

# Adult Hearing Screening: Can we afford to wait any longer?

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The report is the work of the authors.

# Executive summary

Adult hearing loss is among the top ten disabilities in terms of years lived with disability for those over 60. (Murry 2013). For those over 70 it is the top cause of years lived with disability (Davis, 2015). Many people take up to 10 years to address their hearing loss. Although many, if not most, people with hearing loss would benefit from hearing aids, only about one in five people in the UK with hearing loss have hearing aids. Only around 5% of those who could benefit from a cochlear implant currently have one fitted. Addressing the impact of hearing loss should therefore be a major priority for health systems.

The failure to screen and addressing adult hearing loss is causing a major public health issue with people left at greater risk of dementia, mental health issues, more falls and social isolation. We now have a national Action Plan on Hearing Loss for England but no national strategy on hearing screening for adults. Yet the consequences of untreated hearing loss are greater overall costs for the health service and poor quality of life for those who lose the ability to communicate. Hearing aids are an acceptable and well used intervention for hearing loss with over 80-90% usage in many studies (Perez & Edmonds 2012). For those with greater levels of hearing loss cochlear implants are an effective intervention with proven health and social benefits.

## Current reviews of hearing screening programmes are not fit for purpose as they do not:

Take account of the specific issues relating the assessment of using technology which make it difficult to apply standardised methodologies such as RCT's to the process

Recognise patient reported data as being worthy of inclusion in evidence for any review and that this evidence overwhelmingly supports the introduction of hearing screening

Recognise the barriers and inefficiencies in the current patient pathway that national hearing screening would address

Take account of significant recent research on the cost effectiveness of hearing screening.

This report examines the case for introducing national screening programme in the UK and in other European Countries and finds that health systems are storing up greater problems by not introducing a hearing screen.

“If this was picked up sooner, there would be such an improvement to people’s quality of life. I know of so many people who clearly have got hearing loss but won’t ask their GP for a referral to ENT services. If screening was available many of these people would attend, as it would be seen as something that everyone is offered. Hearing loss at any level causes such upset and depression in people and their families.”

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# SECTION 1: Introduction: the challenge of hearing loss

Losing the ability to communicate though hearing loss has a major impact on health and wellbeing.

The World Health Organisation estimates that in the UK adult hearing loss will be in the top ten disease burdens, above diabetes and cataracts by 2030 (Mather 2006). World-wide hearing loss is the greatest cause of Years Lived with Disability (YLD) in the over 70’s. In the UK Hearing loss accounted for about 9% of years lived with disability among people aged 70 and over, being the top cause in men and the fourth most frequent cause of disability in women of that age. (<http://vizhub.healthdata.org/gbd-compare/england>)

Hearing loss in the UK affects over 11 million people (Action on Hearing Loss 2015), and 900,000 people have severe or profound hearing loss. It is predicted that with an aging population, by 2035 there will be more than 15.6 million people with hearing loss, one in five of the population. Almost one in four (22.6%) over 75-year olds report moderate or severe worry because of hearing problems. The direct costs to the health service in England of addressing hearing loss are currently estimated to be around £500 million annually and will increase in line with demographics and the increasing availability of technological innovations.

## IT IS PREDICTED THAT WITH AN AGING POPULATION, BY 2035:



The indirect costs associated with hearing loss because of co-morbidity with other life limiting illness from mental health, dementia, falls, loss of independence and consequent increased reliance on social care far outweigh the cost of not effectively addressing hearing loss. (Lamb et al., 2015)

We know that hearing loss is associated with a number of life limiting and expensive health consequences for individuals. For example:

- Hearing loss is associated with social isolation and loneliness (Pronk et al 2011) which have significant effects on health (Cohen 1997) and in older people there is a strong correlation between hearing loss and cognitive decline (Lin 2013), mental illness and dementia (Lin 2011) and premature death (Friburg 2014; Contrera 2015).
- Each 10 dB worsening of hearing loss is associated with an increased likelihood that a person will report a fall over the preceding 12 months by 40% (Lin 2012).
- Those with mild hearing loss are twice as likely to develop dementia, and those with severe hearing loss have five times the risk of developing dementia as those with normal hearing. (Lin 2013)
- Older people with hearing loss are two and half times more likely to experience depression than those without hearing loss (Matthews 2013) and are also at increased risk of major depression and anxiety (Davis 2011; Gopinath et al., 2009).
- People with hearing loss have higher levels of unemployment than those without (Arrowsmith 2014; Davis 2012).

The health and social implications of losing your ability to communicate has been recognised by NHS England and the Department of Health in the publication of the Action Plan on Hearing Loss (NHS 2015) to ensure that the massive costs to society and individuals through untreated hearing loss are addressed. Similar programmes have been initiated in Northern Ireland with the Physical and Sensory Disability Strategy and Action Plan 2012-2015 and in Scotland with the 2014 See Hear strategic framework for sensory impairments.

These strategies all highlight the need for early diagnosis and intervention for hearing loss, and recognise that hearing checks and screening for hearing loss should be included in care pathways.

However there is a major gap in the Action Plan on Hearing Loss for England: while there is a national screening programme for children there is not a similar programme to systematically check the hearing of adults who could benefit from the latest hearing technologies. The UK Screening Committee's review of evidence in 2015 did not recommend a screening programme be introduced. The situation is the same in many other countries, where discussion continues about adult hearing screening.

How far is the decision not to introduce national hearing screening justified by the evidence we have on the impact of hearing loss and the effectiveness of early intervention? This report reviews the case for screening for adult hearing loss and challenges the thinking that there is not enough evidence to recommend a screening programme for adult hearing loss.

## Why screen for hearing loss?

Health service costs are rising annually everywhere: in England the capacity of the health service to meet future health needs is in question (NHS 2014). The Health service in the UK has rightly looked to early intervention and prevention as being a better solution for patients and more cost effective for the service. Early intervention to address health issues that can reduce expenditure on treatable illnesses later in life makes sense for the individual and society. Screening can be especially relevant where the people affected are unaware of their condition and where the screening process itself facilitates taking action to address their condition-particularly if there is a proven and acceptable intervention as in the case of hearing loss.

The Action Plan on Hearing Loss for England, (NHS 2015 p19), noted the importance of early intervention to address the impact of hearing loss:

"Early identification and intervention are key actions that should make a real difference in reducing risks and attaining better hearing health outcomes throughout life. It is particularly important in reducing the impact and cost of congenital hearing loss and of long term conditions such as adult onset progressive hearing loss."

Person who said quote

Screening would help support patient awareness and choice. Monitor, the sector regulator noted that choice of provider, which is now in place across much of England, encourages people to take action more quickly once aware of their hearing loss;

"Taking steps to make choice work better for patients would benefit some of those millions of people with hearing loss who do not have hearing aids. In the longer term, this has the potential to reduce pressures on health and social services that can be attributed to unaddressed hearing loss. Improving access to hearing services may increase total spend on hearing loss, but we expect this to benefit patients."

Person who said quote



Of the six million people who have hearing loss in England which is significant enough to benefit from hearing aids only two million people have them. People with hearing loss typically wait up to 10 years to take action and when they do seek help, they may be dismissed as the hearing loss may be considered an inevitable consequence of aging. GPs fail to refer 45% of those reporting hearing loss to NHS hearing services (Davis et al., 2007). A Health Technology Assessment found that of those who have consulted their GP about hearing, only 38% also went for audiological assessment; only 41% in the age band 55–74 years (Davis et al., 2013). This means that there are significant unmet health and communication needs in the group who could benefit which is storing up higher long term costs (Davis et al., 2007).

Typically, those who are referred for hearing assessment have had a hearing problem for 10 or more years, are aged in their mid-70s and have a substantial hearing problem. The older people are when they present for assessment and intervention, the more difficult they find adaptation to and care of their hearing aids (Davis et al., 2007). Yet we know that fitting hearing aids earlier is more cost effective, and that "those identified early had greater benefit than those of the same age and hearing impairment who were fitted with hearing

aids later" (Davis et al., 2007). For those with greater levels of hearing loss, cochlear implants have become more widely available in recent years and we also know that the earlier after the onset of deafness they are fitted, the greater the benefit (Mosnier et al., 2015).

A systematic review carried out by the American Association of Audiology Task Force, concluded that hearing aid use is "a comparatively non-invasive, low-risk option with considerable potential benefits, which is the only viable treatment for sensorineural hearing loss" (SNHL). It concluded that "that hearing aids improve adults' Hearing Related QoL by reducing psychological, social, and emotional effects of SNHL" (Chisholm et al., 2007). Further a recent systematic review found that on a number of different quality of life measures people are benefiting from hearing aids (Ciorba et al., 2012). Swan et al., (2012) and Barton et al (2004) also found health improvement benefits of hearing aids using quality of life outcome measures. Kochkin & Rogin (2000) also found positive outcomes with hearing aid users having better social engagement, mental health and physical health than non-users. Wearing hearing aids also mitigates the risk of dependence on social care and risk of dying early (Fisher et al., 2014; Contrera et al., 2015). Saito et al., (2010) found that using hearing aids also had a positive effect on depression, while Cox (2005) also investigated different types of hearing aids and their impact on QoL, concluding that programmable hearing aids provide the most efficient effects. Kochin (2012) found that those with hearing aids had higher levels of employment than those without, with clear health and economic implications. Stark and Hickson (2004) also found that the incidence of frustration and stress in a family setting decreased after the fitting of hearing aids. While the HSE 2014, (HSE 2015) a large scale (n8077 adults) representative household survey, found that those "who reported hearing difficulties but did not currently use hearing aids had higher prevalence of poor mental health and lower positive mental well-being than those who currently used hearing aids."

Studies already carried out for the UK estimate that the costs of screening 65 year olds and providing interventions would be £255 million over ten years, but the benefits across this period would amount to over £2 billion, including avoided personal, employment, social and healthcare costs.

(RNID/London Economics 2010). As discussed later in this report, most people who have then use their hearing aids regularly and gain significant benefits from them, and we also know from other systematic reviews that hearing aids are a cost effective intervention (Chao & Chen 2008; Morris, 2012; Joore 2003). The cost-effectiveness of unilateral cochlear implantation in adults has also been proven, with positive benefits in terms of quality of life, and increased communication abilities (Bond 2009).

Providing an adult hearing screening programme would increase awareness of the health consequences of not addressing hearing loss ensure that those with hearing loss are supported to take early action. It would send out a powerful health awareness message about the importance of hearing to both individual and society, and help normalise hearing loss, addressing the stigma that some people feel is associated with hearing loss. People with more severe unaddressed hearing loss who were picked up by the screen might also be suitable candidates for cochlear implants.

"If I had known then how life-changing deafness would be, I would have acted sooner."

Person who said quote

In addition, the average cost of hearing aids to the NHS over the last five years has gone down showing that the provision of aids has become even more cost effective.

## SUMMARY POINTS:

Unaddressed hearing loss is one of the major health challenges facing the UK and other developed countries

Hearing aids and cochlear implants have been demonstrated to be cost effective interventions to address hearing loss.

There is significant evidence of long term benefits for society and improved health and wellbeing from using hearing aids and cochlear implants.



*"I am waiting for the day that general attitudes change so that hearing loss is no longer something to be ashamed of (as the advertisements tell us) or something to be made a joke of. Sight loss generates sympathy, hearing loss generates ridicule."*

An adult with hearing loss

## SECTION 2: Adult Hearing Screening: the issues

The effectiveness of hearing screening and hearing aids as an intervention has been raised, for example Sibley, (2015) and some of the key points are now examined.

### How should hearing screening be delivered?

There is debate about the best type of test to be used, the level of hearing loss to target, the age at which people should be screened and the amount of time between screening tests.

To be effective, health screening needs to incorporate a test which is both sensitive (identify individuals having the condition) and specific (detect only those who have the condition). For successful implementation it needs to be cost effective, easy to administer and provide an acceptable and effective solution. Research has shown for some time that all these criteria can be met.

The conclusion of the Health Technology Assessment (HTA), a major large scale study in the UK, found that the optimal cut off for screening was 35 dB HL for adults aged 55-74 years, and that the most effective screening test was to ask two verified questions alongside pure tone audiometry (Davis et al., 2007).

About 70% of those who were offered an aid in the HTA accepted a bilateral fitting. This increased to 95% for those with  $\geq 35$  dB HL (averaged over 0.5, 1, 2 and 4 kHz in the better ear) showing that the intervention was acceptable. The costs of screening and intervention were in the range of £800-1000 per quality-adjusted life-year when using the Health Utilities Index and about £2500 using the Short Form 6 Dimensions metric. Either cost is well within acceptable current guidance for cost effectiveness of the intervention.

Morris (2012) showed that hearing screening is cost-effective. Further analysis has supported these conclusions. Morris et al., (2012) used Markov models to estimate the incremental cost-effectiveness ratio (ICER) of potential screening programmes compared with current provision (General Practitioner referral) and also analysed other scenarios. They concluded that "screening for bilateral hearing loss of at least 35 dB HL between the ages of 60 and 70 years, as proposed by Davis et al. is likely to be cost-effective."

Screening was considered more cost effective than the current system of GP-referral as long as a Quality Adjusted Life Year (the standard measurement in health economics) was valued above £2000. The accepted value for NICE is between £20,000 and £30,000. She also proposed that a more cost-effective screening option was to have a one-stage audiometric screen for bilateral hearing loss of at least 30 dB HL offered to adults aged 60, 65 and 70 years (ICER £1461 compared with GP-referral). They concluded that implementation of an Adult Hearing Screening programme should be considered by policy-makers in the UK "as a cost effective way to reduce unmet need for hearing aids and improve quality of life among older adults."

Morris et al (2012) showed that hearing screening is cost effective even at a worst case scenario of take up which was far below what Davis and more recent studies have found;

"... sensitivity analysis shows that even under a worse-case-estimate of 46% take-up (lower 95% confidence interval across all studies), screening remains cost-effective, and in fact this variable has a negligible effect on cost per QALY within the modelled range."

While Morris wanted to see more research on tailored solutions for individuals the clear conclusion was that hearing screening is cost effective and can improve quality of life (Morris 2012).

Similar research has been published in respect of the Netherlands. Anouk et al., (2015) compared no screening, telephone screening, Internet screening, screening with a handheld screening device, and audiometric screening for various starting ages and a varying number of repeated screenings. The costs per quality-adjusted life-year (QALY) for no screening and for 76 screening strategies were analysed using a Markov model. Screening was deemed to be cost-effective if the costs were less than €20,000/QALY. The authors suggested that Internet screening at age 50 years repeated at ages 55, 60, 65, and 70 years was the optimal strategy to screen for hearing loss and recommended that it might be considered for nationwide implementation. While the costings and methodology will be different for the UK context what is important to note is that screening was still found to be acceptable and cost effective.

There is already considerable debate and questioning of whether the current pathway for identifying hearing loss is effective in UK/ England (ICL 2014; Action on Hearing Loss 2011, 2015) and similar issues occur elsewhere. This research suggests that screening is more effective than referral routes through a general practitioner or relying on adults with hearing loss to seek assessment for hearing loss unprompted. Considerations of the effectiveness of hearing screening should be set in the context of how poorly the current available pathways help identify and address hearing loss.

It has been acknowledged that there is minimal risk in using screening for hearing loss. Reviewing the evidence for the UK National Screening Committee, Sibly (2015) accepted that;

“Harms are unlikely to be greater than minimal because screening and confirmatory testing are non-invasive and treatment with hearing aids is not associated with significant harms.”

This follows other systematic reviews which also conclude that screening is safe.

## SUMMARY POINTS:

There are viable models of how to screen, when to screen and at what intervals to screen.

Screening is cost effective, compared to current pathways.

Screening is cost-effective, even if there was low utilisation of hearing aids.

## SECTION 3:

# Hearing Screening: further research issues

In spite of the evidence above, a recurrent criticism of proposals to introduce adult hearing screening is that there has not been an adequate randomised controlled trial (RCT) of the benefit of hearing screening.

Randomised Control Trials (RCTs) remain the gold standard for medical evidence. However making an RCT the requirement in this context is problematic as medical devices such as hearing aids and cochlear implants are difficult to analyse using a RCT due to frequent software updates, model upgrades, and customised fitting. Unlike medicines there is a learning curve associated with device management, user characteristics might have greater impact on outcomes and if the device has multiple channels (like a hearing aid or implant), running an RCT and controlling for all these variables can become a significant challenge and make robust conclusions challenging. Outcomes from hearing aids and implants accrue over a period of time: an RCT will not capture the changes in technology over time, or the possible changes in the participant's hearing loss, and need for new technology over time. The heterogeneity of the group studied adds further to the problem.

Calls for further RCT's in this area also ignore significant ethical issues as hearing aids and implants are already the recognised interventions (treatment) for hearing loss. To therefore conduct a large longitudinal trial which explicitly denies one group an accepted intervention that they would otherwise receive for free is unlikely to gain ethical approval (BSA 2015).

As Dawes et al., (2015) concludes:

“Ethical and practical constraints preclude randomized controlled trials of the impact of hearing aid use among people with hearing impairment that utilize the long study durations that would be required to observe effects on some outcomes (such as on cognitive decline). It would not be ethical to randomize someone with hearing impairment to a 'no hearing aid' condition for a study that would run for several years.”

Further unlike for medicines, the regulatory process for medical devices (hearing aids) creates weak incentives to perform costly RCTs. Taking these factors together the insistence on RCT's as fundamental requirement in this area is a de facto decision not to introduce hearing screening in the foreseeable future and questions the appropriateness of using this as a fundamental requirement.

In evaluations there has also been a tendency to dismiss trials, both randomised and non-randomised, that have already been undertaken. McArdle et al (2005) administered both generic and hearing-related QoL measures to 380 participants randomized into experimental (immediate hearing aid treatment) and control (delayed hearing aid treatment) groups. Hearing aids were shown to improve both generic and hearing-related QoL domains. Murlow et al., (1990) also showed significant quality of life benefits from hearing aids when used by randomly enrolled patients with screening-detected >40 dB hearing loss. Also Jerger et al (1996) illustrated the benefit of hearing aids. Further, hearing aids resulted in near normalization of hearing-related quality of life and function in a subgroup of patients identified by screening, based on >40 dB hearing loss using a handheld audiometric device. Yeuh et al., (2010) showed that hearing aid use was higher after 1 year with screening than without. The research was on specific groups of patients (veterans) which limits its general applicability, but it nonetheless provides useful evidence when supplemented with other evidence, particularly as costs are not an issue for hearing aids in the UK, one of the major considerations in other studies.



*“A screening programme would be helpful because when you have a hearing loss at first you just put up with it and tend to say that it is not a problem whereas to others it can be!”*

**An adult with hearing loss**

Davis et al., (2007) produced evidence of the effectiveness of screening when offering hearing aids to all those found to have low levels of hearing loss (impairment of 25dB and above) with 36% still using hearing aids 12 years after fitting (Davis 2007). If a screening programme targeted people with more severe hearing loss at the age of 65, the uptake and continued use are likely to be even greater – prevalence of hearing aid use among the general population doubles between the ages of 55 and 65. After a systematic review the possibility of using the hearing screening process to alter hearing aid uptake (Jenstad & Moon 2011) concluded that “Other interesting areas for further studies are the possibility of using the hearing screening process to alter HA uptake.”

It also important to consider practice-based evidence. Audiology services have been at the forefront in the use of patient reported outcomes measures (PROMS) within service delivery. Extensive use of research validated PROMS is used to manage individual patients and monitor impact of interventions across cohorts of patients. Data such as from the Glasgow Hearing Aid Benefit Profile (Gatehouse et al., 1999) is used to gauge patient usage and satisfaction in research; for example with cochlear implantation. Many of the patient surveys done with this and similar methodologies show high levels of hearing aids

usage, satisfaction with their aids and considerable patient perceived health benefits (see next chapter). To consign such evidence to “grey literature” does not recognise the legitimacy of such research today. Increasing value is being placed on qualitative research with its own robust methodologies in order to capture the patient experience, and an RCT is not necessarily a feasible or optimal way to obtain such evidence.

In not using such evidence those making assessments of the benefits of hearing aids and their usage miss the insights from developing practice in patient centred care and the self-reported benefits patients derive from this intervention.

### SUMMARY POINTS:

RCT’s should not be seen as the only effective way of assessing the benefit of hearing screening or long term impact of hearing aid usage.

There are some RCT’s in this area, which, although on specific populations, demonstrate that hearing screening can be effective.

There are other valid and robust ways of assessing patient benefit through qualitative research.

## SECTION 4: Effectiveness of hearing technology provision

Another criticism to be addressed is the perceived lack of evidence about the acceptability of the available treatments. It is often claimed that in spite the high prevalence of hearing loss and many options for amplification, a significant proportion of those with hearing loss do not use hearing aids for any length of time.

It is well established in the literature that there are a number of barriers to hearing aid use including stigmatization, underestimation of hearing loss by the individual, personality factors, low trust in hearing aid benefit, cognitive and functional restrictions, cost, false expectations (Meister, et al., 2008) The best practices employed by hearing healthcare professionals play a significant role in the success of the patient’s hearing aid experience and journey (Kochkin et al., 2010). Therefore it is important that the right support, information, and counselling is given at the time of hearing aid fitting (Kochkin 2010). Further evidence shows that given good support, follow up and rehabilitation, high levels of hearing aid use and satisfaction can be achieved at low costs (Abrams et al., 2002). Further, Gianopoulos et al., (2002) found that the majority of non-users rejected their aids for reasons amenable to better training in use of the aid.

The notion that people reject their hearing aids and that usage is low has attained a status far beyond what recent evidence would support. Many of the studies cite cost or value for the decision not to use aids which may be more relevant in contexts where there are charges either for the aid, follow up or batteries. None of these conditions apply for the UK. Stigma is also cited and is clearly an issue often brought up in patient focused qualitative surveys but has seen to be a poor predictor of usage in reviews of the literature (Jenstad & Moon 2011). Many of those studies reviewed in recent systematic reviews to the extent that they apply to the UK are looking at historical studies reporting low usage covered periods where there was a the transition to digital aids and before more recent reforms to NHS audiology services. A scoping study by McCormack and

Fortnum (2013) suggested that key areas for further research should include “should focus on hearing aid value; fit and comfort of the hearing aid; care and maintenance of the hearing aid; attitudes and device factors.” However what is clear from these reviews is that most of the factors that determine hearing aid usage are not fixed but depend on better fitting and aftercare and improved benefit from the devices. All factors which could be addressed further while introducing a hearing screen to ensure greater take up and utilisation.

Attitudinal issues could be addressed further through the promotion of hearing screening as there is evidence that the more we normalise hearing loss and make it acceptable the greater the likelihood that people will be willing to take action. Establishing a hearing screening programme would go a long way to helping to lessen stigma and normalise hearing technology by making the assessment of hearing loss routine (Davis & Smith 2013).

Sibley (2015) relies heavily on the Barker et al., (2014) systematic review which puts non usage of hearing aids at between 5-40 per cent, which is not supported by some of the other recent estimates cited here. Further as Barker et al., (2014) acknowledged “The more recent studies tend to show higher levels of use.” Also as we explore further below most patient surveys show much higher levels of usage and for longer periods than some of the retrospective studies, many of which were not specifically focused on just on usage (McCormack & Fortnum 2013).

As Morris (2012) showed, hearing screening is cost effective even at these lower levels of utilisation,



COCOMAYA  
Fine Chocolatier & Artisan Baker

The uncertainty referred to around non usage is not an issue from a cost effectiveness perspective in considering the introduction of hearing screening. Further if we take more recent studies, which are also focused specifically on hearing aid usage, a more positive picture emerges. In addition to using their aids, hearing aid wearers, including those with mild to moderate hearing loss, show high levels of satisfaction with their hearing aids (Fellinger 2007). Further large scale cross European data also shows significantly higher usage than in some of the older studies that the systematic reviews rely on.

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Eurotrack is major European wide survey of hearing aid usage.

The figures for the UK are very helpful in answering some of the concerns expressed about the acceptability of hearing aids and their utilisation.

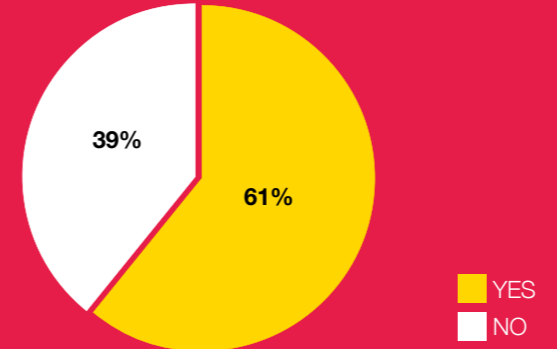
On average, hearing aids are worn:  
**8.1 HOURS A DAY**



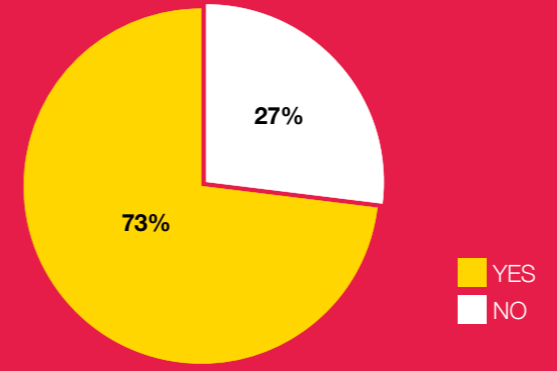
The survey shows that of those where the doctor recommending no further action the main reasons where that patients would not benefit from a hearing aid 39% and that they should wait until hearing loss got worse 36% (n95). Thus one of the main reasons that patients do not proceed is not resistance to taking action but a recommendation, without any form of screening, not to proceed.

Hearing Tests: both hearing screening at the GP and yearly testing for people over 55 is accepted by a majority of the population in the UK

Do you think everyone over the age of 55 should have their hearing tested every year?



Do you think your family doctor should screen (carry out a short test) your hearing when you visit them for medical check ups?



Some of the other key factors outlined in the survey undermine the picture that people are not happy with hearing aid usage;

- **81%** of the hearing aid owners say their hearing aid works better than or as expected
- **70%** of the HA owners are satisfied with their HAs
- The more hours worn per day, the higher the satisfaction
- Hearing aids adoption is increasing it is now **42.4%** of people who would benefit. The UK is at the top of the league.

The value of hearing aids as reported by their owners was also very positive;

- **81%** of the working hearing aid owners state their hearing aid(s) are useful on their job
- People with hearing aids recognise that hearing aids increase the chance of hearing impaired to get promoted, to get the right job and to improve salary
- Hearing aid owners have a lower risk of being depressed (PHQ-2 Screening) compared to impaired non-owners with comparable hearing loss
- Quality of sleep seems to improve if hearing impaired use hearing aids
- For other people in the household/relatives, the situation improves when the person with hearing loss starts wearing hearing aids.

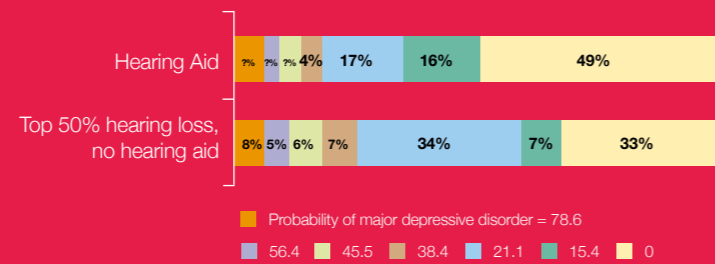
In respect of fear about stigma it is interesting to note that 80% of hearing aid owners think people don't make fun of or reject them because of their hearing aids. It is more likely somebody makes fun or rejects a hearing impaired without hearing aid.

### Depression symptoms:

PHQ-2 Screening:

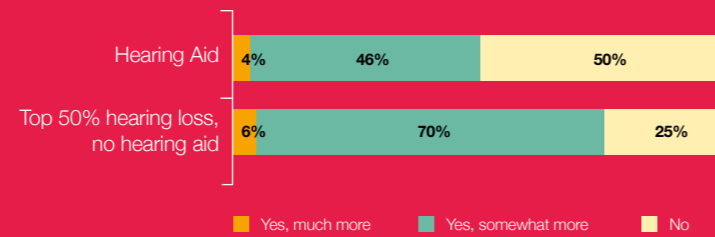
In the last 2 weeks:

- Little interest or pleasure
- Feeling down, depressed, hopeless



### Dementia symptoms:

Getting more forgetful in the last year?

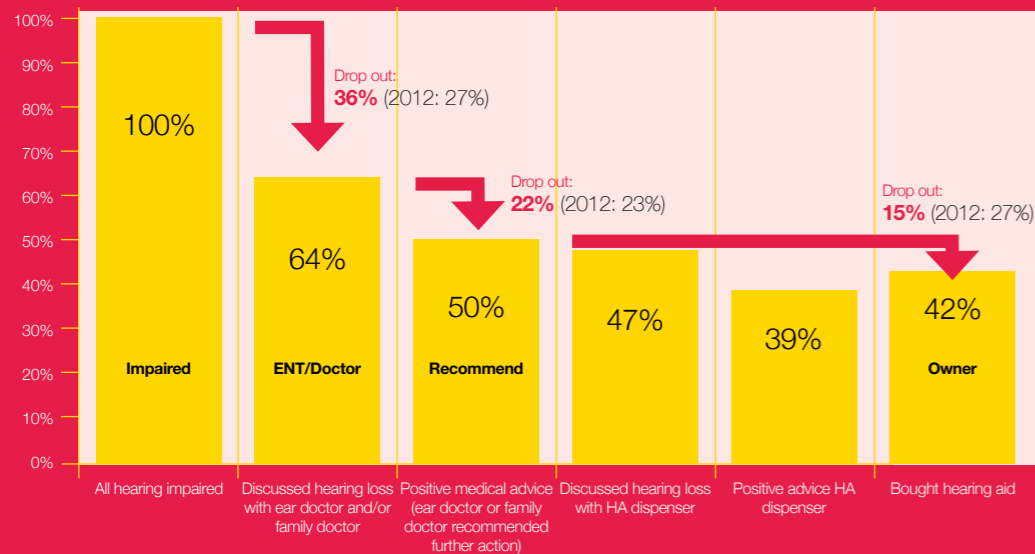


Base: hearing aid = 402, no hearing aid = 118

Further in respect of take up the Eurotrak figures for the UK (2015) show that dropout rates from those who identify with hearing loss to using a hearing aid is getting better.

### The route to the hearing aid:

Compared to 2012 drop out was reduced slightly



Base: n = 1'325

From a Representative sample (sample 1): n=14'473 people; Hearing impaired (sample 2): n=1'325 people; Hearing impaired non-owners: n=720 people with hearing loss (HL); HA owners: n= 605 people with hearing aid (HA).

Anovum 2015 – EuroTrak UK 2015

A systematic review showed that although studies used different time periods and measures, very high numbers of people continued to use and benefit from hearing aids, with up to 80-90%. (Perez & Edmonds 2012). The HSE 2014 report (HSE 2015), also found that "among adults aged 65 years and over in HSE 2014 .....around 80% of those who had been fitted with hearing aids used them, particularly among the older adults." Further "Among participants who reported current hearing aid use, 70% of men and 71% of women were fairly or very satisfied with their hearing aid." Salonen et al., (2013) also found that hearing aid use was improving and factors militating against use were related more to cost of batteries (Finland), follow on support and need to use.

Whether hearing aids were obtained through the public health care systems or privately seems to make little difference overall to satisfaction and usage. Monitor, the UK health improvement body, conducted their own survey of hearing aid users. They found that both in areas where more choice had been afforded patients and areas where choice had not been available there were high levels of usage and satisfaction from patients; 'Between 81 and 85% of patients wore their hearing aids regularly for over 2 hours on most days, and 92% said their hearing aids were 'fairly' or 'very' beneficial' (Monitor 2015). The key point is that under any system of provision most respondents were making good use of their aids and finding them beneficial.

However it is not helpful just to use the total amount of hours a hearing instrument is worn as being the only criteria for their acceptability. We need also to be aware that people will use hearing aids in ways that fit in with their social and lifestyle needs. For some people wearing hearing aids for longer periods will be essential for their capacity to function and quality of life while for others, perhaps with more limited social contacts, intermittent use in particular situations (even under 2 hours per day) may be more appropriate.

The US Institute of Medicine on Hearing Loss and Healthy Aging highlights other factors that need to be taken into account when choosing an intervention for hearing loss. Research shows that cognition, expectations, motivation, willingness to take risks, assertiveness, manual dexterity, vision, general health, tinnitus, occupational

demands, and the presence of support systems should underpin decisions on interventions and outcomes of the intervention (Lustig & Olson 2014). This demonstrates the difficulty in looking in the research for one easy axis of measurement or criteria and that the use of this technology has to be seen in the context of a complex rehabilitative programme. For as Lin et al., (2013) observed "Contrary to popular perceptions, proper hearing rehabilitative treatment is complex, does not simply consist of using a hearing aid, and can vary substantially depending on the treating audiologist."

## Hearing loss: association with cognitive decline

A growing body of evidence has identified a strong association between all levels of hearing loss and cognitive decline and dementia. People with mild hearing loss are twice as likely to develop dementia as people without any hearing loss, and the risk increases threefold for those with moderate hearing loss and fivefold for people with severe hearing loss. Recent research found that hearing loss not only increases the risk of the onset of dementia, but also accelerates the rate of cognitive decline (Lin 2011, 2012, 2013).

There is compelling new evidence that it is possible to address the potential decline in cognitive functioning through the use of hearing aids. An extensive French study among 3,670 randomly selected individuals aged 65 and older has also showed extensive benefits from hearing aid usage. The study began in 1989-1990 and the participants have been evaluated regularly for 25 years. Self-reported hearing loss was significantly associated with lower baseline MMSE score ( $\beta = -0.69, P < .001$ ) and greater decline during the 25-year follow-up period ( $\beta = -0.04, P = .01$ ) independent of age, sex, and education. A difference in the rate of change in MMSE score over the 25-year follow-up was observed between participants with hearing loss not using hearing aids and controls ( $\beta = -0.06, P < .001$ ). In contrast, subjects with hearing loss using a hearing aid had no difference in cognitive decline ( $\beta = 0.07, P = .08$ ) from controls. The study concludes that self-reported hearing loss is associated with accelerated cognitive decline in





*“Normalising the use of hearing aids could vastly improve the quality of life for people with hearing loss. It could put hearing loss on a par with sight loss and do away with the stigma of wearing aids.”*

An adult with hearing loss

older adults but that hearing aid use attenuates such decline (Amieva et al., 2015).

Deal et al (2015) tested the hypothesis that hearing impairment (HI) is associated with lower cognitive function. The researchers evaluated 253 people (mean age of 77 years) with respect to their pure-tone averages and their cognitive status over a 20-year period. Cognitive evaluations were performed in 1990-1992, 1996-1998, and in 2013. Better-ear pure-tone averages (PTAs) from 500 to 4,000 Hz were also evaluated. Subjects were grouped into gross categories according to their PTAs as having normal, mild, or moderate-to-severe hearing loss. Of note, when comparing people with normal PTAs to those with moderate-to-severe hearing loss, the rate of decline over the 20-year period differed by approximately one-half of a standard deviation with regard to memory, and one-third of a standard deviation with respect to global function. The authors report cognitive declines were greatest among participants who had hearing loss but had not worn hearing aids.

Thus we can see that when patient reported studies are used rates of utilisation of aids and satisfaction with them are high and do not reflect some of the poorer levels from older and historical studies which make up the bulk of many of the systematic reviews or where factors are extraneous to the UK situation. This is not to say that further measures should not be implemented

as part of continuous improvements for users of hearing aids and that this would not further improve utilisation. However it is clear that hearing aids are an acceptable intervention in which users report very significant benefits on all areas of their lives and where extended use does have significant health benefits including the potential to arrest cognitive decline.

### SUMMARY POINTS:

Hearing aids are an acceptable intervention and more recent evidence shows that they are being well used and achieve significant quality of life benefits.

Hearing aids are an acceptable intervention to patients and usage increases with more modern aids which offer greater utility, better support at time of fitting and appropriate after care and support.

Where there is a fear of stigma this will depress initial take up and willingness to take action this could be overcome by screening normalising hearing loss and wearing of aids

Evidence demonstrates the long term positive impact of hearing aid usage in improving health and wellbeing and potentially arresting cognitive decline.



*“My own avoidance to really admit that I could be deaf and therefore disabled. Also that I did not realise how bad my hearing loss was compared to other symptoms.”*

An adult with hearing loss

## SECTION 5:

# Effective follow up to screening: demand on services

One of the characteristics of a successful screening programme would be that additional people would have their hearing loss identified and addressed. Even if seen as desirable there are concerns that additional demand would put stress on already stretched health care services.

However in the UK we already have positive examples of managing change programmes. In the NHS in England the introduction of the Modernising Hearing Aid Services (the introduction of digital hearing aids) programme led to an improvement in the intervention; analogue to digital, development and investment in services and a reduction in waiting times once the new system was properly implemented. A massive improvement in patient benefit of around 40% was achieved because of these positive changes (Lamb & Murdock 2009).

Within the NHS in England further changes have been made with different provider models allowing more choice and further service innovation (Monitor 2015). Further service innovation is already underway in the NHS in terms of introducing limited screening models (Davis et al., 2012) and some of these are reviewed later in this report. Monitor's review of adult hearing services makes clear the NHS can do more for less in areas where different delivery models for NHS audiology provision have been tried and standards and access have improved and cost per patient has gone down (Monitor 2015).

It also notes that because of efficiency gains in services;

"Prices adopted by commissioners have been about 20% to 25% lower than the national non-mandated tariff. This can allow commissioners to treat more patients for the same spend and/or release additional funds that commissioners can spend on meeting other patients' needs."

This suggests that new and innovative ways of delivering services, for example in the community, using volunteers for some parts of the pathway, through service redesign or by providing additional support to those with hearing loss, can help to respond to increased demand. Some of these are already in place and been shown to be effective and cost-effective. For example, an independent Social Return on Investment Report of the Hear to Help service, which delivers hearing aid aftercare through volunteers in the community, found increased hearing aid usage, increased confidence in the technology, increased confidence, sociability and ability to participate more fully (AOHL, 2014). Overall, it appeared that for every pound invested in the Hear to Help project there was a social value created of £10.34. Other developments in follow up care include DVDs to support hearing aid usage (Ferguson & Henshaw, 2014) and on-line support through tele-health care (Lamb et al, 2015).

The introduction of a screening programme may require further pilots on the suitability of certain screening methodologies and consideration of the implementation of new approaches within the patient pathway. Establishing a hearing screen would of itself provide further impetus to continue reforming current practices and utilising resources both within the public and the private sector. Conservative assumptions about capacity should not impede progress. Debates on the cost of implementing hearing screening and concerns about the "burden" on the health service should be balanced against the risks of not addressing hearing loss and the even greater financial burden this puts on Health Service and Social Care programmes, and the economic loss to individuals and families.



As an example, some of these savings have been clearly identified in recent studies in the UK of the financial consequences of hearing loss. For example;

- £28 million could be saved in delayed entry to care homes in England if hearing loss was properly diagnosed and managed in people with dementia (Action on Hearing Loss 2013)
- £92 million has already been saved in reduced use of GP's and social work services when 1992 is compared to 2009 in part because of the use of hearing aids and cochlear implants. Over the time period 1992- 2009 this would represent an overall saving to the public purse of £1.56 billion (Lamb et al., 2015 and O,Neill et al., 2016). Greater usage in the future could lead to even larger savings.
- The UK economy lost £24.8 billion in potential economic output because people with hearing loss are unable to work. Because of the ageing population and people staying in work for longer, this estimate that this will increase to £38.6 billion lost per year by 2031. (International Longevity Centre UK 2013).
- Those with severe hearing loss who did not use hearing aids had unemployment rates that were nearly double that of those who did use amplification (15.6 versus 8.3%) Kochin (2010).
- The economic burden of hearing loss is estimated to be £30 billion per year in the UK. (Archbold et al., 2014)
- In 2004, hearing difficulties were estimated to cost Europe 284 billion euros, including the psychosocial impacts of hearing loss. (Shield 2006)

The potential effectiveness of screening must consider the capacity of early intervention to produce significant savings to health and social care system through the prevention or amelioration of life limiting conditions. It would be logical from a health systems perspective to invest further in meeting the needs of the additional population screened as this would produce further long term savings.

## SUMMARY POINTS:

The assessment of the capacity of public health care systems to cope with the introduction of hearing screening does not account for the possible changes in delivery models brought in by service innovations.

Health services would need new delivery models and the wider development of community based provision to implement screening. This would be possible and fundable if the full costs of hearing loss were taken into account.

We need a broader economic assessment of the benefits of hearing screening which puts this in the context of the overall impact of hearing loss on the public health care systems and wider welfare and employment systems.

IN THE HEAR TO HELP PROJECT:

**EVERY £1  
INVESTED  
CREATED  
A SOCIAL VALUE OF  
£10.34**



## SECTION 6:

# Listening to adults: their perception of hearing screening

To help understand how valuable hearing screening might have been for those who had already taken action about their hearing loss and who were already using hearing aids or considering cochlear implants we, together with Ng from The Ear Foundation, conducted an online survey of members of Action on Hearing Loss and The Ear Foundation. In total 188 people over the age of 65 responded and were asked a number of questions related to the identification of hearing loss and screening.

## Reluctance to take action

Some of the reasons why people are reluctant to take action when they become aware of hearing loss have been explored above. Many of these were reflected in our survey.

A number of respondents cited the stigma attached to hearing loss when they were asked why they did not immediately taking action;

*“Stigma. Hearing loss is not as easy for others to cope with and understand than other disabilities.”*

(P116, 66-70 years of age, female, severe hearing loss)

This was even more of an issue for younger people;

*“The stigma attached to wearing hearing aids as a relatively young man”*

(P78, 66-70 years of age, male, severe hearing loss)

The effect of stigma being especially strong for younger adults is also borne out in other studies. Kochkin (1993) found that adults aged 35 to 44 were twice as likely to cite stigma as a reason to reject a hearing aid, compared to adults aged 75 to 84 years old.

Also;

*“My own avoidance to really admit that I could be deaf and therefore disabled.” (P135, 60-65 years of age, female, moderate hearing loss). Also that “Did not realise how bad my hearing loss was compared to other symptoms.”*

(P49, 75+ years of age, female, moderate hearing loss)

While others blamed GPs for not referring them;

*“It could have happened much sooner but for a previous GP who annotated my medical records to the effect that “I had declined hearing aids because of aesthetic reasons.”*

(P44, 60-65 years of age, male, moderate hearing loss)

A number of people said that they would have taken action sooner if they had realised what a profound effect hearing loss would have had on their lives. This was typical;

*“If I’d known then how life-changing deafness would be, I would have acted sooner.”*

(P119, 66-70 years of age, male, moderate hearing loss)

Also;

*“Being more self-aware. Others of course try to be polite and not mention the problems I was creating. I have since learned I was losing my hearing for ten years before I was told.”*

(P88, 75+ years of age, female, severe hearing loss)

Others said they would have taken action;

*“If a check had been done routinely” and “realising I had a problem.”*

(P16, 66-70 years of age, male, moderate hearing loss)

Another commented that;

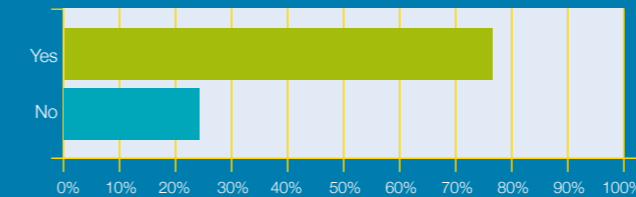
*“I did not realise how bad (relatively) my hearing loss was - had I known I would have asked for help earlier. I assumed it was the tinnitus masking sounds/speech for which I thought there was no help.”*

(P154, 66-70 years of age, female, moderate hearing loss)

## Views on the introduction of hearing screening

We asked hearing aid users their views on how useful introducing a hearing screen might be. Of those who answered (n169) 75 per cent supported the introduction of hearing screening.

**Adult screening is in place for other areas such as bowel cancer or breast cancer, do you think screening for hearing loss should be introduced for adults?**



Hearing aids users saw a number of clear benefits for the introduction of a screen and 76% supported the introduction of a routine rather than voluntary screen:

*“Patients notoriously slow to admit they have a loss in the first place. From my experience it used to take a spouse or family member to drag them kicking and screaming to have a hearing test. If the screenings were voluntary the same problem would occur.”*

(P182, 70-75 years of age, male, mild hearing loss)

Also in ensuring early intervention and helping to normalise hearing loss;

*“If this was picked up sooner, there would be such an improvement to people’s quality of life. I know of so many people who clearly have got hearing loss but won’t ask their GP for a referral to ENT services. If screening was available many of these people would attend, as it would be seen as something that everyone is offered. Hearing loss at any level causes such upset and depression in people and their families.”*

(P135, 60-65 years of age, female, moderate hearing loss)

Normalising the use of hearing aids was also seen as a great advantage by a number of respondents;

*“It could vastly improve the quality of life for people with hearing loss. It could put hearing loss on a par with sight loss and do away with the stigma of wearing aids.”*

(P7, 75+ years of age, male, severe hearing loss)

And;

*“Once diagnosed it gives a person a chance to come to terms with wearing aids and meeting others in a similar situation. I found it takes a long time to admit deafness and be open about it.”*

(P53, 70-75 years of age, female, moderate hearing loss)

*“I am waiting for the day that general attitudes change so that hearing loss is no longer something to be ashamed of (as the advertisements tell us) or something to be made a joke of. Sight loss generates sympathy, hearing loss generates ridicule.”*

(P88, 75+ years of age, female, severe hearing loss)

*“Try to get rid of the stigma that people seem to have about hearing loss. Wearing a hearing aid should be regarded the same as wearing spectacles.”*

(P123, 75+ years of age, male, severe hearing loss)

It was also seen as a potential spur to action;

*“It would be helpful because when you have a hearing loss at first you just put up with it and tend to say that it is not a problem whereas to others it can be!”*

(P168, 75+ years of age, male, severe hearing loss)

*“1. Some people might realise their level / quality of hearing could be improved and might take action as a result. 2. The isolation which can result when people lose some hearing might be avoided. 3. People might come to realise that loss of hearing is not an inevitable part of growing older, and might take action as a result. 4. Awareness among politicians about this potentially growing problem (given ageing population in UK) might grow, with the result that pressure for improved services might grow.”*

(P38, 60-65 years of age, female, moderate hearing loss)

There was also a very clear personal awareness from some people of the benefits of early adoption in ensuring longer term usage of their hearing aids;

*“People would learn to manage their hearing loss whilst still having quite a lot of hearing - using other signals, recognising the kind of adjustments that are needed - coming to terms with being open about the hearing loss and clear about needs - it would also mean there was less of a period of feeling isolated.”*

(P12, 70-75 years of age, female, severe hearing loss)

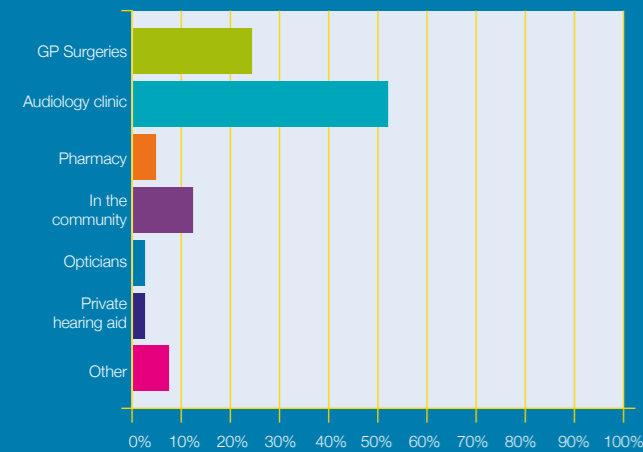
Also that;

*“Hearing loss picked up sooner so opportunity to get into the system and get aided before hearing loss becomes a big issue and isolation/depression sets in. The younger the person is the more likely they are to be able to manage their hearing aids. In my experience as a volunteer with Action on Hearing Loss, if older people have impaired finger dexterity they tend to give up on their HAs and are not prepared to persevere; if aided earlier this wouldn’t be such an issue because they would have experienced the benefits.”*

(P125, 60-65 years of age, female, severe hearing loss)



**Where do you think this adult hearing screening should be carried out?**



There was some interest in looking at alternatives to Audiology Clinics for screening especially where these involved an audiologist in more community based settings;

*"If there was a simple test, perhaps audiologists could come out to GP surgeries or other Community venues in the first instance and then refer people to the Audiology Clinic. Journeys to Hospital Audiology Clinics can be extremely time-consuming when there are no direct buses from so many places. (I have been away from home for 3.5 hours for 10 mins at the drop-in session)."*

(P59, 70-75 years of age, female, moderate hearing loss)

*"Several options could be available, not only from already overworked GPs but also pharmacies and opticians etc."*

(P104, 75+ years of age, male, severe hearing loss)

Many respondents also thought this would help with awareness of the advantages of hearing aids;

*"I would like to be encouraged to have hearing aids. Some people are too vain to want hearing aid, so I think the advantages should be pointed out."*

(P126, 70-75 years of age, female, severe hearing loss)

*"Referral to audiology via GP or, possibly, pharmacist. The strict criteria enforced, for instance, by Shropshire CCG for referrals to private/NHS audiologists under AQP would seem to make direct referrals by pharmacists perfectly possible. Frankly, most GPs, while OK for prescribing treatment for ear infections, know little about deafness and cannot contribute much to the referral process."*

(P148, 70-75 years of age, male, severe hearing loss)

Others wanted to build on models they have seen used for other types of screening which make the process very accessible and convenient;

*"There should be units on lorries set up as audiology clinics which go from town to town like the breast screening units do."*

(P82, 60-65 years of age, female, moderate hearing loss)

It was also felt this would help with acclimatising to hearing loss. However there was a concern expressed by some respondents that community settings would be linked to charging by private dispensers;

*"Receive as much support as possible and advice on how to cope with hearing loss and recommend which type of hearing device would be most suitable for them. Advice on how to cope in noisy social situations. Not get ripped off by private hearing aid companies offering a free hearing test then tricking a person into buying expensive hearing aids when an NHS aid may be just as good."*

(P173, 66-70 years of age, female, profound hearing loss)

*"By a professional audiologist? (Not by people who don't know too much about hearing loss issues and charge for aftercare.) Would be very good and could save NHS money in the long run and cut down waiting lists to see NHS audiology."*

(P64, 60-65 years of age, female, severe hearing loss)

While some people thought that current community services would have to improve first and there to clarity about the potential benefits and drawbacks:

*"With digital hearing aids this has become even more of an issue as the technology is challenging for the audiologist, particularly private audiologists who are dealing with many different products from different manufacturers. Therefore I think that the system for fitting hearing aids and the user feeling benefited by the hearing aids needs to be looked at before trying to alert more people to the need for hearing aids and then possible disappointment because they cause a problem rather than a solution."*

(P78, 66-70 years of age, male, severe hearing loss)

**52%**  
THINK THAT ADULT HEARING SCREENING SHOULD BE CARRIED OUT IN AN AUDIO CLINIC



Further that candidacy for those who already have hearing aids but want to be considered for cochlear implants that there should be a clear pathway and assessment:

*"I am informed that I have severe to profound hearing loss but still would not be referred for cochlear implants. I was being seen every 3 to 4 months but this has been cut back and left to me too contact the senior audiologist in my local hospital should the need arise."*

(P35, 70-75 years of age, male, profound hearing loss)

*"Audiology Department at xxx Hospital is very helpful. I got one hearing aid and 6 months later asked for the second one. When I got the first one, they explained all about how you can adjust it, how to change batteries etc. Also once the hearing aid was in place, I was told to go outside the building and see how I found it, to ensure it was set at a suitable level, and go back in and tell the Audiologist how I found it, before I was allowed to leave."*

(P59, 70-75 years of age, female, moderate hearing loss)

We also asked people how long they had taken between thinking about taking action and actually doing so. This sample is likely to be more proactive than the general population, and over 70 per cent took action within six months, but even in this group nearly 30 per cent took between 1 and over 4 years to take action. Again a screening programme could have provided additional impetus for people to take action even once they have acknowledged a problem. We asked those who left it over a year to take action why they had left it so long.

These responses were typical:

*"This was entirely my fault - my hearing has never been especially acute - I was refusing to recognise the problem"*

(P1270-75 years of age, female, severe hearing loss)

*"I did not realise for at least this time that I could gain from wearing them."*

(P154, 66-70 years of age, female, moderate hearing loss)

Together with fears about stigma associated with hearing loss;

*"Scared of wearing a hearing aid people stare"*

(P106, 75+ years of age, female, severe hearing loss)

We also asked people what they saw as the problems to introducing a hearing screen. Many felt it would not be affordable or would have a lower priority compared with cancer and other life threatening conditions;

*"Because it's not strictly life-threatening, I expect screening would have a low priority in the current economic climate."*

(P79, 60-65 years of age, female, moderate hearing loss)

Overwhelming the other main comments focused on the increase demand this would bring to the NHS. A large number of the respondents had clearly been through the switch over from analogue to digital aids and were concerned that additional pressures would lead to a diminution of the current service.

This comment summed up many of the others;

*"The NHS system would be set back again due to an inability to cope with the upsurge in demand. Many people would have to wait longer as they are unable to afford private fitting."*

(P182, 70-75 years of age, male, mild hearing loss)

While others were concerned that it would take resources away from other services. However as we can see for the overall support for screening amongst those questioned if they still thought that screening was a good idea but would want reassurance that this would not disrupt the service they currently enjoyed.

**SUMMARY POINTS:**

76% of respondents to our survey who have had hearing aids fitted supported a national adult screening programme.

Those who had delayed wished they had taken action earlier – they hadn't realised the impact of hearing loss.

The main benefits were seen to be greater awareness of the impact of unaddressed hearing loss, a simpler route than the current GP pathway and that it would help to address stigma.

Respondents suggested alternatives in the community for screening to be carried out.

Respondents were concerned that investment in screening should not mean any diminution of current service.

## SECTION 7:

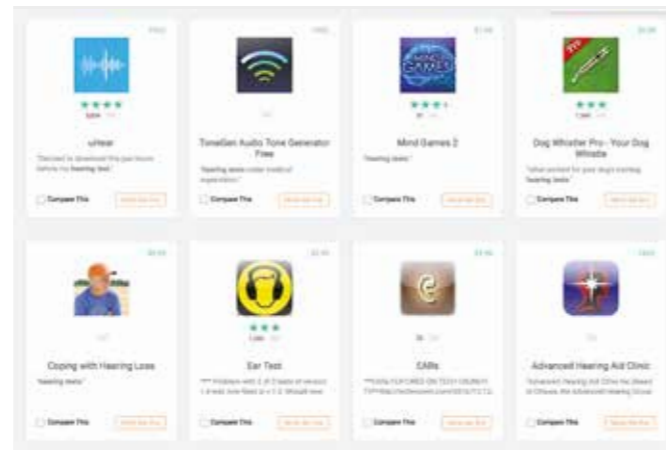
# Innovative approaches to Screening and Service Provision

A number of hearing screening initiatives whether locally or in the community have been attempted for over a decade now.

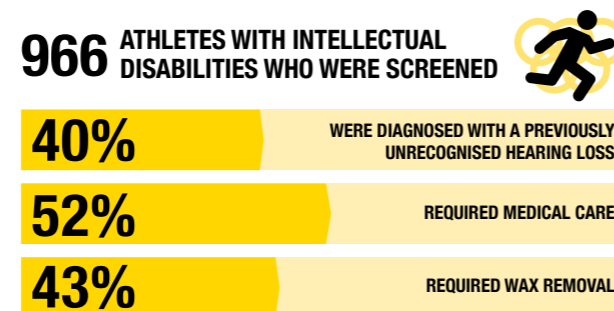
A number of hearing screening initiatives whether locally or in the community have been attempted for over a decade now. A good example is Action on Hearing Loss' hearing check. It was initially released as a telephone hearing screening test nationwide in 2005. A free phone line led to instructions for the test which consisted of listening to a random sequence of three numbers in presence of background noise and responding by pressing the digits on telephone key pad. The level of noise was adaptive. This 'speech in noise' test is now available as an app and can be taken on the tablet/i-pad/pc/laptop. This was perhaps the first robust attempt to drive the adult screening forward with a validated test.

Since 2007 screening tools such as the handheld screener above have been developed, which like full audiometry uses pure tones to effectively screen for hearing loss. There is therefore good evidence that such a screening tool could be deployed which would be low cost and which could be deployed as part of national programme. Speech in noise tests (Smits 2006 and Watson 2012) can be undertaken online or over the phone, and an easy to use, low cost hand-held screener which uses pure tones to screen for sensorineural, conductive and mixed hearing losses at different frequencies and severities is available (Parving et al., 2008). Using pure tones, the hand-held screener has been shown to have high negative and positive predictive values, and there was good correlation when its results were compared with full audiometric testing. It is safe and easy to use, and it was successful and popular when it was piloted by GPs in the UK (Parving et al., 2008). It is estimated that with bulk buying the hand-held screener would cost around £50 per unit, meaning that, as an example, providing one to every GP surgery across the UK would cost around £508,000 (Action on Hearing Loss 2010).

This screening test would be effective at predicting full audiometric testing and at predicting the benefit a patient would get from hearing aids, and it would therefore be effective in a screening programme. Currently, several hearing aid manufacturers (for example, Phonak, Starkey) have developed their own versions of hearing screening tests designed to be taken in the comfort of your own home. The same holds true for the apps (as many as 60!) which offer quick hearing checks through your phone. Hearing screening in adults is thus increasingly seen as self-help/self-report tool. However this does need a systematic programme for these initiatives to be implemented.



Other examples of screening initiatives include a large scale screening which took place at the Special Olympics (McCracken et al. 2013).



This is a good example of what can be achieved by screening, and the unknown hearing loss in some populations.

Ramdoo (2016 personal communication) and colleagues used a 2 stage process of screening with hospital inpatients and nursing home patients 33% of hospital patients had undiagnosed hearing loss and 62% of nursing home patients were suitable for hearing aids. They introduced screening using an iPad and found 30% of outpatients had an undiagnosed hearing loss, and in a GP practice of those who were screened, 60% had a hearing loss. Ramdoo went on to develop a device which clips on to a smartphone and enables a health care professional to look in the ear, clean ears of wax and then perform a hearing test and even remote consultations. This is another example of innovative development that could cut the cost of screening programmes. This follows other opportunistic screening which was also successful in getting a 22% take up rate of patient screened. (Ramdoo et al., 2016)

Other developments included a project at Nottingham University Hospitals, where Nottingham Audiology Service have developed a plan to improve the communication for inpatients with dementia and hearing loss (Brassington, W. personal communication 2015). This has the goal of addressing the hearing needs of inpatients with dementia in order to reduce the impact of hearing loss and restricted communication that evidentially compounds confusion and delirium in dementia sufferers. The overarching impact of this anecdotally often facilitates more straightforward discharge plans and has the potential to significantly reduce length of stay.

A named Audiologist is known to all the health care of the elderly wards and the dementia champions within the trust. She also visits the other wards picking up elderly patients on a daily basis assessing audiological needs and providing appropriate management.

The patients are then managed more effectively in hospital and on discharge where necessary referred to a dementia specific hearing clinic where their future management is dealt with by staff specifically trained in dementia care. Ongoing work will look at how to evaluate this intervention robustly.

The HSE 2014 (HSE 2015) used a hearing screen to identify adults from the survey who had hearing loss and on the basis of their evidence concluded that;

“At present, there is no screening programme for acquired deafness or hearing loss, but there is increasing awareness that early identification of hearing loss would support better outcomes for these people.....Given the benefits that hearing aids can bring, there is considerable scope for screening for hearing problems.... Results from HSE 2014 (HSE 2015) suggest that, if capacity or resources for universal, age-based screening is not available, it would be possible to identify a group with higher likelihood of having objective hearing loss by asking patients aged 55 and over about their hearing, and testing those reporting moderate or great difficulties with group conversations. Another option is opportunistic screening focusing on adults with other long-term conditions, particularly with vision, memory or mental health problems.” This approach was also supported by Pronk et al., (2011)

Organisations, hearing aid manufacturers, audiology equipment manufacturers, audiology departments and research institutes have had screening on their agenda for some time and still do. There is good evidence that low-cost screening tests are available that work well, are acceptable, and a number of initiatives have been undertaken which illustrate the positive outcomes they can bring. Introducing such tests on a comprehensive basis, and followed by good management, is likely to improve outcomes for many people with hearing loss and bring the wider benefits previously discussed.

## SUMMARY POINTS:

There are a number of screening tests available, some of which have been in use for a number of years.

Screening tests are widely available for personal use in the home, for example on a number of apps.

There are a number of initiatives which illustrate a high level of undiagnosed hearing loss where screening has been carried out.

Screening is already taking place in an ad hoc way in the UK and in other countries such as the Netherlands. This ad hoc development with low take up would be better served by a national approach.

## SECTION 8: Conclusion

The impact of hearing loss in adulthood is huge, with significant personal and societal costs. It is linked with isolation, depression, dementia and unemployment. Hearing aids have been shown to have a positive impact in all these areas, as do cochlear implants for those with the greatest hearing losses. However, in many countries, access to this technology is not straightforward. The introduction of a hearing screening programme has shown to be cost effective, acceptable to users and cost effective compared to the current pathway for those with hearing loss.

This report illustrates:

- 1 The personal and societal benefits of the fitting of hearing technology.
- 2 The higher rates of usage of technology than commonly thought.
- 3 The support of adults with hearing loss for the introduction of a screening programme.
- 4 The growing evidence from ad hoc screening that there is a great deal undiagnosed hearing loss in the adult population.
- 5 The numbers of tools available and which are increasingly being used personally.
- 6 The importance of exploring time and cost-effective ways of providing long-term management of hearing technology.

The opportunistic and piecemeal initiatives currently taking place should be harnessed into a national pilot programme in order to ensure that the best possible outcomes take place, and the advances in hearing technologies are not wasted.

We would therefore recommend:

- 1 That NHS England and the Department of Health fund a prospective national trial of hearing screening to bring together the innovative practice already being undertaken in this area.
- 2 That as part of this approach that there is support for more innovative developments of the patient pathway so that the potential opportunities that hearing screening would provide can be addressed by new service models with public services and in the community.
- 3 That more screening is carried out in specific health and care settings for example GP surgeries, care homes, pharmacies and by employers while a national hearing screening programme is developed and which would build on the local and opportunistic initiatives outlined in this report.
- 4 Further economic modelling is done by NHS England on the potential spend to save benefit of early intervention around hearing loss.



The current way in which the assessment of the suitability of hearing screening programmes are not fit for purpose in this area as they do not:

- take account of the specific issues relating the assessment of using technology which make it difficult to apply standardised methodologies such as RCT's to the process
- recognise patient reported data as being worthy of inclusion in evidence for any review and that this evidence overwhelmingly supports the introduction of hearing screening
- recognise the barriers and inefficiencies in the current patient pathway that national hearing screening would address
- take account of significant recent research on the cost effectiveness of hearing screening.

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*“It could vastly improve the quality of life for people with hearing loss. It could put hearing loss on a par with sight loss and do away with the stigma of wearing aids.”*

An adult with hearing loss



If you want more details about the campaign on adult screening for hearing aids or cochlear implants contact Sue Archbold or Brian Lamb c/o Marjorie Sherman House, 83 Sherwin Road, Nottingham NG7 2FB. Telephone 0115 942 985 or 07779 146022.



Action on Hearing Loss is the largest UK charity helping people confronting deafness, tinnitus and hearing loss to live the life they choose. Action on Hearing Loss enables them to take control of their lives and remove the barriers in their way, giving people support and care, developing technology and treatments, and campaigning for equality.

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