



METADATA THE HEARING MAP

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ABOUT THIS DOCUMENT

This document explains how data in the hearing map and accompanying infographic have been derived. This is in order to improve transparency and accountability, encourage engagement with other researchers/organisations and to help improve the hearing map over time. The NCHA welcomes feedback and suggestions on how to improve this public resource, which can be sent to info@the-ncha.com. This document will be updated when new resources are added to the map and/or the accompanying infographic. Previous versions of this document will remain accessible, please email: info@the-ncha.com.

CHANGE LOG

Version	Date	Description of Changes
1	14-04-16	First publication

1. INTRODUCTION

BACKGROUND

The NCHA researched and published the [history of hearing care](#) in 2016. A look back at the hearing sector showed repeated system failures because service planning was often based on past activity rather than local needs. It was also likely that the low priority assigned to hearing loss and structural challenges meant there were weak incentives to assess local need and to plan services accordingly. It was clear that without greater transparency and easier access to information, the hearing needs of millions of people in the UK would continue to be overlooked or misunderstood.

In 2015 commissioners and providers of hearing services in the UK still lacked access to basic local hearing data, making it difficult – if not impossible – to plan sustainable hearing services.

The NCHA is committed to helping providers and commissioners gain access to useful data in order to deliver sustainable hearing care in the UK. The NCHA hearing map is one way the NCHA is supporting providers and decision-makers change hearing services and mitigate the risk of repeated systems failures.

PURPOSE

The NCHA hearing map has been produced to improve awareness about hearing needs throughout the UK, and to help plan efficient, effective and sustainable models of hearing care.

The map aims to address information gaps and help local providers and decision-makers work collaboratively to meet local hearing needs.

The hearing map will remain free to access and will be updated and enhanced with new data based on additional research and feedback from partners and other contributors.

BENEFITS AND LIMITATIONS OF LOCAL DATA

As with all estimates there is a degree of uncertainty associated with any data.

Local prevalence/incidence data is particularly useful when risk factors for any given condition can be controlled for using local population data – i.e. where controlling for these variables can reduce uncertainty/variation association with local estimates. For example, in the case of adult hearing loss both age and gender – and especially age – are important risk factors¹ and whilst the average 2014 estimated prevalence of adult hearing loss across the UK was 21%, the range was 10% (Tower Hamlets) to 31% (West Somerset) at a Local Authority level. This variation was driven by differences in the size of certain age groups (and less so the gender mix within various age groups) of local populations, not controlling for this and estimating hearing loss in the entire population (i.e. including children aged 0-17) would mean local estimates of 16% prevalence in each region – resulting in very different local planning assumptions, despite reasonably similar estimates at a national level.

Where epidemiological data is not as robust, local estimates can be subject to greater uncertainty and therefore only offer a rough guide to local needs. For example it is difficult to estimate the prevalence/incidence of earwax, tinnitus and childhood hearing loss, but by using the best available estimates it is possible to offer a starting point for analysis – which can then be improved with time. It is for this reason this document clearly states which local estimates are likely to be subject to greater levels of uncertainty.

2. ADULT HEARING LOSS

2.1 SUMMARY

A review of the available literature on the prevalence of adult hearing loss was conducted in 2015. It was decided the following study could be used to generate estimates of adult hearing loss in the UK population

- Davis, Adrian (1995), "Hearing in Adults. The prevalence and distribution of hearing impairment and reported hearing disability in the MRC Institute Hearing Research's National Study of Hearing", MRC Institute of Hearing Research, Nottingham, Whurr Publishers Limited, London.

The principle advantages were that this was a large study that reported prevalence in a British female and male population aged 18 to 80, and presented data for six age bands at different severities of hearing loss. It also offered estimated prevalence data for people aged 81 and over based on a review of the literature.

Population estimates were obtained from the appropriate statistical office in each country. 2014 data for single year of age, and female and male gender data was then organised into age groups so that prevalence estimates for adult hearing loss control for age and gender. Section 2.2 provides greater detail.

2.2 ADULT HEARING LOSS MODEL

A review of the available literature on the prevalence of adult hearing loss was conducted by the NCHA in 2015.

The international literature showed significant variation in the prevalence of hearing loss across high, middle and low-income countries – largely driven by differences in definitions, access to immunization, medical care and life expectancy^{2,3}. Occupation was also shown to have an impact on the prevalence of hearing loss⁴ - but the impact varied, e.g. the local economy and health and safety regulations influenced the prevalence of noise-induced hearing loss⁵. These findings have limited the usefulness of some international datasets.

When comparing prevalence data across high-income countries, hearing loss was positively associated with age and male gender^{6,7}. This meant that prevalence sources that controlled for multiple age groups and gender were essential.

The NCHA therefore opted to use Davis's *Hearing in Adults. The prevalence and distribution of hearing impairment and reported hearing disability in the MRC Institute Hearing Research's National Study of Hearing*⁸.

Principle advantages included that it was primary research, included samples from England (Nottingham and Southampton), Scotland (Glasgow) and Wales (Cardiff), a comprehensive audiological assessment was performed, the study involved a reasonable sample (N=2,663) and three main demographics – age (six age bands), gender and occupation - were accounted for⁹. Akeryod, Foreman and Holman of the MRC Institute of Hearing Research also recently noted that this study remained the best source of data available for local use¹⁰.

One significant limitation of *Hearing in Adults* was that it only included subjects aged 18 to 80 years of age, and used the literature to derive estimates of prevalence in people aged 81 and over¹¹. The advantages listed above therefore do not apply to estimates of hearing loss in people aged 81 and over. Although studies in other high-income countries do give us confidence that hearing loss continues to increase exponentially in this cohort and that estimates of the prevalence of hearing loss in people aged 81+ provided by Davis (1995) are likely to hold¹². Another limitation is that the four

cities selected at the time are unlikely to have been representative of the whole population – they appear to have been selected based on accessibility (cost/feasibility) for the Institute of Hearing at the time. Finally the study did not include any sample from Northern Ireland, but we here we found no other viable source.

It is also important to note that the MRC study took place between 1978¹³ and 1986¹⁴, but was only published in full in 1995. This was not a significant concern however because in high-income countries, such as the UK, age-related hearing loss was the single biggest cause of hearing loss in the 1980s and this remains the case in 2016^{15,16}. This means that whilst we might expect some drop off in noise-induced hearing loss due to the trend of the economy shifting from manual to non-manual work and improved health and safety regulation¹⁷, the ageing process is likely to remain the dominant risk factor and contributor to hearing loss in 2016¹⁸, just as it was in the 1980s¹⁹.

We did consider controlling for manual/non-manual occupation but this was fraught with methodological challenges. For example *Hearing in Adults* showed that people aged 18 to 80 from manual occupations were more likely to have a higher prevalence of hearing loss (17.7%) than those from non-manual occupations (14.2%)²⁰, but hearing loss typically occurs over a long period of time and the cost of modelling this effect would exceed any benefits¹. We therefore opted to use overall occupation. If providers and commissioners operate in a region that has a strong manufacturing industry they might find that the hearing map underestimates local prevalence, and those operating in a region with a historically service driven economy might find that the hearing map overestimates local prevalence. However, we expect this effect to be small in either direction and primary research would be required to improve these estimates.

On this basis, we decided to only control for age and gender (using overall occupation) because these were the two main risk factors that were likely to hold true at a population level^{21,22,23}. This does not mean that there are no other important risk factors that could (should) be considered. There are multiple [risk factors](#) for hearing loss, but the strength of evidence for each risk factor varies considerably²⁴ and the cost of trying (however superficially) to control for other variables was likely to far exceed any benefits from marginal changes in prevalence estimates.

The prevalence of adult hearing loss will also vary based on the threshold used to define hearing loss. Here we opted to use the convention of ≥ 25 dB HL as the baseline threshold for hearing loss. We also decided to calculate hearing loss at different thresholds and provide these data in the accompanying infographic for completeness and transparency. It is important to stress however that, after speaking with experts in the field of hearing care, it is clear that there is a strong professional consensus that threshold readings in isolation do not define who will and will not benefit from any specific treatment. Thresholds only help to estimate how many people are likely to have reduced hearing and might seek help from a hearing care professional.

The other variable that influences estimates of adult hearing loss is whether researchers base hearing loss estimates on the better or worse ear. We, once again, adhered to the convention and used hearing loss in the better ear to estimate prevalence. This results in more conservative estimates than if the worse ear was selected – it is important to note however that an unsupported hearing loss in one ear can be disabling and there are valid reasons to derive estimates based on the worse ear, we simply made a value judgement to adhere to what is most widely used.

The hearing map and accompanying infographic therefore estimates the prevalence and number of adults with hearing loss (diagnosed and undiagnosed) adjusted for age, gender, and severity of hearing loss, using overall occupation. We do not present the upper and lower estimates (but do share these in table one below). If stakeholders feel that upper and lower bound estimates would add value, the NCHA can add these data to the hearing map – please email info@the-ncha.com.

The methodology we have adopted leads to more conservative estimates than when researchers use worse ear, do not control for gender and/or age or use manual worker estimates. One or more of these variables will often explain the difference between NCHA hearing map data and other sources of prevalence data in the UK – for example NHS England is likely to share estimates without

¹ It is also unlikely the effect was/is solely due to occupation and there are likely to be confounders such as socio-economic group, diet, smoking etc.

controlling for gender and therefore present slightly higher local estimates than the hearing map. Put simply, stakeholders might find that the NCHA dataset provides lower estimates of hearing loss when compared to other datasets. This is likely to be because we used the better ear average rather than worst ear average, and we have also estimated the prevalence of hearing loss for each gender for each age group and then summed these. We believe this is a strength rather than limitation.

The data in table one has been used to estimate prevalence in each age group from 18 to 80. The data in table two has been used to estimate prevalence in people aged 81 and over.

Table 1. Prevalence of hearing impairment (percentage) as a function of dB HL ages 18 to 80

Prevalence by age group (18 to 80), gender and overall occupational group; relates to better ear averaged over the frequencies 0.5, 1, 2 and 4kHz.																
Gender	Age Group	≥25	LCL	UCL	≥30	LCL	UCL	≥35	LCL	UCL	≥45	LCL	UCL	≥65	LCL	UCL
F	18-30	2.8	1.5	5.1	1.1	0.5	2.2	0.6	0.2	1.5	0.3	0.1	1.1	0.0	0.0	1.7
M	18-30	0.6	0.1	3.0	0.1	0.0	0.2	0.1	0.0	0.2	0.1	0.0	0.2	0.0	0.0	0.2
F	31-40	2.9	1.5	5.5	2.1	0.9	4.6	1.2	0.5	2.7	0.8	0.3	2.2	0.2	0.0	1.2
M	31-40	2.6	1.0	6.9	2.6	1.0	6.9	1.7	0.5	6.3	1.4	0.3	6.2	1.2	0.2	6.5
F	41-50	7.2	5.1	10.1	5.3	3.3	8.2	3.7	2.3	6.1	1.6	0.8	3.2	0.2	0.1	0.9
M	41-50	9.3	6.5	13.2	6.7	4.4	10.0	4.3	2.5	7.3	1.7	1.0	3.1	0.4	0.1	1.6
F	51-60	13.2	10.2	17.0	8.1	5.9	11.1	5.3	3.8	7.4	2.6	1.7	3.9	1.1	0.5	2.1
M	51-60	25.3	21.1	30.1	14.2	11.3	17.8	10.7	8.3	13.7	5.6	3.8	8.2	0.8	0.4	1.6
F	61-70	29.4	24.3	35.2	19.6	16.3	23.3	13.3	9.8	18.0	5.6	4.3	7.4	2.1	1.2	3.6
M	61-70	45.3	38.4	52.4	32.1	26.6	38.2	19.7	16.3	23.6	9.6	7.4	12.2	2.7	1.7	4.3
F	71-80	55.5	45.1	65.5	45.5	36.5	54.8	38.8	29.9	48.5	19.0	14.4	24.7	4.5	3.0	6.9
M	71-80	66.6	56.8	75.1	48.6	38.8	58.4	41.5	32.1	51.5	15.8	11.7	20.9	3.3	1.8	6.0

Source: Davis 1995, Tables: B5124-10 to Table B5124-11 (page 47). Prevalence by age group AND Male and Female for the better ear over 0.5, 1, 2 and 4 Hz²⁵

Table 2: Prevalence of hearing impairment (percentage) as a function of dB HL ages 81+.

Prevalence (percentage) of hearing impairment in people aged 80+ as a function of hearing impairment and gender. Better ear averaged over the frequencies 0.5, 1, 2 and 4kHz					
Gender	Age Group	≥25	≥35	≥45	≥65
F	>80	94.0	83.0	62.3	22.0
M	>80	91.2	76.1	65.1	23

Source: cited in Davis 1995, table 8.1²⁶

2.3 ADULT HEARING LOSS - ENGLAND

2.3.1 – Clinical Commissioning Groups

Notes	See section 2.2
Indicator	Adults (aged 18+) with Hearing Loss
Time period	2014
Geography	Clinical Commissioning Groups, England
Data sources	Prevalence of hearing loss – table one and two (p.7) Population data: <ul style="list-style-type: none"> Office for National Statistics (2014). Mid-2014 Population Estimates for Clinical Commissioning Groups (CCGs) in England by Single Year of Age and Gender. Release number: SAPE17DT5, Date published: 25 November 2015.
Methodology	Prevalence estimates were based on overall occupational group and the better ear averaged over the frequencies 0.5, 1, 2 and 4kHz (see section 2.2). Estimated number of adults with hearing loss was calculated for each gender for the following age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80 and 81+. The total number of females and males was then combined to estimate local prevalence at a CCG level. Local prevalence estimates were derived for adults (number of adults estimated to have hearing loss/number of adults *100). This was done for hearing loss at the following thresholds ≥ 25 , ≥ 35 , ≥ 45 and ≥ 65 dB HL.

2.3.2 – Local Authorities

Notes	See section 2.2
Indicator	Adults (aged 18+) with Hearing Loss
Time period	2014
Geography	Local Authorities, England
Data sources	Prevalence of hearing loss – table one and two (p.7) Population data: <ul style="list-style-type: none"> Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015
Methodology	Prevalence estimates were based on overall occupational group and the better ear averaged over the frequencies 0.5, 1, 2 and 4kHz (see section 2.2). Estimated number of adults with hearing loss was calculated for each gender for the following age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80 and 81+. The total number of females and males was then combined to estimate local prevalence at a Local Authority level. Local prevalence estimates were derived for adults (number of adults estimated to have hearing loss/number of adults *100). This was done for hearing loss at the following thresholds ≥ 25 , ≥ 35 , ≥ 45 and ≥ 65 dB HL.

2.4 ADULT HEARING LOSS - NORTHERN IRELAND

2.4.1 - Health & Social Services Board

Notes:	See section 2.2
Indicator	Adults (aged 18+) with Hearing Loss
Time period	2014
Geography	Northern Ireland Local Government Districts
Data sources	Prevalence of hearing loss – table one and two (p.7) Population data: <ul style="list-style-type: none"> Northern Ireland Statistics and Research Agency (2014). Mid-Year Population Estimates. Health & Social Services Board. Estimates for mid-1991 to mid-2014.
Methodology	Prevalence estimates were based on overall occupational group and the better ear averaged over the frequencies 0.5, 1, 2 and 4kHz (see section 2.2). Estimated number of adults with hearing loss was calculated for each gender for the following age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80 and 81+. The total number of females and males was then combined to estimate local prevalence at a Health and Social Services Board. Local prevalence estimates were derived for adults (number of adults estimated to have hearing loss/number of adults *100). This was done for hearing loss at the following thresholds ≥ 25 , ≥ 35 , ≥ 45 and ≥ 65 dB HL.

2.4.2 - Northern Ireland Local Government Districts

Notes	See section 2.2
Indicator	Adults (aged 18+) with Hearing Loss
Time period	2014
Geography	Northern Ireland Local Government Districts
Data sources	Prevalence of hearing loss – table one and two (p.7) Population data: <ul style="list-style-type: none"> Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015
Methodology	Prevalence estimates were based on overall occupational group and the better ear averaged over the frequencies 0.5, 1, 2 and 4kHz (see section 2.2). Estimated number of adults with hearing loss was calculated for each gender for the following age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80 and 81+. The total number of females and males was then combined to estimate local prevalence at a Northern Ireland Local Government Districts. Local prevalence estimates were derived for adults (number of adults estimated to have hearing loss/number of adults *100). This was done for hearing loss at the following thresholds ≥ 25 , ≥ 35 , ≥ 45 and ≥ 65 dB HL.

2.5 ADULT HEARING LOSS - SCOTLAND

2.5.1 – Health Board

Notes	See section 2.2
Indicator	Adults (aged 18+) with Hearing Loss
Time period	2014
Geography	Council Areas, Scotland
Data sources	Prevalence of hearing loss – table one and two (p.7) Population data: <ul style="list-style-type: none"> ISD Scotland (2014). NHS Board (1st April 2014 configuration) Population Estimates 1981-2014, Last Release: 2014 mid-year population estimates released in April 2015. Source: National Records of Scotland (NRS)
Methodology	Prevalence estimates were based on overall occupational group and the better ear averaged over the frequencies 0.5, 1, 2 and 4kHz (see section 2.2). Estimated number of adults with hearing loss was calculated for each gender for the following age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80 and 81+. The total number of females and males was then combined to estimate local prevalence at a Health Board area. Local prevalence estimates were derived for adults (number of adults estimated to have hearing loss/number of adults *100). This was done for hearing loss at the following thresholds ≥ 25 , ≥ 35 , ≥ 45 and ≥ 65 dB HL.

2.5.2 - Council Areas

Notes:	There was an error in the ONS dataset . This was linked to age distribution therefore, because the methodology we used controls for age, estimates in Scotland at a Council level are slightly out due to underlying ONS data. The ONS aim to correct these data on 28 April 2016. The NCHA will update these estimates shortly after new data is released by the ONS.
Indicator	Adults (aged 18+) with Hearing Loss
Time period	2014
Geography	Council Areas, Scotland
Data sources	Prevalence of hearing loss – table one and two (p.7) Population data: <ul style="list-style-type: none"> Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015
Methodology	Prevalence estimates were based on overall occupational group and the better ear averaged over the frequencies 0.5, 1, 2 and 4kHz (see section 2.2). Estimated number of adults with hearing loss was calculated for each gender for the following age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80 and 81+. The total number of females and males was then combined to estimate local prevalence at a Council Areas, Scotland. Local prevalence estimates were derived for adults (number of adults estimated to have hearing loss/number of adults *100). This was done for hearing loss at the following thresholds ≥ 25 , ≥ 35 , ≥ 45 and ≥ 65 dB HL.

2.6 ADULT HEARING LOSS - WALES

2.6.1 – Local Authorities

Notes	See section 2.2. The NCHA has tried to obtain population data at a Health Board level, but this has not been possible. As soon as we obtain a reliable dataset for 2014 we will update the hearing map to include Health Board regions in Wales. At this stage we include Local Authority estimates only.
Indicator	Adults (aged 18+) with Hearing Loss
Time period	2014
Geography	Local Authorities, Wales
Data sources	Prevalence of hearing loss – table one and two (p.7) Population data: <ul style="list-style-type: none">• Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015
Methodology	Prevalence estimates were based on overall occupational group and the better ear averaged over the frequencies 0.5, 1, 2 and 4kHz (see section 2.2). Estimated number of adults with hearing loss was calculated for each gender for the following age groups: 18-30, 31-40, 41-50, 51-60, 61-70, 71-80 and 81+. The total number of females and males was then combined to estimate local prevalence at a Local Authority level. Local prevalence estimates were derived for adults (number of adults estimated to have hearing loss/number of adults *100). This was done for hearing loss at the following thresholds ≥ 25 , ≥ 35 , ≥ 45 and ≥ 65 dB HL.

3. CHILDHOOD HEARING LOSS – HIGH UNCERTAINTY

3.1 SUMMARY

A review of the available literature on the prevalence of childhood hearing loss was conducted by the NCHA in 2015. A child was defined as a person aged younger than 18 years of age².

There was, perhaps surprisingly, a paucity of reliable data on the prevalence of childhood hearing loss in high-income countries. Challenges included variation in the age of identification, small sample sizes, no uniform decibel threshold and other methodological issues.

The Centres for Disease Control and Prevention (CDC) in the USA provides useful resources for researchers with a particular interest in childhood hearing loss – [available here](#).

The CDC also provides a review of published literature on the prevalence of hearing loss in children, showing prevalence estimates that vary between 0.4 and 7.5 per 1000 children²⁷ - i.e. 0.04% and 0.75%.

The CDC states that European and North American studies have identified a consistent prevalence of hearing loss (40 decibels) in childhood of c.0.1%²⁸. This however might underestimate hearing loss in childhood, as more children are likely to have a hearing loss of at least ≥ 25 dB HL than ≥ 40 dB HL. In 2014 for example, White et al. noted that 35,000 children in England have a hearing loss²⁹, suggesting a prevalence rate of $> 0.3\%$ ³⁰ - i.e. three times as many children than would be expected if using the CDC estimate of 0.1%.

In the end we opted to use 0.3% to estimate hearing loss in children. This was similar to what White et al. and others appear to have used in England³¹. This estimate however is subject to significant uncertainty given the paucity of data. We suspect the actual childhood prevalence of hearing loss is between 0.1% and 0.3%. We will update this resource if new studies add to our knowledge of the prevalence of hearing loss in children. Those using childhood prevalence data to plan services should therefore exercise caution when referring to this particular indicator in the infographic.

The relatively rare occurrence of childhood hearing loss – when compared to adult onset hearing loss – is also why we opted to present the prevalence adult hearing loss in the main hearing map and not the prevalence of hearing loss in the entire population. For example, including children aged 0-17 in the estimates of people with hearing loss (numerator) and the baseline population (denominator) might result in some local services under/over planning local capacity to meet the hearing needs of the ageing population.

² We acknowledge that by defining a child as a person aged <18 our estimates will be lower than datasets that categorise people aged 18 and 19 as children – note, hearing loss in people age 18+ is calculated in section 2 and therefore we do not double count this group here.

3.2 CHILDHOOD HEARING LOSS - ENGLAND

3.2.1 – Clinical Commissioning Groups

Notes	See section 3.1 – estimates are subject to significant uncertainty
Indicator	Children with Hearing Loss
Time period	2014
Geography	Clinical Commissioning Groups, England
Data sources	Prevalence of hearing loss – 0.3% Population data: People aged 0 to 17 from: <ul style="list-style-type: none"> Office for National Statistics (2014). Mid-2014 Population Estimates for Clinical Commissioning Groups (CCGs) in England by Single Year of Age and Gender. Release number: SAPE17DT5, Date published: 25 November 2015.

3.2.2 – Local Authorities

Notes	See section 3.1 – estimates are subject to significant uncertainty
Indicator	Children with Hearing Loss
Time period	2014
Geography	Local Authorities, England
Data sources	Prevalence of hearing loss – 0.3% Population data: People aged 0 to 17 from: <ul style="list-style-type: none"> Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015

3.3 CHILDHOOD HEARING LOSS - NORTHERN IRELAND

3.3.1 - Health & Social Services Board

Notes:	See section 3.1 – estimates are subject to significant uncertainty
Indicator	Children with Hearing Loss
Time period	2014
Geography	Northern Ireland Local Government Districts
Data sources	Prevalence of hearing loss – 0.3% Population data: People aged 0 to 17 from: <ul style="list-style-type: none"> Northern Ireland Statistics and Research Agency (2014). Mid-Year Population Estimates. Health & Social Services Board. Estimates for mid-1991 to mid-2014.

3.3.2 - Northern Ireland Local Government Districts

Notes	See section 3.1 – estimates are subject to significant uncertainty
Indicator	Children with Hearing Loss
Time period	2014
Geography	Northern Ireland Local Government Districts
Data sources	Prevalence of hearing loss – 0.3% Population data: People aged 0 to 17 from: <ul style="list-style-type: none"> Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015

3.4 CHILDHOOD HEARING LOSS - SCOTLAND

3.4.1 – Health Board

Notes	See section 3.1 – estimates are subject to significant uncertainty
Indicator	Children with Hearing Loss
Time period	2014
Geography	Council Areas, Scotland
Data sources	Prevalence of hearing loss – 0.3% Population data: People aged 0 to 17 from: <ul style="list-style-type: none">• ISD Scotland (2014). NHS Board (1st April 2014 configuration) Population Estimates 1981-2014, Last Release: 2014 mid-year population estimates released in April 2015. Source: National Records of Scotland (NRS)

3.4.2 - Council Areas

Notes:	See section 3.1 – estimates are subject to significant uncertainty. Please note there was an error in the ONS dataset . This was linked to age distribution, however given the prevalence of hearing loss in childhood we don't believe this has had a material impact on this estimate. The ONS aim to correct these data on 28 April 2016 and the NCHA will update the hearing map shortly after new data is released.
Indicator	Children with Hearing Loss
Time period	2014
Geography	Council Areas, Scotland
Data sources	Prevalence of hearing loss – 0.3% Population data: People aged 0 to 17 from: <ul style="list-style-type: none">• Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015

3.5 CHILDHOOD HEARING LOSS - WALES

3.5.1 – Local Authorities

Notes	See section 3.1 – estimates are subject to significant uncertainty. The NCHA has tried to obtain population data at a Health Board level, but this has not been possible. As soon as we obtain a reliable dataset for 2014 we will update the hearing map.
Indicator	Children with Hearing Loss
Time period	2014
Geography	Local Authorities, Wales
Data sources	Prevalence of hearing loss – 0.3% Population data: People aged 0 to 17 from: <ul style="list-style-type: none">• Office for National Statistics (2014). MYE2: Population Estimates by single year of age and gender for local authorities in the UK, mid-2014. Release number: MYE8PE1. Date published: 25 June 2015

4. TINNITUS – SIGNIFICANT UNCERTAINTY

4.1 SUMMARY

A review of the literature on the prevalence of tinnitus was conducted by the NCHA in 2016.

The literature review presented several challenges which made comparing studies difficult, including: the subjective nature of the condition, no agreed or gold standard test, variations in question asked, variation in definitions and other confounding factors.

The literature focussed on tinnitus in adults. We therefore only focussed on adults (males and females combined).

Reviewing the literature on tinnitus in adults presented other challenges – e.g. some studies suggest the prevalence of tinnitus increases up to the age of 70 and then stabilises, but there is uncertainty about this trend³². It is therefore unclear what to make of changes in the prevalence of tinnitus with age. Tinnitus was also associated with hearing loss, so it was not clear what proportion of tinnitus was a symptom associated with hearing loss and what proportion was an independent complaint³³ – presenting obvious limitations for commissioners and providers attempting to plan services.

With significant variation of tinnitus with age, we decided to apply a uniform average prevalence rate to adults (males and females) aged 18 and over.

The literature suggests between 10.1% and 14.5% of adults might experience tinnitus³⁴ - in England this would equate to between c.5.5 and c.8.1 million people having tinnitus. However it has been suggested that only 20% of people with tinnitus are likely to seek help³⁵ – i.e. 20% the 10.1% to 14.5% of people with tinnitus might seek help (so 2% to 2.9% of the adult population).

Another subgroup, which we felt warranted special attention was adults that suffer from tinnitus that severely affects their ability to lead a normal life. The most cited study here was Coles (1984), which suggests the prevalence of severe tinnitus is 0.5%³⁶. Whilst this study is widely cited, it is important to note that tables 1 and 2 in the article by Coles (1984) suggests this figure was derived from the pilot arm of the study. The sample size was N=6804 (with 5000 useable responses) and the estimate was derived from a questionnaire³⁷. This is important because this 0.5% figure does not come from the main arm of the widely cited MRC study, as suggested when Coles (1984) is sometimes cited. The 0.5% should therefore be considered to be an estimate subject to significant uncertainty – i.e. it is not correct to claim the same advantages apply to this estimate as the estimates of adult hearing loss from the same study (see section 2.2).

Given the complexity associated with deriving estimates we ran various models. In the end we decided to provide commissioners and providers with estimates for the following two groups

- People with tinnitus that might seek help, range of 2% to 2.9%
- People that might suffer from severe tinnitus, 0.5%
- To avoid double counting, we opted to estimate people that might seek help using a prevalence of 2.5% and people that might have severe tinnitus as 0.5%, an overall prevalence of 3% - accepting that the number of people experiencing tinnitus is likely to be much higher c. 10 to 15%

There is a need, in our view, to better understand the prevalence of bothersome and severe tinnitus in the UK so that services (including workforce training) can be planned appropriately.

4.2 TINNITUS - ENGLAND CLINICAL COMMISSIONING GROUPS

Notes	See section 4.1 – estimates are subject to uncertainty
Indicator	Adults (aged 18+) with tinnitus that might seek help, and those with severe tinnitus
Time period	2014
Geography	Clinical Commissioning Groups, England
Data sources	<p>People with tinnitus that might seek help: 2.5%. People that might have severe tinnitus: 0.5%. See section 4.1.</p> <p>Population data:</p> <ul style="list-style-type: none"> Office for National Statistics (2014). Mid-2014 Population Estimates for Clinical Commissioning Groups (CCGs) in England by Single Year of Age and Gender. Release number: SAPE17DT5, Date published: 25 November 2015.

4.3 TINNITUS - NORTHERN IRELAND HEALTH & SOCIAL SERVICES BOARD

Notes:	See section 4.1 – estimates are subject to uncertainty
Indicator	Adults (aged 18+) with tinnitus that might seek help, and those with severe tinnitus
Time period	2014
Geography	Northern Ireland Local Government Districts
Data sources	<p>People with tinnitus that might seek help: 2.5%. People that might have severe tinnitus: 0.5%. See section 4.1</p> <p>Population data:</p> <ul style="list-style-type: none"> Northern Ireland Statistics and Research Agency (2014). Mid-Year Population Estimates. Health & Social Services Board. Estimates for mid-1991 to mid-2014.

4.4 TINNITUS - SCOTLAND HEALTH BOARD

Notes	See section 4.1 – estimates are subject to uncertainty
Indicator	Adults (aged 18+) with tinnitus that might seek help, and those with severe tinnitus
Time period	2014
Geography	Council Areas, Scotland
Data sources	<p>People with tinnitus that might seek help: 2.5%. People that might have severe tinnitus: 0.5%. See section 4.1</p> <p>Population data:</p> <ul style="list-style-type: none"> ISD Scotland (2014). NHS Board (1st April 2014 configuration) Population Estimates 1981-2014, Last Release: 2014 mid-year population estimates released in April 2015. Source: National Records of Scotland (NRS)

4.5 TINNITUS - WALES (HEALTH BOARDS -TBC)

Notes	The NCHA has tried to obtain population data at a Health Board level, but this has not been possible. As soon as we obtain a reliable dataset for 2014 we will update the hearing map.
Indicator	Adults (aged 18+) with tinnitus that might seek help, and those with severe tinnitus
Time period	TBC
Geography	TBC
Data sources	TBC

5. EARWAX – HIGH UNCERTAINTY

5.1 SUMMARY

Anecdotally GPs, providers, commissioners and other stakeholder highlight earwax as a major challenge in terms of running clinics in an efficient and sustainable way. For service users a build-up of earwax appears to result in multiple visits and unnecessary costs.

This is why, despite knowing any estimate would be a gross estimate, we decided it was worthwhile reviewing the literature to assess whether we could provide at least an insight into the scale of problematic earwax at a local level. A review of the literature on the prevalence and incidence of earwax was conducted by the NCHA in 2016.

The incidence and prevalence of significant earwax varies with age for example: 43% of people aged 0 to 16; 5% of people aged 16 to 59; and 57% of people aged 60 and older might have significant ear wax at any time³⁸. We ran various models based on these and other datasets in England and found between 7.3 and 26.2 million people might have “earwax” at any point in time. These figures – because earwax is a naturally occurring substance – did not however indicate the number of people that would require support from a health care professional.

We therefore opted to derive estimates based on people with impacted wax because this is the group for which earwax is likely to be problematic³⁹. The incidence of impacted earwax is estimated to be 39.3 per 1000 – i.e. 3.93%⁴⁰. We opted to use 3.9% to estimate the potential number of cases requiring support for earwax each year.

5.2 EARWAX – ENGLAND CLINICAL COMMISSIONING GROUPS

Notes	See section 5.1 – estimates are subject to significant uncertainty
Indicator	People likely to seek help for earwax (all ages)
Time period	Estimates for number of people that might seek help in any given year (base year 2014)
Geography	Clinical Commissioning Groups, England
Data sources	Annual incidence 3.9% (see section 5.1) Population data: <ul style="list-style-type: none"> Office for National Statistics (2014). Mid-2014 Population Estimates for Clinical Commissioning Groups (CCGs) in England by Single Year of Age and Gender. Release number: SAPE17DT5, Date published: 25 November 2015.

5.3 EARWAX - NORTHERN IRELAND HEALTH & SOCIAL SERVICES BOARD

Notes:	See section 5.1 – estimates are subject to significant uncertainty
Indicator	People likely to seek help for earwax (all ages)
Time period	Estimates for number of people that might seek help in any given year (base year 2014)
Geography	Northern Ireland Local Government Districts
Data sources	Annual incidence 3.9% (see section 5.1) Population data: <ul style="list-style-type: none"> Northern Ireland Statistics and Research Agency (2014). Mid-Year Population Estimates. Health & Social Services Board. Estimates for mid-1991 to mid-2014.

5.4 EARWAX - SCOTLAND HEALTH BOARDS

Notes	See section 5.1 – estimates are subject to significant uncertainty
Indicator	People likely to seek help for earwax (all ages)
Time period	Estimates for number of people that might seek help in any given year (base year 2014)
Geography	Council Areas, Scotland
Data sources	Annual incidence 3.9% (see section 5.1) Population data: <ul style="list-style-type: none"> ISD Scotland (2014). NHS Board (1st April 2014 configuration) Population Estimates 1981-2014, Last Release: 2014 mid-year population estimates released in April 2015. Source: National Records of Scotland (NRS)

5.5 EARWAX - WALES (HEALTH BOARDS -TBC)

Notes	The NCHA has tried to obtain population data at a Health Board level, but this has not been possible. As soon as we obtain a reliable dataset for 2014 we will update the hearing map.
Indicator	People likely to seek help for earwax (all ages)
Time period	TBC
Geography	TBC
Data sources	TBC

6. SERVICE LEVEL DATA

This section will be added to as we collate and analyse service level data.

6.1. Completed RTT Journeys – England, Clinical Commissioning Groups

Direct access audiology referral to treatment, completed journeys for year end 2014/15. These data are obtained from NHS England.

6.1. Pending Indicators

The NCHA is currently undertaken a series of projects. Data from these projects will be presented in the hearing map whenever this will benefit patients, providers and/or commissioners of services in the UK.

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