

CHAPTER 2

THE EXTENT AND CAUSES OF HEARING IMPAIRMENT IN AUSTRALIA

One in six Australians is affected by hearing loss...With an ageing population, [this] is expected to increase to one in four...by 2050.

Access Economics, Listen Hear! The economic impact and cost of hearing loss in Australia,
(February 2006), p. 5.

The most common causes of hearing loss are ageing and excessive exposure to loud sounds. The effects of age and noise exposure are additive so that noise exposure may cause hearing loss in middle age that would not otherwise occur until old age.

Department of Health and Ageing, *Submission 54*, [p. 1].

Introduction

2.1 The increasing prevalence of hearing loss is due largely to an ageing population, although there are a range of factors and behaviours among other sectors of the population which will have a flow-on effect on people's hearing in later life. These factors will be canvassed in this chapter.

2.2 This chapter will consider the causes of hearing loss, aspects of the severity and impacts of different levels of hearing loss, and the current and projected prevalence of hearing loss in Australia.

2.3 The committee drew on evidence from hearing loss experts and from people with hearing loss themselves. In addition, Access Economics' report *Listen Hear!* was of great value to the committee in considering the issues raised in this chapter.

Severity of hearing impairment

2.4 This section summarises some of the language and concepts around the severity of hearing loss. This will assist the reader to understand the evidence which follows about prevalence and causes of hearing loss.

2.5 There are a range of facets to hearing loss, including:

- decreased audibility, where people with hearing impairment do not hear some sounds at all, depending on the severity of hearing loss. As a consequence, a person may be unable to understand speech, as some essential parts are inaudible;
- decreased dynamic range. The dynamic range of an ear is the level of difference between the threshold of audible sound and the threshold of

loudness discomfort. A person with a hearing impairment will have a smaller dynamic range than that of a person with normal hearing;

- decreased frequency resolution. A person with hearing impairment may have difficulty separating sounds of different frequencies. A person with normal hearing is able to separate speech from background noise; however a hearing impaired person is unable to differentiate between speech and noise where the frequencies are close together. This can also affect the intelligibility of speech in some cases; and
- decreased temporal resolution. Intense sounds can mask weaker sounds that immediately precede or follow them, and inability to perceive the weaker sounds adversely affects speech intelligibility. The ability to hear weak sounds during fluctuating background noise gradually decreases as hearing loss worsens.¹

In combination, these deficits can cause a reduction in intelligibility of speech for a hearing impaired person compared to a normal-hearing person in the same situation.

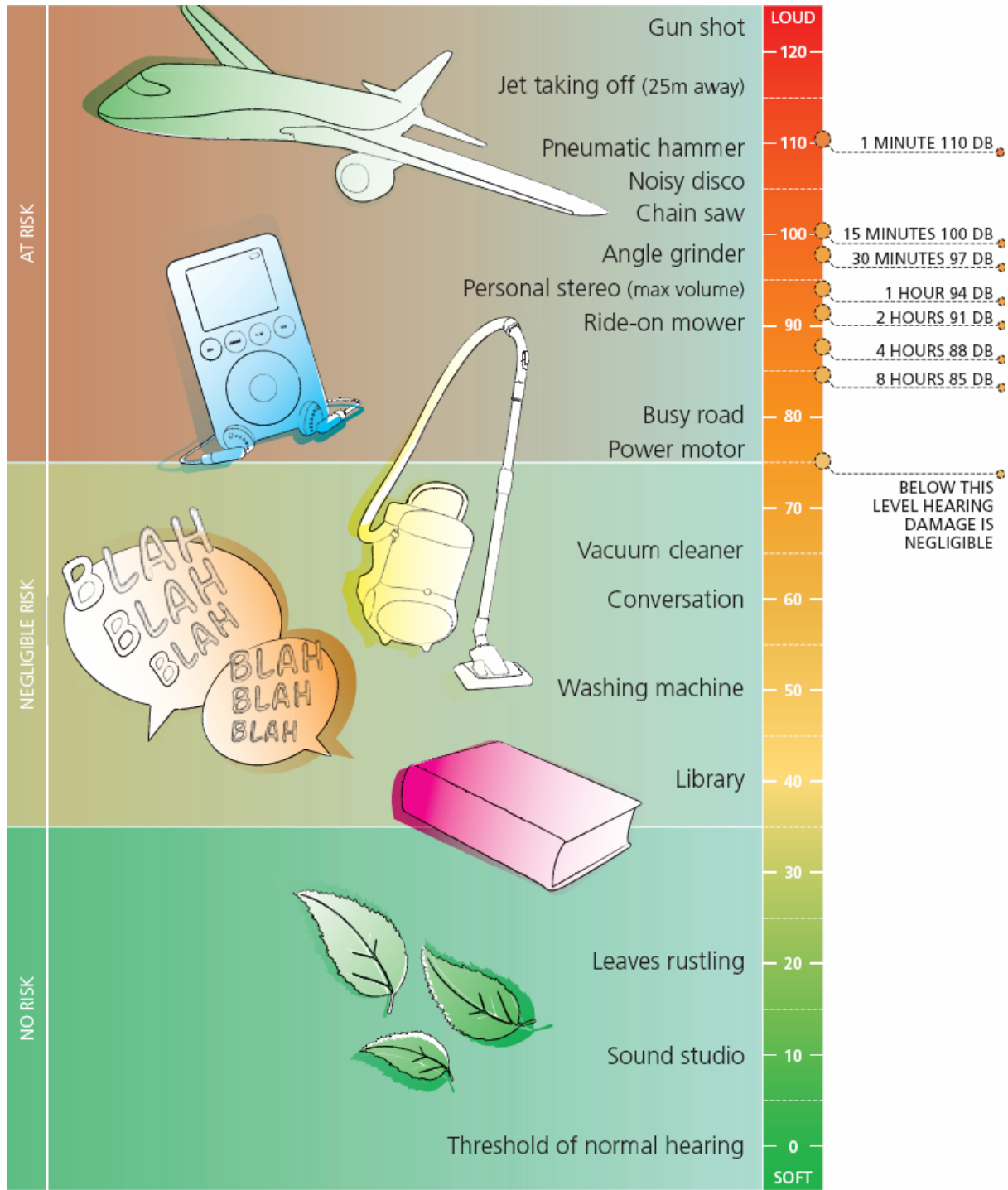
2.6 Hearing levels are determined by testing the range of sounds that can be heard and how softly one can hear such sounds. The range of sounds is measured in hertz (Hz) or waves per second and the intensity or strength of sound is measured in terms of a scale of decibels (dB).²

2.7 Figure 2.1 is a visual representation which equates different decibel levels with common noises.

1 Department of Health and Ageing (DOHA), *Submission 54*, p. 15.

2 DOHA, *Submission 54*, p. 15.

Figure 2.1: Approximate sound levels (dB) for common types of noise exposure



THE NOISE LEVELS SHOWN ARE APPROXIMATE AND SHOULD ONLY BE TAKEN AS A GUIDE

NOISE LEVEL IN A WEIGHTED DECIBELS

Figure by Australian Hearing, provided in DOHA, *Submission 54*, p. 16.

2.8 The severity of hearing loss is categorised as mild, moderate, severe, or profound, depending on how loud a sound has to be before a person can hear it. The severity of hearing loss is categorised differently for different age groups.³

Table 2.1: Severity of hearing loss by decibel range and age

Severity of hearing loss	Decibel (dB) range (< 15 years)	Decibel (dB) range (≥ 15 years)
Mild	0-30dB	≥ 25 dB and < 45 dB
Moderate	31-60dB	≤ 45 dB and < 65 dB
Severe	61-90dB	≥ 65 dB
Profound	≥ 91 dB	

Source: Access Economics, *Listen Hear! The economic impact and cost of hearing loss in Australia*, (February 2006), p. 5.

2.9 Hearing loss is measured using either subjective tests, such as audiometric testing, or objective tests, which measure a physiological response from the individual. Newborn hearing tests are objective tests which use an auditory brain stem response technique to an acoustic stimulus.⁴

The extent of hearing impairment in Australia

2.10 Access Economics reported extensive data on the prevalence of hearing loss amongst Australians. In 2005 around 3.55 million Australians had some hearing loss. Of these, some 99.7 per cent were aged 15 years or older.⁵

Prevalence of hearing impairment in children

2.11 Australian Hearing submitted that 'between nine and 12 children per 10,000 live births will be born with a moderate or greater hearing loss in both ears'. In addition, three to four children per 10,000 live births will be born with moderate hearing loss, and a further 23 per 10,000 will acquire a hearing loss that requires hearing aids by the age of 17.⁶ This evidence suggests that 39 children in 10,000 will have some form of hearing loss by the age of 17.

2.12 Access Economics reported that the estimated severity of hearing loss in the Australian child population is currently 36.7 per cent mild, 38.3 per cent moderate, 13.3 per cent severe and 11.7 per cent profound, as seen in Figure 2.2 below.⁷

3 DOHA, *Submission 54*, p. 15.

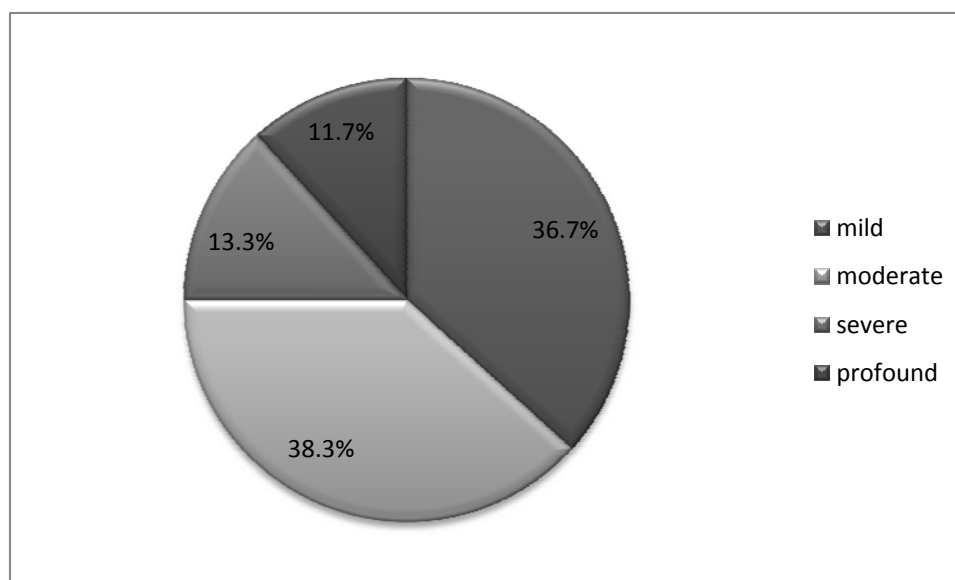
4 Access Economics, *2006*, pp 12-13.

5 Access Economics, *2006*, p. 33.

6 Australian Hearing, *Submission 38*, p. 7.

7 Access Economics, *2006*, p. 30.

Figure 2.2: Hearing loss in Australian children by severity, 2005 (n=10,268)



Source: Access Economics, 2006, p. 30.

2.13 The Hear and Say Centre noted in their submission that, according to the World Health Organisation, hearing loss is the most common disability in new born children worldwide.⁸ The Victorian Deaf Society submitted that more children are having their hearing impairment diagnosed, but fewer children are being found to have a severe-profound hearing loss. This is attributed to medical advances and more sensitive testing.⁹

2.14 Many submitters noted that hearing impairment in Indigenous children is particularly high. This issue is discussed in detail at chapter eight of this report.

Prevalence of hearing impairment in adults

2.15 Access Economics reported that amongst adults, the prevalence of hearing loss varies over age groups. Table 2.2 is a summary of hearing loss among adults by age.

8 Hear and Say Centre, *Submission 153*, p. 2.

9 Victorian Deaf Society, *Submission 147*, p. 4.

Table 2.2: Hearing loss prevalence by age group

Age group	Hearing loss as a proportion of all people in each age group.
15 to 50 years	5 %
51 to 60 years	29 %
61 to 70 years	58 %
71 years and older	74 %

Source: Access Economics, *Listen Hear! The economic impact and cost of hearing loss in Australia*, (February 2006), p. 5.

2.16 The committee heard that hearing loss was more prevalent in men than women due to their higher exposure to workplace noise, though the gap reduces as people get older.¹⁰ Sixty per cent of adults with a hearing loss are male, and approximately half of these men are of working age (i.e. 15 to 64 years).¹¹ The economic and social impacts of this are explored in chapters three and four of this report.

2.17 Of the 3.55 million Australian adults with hearing loss, 66 per cent had a mild loss, 23 per cent had a moderate loss and 11 per cent had a severe or profound hearing loss.¹²

Prevalence projections

2.18 Access Economics estimated that the prevalence of hearing impairment in children is likely to increase from 10,268 in 2005 to 11,031 by 2050, an increase of 7.5 per cent. Unlike projections for the adult population, this estimate is 'fairly static' and is based on population growth.¹³

2.19 Hearing loss prevalence in the adult population is expected to more than double by 2050 to one in four. For all males in Australia, hearing loss is projected to increase from 21 per cent in 2005 to 31.5 per cent (nearly one in three) in 2015. The projected increase will be largely driven by the ageing population. In the absence of a large scale prevention program, the severity of hearing loss is not expected to change. The growth in hearing loss for males is expected to increase from 21 per cent to 31.5 per cent and for females from 14 per cent to 22 per cent.¹⁴

10 Australian Hearing, *Submission 38*, p. 8.

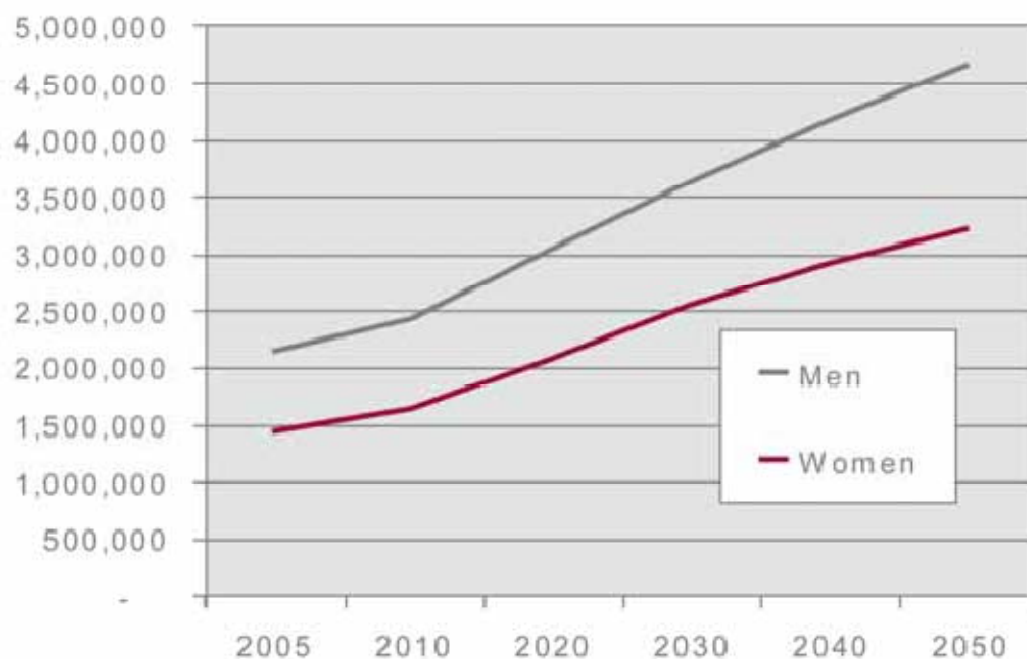
11 Access Economics, 2006, p. 31.

12 Access Economics, 2006, p. 34.

13 Access Economics, 2006, p. 39.

14 Access Economics, 2006, p. 40.

Figure 2.2: Projected growth in hearing loss by gender (worse ear)



Source: Access Economics, *Listen Hear! The economic impact and cost of hearing loss in Australia*, (February 2006), p. 41.

2.20 New South Wales (NSW) Health commented that hearing loss projections support the case for early detection and intervention programs, as well as strategies to prevent noise induced hearing loss through hearing health promotion and education.¹⁵

Causes of hearing loss

2.21 As discussed above, around one in six Australians suffer from some degree of hearing impairment.¹⁶ Hearing loss can be either present at birth (congenital) or occur later in life (acquired).¹⁷

2.22 There are three types of hearing loss: conductive, sensorineural or mixed.¹⁸ The diagram of the parts of an ear provided below at figure 2.3 will assist to understand aspects of hearing loss.

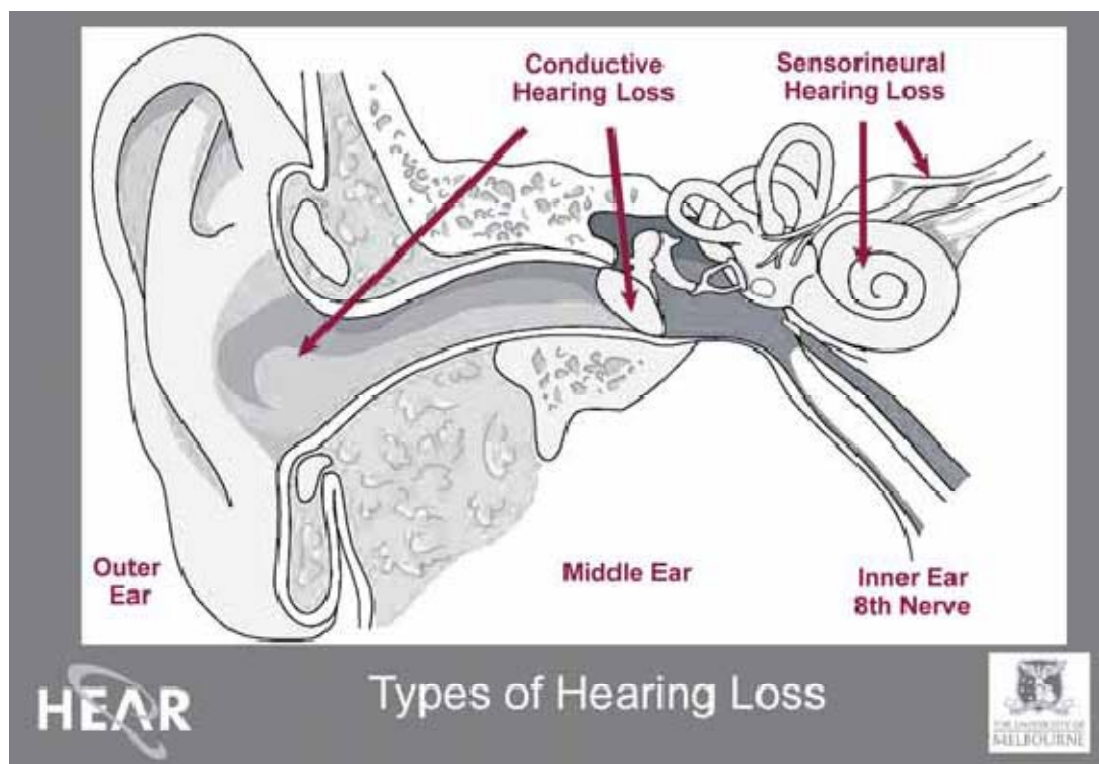
15 New South Wales (NSW) Health, *Submission 167*, p. 5.

16 Access Economics, 2006, p. 5.

17 DOHA, *Submission 54*, p. 17.

18 DOHA, *Submission 54*, p. 18.

Figure 2.3: The hearing system



Source: Access Economics. *Listen Hear! The economic impact and cost of hearing loss in Australia*, (February 2006), p. 15.

2.23 Conductive hearing loss occurs as a result of blockage or damage to the outer and/or middle ear, and can be either transient or permanent. The most common cause of hearing loss in children is eustachian tube dysfunction, which may affect up to 30 per cent of children during the winter months. This may lead to fluid in the middle ear, or otitis media, in which a bacterial or viral agent infects the middle ear or ear drum. Otitis media may result in perforations of the ear drum, and may over the long term cause scarring of the ear drum.¹⁹

2.24 Sensorineural loss is caused by damage to, or malfunction of, the cochlea (sensory) or the auditory nerve (neural). Damage can arise from excessive noise exposures, chemical damage such as smoking, environmental agents or medications and from the ageing process. Hearing loss can also result from damage to the auditory nerve. Sensorineural hearing loss is permanent by nature.²⁰

¹⁹ Access Economics, 2006, p. 15.

²⁰ Access Economics, 2006, pp 15-16.

Hearing loss in children

2.25 Most children born with a hearing loss have a sensorineural hearing loss.²¹ The Alliance for Deaf Children noted that approximately 60 per cent of congenital deafness is due to genetics, with the remaining 40 per cent due to environmental factors or complications during pregnancy or birth. Approximately 95 per cent of children with hearing loss are born to parents with normal hearing.²²

2.26 Aussie Deaf Kids reported that conductive hearing loss in children is due mainly to:

- otitis media – a middle ear infection which is usually treatable and temporary. Otitis media is particularly prevalent in Aboriginal and Torres Strait Islander populations where the disease is likely to become chronic and respond poorly to treatment, as discussed in more detail in chapter eight;
- cholesteatoma – a slow growing, non-malignant growth behind the ear drum which can result in serious damage to the middle and inner ear. It is normally the result of severe and repeated middle ear infections;
- microtia and aural atresia – a congenital deformity of the outer ear and the absence of an ear canal. Microtia and aural atresia has a reported incidence of approximately one in every 6,000 births worldwide. In most cases, microtia is also associated with aural atresia or stenosis and these children will have a conductive hearing loss.²³

Ageing

2.27 As part of the ageing process there is a gradual loss of 'outer hair cell' function in the cochlea or inner ear. This diminishes the ability to distinguish similar speech sounds, or sounds heard simultaneously, such as speech in a noisy setting.²⁴ Therefore, as the committee heard many times during this inquiry, as the Australian population ages there will be increasing numbers of people with hearing loss.

Noise induced hearing loss (NIHL)

2.28 Noise induced hearing loss is associated with 37 per cent of all hearing loss.²⁵ Workplace noise and recreational noise are the most common source of noise injury and, according to the Australian Society of Otolaryngology Head and Neck Surgeons (ASOHNS), the most common form of preventable hearing loss in the western

21 Australia New Zealand Parents of Deaf Children (ANZPOD), *Submission 24*, p. 3.

22 Alliance for Deaf Children, *Submission 58*, p. 4.

23 Aussie Deaf Kids, *Submission 16*, p. 4.

24 Government of South Australia, *Submission 145*, p. 8.

25 Access Economics, 2006, p. 18.

world.²⁶ The ASOHNS argued that it is a very important consideration in terms of maintaining the community's hearing, as its impact is felt across all ages in the community.

Occupational noise induced hearing loss (ONIHL)

2.29 An estimated one million employees in Australia may be exposed to dangerous levels of noise at work. Sound and pressure was the stated cause for over 96 per cent of workers' compensation claims for hearing loss in 2001-02. Risk of hearing impairment in the workplace may also arise through exposure to occupational ototoxins (these include solvents, fuels, metals, fertilisers, herbicides and pharmaceuticals, as discussed further in chapter six). Damage is more likely if a person is exposed to a combination of substances and noise.²⁷

2.30 The Department of Health and Ageing (DOHA) submitted that the principle characteristics of ONIHL are that:

- the hearing loss is usually on both sides as most noise exposures are symmetric;
- symptoms may include gradual loss of hearing, hearing sensitivity and tinnitus (the experience of noise or ringing in the ears where no external physical noise is present);
- noise exposure alone does not usually produce a loss greater than 75dB at high frequencies and 40 dB at low frequencies, however hearing impairment may be worse where age-related losses are superimposed; and
- the rate of hearing loss due to chronic noise exposure is greatest during the first 10–15 years of exposure.²⁸

2.31 Safe Work Australia provided evidence to the committee that each year there are an average of 3,400 successful workers' compensation claims for ONIHL in Australia. The nature of hearing loss is that it has a long latency, and there is often difficulty determining whether a loss is work related. Therefore Safe Work Australia believes that these figures are probably understated.²⁹

2.32 Analysis of workers' compensation claims for hearing loss indicate that three occupational groups (labourers and related workers; tradespersons and related workers; and intermediate production and transport workers) account for 88 per cent of claims. The three highest industry sectors affected by occupational hearing loss are

26 The Australian Society of Otolaryngology Head and Neck Surgeons (ASOHNS), *Submission 137*, p. 3.

27 Safe Work Australia, *Submission 5*, p. 1.

28 DOHA, *Submission 54*, p. 20.

29 Safe Work Australia, *Submission 5*, [p. 1].

the manufacturing, construction, transport and storage industries. The highest incidence rates were in mining; construction; and electricity, gas and water supply.³⁰

2.33 Dr Fleur Champion de Crespigny of Safe Work Australia outlined for the committee some of the highlights of the *National Hazard Exposure Worker Surveillance (NHEWS) Survey, 2008*:

The main findings of the research are [that between] 28 and 32 per cent of Australian workers are likely to work in an environment where they are exposed to non-trivial loud noise. Workers' sex, age, night work, industry and occupation all affected the likelihood of a worker reporting exposure to loud noise. Of these, male workers, young workers and night workers all had increased risk of exposure to loud noise. [Excluding the mining industry], [m]anufacturing and construction workers had the greatest risk of being exposed to loud noise...Technicians and trades workers, machinery operators and drivers and labourers were the occupations with the greatest odds of reporting exposure to loud noise.³¹

Farmers and hearing loss

2.34 The agricultural sector also reports high levels of hearing loss among farmers. 65 per cent of Australian farmers have a measurable hearing loss, compared to 22-27 per cent of the general population. Hearing loss is also high among young farmers compared to the general population.³² A 2002 study found that of the farmers surveyed, the average hearing loss commenced earlier and remained much greater than that expected for an otologically normal population.³³

2.35 The loss of hearing in the farming sector is due to noisy activities such as using a chainsaw, operating noisy workshop equipment, operating firearms or driving tractors which do not have a cabin over a sustained period. While education programs have been conducted to improve hearing protection for farm workers, the 2009 Rural Noise Injury Program assessment found that:

- only around one third of farmers reported adoption of higher order noise reduction strategies, such as upgrading to quieter equipment and dissipating workshop noise;
- farmers aged 35-44 years had significantly worse hearing in their left ears (the ear closest to the tractor engine when the farmer is turned around watching behind him); and

30 Australian Institute of Occupational Hygienists (AIOH), *Submission 157*, p. 6.

31 Dr Fleur Champion de Crespigny, Safe Work Australia, *Committee Hansard*, 19 March 2010, p. 2.

32 Farmsafe Australia, *Submission 33*, p. 4.

33 Vicdeaf, *Submission 147*, p. 5.

- younger farmers who always used hearing protection had significantly better hearing than those who did not.³⁴

2.36 Data collected predominantly from the Rural Noise Injury Program (1994–2008), which includes over 8,000 hearing assessments of mostly NSW farmers, indicate that there has been an improvement in the hearing of farmers, with the proportion of farmers with 'normal hearing' increasing over the period. For younger farmers 15-24 years, those with normal hearing increased from 57.3 per cent in 1994-2001 to 77.0 per cent for the 2002–2008 period.³⁵

The difficulties of relying on workers' compensation data to determine the prevalence of ONIHL

2.37 Most discussion of the prevalence of ONIHL in Australia relies on workers' compensation data. However, there are a number of factors which may indicate that workers' compensation data do not provide a reliable measure of ONIHL.

2.38 For a worker to access compensation for ONIHL, the hearing loss must reach a minimum threshold. The minimum threshold differs across jurisdictions, but the Heads of Workers' Compensation Authorities recommended a threshold of 10 per cent hearing loss in 1997.³⁶ Access Economics commented that a fall in workers' compensation claims arising from ONIHL in recent years is most likely due to the introduction of minimum thresholds. Dr Warwick Williams commented that thresholds in effect hide the real incidence of hearing loss in the community.³⁷

2.39 The Australian Safety and Compensation Council (ASCC) reported in 2006 on work-related hearing loss in Australia and stated that compensation statistics do not fully reflect the true incidence and cost of industrial deafness:

Whilst it is a positive sign, an improvement (reduction) in the number of claims being made does not necessarily correlate with an improvement in the prevention of NIHL. But they provide good indicators and useful trends for further examination.³⁸

2.40 Factors contributing to this understatement include:

- not all employees make claims, or are eligible to make claims, due to differing criteria;
- there is a need to establish that the disease is work-related;

34 Farmsafe Australia, *Submission 33*, p. 5.

35 Farmsafe Australia, *Submission 33*, p. 4.

36 Access Economics, 2006, p. 19.

37 Dr Warwick Williams, *Submission 14*, p. 1.

38 Australian Safety and Compensation Council (ASCC), *Work-related Noise Induced Hearing Loss in Australia*, 2008, p. 15.

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- the industrial deafness threshold is not the same across all jurisdictions;
 - industries in which employees are known to be at high risk of ONIHL are not all identified by the analysis of compensation claims (e.g. the music entertainment industry);
 - the analysis focuses on industries with the largest number of claims. There may be smaller industries with not many claims, but a very high rate of claims per employee;
 - employees move between jobs, so the resulting hearing condition may be due to a combination of activities; and
 - employees may feel under pressure not to claim (e.g. if they think it may impact on their security of employment).³⁹

2.41 In the agricultural sector the reasons for the underestimate include:

- only around 54 per cent of the estimated 375,000 strong agricultural workforce are actually 'employees'. Most farms are small family owned businesses with no employees;
- 'employees' within agriculture are a relatively young demographic. Noise injury is often not apparent for a number of years and job movement of young workers can be high so young workers are less likely to be able to establish a claim; and
- hearing screening services in rural areas are often lacking, and small family-owned farm businesses can not provide hearing screening services themselves. This means baseline and periodic hearing assessment to establish noise injury is difficult.⁴⁰

2.42 While legislation in all Australian jurisdictions seeks to protect employees from exposure to dangerous levels of noise, the evidence indicates that problems remain in the implementation and acceptance of hearing protection.⁴¹ The findings of the *NHEWS Survey, 2008* with regard to training and provision of safety equipment in noisy workplaces, revealed some areas of concern, as Dr Champion de Crespigny explained:

Training on how to prevent hearing damage appears to be underprovided in Australian workplaces. Only 41 per cent of exposed workers reported receiving any training in how to prevent hearing damage. There also appears to be a reliance on the provision of personal protective equipment for reducing exposure to loud noise. The provision of control measures in workplaces was affected by industry, occupation and workplace size. But, with a few exceptions, in general, industries and occupations with high

39 ASCC, 2008, p. 16.

40 Farmsafe Australia, Additional information, 12 November 2009, p. 2.

41 University of Melbourne, Audiology and Speech Sciences, *Submission 9*, p. 1.

odds of exposure to loud noise also seemed to have high odds of providing control measures...On the other hand, smaller workplaces—workplaces of a range of sizes but with fewer than 200 workers—were less likely to provide comprehensive noise control measures.⁴²

2.43 Safe Work Australia told the committee about the *Getting Heard* report, which has been funded by DOHA, and which is due to be launched during Hearing Week in August 2010. Mr Wayne Creaser of Safe Work Australia explained that the *Getting Heard* project:

...is intended to look at what impacts on the effective prevention of hazardous occupational noise and what the attitudinal and institutional barriers are to effective control measures being put in place.⁴³

2.44 Access Economics reported that there is no nationally coordinated ONIHL prevention campaign.⁴⁴ This issue is examined in detail in chapter seven of this report.

2.45 ASOHNS argued the need for reform of noise regulations to implement an evidence-based standard that can be shown to be effective in preventing or minimising ONIHL. ASOHNS added that current regulations do not provide for overarching guidance, supervision, education or the provision of information for employees and employers. The ASOHNS recommended that government should implement policy regarding occupational noise induced hearing loss that provides:

- evidence-based guidance and education to employers and employees with regard to ONIHL; and
- a nationally agreed benchmark method for assessing occupational hearing loss.⁴⁵

2.46 In relation to the comments by ASOHNS concerning research, the committee notes that DOHA was unable to source data linking a reduction in the incidence of work related noise induced hearing loss to prevention activities.⁴⁶

Acoustic shock and acoustic trauma

2.47 Two further sources of preventable hearing loss, commonly associated with the workplace, are acoustic shock and acoustic trauma.

42 Dr Fleur Champion de Crespigny, Safe Work Australia, *Committee Hansard*, 19 March 2010, pp 2-3.

43 Wayne Creaser, *Committee Hansard*, 19 March 2010, p. 3.

44 Access Economics, 2006, p. 20.

45 ASOHNS, *Submission 137*, p. 5.

46 DOHA, answer to question on notice, 12 October 2009 (received 16 November 2009), Question 4.

2.48 Acoustic shock describes the physiological and psychological symptoms that can be experienced following an unexpected burst of loud noise through a telephone headset or handset, and which most often occurs in call centres.⁴⁷

2.49 Acoustic trauma refers to the physiological and psychological symptoms that can be experienced following exposure to very loud noises for a short period of time such as a bomb explosion, localised alarm systems, or artillery fire. Some incidents of both acoustic shock and acoustic trauma may result in temporary hearing loss, however research is not currently available to determine the contribution to permanent hearing loss.⁴⁸

2.50 Of further interest for research into the long-term effects of acoustic shock is the occurrence of tinnitus and a possible relationship with the onset of Meniere's disease.⁴⁹

Recreational hearing loss (RHL)

2.51 Hearing loss due to recreational activities was seen as a real and increasing issue. Concerns were voiced about the lack of regulatory controls on noise exposures for audiences at music and vehicle racing events, patrons in restaurants and bars and for the use of personal music players. Witnesses also commented on increased use of personal music players such as iPods. Personal music players are a growing source of concern for hearing health, with Apple indicating that there are 28 million iPods in use worldwide.⁵⁰

2.52 Self Help for Hard of Hearing people Australia (SHHH) argued that recreational hearing damage is now at 'epidemic' levels through the use of personal music players and commented 'We don't appreciate it yet, but researchers know that young people are losing their hearing at a rate never before experienced'.⁵¹ Mr Daniel Lalor went further, stating that personal music players 'will be the cigarettes and asbestos of Generation Y'.⁵²

2.53 The University of Melbourne Audiology and Speech Sciences commented:

It is clear that recreational noise exposure reaches levels that are known to be dangerous. It is not well-established how much this recreational exposure is contributing to significant hearing loss in later life and the burden of disease and economic costs. Other recreational activities such as

47 DOHA, *Submission 54*, p. 20.

48 DOHA, *Submission 54*, p. 20.

49 Access Economics, 2006, p. 20; DOHA, *Submission 54*, p. 20.

50 Access Economics, 2006, p. 18.

51 Self Help for Hard of Hearing people (SHHH Australia), *Submission 72*, p. 2.

52 Mr Daniel Lalor, *Submission 116*, p. 2.

shooting, motor sport and the use of power tools may also be contributing to the levels of hearing loss in the community.⁵³

2.54 There were differing views concerning recreational exposure to noise on hearing loss. Access Economics stated that there is no epidemiological data that systematically examines RHL. While studies have shown short term or minor hearing damage resulting from personal music players and music exposure generally, there are no studies available that document exposure outcomes that result in permanent measurable and significant hearing loss. Access Economics went on to state that researchers have not reached consensus on the contribution of RHL makes to the overall prevalence of hearing loss.⁵⁴

2.55 Dr Warwick Williams has found that recreational noise can be loud enough to cause damage if the length of noise exposure is long enough. Dr Williams argued that dangerous recreational noise exposure occurs at a particular stage of life (i.e. among young people), and there is no evidence that people are exposed for long enough periods to do damage.⁵⁵

2.56 The Deaf Society of Victoria commented that past research had not been able to draw a conclusive link between personal music players and hearing loss, but noted a recent (2009) study which suggested there was a link.⁵⁶ The Society also commented that, in its experience, more adolescents and young people are exhibiting signs of hearing damage:

...already increasing numbers of adolescents and young adults are showing symptoms related to the early stages of noise-related deafness, such as distortion, tinnitus, hyperacusis, and threshold shifts...This development has also been evidenced in recent hearing screenings undertaken by Vicdeaf.⁵⁷

2.57 Other witnesses provided similar evidence arising from their direct contact with young people. Mr John Gimpel of the Hearing Industry Association commented that the experience of people undertaking hearing testing indicated that:

...the prevalence of high-end loss in people in their late 20s is really starting to come through, and these people have had absolutely no exposure to any noise in the workplace—all they have ever had is the doof-doof in their ears.⁵⁸

53 The University of Melbourne, Audiology and Speech Sciences, *Submission 9*, p. 2.

54 Access Economics, 2006, p. 18.

55 Access Economics, 2006, p. 19.

56 Victorian Deaf Society, *Submission 147*, p. 6.

57 Victorian Deaf Society, *Submission 147*, p. 6.

58 Mr John Gimpel, Hearing Industry Association, *Committee Hansard*, 11 November 2009, p. 112.

2.58 Mrs Noeleen Bieske of the Deafness Foundation commented:

The seal of the iPod is so tight in the ear that it is just giving that full blast going into the hearing mechanism. These young people are not aware. I take calls from people saying, 'I've got this shocking ringing in my ears.' When I say, 'What have you been doing?' they say, 'I've been wearing my iPod for a minimum of three to four hours a day, I play in a band, I don't wear musician plugs and I also work in a bar in a pub.' These kids are 30 maybe or in their late 20s and they are saying, 'Now I can't hear properly. What am I going to do?'.⁵⁹

2.59 Other witnesses pointed to developments overseas. In 2008, the European Union Scientific Committee on Emerging and Newly Identified Health Risks on Personal Music Players and Hearing published a report which warned that listening to personal music players at a high volume over a sustained period can lead to permanent hearing damage. It was reported that five to 10 per cent of listeners risk permanent hearing loss. These are people typically listening to music for over one hour a day at high volume control settings. It estimated that up to 10 million people in the European Union may be at risk.

2.60 In September 2009, the European Commission sought to establish new technical safety standards that would set default settings of players at a safe level and allow consumers to override these only after receiving clear warnings so they know the risks they are taking. Dr Burgess indicated that the Product Safety Section of the Australian Competition and Consumer Commission (ACCC) has been alerted to these developments, and that they have established a project to look at these issues.⁶⁰

2.61 In France the noise level of personal music players has been limited to 95dB.⁶¹ In Switzerland, limits on audience exposure at venues with amplified music have been set with a 93 dB(A) limit for events for under 16 year olds and a 100 dB(A) limit for other events plus a requirement to inform and supply free hearing protectors when over 93 dB(A).⁶²

Causes and prevalence of deafblindness

2.62 The committee heard evidence about the particular challenges faced by Australians who are deaf and blind (deafblind). The Australian DeafBlind Council stated that there are some 300,000 people in Australia who are deafblind (if people with a mild hearing loss are included). Of these 7,000 to 9,000 are under 65 and

59 Ms Noeleen Bieske, Deafness Foundation, *Committee Hansard*, 8 December 2009, p. 100.

60 Dr Marion Burgess and colleagues, Acoustics and Vibration Unit, University of NSW, *Submission 172*, p. 3.

61 Professor Harvey Coates, *Committee Hansard*, 9 December 2009, p. 22.

62 Dr Marion Burgess and colleagues, Acoustics and Vibration Unit, University of NSW, *Submission 172*, p. 3.

281,000 (or 93.7 per cent) are 65 years of age and over.⁶³ The Senses Foundation provided evidence that in Western Australia (WA) 63 per cent of deafblind people were male.

2.63 The causes of congenital deafblindness include infections such as Cytomegalovirus (CMV) and Congenital Rubella Syndrome (CRS), chromosomal abnormalities, genetic disorders and premature birth.

2.64 Senses Foundation indicated that the incidence of deafblindness arising from CRS is relatively rare due to the introduction of widespread vaccination against rubella. In Australia there were no reported cases of CRS between 1997 and 2002. However, Senses noted that concerns have been expressed about the maintenance of the level of immunisation required to stop the spread of rubella. In particular, the lower immunisation levels in Indigenous communities may not provide adequate immunity.⁶⁴

2.65 There are a number of chromosomal conditions and syndromes which may lead to deafblindness. The incidence of two, Usher's syndrome and CHARGE syndrome, have increased in recent years. Usher's syndrome is the most common disease associated with hearing loss and eye disorders.

2.66 Deafblindness is also associated with prematurity and Foetal Alcohol Spectrum Disorder (FASD). The evidence indicates that there appears to be a strong relationship between poverty and the incidence of FASD.

2.67 Acquired deafblindness may be from illnesses such as meningitis, encephalitis and brain tumours, and trauma such as head injuries and ageing.

2.68 The Australian DeafBlind Council stated that there is a lack of 'appropriately qualified interpreters' to assist deafblind people to access health services and community support, and that this causes distress for those most affected.⁶⁵

Committee comment

2.69 The evidence provided to the committee clearly indicates that hearing impairment is a major issue in Australia, with one in six Australians suffering from some degree of hearing loss. While much of the expected increase in hearing impairment over the coming decades is due to the ageing of the population, a significant proportion of hearing loss is due to noise damage which is preventable.

2.70 Governments have recognised the dangers that workplaces can pose to hearing, and have legislated to enforce safety measures, and implemented prevention

63 Australian DeafBlind Council, *Submission 69*, p. 3.

64 Senses Foundation, *Submission 59*, p. 6.

65 Australian DeafBlind Council, *Submission 69*, p. 9.

strategies. However, analysis of workers' compensation data indicate that working in many industry sectors still poses a risk to hearing health. Evidence was received that the workers' compensation data may not be revealing the full extent of ONIHL.

2.71 Evidence also indicates that recreational activities may be an increasing cause of hearing impairment. Whilst the scientific proof is still ambiguous, the committee believes that there may be some connection between hearing loss and the extensive use of personal music players. The committee notes the evidence of hearing services which have observed emerging patterns of the detrimental impacts of recreational noise among young people.

2.72 The committee also notes that overseas there have been moves to limit noise levels on personal music players as well as limiting audience exposure at music venues. The committee considers that the problem of recreational hearing loss should be targeted in two ways: awareness campaigns directed at young people (see chapter seven for recommendations); and introducing limits to exposure to recreational noise.

2.73 The committee heard that the ACCC is already investigating the future application of noise limitations for personal music players sold in Australia.

2.74 Whilst their support needs are often acute, the particular issues facing deafblind people in Australia broadly reflect the issues facing all people with a hearing impairment, namely: access to services and support; forecast increased prevalence; and the need for greater understanding about causes of deafblindness. The committee offers its encouragement to the Australian Deafblind Council in their efforts to represent and advocate for deafblind people. The committee has made recommendations at chapters five and six which, if implemented, will benefit deafblind people.

Recommendation 1

2.75 **The committee recommends that the Department of Health and Ageing work with the appropriate agencies and authorities to devise recreational noise safety regulations for entertainment venues. Specifically, where music is expected to be louder than a recommended safe level, that the venues be required to:**

- (a) post prominent notices warning patrons that the noise level at that venue may be loud enough to cause hearing damage; and**
- (b) make ear plugs freely available to all patrons.**

