International Journal of Population Data Science

Journal Website: www.ijpds.org

Mothers Seeking Sanctuary in Wales: a Cohort Profile

Alix Bukkfalvi-Cadotte[1,*], Ashra Khanom[1], Amy Brown[1], and Helen Snooks[1]

Submission History

Submitted:	18/08/2025
Accepted:	23/01/2026
Published:	03/06/2026

[1] Swansea University, Swansea, UK

Abstract

Introduction
People seeking sanctuary, including asylum seekers and refugees, can face obstacles in accessing maternity care and may experience higher rates of adverse perinatal outcomes. However, a lack of data disaggregated by immigration status can hinder research regarding experiences and outcomes of maternity care for refugees and asylum seekers.

Objectives
The aim of our study was to examine the maternity care service use and perinatal outcomes of refugees and asylum seekers in Wales by comparing them to a group of non-refugee UK-born mothers. In this publication, our objectives were to describe how we built the study cohort and key characteristics of the cohort members.

Methods
Working with the SAIL Databank, we linked multiple datasets and selected individuals recorded as refugees or asylum seekers in general practitioner records to conduct a retrospective cohort study. We produced cross-tabulations for variables related to the characteristics of the cohort members and performed chi-squared tests to identify statistically significant differences ($p < 0.05$) between the refugee or asylum seeker group and the comparator group of non-refugee UK-born women.

Results
Our study cohort comprises 602 mothers categorised as refugees or asylum seekers and a comparator group of 146 665 non-refugee UK-born mothers who have given birth in Wales since April 2014. Our findings indicate that the two groups have distinct profiles: mothers seeking sanctuary are more likely to be part of a minority ethnic group (84.8% vs 3.1%) and to live in an area categorised as the most deprived quintile (56.0% vs 24.7%) and less likely to be obese (19.0% vs 29.9%) than UK-born mothers.

Conclusions
Using general practitioner records allowed us to select a cohort of mothers seeking sanctuary and a comparator group of non-refugee UK-born mothers. Our descriptive analysis of the cohort member characteristics revealed several differences between the two groups. The novel use of GP records to specifically examine refugee and asylum seeker groups in large-scale datasets highlights the potential of routine health data and dataset linkage to investigate health disparities.

Keywords
data linkage; maternity; refugee; perinatal

*Corresponding Author:
Email Address: 2218810@swansea.ac.uk (Alix Bukkfalvi-Cadotte)

https://doi.org/10.23889/ijpds.v6i1.3318

Introduction

People seeking sanctuary, i.e. asylum seekers and refugees, often face barriers in access to high-quality healthcare, including communication barriers [1–4], cultural differences [1, 2, 5], limited financial resources [4, 5], and the lack of accessible, culturally-appropriate healthcare services [1]. In the field of maternity care specifically, evidence shows that mothers seeking sanctuary often experience delays in accessing prenatal care [6, 7] and some studies report disparities in perinatal healthcare processes and outcomes, such as lower rates of caesarean section [7] or clinical pain relief [8] and higher risks of neonatal or perinatal infant mortality [4] among mothers categorised as refugees or asylum seekers.

In the UK, there remain significant social and ethnic inequalities in maternal health outcomes, with women and babies of Black or Asian ethnicity and those living in the most deprived areas facing significantly higher rates of maternal and neonatal mortality [9, 10]. While some studies indicate that migrant mothers experience more adverse perinatal outcomes [11] and an increasing amount of research is being conducted to examine the link between migration and health in the UK, the majority of these studies are conducted in England [12]. In our research, we aimed to examine the use of maternity care services and the perinatal health outcomes of mothers seeking sanctuary in Wales compared to their non-refugee UK-born counterparts. In this paper, our objectives were to describe how we built the dataset and selected the study cohort, and to provide a brief description of the cohort members.

Methods

As described in the protocol for this study [13], we are conducting a retrospective cohort study on the maternity care experiences and outcomes of people seeking sanctuary in Wales using routine health records held by the Secure Anonymised Information Linkage (SAIL) Databank.

The SAIL Databank is a repository of routinely collected individualised records for the population of Wales [14–16]. In the available datasets, each individual is attributed a unique Anonymised Linking Field (ALF), which allows researchers to link fully anonymised records across multiple datasets [17]. We linked six datasets to extract data related to the mother's characteristics, use of maternity care services, and perinatal outcomes:

- Annual District Birth Extract (ADBE) [18],
- Annual District Death Extract (ADDE) [19],
- Maternity Indicators Dataset (MIDS) [20],
- National Community Child Health Database (NCCHD) [21],
- Welsh Demographic Service Dataset (WDSD) [22],
- Welsh Longitudinal General Practice Dataset (WLGP) [23].

We linked these six datasets using the mother's or infant's ALF to create a linked dataset containing data for each mother-infant dyad.

Study Population

The study group of interest in this study consisted of mothers categorised as asylum seekers or refugees who gave birth in Wales. While immigration records are not currently held by the SAIL Databank, the WLGP [23] contains Read codes for particular patient characteristics, including specific codes for physicians to record their patient's asylum seeker or refugee status: 13ZB (refugee) and 13ZN (asylum seeker) [24]. We used these Read codes to select patients recorded as refugees or asylum seekers by their general practitioner (GP) in Wales. A similar approach has previously been used successfully by researchers to select a cohort of migrants (all types) through GP record codes related to visa status, language, country of birth, and origin [25].

For comparative analyses, we selected UK-born mothers who were not categorised as refugees or asylum seekers using the mother's country of birth as recorded in the ADBE and GP records.

We included the mothers for all births recorded in the MIDS, which covers the period from April 2014 to present. We excluded mothers aged under 18 as adolescent pregnancies are themselves linked to adverse outcomes [26] and teenage mothers are subject to particular safeguarding practices within maternity care in Wales [27], which may affect their use of services and outcomes. We also excluded mothers lacking a valid ALF and those lacking valid values for refugee status or country of birth.

Non-refugee migrant mothers (i.e. individuals whose recorded country of birth is outside the UK and who were not recorded as refugees or asylum seekers by their GP) were excluded from this analysis as this group may contain refugees or asylum seekers who were not recorded as such by their GP, introducing bias in the analyses.

Building the Study Cohort

Following the exclusion of duplicate records and ineligible individuals, we built three nested study cohorts to accommodate different denominators for various types of perinatal indicators:

- individual mothers,
- births (including repeated birth events for the same mother within the study period), and
- babies (including more than one baby per birth event in the case of twins and other multiples).

Data Management and Analysis

We conducted statistical analysis using IBM SPSS Statistics software. Adopting an exploratory data analysis approach [28], we first examined the quality of the available data, producing frequency tables and data visualisations to identify patterns and possible outliers.

We examined outliers on a case-by-case basis and removed values determined as invalid in definitions of maternal health indicators by the United Kingdom (UK) Department of Health and Social Care [29]. We also created derived variables (e.g. BMI derived from height and weight) and categorised some

values for ease of analysis (e.g. grouped ethnicity categories from detailed categories).

To describe the characteristics of the cohort of mothers categorised as refugees or asylum seekers, we selected a range of variables that are associated with maternal health outcomes in the literature (e.g. maternal age [30], parity [31], obesity [32]) and were available in the linked dataset. We produced cross-tabulations comparing frequencies among the study group and the comparator group of UK-born mothers and presented counts and valid percentages (i.e. excluding missing data). We performed chi-squared tests to identify any statistically significant differences ($p < 0.05$) in findings. While there is no publicly available data on numbers of mothers seeking sanctuary in Wales, we compared our results to external data where possible to contextualise our findings and assess their validity.

Public Engagement

This study was part of a broader mixed-method doctoral research project which included public engagement activities to inform data collection and analysis. As part of engagement initiatives, the lead author consulted with maternity care providers and third-sector organisations providing services to mothers seeking sanctuary, as well as experts by experience, i.e. refugee mothers living in Wales, to better understand the lived experience of seeking sanctuary and guide research activities.

Results

Identification of Refugees and Asylum Seekers in GP Data

The SAIL Databank provided WLGP records dating from April 2014 until the date of provision (November 2023) for all mothers present in the MIDS. We observed a total of 933 recorded Read codes indicating asylum seeker or refugee status related to 729 individuals, indicating that some individuals had these codes recorded multiple times. Indeed, while the majority of individuals only had one GP record pertaining to refugee status in the dataset, 15.6% of individuals had two records containing refugee or asylum seeker status codes, and 6.2% had three or more. These repeated records could reflect discontinuity of care (i.e. individuals changing GP and disclosing their immigration status to multiple healthcare professionals) or the same GP recording their status multiple times. The majority (81%) of these Read codes indicated asylum seeker status (Read code 13ZN) rather than refugee status (Read code 13ZB).

After excluding ineligible records, the study group included 602 mothers categorised as refugees or asylum seekers who experienced 777 births during the study period, resulting in 791 babies. The comparator group comprised 146 665 non-refugee UK-born mothers, 195 680 birth events, and 198 538 resulting babies (see Figure 1).

Characteristics of Mothers Seeking Sanctuary

We examined some key characteristics of the cohort members to provide a brief demographic profile. The proportion of missing data for each variable ranged from 0% (maternal age) to 28.3% (ethnic group) (see Table 1).

The majority of mothers seeking sanctuary in Wales were born in the Middle East and North Africa (36.7%) or Sub-Saharan Africa (32.4%). Smaller proportions of the group originate from Europe and Central Asia (10.2%), South Asia (9.1%), East Asia and Pacific (9.5%), and Latin America or the Caribbean (2.1%). These results appear broadly consistent with Home Office data concerning the nationalities of migrants who submitted an asylum application in the UK in recent years showing large numbers of applicants from these regions [33]. This coherence with external country of birth data supports the validity of the method used to select the refugee and asylum seeker group within the larger dataset.

While data regarding the ethnicity of the mothers is fairly incomplete (28.3% missing data) and should be interpreted with caution, the two groups appear to have very different profiles (see Table 2). Among mothers seeking sanctuary, 29% are Black (or mixed Black), 24% are Asian (or mixed Asian), and an additional 32% were of another non-White ethnicity. Comparatively, the vast majority (96.9%) of UK-born mothers were of White ethnicity.

Examining all births recorded in the dataset (see Table 3), we observed that asylum seekers and refugees were more likely than UK-born mothers to live in a deprived area as measured by the Welsh Indicator of Multiple Deprivation (WIMD) (56.0% vs 24.7% living in the most deprived quintile). Mothers categorised as refugees or asylum seekers were also more likely to be aged 35 or over at the time of birth (19.9% vs 17.7%), and less likely to be nulliparous (29.7% vs 41.0%), be obese (19.0% vs 29.9%), or smoke at the time of birth (2.2% vs 16.1%). The figures for UK-born mothers appear broadly consistent with national statistics: in 2024, 17.5% of births in Wales were to mothers aged 35 or over, 32.1% to mothers with a BMI over 30, 12.2% to mothers who smoked at the time of birth [34], and 44.7% to nulliparous mothers [35]. These external data, however, refer to all births in Wales, including both UK-born and migrant mothers, only in the year 2024 and thus are not directly comparable to the present study findings.

Discussion

In this study, we used GP Read codes to select individuals recorded as refugees or asylum seekers in health datasets for maternal health research. In the present study, we selected 602 refugee or asylum-seeking women who gave birth in Wales during the study period. We linked multiple datasets and built a study cohort comprising the group of mothers seeking sanctuary and a comparator group of non-refugee UK-born mothers ($n = 146\,665$) in order to conduct a retrospective cohort study on their experiences of maternity care and perinatal health outcomes.

The data available in the linked dataset provided valuable descriptive information regarding the characteristics of mothers categorised as refugees or asylum seekers, including region of origin, ethnicity, maternal age, parity, and deprivation level of area of residence. The majority of mothers seeking sanctuary originated from the Middle East and from Africa. As expected in populations originating from these regions, refugee and asylum-seeking mothers were more likely to be part of a

Figure 1: Construction of the Study Cohort

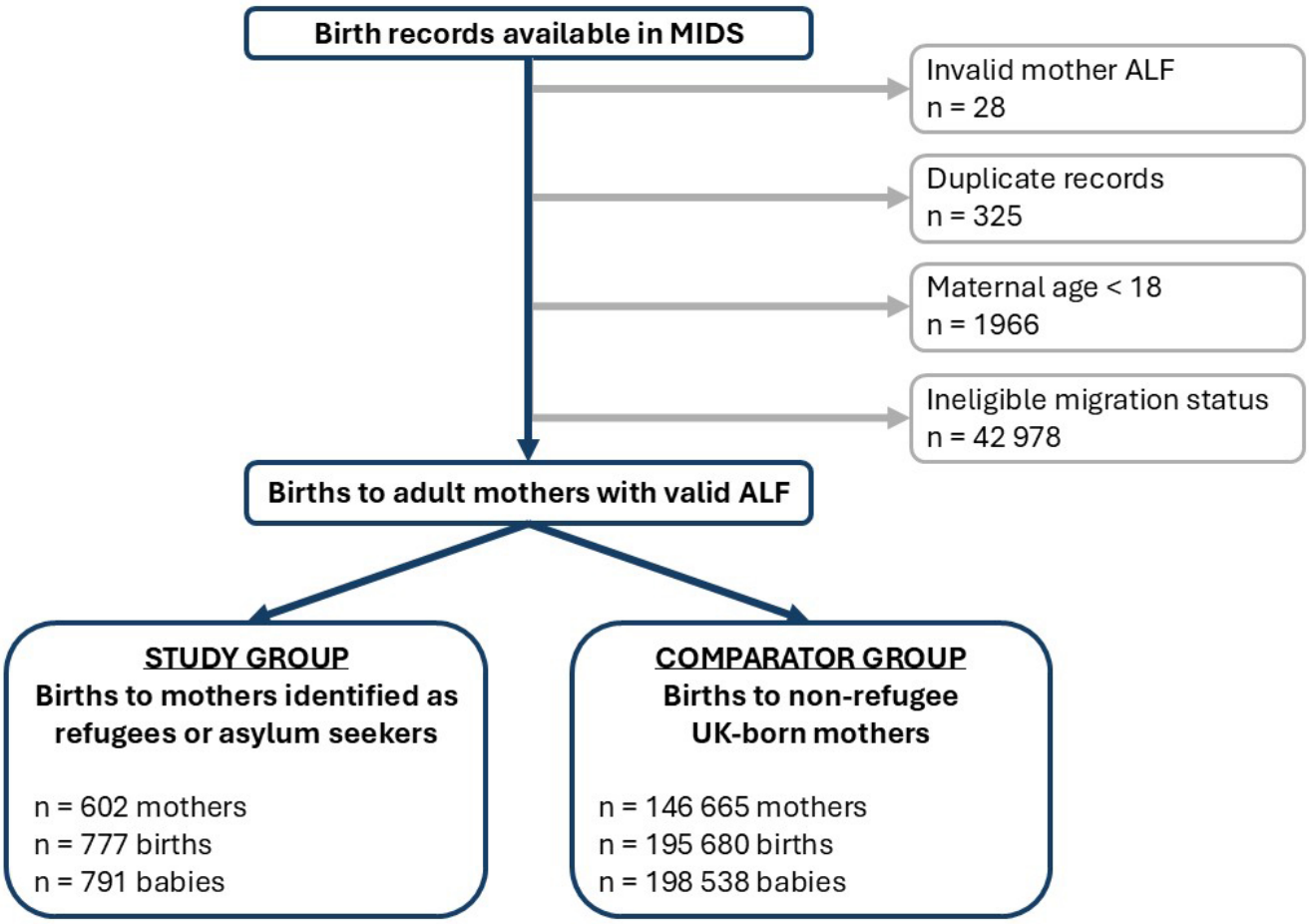

Table 1: Proportion of Missing data for Each Variable

Variable	Missing data (%)
Region of birth (among mothers identified as refugees or asylum seekers)	19.9
Ethnic group	28.3
WIMD quintile of the area of residence	0.3
Maternal age	0.0
Parity	8.5
Obesity at initial assessment	15.8
Smoking at the time of birth	8.0

Table 2: Ethnicity Category of Mothers Categorised as Refugees or Asylum Seekers Compared to UK-born Mothers

	Mothers categorised as refugees or asylum seekers n (%)	UK-born mothers n (%)
Ethnicity		
White	65 (15.3)	101 835 (96.9)
Black or mixed Black	123 (28.9)	877 (0.8)
Asian or mixed Asian	104 (24.4)	1530 (1.5)
Other ethnicity	134 (31.5)	854 (0.8)

non-white ethnicity group than their UK-born counterparts. We also found that refugees and asylum seekers were more likely to reside in a more deprived area, be aged over 35 and to be multiparous, but less likely to be obese or to smoke at the time of birth than the comparator group. These results are not entirely consistent with evidence reported in a 2021 literature review [36]: while refugee mothers are generally reported to have a higher parity than other population groups,

Table 3: Maternal Characteristics in Births to Mothers Categorised as Refugees or Asylum Seekers Compared and Births to UK-born mothers

	Births to mothers categorised as refugees or asylum seekers n (%)	Births to UK-born mothers n (%)
WIMD quintile of the area of residence at the time of birth*		
1 (most deprived)	422 (56.0)	48 110 (24.7)
2	161 (21.4)	42 133 (21.6)
3	111 (14.7)	37 490 (19.2)
4	35 (4.6)	35 065 (18.0)
5 (least deprived)	24 (3.2)	32 260 (16.5)
Maternal age at the time of birth*		
≤ 24	139 (17.9)	42 087 (21.5)
25-29	257 (33.1)	59 757 (30.5)
30-34	226 (29.1)	59 290 (30.3)
≥ 35	155 (19.9)	34 546 (17.7)
Nulliparity at the time of birth*		
Nulliparous	216 (29.7)	73 350 (41.0)
Obesity*		
BMI > 30	93 (19.0)	49 361 (29.9)
Smoking at the time of birth*		
Smoking	17 (2.2)	28 919 (16.1)

*Statistically significant differences ($p < 0.05$).

most studies indicate that they are younger than non-refugee mothers, and findings regarding BMI are inconsistent. These inconsistencies could reflect the heterogeneity of refugee and asylum-seeking populations across different settings. The exclusion of mothers under 18 in the present study may also obscure different trends regarding teenage pregnancies and hinders the comparability with other studies.

While quantitative data collection and analysis is essential to monitor health inequities, there is a recognised lack of high-quality disaggregated data regarding refugees and asylum seekers [37–41]. Due to inconsistent access to refugee and asylum seeker status data, researchers have used various methods to select groups of asylum seekers and refugees [8]. For example, while some have used immigration records [42], others use proxy measures such as country of birth as indicators of refugee status [43]. In the present study, using GP records to select patients recorded as refugees or asylum seekers allowed us to create a study cohort enabling a comparative study on the maternal health and perinatal outcomes of mothers seeking sanctuary in Wales. This method doesn't require access to external immigration data and makes use of existing routine health records to establish the immigration status of refugees and asylum seekers, a particularly under-researched group, within large-scale datasets.

Limitations

The use of GP records to select refugees and asylum seekers in datasets has considerable limitations. This method likely does not provide complete coverage of the target population of refugees and asylum seekers as it only identifies those whose immigration status was recorded in the dataset, excluding any refugee or asylum seeker who didn't disclose their immigration status to their GP or whose GP didn't record their status through the appropriate Read codes. The data recorded may also be inexact due to human error when inputting the data into the information system. In addition, due to a history of data sharing between the NHS and the Home Office for immigration control [44], vulnerable migrants may be more reticent to access healthcare services or share their immigration status.

Additionally, while the majority of Read codes indicated asylum seeker status rather than refugee, this does not reflect the proportions of asylum seekers and refugees in the UK: in 2023, there were far fewer asylum seekers (approximately 138,000) than refugees (approximately 449,000) [45]. Asylum seekers may be more likely to disclose their immigration status as it is linked to more restrictions (specific accommodation, no right to work, etc.). In addition, GPs may not be aware of the difference between the two statuses or may not update records once an individual obtains refugee status. The two Read codes may not accurately represent differences between asylum seeker and refugee status.

Conclusion

The use of GP records to select refugee and asylum seeker groups in large-scale datasets represents a promising opportunity for future research to examine and monitor health inequities that affect vulnerable migrants. Such insights could contribute to improving data collection systems, developing our understanding of the data's potential and limitations, and enhancing public trust in this type of research.

Our planned research will make use of this method to investigate the maternity service use and perinatal health outcomes of mothers seeking sanctuary in Wales, revealing possible disparities and areas of improvement for clinical practice and policy.

Acknowledgements

This study is part of a doctoral research project funded through an Economic and Social Research Council (ESRC) Wales Doctoral Training Partnership studentship (project reference: 2753746 related to ES/P00069X/1). This data linkage study is also funded by Research Wales Innovation Funding (RWIF).

This study makes use of anonymised data held in the Secure Anonymised Information Linkage (SAIL) Databank. We would like to acknowledge all the data providers who make anonymised data available for research.

Statement on Conflicts of Interest

None declared

Ethics Statement

This study is part of a doctoral research project which obtained ethical approval from the Swansea University Medical School ethics committee (approval number: 2 2023 7132 6456). Approval was also obtained from the SAIL Information Governance Review Panel (IGRP) (Project number: 1581).

Data Availability Statement

The datasets used in this study are held by the SAIL Databank, which can be accessed by researchers through an application process.

AI Disclosure Statement

The authors declare that no generative AI tools were used in the preparation of this manuscript.

References

1. Hawkins MM, Schmitt ME, Adebayo CT, Weitzel J, Olukotun O, Christensen AM, et al. Promoting the health of refugee women: a scoping literature review incorporating the social ecological model. *International journal for equity in health.* 2021;20(1):1-10. https://doi.org/10.1186/s12939-021-01387-5

2. Pangas J, Ogunsiji O, Elmir R, Raman S, Liamputtong P, Burns E, et al. Refugee women's experiences negotiating motherhood and maternity care in a new country: a meta-ethnographic review. *International Journal of Nursing Studies.* 2019;90:31-45. https://doi.org/10.1016/j.ijnurstu.2018.10.005

3. Brandenberger J, Tylleskär T, Sontag K, Peterhans B, Ritz N. A systematic literature review of reported challenges in health care delivery to migrants and refugees in high-income countries-the 3C model. *BMC Public Health.* 2019;19(1):1–11. https://doi.org/10.1186/s12889-019-7049-x

4. Heslehurst N, Brown H, Pemu A, Coleman H, Rankin J. Perinatal health outcomes and care among asylum seekers and refugees: a systematic review of systematic reviews. *BMC MEDICINE.* 2018;16(1):1-25. https://doi.org/10.1186/s12916-018-1064-0

5. Tirado V, Chu J, Hanson C, Ekström AM, Kågesten A. Barriers and facilitators for the sexual and reproductive health and rights of young people in refugee contexts globally: A scoping review. *PloS one.* 2020;15(7):e0236316. https://doi.org/10.1371/journal.pone.0236316

6. Saunders SL, Sutcliffe KL, McOrist NS, Levett KM. The associations between women who are immigrants, refugees, or asylum seekers, access to universal healthcare, and the timely uptake of antenatal care: A systematic review. *Australian and New Zealand Journal of Obstetrics and Gynaecology.* 2023;63(2):134-45. https://doi.org/10.1111/ajo.13632

7. Ramadan M, Rukh-E-Qamar H, Yang S, Vang ZM. Fifty years of evidence on perinatal experience among refugee and asylum-seeking women in Organization for Economic Co-operation and Development (OECD) countries: A scoping review. *PloS one.* 2023;18(10):e0287617. https://doi.org/10.1371/journal.pone.0287617

8. Bukkfalvi-Cadotte A, Naha G, Khanom A, Brown A, Snooks H. Are rates of clinical interventions during pregnancy and childbirth different for refugees and asylum seekers in high-income countries? A scoping review. *BMC pregnancy and childbirth.* 2024;24(1):742. https://doi.org/10.1186/s12884-024-06893-2

9. Knight M, Bunch K, Patel R, Shakespeare J, Kotnis R, Kenyon S, et al. Saving Lives, Improving Mothers' Care Core report: Lessons learned to inform maternity care from the UK and Ireland Confidential Enquiries into Maternal Deaths and Morbidity 2018-20. Oxford: National Perinatal Epidemiology Unit (University of Oxford); 2022. 89 p.

10. Draper ES, Gallimore ID, Smith LK, Fenton AC, Kurinczuk JJ, Smith PW, et al. MBRRACE-UK Perinatal Mortality Surveillance Report: UK Perinatal Deaths for Births from January to December 2019. Leicester; 2021. 64 p.

11. Puthussery S. Perinatal outcomes among migrant mothers in the United Kingdom: is it a matter of biology, behaviour, policy, social determinants or access to health care? *Best Practice & Research Clinical Obstetrics & Gynaecology.* 2016;32:39-49. https://doi.org/10.1016/j.bpobgyn.2015.09.003

12. Burns R, Zhang CX, Patel P, Eley I, Campos-Matos I, Aldridge RW. Migration health research in the United Kingdom: A scoping review. *Journal of migration and health.* 2021;4:100061. https://doi.org/10.1016/j.jmh.2021.100061

13. Bukkfalvi-Cadotte A, Khanom A, Brown A, Snooks H. Maternity care experiences and outcomes of people seeking sanctuary in Wales: a data linkage study protocol. *International journal of population data science.* 2024;9(2):2399. https://doi.org/10.23889/ijpds.v9i2.2399

14. Jones KH, Ford DV, Jones C, Dsilva R, Thompson S, Brooks CJ, et al. A case study of the Secure Anonymous Information Linkage (SAIL) Gateway: a privacy-protecting remote access system for health-related research and evaluation. *Journal of biomedical informatics.* 2014;50:196-204. https://doi.org/10.1016/j.jbi.2014.01.003

15. Jones KH, Ford DV, Thompson S, Lyons R. A profile of the SAIL databank on the UK secure research platform. *International journal of population data science.* 2019;4(2):1134. https://doi.org/10.23889/ijpds.v4i2.1134

16. Ford DV, Jones KH, Verplancke J-P, Lyons RA, John G, Brown G, et al. The SAIL Databank: building a national architecture for e-health research and evaluation. *BMC health services research.* 2009;9(157):1-12. https://doi.org/10.1186/1472-6963-9-157

17. Lyons RA, Jones KH, John G, Brooks CJ, Verplancke J-P, Ford DV, et al. The SAIL databank: linking multiple health and social care datasets. *BMC medical informatics and decision making.* 2009;9:1-8. https://doi.org/10.1186/1472-6947-9-3

18. Health Data Research UK. Annual District Birth Extract (ADBE) [Web Page]. 2024. https://healthdatagateway.org/en/dataset/321.

19. Health Data Research UK. Annual District Death Extract (ADDE) [Web Page]. 2024. https://healthdatagateway.org/en/dataset/316.

20. Health Data Research UK. Maternity Indicators Dataset (MIDS) [Web Page]. 2024. https://healthdatagateway.org/en/dataset/353.

21. Health Data Research UK. National Community Child Health Database (NCCHD) [Web Page]. 2024. https://healthdatagateway.org/en/dataset/360.

22. Health Data Research UK. Welsh Demographic Service Dataset (WDSD) [Web Page]. 2024. https://healthdatagateway.org/en/dataset/359.

23. Health Data Research UK. Welsh Longitudinal General Practice Dataset (WLGP) - Welsh Primary Care [Web Page]. 2024. https://healthdatagateway.org/en/dataset/355.

24. Welsh Government. Health and wellbeing provision for refugees and asylum seekers. Cardiff: Welsh Government; 2018. p. 40 p.

25. Pathak N, Zhang CX, Boukari Y, Burns R, Mathur R, Gonzalez-Izquierdo A, et al. Development and Validation of a Primary Care Electronic Health Record Phenotype to Study Migration and Health in the UK. *International journal of environmental research and public health.* 2021;18(24):13304. https://doi.org/10.3390/ijerph182413304

26. Maheshwari MV, Khalid N, Patel PD, Alghareeb R, Hussain A. Maternal and neonatal outcomes of adolescent pregnancy: a narrative review. *Cureus.* 2022;14(6). https://doi.org/10.7759/cureus.25921

27. Fairman A. Safeguarding under 18's within maternity services (version number 3). NHS Wales Cardiff and Vale University Health Board; 2020. 11 p.

28. Jones JS, Goldring J. Exploratory and descriptive statistics. London Sage Publications Limited; 2022.

29. Office for Health Improvement and Disparities. Public health profiles: Child and Maternal Health [Web Page]. 2024 https://fingertips.phe.org.uk/profile/child-health-profiles.

30. Lean SC, Derricott H, Jones RL, Heazell AE. Advanced maternal age and adverse pregnancy outcomes: A systematic review and meta-analysis. *PloS one.* 2017;12(10):e0186287. https://doi.org/10.1371/journal.pone.0186287

31. Kozuki N, Lee AC, Silveira MF, Sania A, Vogel JP, Adair L, et al. The associations of parity and maternal age with small-for-gestational-age, preterm, and neonatal and infant mortality: a meta-analysis. *BMC Public Health.* 2013;13:1-10. https://doi.org/10.1186/1471-2458-13-s3-s2

32. Marchi J, Berg M, Dencker A, Olander E, Begley C. Risks associated with obesity in pregnancy, for the mother and baby: a systematic review of reviews. *Obesity reviews.* 2015;16(8):621-38. https://doi.org/10.1111/obr.12288

33. Home Office. Immigration system statistics data tables [Web Page]. 2023. https://www.gov.uk/government/statistical-data-sets/immigration-system-statistics-data-tables#asylum-and-resettlement.

34. StatsWales. NHS primary and community activity [Web Page]. 2024 https://statswales.gov.wales/Catalogue/Health-and-Social-Care/NHS-Primary-and-Community-Activity.

35. Office for National Statistics. Births in England and Wales: birth registrations [Web Page]. 2025 https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/livebirths/datasets/birthsinenglandandwalesbirthregistrations.

36. Sturrock S, Williams E, Greenough A. Antenatal and perinatal outcomes of refugees in high income countries. *Journal of Perinatal Medicine.* 2021;49(1):80-93. https://doi.org/doi.org/10.1515/jpm-2020-0389

37. Sağnıç ŞG. Lost in data translation: A critical review of datasets on refugees. *INTERNATIONAL MIGRATION.* 2023;61:193-208. https://doi.org/10.1111/imig.13159

38. Angenendt S, Kipp D, Koch A. Many refugees, poor data: development cooperation requires higher-quality data. SWP Comment 37/2016. Berlin; 2016. 5 p.

39. Aspinall P. The extent of collection of information on migrant and asylum seeker status in routine health and social care data sources in England. *International Journal of Migration, Health and Social Care.* 2007;3(4):3-13. https://doi.org/10.1108/17479894200700020

40. Aspinall P. Hidden needs: Identifying key vulnerable groups in data collections: vulnerable migrants, gypsies and travellers, homeless people, and sex workers. Canterbury; 2014. 88 p.

41. Bozorgmehr K, McKee M, Azzopardi-Muscat N, Bartovic J, Campos-Matos I, Gerganova T-I, et al. Integration of migrant and refugee data in health information systems in Europe: advancing evidence, policy and practice. *The Lancet Regional Health–Europe.* 2023;34:100744. https://doi.org/10.1016/j.lanepe.2023.100744

42. Burns R, Wyke S, Boukari Y, Katikireddi SV, Zenner D, Campos-Matos I, et al. Linking migration and hospital data in England: linkage process and evaluation of bias. *International journal of population data science.* 2024;9(1). https://doi.org/10.23889/ijpds.v9i1.2181

43. Gibson-Helm M, Boyle J, Block A, Teede H. Use of country of birth as an indicator of refugee background in health datasets. *BMC medical research methodology.* 2014;14:1-7. https://doi.org/10.1186/1471-2288-14-27

44. Papageorgiou V, Wharton-Smith A, Campos-Matos I, Ward H. Patient data-sharing for immigration enforcement: a qualitative study of healthcare providers in England. *BMJ open.* 2020;10(2):e033202. https://doi.org/10.1136/bmjopen-2019-033202

45. UN Refugee Agency. Refugee Data Finder [Web Page]. 2024. https://www.unhcr.org/refugee-statistics/download/?url=Ue72H2.

Abbreviations

ADBE:	Annual District Birth Extract
ADDE:	Annual District Death Extract
ALF:	Anonymised Linking Field
BMI:	Body Mass Index
GP:	General Practitioner
MIDS:	Maternity Indicators Dataset
NCCHD:	National Community Child Health Database
SAIL:	Secure Anonymised Information Linkage
UK:	United Kingdom
WDSD:	Welsh Demographic Service Dataset
WLGP:	Welsh Longitudinal General Practice Dataset