Digital Television and Deaf/Hard of Hearing Audiences in Wales

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Executive summary

This document summarises the main statistical findings from a survey of digital television viewing patterns and barriers to accessibility for deaf/hard of hearing audiences in Wales. The survey ran during the entire month of August 2013, and was part of a research project based at Swansea University, funded by Action on Hearing Loss Cymru, BBC Wales, Coleg Cymraeg Cenedlaethol and S4C. The survey aimed to gain a better understanding of some of the benefits that digital television have brought to viewers in Wales and some of the barriers to enjoying television services that affect viewers who have hearing loss.

This survey firstly provided a general mapping of deaf/hard of hearing digital television audiences in Wales.

Respondents to this survey are mainly elderly people, with more than 60% of the respondents aged over 65 and predominantly female. Audience members came from different parts of Wales. However, the predominant ethnicity for the survey respondents is White Welsh or White British. About 15% of the respondents understand spoken Welsh, 7% read Welsh and a further 5.8% could be regarded as fluent Welsh users.

The majority of the survey respondents wear digital hearing aids (68%) and about one third lip read (30%). The findings also suggest that 5% of the survey respondents use British Sign Language and 8% use Sign Supported English.

In terms of media consumption, 96% of the respondents use broadcast television for information, entertainment and education. Public broadcasters (especially the BBC) are regarded as the major sources of information. The average hard of hearing audience watches 3.39 hours television per day and more than half of respondents (57%) watch 2-5 hours television per day. We also identified a significant percentage of audiences (around one third) viewing television via online services and applications (such as iPlayer and Clic) or accessing recorded programmes stored on a PVR or DVD. Television via other platforms, such as paid on-demand services and social media sites such as YouTube, currently have a small percentage of users. However it indicates a rising alternative platform to the mainstream broadcasting.

The traditional television channels remain the central information source for deaf and hard of hearing audiences. News, documentaries and drama are the three most preferred television genres.

The provision of Welsh television content is welcomed by deaf and hard of hearing audiences in Wales. Both television programmes spoken in Welsh language and programmes provided with subtitles in the Welsh language serve to enhance the television viewing experience, deepen the audience's appreciation of local culture and provide resources for the learning of the Welsh language.

This study has established that subtitles are the most important facilitating tool for deaf and hard of hearing audiences in their understanding of television programming. Common problems associated with sound quality and subtitles affect both the wider audience as well as deaf or hard of hearing audience. However, for the deaf or hard of hearing audience, where a

significant number rely on digital hearing aids (68%) and also lip read (about one third), the demand for better sound quality and better subtitling service is more acute.

This survey has identified a number of barriers facing people who are deaf or hard of hearing in Wales in accessing information, education and entertainment via digital television. Barriers were identified mainly in the areas of sound quality and subtitles.

Finally, we would like to make the following recommendations:

- Ofcom guidelines on the quality of subtitles should be further implemented.

- An awareness campaign is needed to help deaf and hard of hearing audiences to understand the full range of interactive services available on the digital television platform, including altering the size and colour of subtitles, and switching on Welsh language subtitles.

- Accredited deaf and hard of hearing awareness training should be ensured for public broadcasting staff as well as commercial programme producers. Such training should exemplify European standards such as the R128 Loudness specification and the best practice in dealing with issues such as background noise in news production.

- More opportunities for people who are deaf and hard of hearing to take part in media co-production.

- Broadcasters should consider the identified needs from people who are deaf and hard of hearing for more Welsh language subtitles.

Section One: Introduction to the Survey

This document is a summary of the main statistical findings from a survey into the digital television viewing patterns and barriers to accessibility for deaf and hard of hearing audiences in Wales. The survey ran during the entire month of August 2013, and was part of a research project based at Swansea University, funded by Action on Hearing Loss Cymru, BBC Wales, Coleg Cymraeg Cenedlaethol and S4C. The aims of this survey were to gain a better understanding of some of the benefits that digital television have brought to viewers in Wales, and some of the barriers to enjoying television services that affect viewers who have hearing loss.

BACKGROUND: HEARING LOSS IN WALES

Action on Hearing Loss reports (2011) that there are more than 10 million adults in the UK with some form of hearing loss, or one in six of the population. From the total figure, around 6.4 million are of retirement age (65+) and about 3.7 million are of working age (16–64). From the total number of ten million, more than 800,000 people have severe or profound hearing loss.

Table 1.1 Statistic Data of Hearing Loss in the UK and Wales

	Wales		UK	
	Severe	**All**	**Severe**	**All**
Working Age	7,000	190,000	140,000	3,700,000
Retired	38,000	350,000	690,000	6,400,000
Total	**45,000**	**530,000**	**820,000**	**10,100,000**

Source: Action for Hearing Loss (2011)
*Statistics within the margin of error.

According to the most recent health survey, around 1 in 7 adults in Wales (or 15%) reported having difficulties with their hearing (Welsh Government, 2013, p. 11). This health concern increased with age, affecting around one third of senior citizens aged 65 and over and affecting men more than women. A 2010 study estimated that British Sign Language (BSL) is the first or preferred language of approximately 3,000 people in Wales (Siôn, 2010). By 2031, the projection for the total number of people in Wales with hearing loss will be in excess of 725,000 (Wales Mental Health in Primary Care, n.d.).

AIMS AND OBJECTIVES OF THE DIGITAL TELEVISION AND DEAF AND HARD OF HEARING AUDIENCES IN WALES SURVEY

Wales is the UK's first digital television nation since the Digital Switchover was completed in March 2010 (DigitalUK, 2012) and this technological revolution brought in new forms of data dissemination that transformed not only the ways people acquire information from television but also the way people interact with television services. Audiences have not only more programme choices but also new means of access via various platforms (such as Freeview, cable, satellite and the internet).

Academic research found that visual media (especially television) could alleviate the frustration and social exclusion in physical, mental and social domains for the deaf/hard of hearing community (Austin, 1980; Austin & Myers, 1984). We believe that digital television is intrinsically a form of assistive technology and could enable the deaf/hard of hearing community to have more access to information and services. However, current regulating measures place emphasis more on quantity (e.g. the percentage of television programme subtitling) but less on quality. Over emphasising the quantity of subtitling could lead to overlooking other quality-related constraints (such as poor quality of sound in television programmes) faced by deaf/hard of hearing audience.

For this research, we aim to:
- identify the patterns of digital television adoption and usage within the deaf/hard of hearing audience in Wales;
- evaluate the enabling and disabling effects of Digital Television on the deaf/hard of hearing community in Wales;
- provide a comprehensive report of suggestions by deaf and hard of hearing viewers' on improving digital television service.

METHODOLOGY

In order to complete the study, a triangulation of qualitative and quantitative research methods were utilised, collecting data from a self-completion questionnaire and eight semi-structured interviews.

Prior to the survey, semi-structured interviews were conducted in Swansea and neighbouring areas between May and June 2013 to investigate the main issues of concern for deaf and hard of hearing audiences in terms of digital television accessibility.

In order to examine the experience of different age groups, the semi-structured interviews were conducted with the following eight respondents, reflecting a spectrum of socio-economic and demographic backgrounds:

Table 1.2 Participants of the semi-structured interviews

Participant	Gender	Age	Level of hearing Loss	Living status
1	M	22	Deaf, uses digital hearing aid	Shared housing
2	F	43	Deaf, uses digital hearing aid	With children
3	M	19	Deaf, uses digital hearing aid	With parents
4	F	11	Deaf, uses digital hearing aid	With parent and 4 siblings
5	M	54	Hard of hearing, uses digital hearing aid	Alone
6	M	62	Hard of hearing	Alone
7	F	25	Deaf, lip reads	With family
8	F	55	Hard of hearing, uses digital hearing aid	With husband

An easy-to-follow questionnaire was developed following this pilot study (Appendix 1). The questionnaire was designed to extract both quantitative data as well as qualitative data from

respondents. The quantitative questions measured facts (e.g. demographics), preferences (e.g. digital television over analogue television), and behaviour (e.g. hours spent in watching television) in the format of nominal or ordinal questions. The qualitative questions measured attitudes (e.g. suggestions to the public broadcasters regarding improving service). The questionnaire was available in English and Welsh, enabling respondents to respond in their preferred language. The questionnaire was also available in hard copy as well as via the Swansea University website. A freepost envelope was provided to ensure questionnaires could be returned easily and efficiently.

The questionnaire consisted of four sections investigating the following areas:
- Demographics;
- Media usage: preference and accessibility
- Digital television usage: preference and accessibility
- Suggestions on improving digital television service.

A total of 900 paper copies of questionnaires were distributed and disseminated to target audiences who are deaf or hard of hearing across Wales as follows:
- 550 questionnaires in English were sent directly to Action on Hearing Loss Cymru members;
- 350 questionnaires in Welsh language were distributed at the National Eisteddfod in Denbigh;
- The online questionnaire in both languages was promoted on the BBC website, S4C, Action on Hearing Loss websites as well as via social media include Facebook and Twitter;
- The promotional message was also circulated via the national Media Communication and Cultural Studies Association mailing list;

339 questionnaires were returned, with 240 valid answers and 99 incomplete, giving it a 42% response rate. Among the valid questionnaires, 15 responses were completed online and 225 were from a paper-based survey. Among the 99 incomplete questionnaires, 26 were online and 73 from paper copies. All responses were entered into an Excel spreadsheet for quantitative analysis. Percentages in the tables presented in the report may not equal 100% due to respondents selecting multiple answers. For data validation reasons, incomplete surveys are not included in the quantitative analysis; however, they are included in the qualitative analysis and may be used in future publications if the information returned is relevant to the specific research questions posed by those investigations.

Section Two: Key Quantitative Findings

DEMOGRAPHICS

Two hundred and forty valid answers were returned, giving a 30% valid response rate; 41% of respondents are male, while 59% are female. However, it should be noted that this is a self-selecting sample and therefore demographic data may not necessarily accurately reflect the nature of the deaf and hard of hearing community in Wales.

The following table and figure indicates the age range of survey respondents.

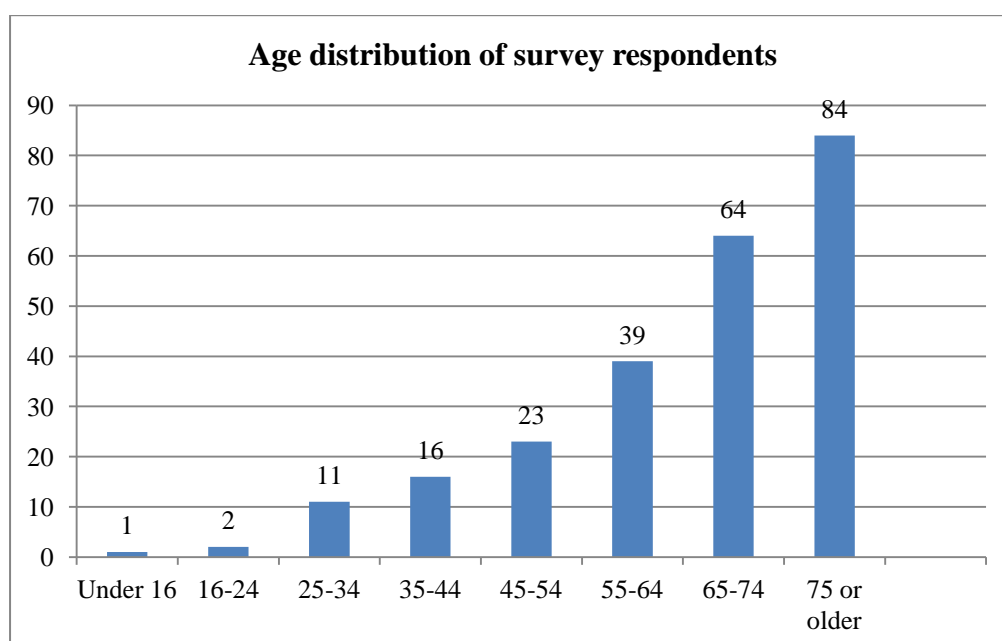**Figure 2.1 Graphical summary of age distribution of participants**

Figure 2.1 indicates that:
- 1 respondent is under the age of 16;
- 2 are between the ages of 16 -24;
- 11 are between the ages of 25-34;
- 16 are between the ages of 35-44;
- 23 are between the ages of 45-54;
- 39 are between the ages of 55-64;
- 64 are over the age of 65 years with 84 of the respondents 75 years or older.

There is a skewed distribution of ages of participants in the survey, with 62% of the sample population over the age of 65, reflecting the fact that hearing loss affects senior citizens more often. This is to be expected given that the sampling was of persons specifically identified as having a difficulty with hearing, which is more prevalent in older people in the general population. This is in accordance with the Action on Hearing Loss (2011) figure showing that 65% of people with hearing loss are of retirement age.

Of the respondents, the overwhelming majority (95%) state that they were white British.

Table 2.2 Ethnic background of respondents.

Ethnicity	The Number of respondents	Percentage%
White Welsh	120	50
White British (non-Welsh)	108	45
White non-British	7	3
Prefer not to say	2	1
Other	2	1

Although overwhelmingly respondents to the survey identified themselves as either White Welsh or White British (non-Welsh), there is evidence that Wales is becoming gradually more multi-cultural[1]. The 2001 census reports that 2.1% of the Welsh population was made up of persons from ethnic minority groups and so this sample does correspond to the population of Wales as a whole, when considering ethnicity.

Questionnaires were returned from all five main regions in Wales, with the highest response from South East Wales (38%) and lowest from North East Wales (8%).

Figure 2.2 Regional distribution of respondents
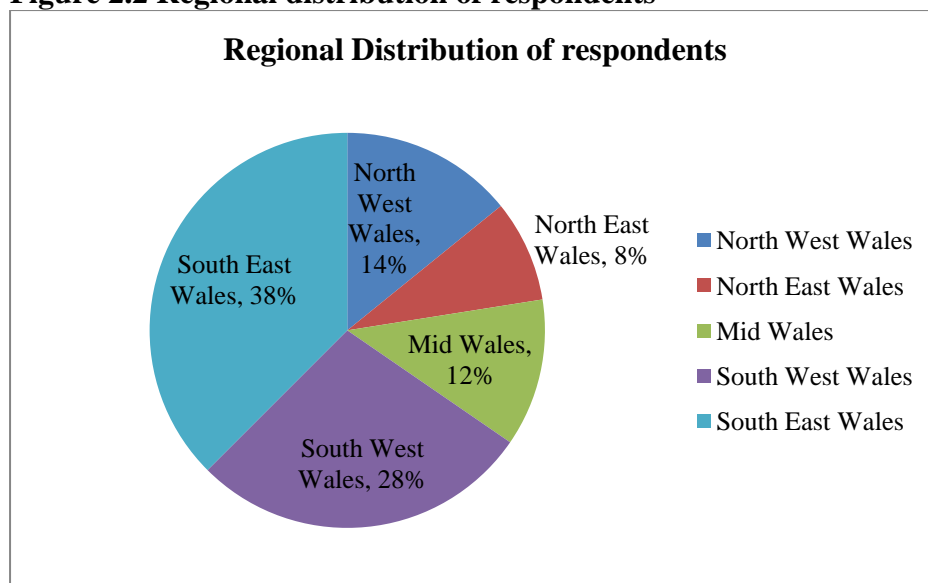
The above figure illustrates that most respondents came from South West Wales and South East Wales. There is a relative underrepresentation of North East Wales in the survey, compared to mid Wales and North West Wales.

The overwhelming majority of the respondents (90%) have English as their first language. This is also apparent in the returned surveys, where all surveys (both complete and incomplete) were returned in the English language. However, 11 respondents (5%) reported

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[1] RNID Cymru's 2010 study indicated that 98% of the respondents were white British.

that their first language is Welsh; 5 respondents (2%) use British Sign Language as their first language; and 7 respondents (3%) speak other languages as their first language.

Table 2.3 Proficiency of Welsh language of respondents

Language Skills	The Number of respondents	Percentage%
Understand spoken Welsh	35	15
Speak Welsh	15	6
Read Welsh	17	7
Write Welsh	7	3
All of the above	14	6
None of the above	183	76

The analysis of levels of understanding of the Welsh language shows that a majority of respondents do not have a basic understanding of the Welsh language. Fourteen respondents expressed that they could understand spoken Welsh, read Welsh, write Welsh and speak Welsh (indicating fluency). Considering the nature of this survey is to measure the reception of television messages among deaf and hard of hearing audiences, the indicators of being able to 'understand spoken Welsh' (15%) and 'read Welsh' (7%) provide a more realistic profile of deaf/hard of hearing viewers access to Welsh television content.

In answering the question with regards to degree of hearing loss, respondents were allowed to respond to as many options as are appropriate to the question regarding their deafness and hearing loss.

Table 2.4 Degree of Hearing Loss

Degree of Hearing Loss	The Number of respondents	Percentage%
Wear digital hearing aid	162	68
Hard of Hearing	116	48
Have Tinnitus	100	42
Deaf	80	33
Lip read	73	30
Have balance problems	40	17
Have Ménière's disease	20	8
Use British Sign Language (BSL)	20	8
Wear hearing aid, not sure if digital	16	7
Have cochlear implant	14	6
Deafened	12	5
Use Sign Supported English (SSE)	7	3
Wear non-digital hearing aid	2	1
Wear a bone-anchored hearing aid (BAHA)	1	0.5

The key findings are:
- Most respondents, over two thirds (68%) have digital hearing aids and a further 8% of the respondents wear other types of hearing aids;

- Nearly half of the respondents (48%) identified themselves as hard of hearing and one third as deaf (33%);
- 8% of respondents reported using BSL and a further 3% of respondents use Sign Supported English, which indicates that questions around the use of BSL and BSL-signed programmes would be answered by few of the respondents in the survey;
- An interesting finding is that around 1 in 3 of the respondents (30%) lip-read, which is reflected in later suggestions about the positioning of subtitles.

TELEVISION USAGE AND PREFERENCES FOR WATCHING TV

This section aims to identify the usage and preference for watching television among deaf and hard of hearing audiences. In measuring television usage, the key findings of the survey concern television-watching choices (with regards to technological options such as types of receivers and methods of receiving television broadcast) and television viewing patterns (such as hours spent watching television everyday); In measuring deaf and hard of hearing audiences' preference for watching television, the key findings of the survey concern the preference of channels, programme types, and facilitating mechanisms such as subtitles and BSL language programmes for deaf and hard of hearing audiences.

Table 2.5 Technology used in watching television

Technology used to watch television	The Number of respondents	Percentage %
TV – on air	231	96
TV – watch again via iPlayer and Clic	79	33
TV – Watch again via on demand services such as Virgin On Demand and Youview	33	14
TV – Recorded Programmes stored on a PVR, hard disk recorded or DVD	99	41
TV – via service such as Netflix or LoveFilm	13	5
TV – via social media such as YouTube	16	7

Overwhelmingly, respondents used a dedicated television set that receives digital broadcasts to watch television (96%). Although online services and digital recording are used increasingly, they are not yet as popular as broadcast television.

Worth noting here is also the growing popularity of the internet broadcasting service and software application iPlayer and Clic developed by the BBC and S4C. Almost one third of the respondents use these services. These digital platforms enable viewers to watch live TV or catch up[2], as well as enable viewers to watch TV via various digital devices such as an iPad. Deaf and hard of hearing audiences face the situation in which the traditional pattern of television viewing as a communal activity among family members is evolving into a more personalised viewing experience.

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[2] On BBC iPlayer, most programmes are available for up to seven days after broadcast; some current affair programmes (such as Panorama) are available for 365 days via desktop computer but for seven days on other platforms; some programs in BBC Four Collections are available for a long period of time while others are available permanently. On S4C Clic, programmes are available for up to 35 days after broadcast.

Table 2.6 Types of TV receivers used by respondents

TV Receiver	The Number of respondents	Percentage%
Old Analogue TV with a set-up box	20	8
Digital TV (non-High Definition)	132	55
High-definition Digital TV	118	49
3D TV	3	1
Don't know	2	1
Other	4	2

The breakdown of televisions used shows that:
- Very few respondents (8%) use old television sets with a set-top box;
- Since the digital switchover, most people have moved to using digital televisions or high-definition sets. More than half of the respondents (55%) have at least one digital television set in their household and almost half of the respondents (49%) have at least one high-definition digital television set in their household.

Table 2.7 Methods of receiving TV broadcast

Methods of receiving TV broadcast	The Number of respondents	Percentage%
Via an aerial (e.g. Freeview, BT Vision, or Top Up TV)	154	64
Via satellite connection (Sky or Freesat)	122	51
Via cable connection (Virgin Media, TalkTalk)	16	7
Other	5	2

As the above figure suggests, the dominant modes of receiving television broadcasts are through a traditional aerial connection or through a satellite connection. This figure corresponds to the official statistics. Due to its mountainous terrain, fewer than 60% of homes in Wales were able to receive Digital Terrestrial Television (DTT) in the pre-switchover period. However, digital television adoption in Wales (72%) was already higher than UK average (65%) in 2007 and this was driven by the satellite coverage (98%) (National Assembly for Wales, 2007). Ever since the completion of the switchover, public service broadcast channels have achieved over 90% coverage in Wales with some areas (such as Rhondda Cynon Taf) achieving a 100% coverage rate (Ofcom, 2013a).

We aimed to identify the experience of people who are deaf or hard of hearing in accessing information and service via television in Wales. We asked questionnaire respondents how many hours they usually spent viewing television every day.

Figure 2.3 Television Viewing Pattern: Hours spent on watching television daily
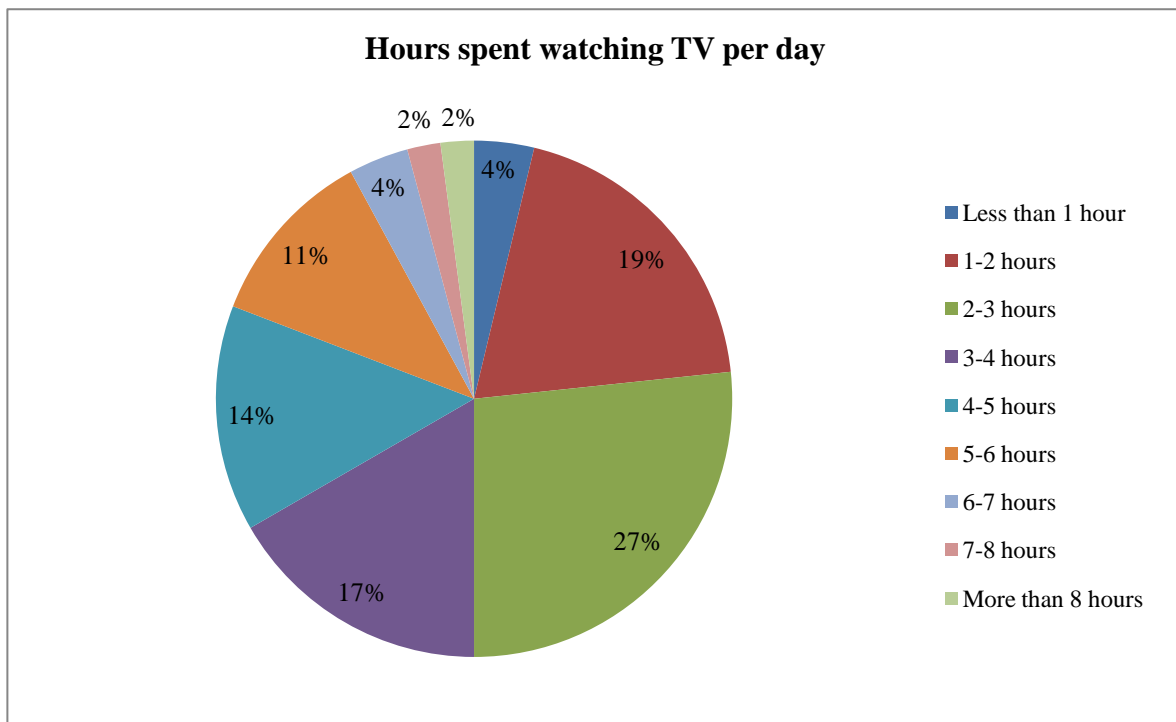
Reported data on time spent watching television per day shows that:

- Television plays a central role in informing, educating and entertaining deaf/hard of hearing audiences in Wales with 96% of the respondents watch more than one hour of television every day.
- More than half of the respondents (58%) watch 2-5 hours television per day.
- One thirds of the respondents (33%) watch more than 4 hours of television per day.
- The average hard of hearing audience watches 3.39 hours television per day. This figure is largely compatible with the Broadcasters Audience Research Board (BARB) statistics from the same period (August 2013). These statistics suggest that the average UK audience spend 24.49 hours per week watching television, that is, 3.49 hours per day watching television (Broadcasters Audience Research Board, 2013).

In choosing among a range of television channels, survey respondents watch the traditional three terrestrial channels (BBC 1, BBC 2, ITV1) more than any others.

Table 2.8 Television channels watched by respondents

TV Channels	The Number of respondents	Percentage%
BBC1	234	98
BBC2	218	91
ITV1	198	82
Channel4	176	73
BBC4	157	65
Channel5	144	60
BBC3	134	56
News channels e.g. BBC News; Sky News	130	55

ITV3	116	48
ITV2	107	45
Documentary channels e.g. Discovery, History, Yesterday	93	39
ITV4	87	36
S4C	75	31
Movie Channels e.g. Film4, Sky Movies	74	31
More4	72	30
E4	60	25
Satellite or cable entertainment channels e.g. Dave, Sky Living	53	22
Sports channels e.g. Sky Sports	36	15
Others	25	10
Music channels e.g. VH1, Kerrang!	7	3
Children's channels e.g. Nickelodeon	7	3

As the above table indicates,

- Public broadcasting services (especially the BBC) remain essential in providing access to deaf/hard of hearing audiences;
- BBC1, BBC2, BBC3, BBC4, Channel 4, Channel5 and ITV1 were all watched by over 50% of respondents;
- Around a third of respondents (31%) reported watching S4C;
- Unsurprisingly given the age demographic of participants, very few watched children's television channels or used the music channels.

Table 2.9 Types of television programmes preferred by deaf/hard of hearing audiences

Type of television show	Number of respondents	Percentage %
News Programmes e.g. 10 o'clock news	198	83
Documentary	189	79
Drama	168	70
Films	149	62
Live events e.g. Royal weddings, live 24-hour news channels	144	60
Comedy	131	55
Current affairs	115	48
Live sport	103	43
Quiz Shows	102	43
DIY/Gardening	87	36
Soap Operas	85	35
Entertainment e.g. X Factor, Splash, Strictly Come Dancing	82	34
Property	80	33
Cookery Shows	73	30
Music	56	23
Sports Highlights	54	22
Reality Shows	28	12
Chat Shows	27	11

Other	15	6
Children's	10	4

For this question, respondents were asked to choose all the television programmes they preferred to watch. The broad range of television shows watched in this analysis contextualises the deaf and hard of hearing audience in a few key ways.

Firstly, deaf and hard of hearing audiences prefer a mix of both factual and drama and entertainment programmes. The following programmes are preferred by more than 50% of the respondents:
- News programmes (83%),
- Documentary (79%),
- Drama (70%),
- Film (62%),
- Live events (60%)
- Comedy (55%)

Secondly, in terms of live broadcast on television, 60% of the respondents indicate that they enjoy watching live events such as the Royal Wedding or live news on 24/7 news channels. A further 43% of the respondents state that they enjoy live sports. Such a high popularity of live events results in a high demand for quality subtitling during live broadcasts, as will be discussed in the following section of this report.

Thirdly, less serious entertainment (e.g. reality shows, chat shows) are not reported as popular.

Figure 2.4 Frequency of using subtitles or BSL in television viewing

A critically important subset of the data was on the comparison of subtitles and BSL in facilitating television viewing.

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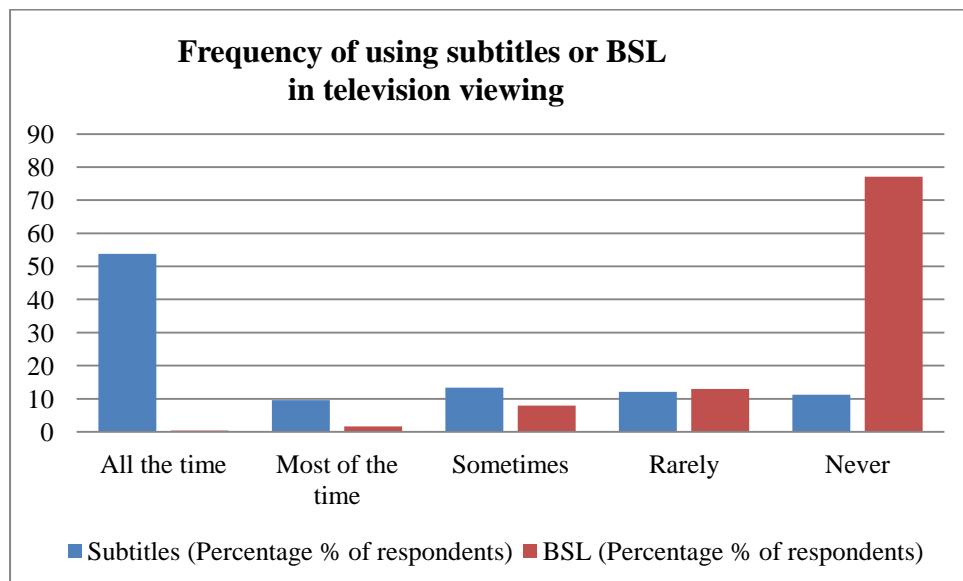
Comparing the data on the use of subtitles and the use of BSL, we found that subtitles are the most popular solution to hearing difficulties when watching television. These findings reflect the fact that subtitling is much more prevalent, with the main broadcasters (BBC, ITV, Channel 4, S4C and Five) all subtitling upwards of 80% of their content, while only late night television is BSL interpreted and these same broadcasters only have a 5% target for signing from OFCOM.

- 89% of respondents reported using subtitles at some point and 54% all the time to watch television. This makes further questions on subtitle use particularly relevant;
- The vast majority of respondents do not use BSL programming frequently and only 24 reported using BSL programming more than rarely (10%).

Closely related to this, we detected some general dissatisfaction about the provision of BSL programming, mainly in *the lack of programming* and the *inconvenient time* of broadcasting:

> Need more signed programmes, better publicity.
> (Male, 55-64, South East Wales, hard of hearing with digital hearing aid)

> Whenever a program uses a BSL interpreter, which isn't often, they are on at unsocial times.
> (Female, 65-74, North East Wales, deaf and use BSL)

> Say *See Hear* is not at a convenient time plus not repeated! (Male, 75 or older, S-E Wales, deaf, tinnitus and lip reader)

We believe that this frustration from the deaf and hard of hearing community is caused by the insufficient provision of signed programmes via broadcast television as well as the lack of knowledge about the availability of BSL programmes via other digital platforms. Currently the BBC broadcasts two types of BSL programmes. One is BSL sign-interpreted version of mainstream BBC programmes in the Sign Zone (via iPlayer); the other is programmes created for BSL users such as *See Hear* (via broadcast and iPlayer). Unless deaf and hard of hearing audiences are capable internet users or confident users of iPlayer, they receive only a small percentage of BSL interpreted programmes via their television screens

Some viewers are aware of the need in digital literacy training and suggested:

> Put on a presentation for deaf/hard of hearing people demonstrating some of the options around subtitling etc which they may not be aware of (Female, 65-74; S-E Wales, hard of hearing, digital hearing aid; lip read)

Further comments from other respondents expressed a demand for public broadcast programming as *a resource for learning BSL*.

> TV programme for deaf/hard of hearing children in Wales to learn Welsh BSL.
> (Female, 35-44, South East Wales, deaf, BSL user)

> Programmes for learners of British Sign Language would be a great help for people who find it difficult to get to their local classes. Suggest three levels: basic, intermediate, improve classes.
> (Female, 65-74, South East Wales, deaf, with digital hearing aid)

DIGITAL TELEVISION USAGE AND BARRIERS OF ACCESSIBILITY

In general, respondents enjoy the better picture quality, variety of programmes and better sound quality available on digital television since the digital switchover completed in Wales. 62.5% of the respondents believe that digital television provides a better service than the old analogue television.

Table 2.10 Perceived benefits of switching to digital television by respondents

Perceived benefits of DTV	Number of respondents	Percentage %
Better Picture Quality	148	62
Better Range and Quality of Programmes	115	48
Better Sound Quality	98	41
Better Subtitling Options	84	35
Better Quality of Subtitles	78	33
Other	13	5
Better Sign Language Availability	5	2

In the main, perceived benefits were seen through a technological lens, i.e. better picture quality (62%), wider range of choices (48%), and better sound quality (41%). The improvement of subtitling and subtitling options is significant (35% and 33% respectively), the availability of BSL programming was seen as beneficial by 2% of the respondents.

The difficulties reported in using digital television are very important in the overall scope of this research.

Table 2.11 Reported difficulties of using digital television

Reported difficulties of using DTV	Number of Respondents	Percentage %
Delay on subtitles	148	62
Subtitles missing	140	58
Difficult to hear speech	125	52
Misspelling on subtitles	121	50
Subtitles use wrong words/inappropriate words	108	45
Background noise	104	43
Poor quality subtitles during live broadcast	101	42
Subtitles moving too quickly	66	28
Poor Sound Quality	54	23
Other	46	19
Sparse subtitles	39	16
Cannot follow subtitles	17	7
Cannot get subtitles to work	15	6
Not enough sign language availability	15	6
Cannot access subtitles due to low signal strength	13	5
Sign language programmes at inconvenient times	10	4
Size of subtitles too small	10	4

More than half of the respondents reported difficulties in the delayed subtitles, missing subtitles, misspelling on subtitles and difficulties hearing speech.

Inappropriate linguistic choices in subtitles (45%), background noise (43%), and poor subtitles during live broadcasts (42%) all indicate that for this demographic (that use subtitles often) the service provided is often perceived as less than adequate.

Although digital television is perceived as better than or as good as the old analogue service by the majority of respondents (63% and 18% respectively), some respondents expressed a sense of nostalgia towards the teletext service that was available on analogue television.

> I miss the teletext pages that were available on ITV. They were very useful
> (Female, 75 or older, didn't identify region; tinnitus, wearing hearing aid)

A much younger viewer provided a more detailed explanation of his preference of teletext on analogue television:

> I personally preferred Teletext as the whole system was a lot easier to use than the digital media system. The first reason was that with the Teletext system, different speakers were attributed a different colour. This enabled for the viewer to distinguish between different speakers, who might be speaking quite quickly. Whereas the digital system featured only has one colour and that sometimes interferes with the background of some programmes unlike the black block of teletext. Last but not least would be the reset function on the Teletext was quite simple if the programme did not sync up to the subtitles. I would turn the subtitles off, switch to another programme and return to my original programme, place the subtitles on and they would generally work. Whereas with the Freeview box, when the subtitles have stopped working, it would require a whole system reboot as such which gets irritating after a while. (Male, 22, S-W Wales, Deaf, Uses digital hearing aid)

However, the preference of teletext over subtitles could be due to the result of lack of awareness of various subtitling functions available on digital television. We tested our respondents' awareness of services to alter colours or size of subtitles on digital television. The awareness is far from widespread.

Table 2.12 Use of service to alter colour or size of subtitles

	Number of Respondents	Percentage %
I have used these services often	2	1
I have used these services	9	4
I am aware of these services but have not used them	32	13
I do not know about and have not used these services	197	82

A significant finding is that 82% of respondents did not know about services that could alter the size and colour of subtitles. Given the high number of survey participants that use subtitles, more publicity of these services seems critical.

In comparison to this, the awareness of video on demand service and 'red button' for extra information is much stronger (72% and 85% respectively).

Figure 2.6 Using digital television facilitating services: A comparison of the use of service to alter colour and size of subtitles, the use of VoD and the use of red button
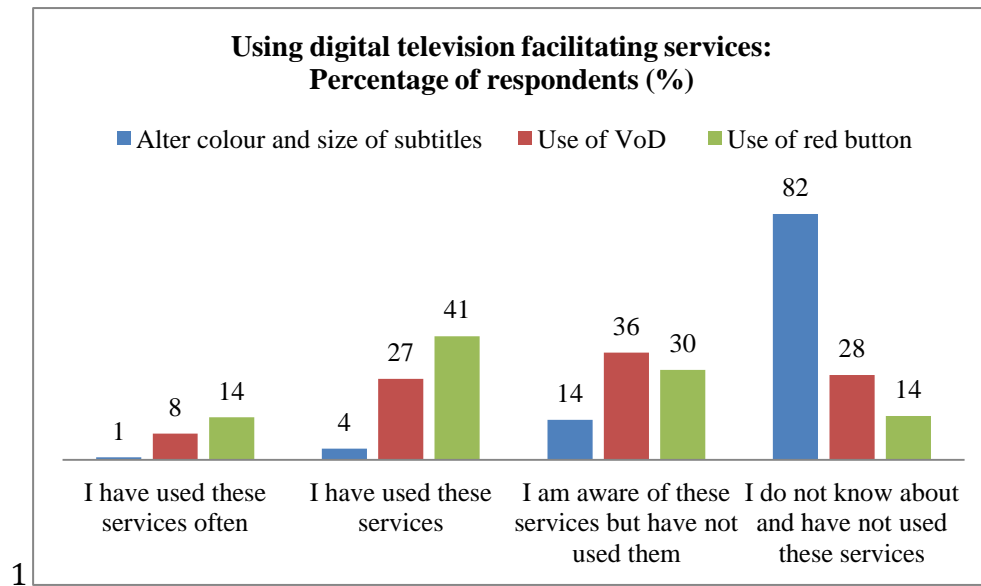
Although the general awareness of video on demand services and 'red button' for extra information is stronger, it seems that only a small proportion of respondents actually used these services regularly (8% and 14% respectively).

There was a good awareness of the assistance available during the digital switchover (61%). 20% of respondents received support and the comments are favourable:

> Excellent service from trained staff when meeting with problems during the TV switchover. (Male, 75 or older, S-W Wales, hard of hearing with digital hearing aid)

> During the switchover, a man [an engineer] called at my house with a digital box. He fitted it and showed me how to use it. He also gave me a phone number to use if I had problems. I used this number and received excellent help (Female, 75 or older, S-W Wales; tinnitus, wearing digital hearing aid)

Local authorities and Action on Hearing Loss are frequently mentioned as sources of information and assistance. Local businesses (e.g. retailers), family members, or neighbours are regarded as helpful as well.

However, there is still a perceived need to understand the wide range of features of digital television comprehensively. Among the deaf/hard of hearing audience surveyed, only 20% of them feel that they understand the range of services available; 52% of the respondents believe that they 'know some of the features'; while 28% of the respondents do not feel that they understand the services available on digital television. We therefore believe that there is evidence indicating a market for education on the topic.

This is particularly true of the elderly audience who constitute the majority of the deaf/hard of hearing population. They often 'find modern technology very tricky' according to an 84-year old woman. In terms of the training or service received, survey respondents particularly praised Action on Hearing Loss, while at the same time pointing out that there was room for improvement:

Action on hearing. It is a very valuable service, but more needs to be done to help the very elderly who are mostly confined in their homes by the use of home service by ever well trained staff. Many have profound deafness and often do not use their hearing aid etc. (Female, 75 or older, N-E Wales, deaf))

I think a lot of deaf/hard of hearing people are unaware of the listening aids available from local authorities and Action on Hearing Loss (RNID) (Male, 75 or older, Mid Wales; deaf, wearing digital hearing aid)

DIGITAL TV CONTENT IN THE WELSH LANGUAGE

A subsidiary question arising from the use of subtitles regards the use of subtitles with Welsh language broadcasting. Of those respondents that reported watching programmes on S4C most reported using English language subtitles, which is consistent with the Welsh language proficiency data from the respondents. More importantly, this reflects the fact that only a small number of new programmes are subtitled in Welsh each week (around 7 to 8 hours a week), in comparison with the roughly 80% of the programmes which are subtitled in English.

Table 2.13 Subtitle used with Welsh language television

Language	Number of Respondents	Percentage %
English	93	39
Welsh	5	2
I use subtitles in both English and Welsh	8	3
I do not use subtitles when watching S4C	6	3
I do not watch programmes in the Welsh Language	128	53

One respondent made a suggestion on improving the popularity of Welsh drama programmes with the help of English subtitles:

> Promote Welsh drama programmes (with subtitles-English) on BBC. I like drama programmes but do not know the Welsh language, so do not normally switch on S4C [nor am I]] aware of such programmes on S4C. Ta. (Female, 65-74, S-E Wales, deaf, Digital hearing aid)

This suggestion is a practice which is increasingly being used by S4C with the recent promotion of dramas *Y Gwyll* and *35 diwrnod* on both the BBC and ITV in Wales.

A further question was asked regarding whether people liked the presence of burned-in subtitles, i.e. subtitles keyed onto video that cannot be taken away by end-users. 12% of the respondents prefer burned-in subtitles; 42% prefer called-up subtitles; 45% have no strong preference; and 13% of the viewers say their preference varies with the programme being watched.

There is a clear indication that some Welsh audiences would like to have the option of having subtitles in Welsh. As one female audience from North East Wales (45 -54, Cochlear

Implants) said, she 'would like subtitles in Welsh, not English', but she cannot find the option to have subtitles in Welsh. This demand was echoed by another respondent:

> Make it clear how I can get Welsh subtitles on Welsh programmes. Have subtitles on ALL programmes – S4C falls behind on this especially live or chat programmes e.g. y Babell Lên in the Eisteddfod. (Female, 45-54, S-W Wales, deaf wearing digital aid)

Such responses re-iterate the demand for digital media literacy among deaf and hard of hearing audiences and a demand for education in this market, but it also suggests that the programmes which are subtitled in Welsh should be better signposted so that they can be easily identified by the audience. Finally, this participant found a practical advantage derived from completing the survey:

> I was not aware that I could receive Welsh subtitles as the subtitle language available was not displayed on the general TV setting, i.e. Welsh/Cymraeg. I then tried entering menu when tuned to S4C, and… Hey presto Cymraeg!! I would not have tried this without information from this survey, THANKS!
> (Male, 75 or older, South West Wales, hard of hearing with digital hearing aid)

Section Three: Key Qualitative Findings and Suggestions on improving digital television services for deaf/hard of hearing audiences

In this section, we analyse qualitative data extracted from both semi-structured interviews and the survey questionnaires. The key research question posed was: 'Do you have any other comments or suggestions to BBC and S4C regarding services for deaf and hard of hearing people in Wales?' Most suggestions made by participants in longer, textual answers concerned primarily two key areas of complaint: sound quality in television broadcasting and the quality of subtitles. Suggestions for improvement correspond to the BBC editorial guidelines on providing service to hearing impaired audiences (BBC, 2011) but suggest that more action is needed to meet this audience's needs.

SUGGESTIONS ON IMPROVING SOUND QUALITY

The use of background music

The use of background music is regarded as unnecessary and inappropriate in most factual programmes, such as news, current affairs programmes, documentaries and reality shows (such as cookery programmes). Many respondents complained about how background music obscured speech. Audiences particularly complain about the use of background music in documentaries about nature and wildlife, as it is intrusive to the beauty of the natural sounds.

> The worst thing is background music which is not necessary – e.g. documentaries showing animals etc. No need for music when person is talking, as music drowns out speech. (Female, 55-64; S-W Wales; deaf wearing digital hearing aid)

> Remove music from voice. Some BBC Wales are guilty of this. Some of their programmes have so much music behind voice that I cannot hear the dialogue.
> (Male, 75 or over, South East Wales, hard of hearing with digital hearing aid)

> Music which accompanies *most* programmes – which often obscure speech for those deaf or hard of hearing … please, less 'pounding' music on documentary and specially Natural World programmes (Female, 75 or above, deaf wearing digital hearing aids)

> Why do most programmes play music, when people are speaking? I love music, but not when it detracts from what people are saying. I find it very annoying, and I am not alone in thinking this, even from people who have good hearing (Female, 65-74, South West Wales, deaf, tinnitus, lip-reading)

In some cases, the use of background music in drama is regarded as 'drowning' speech as well.

> There is a tendency to use background music on practically most programmes. Many programmes would be more enjoyable without background music […] It also 'drowns' the spoken word is some film and drama. (Male, 75 or older, South West Wales, hard of hearing with digital hearing aid)

Some respondents pointed out that background music (especially particularly heavily percussive music) particularly concerns deaf or hard of hearing audiences. Turning up the volume on the television or a hearing aid may even aggravate the problem as it amplifies the music as well.

Remove all background music! As this destroys many otherwise excellent programmes. Try listening with a hearing aid and you will see what I mean. (Male 65-74, S-E Wales, tinnitus, wearing digital hearing aid)

While appreciating the value of music as a background to programmes, it is often too loud and drowns dialogue. Being deaf or hard of hearing is harder work for the brain computing what is being heard, and can be very tiring rather than a pleasurable, enjoyable experience. (Male, 65-74, North West Wales, deaf with digital hearing aid)

Background music!! Not only hearing impaired people have difficulty with this problem, using the loop system is of no help. This amplifies the music as well. It ruins TV viewing. (Female, 65-74, North East Wales, hard of hearing with digital hearing aid)

There are complaints about background noise (see the following section). However, noise in general is regarded as less of a problem compared to background music. The use of background music clearly provokes very strong feelings amongst this audience, as it affects the comprehension of programmes and the general enjoyment of programmes. In terms of viewers who are deaf or hard of hearing particularly, it may affect their opportunities in learning, as one audience member commented: 'I have difficulty in learning the talking because of noise or music' [*sic*] (Male, 75 or older, S-W Wales, deaf, wearing digital hearing aid)

Clarity of speech

Factors inhibiting clarity of speech on air include 'poor and very fast delivery, mumbling and muffled dialogue, turning away from camera, people talking over each other, trailing off at the end of sentences' (Armstrong, 2011, p. 1). In this survey, deaf or hard of hearing viewers identified almost all of these factors:

Many actors (male and female) do not enunciate their words and seem to think muttering gives authenticity and atmosphere, I have to ask my companion for translation.
(Female, 65-74, N-Et Wales, hard of hearing with digital hearing aid)

Dialects were difficult to hear but this is perhaps understandable. And of course in *Newsnight* or other debating programmes when two people speak at once.
(Male, 75 or over, N-E Wales, hard of hearing with digital hearing aid)

Choose news readers and all presenters with much clearer diction. I get really annoyed with presenters who begin a sentence and appear to 'swallow the rest'.
(Female, 65-74, S-W Wales; Ménière's disease, wearing digital hearing aid)

For the deaf or hard of hearing viewers who lip-read, factors inhibiting clarity of speech on air affect their ability to lip-read. Improving the clarity of speech would help to enhance the intelligibility of the television audio-visual messages.

Because I partially lip-read, I like to be able to see the speakers' lips. The weather presenters often turn away from the camera (Female, 75 or older, S-W Wales; tinnitus, wearing digital hearing aid)

It would help if announcers spoke more clearly so it would help lip reading (Female, 75 or older, S W Wales, deaf, wearing digital hearing aids)

There are some complaints about the background noise in news programmes affecting clarity of speech. Journalists conducting interviews in a noisy environments featuring high-pitched sounds, for example, sports stadiums filled with shouting spectators or airports where engines roar. One respondent suggested:

> Can more thought be given to the location of interviews of the type where interviewer and interviewee are forced to shout at each other but little context is discernible, sometimes large facts of conversation are lost. (Male, 75 or older, S-E Wales, deaf, digital hearing aid)

> [Wish] your reporters/presenters not to present reports from noisy environment. e.g. Royal Welsh show, reporting from main ring with events going on; or from a busy roadside. This is important for hearing people as well as hard of hearing (Male, 75 or older, S-E Wales; deaf, wearing digital hearing aid)

Inconsistency of sound levels across programmes and channels

The survey audience also identified other sound quality related problems in broadcasting. One complaint is about the inconsistency of sound levels across programmes and channels. As one respondent complains, 'Sound levels vary on different programmes and channels from soft to loud without touching settings' (Males, 65-74, N-E Wales, tinnitus, digital hearing aid).

This is particularly a problem for deaf/hard of hearing audience living with family members who do not have hearing loss. When changing programmes or switching channels, deaf and hard of hearing viewers often find the discrepancies between sound levels across programmes and channels frustrating. As one young respondent said, her family complain when the TV gets too loud (female, under 16, S-W Wales, deaf, lip-reader)

SUGGESTIONS ON IMPROVING THE QUALITY OF SUBTITLES

Subtitles are crucial for the understanding and appreciation of television for the deaf and hard of hearing audience. As the quantitative data suggests, 89% of respondents reported using subtitles at some point and 54% at all times to watch television.

In terms of the quality of subtitles, most deaf and hard of hearing viewers applaud the subtitling service from the public broadcasters, but at the same time express their demand for further improvement:

> I find the subtitling service useful – especially in dramas where speech can be quiet or fast. It is a good service, but could be improved a little (Male, 75 or older, South West Wales, deaf, wearing digital hearing aids)

In terms of improving the quality of subtitles, a thematic analysis of qualitative data reveals the following areas of suggested improvement:
- Accessibility;
- Accuracy;
- Continuity and better synchronization;
- Better presentation.

Accessibility

'Subtitles should be available for *all* programmes' is a suggestion echoed by several respondents. For many respondents, subtitling is as important as the soundtrack and is the key element of information that allows access for the deaf/hard of hearing community to the rest of the world via television. It is not surprising to learn of the demand for subtitles on all programmes and channels:

> Make subtitles consistent and lack of subtitles as unacceptable as lack of soundtrack.
> (Female, 55-64, North West Wales, deafened)

> Please keep providing subtitles on ALL programmes. It means I don't misunderstand what is being shown and can then discuss appropriately with colleagues. It helps to understand TV clearly, so I don't feel left out.
> (Female, 25-34, North West Wales, hard of hearing with digital hearing aid)

> Make subs mandatory for every channel and for every programme.
> (Female, 25-34, South East Wales, deaf)

This was not limited to digital television or public broadcasters, as this demand includes commercial providers such as Sky and Netflix. For example, as one respondent complained, Netflix only provides subtitles to around 10% of its films[3] (Female, 65-74, South West Wales, tinnitus).

Accuracy

Quantitative data from this survey suggests that subtitling of live events is the most frequently cited area for improvement (55% saw this as very important). One issue of particular concern is inaccurate subtitling.

Inaccuracy in subtitling can range from omission, to minor spelling errors or even major misleading subtitles. No matter if it is major or minor, inaccuracies in subtitling affect the comprehension and enjoyment of television viewing:

> Better subtitles on live news programmer are needed. They are slow and inaccurate.
> (Female, 45-54, North East Wales, hard of hearing with digital hearing aid)

> Correcting wrong words, can create more problems not intended.
> (Female, 65-74, South West Wales, deaf with digital hearing aid)

> Spelling errors are a major problem. It makes me feel like a sub-editor when I should be enjoying TV!
> (Female, 35-44, South East Wales, deaf, BSL user)

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[3] Netflix provides subtitles on almost all of its programmes, but it is not always obvious as to how to turn them on as it varies by the platform (computer, Apple TV, Roku, etc.). See https://help.netflix.com/en/node/372. Meanwhile, the poor quality of Netflix's closed captions was criticized for 'alienat[ing] subscribers who are deaf, hard of hearing, or simple have difficulty understanding dialogue' See http://theweek.com/article/index/255618/how-netflix-alienated-and-insulted-its-deaf-subscribers#axzz33TplpBki

Continuity and Synchronization

Respondents commented on the frustration over *intermittent subtitles*, which disappear for various reasons:

> It's maddening when watching a programme and the subtitles vanish, we then cannot follow programme (Female, 65-74, Mid-Wales; deaf, cochlear implant, tinnitus)

Several respondents commented on the problems of *latency* in particular, i.e. the delay between speech and live subtitling or the delay between subtitling and the audio and visual content.

> a. The same statements are left on screen for prolonged period. b. There is also too much of a gap between the spoken word and the visual form.
> (Male, 75 or older, regions not identities; deaf wearing hearing aid, tinnitus)

> It is annoying when subtitles run late and a change of subject means cutting subtitles to catch up. It is difficult to concentrate when there is a delay between what I see and when I understand it.
> (Male 65-74 S-E Wales; tinnitus, wearing digital hearing aid)

> Synchronization of subtitles with speech in both live and recorded programmes is very important. It is very frustrating and difficult to follow when it is not.
> (Female, 65-74, S-W Wales, deaf with digital hearing aid)

Synchronization of subtitles with speech in both live and recorded programmes is very important to all viewers. For the deaf and hard of hearing audience, this is particularly important due to the fact that the majority rely on subtitles to complement their understanding of audio messages from television. For audience members who are deaf or hard of hearing and suffer from other medical complications (such as chronic fatigue syndrome, as one of the respondents reported), correct and complete subtitling is essential to the enjoyment of digital television.

Some audience members offered solutions for the problems of lack of synchronization between speech and subtitling:

> Delay all live broadcasts by a few second, to enable the subtitles to catch up.
> (Male, 65-74, South West Wales, hard of hearing)

> I have dyslexia so subtitles do not help me. Make an app to transmit sound through tablets to synch with live programs. Hand held subtitles app would be a good idea for some.
> (Male, 35-44, S-E Wales, deafened, BAHA and lip-reads)

Better Presentation

The presentation of subtitles, i.e. the positioning, style, colour and speed is a concern for many deaf/hard of hearing viewers. Some comments highlighted a barrier to accessibility of information through the positioning of subtitles:

> Often, subtitles obscure other information on the screen, particularly the weather forecast. As we live on the south coast, the detail is often hidden by the subtitles! This is true of other information generally shown on the bottom of the screen

(Female, 45-54, South West Wales, deaf with digital hearing aid)

Position of subtitles on the screen e.g. during an interview, the subtitles were across the heads of the people, cannot see white subtitles on a white background
(Male, 75 or older, N-W Wales; Deaf, wearing digital aid).

Subtitles often in wrong place: obscure speakers' titles so no clue as to who is speaking.
(Male, 75 or older, S-E Wales, Deaf, tinnitus and lip read)

Sometimes the subtitles cover up text on the bottom of the screen such as clarified or translated speech. It is possible for the subtitles to be shifted when needed so they don't obscure other text?
(Female, 65 -74; S-E Wales, tinnitus, Ménière's disease, wearing digital aid)

Some channels use light colour subtitles that can be hard to read against a light background. Light letters can be heavily bordered with dark contrast colour and vice versa.
(Male, 45-54, S-E Wales, Deaf/tinnitus, wears digital hearing aids and lip-reads)

I cannot differentiate well between different subtitles that indicate different speakers in fast moving programmes. It is a problem for some of the programmes I like, such as *Question Time*. It usually results in speech passing too quickly and me losing the thread of the programme.
(Male, 55-64, South West Wales, hard of hearing with digital hearing aid)

Leave subtitles on *longer*, Not flash on and off before you can read it. Keep up with what is happening in programme.
(Female, 75 or older, S-E Wales; Ménière's disease, tinnitus, lip-reads, wearing digital hearing aid)

The obstruction of other audio-visual or textual information by subtitles pose another challenge for deaf and hard of hearing viewers who lip-read, these account for almost one third of the total respondents (30%):

As I lip-read, I frequently find the subtitles are shown over the lips. This is frustrating.
(Female, 75 or older, South East Wales, deaf, wearing hearing aids)

Some participants expressed a desire for more control over the presentation of subtitles:

Subtitles on wrong part of screen-need to be able to move them via wheel on remote-up/down/left/right.
(Female, 55-64, N-W Wales, tinnitus)

Subtitles position extremely poor (need to be able to move them down screen). I also would appreciate option to reduce font size too.
(Female, 55-64, South East Wales, deaf wearing digital hearing aids, lip-reader)

I would love a speech channel where I could raise speech above all other sounds or reduce other sounds. Failing that, I would like to move subtitle around the screen so that on-screen captions and objects on display could be usable.
(Male 65-74 S-E Wales; tinnitus, wearing digital hearing aid)

Section Four Conclusions

This survey firstly provided a general mapping of deaf or hard of hearing digital television audiences in Wales.

We identified that the deaf and hard of hearing audience body consists of a predominantly female audience and mainly older people with more than 60% of the respondents aged over 65. Audience members come from different parts of Wales and the predominant ethnicity is White Welsh or White British. About 15% of the respondents understand spoken Welsh, 7% read Welsh and a further 6% could be regarded as fluent Welsh users.

The majority of the deaf and hard of hearing respondents wear digital hearing aids (67.5%) and about one thirds of them lip read (30%). 5% of the respondents use British Sign Language, while 8% of the respondents use Sign Supported English.

Broadcast television occupies a central position in the media consumption of this community with 96% of respondents using the medium, and more than half of the respondents (57%) watching 2-5 hours television per day. Public broadcasters (especially the BBC) are regarded as the major sources of information. However, we identified a significant percentage of audiences (around one third) also use online broadcast channels or applications (such as iPlayer and Clic) and recorded programmes stored on a PVR or DVD. Television via other platforms such as paid on demand services and social media currently have a small percentage of users, nonetheless indicating a rising alternative platform to the mainstream broadcasting.

The traditional terrestrial television channels remain the central information source for deaf or hard of hearing audiences. News, documentaries and drama are the three most preferred television genres.

The provision of Welsh content as well as BSL is welcomed by deaf or hard of hearing audiences in Wales. A comparison could be drawn here between the provision of BSL and subtitles in the Welsh language. Both serve to enhance the television viewing experience, and provide resources for the learning of BSL/Welsh language.

This study has established that subtitles are the most important facilitating tool for deaf/hard of hearing audiences in their reception of television messages. Common problems associated with sound quality and subtitles affect both normal audiences as well as the deaf/hard of hearing audience. However, for the latter, a significant amount of whom rely on digital hearing aids (68%) and also lip reading (about one third), the demand for better sound quality and a better subtitling service is more acute.

This survey has identified a number of barriers facing people who are deaf or hard of hearing in Wales in accessing information, education and entertainment via digital television. Barriers were identified mainly in the areas of sound quality and subtitles.

KEY RECOMMENDATIONS:

1. Ofcom guidelines on the quality of subtitles should be further implemented

Less than three months before this survey commenced, Ofcom (Ofcom, 2013b) published a consultation proposal aiming to improve the quality of subtitling on TV to benefit deaf and hard-of-hearing viewers across the UK. In this proposal, Ofcom identifies the following main problems associated with subtitling:

- latency – the delay between speech and live subtitling;
- inaccuracy – mistakes that vary from minor spelling errors to major omissions or misleading subtitles;
- intermittent subtitles, which freeze or disappear for unpredictable reasons; and
- presentation – whether subtitles are shown scrolling across the screen or in more readable blocks containing one or more sentences.

In October 2013, Ofcom's statement (Ofcom, 2013c) provides clear information on the current work in improving the quality of live subtitling and subtitling for repeats and on-demand programming. This is a timely intervention from Ofcom and we believe that findings from this survey provide further evidence for Ofcom guidelines on improving the quality of subtitling.

2. An awareness campaign is needed to help deaf and hard of hearing audiences to understand the full range of interactive services available on digital television platforms.

This study revealed that a significant percentage of respondents are not aware of the range of services available on digital television platforms. Although there was assistance during the switchover, it appears that sustained support from local authorities, charities and public broadcasters is needed to help deaf and hard of hearing audiences grasp the whole range of functions enabled by the digitalisation. Based on this study, we would recommend that priority should be given to making people aware of the interactive services that enable users to perform activities such as to alter the size and colour of subtitles and switch on Welsh language subtitles. There is clearly a market for education in the area of digital television literacy.

3. Accredited awareness training should be ensured for public broadcasting staff and their independent producers in promoting accessibility for deaf and hard of hearing community. Such training should exemplify the best practice in dealing with issues such as background noise in news production.

The BBC has promulgated various editorial guidelines in promoting accessibility for deaf and hard of hearing audiences. Such endeavours could be seen in documents such as *Editorial Guidelines for Hearing Impaired Audiences* (BBC, 2011), *Online Subtitling Editorial Guidelines* (BBC, 2009) and more recently the promotion of accessibility on the Internet[4]. S4C has also created guidelines for subtitles on their programmes – *Canllawiau S4C ar gyfer isdeitlwyr yng Nghymru* (S4C, 2008). All these guidelines on the production of media

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[4] For example, television content available in British Sign Languages or with subtitles on the My Web My Way page at http://www.bbc.co.uk/accessibility/guides/hearing_index.shtml.

content provided information on how to improve sound quality and subtitle accessibility during the pre-production, production and post-production stages.

For example, the BBC *Editorial Guidelines for Hearing Impaired Audiences* (2011) addressed issues such as background music, background noise, clarity of speech and unfamiliar or strong accents in programme production. The guidelines inform readers of various types of intrusive background noise and their detrimental effects on listening comprehension. For example, 'low-pitched sounds like traffic, fans and air conditioning or rumbling background effects and music are more likely to cover up the sounds of speech' (BBC, 2011, p. 5). However, this survey suggests that the use of background music and the presence of background noise caused problems for many deaf and hard of hearing respondents. It is therefore important that programme makers produce content that does not have overwhelming background noise or music.

The Digital Production Partnership (DPP)[5] Technical Standards provide television broadcasters in the UK guidance for compliance to the European Broadcasting Union R128[6] Audio Loudness specification. Ever since its introduction in the UK on 15 Oct. 2013, broadcasters such as the BBC now can measure and normalise audio using Loudness meters. We are aware that the introduction of the R128 standard is a comparatively new professional guidance and it provides opportunities as well as new challenges in post-production.

The first issue is technical constrains. Although technically speaking, by meeting the R128 specifications, dialogue becomes more intelligible. David Old, Head of Audio Encore, however, warned that R128 loudness metering does not fix editorial problems where producers have not left enough space for the dialogue in a fast-paced programme, and dialogue then has to compete again the sound effects and music for audibility[7]. This leads to the second issue about adherence. Currently DPP led by the BBC, ITV and Channel 4 with representation from Sky, Channel 5, S4/C, UKTV and BT Sport. This not-for-profit initiative does not include the large number of commercial producers and freelancing programme makers in the country. It requires more than public broadcasters' good will to ensure the commercial sector in program production shoulder the responsibility for EBU R128 as well.

We recommend that further awareness training of the special needs of deaf and hard of hearing audiences from public broadcasting staff members as well as commercial producers is necessary. Meanwhile, we recommend further monitoring of the use of background music and background noise in news, live events, documentaries, and drama programmes. Training of programme makers would help to raise awareness of the difficulties faced by people with hearing loss. Monitoring by both the broadcasters and the regulator would help to raise the profile of this issue and lay the foundation for future work in this area.

4. More opportunities for people who are deaf and hard of hearing to take part in media co-production.

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[5] Founded in May 2010, this not-for-profit partnership is led by the BBC, ITV and Channel 4 with representation from Sky, Channel 5, S4/C, UKTV and BT Sport. Its work consists of mainly two parts: the standardization of technical and metadata requirements with the UK broadcast industry and sharing of thinking, information and best practice. Source: http://www.digitalproductionpartnership.co.uk/who-we-are/

[6] Full details could be accessed at: https://tech.ebu.ch/docs/r/r128-2014.pdf.

[7] David Old made this comment at BBC Academic Sound Matters Event Creative Opportunities in Post Production by using R128. The video could be accessed at: http://www.bbc.co.uk/academy/technology/article/art20140310151043961

Several respondents expressed strong interest to control the viewing experience themselves. For example, viewers would like to have the ability to reduce the volume of background music or fade background noise, move the position of block subtitles, or use an app for a more individually tailored subtitling service. The digital platform offers the possibility of co-production between media professionals and conventional users. We believe a more forward-looking approach to the issue of enhancing accessibility could be an investigation into the technological possibility of incorporation of audiences into the co-production of sound and subtitling.

5. S4C should consider the identified needs from people who are deaf and hard of hearing for more Welsh language subtitles.

Even though the number of respondents who were fluent in Welsh was small, a clear indication was given in the qualitative findings of the desire to see more Welsh language subtitles available on S4C. At present there is a provision of around 7 to 8 hours a week, however, what is clear, is that many deaf and hard of hearing audience members are unaware when subtitles are available in Welsh on particular programmes. This indicates that more needs to be done in order to signpost these Welsh language subtitles. This could be done by adjusting the current drop down symbol which is shown at the beginning of programmes and after each advertising break highlighting which subtitle language options are available, in order to highlight that it is possible to select either English or Welsh subtitles. Information about the availability of Welsh language subtitles should also be made clear on any programme guides and published schedules (EPG – especially the information bar which appears on the channel itself, online schedules, newspaper/magazine schedules) to allow deaf and hard of hearing audiences to plan their viewing[8]. As already mentioned in point 2 above, audiences also need to be aware of how to select Welsh language subtitles when both English and Welsh subtitles are available[9]. As this is a different process for each digital television provider, we would encourage S4C to make the guides which they have on their website (http://www.s4c.co.uk/e_access.shtml) much more visible, possibly by having a link on their homepage.

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[8] Currently only the schedules on S4C's own website note the language of the subtitles, published schedules in newspapers only note the availability of subtitles. S4C provides information to press bureau's indicating the language of subtitles, as well as all access services, however these do not go to print.
[9] Sky, Freeview, YouView and Freesat allow audience to select the preferred language of subtitles (English, Welsh, Scots Gaelic, Irish, etc.). If it is available, it will be used automatically after that. Most DVD players, etc. work similarly.

Bibliography

Action on Hearing Loss. (2011). *Facts and figures on hearing loss and tinnitus.* Retrieved May 20, 2014, from Action on Hearing Loss Web site: http://www.actiononhearingloss.org.uk/your-hearing/about-deafness-and-hearing-loss/statistics/~/media/56697A2C7BE349618D336B41A12B85E3.ashx

Armstrong, M. (2011, April). *Audio Processing and Speech Intelligibility: A literature review.* Retrieved January 3, 2013, from BBC Research White Paper: http://downloads.bbc.co.uk/rd/pubs/whp/whp-pdf-files/WHP190.pdf

Austin, B. A. (1980). The deaf audience for television. *Journal of Communication, 30*(2), 25-30.

Austin, B. A., & Myers, J. W. (1984). Hearing-impaired viewers of prime-time television. *Journal of Communication, 34*(4), 60-71.

BBC. (2009, January 5). *Online Subtitling Editorial Guidelines.* Retrieved May 20, 2014, from BBC Web site: http://www.bbc.co.uk/guidelines/futuremedia/accessibility/subtitling_guides/online_sub_editorial_guidelines_vs1_1.pdf

BBC. (2011). *Editorial Guidelines for Hearing Impaired Audiences.* Retrieved May 22, 2014, from BBC Web site: http://downloads.bbc.co.uk/guidelines/editorialguidelines/pdfs/hearing-impaired.pdf

Broadcasters Audience Research Board. (2013). *Total viewing Summeary - Monthly.* Retrieved May 22, 2014, from BARB Web Site: http://www.barb.co.uk/viewing/monthly-total-viewing-summary?period%5B%5D=20130801&button_submit=View+figures

DigitalUK. (2012). *Digital TV Switchover 2008-2012 Final Report.* Retrieved May 20, 2014, from DigitalUK web site: http://www.digitaluk.co.uk/__data/assets/pdf_file/0019/82324/DigitalUK_Switchover final_report_Nov2012.pdf

National Assembly for Wales. (2007 йил April). *Digital Switchover.* Retrieved 2014 йил 12-January from National Assembly for Wales: http://www.assemblywales.org/tb-07-023.pdf

Ofcom. (2013a). *UK Digital Terrestrial Television Map 2013.* Retrieved May 20, 2014, from Ofcom Web site: http://maps.ofcom.org.uk/dtt/

Ofcom. (2013b, May 17). *The quality of live subtitling: Improving the viewer experience.* Retrieved January 25, 2014, from Ofcom: http://stakeholders.ofcom.org.uk/binaries/consultations/subtitling/summary/subtitling.pdf

Ofcom. (2013c, October 16). *Measuring the quality of live subtitling.* Retrieved March 2, 2014, from Ofcom Web site: http://stakeholders.ofcom.org.uk/binaries/consultations/subtitling/statement/qos-statement.pdf

S4C. (2008). *Canllawiau S4C ar gyfer isdeitlwyryng Nghymru.* Retrieved May 20, 2014, from S4C Web site: http://www.s4c.co.uk/production/downloads/guidelines/c_canllawiau_isdeitlo_s4c_0308.pdf

Siôn, M. (2010). *RNID Cymru study into the inclusion barriers facing people who are deaf or hard of hearing in Wales.* Cardiff: The Royal National Institute for Deaf People Cymru.

Wales Mental Health in Primary Care. (n.d.). *Information Sheet 14: Mental Health, Deafness and Hearing Loss.* Retrieved October 11, 2013, from Wales Mental Health in Primary Care: http://www.wamhinpc.org.uk/sites/default/files/information-sheet-14.pdf

Welsh Government. (2013). *Welsh Health Survey 2012.* Retrieved May 20, 2014, from BHF
    National Centre Web site:
      http://www.bhfactive.org.uk/userfiles/Documents/welsh_health_survey_2012.pdf

Appendices

Digital Television and Hard of Hearing Audiences in Wales Survey

1 Your Age. Please choose **only one** answer:

☐ Under 16 ☐ 25-34 ☐ 45-54 ☐ 65-74
☐ 16-24 ☐ 35-44 ☐ 55-64 ☐ 75or older

2 Your Gender Please choose **only one** answer:

☐ Female ☐ Transgender
☐ Male ☐ Prefer not to say

3 Your ethnic background. Please choose **only one** answer.

☐ White Welsh ☐ Asian Welsh
☐ White British (non-Welsh) ☐ Asian British (non-Welsh)
☐ White non-British ☐ Asian non-British
☐ Black Welsh ☐ Mixed (multiple ethnic background)
☐ Black British (non-Welsh) ☐ Prefer not to say
☐ Black non-British ☐ Other

4 Which region of Wales do you live in? Please choose **only one** of the following:

☐ North West Wales ☐ Mid Wales ☐ South East Wales
☐ North East Wales ☐ South West Wales

5 Which language is your first language i.e. which language you learned from birth or which you speak best. Please choose **only one** answer.

☐ English ☐ British Sign Language
☐ Welsh ☐ Other

6. In terms of your use of Welsh language. Please choose **all that apply**:

☐ Understand spoken Welsh ☐ Write Welsh
☐ Speak Welsh ☐ All of the above
☐ Read Welsh ☐ None of the above

7 Your degree of hearing impairment? Please choose **all that apply**:

☐ I am deaf
☐ I am hard of hearing
☐ I am deafened
☐ I use British Sign Language (BSL)
☐ I use Sign Supported English (SSE)
☐ I wear non-digital hearing aid(s)
☐ I wear hearing aid(s), but I'm not sure whether they are digital
☐ I have cochlear implant(s)

☐ I wear a bone-anchored hearing aid (BAHA)
☐ I have tinnitus
☐ I wear digital hearing aid(s)
☐ I have Ménière's disease
☐ I have balance problems (not general unsteadiness)
☐ I lip read
☐ I do not have hearing loss
☐ Other (please specify)

_____

8 Do you use Sign Language? Please choose **only one** of the following:
☐ I am fluent in British Sign Language
☐ I have moderate British Sign Language skills
☐ I have basic British Sign Language skills
☐ I use a non-British Sign Language
☐ I use sign-supported English
☐ I do not use Sign Language at all
☐ Other (please specify)

_____

9 Please indicate your current status of living. Please choose **only one** of the following:
☐ Alone
☐ Share a household with (at least) another person that is deaf or hard of hearing
☐ share a household with no one that is deaf or hard of hearing
☐ With support
☐ Prefer not to say
☐ Other (please
specify)_____

10 Please rank the following television usage according to frequency of use.

	Daily	Weekly	Fort-nightly	Monthly	Rarely	Never
TV via TV set						
TV via a laptop/computer						
TV on a mobile phone						
TV on a tablet device e.g. iPad						
TV via game console e.g. Connected TV						
TV via other video media e.g. DVD						

11 Please rank the following television usage according to your preference of use, with 1 being most preferred and 5 being least preferred. If you *never* use a particular TV provision service, please *do not* rank that option.

	1	2	3	4	5
TV via TV set					
TV via a laptop/computer					
TV on a mobile phone					
TV on a tablet device e.g. iPad					
TV via game console e.g. Connected TV					
TV via other video media e.g. DVD					

12 How do you receive and watch TV? Do you use the following services? Please choose **all that apply**.
- ☐ TV - as broadcast
- ☐ TV – watch again via online services such as iPlayer and Clic
- ☐ TV – watch again via on demand services such as Virgin On Demand and YouView
- ☐ TV – recorded programmes stored on a PVR, hard disk recorder or DVD
- ☐ TV – via service such as Netflix or LoveFilm
- ☐ TV – via social media such as YouTube

13 Which of the TV distribution platforms do you prefer? Please rank the services, with number 1 being the most liked and number 5 being the least liked. If you *never* use a particular TV provision service, please *do not* rank that option.

	1	2	3	4	5
TV – as broadcast					
TV – watch again via online services such as iPlayer and Clic					
TV – watch again via on demand services such as Virgin On Demand and YouView					
TV – recorded programmes stored on a PVR, hard disk recorder or DVD					
TV – via service such as Netflix or LoveFilm					
TV – via social media such as YouTube					

14 Which type (or types) of TV do you have or do you regularly use? Please choose **all** that apply:
- ☐ Old Analogue TV with a set-top box
- ☐ Digital TV (non-High Definition)
- ☐ High-definition Digital TV

☐ 3D TV
☐ Don't know

☐ Other (please specify):_____

15 Thinking about the way you receive television at home, is that via an aerial, cable or satellite connection? You may choose *more than one option* i.e. if you have both freeview through an aerial and Sky TV through a satellite connection.

☐ Via an aerial (e.g. Freeview, BT Vision, or Top UP TV)
☐ Via cable connection (Virgin Media, TalkTalk)
☐ Via satellite connection (Sky or Freesat)
☐ Don't know
☐ Other (please specify)

_____

16 How many hours do you spend watching TV per day, on average? Please choose **only one** of the following:

☐ Less than 1 hour
☐ 1-2 hours
☐ 2-3 Hours
☐ 3-4 hours
☐ 4-5 hours

☐ 5-6 hours
☐ 6-7 hours
☐ 7-8 hours
☐ more than 8 hours

17 Which channels do you watch? Please select **as many choices as are appropriate**.

☐ BBC1
☐ BBC2
☐ BBC3
☐ BBC4
☐ ITV1
☐ ITV2
☐ ITV3
☐ ITV4
☐ S4C
☐ Channel 4
☐ Channel 5
☐ E4
☐ More4
☐ Other (please specify)_____

☐ Music channels e.g. VH1, Kerrang!
☐ News channels e.g. BBC News. Sky News
☐ Documentary channels e.g. Discovery, History, Yesterday
☐ Sports channels e.g. Sky Sports
☐ Movie channels e.g. Film4, Sky Movies
☐ Childrens channels e.g. Nickelodeon
☐ Satellite or cable entertainment channels e.g. Dave, Sky Living

18 Which type of programmes do you watch or like watching? Please select **as many as are appropriate**.

☐ Live events e.g. Royal Weddings, Live 24-hour news channels
☐ News programmes e.g. The 10 O'clock News, Newsnight
☐ Current affairs programmes e.g. Dispatches
☐ Documentary
☐ Live sport
☐ Sports highlights

- [ ] Entertainment programmes e.g. X-Factor, Splash, Strictly Come Dancing
- [ ] Comedy
- [ ] Music
- [ ] Reality shows
- [ ] Drama
- [ ] Soap operas
- [ ] Children's shows
- [ ] Cookery shows
- [ ] DIY/Gardening shows
- [ ] Property shows
- [ ] Chat shows
- [ ] Films
- [ ] Quiz shows

- [ ] Other (please specify):_____

19 Do you use subtitles to watch TV? Please choose **only one** of the following:
- [ ] All the time
- [ ] Most of the time
- [ ] Sometimes
- [ ] Rarely
- [ ] Never

20 When watching television programmes in the Welsh language (e.g. via S4C live or on the online service Clic), do you select the subtitles in Welsh or English? Please choose **only one** of the following:
- [ ] English
- [ ] Welsh
- [ ] I use subtitles in both English and Welsh to watch S4C/Clic
- [ ] I do not use subtitles at all to watch S4C
- [ ] I do not watch programmes in the Welsh language

21 Which is your preferred language for subtitles when watching programmes on S4C?
☐ Welsh
☐ English

22 Do you view S4C with BIST (Burned in subtitles) at all? BIST is when a programme has subtitles that cannot be removed from the broadcast.
☐ Yes
☐ No

23 Do you view S4C with subtitles that can be called up? Called up subtitles are chosen via an option like pressing the red button or a subtitling service button.
☐ Yes
☐ No

24 Do you prefer burned in subtitles or called up subtitles?
☐ Burned in subtitles
☐ Called up subtitles
☐ No preference
☐ Varies with the programme being watched

25 Do you watch S4C using mobile devices such as tablet computers (e.g. iPad) or mobile phones?
☐ Yes
☐ No

26 Do you watch TV programmes presented in British Sign Language? If so, which programmes do you watch? Please give examples in the comment box provided.
☐ All the time   ☐ Never
☐ Most of the time
☐ Sometimes
☐ Rarely

Please give examples here:

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27 Do you watch TV programmes with British Sign Language interpretation? If so, which programmes? Please give examples in the comment box provided

☐ All the time   ☐ Rarely
☐ Most of the time   ☐ Never
☐ Sometimes

Please give examples here:

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28 Would you like more British Sign Language interpretation programmes?

☐ Yes   ☐ No

29 What benefits have you experienced with using digital TV compared to old analogue TV services? Please tick any of the options that apply to your experiences.

☐ Better sound quality   ☐ Better picture quality
☐ Better subtitling options   ☐ Better range and choice of
☐ Better quality of subtitles   programmes
☐ Better sign language programme
   availability
☐ Other (please specify)

_____
_____
_____

30 Which difficulties have you experienced when watching digital TV? Please choose as many options as are appropriate to you.

☐ Poor sound quality   ☐ Cannot follow subtitles (e.g. hard to
☐ Difficult to hear speech on TV   understand subtitles)
☐ Not enough sign language   ☐ Cannot access subtitles due to low
   availability   signal strength
☐ Sign language programmes at   ☐ Background noise
   inconvenient times   ☐ Size of subtitles too small
☐ Subtitles missing   ☐ Cannot get subtitles to work
☐ Delays on subtitles   ☐ Sparse subtitles
☐ Subtitles move too quickly   ☐ Poor quality subtitles during live
☐ Misspelling on subtitles   broadcast
☐ Subtitles use wrong
   words/inappropriate words
☐ Other (please specify):

_____
_____
_____

31 Compared to the old analogue system, do you find Digital TV better or easier to use?
Please choose **only one** answer and leave a comment if you would like to explain your answer.

☐ Better than analogue ☐ Worse than analogue
☐ The same as analogue ☐ No opinion

Leave a comment if you would like to explain your answer

32 Have you used video on demand services on your digital TV? For example, have you used BBC iPlayer? Please choose **only one** of the following:

☐ I use these services often

☐ I have used these services

☐ I am aware of these services but do not use them

☐ I do not know about and have not used these services

33 Have you used extra information services through your digital TV, such as the 'Red Button' services on BBC? Please choose **only one** of the following:

☐ I use these services often

☐ I have used these services

☐ I am aware of these services but do not use them

☐ I do not know about and have not used these services

34 Are you aware of the services available on digital TV to change the text size or colours of subtitles? Please choose **only one** of the following:

☐ I use these services often

☐ I have used these services

☐ I am aware of these services but have not used them

☐ I am not aware of these services and have not used these services

35 Have you used the interactive features of your digital TV? For example, have you used your digital TV to access websites, social media services, email or to contact your local council? Please choose **only one** of the following:

☐ I use these services often

☐ I have used these services

☐ I am aware of these services but do not use them

☐ I do not know about and have not used these services

36 Which of the following would you suggest to broadcasters in Wales to improve services? Please rank these possible options as appropriate, with 1 being most important and 5 being least important.

	1	2	3	4	5
Two subtitling settings for each TV programme with one setting offers a summary of audiovisual text and the other offers word-by-word audiovisual translation					
Programmes for learners of British Sign Language					

A wider variety of programmes with Sign Language					
More programmes with Sign Language					
Subtitles available on catch-up TV services e.g. iPlayer, Clic on all devices including tablets and mobile phones					
Sign language available on catch-up TV services e.g. iPlayer, Clic on all devices including tablets and mobile phones					
Making it easier to discover how to use subtitles on the different platforms and devices					
Better quality subtitles during live broadcasts (such as sports and events).					

37 Do you have any other comments or suggestion to BBC and S4C regarding services for deaf and hard of hearing people in Wales?

Please write your answer here:

38 Were you aware of the support that was offered during Digital TV switchover?
☐ Yes
☐ No

39 If you received support during the digital TV switchover, please you provide some details of that support in the comment box below

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40 Do you feel that you fully understand the services that are available through your digital TV?

☐ Yes, I feel I understand the range of services available

☐ I know some of the features available through Digital TV

☐ No, I do not feel I understand the services available through digital TV

£20 Boots Vouchers

If you would like to be entered into our prize draw for one of five £20 Boots vouchers for taking part in this survey, please enter your contact details (name, postal address, or email address) into the box below

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Data Protection Your name and address will be added to the University database and used for University purposes only. These purposes may include, but are not limited to, mailing of additional information that we think may be of interest to you. If you would prefer not to be included on the database, please tick here ☐

Please return the completed questionnaire in the enclosed stamped-addressed envelope
by 31 August 2013
Many thanks for taking part in this survey - we value your input greatly!

Hosted by: Swansea University Prifysgol Abertawe — Research Institute for Arts and Humanities Swansea University

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