work: Key Stakeholders to the Reablement Service

This table outlines the diverse range of key stakeholders that the Reablement Service must engage with and consider when planning and implementing change initiatives.

Effective change management within the Reablement Service requires a comprehensive understanding of the diverse stakeholders involved in service delivery and development. Stakeholders influence, support, or are impacted by the service, and their engagement is essential to ensure that change initiatives are contextually relevant, operationally feasible, and sustainable. The table below categorises key stakeholders across five domains: economic, social/political, technological, community and society, and internal. This classification reflects the multifaceted nature of the service, and the breadth of collaboration required to implement meaningful change.

<u>Economic</u>	<u>Social/Political</u>	<u>Technological</u>	<u>Community and Society</u>	<u>Internal</u>
Welsh Government		ITC Team	Individuals	RI/Head of Service
Regional Partnership Board		PARIS support	GP/DN's	Leadership Team
Care Inspectorate Wales		WCCIS team	WAT	OT's
Social Care Wales		Software Provider	Call Centre	Reablement Managers
The Health and Care Professional Council		Information Governance	Referrers-Primary and Secondary Care	RSW's
Chartered Institute of Physiotherapists			Families of supported individuals	Admin
Relevant University Health Board		Media		HR
Trade Unions		Procurement		
MP's		Legal Team		

Figure 7. Stakeholder Analysis Table. Source: The Researcher (2025)

Engaging these stakeholders early and meaningfully fosters collaboration, reduces resistance, and enhances the likelihood of successful outcomes. For example, collaboration with the Welsh Government and local health boards ensures alignment with national policy and funding priorities, while engagement with frontline staff and service users ensures that changes are grounded in practical realities and lived experiences. Stakeholders such as IT teams, software providers, and information governance bodies are

critical in supporting digital transformation, while community-based stakeholders, including families, GPs, and voluntary organisations, play a vital role in ensuring continuity of care and person-centred planning. Internally, leadership teams, reablement managers, and administrative staff are instrumental in operationalising change and maintaining service quality. This stakeholder analysis highlights the importance of a whole-system approach to service improvement, where the perspectives and contributions of all relevant actors are considered. It also reinforces the need for transparent communication, shared decision-making, and co-production in the planning and implementation of change initiatives.

5.1.8 Field Work: Key Issues and Challenges

Over the past 18 months, the service has employed a range of diagnostic mapping tools to identify key operational challenges. In addition, root cause analysis was conducted to gain a deeper understanding of the underlying factors contributing to these issues.

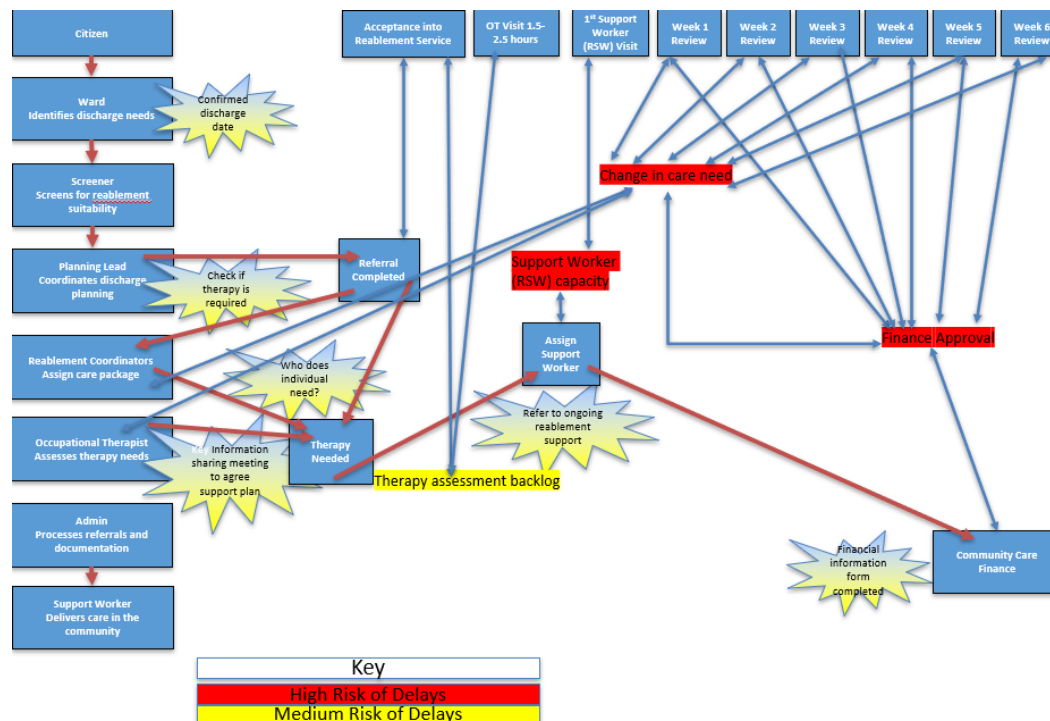


Figure 8. Swim Lane Mapping – Individual's Journey through the Reablement Service. Source: The Researcher (2025)

5.1.9 Field Work: Shift Patterns and Workload

The Reablement Service operates on a 7-day schedule with two primary shifts: 07:00–15:00 and 14:30–22:30. This structure is designed to ensure continuity of care and support the timely delivery of interventions in line with the Discharge to Recover then Assess (D2RA) framework. While this model enhances patient flow and responsiveness, it also places considerable demands on staff, with potential implications for wellbeing, job satisfaction, and long-term retention.

To evaluate the sustainability of this approach, staff feedback was gathered on shift preferences, perceived workload, and team support. This data was processed using a bespoke computer programme developed by the service team, which optimised shift allocation based on staff preferences. By removing the potential for human bias in rota planning, the system aimed to promote fairness and transparency. In parallel, planners within the team played a pivotal role in reshaping the forward planning process. The traditional six-week rota planning model was replaced with a more agile three-day planning cycle, enabling the implementation of a “Ladder Planning” approach. This method allows for the dynamic adjustment of call durations based on the evolving needs and recovery progress of individuals receiving support. By reviewing and modifying call times every three days, rather than weekly, the service can more effectively release capacity in real time. This increased flexibility supports more timely hospital discharges into the community and ensures that available resources are used efficiently.

Two key areas emerged as priorities for improvement. First, there was a need to ensure more consistent staffing levels across the week, for example, ensuring that an average of 10 rotas were filled with full 6-hour shifts. Second, concerns around workload distribution and scheduling required proactive attention. Addressing these issues is essential for improving staff morale, reducing burnout, and maintaining a resilient and effective workforce. Ultimately, aligning shift structures with operational demands and staff needs is critical to sustaining high-quality, person-centred care.

5.1.10 Key Issues and Challenges: Fishbone Analysis

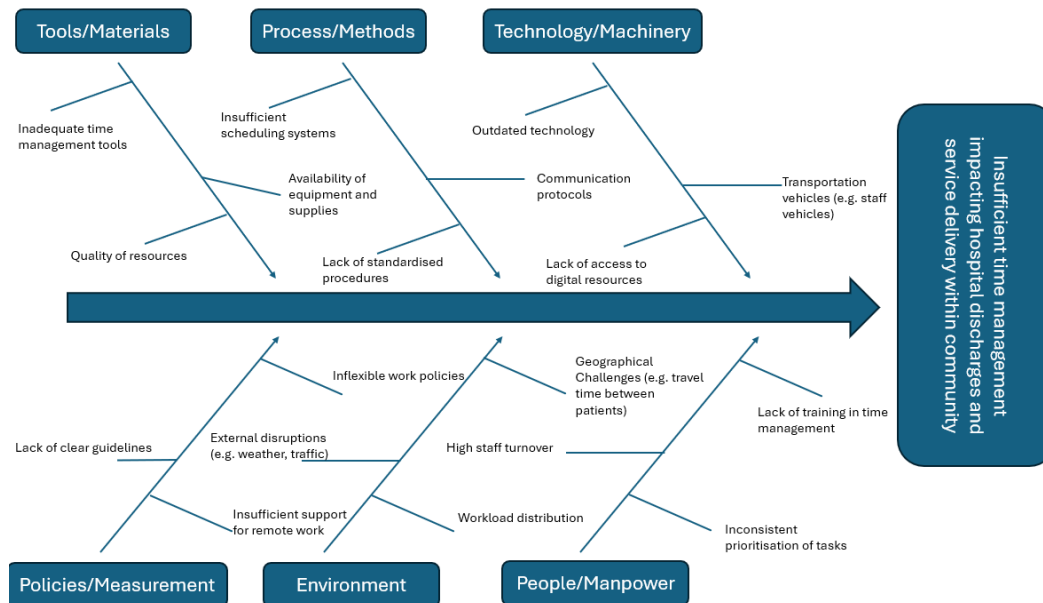


Figure 9. Key Issues and Challenges Diagram. Source: The researcher.

5.1.11 Results: Outcome Metrics

The outcome data from this study revealed that 352 out of 417 reablement packages resulted in mitigated support needs, equating to an 84% success rate. This figure is notably high and suggests that the local authority's reablement model is highly effective in promoting independence and reducing long-term care dependency. When compared to the national average in Wales, where approximately 71% of individuals receiving reablement require less or no ongoing support, this local success rate exceeds expectations and may reflect strong operational practices, effective staff engagement, and well-integrated service delivery.

The implications of this success extend beyond individual wellbeing. Reablement is widely recognised as a cost-effective intervention. According to recent estimates, each day of delayed hospital discharge costs the NHS approximately £395 per patient. If reablement enables earlier discharge and prevents hospital readmission, the potential savings are substantial. For example, if each successful reablement case reduces hospital stay by just three days, the estimated savings across 352 cases could exceed £415,000. These figures do not account for additional savings from reduced demand for residential care, outpatient services, or long-term home support.

Despite these promising outcomes, the study also highlights a significant limitation: the lack of standardised outcome reporting across local authorities. While the StatsWales dataset provides figures on completed reablement packages and their outcomes the definitions and metrics used vary between regions. This inconsistency makes it difficult to benchmark performance, identify best practices, or evaluate the impact of different service models. The absence of comparable data from the other two authorities in this study further constrained the ability to draw broader conclusions. To address this, future service evaluations should adopt common data standards and outcome definitions, as recommended by Public Health Wales and the Networked Data Lab. Standardisation would enable more accurate comparisons, support evidence-based policy development, and facilitate the scaling of successful interventions. Moreover, integrating patient-reported experience measures (PREMs) alongside quantitative metrics would provide a more holistic view of service effectiveness and ensure that outcomes reflect both operational efficiency and user satisfaction.

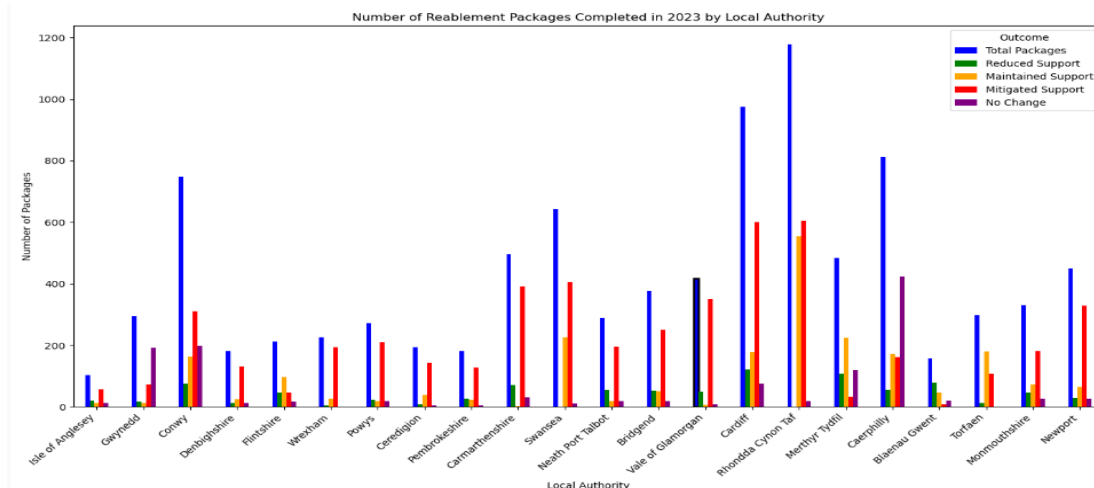


Figure 10. Outcome Metrics and Service Performance. Source: The Researcher (2025)

5.1.12 Contributions and Comparisons

The next section will present the research findings against a second chosen case study of good practice (Dudley). A reablement service contributes significantly to reducing hospital stays and promoting independence through reablement. However, areas for improvement include digital integration, staff training, and inter-agency coordination. Comparing this reablement service with other reablement services across Wales reveals best practices, such as integrated digital care records and co-located teams. The Welsh Government's support through the Integrated Care Fund and Transformation Fund has been instrumental in scaling these innovations.

5.1.13 Field Work: Comparative Case Study of Dudley Integrated Health Care Team

The Dudley Integrated Health Care Team in the West Midlands offers a compelling comparator to the South Wales Reablement Service. Dudley's model is built around a fully integrated, multidisciplinary team that includes occupational therapists, physiotherapists, social workers, and reablement support workers. A key feature of their approach is the emphasis on continuity of care and appropriate time allocation for each client, which has been shown to reduce hospital readmissions and improve patient satisfaction (Dudley Council, n.d.). Unlike the South Wales model, which operates on a two-shift system with dynamic rota planning, Dudley's service uses a zone-based planning model. Staff are assigned to specific geographic areas, which reduces travel time and allows for more consistent staff-client relationships. This model also supports better communication among team members, as co-location and regular multidisciplinary meetings are standard practice. These structural differences contribute to a more stable and predictable working environment, which in turn enhances staff morale and retention.

Despite these differences, there are several transferable lessons. Dudley's success in reducing hospital readmissions aligns with the South Wales service's goal of promoting independence and reducing long-term care dependency. The emphasis on continuity of care and appropriate visit durations mirrors the recommendations made in this study, particularly around Ladder Planning and rota fairness. Furthermore, Dudley's use of integrated digital care records supports smoother transitions and more coordinated care, an area identified as a development priority in the South Wales context.

By examining Dudley's model, the South Wales Reablement Service can draw valuable insights into how structural and operational changes, such as zone-based planning and co-location, can enhance both staff and service user outcomes. These findings reinforce the importance of context-sensitive adaptation and the potential for cross-regional learning in the ongoing evolution of reablement services.

6 Discussion: Context and Transferability

This study was conducted within the specific context of the Reablement Service, a multidisciplinary team operating in South Wales. While the findings are rooted in this local setting, the challenges and innovations identified, such as coordination across services, digital tool integration, and reablement-focused discharge planning are common across many community health systems. As such, the insights gained are not

statistically generalisable but are highly transferable. Services in other regions, both within and beyond Wales, may find value in adapting these practice-led strategies to improve patient flow in their own contexts. Focusing on practical application, these insights offer valuable guidance for wider service development and policy formulation.

These examples highlight key lessons: continuity builds trust; localised planning reduces stress; fair workload distribution supports retention; digital tools enhance coordination; and integrated models enable holistic care. Together, they provide real-world validation for the recommendations proposed in this study and underscore the importance of context-sensitive, person-centered service design.

Examples from other services reinforce these findings. The Dudley Integrated Health Care Team's reablement model, which prioritised continuity and appropriate time allocation, led to reduced hospital re-admissions and improved satisfaction (Dudley Council, n.d). South Cheshire's zone-based planning reduced travel time and improved punctuality (Department of Health & Social Care, 2024). Community Health and Wellbeing Worker pilots in England demonstrated that equitable caseloads and local recruitment improved morale and engagement (Leeds City Council, 2021). Digital tools like Good Boost enhanced coordination and accountability in community rehabilitation (NHS England, 2023). Internationally, Italy's AgICOT model showed how integrated care pathways and shared budgets can improve continuity and outcomes (World Health Organization, 2016).

The potential impacts of implementing the recommended changes are significant. Improved call durations and continuity of care can enhance client trust and support more effective reablement outcomes. Fairer rota allocation and realistic travel planning can reduce staff stress and improve retention. These operational improvements also align with broader policy goals, such as those outlined in A Healthier Wales, by promoting seamless, person-centered care.

The study's mixed-methods approach, combining qualitative insights from semi-structured staff interviews with quantitative data from surveys and secondary sources, enabled a comprehensive exploration of these dynamics. Thematic analysis, following Braun and Clarke's (2012) six-phase framework, revealed key patterns in staff experiences, while descriptive statistics provided measurable indicators of communication effectiveness, digital tool utility, and overall satisfaction. This dual approach ensured that both the lived realities of practitioners and the operational performance of the service were captured, offering a well-rounded understanding of the barriers and enablers of patient flow. By integrating these perspectives, the study contributes a nuanced view of how reablement services function in practice and highlights the need for adaptable, person-centered models that are responsive to local conditions. These insights not only inform service improvement but also support the development of more robust evaluation frameworks that can guide future policy and practice in community-based care.

This study reinforces the importance of local context in shaping the effectiveness of reablement interventions. While Buma et al. (2022) concluded that such interventions generally enhance activities of daily living (ADL), the findings here suggest that outcomes are not universally consistent and are significantly influenced by local implementation factors. For example, one local authority demonstrated a high success rate, with 352 out of 417 reablement packages resulting in reduced support needs. However, the absence of comparable data from other regions highlights a critical gap in standardised outcome reporting, making it difficult to draw broader conclusions or benchmark performance across services. This disparity underscores the role of digital infrastructure, inter-agency collaboration, and staff training in shaping service outcomes.

7 Conclusion

This study underscores the importance of a whole-system, context-sensitive approach to improving patient flow in community-based care. By integrating qualitative insights from staff with quantitative service data, the research provides a nuanced understanding of the barriers and enablers within the Reablement Service. The findings support the value of the Discharge to Recover then Assess (D2RA) model in promoting timely, person-centred transitions and reducing long-term care dependency. Practical recommendations, such as enhancing digital integration, strengthening inter-agency collaboration, and tailoring workforce models, offer actionable strategies for service improvement. These insights contribute to the broader goal of delivering sustainable, ethical, and inclusive care aligned with national policy priorities.

7.1 Gaps in the Current Service Provision and Areas of future Research Needed

Future research should build on these findings by exploring the following areas:

7.1.1 Digital Tools and Infrastructure:

Investigate the impact of integrated digital care records and shared platforms on patient flow, coordination, and service efficiency. Future research should explore the transformative potential of advanced digital tools in reablement services. AI-driven scheduling systems, for example, could optimise rota planning by analysing staff availability, travel times, and client needs in real time, reducing inefficiencies and improving continuity of care. Mobile applications also offer promising avenues for enhancing communication, enabling frontline staff to update care notes, flag concerns, and receive rota changes instantly. These tools can support more responsive, coordinated service delivery and reduce administrative burden. However, barriers to digital adoption in community settings must be addressed. These include limited digital literacy among staff, inconsistent access to devices or connectivity, and concerns around data privacy and governance. Research should investigate how to overcome these challenges through training, infrastructure investment, and co-designed digital solutions. Understanding the impact of digital innovation on staff wellbeing, service efficiency, and patient outcomes will be critical to shaping future policy and practice.

7.1.2 Changing the Current Workforce Model

The case study leadership should examine the effectiveness of flexible shift patterns, co-located teams, and targeted training in reablement principles to support staff wellbeing and service delivery.

7.1.3 Patient and Carer Perspectives

Incorporate patient-reported experience measures (PREMs) and qualitative feedback to ensure service evaluations reflect lived experiences and unmet needs.

7.2 Long-Term Recommendations and Outcomes

Assess the sustained impact of reablement on hospital readmission rates, independence, and quality of life across diverse populations and settings.

7.2.1 Standardised Evaluation

Develop and implement consistent outcome reporting frameworks to enable cross-regional comparisons and support evidence-based policy development. By addressing these areas, future studies can enhance the evidence base for community-led care models and support the ongoing evolution of integrated health and social care systems.

7.2.2 Operational Improvements Based on Staff Feedback

Adjust Call Durations for Complexity and Continuity

Why: Staff frequently reported that 20-minute calls are insufficient, especially for new clients or those requiring multiple tasks (e.g. personal care, meal prep, mobility support). This can compromise care quality and increase stress.

- Introduce a minimum 45-minute duration for initial visits to new clients to allow for assessment, rapport-building, and safe delivery of care.
- Reassess standard call durations based on task complexity and client needs, allowing for flexibility in scheduling.

Improve Travel Time Accuracy and Route Planning

Why: Many staff noted unrealistic travel times between calls, especially in rural areas or during peak traffic. This leads to delays, stress, and reduced time spent with clients.

Recommendations:

- Use real-time mapping tools that account for 20mph zones, parking, and PPE donning.
- Avoid zig-zag routes and large geographical jumps, particularly during busy periods.

- Prioritise geographical clustering of calls to reduce travel time and improve punctuality.

Enhance Continuity of Care

Why: Staff highlighted that frequent changes in assigned workers disrupt trust-building and reduce the effectiveness of reablement. Clients often see multiple unfamiliar faces, which can be distressing.

Recommendations:

- Assign staff to consistent rounds or client groups where possible.
- Promote continuity by minimising unnecessary changes in staff-client pairings, especially during reablement journeys.

Ensure Fair and Transparent Rota Allocation

Why: Several staff expressed concerns about unequal distribution of workload and travel distances. Some consistently receive more demanding runs or are sent out of area more frequently.

Recommendation:

- Implement rota audits to ensure equitable distribution of calls and travel.
- Rotate out-of-area assignments fairly among available staff.
- Consider staff preferences and personal commitments when planning rotas.

Strengthening Communication and Flexibility

Why: Conflicting instructions from office staff and lack of advance notice for rota changes were common concerns. Some staff prefer weekly visibility of their schedules to plan routes and personal commitments.

Recommendation:

- Improve internal communication protocols to reduce confusion and ensure consistency.
- Provide weekly rota visibility to support planning and reduce anxiety.
- Encourage two-way communication between frontline staff and coordinators for real-time adjustments.

Incorporating Staff Feedback into Service Design

Why: Staff insights are essential for identifying operational challenges and practical solutions. Their lived experience offers valuable context for service improvement.

Recommendation:

- Continue regular staff surveys and feedback forums.
- Use feedback to inform ongoing adjustments to shift patterns, call allocations, and digital tools.
- Recognise and act on recurring themes to demonstrate responsiveness and build trust.

7.2.3 Policy and Practice Implications

This study provides actionable insights that can inform both local and national policy agendas aimed at improving patient flow and reablement outcomes. The findings align closely with strategic frameworks such as A Healthier Wales (Welsh Government, 2018), the Six Goals for Urgent and Emergency Care (NHS Wales, 2023), and the Discharge to Recover then Assess (D2RA) model, all of which emphasise integrated, person-centred care, timely discharge, and community-based recovery.

By highlighting operational challenges faced by frontline staff, such as time constraints, travel inefficiencies, and continuity issues, the research offers a grounded evidence base for refining service models. The high success rate of reablement packages (84%) underscores the potential of community interventions to reduce long-term care needs and hospital readmissions, directly supporting Goal 6: Home First. Recommendations include:

- Enhancing digital integration

- Improving rota planning through tools like “Ladder Planning” and rota audits
- Adjusting call durations
- Embedding staff feedback and co-production into service design
- Introducing Patient-Reported Experience Measures (PREMs) via co-designed, small-scale trials

These proposals reflect the principles of A Healthier Wales, particularly its focus on digital transformation, workforce sustainability, and inclusive service design. At the local level, findings can guide transformation plans led by regional partnership boards and local authorities.

To support wider adoption, it is recommended that local authorities:

- Establish pilot sites to test new planning models and digital tools
- Share learning through regional networks and Communities of Practice
- Collaborate with health boards to align reablement with broader system goals
- Secure funding through the Integrated Care Fund or Transformation Fund to support innovation and evaluation

By embedding these recommendations into policy and practice, reablement services can become more responsive, equitable, and sustainable, delivering better outcomes for both staff and service users. The findings of this study offer actionable insights that can directly inform both local and national policy agendas aimed at improving patient flow and reablement outcomes. By highlighting the operational realities faced by frontline staff, such as time constraints, travel inefficiencies, and continuity challenges, this research provides a grounded evidence base for refining service models. The recommendations proposed, including adjustments to call durations, rota planning, and digital integration, align with the strategic goals of A Healthier Wales and the D2RA framework. If adopted, these changes could lead to more equitable, efficient, and person-centred care delivery. Furthermore, the study’s emphasis on co-production and staff feedback supports a more inclusive approach to service design, ensuring that future models are both sustainable and responsive to the needs of those delivering and receiving care.

7.2.4 Translating Findings into Policy

Translating the findings of this study into local authority policy or national strategy requires a deliberate and collaborative approach. Engaging policymakers early, through briefings, stakeholder workshops, and evidence summaries, can help align service-level insights with broader strategic goals. Pilot schemes offer a practical route for testing innovations such as Ladder Planning or digital rota tools in a controlled environment, allowing for iterative refinement before wider rollout. These pilots can also generate real-world data to support business cases for investment. Importantly, cost-benefit analysis should be embedded into evaluation frameworks to demonstrate the financial and social value of reablement interventions. Quantifying outcomes such as reduced hospital readmissions, improved staff retention, and enhanced patient independence can strengthen the case for sustained funding and policy support. By grounding policy development in frontline experience and measurable impact, reablement services can evolve in ways that are both evidence-based and person-centred.

7.2.5 Policy Implications for Workforce Planning

The findings of this study underscore the urgent need for workforce planning policies that prioritise staff wellbeing, retention, and operational sustainability. High levels of burnout, driven by rigid shift structures, unrealistic travel expectations, and inconsistent rota planning, threaten the long-term viability of reablement services. Policymakers should consider embedding flexible scheduling models, such as Ladder Planning, into national guidance to support staff autonomy and reduce fatigue. Additionally, investment in digital tools that streamline communication and rota management can alleviate administrative burdens and enhance job satisfaction. By aligning workforce planning with the principles of co-production and person-centred care, policy can help build a resilient, motivated workforce capable of delivering high-quality reablement support.

Summary of Key Future Recommendations



Figure 11. Future Recommendations Diagram

7.3 Limitations and Future Research Resulting from this Study

Future research should prioritise the inclusion of service user and carer voices through qualitative interviews, focus groups, or PREM surveys. A follow-up study could explore how patients experience reablement interventions, what they value most in their care, and where they see opportunities for improvement. This would not only enhance the validity of service evaluations but also ensure that reforms are grounded in lived experience. By embedding patient and carer perspectives into future studies, reablement services can move closer to delivering truly person-centred, responsive, and equitable care.

While this study provides valuable insights into the functioning and outcomes of a Reablement Service in South Wales, several limitations must be acknowledged. First, the sample size was relatively small and limited to a single local authority, which may affect the breadth of perspectives captured. Although purposive sampling ensured a range of staff roles were included, the absence of patient or carer voices limits the understanding of service impact from a user perspective.

Although this study did not directly collect data from patients or carers, their experiences were frequently referenced in staff narratives. These second-hand insights suggest that patients' wellbeing is closely tied to system performance. Future research should incorporate Patient-Reported Experience Measures (PREMs) and qualitative interviews to ensure service evaluations reflect lived experience and unmet needs. As NHS Wales (2023) note, "delays in discharge are not just operational issues, they are deeply human ones, affecting both staff morale and patient dignity." Additionally, the findings are context-specific and shaped by the operational structure, digital maturity, and inter-agency dynamics of the local setting. As such, while the results are transferable to similar services, they are not statistically generalizable. The lack of comparable outcome data from the other two local authorities further constrained the ability to draw broader conclusions about regional performance. As noted in the literature, "there is limited research evidence about the effectiveness of different reablement service models, particularly when considering variations in local delivery and funding structures" (MoRE Study, 2018). Furthermore, "identifying and addressing limitations throughout a project strengthens arguments and validates the integrity and transparency of a researcher" (Resnik, 2020).

Future research should address these limitations by incorporating larger, multi-site studies that include both staff and service user perspectives. There is also a need to explore the long-term impact of reablement on hospital readmission rates and sustained independence. Given the study's findings on the importance of digital tools and inter-agency collaboration, future investigations could examine the effectiveness of integrated digital care records and shared platforms in improving patient flow. As highlighted in the Welsh

Government's A Healthier Wales (2018), digital transformation is central to achieving seamless, person-centered care. Additionally, research into workforce models—such as flexible shift patterns, co-located teams, and training in reablement principles—could provide evidence for more sustainable staffing strategies. The Models of Reablement Evaluation (MoRE Study, 2018) emphasizes the need for further research into how reablement services are organized and delivered, particularly in relation to digital infrastructure and workforce design. Embedding patient experience metrics and standardized outcome reporting across services would also enhance the comparability and accountability of reablement interventions, supporting continuous improvement and policy development.

7.4 Final Words

This study has involved significant numbers of hours in its design and execution. The study has given a range of significant insights into 'patient facing' services that deliver high levels of value and the study has identified significant improvements that could be undertaken to improve the service further for staff and the citizens. It is hoped this work will be inspirational to others who are researching this subject and that they will take my work further forwards as a result.

Emma Chandler

September 2025

8 References

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9 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Can mobile blood microscopy be successfully utilised by APPs in the Welsh Ambulance Service.

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Abstract:

Across the UK, the NHS is in need of major changes to ensure patients receive the right care, at the right time. With ambulance conveyances and hospital admissions at a high level, having being severely impacted by the COVID19 pandemic, initiatives are needed to reduce ambulance conveyance to emergency departments. Several research projects exist already showing that point of care blood analysis is beneficial to patients and provide a significant cost saving to the NHS, however these have been small scale projects. A nationwide pilot is required and has been suggested for Wales and the Welsh ambulance service, utilising point of care testing devices with the aim of not only reducing admissions and the financial impact on the NHS, but mainly to ensure that patients receive the correct care they require.

Keywords: Prehospital, Point of care, POC

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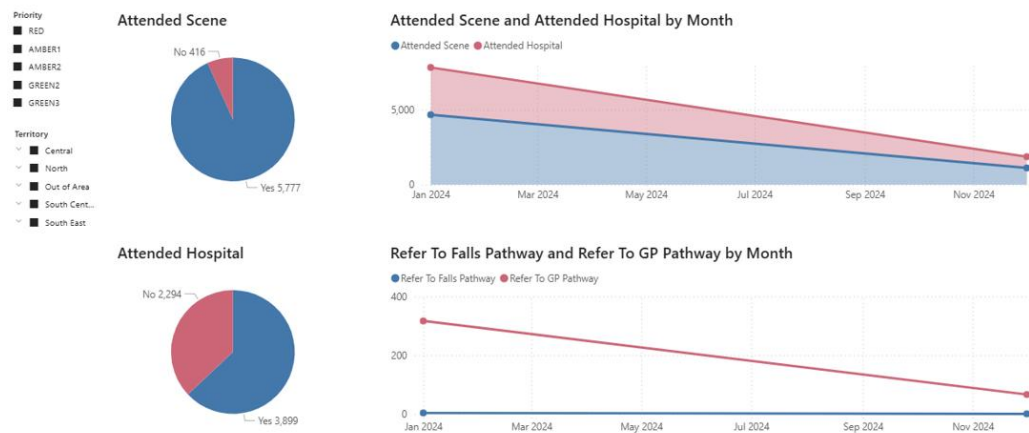
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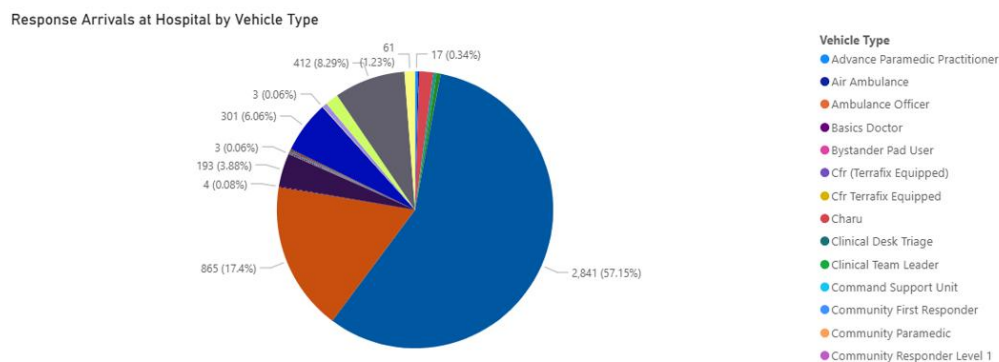
1 Introduction

In 2024, the Welsh Ambulance University NHS Trust (WAST) attended 5777 patients. Of those patients, 2294 were deemed not to need hospitalization, however, they would benefit from point of care (POC) testing and treatment ("Power BI - Call Outcomes," 2025). However, there were zero referrals to pathways such as the falls pathway or General practitioner (GP) led pathway. In 2017, WAST began the introduction of Advanced Paramedic Practitioners (APP), who, with the advanced training and prescribing ability, can attend to those patients who need care and treatment, but perhaps not within a hospital environment. This small-scale pilot saw patients assessed and treated within the community, avoiding unnecessary admission to hospital and improving their care and outcome (*Advanced Paramedic Practitioners*, 2025). Currently, point of care testing is limited to blood glucose testing, dip stick urinalysis, and physical examination; however, with the introduction of Point of Care (POC) blood microscopy devices, this could expand the potential of treating patients. If successful, the Welsh Ambulance service can reduce hospital admissions and improve outcomes for patients and be a major influence in POC use in the prehospital environment.

A short survey was created to gain insight into the views on POC and its use by APP's. An application was made to Swansea University's Research Ethics department and approval was given prior to these surveys being conducted. Full approval of the application can be found at Appendix A



("Power BI - Call Outcomes," 2025).



("Power BI - Call Outcomes," 2025).

Figure 1

A review will be conducted, looking at existing use of prehospital POC testing, devices available, in order to form a pilot scheme for WAST to introduce. The aim of the pilot scheme would be to assess the effectiveness of the devices, the improvement in care of patients, and any cost savings to the wider NHS.

2 Background

In the UK, there is currently no ambulance service that offers point of care blood testing to patients in order to reduce the need for transport to hospital. However, South Central Ambulance Service carried out a 3-month trial in 2022 into the use of these devices, and following this trial, hospitalization of patients was found to have been reduced by 52% (*Trial of Paramedic-led Home Blood Testing for Frail and Elderly Halved Need for Hospital Transfers* | South Central Ambulance Service, 2022). However, this trial was very limited, as was limited to patients in a frailty response program and only saw 56 patients enrolled in the trial. Whilst it is possible to surmise that the use of these devices is extremely beneficial, this cannot be widely applied to the greater population and further trials would need to be carried out (Novak et al., 2024).

In a trial completed by universities in West of England, Bristol, Birmingham and Manchester, in collaboration with emergency healthcare providers, devices were researched, alongside what tests were available. 40 different POC tests were identified as part of this research, showing to include testing to assess poisoning, diabetes and seizures, sepsis, heart attacks and trauma (*GHOST - West Midlands Ambulance Service University NHS Foundation Trust*, 2025). Following the research, recommendations were given, including the need for funding and infrastructure investment for ambulance services, the need for randomized studies to assess the benefits to patient, and assessing the impact of the tests on the health care system. The aim of the study was to provide evidence to policymakers on how to implement these devices in the ambulance setting (NIHR ARC West, 2025).

A feasibility study has been commenced by Lightowler et al., 2023, which has been comprehensively set out to assess the effectiveness of the study. Objectives have been set up with the primary objective set to understand experiences and impact of using the POC devices in a community setting, and secondarily to understand the practicality and patient populations that the devices are most used. This study is still ongoing and will help shape how POC is incorporated into emergency medical services.

A scoping review completed by Moore et al., 2025, again outlines that the devices are beneficial for use in the community and there is a wide base or research that has been completed into their accuracy and efficacy. However, main conclusions saw that the lack of funding and infrastructure to introduce these and to research the potential for their introduction beyond the diagnostic accuracy.

2.1 What are APP's?

APPs are MSc trained clinicians who operate autonomously across emergency, urgent care and primary care settings. In Wales, their deployment is guided by WAST's clinical response model (CRM), and calls are categorized into Purple, Red, Amber and Green (*Paramedics*, 2025).

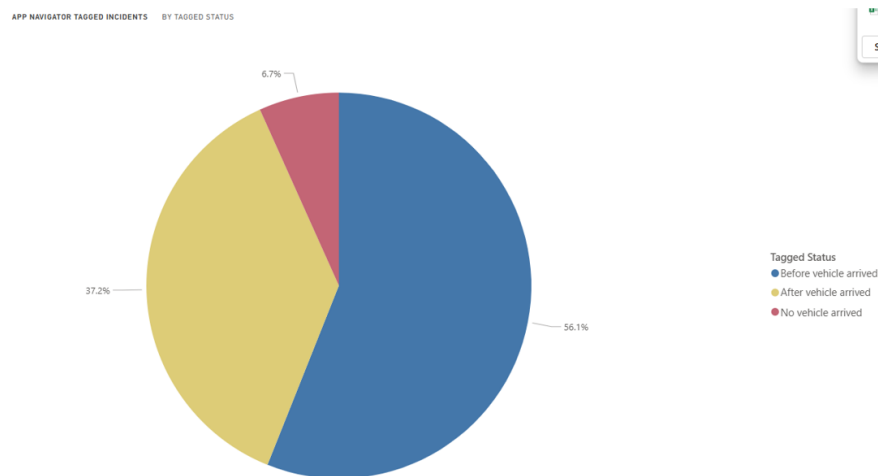
It is rare that APP's are the primary responder for Purple or red calls, the most appropriate dispatch for APPs is amber and/or green calls, where they can use their advanced skill and wider drug set to treat patients at home, gain access to a wider range of pathways and avoid unnecessary conveyance to hospital ("Welsh Ambulance Clinical Response Model," 2025).

Calls to any ambulance service are initially triaged using a medical priority dispatch system (MPDS), which limits questions and is often carried out by non-clinicians. These calls are initially given a response code as described above, with the aim of having the most urgent need receive an immediate dispatch. Patients that are deemed to not require an immediate dispatch are then triaged by a clinician, either a nurse or paramedic in the clinical contact center (CCC). This could then result in an APP being dispatched to assess the patient and make the decision as to how best to treat the patient (*Paramedics*, 2025).

The attendance of an APP can benefit the patient, mainly in ensuring that they receive the right care, from the correct service. As we have seen, not all patients who call 999 require admittance to hospital and would benefit much more from receiving care either at home, or from a specialist pathway. Currently in WAST, there are several pathways available to patients, however, some conditions, such as chest pain, require blood analysis prior to utilizing these pathways. Unfortunately, many of these blood tests currently require transport to an emergency department in order for them to be carried out. GP practices can request these blood tests, however there is often at least a 24 hour turn around in receiving the results, as they need to be sent to the hospital lab to be carried out.

By introducing POC testing within ambulance services across the UK, not only could hospital admittance to emergency departments be reduced, but patients could receive prompt care in the community, ensuring the best outcome possible.

Below is a representation of calls tagged for APP navigator intervention at different stages of the call cycle, showing over half of the calls with APP intervention have been screened prior to a vehicle arriving at the incident. These show that processes are already in place to identify patients that may benefit from APP treatment to avoid hospital admission and may further benefit from POC testing and at home treatment.



("Power BI - Call Outcomes," 2025).

Figure 2.

3 Analysis

3.1 What is point of care blood microscopy?

POC microscopy is the use of microscopic analysis of blood samples conducted at or near the site of care, with the goal of delivering rapid and actionable diagnostic results. This approach bypasses the need for centralised laboratory infrastructure, making it particularly valuable in resource limited settings where access to full laboratory facilities is constrained. Derda et al., 2015 emphasized the transformative shift in healthcare delivery by enabling timely decision making, which is particularly beneficial in rural or underserved areas.

Recent technological advances have led to the development of portable digital devices, these allow for automated image capture, remote diagnosis via telemedicine and integration with AI based algorithms to assist with interpretation. Research by Breslauer et al (2009) demonstrated the feasibility of using mobile phone-based microscopes for blood smear analysis, suggesting that these technologies can democratize access to high-quality diagnostics even in low-income areas.

Despite its advantages, POC blood microscopy faces challenges including the need for trained personnel, variable quality of slide preparation and potential subjectivity in interpretation. Initiatives to train community health workers and standardize protocols have shown promise in improving diagnostic reliability. Moreover, digital tools and AI assistance are increasingly addressing inter-observer variability and improving diagnostic accuracy in the field (Bajwa et al., 2021).

3.2 What's already in use?

In the UK, there is currently no ambulance service that offers blood testing point of care to patients to reduce the need for transport to hospital, other than that of blood glucose monitoring. However, South Central Ambulance Service conducted a 3-month trial in 2022 into the use of these devices, and following this trial, hospitalization of patients was found to have been reduced by 52% (*Trial of Paramedic-led Home Blood Testing for Frail and Elderly Halved Need for Hospital Transfers* | South Central Ambulance Service, 2022).

This trial was extremely limited, as it was limited to patients in a frailty response program and only saw 56 patients enrolled in the trial. Whilst it is possible to surmise that the use of these devices is extremely beneficial, this cannot be widely applied to the greater population and further trials would need to be carried out (Novak et al., 2024).

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A scoping review completed by Moore et al., 2025, again outlines that the devices are beneficial for use in the community and there is a wide base of research that has been completed into their accuracy and efficacy. However, main conclusions saw that the lack of funding and infrastructure to introduce these and to research the potential for their introduction beyond diagnostic accuracy.

This shows that POC testing would greatly benefit both the patient, and the NHS as a whole, however will require significant funding, and effective pilot schemes in order to ensure this is used to its highest efficiency.

3.3 Devices and their accuracy

POC blood microscopy devices encompass a wide range of technologies designed to provide rapid diagnostic results at or near the site of patient care. These devices are broadly categorised based on the type of test performed and the technology they employ. One common category includes electrochemical biosensors, such as glucometers, which are widely used for self-monitoring of blood glucose in patients with diabetes. These devices use enzymatic reactions and electrodes to produce electrical signals proportional to the glucose concentration (Heller and Feldman, 2008).

Another significant category comprises immunoassay-based devices, such as lateral flow assays (LFA), which are often used for detecting infectious diseases, cardiac markers or pregnancy. These tests use antibodies to detect specific antigens in the blood and provide results visually or through reader devices. According to Drain et al (2014), LFA's are particularly beneficial in low resource settings due to their ease of use, affordability and minimal infrastructure requirements.

Microfluid devices represent a more advanced form of POC testing, incorporating small volumes of blood into chip-based systems, that can perform complex assays including cell counting, biochemical analyses and nucleic acid detection. These lab-on-a-chip systems can integrate multiple testing steps, such as sample preparation, reagent mixing and signal detection – into a compact often disposable platform (Sia and Kricka, 2008). Microfluidic platforms are increasing being developed for rapid diagnosis of sepsis, HIV and cancer biomarkers.

Another growing category involves haematology analysers designed for POC use. These miniaturised devices can perform full blood counts (FBC). While traditionally confined to large laboratories, portable models like the HemoCue and the Sysmex XW100 are now enabling basic haematological analysis at the bedside or in field clinics (Mabey et al., 2004).

Emerging technologies also include molecular diagnostics at the point of care, such as isothermal nucleic acid amplification tests and portable PCR systems. These devices can detect viral and bacterial DNA/RNA directly from blood samples with high sensitivity and specificity, offering timely diagnosis of diseases. (Nasseri et al., 2018)

In summary, POC blood microscopy devices range from simple, low-cost strip-based tests to sophisticated portable analysers and microfluidic platforms. The diversity of these tools reflects the growing demand for rapid, decentralised diagnostics that improve access to care, particularly in remote or underserved populations.

POC devices generally offer good accuracy for many of the common laboratory tests, but performance depends strongly on the sample type, patient physiology and accurate use. For example, a systematic review of POC glucose testing devices saw a very high accuracy with an average of 98.8% of tests matching those of central laboratory tests (Ukpe & Ezeanuka, 2025).

Devices operating haemoglobin testing have had a more variable accuracy in control tests. A meta-analysis assessing POC haemoglobin devices found that whilst mean biases were small, the limits of agreement were wide. This indicates that in many instances POC devices cannot be assumed fully interchangeable with laboratory haematology, especially when fine accuracy is required, for instance when making transfusion decisions (Ahn et al., 2024).

Measuring electrolytes and blood gas levels utilising POC devices have shown to correlate well with laboratory values under stable conditions but have shown some greater differences in extreme or unstable conditions. In a study of critically ill patients, error was higher in capillary sample and in the hypoglycaemic range or with haemodynamic instability (Inoue et al., 2013). Similarly, in an ED audit of POC venous blood gas testing, potassium and sodium showed strong correlations with laboratory values, with biases small but appreciable for certain clinical decisions (Lasfer et al., 2025).

There are also device specific comparisons: in a community paramedic setting comparing epoc and i-STAT results vs laboratory, critical value discordance was rare, especially for most analytes other than sodium or potassium (Blanchard et al., 2019).

POC testing devices can deliver clinically acceptable accuracy for many analytes, especially when results are needed rapidly. But for decisions that depend on small differences, the limitations must be understood and possibly confirmed by central testing.

3.4 Review of NHS pilots and Services using POC

The NHS faces persistent challenges with emergency department crowding ambulance handover delays and central laboratory turnaround times. POC offers the potential to address these by:

- Reducing turnaround from hours to minutes
- Supporting immediate triage and treatment decisions
- Avoiding unnecessary hospital admissions
- Shortening ed length of stay

Evidence from UK pilots, such as CRP POC in primary care (Mahmoudi et al, 2023) and multi-parameter testing in ambulance services (Rief et al., 2024), shows improved patient flow and targeted resource use. However, concerns remain over device costs quality control and ensuring results influence clinical decisions.

Several NHS trusts have piloted or adopted POC in acute and community care:

- West Midlands Ambulance Service tested multi-parameter devices, including lactate and troponin, to inform prehospital triage (Moore et al, 2025)
- Community hospital at home models integrated CRP and blood gas POC to manage acute respiratory disease at home, reducing admissions.
- Primary care urgent care hubs used D-dimer and CRP testing to reduce unnecessary ED referrals. (Savira et al., 2025)

These projects underline the importance of embedding POC in clinical pathways, ensuring rapid results lead to timely interventions.

3.5 POC in Wales

Within Wales, the Emergency Medical Retrieval and Transport Service (EMRTS) already use a POC system in their treatment plans for patients. A short survey was sent to Critical Care Practitioners (CCP) to gain better understanding of these devices, the results received and identify any issues that have been

encountered from the devices. The full results from this survey can be found at Appendix B. Due to the limited members of EMRTS staff, the survey could not have a large response, however, responses received provided great insight into POC already in use within Wales.

EMRTS attend a wide range of incidents across Wales, providing critical care, assessment and treatment, above and beyond what WAST provide. CCP's provide comprehensive support to Paramedics in WAST, by bringing advanced technologies, treatment options and clinical support, along with transport by air for those severely critically unwell. The survey completed identified that the device used by EMRTS in Wales is the Siemens EPOC.

1. What kind of point of care testing unit do you use?

5 Responses

ID ↑	Name	Responses
1	[REDACTED]	Siemens EPOC
2	[REDACTED]	Siemens EPOC - single card test. Coagucheck INR
3	[REDACTED]	EPOC (Siemens Device). Coagucheck (Roche Device). BM device (cant remember manufacturer)
4	[REDACTED]	Siemens - EPOC
5	[REDACTED]	Siemens EPOC blood gas analyser

Figure 3.

The range of treatment offers varies pending on the cause for attendance, but this includes, but not limited to targeted ventilation for intubated patients, identifying or ruling out reversible causes of cardiac arrest, prognosis testing for cardiac arrest outcomes using blood pH levels, establishing severity of shock and metabolic dysfunction in sepsis and trauma patients, and targeted blood transfusions for patient with sub-acute bleeding. These units are used to guide treatment, ensure at scene time is used effectively and to target transport to definite care. This information can also be provided to hospitals prior to arrival, for the prompt continuation of treatment following transport. This is of great benefit to patients needing target treatment and ensures that the correct care is given in a timely fashion.

2. What blood tests does this carry out?

5 Responses

ID ↑	Name	Responses
1	[REDACTED]	Blood gases, electrolytes, Hb
2	[REDACTED]	Standard arterial, venous & capillary blood gas panel, metabolic, electrolytes, haemoglobin, limited renal function // Coagucheck Device = INR only
3	[REDACTED]	EPOC - ABG, VBG, Cap Gas (multiple values given but this depends on the card/insert you use. I.e. you can purchase different cards for more/less. INR tests coagulation time for those warfarinised patients.
4	[REDACTED]	ABG/VBG. pH. pCO2. pO2. Na+. K+. Ca++. Cl-. Hct. Glucose. Lactate. Crea. Urea.
5	[REDACTED]	VBG/ABG Blood gas - pH Na+ Glu pCO2 K+ Lac pO2 Ca+ Crea TCO2 Cl- BUN Hct

Figure 4.

3. Please explain how these tests support the care given to patients.

5 Responses

ID ↑	Name	Responses
1	[REDACTED]	Targeted ventilation for intubated patients Assessing reversible causes during cardiac arrest Investigation of undifferentiated patients (unconscious ? Cause)
2	[REDACTED]	Clinical applications are broadly the same as what they would be in the A&E / ICU setting for us. Examples of which I use in my practice regularly are: EPOC: - Reversible causes of arrest (predominantly hypo/hyperkalaemia) - Cardiac arrest prognostication using pH / base deficit - Prognostication of hypothermic cardiac arrest using HOPE scoring for ECLS referral etc. - Facilitate diagnosis of the undifferentiated unconscious / collapsed patient - Toxidromes / Overdoses - Categorisation and assessment of respiratory failure - Guidance of invasive and non-invasive ventilation strategies - Establish severity of shock and metabolic dysfunction in sepsis / trauma - Electrolyte assessment in patients with brady / tachyarrhythmias - Using haemoglobin to guide blood transfusion in patients who have sub-acute bleeding (GI bleeds etc). Coagucheck INR: - Result is predominantly used as a guide for the dosing / administration of prothrombin complex concentrate for the reversal of anticoagulation in patients taking vitamin k antagonistic anticoagulants (Warfarin etc) - in major trauma or intracerebral haemorrhage etc. - Can be used in the assessment of acute liver failure too, but less frequently.
3	[REDACTED]	EPOC: Blood gases can help your management by interpreting the results. Eg PaCO2 more accurate than ETCO2 so this will help ventilator strategies. You can find out if your pt is T1 or T11 resp failure. Blood gases can help support a more accurate acute history and management strategies (too big to explain here). INR tests the time ratio of clotting and support administration of reversal agents (which is a blood product).
4	[REDACTED]	During acute illness/injury the ability to perform POC testing enables our team to identify reversible causes for illness and target therapy accordingly.
5	[REDACTED]	Utilised as an additional tool to primary survey and overall decision making. Like any other diagnostic tool, not to be used in isolation. Useful for transfers in the retrieval context when ventilating patients and aiming for specific targets i.e. CO2 control for TBI - Ideally with arterial line for ease of repeat samples. Useful for electrolyte disturbances when treating arrhythmia or looking for cause of reduced GCS. Occasionally used for prognostication of cardiac arrest and identifying reversible causes.

Figure 5.

However, issues have been identified with the devices that are used by CCP's. The main highlighted issue identified is that the device can be severely impaired due to temperature variations to both ends of the thermometer. There is also a need for a monthly quality check, and external validation to ensure quality assurance. It has also been highlighted that these devices are expensive to obtain and maintain, which would have a great impact on the amount of devices that can be obtained, and if they can provide an improvement in care whilst consideration is also given to cost impact on any service that utilise them.

4. Have you encountered any issues with regards to these units?

5 Responses

ID ↑	Name	Responses
1	[REDACTED]	Subject to temperature variation (both hot and cold) Needs monthly QC and external validity by QA to safely make clinical decisions based on results.
2	[REDACTED]	Can reject samples if the device is too cold or too warm (has a relatively narrow range of function in relation to ambient temperature), usually not an issue at all in spring / summer months, but can occasionally reject the first sample attempt - particularly if the device has got cold en route to scene etc. Having close ties with other pre-hospital critical care services, I know those that use the Abbott i stat device have the same issue. Devices have to be subjected to a robust and regular internal QC process, and a national (WEQAS) QC process on a weekly / monthly basis which can be quite time consuming for the duty teams. If the devices fail these QC processes, they have to be quarantined / sent back to manufacturer. Test cards are very expensive (in comparison to how much it costs for a single use of a hospital ABG machine / INR coag assay)
3	[REDACTED]	EPOC - extremes of ambient temperature.
4	[REDACTED]	Yes. They are very sensitive to changes in temperature: i.e. if they get too hot or too cold they will not work.
5	[REDACTED]	Machine doesn't work when its cold and is temperamental when inserting sample cards. Often requires multiple attempts to work. Occasional false readings with regards to potassium, in some cases this could have changed clinical treatment. This has been unrelated to poor samples.

Figure 6.

Responses also show a positive view on these devices. Input has shown that the devices can be used with minimal training and upskilling with regards to interpretation of the results. A highlight has been made that the devices should be used in order to support a treatment plan and support critical thinking and not used as a substitute for this.

Additional questions were also asked around demographics of those responding, however these do not bear any weight of insight into the search for the device, only show that these devices are used across many areas of Wales, however due to being carried mainly by air, these can reach further across the country in less time than those on road-based vehicles.

Another survey was compiled and completed by existing APP's withing WAST, to gain understanding of their views on POC and their confidence in using these devices. The full survey response can be found at appendix C; however key aspects have been included below and discussed.

Of the 47 responses received, it was a positive response in regard to the benefit of using these devices and the improvement of care that could be given to patients. On the whole, APPs felt that these devices would be of benefit to their patients, with 91% of responses being positive. The remaining 9% stated that they felt that the devices could be overused, or used as a routine approach, and reducing the confidence in clinical decisions making based on symptoms and presentation. This is an important aspect when considering any possible pilot.

1. Do you think point of care blood testing would be beneficial to your role?



Figure 7.

Table 1.

		Do you have any concerns regarding the use of point of care blood testing?
		47Responses
1	anonymous	Interpretation of results in complex care cases would need senior clinical support, e.g Sicat gp who aren't always available currently
2	anonymous	Some tests give negative positives, which provides safety netting, as those false positives will safety net patients
3	anonymous	Yes, I fear this may become a routine approach in a patient interaction that is used because I'd have the ability, rather than required to guide a treatment plan
4	anonymous	Reliability of measures
5	anonymous	Yes. I wonder would it change your management of a patent. Are clinical sign and symptoms different from POC results.
6	anonymous	I'm still very inexperienced with this and hope to build this knowledge and experience over the next 3 years and more.
7	anonymous	Cost, over use in substitute for rigorous clinical judgment. Confirmation bias.
8	anonymous	Storage, maintenance, quality testing. Reliability of results
9	anonymous	Cost and would it change management of pt
10	anonymous	In the out of hospital setting, particularly when clinicians do not provide 24h coverage, there is a logistical issue of safely managing patients
11	anonymous	cost and reliance on testing as opposed to holistic care, however I would like to think that would not happy in the APP team.

12	anonymous	Would APPs then be used inappropriately???... "lets just send an APP so they can do bloods" (this should be DN/prc nurse)
13	anonymous	It would be easy to be led by the numbers and not the patient. Lack of training on reading blood test results
14	anonymous	More training would need to be undertaken to become more confident in interpreting results.
15	anonymous	Inappropriate use by staff without relevant training or non-APP clinical grade
16	anonymous	No
17	anonymous	potential false positives/negative, ensuring all who have access and are in a role to use the equipment are assessed on their knowledge on it prior to use
18	anonymous	Used when appropriate, not for every patient
19	anonymous	does the technology used in POCT change the clinical outcome of the patient? health inequalities as majority of PC in Wales are not using POCT which patients feel they receive a better service from an ambulance service response.
20	anonymous	Troponin takes time to come back, however once HPC has been gained a test could be considered before starting other observations if no time critical presentation.
21	anonymous	accuracy, cost
22	anonymous	How is the blood taken, small pin or butterfly needle? is it expensive?
23	anonymous	No
24	anonymous	yes, it may become an expensive reliance, would it really change our practice? Would it prevent admission?
25	anonymous	no
26	anonymous	Yes. WAST purchased many ISTAT machines for use during COVID, this never came to anything as the equipment wasn't up to spec and cost was cited as major barrier to roll out to APPs. Cost is big factor. Don't think it is cost effective for us given the added benefit will be ? minimal to a small cohort of patients. Also this many would do it just because it is there, (availability bias) e.g how many unnecessary blood sugars are done that don't need to be.
27	anonymous	Governance, education, development of pathways within best practice
28	anonymous	None
29	anonymous	Yes - My biggest concern is when Not to use POC testing. My fear is that by having a test available, it makes it challenging to not use that test. For example if you have a patient with a mild infection - how do you justify not doing CRP and Lactate if you have them? Then (as well as the cost impact) what do you do if CRP is unusually high? Does that mean that this patient now needs hospital - it is possible that POC testing may lead to unnecessary admissions.
30	anonymous	Would need good bespoke guidelines
31	anonymous	Previous experience using CRP POC required the machine to be at base. I'm unsure if there are CRP POC machines that can be taken to the pt.
32	anonymous	Over use or misuse can lead to inappropriate investigation referral or discharge. Misinterpretation of results can lead to poor patient care.
33	anonymous	Results may change over the following 24-48hours.

34	anonymous	No
35	anonymous	Would need to ensure adequate training of interpretation.
36	anonymous	None
37	anonymous	accuracy and calibration of machines
38	anonymous	Cost implications
39	anonymous	Yes POC testing should be used to confirm diagnosis not lead you to a diagnosis
40	anonymous	No
41	anonymous	Over reliance - rather than generating a clear rationale for the decision making
42	anonymous	No
43	anonymous	Validity of devices
44	anonymous	Appropriate training in any new devices
45	anonymous	No
46	anonymous	Not particularly
47	anonymous	the person using the testing needs to have good experience in reviewing bloods i.e having worked in GP practice etc.

Another important aspect of this survey was ascertaining what clinical presentations APP's felt these devices would be most benefit to and which testing capabilities they would require. This is vital in shaping the search strategy for POC devices; in order to find the correct one and ensuring it will provide the best possible outcome for a larger number of patients. As can be seen below, a wide range of tests have been highlighted. It is important to consider devices that can include as many of these as possible, whilst still considering the financial implications of these units, and then the benefit to NHS Wales in reducing patient attendance at ED's.

2. What blood tests would be beneficial to assist in providing the best care pathway to patients?

[More details](#)

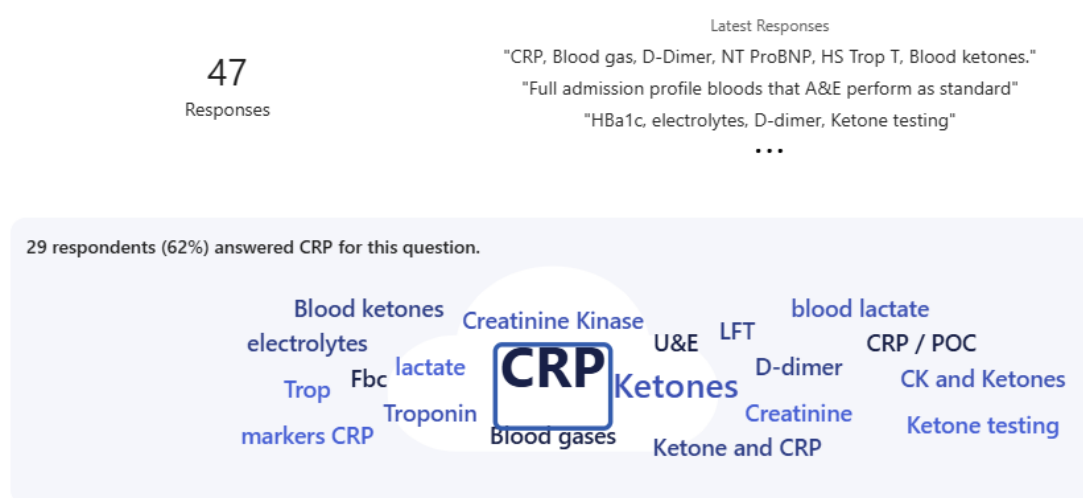


Figure 8.

These tests cover a range of symptoms or conditions, that if identified within the community, can be treated either with a specific pathway that is already in place, by helping form future pathways where conditions require blood testing in order to safely treat the patient or by bypassing ED assessment by being able to direct the patient to the correct hospital treatments, such as with (NON STEMI) where a troponin test is the

only definitive way of confirming an myocardial infarction (MI). The responses below highlight which conditions existing APPs feel they could benefit from having these POC devices within their scope of practise.

3. What nature of symptoms or conditions would these tests be considered?

[More details](#)

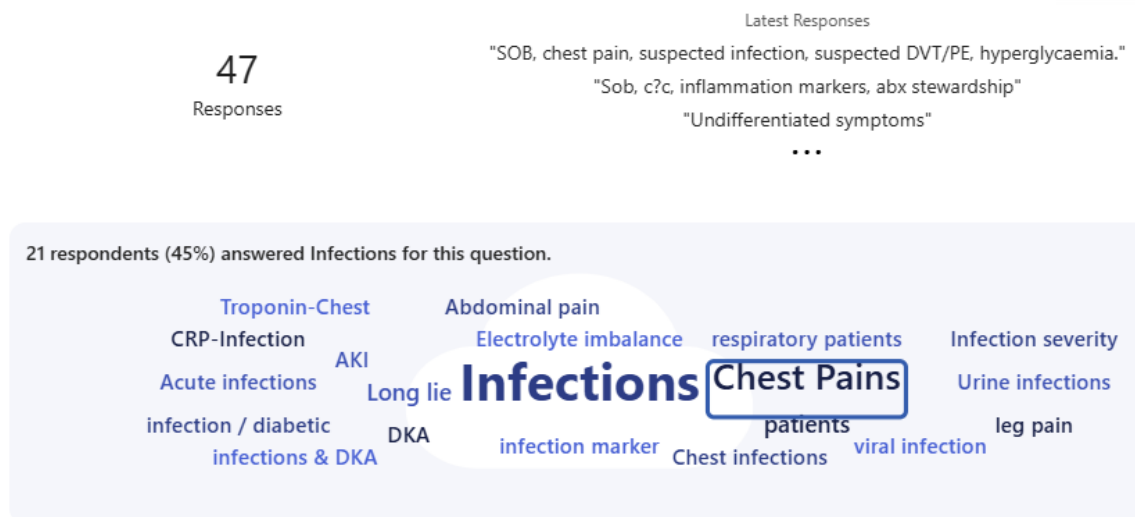


Figure 9.

Whilst it is not completely relevant to shaping the search for POC devices, it is beneficial to understand the ability of the clinician and their confidence in interpreting results. It is of benefit to the search for devices, as some devices may present results in easy-to-understand layouts, highlighting abnormalities more than other devices. However, the main aspect of clinician confidence will again play a vital part in forming a pilot of these devices, by ensuring that all clinicians receive sufficient training and have support from senior clinicians in interpreting the results provided.

5. How confident are you in interpreting blood tests results?



Figure 10.

Further questions in this survey were aimed at gaining an insight of the demographic of the APP's in WAST, showing that there is a diverse spread of APP availability pan Wales. This is beneficial to the arrangement of a pilot in WAST as there are sufficient APPs to allow a widespread pilot, ensuring urban, rural and remote areas are involved to gain the highest use of the devices during the pilot.

7. Where are you currently based?

[More details](#)



Figure 11.

Lastly, the views of the APPs in Wales show some concern that the dispatch criteria for their role will mean they are used purely to utilise these tests. It is important to include that autonomy in deciding to use the device will remain with either the APP on scene with the patient, or the APP that has triaged the call to ensure the correct resource is dispatched.

3.6 The search for POC devices

Utilising responses from both surveys, searches were carried out using a range of terms to identify devices. These searches have been outlined below:

3.6.1 Cardiac Markers

Search Terms: 'poc troponin', 'pre-hospital cardiac biomarkers', 'point-of-care myocardial infarction diagnosis'

Devices identified: Abbot i-STAT troponin cartridges, Roche Cobas h232, LumiraDX troponin.

3.6.2 Lactate and Sepsis

Search terms: 'POC Lactate testing', 'prehospital sepsis biomarkers', 'ambulance lactate analyser'

Devices found: Lactate Scout+, Abbot i-Stat, Siemens epoc

3.6.3 Blood Gases and electrolytes

Search terms: 'POC blood gas analyser', 'prehospital electrolytes', 'ambulance blood gas testing'

Devices found: Abbot i-STAT, Siemens EPOC, Radiometer ABL90Flex

3.6.4 Glucose and ketones

Search terms: 'POC glucose meter', 'POC ketone testing', 'prehospital diabetic emergencies'

Devices found: Accu-Chek Aviva, Nova Biomedical StatStrip, Precision Extra, Abbot i-STAT

3.6.5 Coagulation and haematology

Search Terms: 'POC INR testing', 'prehospital coagulation', 'ambulance haemoglobin testing'

Devices found: CoaguChek XS, Abbot i-STAT, HemoCue, Siemens epoc.

3.6.6 CRP

Search Terms: 'POC CRP testing', 'CRP testing devices', 'prehospital CRP'

Devices Found: Abbott i-stat, HemoScreen, QuikRead go.

Common devices identified include the Siemens epoc device, which is currently already in use within Wales by EMRTs and the Abbot i-STAT device. This has now formed a more in-depth look at these devices.

3.7 Siemens epoc vs Abbott i-STAT

This comparison outlines the two leading POC devices identified in the search for POC devices, which was shaped by approaching APPs and CCPs within Wales. With a focus on clinical, operational and financial implications, a comparison has been completed to ascertain which device is most beneficial and will support and inform a pilot introducing POC testing in WAST.

Both platforms are established handheld POC devices designed to provide rapid results at the bedside, but they differ in product designs and test delivery.

The Siemens epoc is based around a mobile host, a reader and single use cartridge that contains multiple sensors which analyses multiple markers within the sample covering blood gases, electrolytes, metabolites and haematocrit in one disposable test card. The Abbott i-STAT uses similar cartridge-based testing functions, each one providing a specific testing ability, therefore different testing cartridges are needed for different testing functions. (*Siemens Healthineers Receives CE Mark and FDA Clearance for the Epoc NXS Host Mobile Computer for Point-of-Care Testing*, 2025.)

The practical difference is that the epocs single card design aims to deliver that broad set of testing ability, from on singular testing card, whilst the i-STAT device is modular, needing different cartridges for separate needs. That modular design means the i-STAT can be used to target a specific test, whereas the epoc returns the full range of panel assessments (Nichols et al., 2008).

The analytical performance compared to central laboratory tests have been tested independently as well as by each manufacturer themselves, showing a high correlation between epoc and i-STAT. Multiple studies found that both devices give clinically similar results for comparable analyses. One clinical evaluation noted the i-STAT was higher on useability and had fewer comparisons exceeding predefined differences. Both devices were found to be effective in poc use; however, awareness of analyte-specific bases is essential (Stotler & Kratz, 2013).

The connectivity and ergonomics vary in a way that can impact the clinical adoption. Siemens highlight the need for temperature control of the cartridges and the need for calibration prior to each test. There is no such requirement for the testing cartridges with the i-STAT device (Füzéry et al., 2022).

Both devices are used outside the central laboratory, require careful local implementation, including operator training, ongoing quality checks and periodic method comparisons with the central laboratory, which are mandated by many regulatory frameworks.

Whilst currently not providing all POC testing facilities, the i-STAT had continued to expand the range of testing cartridges, whilst epoc literature stresses integrated features for critical care. (Food and Drug Administration, 2021)

Both the epoc and i-STAT are clinically validated POC devices capable of producing rapid results at the bedside. An effective local trial would be required to ascertain which device is most beneficial in the specified setting, as each device is effective in their ability, however the approach and testing options differ.

3.8 Cost Comparison

A full cost comparison cannot be completed in its entirety as prices for both devices are not readily available through internet searching, however a comparison has been formed from some report's statin costs incurred and refurbished units.

The Abbot i-STAT shows an overall cost per test of approximately £6.71 which encompasses capital investment, servicing, consumables and quality control, whilst the Siemens epoc is showing a significantly higher cost per test of £8.95 encompassing the same inclusions (Füzéry et al., 2022b).

The Siemens epoc requires a significantly higher investment in obtaining the device compared to that of the Abbott i-stat, currently approximately £10000 more, and this does not include the costs for additional accessories, servicing and consumables.

Assumptions made for scenario analysis:

- Device cost: Siemens epoc £11950/Abbot i-stat £1575
- Tests/Day 100 (3650/year)
- Consumables: £15/test
- Staff cost: £25/hour, 12mins/test
- Admission avoidance rate!5%
- Admission cost: £800
- ED stay reduction: 1hour/patient £75/hour

Table 2. Scenario analysis based on 100 tests per year

	Capital	Maintenance	Tests	QC	Year 1 total	Subsequent years
Abbott i-STAT	£1575	£850	£6.71	£108	£9243	£7668
Siemens epoc	£11950	£816	£8.95	£744	£22460	£10510

3.9 Summary

The Abbott i-stat poc device has highlighted a significant overall cost difference in comparison to the Siemens epoc. It is important to also consider the cost savings when considering possible hospital attendance reduction

3.10Economic analysis: UK NHS perspective

3.10.1 Assumptions

Based on the above figures assuming 100 tests per year, below is a summary of the cost-benefit for both the i-stat and the epoc devices

Table 3. Annual cost-benefit summary

Item	Value (£)	Siemens epoc	Abbott i-stat
POCT direct costs		£11,950	£1,575
Savings from admissions avoided	£437,600		
Savings from reduced ed time	£273,750		
Net annual benefit		£699,400	£709,775

Despite having higher consumable costs per test, the Abbott i-STAT provides a slightly higher cost benefit. Also, whilst the range of tests available differ, the i-STAT offers the higher likelihood of new testing abilities being introduced than the epoc, as more cartridges may be developed in the future.

3.10.2 Implementation recommendations

- Deploy in eds, urgent care centres, ambulances and hospital at home services
- Prioritise pathways with time critical decisions, sepsis, acs, respiratory distress
- Ensure full HER integration to avoid transcription errors
- Implement robust quality control and operator training
- Monitor utilisation rates to maintain cost-effectiveness

4 Recommendations

From the research completed, a focused pilot in Wales is required to show the validity of the assumption that POC testing would be of great benefit to patients and the NHS as a whole. It is proposed that WAST create a pilot across several regions to utilize these devices and assess, along with the Welsh Government, the savings that have results from the pilot. Below is a recommendation for such a pilot. This is presented in a business case scenario to ensure all aspects are provided.

Recommendations for the trial include the introduction across Wales, ensuring a range of localities in both rural and urban areas. These areas could be informed by existing pathways in both directions to a more appropriate setting such as cardiology or respiratory pathways, but also those that can avoid hospital admission, such as acute clinical care teams working in the community, and directing GP referrals.

A pilot scheme has been drafted below.

4.1 Piloting Point of Care Blood Testing in the Welsh Ambulance service

4.1.1 Executive Summary

The recommendation is for a 12-month pilot of point of care testing within WAST. The initiative aims to enhance prehospital diagnostics, improve patient triage, reduce unnecessary hospital conveyances and support more efficient use of NHS Wales resources. Evidence from international and UK studies indicates that prehospital POC testing (including troponin, Lactate, blood gases, and electrolytes) improves diagnostic confidence, enables earlier clinical decision making and may lead to better outcomes for patient presenting with time-critical conditions such as chest pain, sepsis and acute respiratory compromise. The overall aim is to have a large scale, diverse pilot put in place to provide real life support to have these devices permanently installed as part of WASTs operations.

4.1.2 Background and Rational

The ambulance service in Wales is under severe strain from multiple fronts, undermining both its ability to deliver high-quality emergency care and the NHS's aim of prudent and value-based health care (VBHC). A major issue is hospital handover delays, where ambulances arriving at emergency departments (EDs) cannot transfer care of the patient to the hospital, causing crew and vehicle unavailability, impacting on their ability to respond to incidents in the community, and having patients waiting in ambulances, sometimes more than 24 hours.

Along with this, any hospitals are overcrowded, with wards full of patients who are medically fit for discharge but cannot be moved due to a lack of social care support, which in turn causes backlogs. This not only impacts hospital capacity but also contributes to ambulances being stuck at hospital doors.

When viewed with the input of prudent health care, these challenges illustrate tensions between what is clinically necessary, what resources are available and where the inefficiencies are doing harm. Prudent healthcare emphasizes doing no harm, avoiding unnecessary interventions and using the minimum and appropriate level of care required. Meanwhile, VBHC demands focus on outcomes relative to costs. If ambulances are tied up outside hospital or are unable to respond to calls promptly then costs are high when outcomes are reduced.

WAST responds to over 500000 emergency calls annually, with chest pain, sepsis and shortness of breath being leading presentations ref. Current decision making relies heavily on clinical assessment and standard vital signs with blood testing only available after hospital arrival. This can lead to:

- Over Conveyance of patients who may be safely managed at home or in community pathways
- Delays in initiating definitive treatment for patients with ACS, Sepsis or metabolic disturbances
- Strain on emergency departments already under pressure

WAST is grappling with rising demand, under-capacity, social care and staffing issues, alongside outdated or misaligned care pathways and targets. These difficulties limit the ability to deliver care efficiently, effectively to the benefit of both the patient and the wider NHS. A review is carried out annually and a report produced by WAST showing their long terms goals of changing the way the ambulance service responds to incidents in Wales, and part of this has shown an increase in APPs pan Wales and regular, ongoing investment is being made to continue to train these clinicians and increase the overall numbers within WAST.

A pilot introduction of POC Blood testing aligns with A healthier Wales (2018) and NHS Wales' goal for value-based healthcare, by providing earlier diagnostics, improving patient flow and reducing avoidable admissions.

4.2 Proposed Pilot

- **Scope:** Deploy handheld POC testing devices in 10 trial sites across Wales, including both urban and rural ambulance bases.

- **Analytes:** Troponin, Lactate, electrolytes and blood gases
- **Duration:** 12 months
- **Participants:** Paramedics trained in advances practice and community paramedic teams
- **Integration:** Test results recorded in the Welsh Ambulance electronic patient care record (ePCR) and shared with hospitals/GPs

The pilot must be formed to ensure that the correct patients are provided with care effectively and ensuring that it is not a misused option.

Currently in Wales, lower acuity calls are triaged either by a nurse or a paramedic in clinical contact centres, and those suitable have an APP dispatched with the aim of providing care at home. Operational APP's also can self-task to incidents, however they are only utilising information gained at point of call, not through a further triage by the clinicians in CCC. These aspects of APP dispatch to patients should not be changed, as the fear is that the option of POC testing will be overused and impact proper assessment and diagnosis. The POC testing ability should be used to support or re-enforce this clinical decision making, alongside allowing effective integration of pathways.

For example, currently patients with chest pain require blood tests to rule out cardiac issues, and this is currently only obtainable at hospital. However, with POC testing, following a clinical assessment on scene of the patient, it may be preferable to offer this blood test on scene, where there is a high suspicion that the pain is not cardiac related. This will avoid unnecessary transport to hospital and form a better route of care for the patient.

Similarly, for patients who have suffered a non-injury fall, but are at risk of kidney damage due to the inability to get up, currently patients need to be transported to hospital for a blood test to rule out kidney injury. These patients can greatly benefit from POC testing and avoid being transported to hospital by analysing blood markers for kidney damage.

Full support from senior clinicians within WAST is needed to further develop the pilot in regard to clinical presentations, the level of suspicion required to support blood testing, and ascertain the wide range of clinical presentations that can benefit from these tests. Also, support will be needed from these senior clinicians to support on scene decision making if needed.

A supporting training course will need to be developed, again with support of the senior clinicians within the trust so as to ensure that all those that use these devices are confident and competent with interpreting the results. This could be an in house facilitated course, with training provided by a range of clinicians, including emergency department doctors and nurses, GPs and advanced practitioners from both paramedic and nursing backgrounds. It may also be beneficial to invite EMRTS CCPs and Doctors along to provide their insight into the device use, albeit a different device being utilised.

4.2.1 Objective

Clinical:

- Improve early identification of ACS, sepsis and metabolic emergencies
- Support risk stratification and decision making in community care

Operational

- Reduce unnecessary ED conveyances by enabling safe 'see and treat' or 'hear and treat' models
- Enhance collaboration between paramedics, GPs and hospital teams

Strategic

- Demonstrate alignment with NHS Wales' digital and innovation strategies
- Build evidence for future scaling of POC diagnostic across Wales

By having clear aims and objectives for this pilot, we can ensure that to correct information is gathered from the highest number of patients, showing the overall benefit by introducing the testing devices.

4.2.2 Benefits

- Patients: Faster treatment decisions reduced hospital exposure, safer care closer to home

- Clinicians: Improved diagnostic confidence, better triage accuracy and stronger integration with secondary care
- System: Potential reduction in ED attendances, improve patient flow, cost savings through avoided admissions.

4.2.3 Risk and Mitigations

Table 4. Risks and Mitigations

Risk	Mitigation
Device Reliability in pre-hospital conditions	Selection of robust, ambulance tested devices, regular calibration and QA
Training needs	Structures training programme and competency checks for APPs
Cost pressures	Start with Pilot; explore Welsh Government innovation funds and NHS Wales R&D support
Data integration challenges	Work with Digital health and care Wales (DHCW) to embed POC results into ePCR

Introducing POC devices into WAST offers significant opportunities to improve prehospital care, however it also carried clinical, operational, governance, financial and workforce risks that need careful management. A well-developed pilot will address these risks.

Clinically, there is a risk of inaccurate results due to operator error, poor calibration and environmental factors, potentially leading to false positives or negatives, ultimately impacting the care provided. There is also a danger of over-reliance on these tests, at the cost of clinical judgement. These can be mitigated by robust quality assurance programmes, ongoing training and competency assessments.

Whilst operationally the POC testing may increase on scene times for APP's the overall impact will result in fewer conveyance requests to hospital, reducing the use of multiple resources required for one incident, and providing better care to patients.

Considering the governance perspective, the integration of test results into electronic patient records is essential as is clarity around accountability for interpretation and compliance with MHRA and UKCA regulations. To mitigate these risks, it is essential to establish strong clinical governance frameworks and ensure digital interoperability.

The introduction of POC devices into WAST will result in significant initial and ongoing costs for the equipment, consumables and maintenance, with an additional risk of low use if these devices do not result in altered care pathways.

Finally, workforce and cultural issues must be considered, as staff may perceive POC as increasing their workload or over complicating their role. It is important that the pilot includes input from operational staff, ensuring that the correct process is followed prior to use, i.e, full clinical triage and physical assessment, utilising clinical judgement prior to use of the devices, and testing only being used to further support that clinical assessment and judgement.

Success will depend on a phased implementation, strong governance and continuous evaluation to risk balanced with the potential benefits.

4.2.4 Financial Case

- Capital costs:
 - £250000 for devices, cartridges, IT integration and training materials
- Revenue Costs (pilot year):
 - £150000 for cartridges, quality control and maintenance).
- Potential Savings:
 - Avoided ED attendances (£160 per attendance)
 - Reduced admissions for chest pain 'rule out' patients
 - Efficiency gains through faster triage and reduced hospital length of stay.

Table 5. Financial Case.

Item	Value (£)	Siemens epoc	Abbott i-stat
POCT direct costs		£11,950	£1,575
Savings from admissions avoided	£437,600		
Savings from reduced ED time	£273,750		
Net annual benefit		£699,400	£709,775

4.2.5 Evaluation Framework

Primary outcomes:

- Reduction in unnecessary ED conveyance
- Diagnostic accuracy compared to hospital reference labs
- Patient safety outcome (30-day attendance/Admissions).

Secondary outcomes:

- Clinician confidence and satisfaction
- Cost-effectiveness analysis
- Impact on patient experience

Data will be independently analysed in collaboration with a Welsh University partner. It is hoped that WASTs existing patient care record (ePCR) can be adapted to include information for APP deployment, including tests utilised, results obtained and the outcome of the patient. This information can then be quickly gathered and analysed over time to evaluate the pilot, taking into consideration the framework above.

4.2.6 Recommendation

Approval is sought for a 12-month pilot of point of care testing in WAST, supported by Welsh Government Innovation and Technology Funds. If successful this pilot could inform a national rollout of pre-hospital testing, strengthening NHS Wales' ambition to deliver safer, more efficient and more patient centred emergency care. It is suggested that the device utilised is the Abbott i-STAT device, as whilst the Siemens epoc has fewer consumables, and more test functions per test card, the i-STAT has a significant lower financial outlay, both initially in obtaining the devices and ongoing testing and maintenance costs. There is no difference in the accuracy of test results gained from either device and this will not have any clinical deficit to the patient, however the i-STAT will offer the highest financial benefit to the service and wider NHS.

Further work needs to be done in setting out boundaries for clinical presentations that can be included in the pilot to enable to procurement of the correct testing cards. This will need to be carried out by senior clinicians, ensuring that the correct support be offered to operational APP's and possible development of further pathways that can be utilised following a supportive blood testing result.

5 Conclusion

The NHS in Wales, as well as across the UK, is currently strained with the demand outweighing the capacity to provide prompt, effective care to patients. Whilst there are numerous reasons contributing to the current state of the NHS, incorrect admission to hospital is possibly one of the highest factors.

Commitments have been made in Wales, promising that hospital admissions will be cut, reducing the impact of hospital delays on the ambulance service, and ensuring that ambulance resources are available to attend the highest acuity calls within the community.

By providing point of care testing in the ambulance service, patients can be treated at home or directed to the correct care pathway, reducing the number of patients that are transported to hospital. This review has shown that devices are available that will provide a wide range of these at home testing abilities, and that whilst a significant financial commitment is required, this investment will begin immediately to reap the benefits to the NHS.

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7 AI Acknowledgment

ChatGPT was utilised in brainstorming, ensuring understanding and forming tables from input by the author.

8 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

The implementation of digital resilience documentation to support major incidents

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Abstract:

A logbook serves as an essential tool for a commander at any level during a major incident, it is a resource for effective communication, coordination and documentation. A simple but powerful tool that keeps those involved informed and organised. A logbook is a way of documenting actions and observations in real time, creating a clear timeline of events vital for understanding how a situation has unfolded and helps with future response planning. A logbook acts as a central point for all services to provide updates and decisions that are being made throughout an incident. It offers analysis for improvements and offers reflection for training and discussions on what went well and what didn't, improving future preparedness for event work and major incidents (Bull '16).

Logbooks are currently paper copies in the Welsh ambulance service, making the transition from paper to digital formats not only enhance efficiency but also improve accuracy and accessibility. It offers numerous benefits while covering events and in a major incident, improving the speed of sharing information, reducing errors, increasing accessibility and allowing better data analysis. Embracing digital technology can lead to more efficient and effective responses which could ultimately save lives and improve care. Logbooks becoming digitalised is not just a modernisation but a necessary step towards a more effective emergency response system.

Keywords: Logbook, Digital, Major Incident

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1 Introduction

Currently in the Welsh ambulance we do not have a legally governed, secure digital way of producing a personal log when dealing with a major incident or completing any type of event work. Event work involves managing stadium concerts, festivals or sporting events which often have high-capacity numbers of people in a small location – an example would be the recent Oasis concert in the principality stadium concert were approximately 58,000 people were in attendance. These situations along with major incidents can be high pressured and take a lot of continuous planning and preparedness (WAS '24). As a tactical commander myself and working with a paper log I find it can be slow, stressful, times can be missed, and you are easily open to making mistakes. There is also need for shared situational awareness with other services and by introducing a digital log there could be an option to share at a much quicker speed. By having the facility of a digital log there would be a time stamp facility, it would be secure and locked options for drop down adds and sharing would also take the risk of error in mishearing and slowness away. This research project will look at the benefits and thoughts of other commanders and service leads around the development and benefits of producing a digital version of or current paper command logbook.

1.1 Context

Digitalising a logbook for reporting during any type of event work or major incident brings numerous advantages that can significantly enhance the effectiveness of all staff in the Welsh ambulance service (WAST). The transition from traditional paper logs to digital formats not only streamlines processes but also improves overall communication and coordination. A log is used by all levels of commanders Strategic, Tactical and Operational.

One benefit is the ability to capture real-time data. In the chaos of a major incident, every second counts, and having immediate access to updated information is crucial. Digital logbooks allow responders to input details as events unfold, ensuring that all staff have the latest information at their fingertips. Another benefit is the enhanced accuracy of data entry as handwritten notes can lead to misunderstandings due to illegible handwriting or misplaced information. Digital logbooks eliminate these issues by providing a clear and standardised format for data entry. Features like drop-down menus and automatic prompts help ensure that information is entered correctly. This accuracy allows for a reliable record of events, which can be used for analysis and future training.

Accessibility is a further benefit of digital logbooks. At a major incident, all three emergency services and often other services would need access into what information WAST have helping with the response, and this can be shared easily with a digital platform. It helps with the joint emergency service interoperability programme (JESIP) principles of joint working and using the joint decision-making tool (JDM) (Betts '25, EASC '22).

Digitalisation offers better data management and storage. Physical logbooks should be stored in a central point, but they can be easily lost, damaged, or misfiled, making it challenging to retrieve important information later. In contrast, digital records can be securely stored in the cloud, ensuring that they are safe and easily accessible whenever needed. This secure storage also allows for easier compliance with legal and regulatory requirements, as digital records can be backed up and archived automatically. Comprehensive reporting and analysis can be facilitated, for reviewing the data being collected and provided, this offers valuable insights into the response efforts. Reports can be generated that highlights trends, response times, and areas that need improvement.

This research project will look at the benefits of using digitalisation and will question the need, benefits and risks associated with making the change.

2 Literature review on the use and need of a logbook during a major incident, and the benefits of it being digital.

Emergencies can happen at any time, and during these critical moments, the response of the Welsh ambulance service can save lives. The Welsh government's guidance on how these services should operate during major incidents is essential for ensuring the safety and well-being of the public. This guidance sets clear expectations, enabling us to respond effectively when time is most precious (WAG '18).

To begin with, the Welsh government emphasises the importance of clear communication during major incidents. When emergencies unfold, accurate information must flow between WAST, Health Boards, police, fire, public health, local delivery forums and Welsh government officials. For example, during the COVID-19 pandemic, rapid sharing of information allowed WAST to assess patient needs and transport them to the right facilities. This coordination helped prevent hospitals from becoming overwhelmed and ensured that each patient received the care they required. WAG '18's WAST framework document guidance highlights the necessity of proper training for ambulance staff. Well-trained personnel can make quick decisions that are vital during crises.

Additionally, the Welsh government's '18 Parliamentary review of health & social care guidance includes the importance of community involvement. Local communities play a crucial role in supporting all responders during major incidents. For example, when a major flooding occurred, volunteers helped clear roads and provided food and shelter for first responders. Such community support allows us to focus on their primary mission—saving lives. These elements work together to create a strong response system that can handle emergencies successfully. A well-prepared ambulance service can make a significant difference in saving lives, reminding everyone of the importance of readiness and teamwork in times of crisis.

During these times of crisis, external support and pressures play a vital role in shaping outcomes. Understanding these influences through the PESTLE framework—Political, Economic, Social, Technological, Legal, and Environmental factors—can provide valuable insights into how society responds to major incidents.

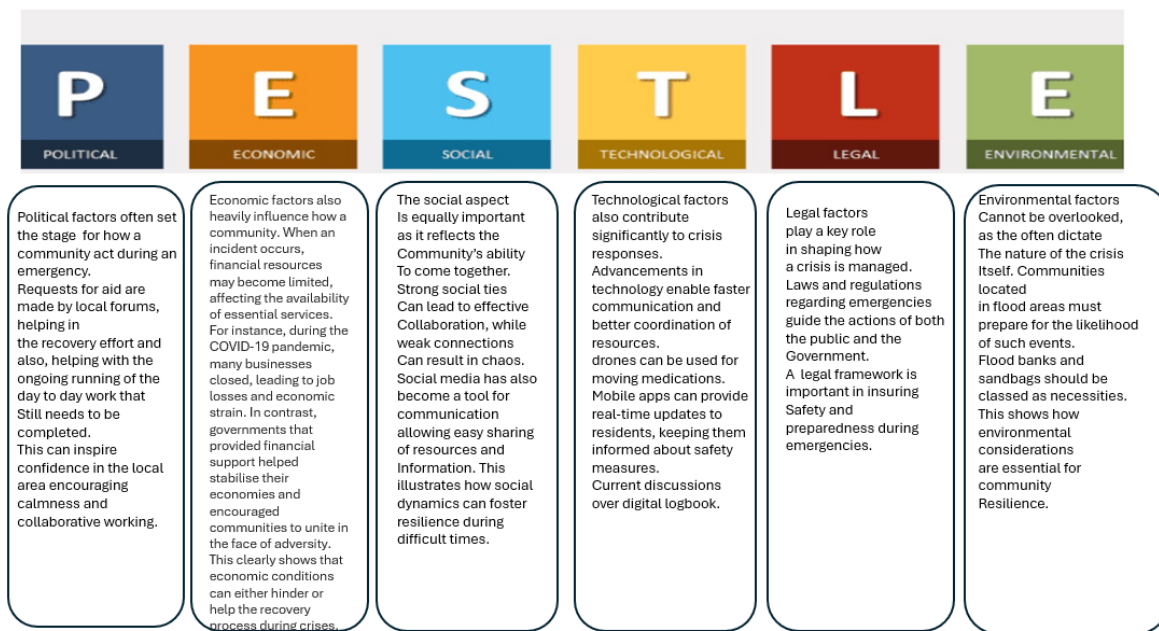


Figure 1: PESTLE Analysis (Perera '17, Pettinger'23, HM Gov '13 HM Gov '25)

External support and pressures during major incidents significantly shape community responses. Analysing these influences through the PESTLE framework reveals how political, economic, social, technological, legal, and environmental factors interact to either strengthen or weaken resilience. By understanding these elements, communities can improve their preparedness and response strategies for future crises. It is essential to recognize the value of these factors and work towards a more resilient society (Pettinger '23).

Utilising a digital log for major incidents and event work, particularly within the frameworks of prudent healthcare and value-based healthcare, offers several significant benefits:

- **Enhanced Communication:** Digital logs facilitate clear and efficient communication among healthcare teams during major incidents, ensuring that vital information is shared quickly and accurately.
- **Real-Time Data Access:** Healthcare providers can access real-time data regarding incidents, patient status, and resource availability, allowing for timely decision-making and intervention.

- **Improved Accountability:** A digital log records all actions and decisions taken during an incident, promoting accountability among staff and ensuring that changes in care processes can be reviewed and analysed.
- **Data Analysis and Reporting:** Digital logs enable thorough analysis of incidents, helping to identify patterns, trends, and areas for improvement. This supports evidence-based practice and enhances learning from past experiences.
- **Patient-Centred Approach:** By focusing on value-based care, a digital log can track patient outcomes and satisfaction, ensuring that interventions prioritize patient needs and preferences (Bevan Commission '20).
- **Resource Optimisation:** The data from digital logs can inform resource allocation and management, helping healthcare facilities to effectively deploy staff and supplies during incidents.
- **Regulatory Compliance:** Maintaining a digital log assists in meeting regulatory requirements for incident reporting and documentation, reducing the risk of non-compliance.
- **Quality Improvement Initiatives:** Insights gathered from digital logs can drive quality improvement initiatives, ultimately leading to better patient care and enhanced outcomes.
- **Streamlined Processes:** Implementing a digital log can streamline incident management processes, reducing paperwork and minimising disruption to daily operations.
- **Collaboration and Coordination:** Digital logs promote collaboration between various healthcare stakeholders, including emergency services, administrative staff, and clinical teams, enhancing overall incident response efforts (Donning & Lecky '04, WAS '24, PHC '19).

Digital logs can also play a crucial role in quality improvement initiatives in patient care during an incident in several impactful ways, here are some additional considerations:

- **Identifying Best Practices:** By logging various aspects of care and their outcomes, healthcare providers can identify effective practices that lead to better patient results, enabling the dissemination of these best practices across the organisation.
- **Root Cause Analysis:** When adverse events or incidents occur, digital logs provide detailed records that facilitate root cause analysis. Understanding the underlying reasons for incidents helps to implement targeted improvements.
- **Feedback Mechanisms:** Digital logs can be used to gather feedback from patients and staff about their experiences, which is invaluable for identifying areas for improvement and fostering a culture of continuous feedback.
- **Standardisation of Care:** By documenting care processes and protocols, digital logs encourage standardisation across healthcare practices. Standardisation can reduce variation in care and improve overall quality.
- **Performance Measurement:** Digital logs enable the tracking of key performance indicators (KPIs) related to patient care, helping organisations measure their performance against established benchmarks and goals.
- **Facilitation of Training and Education:** Insights from digital logs can inform staff training and education programs, ensuring that healthcare teams are well-prepared to implement best practices based on real-world data.
- **Real-Time Data Utilisation:** The ability to access and analyse log data in real time allows healthcare providers to make immediate improvements in care delivery, adjusting processes promptly based on current information.
- **Patient Safety Enhancements:** Digital logs contribute to patient safety initiatives by documenting incidents of harm or near misses and enabling the development of strategies to prevent recurrence.
- **Supporting Accreditation and Compliance:** Quality improvement initiatives often require adherence to accreditation standards. Digital logs help organisations maintain compliance through thorough documentation and reporting of care quality (Teisberg et al '20).

A well-written log during a major incident can save lives and improve outcomes. Considering human factors when creating these logs is essential for understanding events and making better decisions in the future. By focusing on clear communication, emotional awareness, and teamwork, logs can become more effective

tools for handling crises. Clear communication is crucial when writing logs for major incidents or events. Log entries should use simple language and focus on the most important information. For example, during a fire in a crowded building, it is vital to record the number of people evacuated and the locations of any remaining individuals. This information can help responders prioritise their actions. Clear logs reduce misunderstandings and ensure everyone involved knows what is happening. In this way, logs serve as a lifeline during emergencies.

Emotional awareness also plays a significant role. People involved in major incidents often experience stress, fear, and confusion. Understanding these emotions can help responders create more accurate logs. For instance, individuals may panic, making it difficult to remember important details. Acknowledging these feelings allows responders to take a step back and focus on gathering vital information. By capturing the emotional state of those involved, logs can provide valuable insight into the challenges faced during an incident.

Teamwork is another key factor to consider when writing logs, each person involved in the response process has unique experiences and perspectives. By working together to create a comprehensive report of the events with the individual logs, responders can ensure that no important information is overlooked. Combining these perspectives leads to a more complete understanding of the situation and ultimately improves response efforts.

Clear logs help prevent misunderstandings, acknowledge emotions, and ensure all perspectives are included, embracing these factors, responders can create logs that not only document events but also enhance future emergency responses. It is essential to prioritise these elements to create a safer and more effective approach to crisis management (Teisberg '20, NHS Wales '21).

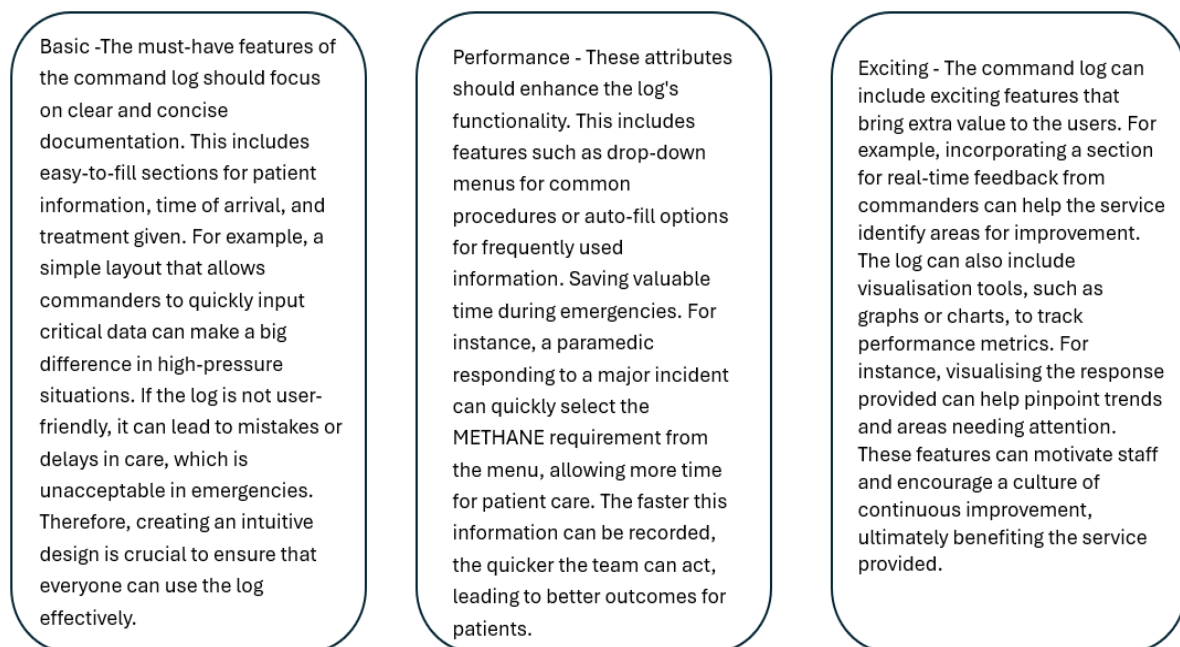


Figure 2: Kano model discussing requirements for a Digital Incident Logbook to manage event work and major incidents (Rotar & Kozar '17).

A well-maintained logbook serves as a vital tool that helps organise information and improve response times during major incidents or when covering special events. Clear communication is essential during any major incident, and a logbook plays a critical. When multiple teams are involved, it is easy for information to get lost or mixed up. It allows each commander to record their actions and the status of any patients. This organised record helps ensure that everyone is on the same page, which where necessary can save lives. When all information is easily accessible, it reduces confusion and allows other services and operational staff to work together more efficiently.

When multiple patients are involved, it is crucial to monitor their conditions closely. A log for an operational commander enables the ability to document vital signs, treatments provided, and any changes to numbers

of patients and their conditions. This helps prevent mistakes and ensures that each patient receives the best possible care. Maintaining accurate records can also aid in the transfer of patients to hospitals, making the process smoother and more effective.

Furthermore, a logbook supports decision-making in critical situations. When faced with difficult choices, having a clear record of events can provide valuable insights. For example, during a major incident where resources are limited, commanders can use the log to identify which areas need the most attention. Allowing them to allocate resources more effectively, ensuring that help reaches those who need it most. By analysing past incidents recorded in a logbook, WAST can also learn from their experiences and improve their response strategies for future emergencies.

Correct recording can make a significant difference in managing incidents effectively. Here are the do's and don'ts of incident logbook recording, along with reasons why these practices are important.

Starting with the do's, it is crucial to document every detail accurately. This includes the time of arrival, the number of casualties, and the conditions of each patient. Accurate records provide a clear timeline of events, which can be vital for understanding what happened during an incident. Clear documentation also helps in investigations and reviews, allowing services to learn from each experience.

Another important practice is to use clear and concise language. The log should be easy to read and understand. Using technical jargon or unclear abbreviations can lead to confusion among team members. A well-written log ensures that anyone reviewing it can quickly grasp the key information. This clarity is essential for effective communication among different emergency services (Tovey et al '18, WAS '25).

Additionally, updating the log in real-time is a must. Waiting until after the incident to write down information can lead to missed details. As events unfold, recording information immediately ensures that nothing is forgotten. This practice also helps in maintaining an accurate account of the response, which is critical for post-incident analysis.

On the other hand, there are several don'ts that must be avoided. One major mistake is neglecting to record information. Omitting key details, such as the number of patients or actions taken, can create gaps in understanding the incident. These gaps can hinder future responses and prevent lessons from being learned.

Another common error is using vague terms. Words like "okay" or "fine" do not provide useful information. Instead, specific descriptions of environment or the actions taken should be included. Vague terms can lead to misunderstandings and a lack of clarity in communication.

It is also important to avoid personal opinions or unnecessary comments in the log. The log should remain objective and factual. Including personal thoughts can cloud the focus of the log and may lead to confusion during reviews or investigations.

Finally, one should never forget to sign and date entries. This practice ensures accountability and allows for tracking who recorded the information. It is essential for maintaining a reliable log, especially when it is reviewed later (Burrows- Sutcliffe '20, Civil Contingencies Act '04).

The Joint Emergency Services Interoperability Principles (JESIP) are important when completing a log during an incident because they provide a clear framework for how different emergency services can work together effectively. This framework helps ensure that all teams, such as ambulance services, police, and the fire service, communicate and collaborate efficiently. Here are several reasons why JESIP is crucial in this context.

- First, JESIP emphasises a shared understanding of the situation. When completing a log, all commanders need to have the same information about what is happening on the ground. This shared understanding helps avoid confusion and ensures that everyone is working to manage or end the incident safely and with as little disruption as possible.
- Second - It promotes effective communication. Clear communication is vital during any emergency. By following JESIP principles, responders can ensure that the information they record is relevant, accurate, and easy to understand. This makes it easier for all to access important details and contributes to smoother operations.
- Third - Encourages coordinated decision-making. When various emergency services come together, they must work as a single unit. By adhering to JESIP, responders can ensure that their

logs reflect a unified approach to managing the incident. This coordinated effort helps leaders make better decisions based on the combined information from all teams, leading to a more effective response.

- Lastly, JESIP supports continuous learning and improvement. After an incident, reviewing the logs completed with JESIP principles can provide valuable insights into what went well and what could be improved. This evaluation helps emergency services learn from their experiences and enhances their responses in future incidents (Bull '16, Davidson '23, WAS '25).

As noted in the Saunders report (HO '23) from the inquest after the Manchester arena inquiry communication and joint working was poor and it was limited at a strategic level, especially in the early stages of declaration of a major incident. It was also highlighted that the lack of communication and shared risk assessment led to a delay in ambulance staff being deployed into the city room. By sharing the information provided on a log the principles of JESIP are followed and this could be an easier system to follow with the introduction of a digital log.

During the Manchester Arena attack, it became clear that communication breakdowns led to delays in medical assistance. A digital log would allow a record of vital information to be available instantly, such as the number of casualties and their conditions. This immediate data can help dispatchers prioritise cases and allocate resources more effectively, ultimately leading to faster treatment for those in need. It helps to improve collaboration among emergency services. In chaotic situations, different agencies must work together seamlessly. With traditional paper logs, information can sometimes be lost or misinterpreted. The digital system allows various teams, such as police, fire, and ambulance services, to access and share information instantly. This was a significant issue during the Manchester Arena inquiry, where the lack of shared data hindered the response. By using digital logs, all teams can stay informed and coordinate their efforts, ensuring a more efficient response to crises (HO '23).

Another advantage of digital logs is their ability to provide a clear record of events. In the aftermath of major incidents, investigations are often conducted to understand what happened and identify areas for improvement. Digital logs create an accurate timeline of actions taken during an emergency as they can be time stamped at the point of adding the information. This information can be invaluable for learning from past mistakes. For instance, the Manchester Arena inquiry highlighted several failures in the response. With digital logs, lessons learned can lead to better training and preparation for future incidents, ultimately saving more lives. The lessons learned from the Manchester Arena inquiry emphasise the need for better systems in place. Embracing digital technology can lead to more efficient responses and ultimately save lives in emergencies. It is time to advocate for the implementation of digital logs in the Welsh ambulance service for a safer future.

The Manchester Arena inquiry has brought to light important issues regarding the response of emergency services, particularly the ambulance service, during major incidents. On May 22, 2017, a terrorist attack at the Manchester Arena resulted in the tragic loss of 22 lives and left many others injured. The inquiry aimed to investigate the circumstances surrounding the attack and the effectiveness of the emergency response.

One key focus of the inquiry was how the ambulance service handled the situation. On that night, the initial response from the emergency services faced significant challenges. The inquiry revealed that there were delays in the deployment of ambulances to the scene. While police and fire services were quickly dispatched, the ambulance service did not arrive as promptly as needed. This delay in medical assistance contributed to the chaos and confusion during the aftermath of the attack (HO '23).

Another crucial aspect highlighted by the inquiry was the communication breakdown among the various emergency services. Effective communication is essential in any emergency response, but during the Manchester Arena attack, information sharing was hampered. Paramedics reported that they had difficulty receiving updates from other services, which hindered their ability to provide timely care to victims. The inquiry noted that a more organized and streamlined communication system could have improved the coordination of the ambulance service with police and other responders.

Additionally, the inquiry pointed out the need for better training and preparedness among ambulance staff for dealing with major incidents. Many paramedics arrived at the scene without clear information about the situation, which left them unprepared for the scale of the emergency. The inquiry suggested that regular training exercises and clearer protocols for responding to terror attacks could enhance the ambulance service's readiness for similar incidents in the future.

The use of digital logs and systems for real-time data sharing was also discussed in the inquiry. A digital log could have facilitated better communication between the ambulance service and other emergency responders, allowing for quicker decision-making and resource allocation. By documenting critical information instantly, paramedics could have shared details about casualties, their conditions, and the level of medical assistance required. This could have led to a more effective response and potentially saved more lives (HO '23).

2.1 'Core standard 29 Decision Logging' (Civil Contingencies Act '04)

To ensure decisions are recorded during business continuity, critical and major incidents, the organisation must ensure:

14. Key response staff are aware of the need for creating their own personal records and decision logs to the required standards and storing them in accordance with the organisations' records management policy and
15. has 24-hour access to a trained loggist(s) to ensure support to the decision maker.

A well-run operation during an incident can mean the difference between chaos and control. Having a loggist as part of the tactical command team can help with the effective decision-making and organisation. Loggists play a critical role in ensuring that every detail is recorded, analysed, and communicated, which leads to successful outcomes in high-pressure situations.

The first significant benefit of including a loggist is the accurate documentation of events. During incidents, information can change rapidly, and details can easily be forgotten. A loggist keeps a detailed record of what happens, for the commander at tactical and strategic level. When there is an incident there can be several different conversations that are needed, and the log creation can become lost when dealing of the overall situation and managing the safety of the crews and operational commanders on the scene. A loggist helps to track equipment, personnel, and their locations. This is especially useful in complex situations where many teams are working at once. This organisation allows commanders to allocate resources effectively and avoid wasting time or effort.

A loggists can help with improving communication within the team. They ensure that everyone is on the same page by providing updates and sharing critical information. A loggist gives the tactical or strategic commander one less thing to think about but they must make sure they are only logging conversations and decisions for the commander they are working with. This clear communication helps to prevent misunderstandings; the commander must also make sure they read and understand the log before entering it as it is their account of the incident not the loggists (WAS '25).

By having a loggist for a tactical or strategic commander during an incident is not just beneficial; it is essential. Accurate documentation, resource organisation, and improved communication help lead the incident and help to better decision-making and more effective operational decisions and plans are then developed and shared. Embracing the role of a loggist can greatly enhance the chances of a successful outcome in any critical situation.

A well-maintained log serves as a vital record that can protect individuals and organisations from legal consequences. By understanding the legal aspects of producing a log, it becomes clear that this practice is essential for safety, accountability, and clarity during chaotic situations. When emergency services respond to a crisis, they need accurate information to make quick decisions, and a log ensures safety for all involved. For instance, during a fire, knowing the time of the first call, the location of the fire, and the actions taken can help firefighters plan their approach. A detailed log can also track the presence of any hazards, which can prevent injuries. Therefore, documenting every detail can save lives and protect responders from liability.

In addition to ensuring safety, a log also provides accountability. When an incident occurs, many people may be involved, such as medical personnel, firefighters, police officers, and other medical services. Each person's actions could be questioned later, so a comprehensive log serves as a record of who did what and when, if a paramedic administers care to a patient, the log will show the time and actions taken in an operational commander's plan. This helps to clear any misunderstandings and holds individuals accountable for their actions. Without proper documentation, it becomes easy to blame others, which can lead to disputes and legal issues. Maintaining a log brings clarity to the situation. After an incident, investigations often take place to understand what happened. A clear and detailed log can help investigators

see the sequence of events and decisions that were made, which is crucial for determining the cause of the incident. It can provide insights into the actions of each commander; this information is important for legal proceedings and can help prevent future incidents, by recognising the value of this practice it can lead to better preparedness in times of crisis. Embracing the habit of logging information during incidents is a step toward ensuring safety and accountability in any situation (Power et al '24).

3 Methodology.

When looking at the research for developing a digital logbook the right approach can make all the difference. Mixed methods methodology combines both quantitative and qualitative research techniques, allowing for a more comprehensive view of a subject. This approach not only enriches the data collected but also leads to more reliable and insightful conclusions. I have received ethical approval for my studies with the medical research council.

One major benefit of mixed methods is the ability to capture a fuller picture of reality. Quantitative data, such as statistics, offers hard numbers that reflect trends and patterns. For instance, one of the questions asked was on the availability of an iPad and ease of use for a new system, giving me a response on the availability of access. However, this data alone does not explain what the needs are and what the views are of highly reliable leaders in the digital field and the requirements of emergency, preparedness, response and resilience (EPRR) leaders and trainers. By adding qualitative research, such as interviews with subjects, deeper insights emerge. Understanding the reasons behind the scores can help me make better decisions for future development strategies (Patel & Patel '19, Sreekumar '23).

Another important advantage of using mixed methods is the opportunity to validate results. When both qualitative and quantitative data point in the same direction, confidence in the findings increases. For example, the **questionnaire** speaks about the need for, a loggist and this has been echoed in the interview work carried out the results are more trustworthy. Researchers can feel more assured that their conclusions are accurate and reflect the true feelings of the Commanders working within WAST.

Mixed methods also encourage collaboration and creativity in research. By blending different approaches, researchers can think outside the box and explore new angles. This flexibility can lead to innovative solutions. Take the example of sharing the data with other stakeholders. By combining surveys, clinical data, and personal accounts, researchers can better understand the benefits and downfalls. This mixed approach can reveal not only the effectiveness of the shared reporting but also how it impacts the effectiveness of managing the incident.

The use of mixed method methodology provides several key benefits, including a more complete understanding of subjects, increased validation of results, and greater creativity in research. Embracing this approach can lead to richer insights and better solutions in various fields. Researchers should consider using mixed methods to enhance their work and ultimately contribute to a deeper understanding of the world around us (Patel & Patel '19, Sreekumar '23).

3.1 Figures and Tables

When completing my questionnaire out of a possible 40 commanders picked from those in WAST 30 responded and all agreed to consent to answering questions in relation to the incident command logbook. Of those 30 the breakdown of command role is shown below.

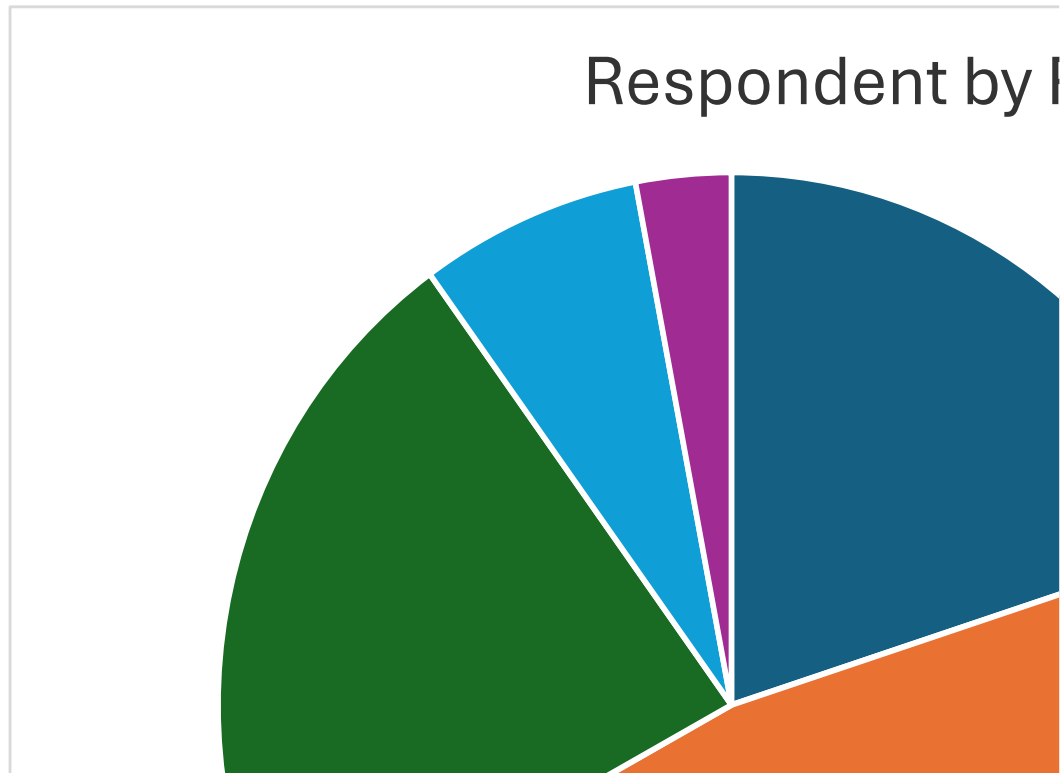


Figure 3: Respondent by Role.

These are the roles that would be responsible for completing a log, during a major incident or when managing an event.

This shows I have been able to get a variety of respondents and different grades of responsibility when working within WAST.

My current role is a tactical commander, and I have operational staff working under me in my locality managing from the scene.

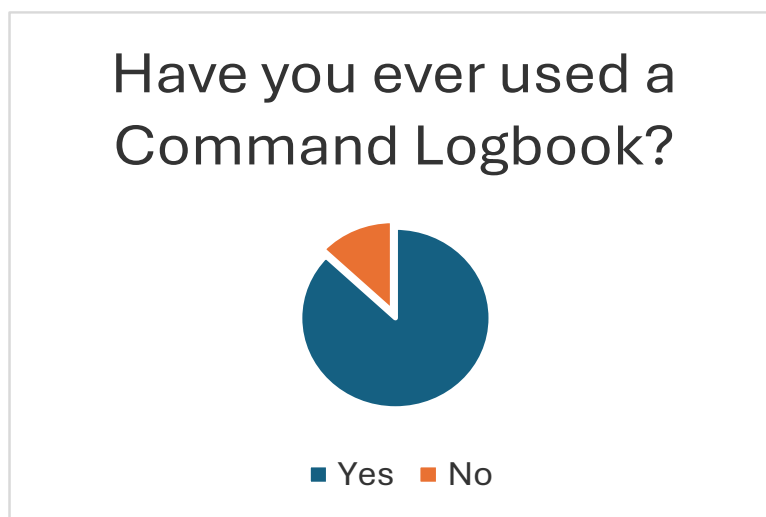


Figure 4.

Another question asked relevant to log keeping was if the commander had ever had experience in completing a log, as this shows the relevance in their response and the level of understanding in the questionnaire. These results are shown and provide evidence to support the understanding of the respondents. It was important to make sure they were experienced as completing a log can be challenging and you need to be constantly aware of all the asks during the event or incident, and these are some of the things being looked at in the development of the logbook.

To be able to make sure a digital log would be easily accessible we needed to look at who had a WAST issued iPad, out of the 30 responders there was one person who did not have one, but they had left a note to me saying they were waiting on a replacement.

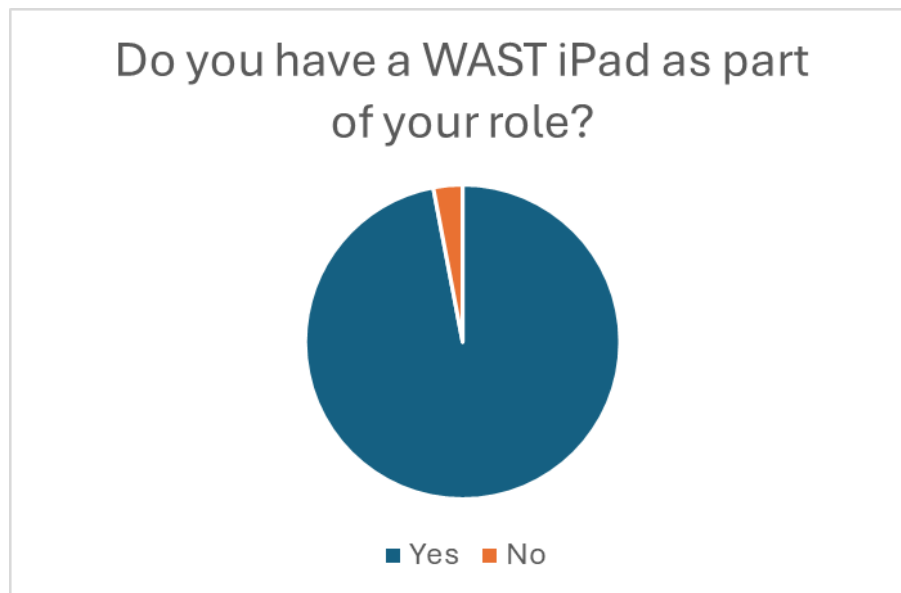


Figure 5.

The preference of a logbook being digital or paper was a consideration as paper has always been the approach. There were 11 staff who rather paper and this will be explored more later.

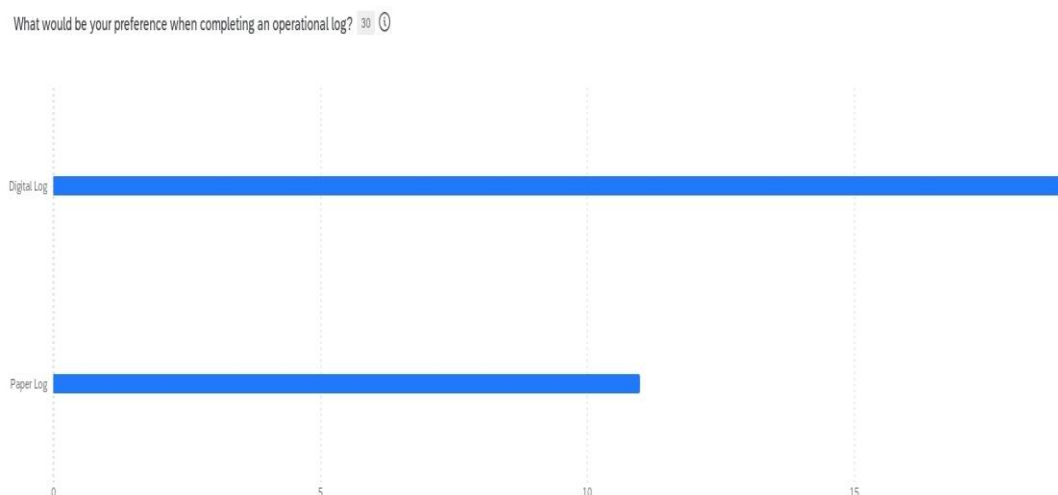


Figure 6.

I looked at the amount of training was undertaken per year by each commander. It is individual preference on training for their own CPD with some annual and 3 Yearly compulsory training that needs to be completed.

WAST EPRR team will often offer sessions, and it is on a volunteer basis which then counts towards your own CPD.



Figure 7.

When looking at the changes that have been implemented since Manchester Arena most command staff felt that there was a change, and we were more aware and prepared but there was still some staff that felt we needed to offer more training to support the recommendations that have been made.

The graph below shows this.

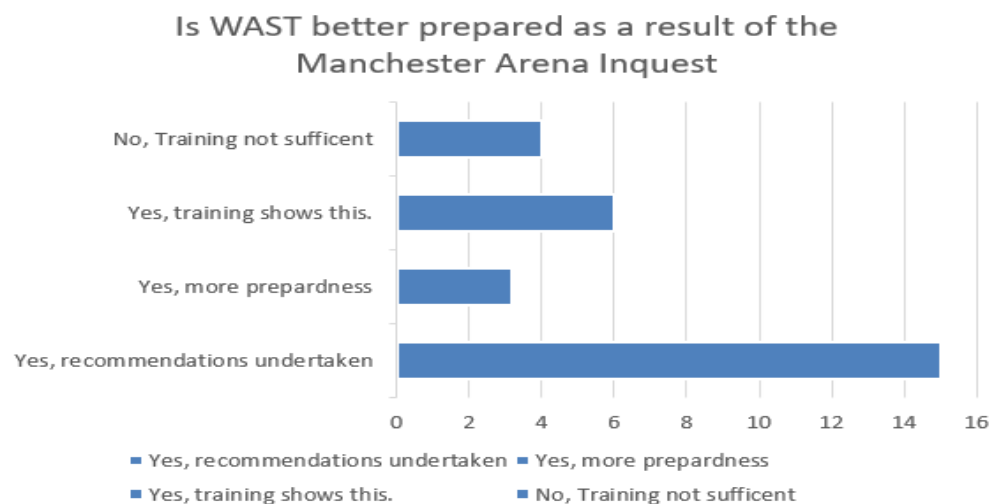


Figure 8.

This chart looks at the concern over the risk of error when using a digital platform. Four of the 30 staff asked felt there could be some risk.

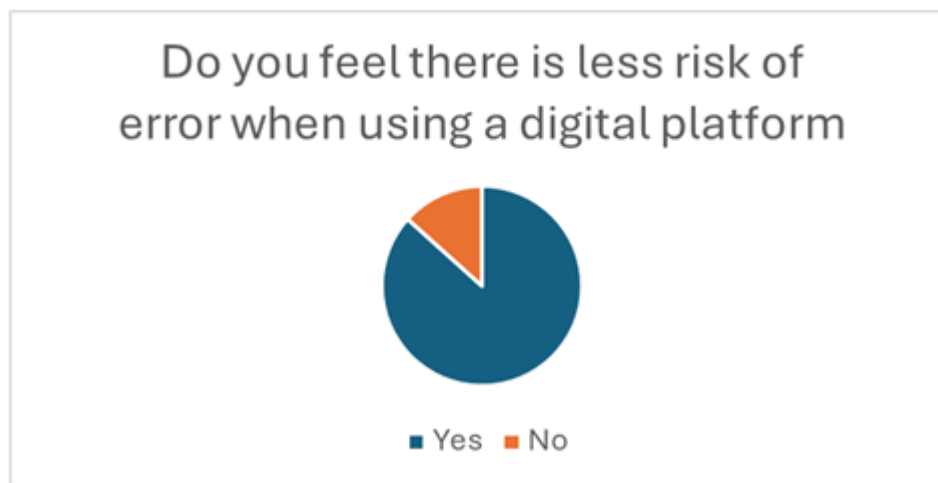


Figure 9.

The next graph shows the concerns people had when completing the current paper logbook that is in place with WAST. There were several weaknesses that would be overcome by using a digital platform. When gathering this information, I looked at common themes which were picked up and mentioned in each questionnaire.

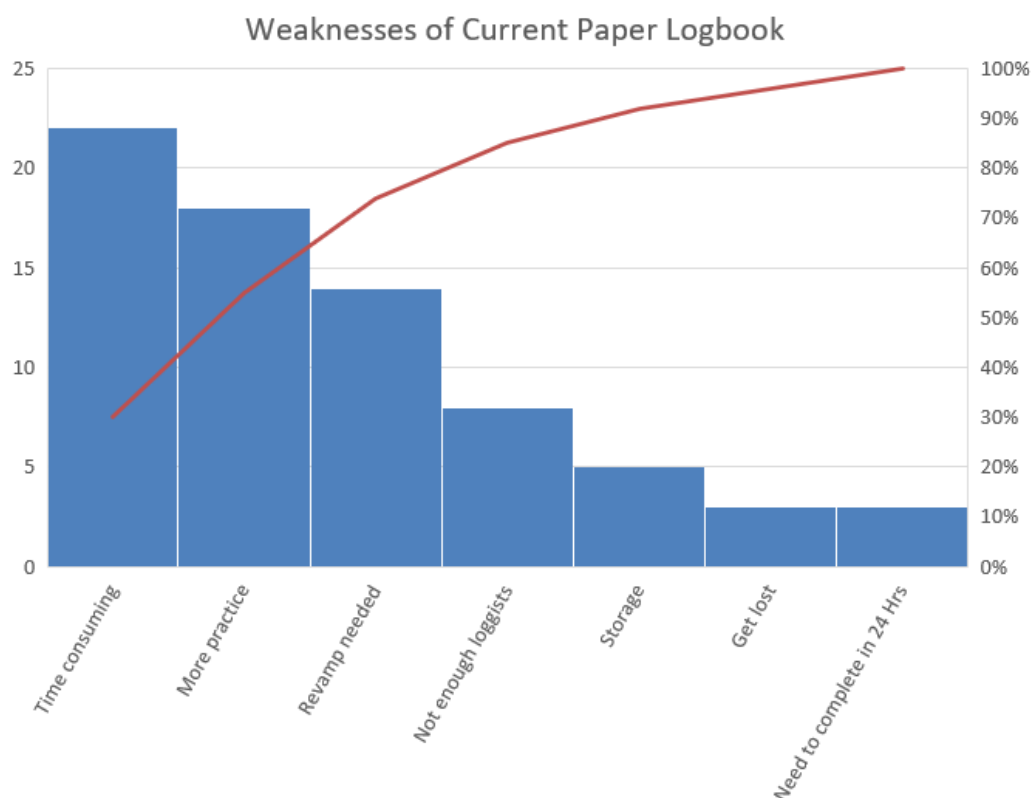


Figure 10.

This graph below shows several options in relation to how they feel a digital copy would work and what benefits it would have when dealing with an incident or an event. It clearly shows that there is a clear shift towards using a digital log rather than a paper version.

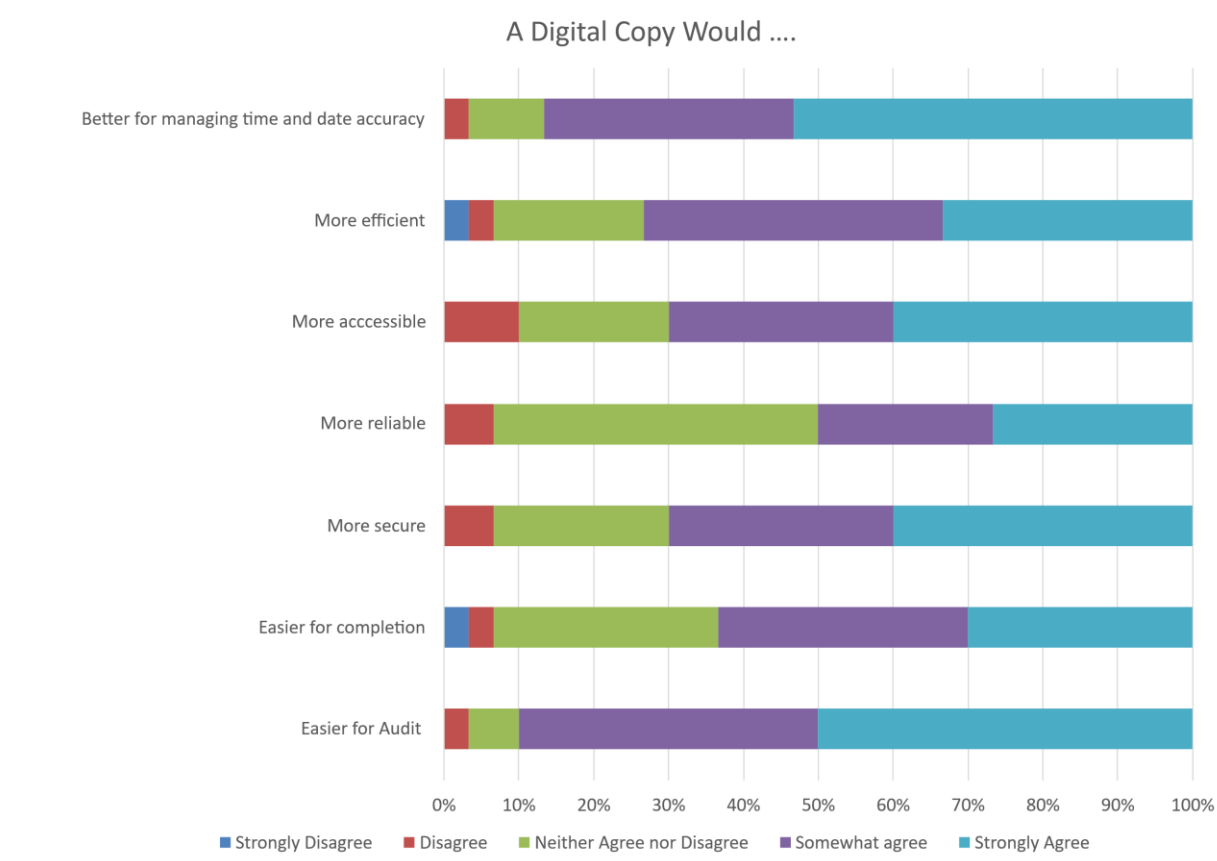


Figure 11.

When listening to details being transferred over the phone in a noisy environment or over the radio there can be a risk of mishearing the information correctly, with a digital log that is shared without the need to verbally transfer there is a better opportunity to correctly receive the information and share it with either other services or commanders.

Digital Less Risk of Miss-hearing Information

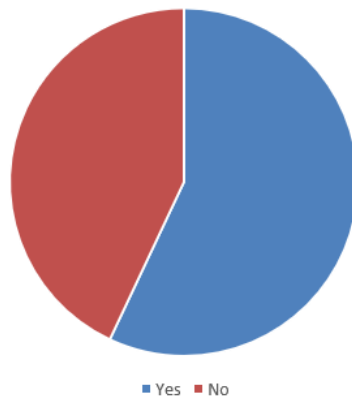


Figure 12.

This is something that has been seen in the pie chart below but there would need to be more understanding. It would affect the operational commanders more as they would be on scene and more likely to be in an environment where noise or communication could be an issue.

Do you know of any other service that uses a digital log?

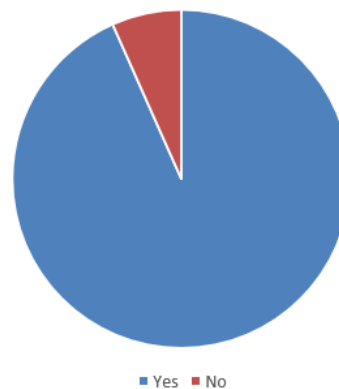


Figure 13.

When asked about other services that use a digital log there were only 2 respondents who were aware. When completing my research and speaking to other ambulance trusts I was able to get a better idea of the types of digital platforms if any being used in the UK. Many being trial and error and all still looking for the most adequate system. The 2 respondents who were aware of digital logs outside of WAST were the Police force.

As a trust we like to make sure all commanders are using and are aware of the JESSIP principles a the need to use the joint decision making tool and the graph below shows that this is a practice that is undertaken and considered when making sure we are prepared and comfortable with how we respond to a major incident or event as all commanders were happy to share relevant information and in the second graph discuss who they would share the information with.

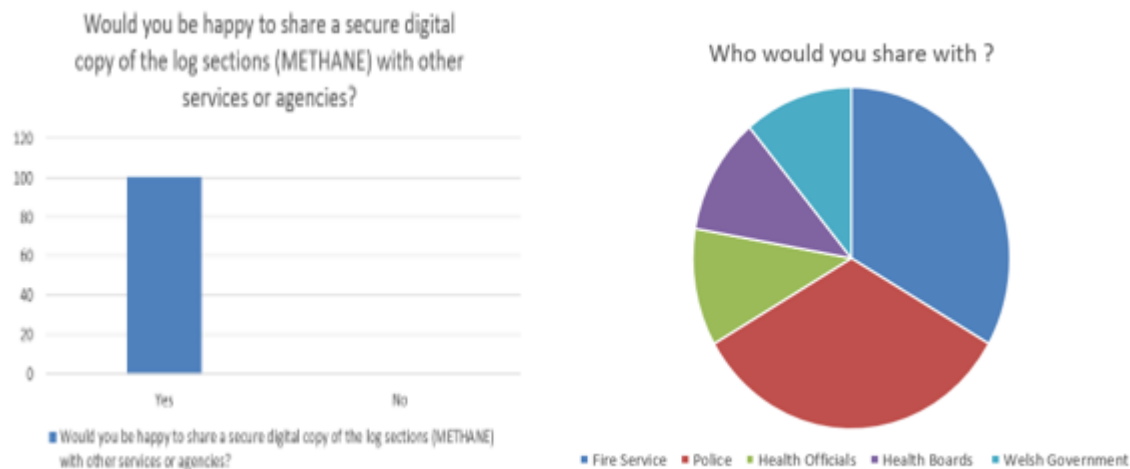


Figure 14.

The next three questions asked were around the use of the digital log and if there were any concerns around training. When asked about training to use the log there were limited concerns. There were also a number of reasons spoke about as to why it could be a problem when using it in a major incident or while at an event. Here the consideration for a paper log as a back up was mentioned.

Would you have any concerns about training to use a digital logbook?

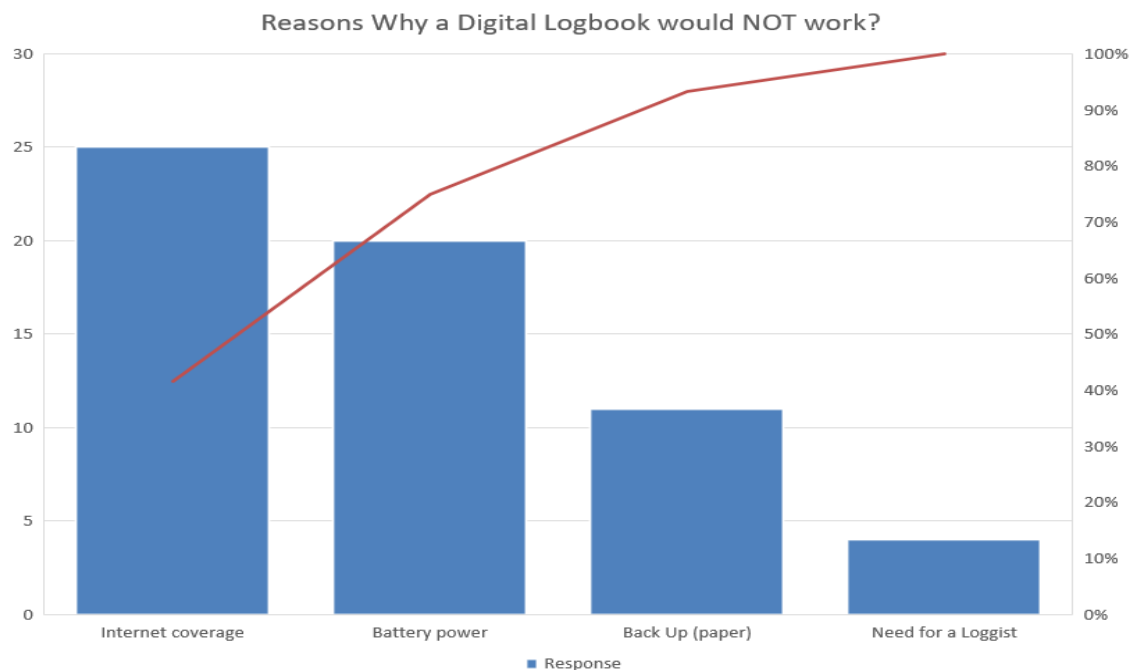
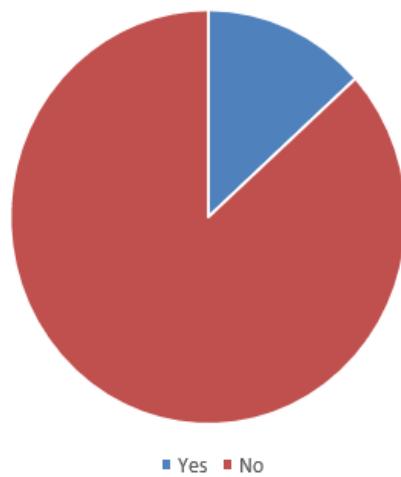


Figure 15.

When talking about the benefit of a digital log for managing decisions and making sure all information required was added, there seemed to be an understanding of the benefit to the digital platform and the support it could give when there are many questions being asked and considerations during a high pressure situation.

Do you think a digital log would help when managing decisions and making sure all information is added.



Figure 16.

The final set of questions looked at what the respondents thought would be beneficial if a digital log book was a reality for WAST and what thinkgs would they like to be considered in the development. Some of the requests would be a must when completing the digital platform such as security and the request for a video recording section would me most benifical when working in a operational role for feeding back information about the scene and the surronding risks or access and egress routes. It could help a tactical in the hight of the incident to make sure no details are missed but the need to be factual and not take personal or emotional detail into account would be difficult.

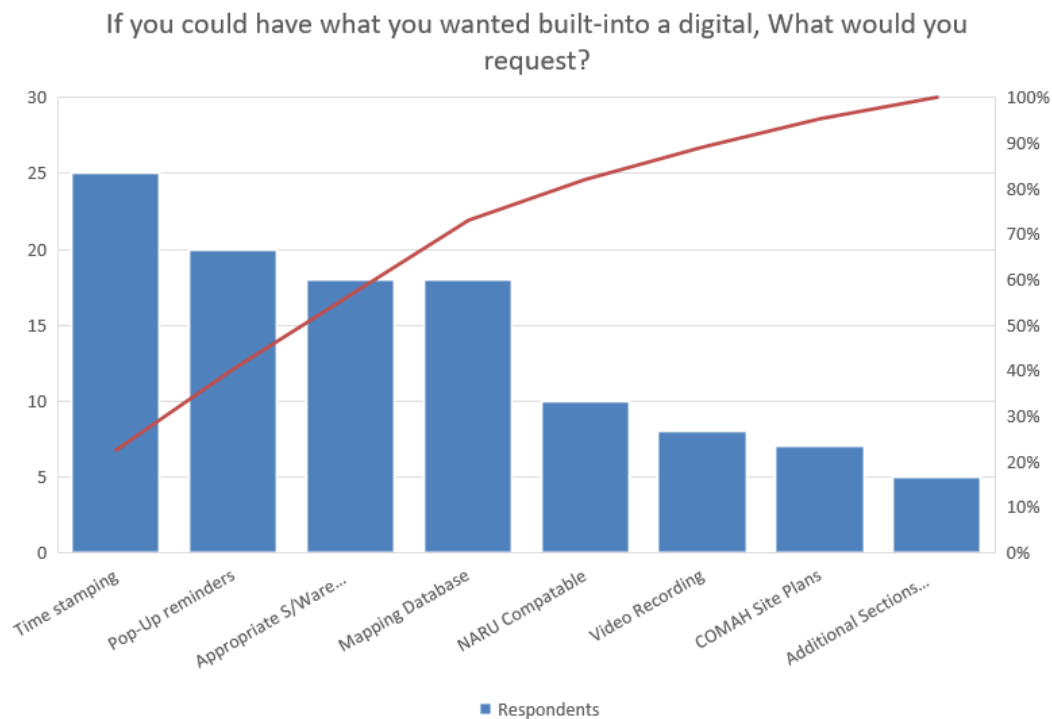


Figure 17.

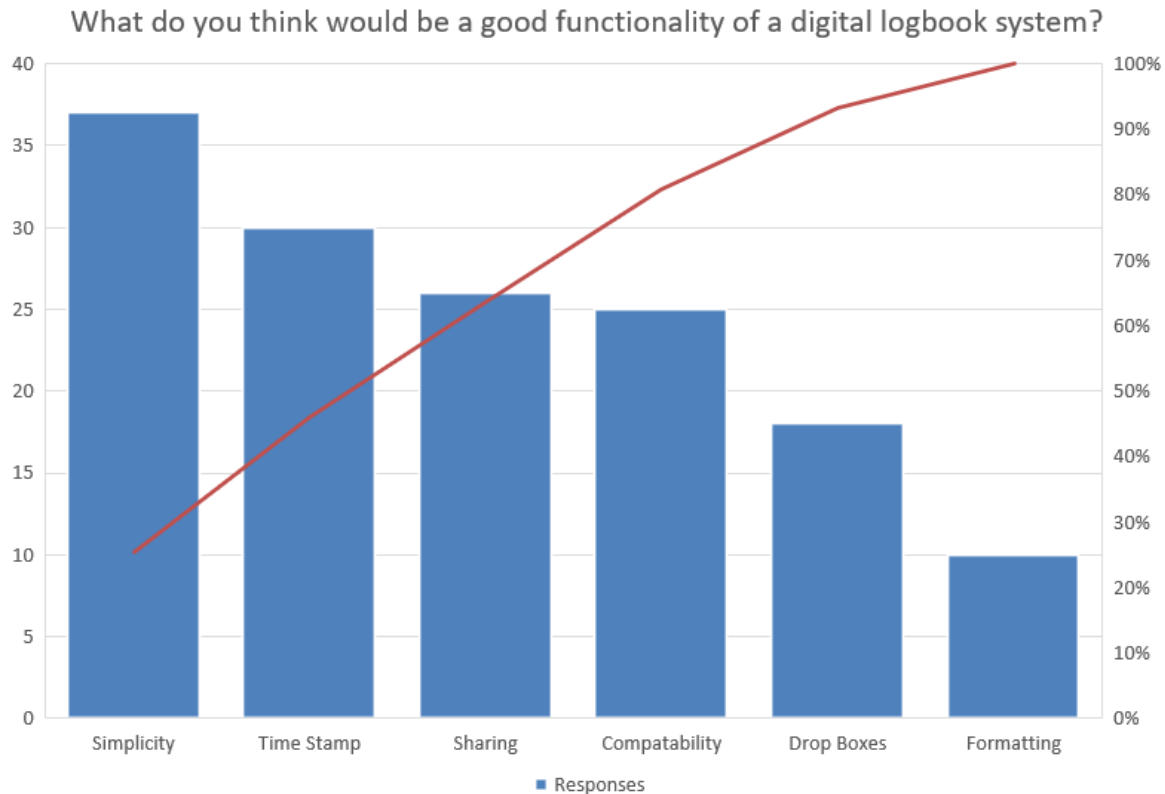


Figure 18.

Simplicity is the most important factor discussed when considering good functionality of the digital log and time stamping is also important as this takes a big responsibility away from the commander with confidence. As discussed earlier the ability to share and having compatibility is important and goes a long way to show WASTs commitment to working with the JESSIP principles.

Having spoken to a number of different representatives from trusts throughout the UK, leads in WAST for digital services and EPRR then having a discussion with a barrister and a solicitor's advocate delivering training in the world of major incident preparedness around the need for a digital log, it was clear that this is an area that needs more development and discussions. Some of the comments made after interview are mentioned below.

4 Discussion

In this section I will look at the benefits and further steps of the implantation of a digital logbook for WAST. I have used the quality function deployment method to help put together some of the considerations given and completed this for each commander level within WAST. By using Quality Function Deployment (QFD), I can look at how to create a better product, satisfy my colleagues and improve delivery of resilience work and the care of patients. Helping to connect with what commanders want with a digital logbook can help provide what we can deliver, leading to successful implementation.

QFD helps me understand needs more clearly. By gathering feedback through the questionnaires and interviews, I have learnt what features matter most. For example, a digital platform that time stamps becomes more efficient for the commanders when logging information as the event or incident develops and is one less thing to be thought of, by using this aspect, we can design and meet expectations, leading to higher satisfaction and support (Burge '07).

QFD promotes teamwork within an organisation. When different departments work together, such as product development, digital, EPRR, research, digital security and procurement, everyone shares the same goal: creating a great product. This collaboration is helping to lead to an innovative idea, and we are looking at solutions that might not have been possible in isolated teams. For instance, we have been offered a trial of

a digital logbook. QFD can help the digital and security team that can work with procurement and EPRR to ensure that the new design appeals to us while also being practical to produce. By implementing QFD I can lead and share a product that will be designed with colleague input, this means I will be more likely to succeed. The software company would need to listen to our feedback during the trial so we can create a program that meets real needs, resulting in more positive feedback and satisfied users. This success can encourage positive word-of-mouth as it would not be a continuous daily used platform (Burge '07).

Below are the QFD method requirements fed back through questionnaires and interviews with area leads for the departments above working for WAST and other trusts EPRR and digital managers around the UK who have been interviewed.

Requirements Strategic						
	Security	◇	◇	⊙	☆	
	Completion	⊙	◇	◇	☆	
	Efficiency	⊙	⊙	☆	☆	
	Simplicity	☆	◇	⊙	☆	
	Internet	⊙	◇	⊙	☆	
	Concentration	☆	◇	⊙	☆	
		Loggist	Paper	Voice Command	Manual	
Symbols	☆ Strong relationship					
	⊙ Medium relationship					
	◇ Weak relationship					

Requirements Tactical						
	Security	◇	◇	⊙	☆	
	Completion	⊙	◇	◇	☆	
	Efficiency	⊙	⊙	☆	☆	
	Simplicity	⊙	◇	☆	☆	
	Internet	⊙	◇	☆	☆	
	Concentration	⊙	◇	☆	☆	
		Loggist	Paper	Voice Command	Manual	
Symbols	☆ Strong relationship					
	⊙ Medium relationship					
	◇ Weak relationship					

Requirements Operational						
	Security	◇	◇	⊙	☆	
	Completion	⊙	◇	◇	☆	
	Efficiency	⊙	⊙	☆	☆	
	Simplicity	⊙	◇	☆	☆	
	Internet	⊙	◇	☆	☆	
	Concentration	⊙	◇	☆	☆	
		Loggist	Paper	Voice Command	Manual	
Symbols	☆ Strong relationship					
	⊙ Medium relationship					
	◇ Weak relationship					

Figure 19.

The requirements for a digital log were kept the same at each level of commander, I then looked at different options for completion, having a loggist, using a paper log, having the option of voice command and then manually completing the log themselves. While completing my research the need for a loggist have been something that has regularly been mentioned as a sought-after requirement. We do not have a high number of loggists, they are normally those in admin and personnel assistant roles within the trust and it has not always been a priority for them to be trained. In some high-pressure situations, a loggist can prove invaluable especially in the tactical and strategic role and can help with better outcomes when completing any style of log. This is highlighted in the results shown below as there is a high or medium relationship between all the requirements for commander levels apart from security as the most secure log of all would be one completed by the commander themselves (WAS '23, WAS '24).

A paper copy has the weakest relationship with all requirements discussed apart from efficiency as there would be no reason to believe the paper copy would not be completed efficiently. relying on paper logs might seem like a straightforward solution. However, several risks associated with using paper logs can have serious consequences during critical times. Understanding these risks is essential for ensuring effective communication and response. One major risk of using paper logs is the potential for loss or damage to the documents, papers can easily be misplaced, damaged, or destroyed. There is the possibility of human error. Writing information down by hand can lead to mistakes, such as misspellings or incorrect details. Individuals under pressure may rush and overlook important facts, the time of an event might accidentally be written down putting the wrong hour, leading to misunderstandings about the sequence of actions taken. Such errors can complicate investigations and responses later.

Additionally, paper logs can slow down communication. During a major incident, time is often of the essence. Relying on written logs may delay the flow of information, as individuals must stop to write down details instead of sharing them immediately. Needs to relay critical information about a developing situation, and pausing to write it down could waste precious time. This delay can impact the overall effectiveness and lack the flexibility of digital alternatives. Paper logs can become outdated and may not reflect the current state of an incident. For instance, if new information arises, individuals may need to create entirely new logs rather than simply updating existing records. This can lead to confusion and inconsistencies in the information available to responders. Recognising these risks is crucial for improving preparedness and ensuring that accurate information is available when it matters most. Exploring alternative methods, such as digital documentation, can lead to more efficient and effective responses in critical situations.

Voice command recorders have become essential tools, during major incidents. These devices not only provide a way to record important information but also help in making decisions quickly and accurately. The benefits of using voice command recorders in critical situations are clear and can make a significant difference especially in the role of the operational commander who would be working in the business of the incident or event and may not have the time to sit and manually update a log, they would also not have the advantage of a loggist as the area would not be considered safe for an untrained administrator.

One major advantage of voice command recorders is their ability to free up hands as individuals often find it challenging to write down vital information while trying to manage the crisis. Operational commanders can use voice command recorders to document details about the scene and this ability to multitask can save lives and ensure that vital information is not lost in the chaos. Additionally, voice command recorders enhance accuracy and reliability. When emotions run high, it can be difficult to remember every detail of an incident. By using these devices, commanders can capture conversations and observations exactly as they happened. Eyewitnesses can record their accounts of an event in real time, providing police and legal teams with accurate testimonies. This evidence can be crucial in investigations (Lombard '23).

Voice command recorders can promote better communication among team members during incidents and in stressful environments, this clear communication is vital. With voice command technology, team members can share updates and instructions without needing to stop and write notes. This immediate exchange of information can improve coordination and lead to quicker responses. A well-coordinated team can make all the difference in saving lives and managing crises effectively.

However, there are several risks associated with its use that deserve careful consideration. One significant risk of using voice command technology is the potential for misunderstandings. Voice recognition software is not always perfect and can misinterpret commands or words. In a noisy environment, the software might struggle to accurately capture voices, leading to incorrect information being recorded. There is a risk of technical failures. Voice command devices rely on batteries and software, which can malfunction. If a device runs out of battery or crashes unexpectedly, valuable information could be lost. Privacy is also a significant issue when using voice command technology in public or sensitive situations. Recording conversations without consent can lead to legal repercussions and ethical dilemmas, it may violate privacy laws and compromise patient confidentiality. This risk can discourage individuals from sharing vital information, ultimately affecting the response to the incident. Over-reliance on voice command technology can also lead to a lack of preparedness. If individuals depend too much on devices to record and communicate information, they may neglect traditional methods of documentation (Chen '22).

Having spoken to commanders and EPRR leads for Scotland and Yorkshire Ambulance trusts it was clear that the CLIO digital system developed by the police during the commonwealth games in 2022 was a trusted, consistent and robust incident management system for contemporaneous recording of decision making and the operational response of the police. This is where the manual responses show that the digital method of recording is rapidly becoming the preferred option when recording a log. This system is costly and now slightly dated in relation to newer systems being considered and trialed in places outside the UK including Abu Dhabi and Las Vegas.

There are several different options being looked at by different trusts around the UK which have all in different ways offered an alternative to paper and a starting point in the development of digitalisation. The most vital element being security and the ability to facilitate an operational debriefing or provide evidence during an inquiry (Burrows-Sutcliffe '20 Betts & Power 25)). Memories can fade and an inquest can take several years to reach a date for hearing so having a secure safe platform is something that I have seen a few of the trust leads interviewed striving to achieve.

Another important factor when considering the legal aspect of completing a log is best practice and all documentation should be Clear, Intelligible and Accurate when discussing this with Graham Watson a barrister involved in log taking including training working with the national ambulance resilience unit and currently formulating a digital log program with Simon Sparrow a resilience lead working with NHS England, he explained digital formats will help you to complete in a more timely manner linking you to the information, your experience of the event and your decision making. Many of the rules around best practice including numbering/time stamping pages and comments, no spaces, no erasing, not tearing out pages, no blank spaces, no overwriting and not writing in the margins are instantly removed and having an option where all deletions are saved makes sure all the documentation is legally correct (Bull '16).

5 Conclusion

The main aim of this project was to discuss the use of the logbook for incident command and how changing the system to a digital platform would benefit WAST and the resilience team when dealing with any type of event work or a major incident. There are several considerations which need to be considered, these include security, ease of use and cost. Storage, internet connection and the ability to charge a WAST issued iPad are also concerns that would need to be looked at and an option for a backup plan would be needed. The need for more trained loggists has also been something that has been highlighted, and this will be taken back to WAST for investigation.

It is a viable option which would now need exploring more within the WAST environment. There has been an option of a free trial from a developer working in NHS England that needs to be explored, this would need investigation from the procurement team, cyber security department and project management development before considering a plan, with timeline with the developer.

The idea of having the ability to share the log outside of the WAST environment with other emergency services and responders is currently something that would need to have more investigation, especially around the legality and GDPR considerations but is definitely something that could be a next step in development.

This project has opened the options and benefits to WAST of using a digital logging system and has given me opportunities to learn how different directorates work and the different concerns that are involved in the setting up of a new system.

It has been a positive experience and has opened further opportunities for myself so I can develop my career in WAST and provide a better way of working when we are at one of our most vulnerable points. My project will help discuss the next steps needed in the development and shows the positivity around the topic with the results of my questionnaires.

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What policy and process changes would support the shift of urgent care services into a community-based model and enhance care closer to home?

Megan Owen

Urgent Care Policy Manager

Welsh Government

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Abstract:

This paper draws on key Welsh policy documents, strategic frameworks and interviews 20 experts working to deliver or enable urgent care closer to home. Evidence is synthesised and explored through a micro, meso and macro lens to identify common themes and gaps. Key findings include issues such as funding models, workforce morale, culture, accessibility and policy coherence, these themes dominated discussions, reflecting their immediacy in daily delivery. However, several lower-frequency sub-themes such as legislation, de-medicalised language, spread/scale/evaluate, and whole-system framing were retained due to their system-level leverage or role for enabling transformation. These findings highlight a dynamic tension between enabling conditions and structural barriers, with both high and low frequency themes necessary to explain the full cycle of reform. Urgent Care needs to be clearly defined as does what the 'shift' means practically in an urgent care context, it is recommended that a policy position statement clarifies the role of urgent care underpinned by a long-term strategy bridging the gap between the policy vision and system delivery.

Keywords: Urgent Care, Urgent Primary Care, Care Closer to Home, shift, community, policy, process, transformation, NHS, Wales

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1 Introduction

1.1 Urgent and emergency care

Urgent and emergency care (UEC) in the United Kingdom (UK) is frequently referred to as a ‘wicked’ problem with no single quick or easy fix (Javidan et al., 2021; Conroy & Turpin, 2016; University of Leicester, n.d.). The wickedness, an inherent symptom of the complex system that is the NHS. In secondary care, frontline pressures such as long community waits for an ambulance response, waits in emergency departments and ambulance patient handover delays are reported on frequently. Radical and definitive change across the whole-system is being called for to improve services and make UEC sustainable over the long term. One widely accepted way of doing this is shifting care out of hospitals and into communities, to deliver care closer to home. Shifting resources to the community and intervening further ‘upstream’ has been a clear and consistent thread through Welsh policy and strategy in modern years. Earlier this year Llais called for urgent action to address UEC failings in Wales, the report suggests patient experiences fall short of the commitments made in A Healthier Wales (AHW) and the Six Goals for UEC (6 goals) Policy Handbook (Aitken, 2025; Dalling, 2025; The NHS Confederation, 2024; Welsh Government, 2018; 2022c).

UEC definitions are included in the 6 goals Policy Handbook, emergency classified as “health and wellbeing issues that may result in significant or permanent harm or death if not dealt with immediately” and urgent care outlined as “health and wellbeing issues that may result in significant or permanent harm if not dealt with within the next 8 hours”. Although there is debate emerging across the UK, positioning urgent care needs as health and wellbeing issues that require a response on the same day, or within 24 hours rather than 8 (The Confederation Hillingdon, 2025; NHS Somerset, 2024). The Primary Care Model for Wales (PCMW) acknowledges the difficulty in defining the concept of urgent care and argues that a clearer understanding and definition is needed. Urgent care may be closely associated with Accident and Emergency (A&E) or ambulance services but it straddles both primary and secondary care, with advice and care for urgent needs being sought and treated across a broad spectrum of services, some in and some out of hospital. To acknowledge this complexity is crucial to realising a shift of services (Primary Care One, n.d.-b).

The desire and dedication to improve services and innovatively treat people with urgent care needs in the most appropriate place is visible throughout organisations. There has recently been notable national progress against ambulance patient handover times, which came down from 19,700 hours in May to 15,300 hours in June (The NHS Confederation, 2025). More local examples include services like Delta wellbeing in Hywel Dda University Health Board (UHB), which supports people to stay at home and reduce admissions via emergency departments (ED) (York & York, 2024). A falls response project in Swansea Bay UHB saw hospital conveyance drop from 60% to 8% and average time on floor reduce by of 130-minute (NHS Performance and Improvement, 2025). Another NHS award winner is Cardiff and Vale UHB multidisciplinary team (MDT) targeting diabetes in the community, it has seen secondary care referrals reduce from 100% to 30% and secondary care waiting times drop from 11 to 6 weeks (NHS Performance and Improvement, 2024). A Velindre project aimed at enhancing person centred care for patients with life-limiting conditions successfully reduced inappropriate hospital admissions by 61% with annual savings of over £100,000 (NHS Performance and Improvement, 2025b). Evidently, community services and initiatives are having impact on how urgent care is being delivered across Wales, however, it is nearly unanimous that the gap between policy and practice remains and needs to be better understood then addressed to ensure system resilience and sustainability (Betteley, 2025; Bevan Commission, 2025; Marsden, 2024).

For the purposes of this paper, a light literature review will explore relevant UK and international examples, but Wales will be used as a microcosm of the whole-system through expert interviews. The author’s position as a policy manager for urgent care in Wales strengthens relevance to research and provides deeper insight into how services are operating nationally and how that does or doesn’t align with policy intent. UEC in Wales exists within the context of seven local health boards (LHBs), NHS Performance and Improvement (NHS P&I), Regional Partnership Boards (RPBs), Velindre University NHS Trust, the Welsh Ambulance Service University NHS Trust (WAST), Public Health Wales NHS Trust (PHW) and other supporting organisations such as NHS JCC (JCC), Health Education Improvement Wales (HEIW) and Digital Health and Care Wales (DHCW).

1.2 Why this moment matters

The Bevan Commission describes Wales as being at a 'turning point', this moment in time matters because the system is already arguably operating in a perpetual cycle, there is a short window to identify root causes and address long term sustainability whilst simultaneously tackling fraught operational pressures in the here and now (2025). Diverse interconnected organisational players with dynamic interactions, have various funding structures and intricate governance webs. Because of this complex nature, it is essential to consider how trends or drivers in the broader environment could impact demand, to build resilience, sustainability and adaptability into systems. The below PESTEL table outlines a snapshot of evolving factors likely to be a driver for or impact on urgent care services in the near or far future.

Table 1. Political; Economical; Social; Technological; Environmental; Legal	
P	Tobacco control, sugar taxes, alcohol pricing, and vaccination mandates are rising in prominence (Public Health Wales, 2024) Government targets on waiting times and ambulance handovers (Welsh Government, 2025d) Health service reforms e.g., RPBs / RIF (Welsh Government, 2022a; 2022b) Political instability or shifting priorities in healthcare funding (O'Dowd, 2025)
E	Cuts to public services increasing unmet needs and reduced service availability (Doetsch et al., 2023; McHardy, 2025) Widening health inequalities due to the cost-of-living crisis (Lloyd-Jones, 2022; Public Health Wales, 2023b) NHS appointment cancellations due to workforce pay disputes (Riva, 2024) Shrinking workforce & sickness absences predicted to cost the Welsh economy £1.4 billion annually (Blake, 2025)
S	Ageing population and increasing comorbidities (Lyons et al., 2018; Older People's Commissioner, 2024) Growing prevalence of obesity and diabetes (Matthews, 2025; Public Health Wales, 2023a; Watkins, 2024) Deterioration of public satisfaction for NHS (NHS England, 2025) Lowest fertility rate on record (Office for National Statistics, 2024) Increase in unpaid carers and reliance on family/community networks (Carers Wales, 2022) Increasing mental health crises, homelessness and substance misuse driving emergency attendances (British Red Cross, 2021; James et al., 2025)
T	Increase in AI-driven triage and decision-support tools (Watson, 2024; Welsh Government, 2025c) Remote solutions to support self-management (Welsh Ambulance Services University NHS Trust, 2025)
E	Climate change associated risks rising (Netherwood, 2021) People living in deprived areas most likely to be harmed by poor air quality (Public Health Wales, 2020)
L	WBFGA legally binds public bodies to making sustainable decisions (Welsh Government, 2024). SSWBA mandates increase in preventative and earlier interventions within the community (Welsh Government, 2022) General Data Protection Regulation controls how information is used (UK Government, 2025)

To demonstrate how the external environment plays a role in the systems success or failure, Figure 1 crudely illustrates the consequences of inaction, exhibiting the need to tackle root causes and upfront pressures simultaneously to avoid entering or re-entering a perpetual cycle.

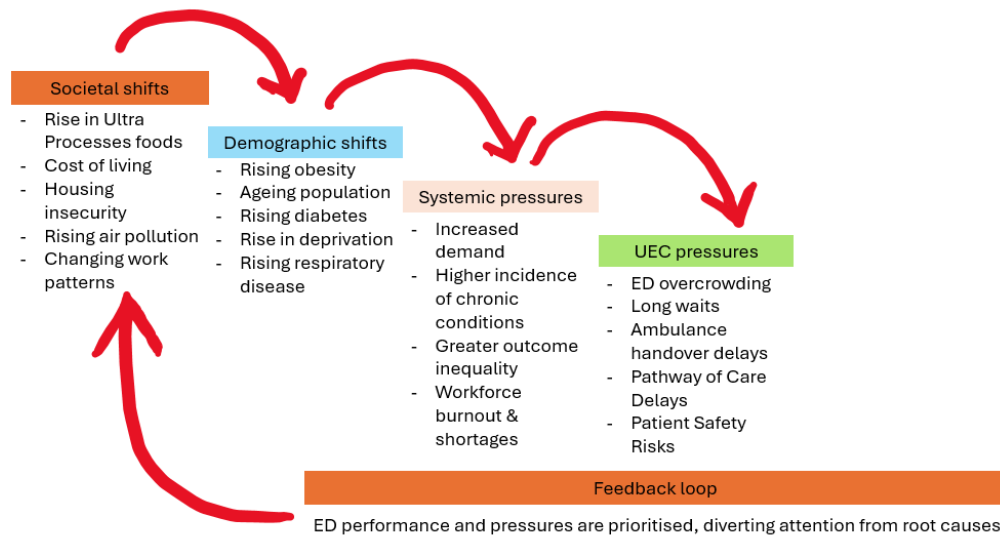


Figure 1: Domino effect diagram to show broader context impact on UEC (consequence of inaction) – (authors own, 2025)

Whilst this paper will specifically explore policy and process changes required to support urgent care at a community level and closer to home, it also needs to reflect root causes and broader context. Urgent care cannot be viewed as a siloed part of the system. Table 2 provides individual detail on independent yet interconnected parts of the system.

Table 2. Definitions

Title (acronym)	Definition (in this context)
Health Education Improvement Wales (HEIW)	Statutory education and strategic workforce body for the NHS in Wales, responsible for commissioning and planning workforce education, training and leadership to align with AHW (Health Education Improvement Wales, n.d.)
Digital Health and Care Wales (DHCW)	A Special Health Authority in Wales that plays a role in building and designing digital services for health and care in Wales (Digital Health and Care Wales, n.d.)
NHS Joint Commissioning Committee (JCC)	A Joint Committee of the seven health boards in Wales, its role is to coordinate commissioning across NHS Wales for a range of services including ambulance services and NHS 111 Wales (NHS Joint Commissioning Committee, 2024)
Regional Project Boards	Statutory regional partnerships whose purpose it is to drive strategic regional delivery of social care services aligned to and collaboratively with health (Social Care Wales, 2025)
Regional Integration Fund	A five-year Welsh Government programme aimed at creating sustainable system change through integration of health and care services (Welsh Government, 2025b)
General Medical Services (GMS)	Core contractual framework for GP services in Wales, covering patient care delivery in primary settings, outlining what all GP practices in Wales must deliver (British Medical Association, 2024)
Local Authorities (LAs) / Welsh Local Government Association (WLGA)	There are 22 local authorities, they provide a range of statutory services to communities, the Welsh Local Government Association supports local government through representing the interests of councils in Wales (Welsh Local Government Association, 2024)

Welsh Ambulance Service University NHS Trust	Provides emergency, urgent and non-emergency patient transport services, care and advice for the population of Wales via 999 and 111 (Welsh Ambulance Services NHS Trust, n.d.)
Single Point of Access (SPoA)	A professional-to-professional service enabling remote clinical assessment, patient navigation and care closer to home (NHS Performance and Improvement, 2025c).
Third Sector	Voluntary and community organisations contributing to health and care services supporting the voluntary sector (Third Sector Support Wales, n.d.)
NHS Performance Improvement (NHS P&I) &	Formerly known as NHS Executive, established in 2023 as a national support function, it brings together pre-existing national teams and aims to drive improvements collaboratively (NHS Performance and Improvement, 2023)
Llais	An independent statutory body designed to enable a patient voice in planning and delivery of health and social care in Wales (Llais, n.d.)
Micro	Immediate operational pressures / frontline delivery / staff and patient experiences
Meso	Intermediate system-level dynamics / organisational and system structures
Macro	Broader political, strategic and societal context
System Dynamics	Digitally aided approach to making sense of and communicating findings within complex systems (System Dynamics Society, n.d.)

2 Policy backdrop

2.1 Welsh policy in relation to urgent care

Table 3 presents relevant policy, legislation and government documents that are having or will have an impact on urgent care services.

Table 3. Policy & Context

Policy / legislation	Year	Relevance
Prudent Healthcare (PHC)	2014	Designed to underpin all health policy in Wales, ensuring care is appropriate, avoids harm and makes best use of resources (Welsh Government, 2019).
Social Services and Well-being (Wales) Act (SSWBA)	2014	A legal framework that brings together social service law through imposing duties on public sectors to promote the well-being of people and carers who need support (Welsh Government, 2014).
Well-being of Future Generations (Wales) Act (WBFGA)	2015	Requires public bodies to work towards long-term well-being goals and sustainable development (Welsh Government, 2024b).
Nurse Staffing Levels (Wales) Act	2016	Ensures nurse staffing levels are safe, effective and provide quality nursing care to patients (Welsh Government, 2023)
A Healthier Wales (AHW)	2018	Reference as the overarching long-term plan for health and social care, focusing on prevention, integration, and person-centred care (Welsh Government, 2018).
Primary Care Model for Wales (PCMW)	2018	WG endorsed the PCMW, in alignment with AHW, which sets out how community care should be delivered now and, in the future (Primary Care One, n.d.).
Value-Based Healthcare (VBHC)	2018	A principle for maximising outcomes and resource use (Welsh Government, 2019).

Six Goals for Urgent and Emergency Care (6 goals)	2021	Six strategic goals for whole-system UEC transformation from prevention to a home first approach (Welsh Government, 2022).
Help Us Help You (HUHY) communications campaign	2021	Aimed at helping the population of care get the right care, in the right place, first time, the HUHY campaign highlights local services and health professionals available for various needs (Welsh Government, 2021; Welsh Government, 2023b).
Health and Care Quality Standards	2023	Welsh policy that sets out standards that the NHS in Wales should use to improve quality and safety of services (Welsh Government, 2023a)
Quality statement for care in emergency departments	2024	Developed in line with AHW commitments to define outcomes and standards, intended to support a reduction in ED presentations and improved timelessness of flow through hospital systems (Welsh Government, 2024a)

2.2 Urgent care fit into NHS transformation

As determined in the introduction, urgent care sits at the junction of wider NHS transformation, rather than a standalone hospital or community function, it is a bridge that crosses primary, secondary and social care. Modern urgent care services, such as urgent primary care centres, NHS 111 and urgent community response teams, provide alternatives to emergency department attendance, helping to reduce avoidable hospital admissions. On the other side of the pathway, rapid response and step-down services, such as Delta Wellbeing in Hywel Dda UHB support early discharge, freeing up acute beds and smoothing patient flow.

3 Literature Review

To understand the factors influencing the success of urgent care services, the evidence has been examined through a micro–meso–macro lens, making it easier to identify both the root causes of current challenges and the opportunities for sustainable and immediate improvement.

The discussion below focuses on the top sixteen quality publications found that outline recommendations for UEC improvements, including policy and process changes that would enable urgent care delivery closer to home, or in the community. The evidence found predominately focusses on current literature and government plans as there is little academic literature in this area. Out of the sixteen pieces of literature, four placed emphases on micro changes, five on meso and on seven macros.

3.1 Micro Tab: Immediate Pressures

Evidence that focused on driving urgent care transformation at on a micro level included defining ‘what good looks like’ for urgent care treatment centres and having core design principles. Concrete and immediate targets for UEC were also set out, Northern Ireland’s perspective as a devolved nation, on navigation and triage supported a unified approach. Priorities around delivery at the frontline included measures such as zero tolerance for 45-minute handovers, seeing 78% or over of attendances in ED within 4 hours were proposed alongside improved discharge and data transparency, combined with enhanced urgent care across virtual wards and urgent treatment centres. Minimum standards were suggested for urgent care response within the community included a clear argument for extended (12 or more) opening hours, with services accepting bookings and walk-ins, alignment with primary care, community diagnostics and robust triage. There was also consensus that there was a need for regional and neighbourhood planning combined with robust primary care integration to enable delivery and to tackle discharge delays. Throughout sources it is acknowledged that the approach to improving access and reducing demand across UEC is constrained by short-term funding and reliance on local capacity and social care, it’s also explicit that governance and context are critical. The recent Ministerial Advisory Group (MAG) reinforces this micro challenge, in its assessment, variation is highlighted across Welsh health boards in UEC metrics, the report points to the need to tackle handover practices and address organisational bottlenecks for improved frontline delivery. The MAG did suggest the 6 Goals comprehensively covers the UEC pathway but argued data showing frontline progress should be made available publicly. Overall, the micro evidence shows a system under immediate pressure, responding with targeted interventions to divert low-acuity demand from EDs and improve urgent care access closer to home, but facing persistent gaps in workforce, funding, data-sharing

and implementation (Benjamin et al., 2022; Department of Health, 2022; NHS England, 2023b; NHS England, 2025; Welsh Government, 2025a).

3.2 Meso Tab: Intermediate/System Pressures

At the meso level, evidence centred on integrated system-wide redesign over site-level interventions to improve UEC services and build out-of-hospital capabilities. Performance recovery was presented as a whole-system task and emphasis was placed on integration with shared plans required between acute, ambulatory services and community infrastructure, such as Integrated Care Boards, to standardise urgent care pathways and deliver national targets (NHS England, 2023a). Literature documenting case studies showed that intermediate care and primary care networks are integral to coordinating capacity to enable a reduction in avoidable admissions. Having a flexible workforce with data-sharing agreements to support joint triage is important but concessions are made that unless government action supports a fully funded workforce plan, ambitions will only go so far. Rapid response and community paramedicine teams, virtual wards and urgent treatment centres are presented as being beneficial when commissioned as a single offer rather than fragmentally, with sources arguing that the “bridge” between hospital and home is having consistent referral criteria, shared metrics and shared local escalation plans (Ruthven, 2022; The NHS Confederation, 2022; The Community Network, 2023; Scottish Government, 2025).

Across these sources, there is a clear argument that meso-level leadership is needed to turn national policies into operational reality through connectedness of services, pooled budgets, cross-sector governance and common outcome frameworks. However, these plans also present persistent barriers such as misaligned incentives between NHS and social care, variation in digital capabilities and a range of maturity levels across providers. The evidence depicts a shift from reactive, siloed responses to integrated system delivery but acknowledges challenges with scaling, variability and sustainability as well as noting that progress is slowed by culture change, resource fragmentation and limitations around commissioning.

3.3 Macro Tab: Broader Pressures and Shifts

Exploring evidence through a macro lens shows how wider policy, workforce and population health context are key to re-shaping urgent care design. An inflection point is described, and it's argued that investment and legislation support could rebalance systems to allow for a more community-based and person-centred approach, with lesser focus on pathways. Entrenched hospital-centric funding arrangements are flagged as something to overcome (Johnston & Macconnachie, 2025; NHS providers, 2025). In the Public Accounts Committees 2023 report on access to UEC, calls are made for improved use of public money and more efficient workforce plans, the report highlights systemic consequences of rising demand, geographical inequity, delayed discharges, financial pressures and the impact of the pandemic. It was also argued that NHS England has not sufficiently been held to account for UEC performance. Sources emphasised that achieving UEC improvements depends on a clear, long term and well understood vision, with stable local government finances, cross-agency data sharing and mature partnerships between NHS, councils, voluntary and third sector organisations at a community level to support. (Baird et al., 2024; Ross et al., 2025). International exemplars, such as Singapore's shift to preventive, primary and community care offers lessons in capitated funding, digital access, and population health approaches. Community hubs and integrated access points are shown to anchor closer-to-home urgent and supportive care, but evidence is heterogeneous and transferability may be limited (Manis et al., 2021; Tan et al., 2021; Thilo, 2024).

A report published in 2023 projecting the impact of long-term conditions and risk factors in Wales, contributes to a forward-looking macro framing and predicts increases in multi-morbidities and therefore the need to reduce health inequalities, retain and attract talent within the NHS workforce and consider how to address long-term conditions. The picture of an ageing population is painted with strong emphasis on the necessity of shifting care out of hospitals and toward community settings. The roles of preventive and population health management strategies, population segmentation and social care are underscored, new technologies, including AI innovation, and structural realignment of governance, funding and accountability are also proposed to sustain capacity (Welsh Government).

Collectively, these macro-focused sources point to a health system at a crossroads: national policy rhetoric strongly supports “care closer to home,” but recurrent short-term funding cycles, workforce gaps, demographic pressures, barriers to data-sharing and fragmented accountability threaten to undermine delivery. The evidence suggests that without sustained cross-sector capital investment, a rebalanced payment system and a stronger social care offer, the ambitions of UEC reform will remain fragile. Overall,

the macro evidence points to the need for strategic vision, funding reform, and robust governance to enable the system-wide shift towards community-based urgent care.

“At a national level, there should be consideration of the contractual and funding levers needed to create the right environment for integration and improving local health outcomes.”

(Ruthven, 2022)

While the literature provides a foundational overview of what is needed to address frontline pressures and barriers to strategic delivery, there is still a question around what exact policy and process changes could be leveraged in the Welsh context to ensure sustainability. This research must focus on actionable solutions for workforce development, digital infrastructure, and cross-sector collaboration, informed by real-world experiences and local system learning.

To build on the insights from the literature review and the authors expert knowledge, the following conceptual framework below has been created. This framework will be shared with experts across the urgent care landscape for feedback, grounding it in both evidence and lived experience from the Welsh context.

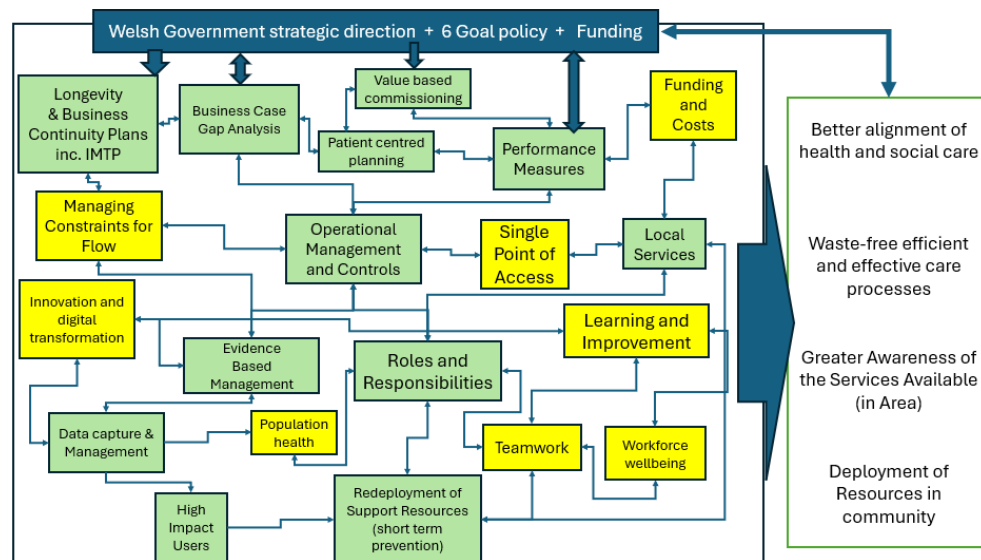


Figure 2: MO original conceptual framework (authors own, 2025)

4 Methodology

This study adopts a realist, inductive approach, positioning urgent care within the broader health and social care system in Wales. Twenty semi-structured interviews were conducted with senior stakeholders across policy, practice, and third sector organisations. The aim was to capture a range of perspectives on the current challenges, barriers, and opportunities in shifting urgent care closer to home. The methodology is summarised in Table 4, covering the philosophical stance, data collection, ethical procedures, analytical approach, and the strengths and limitations of this study.

Table 4. Methodology

Philosophy	Realist, inductive approach recognising that urgent care operates within complex, multi-layered systems. A case study of Wales provides contextual depth while acknowledging transferability limits.
Method	Semi-structured expert interviews (20) with experts across health, social care, policy, third sector, economists, operational leads, clinical leads, commissioners, and other system leaders. Sampling based on relevance to urgent/emergency care reform; inclusion/exclusion criteria (detailed in table 5 below applied.)

	Conceptual framework based on authors' experience and review of literature will be shown to participants at the end of interviews, feedback will be incorporated into an updated framework and shown in discussions.
Ethics	Participants provided informed consent, with the right to withdraw at any point. Anonymity and confidentiality maintained. Recording files securely stored and deleted post-transcription. Data handled in compliance with Swansea university ethics approval.
Analysis plan	Thematic analysis using iterative coding framework. Pattern matching across micro, meso, and macro levels. Attention to convergence/divergence of perspectives, outliers, and links to existing policy/literature.
Strengths	Access to senior system leaders and cross-sector perspectives. Rich qualitative data providing insight into current policy-practice gaps. Whole-system framing enables identification of both immediate and long-term levers.
Limitations	Findings are context-specific to Wales and may not be fully generalisable. Potential bias due to purposive sampling and interviewee positionality. Time/resource constraints limited triangulation with quantitative data.

Table 5. Inclusion / Exclusion

Criteria	Inclusion	Exclusion
Role	Senior leaders, policymakers, clinical directors, operational managers, third sector leaders directly influencing or delivering urgent/emergency care services in Wales.	Frontline clinical staff without system or policy responsibilities; individuals outside the urgent/emergency care pathway.
Sector	Health (economist, primary, secondary, ambulance, mental health), social care, policy/government, third sector.	Private healthcare providers not commissioned by NHS Wales; unrelated sectors (e.g. education, housing without health/social care remit).
Geography	Based in Wales, with direct knowledge of Welsh UEC context.	Non-Wales based experts without involvement in Welsh health and social care.
Experience	Minimum 3 years' experience in relevant field; demonstrated involvement in service design, policy, or strategic planning.	Limited or no experience in urgent or emergency care policy, planning, or delivery.
Relevance to study	Contribution to understanding of policy and process change required to shift urgent care into the community.	Views not related to urgent or emergency care delivery, integration, or policy context.

Table 6. Interview Participants

Participant number	Role
P1	National Clinical Programme Lead for Six Goals, NHS Performance & Improvement
P2	Deputy Chief Social Care Officer for Wales, Welsh Government
P3	National Director for Primary Care, NHS Performance & Improvement
P4	Senior Medical Officer for Primary Care and Mental Health, Welsh Government
P5	Director of Commissioning for Ambulance Services and NHS 111, NHS JCC
P6	Royal College for Emergency Medicine Vice President
P7	Professional Advisor & Policy Integrator, Welsh Government
P8	Strategic Lead for 24/7 Urgent Primary Care, ABUHB
P9	Chief Executive of Age Connects Morgannwg and independent member of CTMUHB

P10	Directorate manager for Urgent Primary Care, CTMUHB
P11	Assistant Director for Ambulance Care, Welsh Ambulance Service University NHS Trust
P12	Consultant Paramedic for Urgent Care, BCUHB
P13	Associated Medical Director for Unscheduled Care / Clinical Lead for Acute Medicine, HDUHB
P14	Head of Health Economics, Policy Modelling, Analytics, Welsh Government
P15	Head of Urgent Care, Welsh Government
P16	Clinical director for Urgent Primary Care, SBUHB
P17	Urgent and Emergency Care Clinical Transformation Lead, PtHB
P18	Coordinating Lead for Primary Care Model for Wales, Welsh Government
P19	Director of Primary Care, Mental Health and Early Years, Welsh Government
P20	Head of Emergency Care Policy, Welsh Government

5 Findings

This section presents the results of the 20 expert interviews. Perspectives were explored and findings have been analysed thematically to identify the policy and process changes needed for a sustainable shift of urgent care services into the community. A summarised view is provided where specific perceptions around the shift, success measures, potential impact on secondary care and best practice examples were given. Nine overarching themes were identified, each containing multiple sub-themes. These themes represent the recurrent issues, tensions and opportunities raised across the data. Themes and sub-themes are listed in table 7 below. Raw data evidencing these themes can be found in Appendix A.

5.1 Themes identified

Table 7. Themes and Sub-themes.

Themes	Sub-themes	Number of mentions
Theme 1: Funding and Resources	Pooled funding	5
	Has funding shifted?	6
	Double running costs	4
	Value-based commissioning	3
	Annual funding cycles	4
	Broader economy	1
	Physical space & equipment	2
Theme 2: Policy Coherence and Service Specifications	Policy integration and coherence	8
	Policy commitment	10
	Policy intent	15
	Policy & practice gap	6
	Service specification	9
	Legislation	1
Theme 3: Language and Definitions	Aim of the 'shift'	4
	Urgent care	7
	De-medicalised language	3
Theme 4: Public Expectations and Communication	What matters to the public?	3

	Societal shifts	5
	Education	6
	Personal responsibility	2
	Behaviour change	6
Theme 5: Workforce	Morale	7
	Culture	6
	Change management	10
	Job satisfaction	11
	Career pathways	9
Theme 6: Patient Experience	Accessibility	9
	Convenience	9
	Experience & outcomes	12
Theme 7: Social Determinants of Health & Holistic Care	Whole-system	8
	Preventative & proactive care	2
	Place-based care	4
	Population health management	6
Theme 8: Governance & Contracts	GMS contract	2
	Architecture	6
	Red tape	4
	Fragmentation	2
	Structures	4
Theme 9: Measures & Accountability	Spread, scale & evaluate	4
	Measures & performance management	11
	Data & digital	9

Themes were identified post interviews determined by the number of mentions and potential magnitude of impact. Some factors, despite being an outlier, were thought to relevant given their potential system wide consequence, legislation for example. Chart 1 shows the total mention of sub-themes across interviews, including where participants repeatedly discussed a theme whereas Chart 2 shows where participants heavily referenced particular sub-themes and where they are lesser mentioned.

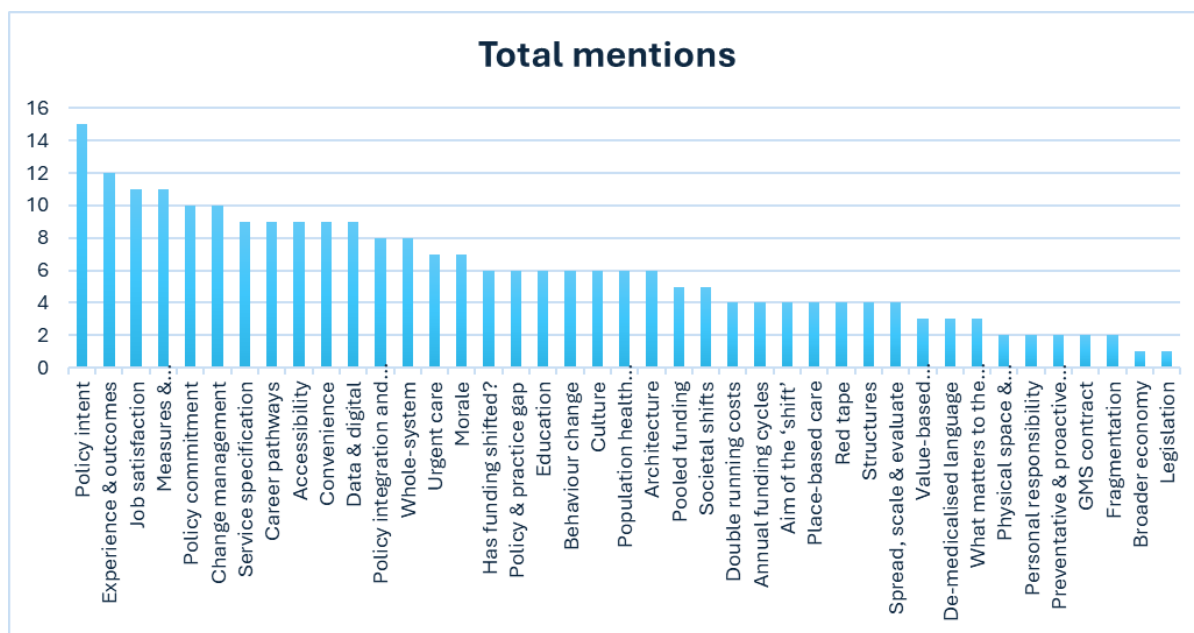


Chart 1: total mentions of sub-themes

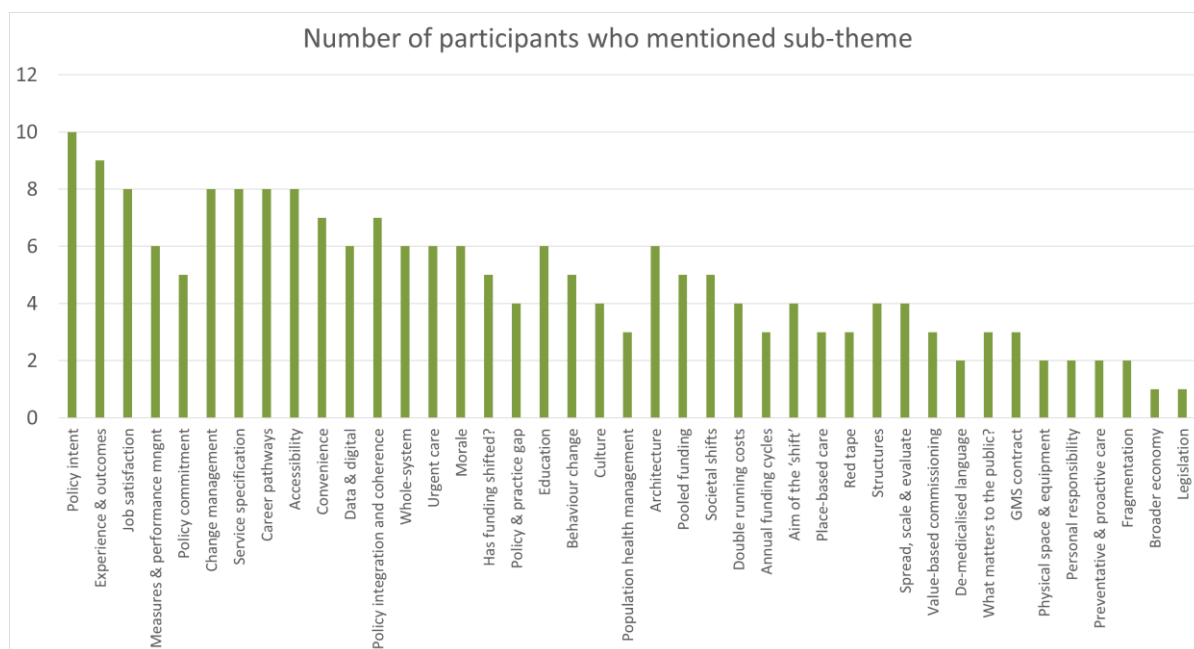


Chart 2: number of participants that mentioned sub-theme

5.1.1 Theme heat map

Figure 3 uses colours to visually indicate the most frequently mentioned themes and sub-themes.

Theme	Sub-themes	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	P11	P12	P13	P14	P15	P16	P17	P18	P19	P20
Theme 1: Funding and Resources	Pooled funding		1									1			1	1					1
	Has funding shifted?	1													1	1	1				2
	Double running costs					1					1							1	1		
	Value-based commissioning												1	1							
	Annual funding cycles									2				1					1		
	Broader economy														1						
Theme 2: Policy Coherence and Service Specifications	Physical space & equipment										1						1				
	Policy integration and coherence	1	1	1	1							1						1	1		1
	Policy commitment		1			2				2											
	Policy intent	1		1	1	2		2		1				3		1				2	1
	Policy & practice gap				2		2	1					1								
	Service specification					1	1			1		2	1		1		1		1		
Theme 3: Language and Definitions	Legislation											1									
	Aim of the 'shift'		1			1	1									1					
	Urgent care								1			1		1				1	1	2	
Theme 4: Public Expectations and Communication	De-medicalised language		1					2													
	What matters to the public?					1		1					1								
	Societal shifts	1		1			1		1						1						1
	Education	1					1		1				1					1			
Theme 5: Workforce	Personal responsibility					1												1			
	Behaviour change	2	1	1			1									1					
	Morale						1							2			1	1	1		1
	Culture							1						2				2	1		
	Change management		2		1		1			2					1						
Theme 6: Patient Experience	Job satisfaction		1	1			1		1	1		3				1	2		1		
	Career pathways	1		1		1					1		1		1	2					1
	Accessibility				1		1		1	1		2	1		1					1	
Theme 7: Social Determinants of Health & Holistic Care	Convenience			1	1	1				3					1			1		1	
	Experience & outcomes	1				1	1				1		2		3	1	1				1
	Whole-system			1		2				1			1	2	1						
	Preventative & proactive care	1																1			
Theme 8: Governance & Contracts	Place-based care							1		2				1							
	Population health management							4	1		1										
	GMS contract				2											1					
	Architecture			1			1							1	1				1		1
	Red tape									1					2		1				
Theme 9: Measures & Accountability	Fragmentation								1		1										
	Structures							1									1	1		1	
	Spread, scale & evaluate	1											1							1	1
	Measures & performance mgmt			3	4	1	1							1							1
	Data & digital										2	1			3		1		1		1

Figure 3: Heat map of themes and sub-themes (authors own, 2025)

5.2 Summary of perceptions

5.2.1 The 'shift'

Participants expressed mixed views on the term “shift”. Some saw it as a move toward community-based care, while others described it as a buzzword lacking clarity, with concerns it implied workload transfer to primary care rather than genuine redesign. There was broad agreement on the need for concrete definitions and parameters to clarify what is being shifted, why, and with what benefit for patients and staff. Most participants described the shift as enabling people who do not require hospital-level intervention to be cared for at home or in the community, avoiding unnecessary ambulance conveyance or ED attendance. Urgent care was often defined as care that needed a response within 8–24 hours, ideally never requiring a general hospital visit, though some stressed that urgent care needs will always exist within secondary care demand.

5.2.2 How to measure success

Participants were asked to define what a successful shift would look like and how it might impact on patient experience. Responses varied from a reduction in ED attendances to seeing a visible increase in resources in the community, or that success initially would simply be having a clear definition of urgent care. The most frequently suggested measure to determine success was “Healthy days at home”, mentioned by over 80% of participants, highlighting its potential importance as a system-wide indicator of wellbeing, independence, and effective community infrastructure. Reduction in ED attendances, patient satisfaction, and staff morale were also commonly cited (mentioned by 60–70%), reflecting priorities around demand management, experience, and workforce sustainability. Measures such as wait times, treatment times, and economic impact appeared in around 40–50% of responses, indicating a strong interest in operational efficiency. Less frequently mentioned but still valuable were indicators like percentage of care home cases turned around in 12 hours, preferred place of death, and transfer of budgets, each referenced by approximately 20–30% of participants. Outliers included the ability to map out full patient journeys, public behaviour, and ambulatory

clinic location, which were noted by fewer than 20% but offer important insights into system design and access.

5.2.3 Impact on secondary care

When asked if the shift would reduce pressure on secondary care, respondents answered overwhelmingly with yes, especially when combined with stronger prevention, improved referral routes (so that people don't default to EDs) and more holistic, person-centred care that is seamlessly connected to communities. There was a level of debate around specific conditions needed for impact, it was argued that potential benefits are dependent on being clear about what is being shifted and to what scale, whether funding and resource would follow the activity and a willingness to make and commit to difficult reallocation decisions. Several noted that it is "not an exact science" and given demand is rising across the system, warned about overselling immediate relief. A small number of participants cautioned that secondary care will always have "churn" and we must have realistic expectations but ultimately, participants agreed that demand should be more reasonable if the shift is well designed and managed.

5.2.4 Best practice examples

Table 8. International and Welsh best practice examples

Examples given	Number of mentions
Scheduling care in Denmark	6
Delta Wellbeing, Hywel Dda	5
Single Point of Access in Wales	4
Early years, prevention and AI in Canada	3
Canterbury urgent care model in New Zealand	2
Urgent Treatment Centres, England	2
Cwmataw Cluster Mental Health and Emotional Wellbeing (MH&WB) Model	2
MDT model in Dundee, Scotland	1
LUCI technology WAST to avoid conveyance to hospital	1
WAST rotational model is one of the best in UK	1
NHS England social charter	1
Proactive care in Singapore	1
Wellness Improvement Service (WISE) in CTMUHB	1
Colchester, Yeovil, South-west England	1
Borth Integrated Health and Care	1
Same Day Emergency Care Centre, Cardigan, HDUHB	1
One Devon Integrated Care	1
Nuka System of Care, Alaska, USA	1
Bridgend community hub, CTMUHB	1



Chart 3: Examples experts gave of good practice

5.2.5 Suggested stakeholders

Table 9. Suggested Stakeholders

Stakeholder / Group	Number of Mentions
Health Boards	12
Welsh Government (WG)	10
Local Authorities	8
Primary Care (inc. GPs, GMS)	8
Social Care	8
Third Sector	7
Patients / Public / Population	7
NHS Staff / Workforce	7
Policy Makers / Policy	6
Cabinet Secretary / Politicians	5
Programme / National Programmes	4
Directors (Social Care, Community Health, etc.)	4
Education / Schools / Children	4
Llais / Patient Representatives	3

Independent Contractor Reps	3
Transport	3
Executive Space / System Leaders	3
Royal Colleges / Trade Unions	2
Private Sector	2
Older People's Commissioner	2
Children's Commissioner	2
Data Professionals	2
Health Economists	2
WAST (Welsh Ambulance Service Trust)	2
Community Services / Clusters	2
Housing	2
HEIW	2
PHW	2
Media	1
Charity / NGO	1
Care Homes	1

5.3 Themes

The following funding summaries are supported by direct participant quotes, which are provided in Appendix A.

5.3.1 Funding and resources

Participants consistently raised funding as a fundamental barrier to shifting urgent care into the community. Pooled budgets were seen as a potential enabler but were described as underutilised or ineffective, with doubts about whether or not they reduce siloed behaviours. Views differed on whether funding has shifted: some argued resources have moved into community settings but without visible benefit, while others said funding has not followed policy intent at all. Several highlighted the need to “double run” new services alongside existing hospital provision. Annual cycles were widely criticised for forcing short-term fixes, while political short-termism was also viewed as limiting the ability to prioritise strategically. Value-based commissioning approaches were suggested as a way to direct resources towards what works and decommission services where there is duplication. A small number noted broader fiscal pressures and compliance demands restricting flexibility, while others stressed the need for physical enablers such as diagnostics, space, and IT to be present in community settings.

5.3.2 Policy coherence and specification

Participants broadly recognised the presence of strategic intent and policy ambition but identified inconsistency, siloed working, and weak execution. Several stressed the need for clearer integration across health, social care and local authorities, noting misaligned priorities between Welsh Government, health boards, and operational delivery. Calls for coherence and consistent national messaging were frequent. Political commitment was seen as fragile, with repeated references to short-term priorities, such as waiting times, diverting attention from prevention and community care. Long term, cross-party consensus and government backing for bold health board decisions were described as essential for sustainability. Many described the shift as happening in pockets, at varying pace across Wales. There was strong support for national service specifications and guiding principles, particularly 24/7 access, equitable provision and a

unified access point, but with flexibility for local population needs. An outlier was the potential use of legislative drivers to underpin and support delivery.

5.3.3 Language and definitions

A lack of shared language and definitions were frequently mentioned as a barrier to progress. Participants called for clarity on what the shift means in practice and how it should be measured. Agreement was strong that “urgent care” itself is poorly defined, with different interpretations across health, social care, and local authorities. Several emphasised the importance of consistent definitions to support evaluation, data standards, and communication with patients. Some cautioned that current language risks reinforcing a risk averse medical model that keeps patients in hospitals. A small number raised the need to de-medicalise terms and frame care around people rather than patients, aligning with population health and person-centred approaches.

5.3.4 Public expectations and communication

Understanding public expectations were seen as central to designing successful urgent care reform. Participants stressed the need for clear and potentially difficult conversations with citizens about what services can realistically be delivered in the confines of finite resources. Participants also emphasised the importance of clinicians having the “what matters to you” conversation with patients as a guiding principle. Societal shifts were repeatedly noted, including rising consumerism, the “Amazon generation,” and changes in family and community structures, all of which increase demand for flexible accessibility. Education and re-education were identified as critical, both in schools and through wider public messaging, to help people understand and navigate services appropriately. Personal responsibility for health was raised by some, though others highlighted challenges in changing entrenched behaviours. Behavioural change was widely discussed, with participants stressing the need to move away from defaulting to hospital care, supported by stronger communication, accessible alternatives, and public trust in community services.

5.3.5 Workforce

Workforce issues were among the most widely raised concerns. Participants, in particular those with clinical or operational perspectives, described burnout, low morale, and “moral injury” from operating in an overstretched system. Several emphasised the cultural silos between primary, secondary, and social care, noting potential lack of trust and misalignment in leadership. Change management was described as slow and difficult, with staff resistance common, but training, consistent service offers, and visible leadership seen as solutions. Many stressed the need to “sell” community-based careers and make them attractive, with rotational models across settings described as a promising approach. Job satisfaction was linked to collaboration, continuity, and empowerment, with participants observing that integrated community teams tend to be motivated and innovative. Career pathways were highlighted as an opportunity to build a sustainable workforce, but acknowledged this would require investment in training, advanced roles, and retention strategies.

5.3.6 Patient Experience

Accessibility and convenience were recurring priorities. Transport and geography were highlighted as barriers, particularly for older people, those with frailty, or people living in rural areas. Participants argued services must adapt to lifestyles, with easier navigation, digital access, and a simplified single point of entry (such as 111). Convenience was linked to continuity, responsiveness, and timely care, with extended hours and co-located services seen as ways to reduce repeat visits. Experiences and outcomes were generally expected to improve if the shift is well implemented, particularly for those with multi-morbidities who currently face fragmented, hospital-centred care. One participant captured the collective view of success as responsive, consistent care where patients know what is happening at all times and feel supported every step of the way. Overall, the patient voice was described as central to design, with positive experiences expected to build confidence, trust and momentum in shaping the future of urgent care access.

5.3.7 Social determinants and holistic care

Participants stressed that urgent care demand is often driven or caused by social and environmental factors rather than medical need. Deprivation, poor housing, loneliness, substance misuse, adverse childhood experiences and wider determinants, were repeatedly linked to increased presentations. Allied health professionals and the third sector were described as integral to a whole-system response, but their

contribution was seen as undervalued at present. Preventative and proactive approaches were strongly advocated for, particularly investment in early years, education, and nutrition to reduce long-term conditions. Several emphasised place-based approaches, building on existing community assets and informal networks to reduce reliance on statutory services. Population health management was described in detail, with calls for segmentation and stratification to manage both high-risk groups and those with rising risk. Illustrative examples were used, such as how minor unmet needs can escalate into acute admissions, highlighting how unaddressed needs can lead to disproportionate demand.

5.3.8 Governance and contracts

Governance and contractual frameworks were frequently described as misaligned with the ambition to shift urgent care closer to home. GMS contracts were criticised as a blocker, with one questioning whether GP services should remain under independent contractual models, another suggested health boards focus on what they can directly control, leaving contracted services less aligned with strategic priorities. Existing structures such as clusters, RPBs, and SPoAs were recognised but seen as inconsistently implemented and varying in maturity. Participants strongly emphasised the need to simplify access and reduce duplication, with SPoAs often cited as an effective model if delivered consistently. Red tape was repeatedly described as frustrating and disempowering for innovators, leaving promising ideas unimplemented. Fragmentation was reported as leading to duplication and repeated patient handoffs. Some raised concerns that high-level Welsh Government and health board organisational structures do not reflect the integrated intent of national policies, highlighting misalignment between executive portfolios and whole-system ambitions.

5.3.9 Measures and accountability

Measures were widely described as being misaligned with system goals. Participants criticised restrictive targets for driving gaming and short-term behaviours, with repeated calls to shift towards outcomes-based and whole-system measures. There was strong consensus that what is measured drives activity, and current measures overtly prioritise secondary care. Wales was described as “good at starting initiatives but poor at reviewing or scaling,” with participants calling for stronger evaluation and modelling of urgent care demand. Data and digital systems were highlighted as major barriers, with outdated “archaic” platforms, poor interoperability, and lack of real-time access preventing capacity planning and patient flow analysis. Participants repeatedly called for consistent patient journey tracking and dynamic data dashboards. Several participants also stressed the need for accountability to be applied across the whole system, for example, GPs, community services, and social care sharing responsibility for ambulance handover delays - to encourage collaboration and reduce siloed behaviours.

6 Discussion

6.1 Interpretation

A common thread throughout interviews was that the policy that exists in Wales has been “unwavering” in recent years and aligns with the aspiration to deliver urgent care closer to home. There were varying views about whether that shift has happened, with the overwhelming majority suggesting “it has in pockets” but debate emerged around whether or not funding had followed the strategic direction and if policies across the health and social care sphere were integrated enough to enable the vision set out in AHW, with progress being held back by macro level constraints.

Findings have been plotted onto a micro-meso-macro map, illustrating cascading impacts. Many “solutions” people raised sit at macro, but the pain points show up at micro. Figure 4 represents the system and environment we have today as described by participants. Without harnessing the enablers and tackling the barriers identified throughout the literature and in interviews, pressures cascade across layers, resulting in the perpetual cycle that exists today.

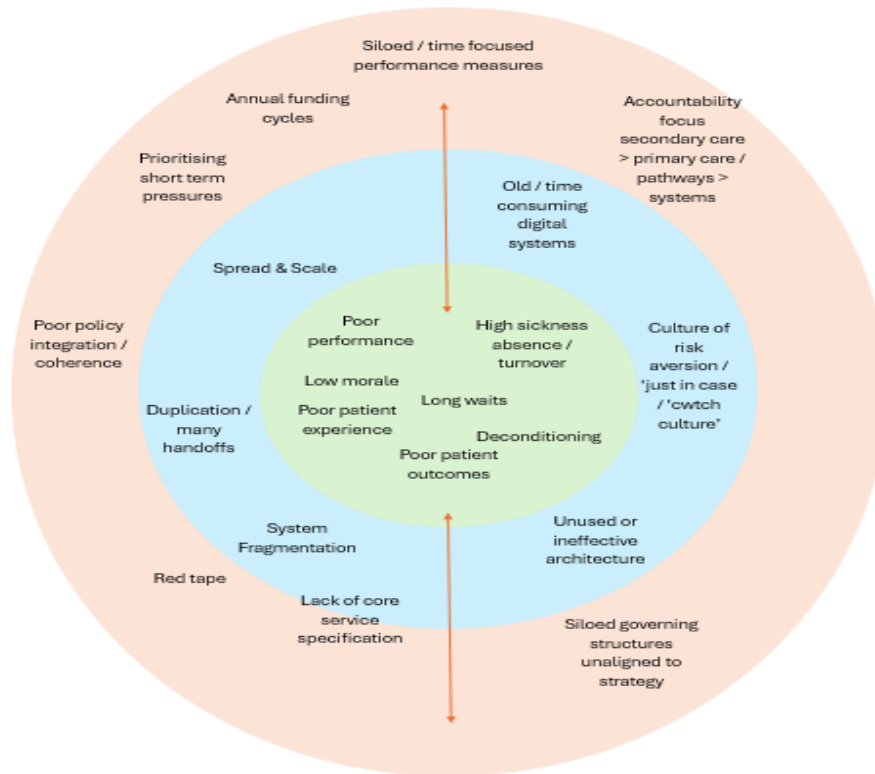


Figure 4: Micro-meso-macro perpetual cycle (authors own, 2025)

Figure 5 represents the system and environment possible if enabling conditions were present and barriers were addressed. There is a positive ripple effect both inward and outward, creating a cycle of success.

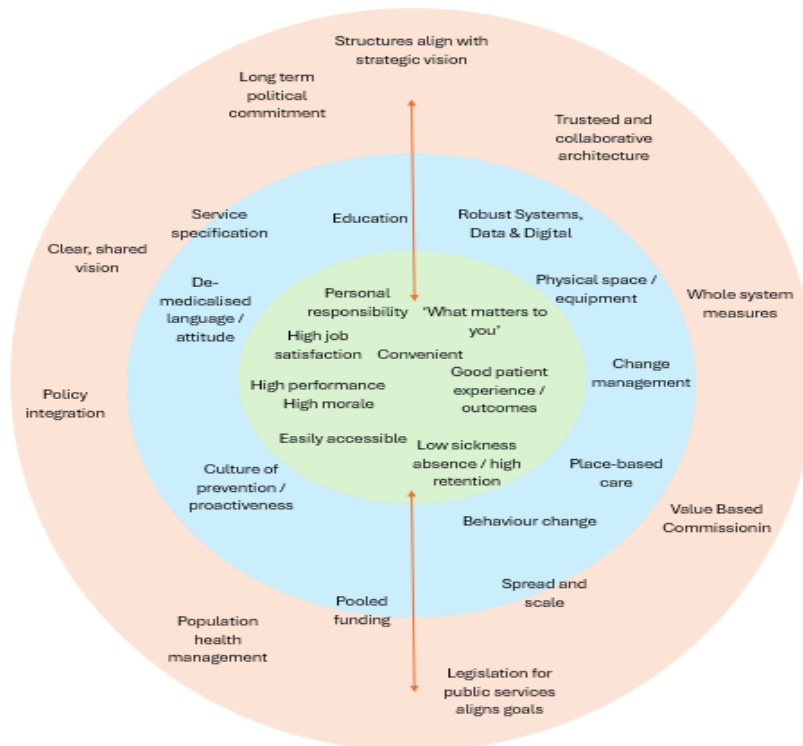


Figure 5: Micro-meso-macro cycle of success (authors own, 2025)

Subthemes will now be clustered into domains, reviewing how macro enablers cascade into meso and micro barriers, and triangulating this with literature to allow for clear policy and process gaps to emerge.

6.2 Clustered Theme Discussion

6.2.1 System enablers (Funding, Policy, Digital, Legislation & Governance)

Systems enablers define the structural scaffolding which urgent care operate within and dominated discussions. Whilst some argued funding has moved into community services without yet relieving hospital pressure, others said funding has not followed policy. Evidence suggested there is a definitive gap between primary and secondary care expenditure that has been growing rather than shrinking over recent decades, despite the overall budget for health and care in Wales increasing year on year to over £12 billion in 2025-26, this chart demonstrates where expenditure dominates.

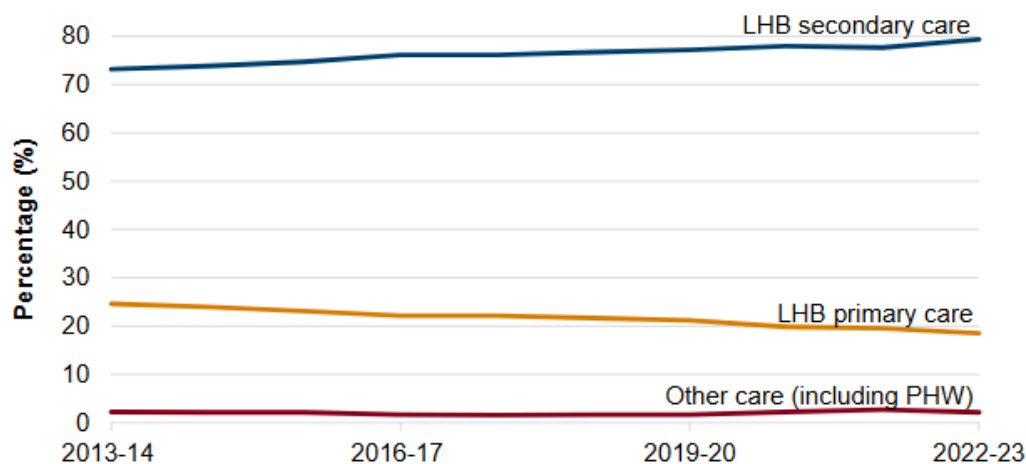


Figure 6: NHS expenditure by commissioner, 2013-14 to 2022-23 (Welsh Government, 2024b)

Proportionately, there is some evidence of a gradual shift since 2020, primary care's share has crept up from 24.4% to 24.9%. But the change is marginal. Secondary care still takes 70% of all Welsh NHS spend. This suggests that while Welsh policy ambitions emphasise care closer to home, the financial rebalancing to align with that to date is minimal, although it is unclear if some urgent care community services could be categorised as secondary care, this supports calls throughout interviews for a clear and well understood definition and a rethink about how funding needs to follow policy (StatsWales, n.d.).

It was acknowledged that using a reduction in ED attendances, and potentially therefore secondary care spend as a measure of the shift, might be flawed. It reoccurred in the literature and in interviews that it is unrealistic to expect a sudden release of pressure in hospitals, even if there were more easily accessible community services in operation. This suggests there needs to be a level of managing expectations around the time it will take to see impact at a secondary care level. This is potentially in-part due to the current inefficiencies in the system at a micro level, such as staff workload, lengthy pathway of care delays or leadership, which in turn is influenced by larger and more system-wide issues. It could also be attributed to the reported risk averse and medicalised “cwch culture”, which sees patients admitted to hospital for long periods and subsequently deconditioning.

Persistent misalignment between national policy intent and operational delivery was described “it feels like the policy is there and then we drop off a cliff” P3. Despite consistent policy ambition for care to be delivered closer to home across AHW, 6 Goals and the PCMW, implementation remains fragmented and often short-lived supporting the literature suggesting an evident gap between policy and practice.

Annual funding cycles and reliance on short-term pilots being identified as core barriers suggests health boards must simultaneously meet immediate demand and address long term pressures all while trying to innovate for strategic redesign. A few experts acknowledged that double running would be costly but argued it is unavoidable. The Berkana Two Loops Model, raised during an interview, can support in understanding and managing the transition from one system to a new one, it aims to help people involved in systems

change to comprehend how they slot into the shift, whether what they are doing supports the new or old system or connects both efforts.

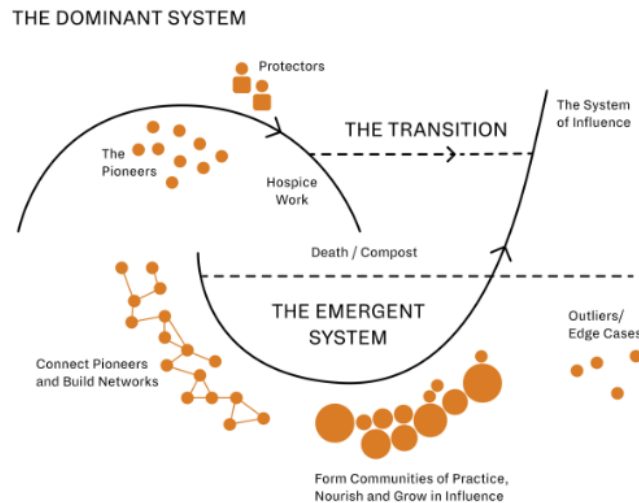


Figure 7: The Dominant System (Gibelin, 2025)

For double running to truly be worthwhile, inefficiencies in the system and duplication need to be identified and decommissioned. Both perspectives in the debate over whether funding has shifted to the community aligned on the same point, without outcome or experience measures, there is risk of either invisibility or inefficiency. Value-based commissioning was consistently highlighted as the way forward, invest where returns are greatest, reduce duplication and fund prevention, even when benefits accrue elsewhere in the system.

The GMS contract emerged as a potential barrier, with it being noted that “you might need to talk to 60 practices across your health board to commission one service but only one department in your hospital, you’re going to pick the easier route” P4, supporting calls throughout to design systems that enables policy intentions through making the right choices the easiest ones. An outlier across interviewed included a call to bring GPs back under health board ownership, with another agreeing that there should at least be a mandated cluster-level commissioning, this reflects a desire to re-balance governance to enable system stewardship. Architecture mattered too, SPoAs, RPBs, and cluster models were described as partially successful and having potential to be transformative but at present they are inconsistently implemented. The absence of robust integration undermines coherence, and red tape was repeatedly cited as a demoralising barrier, “our red tape is so restrictive. And actually, it leaves innovators and entrepreneurs, passionate leaders, really frustrated to the point where you think, right? You know, I’ve given my all. I’ve given more than my all. I’ve given my soul actually. And I cannot physically make this a reality. So, things stay as a vision, or they stay as an infographic.” One participant argued that structures at WG level need to mirror the strategic direction of AHW to allow improved integration of health and social care with population health management to trickle down from the top.

Short termism and political backing were described as an issue throughout interviews; micro and frontline pressures consistently receive the majority of attention in media and therefore scrutiny follows. Participants emphasised that when HBs do take action to align delivery with strategy, WG should “stick by health boards when they make bold decisions,” particularly if that includes service change that may result in population backlash. “Successive governments that stick to policy, don’t nuance it, don’t change language, just reinforce policy” P18 supports this point. Other participant views aligned, with several suggesting a cross-party consensus was needed to prevent pushing for immediate improvements at the end of a political term, this presents an opportunity to use legislative levers, such as the WBGFA and SSBA, more to enable a-political, cross organisational alignment and long-term strategic visions. Figure 8 aims to depict the cascading effect short-termism can have on macro-meso-micro levels of delivery.

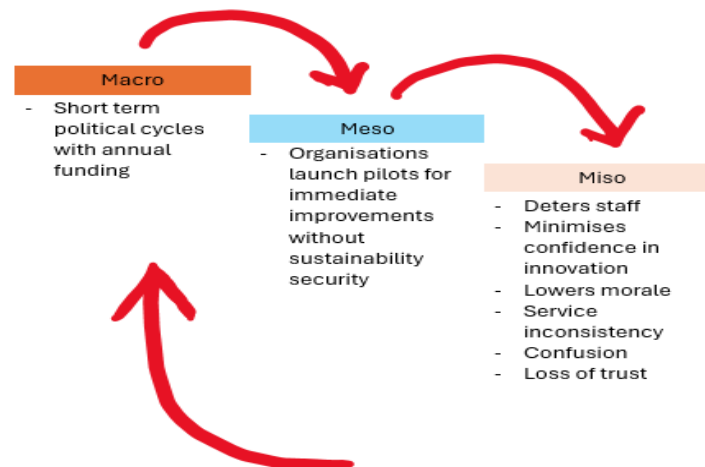


Figure 8: Cascading Example – Short-termism → Sustainability → Patient Trust (authors own, 2025)

“Healthy Days at Home” was a frequently mentioned metric, positioned as a suite of measures, this is an existing dashboard which could be further applied to understand benefits in greater depth, this would also support the calls for various parts of the system to share responsibility and move away from siloed accountability. Digital capabilities and interoperability were repeatedly reported as a challenge, real-time dashboards and robust data to support evaluation of patient journey mapping were underpinned as crucial to service reforms. “We think our policy failed if we don’t see big changes, but we didn’t create the right conditions for its success” P2. These viewpoints suggest that despite policy being clear, unwavering even, there is still more government can do at a national level to enable to system to deliver the strategic direction it sets out.

6.2.2 Culture & behaviour (Workforce, Language, Public Expectation)

Culture and behaviour were considered the human infrastructure of system change, determining whether policy intent is embraced and embedded in practice or resisted and reshaped. Experts consistently described urgent care reform as just as much of a cultural challenge as practical one. “We have to change people’s perception of hospital settings being the safer place, we have to address cwtch culture” P2

At the micro level, staff described “moral injury” and burnout, stating “goodwill has run out”. The Sandcone model is useful here, it helps demonstrate why improvements to morale and safety are the base of enabling reliable, timely and cost-efficient care.

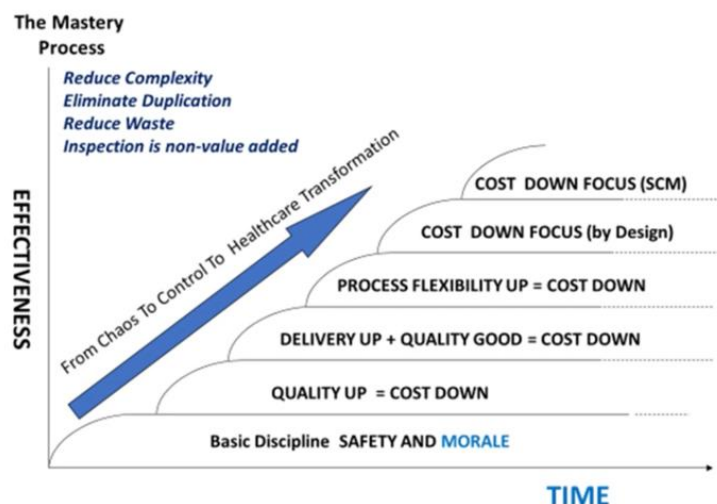


Figure 9: Mastery Process Framework: Progressing from basic discipline and quality improvement to flexibility and cost optimisation over time. (Rich et al., 2006)

Quality statements in Wales being based on the 12 quality standards, the first of which is safe, however, feelings from clinicians in interviews repeatedly described “moral injury” and burnout, poor morale being intrinsically linked to safety and without solid foundations, quality erodes, there is an opportunity to prioritise micro level pressures like morale to enable quality improvements. One participant stressed the importance of legislating minimum viable staffing capacity, others suggested a clarity of purpose and shared vision brings people together, compassionate leadership was also mentioned as a potential productivity intervention. Rotational models, bridging the gap between primary and secondary silos, were presented as an enabler, as well as the need to attract staff, retain them and provide progression routes for those opting to work in the community being reiterated.

Experts articulated how language frames behaviour across micro-macro levels. De-medicalised language enables shared ownership with social care and coherence between policies, as well as reinforcing a more person-centred approach to care. Conflicting organisational languages (health, social care, third sector) hinder collaboration. For the public, “A&E” remains the most recognisable brand and without re-education, people will continue to default to it.

Behavioural change was posed again as requiring alignment of the “path of least resistance” with the desired policy direction. Digital self-triage, one access point, extended hours, and convenient locations were repeatedly cited as essential to shifting patient behaviour. Personal responsibility was also a reoccurring thought with the need for people to take ownership of their health and wellness mentioned throughout interviews.

6.2.3 Care delivery & Experience (Patient Pathways, Access, Outcomes)

At the heart of the conversations were patient experiences, covering access, convenience and outcomes. The shift is not an abstract concept but a tangible redesign of where and how patients receive care “it’s not about shifting care, it’s about treating the patient where it is most appropriate for that patient to be treated” P16.

Transport and geography were cited as major barriers, particularly for older adults, making addressing transport needs integral to ensure health inequalities are not inadvertently caused. Digital access is an enabler but risks excluding those without literacy or connectivity, although it was argued it should be available to those who want it. Participants stressed the need for a unified entry point for triage and booking into the system, ensuring patients reach the right service first time regardless of entry route (GP, 111, or 999), supported by 7 day working. This aligns with the Six Goals plan for a 24/7 urgent care service accessible via NHS 111 Wales.

Societal trends, including consumerism, changing family dynamics and a digital era were referenced throughout interviews, a generational divide was outlined, younger people who expect responsive, digital and transactional care, conversely, older generations who may be more vulnerable or frail were said to benefit from continuity of care and trusted relationships. Continuity of care for complex patients was strongly linked to reduced urgent care demand. This required balancing system flexibility with equity.

P9, gave a striking and eloquent response in terms of what success would look like from a patient’s perspective, the same sentiment echoed throughout all interviews:

“If I was a patient? It would look responsive, I would know what was happening with my care at any point in time. I would be confident that people were doing what they said they were going to do, so I wouldn’t have to be navigating the system, making different phone calls, contacting different departments. I would see consistency of care. I would be seeing the same person or the same small team of people. I would feel that I could ask questions and that I could challenge decisions about my care. I would be able to advocate for myself. And if I couldn’t, then somebody else would be appointed to advocate for me. My care would be timely so I wouldn’t be waiting a long time. I’d know what was going on and I would have control, I think that’s what success would look like... regardless of whatever my condition was, regardless of how unwell I was, either me or my appointed representative would say that they were supported and confident every step of the way, through whatever it was I was experiencing and that access to care wasn’t difficult.”

Patients need equitable, same-day access via 111/digital front door, supported by extended hours, co-location, and simplified navigation, these changes will make the vision tangible to patients.

6.2.4 Population & Accountability (Social Determinants, Prevention, Data, Measures)

It was stressed throughout interviews that urgent care demand can be socially driven, by loneliness, deprivation, damp housing, yet the system responds medically. One participant described a scenario where by a person had lost mobility and become socially isolated, at this point a third sector organisation could have stepped in and provided care had they been in the right enabling environment, in this instance that didn't happen, the persons needs escalated, they become unable to cut their own toenails resulting in further mobility loss and frailty, eventually the person fell and went onto face a lengthy wait for an ambulance and handover at hospital, was then admitted and deconditioned further whilst in hospital. This is a real example of where early intervention would have been more valuable for both the person and system. Participants called for health boards to strengthen relationships with third sector, who can support upstream to prevent escalation of needs, it was acknowledged that annual funding is a barrier to third sector sustainability, with workforce retention a key issue.

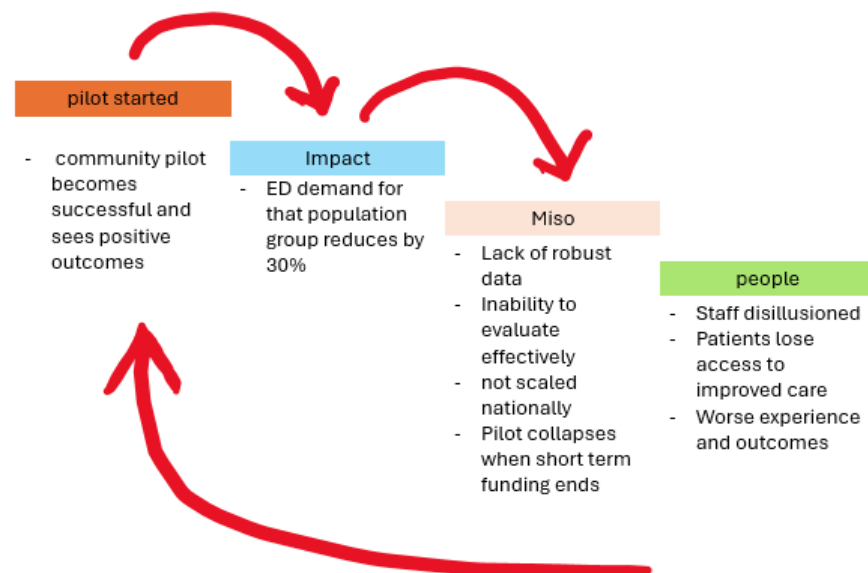


Figure 10: Cascading Example: Poor Data → No Evaluation → Stalled Innovation (authors own, 2025)

It was suggested that “social hubs” can address drivers of attendance and in turn reduce demand. Population segmentation for well, low risk, rising risk and high risk was presented as the critical direction of travel, alongside place-based care, drawing on community assets and third sector, was reiterated as vital to prevention.

There was equal frustration from experts about “archaic” IT systems and siloed measures. “What we measure drives activity,” one noted; with time-based ED targets dominating, transformation stalls. At the micro-meso level, dynamic data sharing to map patient journeys was described as a potential “quick win” but remains unrealised. Poor data at both an operational and national level was consistently addressed, “It’s one thing taking resources out of secondary care and into the community, but how do we know how much resource needs to go, which people are we targeting, why, how can we better support them and what is the choreography around that?” P20

Wales was seen as strong at starting initiatives but weak at scaling and spreading where successful or evaluating to determine what value interventions are adding. Without evaluation and spread, good practice remains “pockets.” Multi-year funding and national adoption frameworks were recommended to break this cycle.

Overall, the evidence indicates that macro reforms will enable meso delivery improvements which will in turn create the micro experience for patients and staff the policy intends. Without funding stretching over longer periods, aligned contracts, clear service specifications, interoperable data and digital infrastructure and system wide accountability, frontline improvements will remain episodic and organisational efforts will continue to feel like “trying to fly the plane and fix the engines at the same time” P9.

6.2.5 Conceptual Framework Update

The conceptual framework has been updated to reflect comments throughout interviews and factors have been categorised into micro, meso or macro elements, this can be used as a snapshot of what needs to be done at what level to achieve the policy intent.

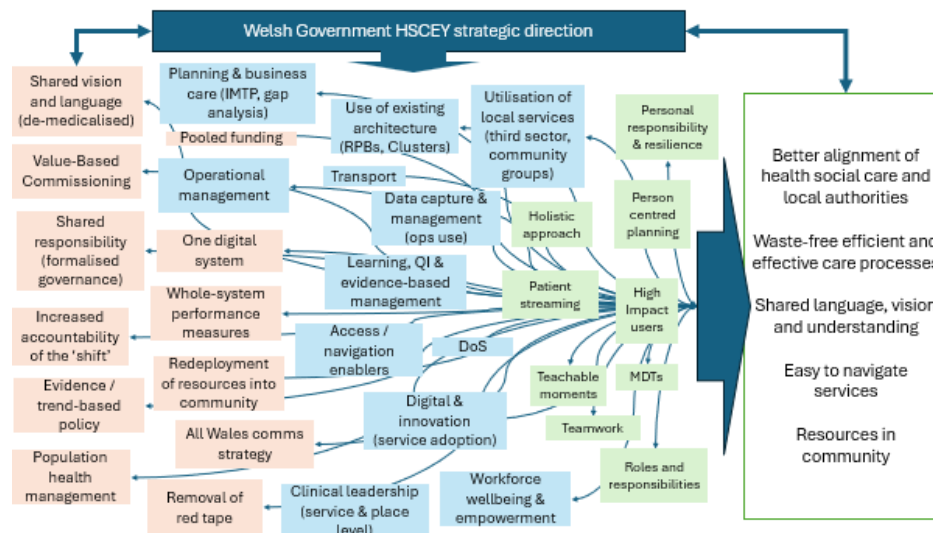


Figure 10: MO updated conceptual framework (authors own, 2025)

7 Conclusion

Urgent care reforms must target all micro–meso–macro layers simultaneously. Without macro reforms, micro initiatives collapse, without micro delivery, macro policy has no traction. There are multiple players crucial to enable delivery of policy and the strategic direction set out in AHW and the 6 Goals, WG, HBs, professional bodies and supporting organisations all have a role to play with process and policy changes needed. In summary, findings highlight that urgent care transformation cannot be achieved through individual action. Challenges span structural, cultural, delivery and population levels, meaning a shared vision is required across the system to truly deliver care closer to home.

7.1 Recommendation

A policy position statement should set out the vision for urgent care in Wales and be followed by a Urgent Care Strategy to enable delivery. Informed by this research, urgent care should be defined clearly including what the shift means in this context: who owns what, when, where, how and why. This will ensure a shared vision, clarity of roles and responsibilities and avoid fragmentation.

To bridge the gap between policy vision and delivery the Urgent Care Strategy should be broken down into following domains:

- System Enablers – the foundational levers (funding, policy, governance, digital, legislation) without which delivery is impossible.
- Culture & Behaviour – the workforce, leadership, language, and public expectations that underpin how change is experienced and sustained.
- Care Delivery & Experience – the patient-facing pathways, access mechanisms, and outcomes that make the shift tangible.
- Population & Accountability – the wider determinants, prevention, data, and measurement systems that ensure equity, value, and shared responsibility.

Each domain identifies specific policy and process changes, matched to the level of ownership (WG, HBs, LAs, NHS P&I etc.) and are sequenced over short, medium, and long-term horizons. Patient safety and staff morale must be prioritised, as these form the foundation for quality, reliability, and sustainability across the system. Without a workforce that feels safe, supported, and valued, neither cultural change nor system

transformation can take root. Importantly, **the following does not intend to suggest all actions are new or not currently underway**; rather, the recommendations are grounded in evidence from the literature review and expert interviews and highlight where clarity, alignment, and consistency are most wanted and needed from experts working within the Welsh context .

The proposed policy and process changes needed are outlined in the following tables:

Table 10. Domain 1: System Enablers

What	Who	When
Multi-year funding settlements for urgent care innovation	WG	Short-medium term
Healthy Days at Home as headline metric	WG/NHS P&I	Short term
Digital interoperability (real-time dashboards, patient journey mapping)	WG/NHS P&I	Medium-long term
Shared accountability frameworks across health & social care –	WG/HBs/LAs	Medium term
Revisit GMS contractual arrangements	WG/HBs/LAs	Medium term
Core national specifications with local flexibility (24/7 cover, digital triage, same-day access)	WG	Short-medium term
Review governance and executive structures	WG/NHS P&I	Short-medium term
Reduce red tape (fast track sign off of integrated models)	WG/ NHS P&I	Short term
Harness legislative levers (WBFGA, SSWA, Staffing Mandates)	WG	Short-long term
WG to support HBs with bold decisions aligned to strategic direction	WG	Short-long term
Introduce robust demand modelling to support evidence-based policy position and strategic direction	WG	Short-long term

Table 11. Domain 2: Culture & Behaviour

What	Who	When
Invest in change management capacity and capabilities	HBs/NHS P&I	Short-Medium term
Promote rotational workforce models and career pathways	HBs/Professional bodies	Medium
Support compassionate leadership	WG/HEIW/HBs	Short-medium term
Embed public re-education campaigns, starting in schools	WG/LAs	Medium-long
Reframe language (define urgent care, de-medicalise, align across health & social care)	WG/LAs/Professional bodies	Short term
Reset expectations (balance generational wants/needs between digital convenience and continuity of care)	HBs/NHS P&I	Medium

Table 12. Domain 3: Care Delivery & Experience

What	Who	When
Embed 111 as national front door (digital and phone parity)	WG/WAST	Short-medium term
Design for equity of convenience (apps, online booking, but maintain continuity for complex care)	HBs/NHS P&I	Medium term

Decommission duplication & invest in value-based commissioning	<i>WG/NHS JCC/HBs</i>	<i>Short-medium term</i>
Spread-and-scale mechanism with protected funding for proven pilots	<i>WG/NHS P&I/HBs</i>	<i>Medium term</i>
Ensure transport planning aligns with healthcare accessibility	<i>LAs/Transport Wales/WG</i> for	<i>Medium-long term</i>
Guarantee 7-day service offers where policy intent requires it	<i>HBs/LAs</i>	<i>Medium term</i>

Table 13. Domain 4: Population & Accountability

What	Who	When
Embed population health management (segmentation & stratification)	HBs/RPBs/LAs	Short-long term
Develop social hubs integrating health, social care and community assets	HBs/LAs/Third sector	Medium-long term
Adopt whole-system measures (demand reduction, morale, outcomes, experiences)	WG/NHS P&I/ HBs/LAs	Short-long term
Invest in preventative interventions (housing, nutrition, wellness, early years, mental health)	WGs/LAs/HBs/Third sector	Short-long term
Strengthen accountability for scaling proven pilots	WG/NHS P&I	Medium

7.2 Closing remarks

Urgent care in Wales stands at a crossroads. The evidence from this study shows that while there is consensus on the need for a shift of urgent care services, progress has been fragmented, constrained by short-termism, siloed measures, and cultural barriers. An overarching Urgent Care Strategy, grounded in a clear policy position statement is essential to define what urgent care is, who owns it, and how it is delivered consistently across Wales.

The proposed framework, which spans System Enablers, Culture & Behaviour, Care Delivery & Experience and Population & Accountability, provides the scaffolding for urgent care transformation. Future success depends not only on new services but on embedding shared accountability, consistent definitions, and robust whole-system measures. It also requires courageous leadership, supporting Health Boards to take difficult decisions, investing in prevention, and aligning governance structures with strategic intent.

By targeting all levels, from micro patient experience to macro system enablers, Wales can move beyond perpetual crisis management toward a future-proof, sustainable model of urgent care.

7.3 Where next for the research?

- Comparing with a more established country: Compare Wales with other countries.
- Understanding how we can change for the better: Longitudinal study of sequence that results in more effective change and better outcomes.
- Workforce perspectives: How does it feel from a professional's perspective to have their role changed in this way?
- Demand modelling: System dynamic modelling that incorporates patient expectations, decision-making and behaviours to understand changes required as the system transforms.

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Views expressed are those of the author and do not necessarily reflect the positions of Welsh Government.

10 Appendices

Appendices can be found in the following page:

<https://cronfa.swan.ac.uk/Record/cronfa71900>

Innovation Academy: Innovation Management in Health & Social Care

[Back page](#)

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