5 Sensory/speech disability

5.1 A brief overview of existing definitions and estimates of prevalence

This section begins by summarising some main issues about definitions, classifications and prevalence of sensory (visual and hearing) and speech disabilities. Existing estimates of prevalence and patterns of sensory/speech disability, and causes of visual and hearing impairment, are also discussed.

Issues relating to definitions and methods of estimation

Definitions of visual impairment and disability

The terminology used to describe vision loss is often inconsistently applied (ICO 2002), with various meanings and definitions attributed to general terms such as visual disability, visual impairment, low vision and blindness. To counteract this problem, the International Council of Ophthalmologists (ICO) recommended and defined a core set of common terms to be used in reporting survey and population-based estimates (ICO 2002). These terms, used throughout this section, are vision loss, visual impairment and functional vision.

Vision loss is a generic term used to describe both visual impairment and loss of functional vision (ICO 2002). Both the ICO and the ICF define vision loss as being attributable to changes that occur both at the organ level and at the person level. Visual impairment (or function) relates to the structure and function of the eye, and any changes that cause structural or functional problems. In turn, functional vision (otherwise, visual disability) refers to the individual's ability to perform activities or participate in social, economic and domestic spheres, as a result of their visual impairment (ICO 2002; WHO 2001a).

Population survey data on vision loss predominantly report findings based on levels of visual impairment, including diseases and disorders of the eye(s).

Visual impairment

Visual impairment is defined, and hence measured, as the best-corrected visual acuity (i.e. the ability to read and detect fine details or objects at a distance), best-corrected visual field (the area simultaneously visible to one eye without movement) or both.[3] Many prevalence estimates, however, use visual acuity only as their measure of visual impairment, despite the importance of visual field loss as a component of severe visual impairment (Taylor et al. 1997; WHO 1979). The fact that visual field loss can exist independent of visual acuity loss

3 Best-corrected visual acuity and visual field refers to the best possible visual acuity and visual field achievable with or without the use of vision aids.

(ICO 2002) suggests that prevalence estimates based solely on visual acuity might underestimate the real prevalence rate.

Visual impairment may occur in one or both eyes and result in complete (blindness) or partial (low vision) vision loss (WHO 1979).

Blindness

The WHO defines blindness as having a visual acuity of less than 3/60 or a corresponding visual loss of less than 10^{o} in the better eye with best possible correction (WHO Study Group on the Prevention of Blindness 1973; Table 5.1). This standard definition was developed after a WHO review discovered over 60 different definitions of blindness in use in different countries. The WHO definition of blindness has been widely accepted, and is incorporated into the ICD–10 where it has undergone further refinement into three ranges of visual acuity (category groups 3, 4 and 5). The ICO (1978, cited in ICO 2002) relates these category groups to profound visual impairment, near-blindness and blindness respectively.

Some epidemiological studies, however, choose to operate variants of the WHO definition of blindness, such as the Melbourne Visual Impairment Project in Australia (see, for example, Van Newkirk et al. 2000, 2001). These variants generally relate to different degrees of visual acuity, and sometimes visual field loss, applied to indicate level of impairment. Given the range of definitions still in use, the ICO (2002) has defined blindness as 'having such little vision that light perception is absent and/or other senses (vision substitution skills) must be mainly relied upon'.

Legal blindness

The concept of legal blindness emerged with the advent of social security systems. Legal blindness is a term generally used by governments to define the conditions by which a person is eligible for special benefits and services. It is a single cut-off point used solely to determine eligibility. For example, in Australia, a person deemed legally (or permanently) blind is immediately qualified to receive the Disability Support Pension (DSP) (FaCS 2002).[4] In the United Kingdom, registration as a (legally) blind person under the National Assistance Act is required before assessment can be made for the receipt of benefits (such as the Disability Living and Attendance Allowances) and services (RNIB 2001). Access to social security in the United States of America is also determined by a prescribed definition of legal blindness (US Social Security Administration 2003). Table 5.1 lists definitions of legal blindness in Australia, the United Kingdom and the United States.

Low vision

Low vision, sometimes referred to as partial blindness or partial sight, covers all conditions of less than normal vision, excluding blindness (ICO 2002). Levels of low vision as defined by WHO (see Table 5.1) are covered in ICD–10 by category groups 1 and 2, based on ranges of visual acuity. These groups relate to moderate and severe visual impairment respectively (ICO 1978, cited in ICO 2002) but consistency in application of these categories varies, particularly in epidemiological studies.

4 Some people who have a visual impairment but do not meet the guidelines for permanent blindness may still qualify for the DSP under the general qualification criteria.

Table 5.1: Definitions of visual impairment (blindness, legal blindness and low vision)

Source	Definition
	Blindness
WHO (1973)	Visual acuity of less than 3/60 (0.05) or corresponding visual loss (a field less than 10º in the better eye with best possible correction). This relates to loss of walk-about vision.
ICD–10 (WHO 1992)	Category groups 3 (visual acuity of less than 3/60), 4 (visual acuity of less than 1/60) and 5 (no light perception), relating to blindness in one or both eyes.
ICO (2002)	Total vision loss, no light perception, or where individuals have to rely predominantly on vision substitution skills such as other senses.
	Legal blindness
Guide to Social Security Law (Australia) (FaCS 2002)	Visual acuity less than 6/60 (20/200) in both eyes *or* constriction to within 10º of fixation in the better eye irrespective of corrected visual acuity *or* combination of visual defects resulting in the same degree of visual impact as that occurring above.
Social Security Administration (USA) (2003)	Visual acuity with best correction in the better eye or worse than or equal to 20/200 or a visual field extent of less than 20º in diameter.
RNIB (2001)[(a)]	Acuity below 3/60 or 1/18 *or* acuity better than 3/60 but below 6/60 with a very restricted visual field.
	Low vision
WHO (1973)	Visual acuity of less than 6/18 (0.3) but equal to or better than 3/60 (0.05) in the better eye with the best possible correction. This relates to visual impairment categories 1 and 2 in ICD–10.
ICD–10 (WHO 1992)	Category groups 1 (visual acuity of less than 6/18) and 2 (6/60), relating to low vision in one or both eyes.
Charman (1985)	Visual acuity of less than 20/40 but better than 20/200 in the better eye.[(b)]
RNIB (2001)	Visual acuity from 3/60 to 6/60 with a full field *or* visual acuity up to 6/24 with moderate restriction of visual field *or* visual acuity of 6/18 or better with a gross field defect (e.g. hemaniopia) or a marked constriction of the field (e.g. glaucoma or retinitis pigmentosa).

(a) These definitions apply to the 1948 UK National Assistance Act, where people wanting to access services because of their visual impairment need to register as blind or with a visual impairment on the UK Blind or Partially Sighted Register.

(b) This definition is used in most states in the USA to assess whether a person can obtain a drivers licence.

Functional vision

Functional vision as defined by the ICF relates level of visual impairment (e.g. visual acuity and visual field functions) with associated activity limitations or participation restrictions (Table 5.2). A scale of difficulty (or performance qualifier) indicates the level of difficulty experienced in performing, for example, everyday tasks with relation to a specified visual impairment. The ICO proposes a similar approach, in this case relating visual impairment with ability to perform activities of daily living, and job or social-related tasks. Both recognise the importance of environmental factors, specifically personal and non-personal assistance, in the experience of visual disability.

Causes of visual impairment

Cataracts, trachoma and glaucoma are the leading causes of blindness and other visual impairments, especially in developing countries, and are responsible for 70% of blindness worldwide (WHO 1997). Other significant causes include childhood blindness, diabetic retinopathy, onchocerciasis (river blindness), ocular injuries, age-related maculopathy (AMD), retinal diseases, congenital abnormalities and, to a lesser extent, alcoholism, smoking, accidents and over-use of prescription drugs (Gilbert & Foster 2001; Mitchell et al. 1999; Roodhooft 2002). Of these conditions, only childhood blindness and congenital abnormalities are present at birth; the others are acquired during a person's lifetime.

Table 5.2: Definitions and classifications of functional vision

Source	Definition
ICF (WHO 2001a)	Level of difficulty participating or performing activities related to a visual impairment (either structural or functional), in the presence or absence of assistance.
ICO (2002)	Ability to perform activities of daily living due to blindness or low vision, in the presence or absence of aids.
National Community Services Data Dictionary, version 3 (AIHW 2003b)	Vision disability encompasses blindness and vision impairment (not corrected by glasses or contact lenses), which can cause severe restrictions…in the ability to participate in community life.
Vision Australia Foundation (2002)	Vision loss that is severe enough to impede performance of vocational, recreational and/or social tasks, but still allows some useful visual discrimination.

Refractive error, a condition easily corrected by the use of glasses or contact lenses, also contributes to a significant proportion of visual impairment worldwide (Dandona & Dandona 2001). In developed countries, it is a common diagnosis for mild, moderate and severe visual impairment (Attebo et al. 1996; Klein et al. 1991; Tielsch et al. 1990; Van Newkirk et al. 2001) and contributes to a not insignificant proportion of blindness in developing countries (see Dandona & Dandona 2001 for a review). It is estimated that the number of people with a visual impairment could be halved simply by the provision of new spectacles (Taylor et al. 1997).

Diabetic retinopathy, cataract, glaucoma, AMD and uncorrected refractive error contribute to the majority of cases of vision loss amongst the Australian population aged 40 years and over (Attebo et al. 1996; Van Newkirk et al. 2000, 2001; Weih et al. 2000). AMD is the primary cause of vision loss in people aged 70 years and over, with the frequency of causation increasing exponentially with age (Mitchell et al. 1995). Compared with other leading causes, glaucoma and diabetic retinopathy tend to account for a higher proportion of cases of vision loss in the 40–60 year age group.

Definitions of hearing impairment and disability

Loss of hearing is generally defined in terms of a hearing impairment in one or both ears and resulting in complete (deafness) or partial (hearing-impaired) hearing loss. Hearing loss can be caused by a conductive or sensorineural hearing impairment. Conductive hearing impairments occur where there is interference in the transmission of sound from the outer canal to the inner ear while sensorineural hearing impairments are caused by damage to the cochlea or the auditory nerve. A sensorineural hearing impairment does not only affect the ability to hear speech at reduced loudness levels but may also cause sound distortion and other problems affecting the processing of speech. The ICD–10 includes conductive and sensorineural hearing loss along with other forms of hearing loss, such as that caused by noise or ototoxic drugs (WHO 1992).

Hearing impairments are also categorised according to whether the hearing loss occurred before (prelingual) or after (postlingual) the development of language. Most people with a prelingual hearing impairment were born deaf or with a profound or severe hearing loss. Prelingual deafness can lead to a severe and lasting language impairment (Wake et al. forthcoming, cited in Wake 2002) although very early detection may help children to achieve 'normal' language skills (Moeller 2000; Yoshinaga-Itano et al. 1998).

The severity of a hearing impairment is rated by degree of hearing loss. The WHO (1991) defines deafness (or profound hearing loss) as a permanent unaided hearing threshold for

the better ear of 81 dB or greater, or where the individual is unable to hear and understand even a shouted voice (Table 5.3). Definitional variations, however, do occur. In Australia, for example, the definition of deafness is an unaided hearing threshold for the better ear of 91 dB or greater, or where the individual may hear loud sounds but does not rely on hearing as a primary form of communication (as adapted from Stabb 1994). Communication, and specifically the use of visual skills such as lip reading and sign language for communication, has been increasingly incorporated into definitions of deafness, particularly by peak organisations and in some epidemiological studies. The language of communication also forms the basis of Deaf culture, a community of people who were born deaf and regard themselves as a distinct cultural group characterised by their reliance on visual forms of communication.

Lesser degrees of hearing loss are categorised on the basis of hearing threshold and/or the ability to hear words projected at different volumes. In Australia, reliance on visual skills is also used in defining more severe cases of hearing loss. These ranges are given in Table 5.4.

Grades of impairment are different for children under the age of 15. According to WHO (1991), a 'disabling' hearing impairment in children is defined as a permanent unaided hearing threshold for the better ear of 31 dB or greater.

Table 5.3: Definitions and classifications of hearing impairment and disability

Source	Definition
	Deafness
WHO (1991)	Unaided hearing threshold for the better ear of 91dB or greater. Unable to hear and understand even a shouted voice.
Australian Deafness Forum (as adapted from Stabb 1994)	Unaided hearing threshold for the better ear of 91dB or greater. May hear some loud sounds and does not rely on hearing as primary channel for communication.
ICD–10 (WHO 1992)	Conductive and sensorineural deafness (including congenital deafness) and other hearing loss.
	Other hearing impairment
WHO 1991 (Adults)	Unaided hearing threshold for the better of between 26 and 80 dB (covers slight, moderate and severe impairment). Differential ability to hear words spoken at increasingly louder volume and distances.
WHO 1991 (Children under 15)	Unaided hearing threshold for the better ear of 31dB or greater.
Australian Deafness Forum (as adapted from Stabb 1994)	Unaided hearing threshold for the better ear of between 25 and 90 dB (covers mild, mild to moderate, moderate to severe, and severe hearing loss). Differential ability to understand speech in noisy to quiet environments and increasing reliance on visual forms of communication.
ICD–10 (WHO 1992)	Conductive and sensorineural hearing loss and other hearing loss (e.g. noise-induced).
	Hearing disability
ICF (WHO 2001a)	Level of difficulty participating or performing activities related to a hearing impairment (either structural or functional), in the presence or absence of assistance.
National Community Services Data Dictionary, version 3— Disability grouping (AIHW 2003b)	Hearing disability encompasses deafness, hearing impairment, and hearing loss, which can cause severe restrictions in communication, and in the ability to participate in community life.

The definitional acknowledgment that a hearing impairment affects the ability to communicate, and a consequent need to rely on alternative forms of communication, captures in part the experience of a hearing disability. As for visual disability, the ICF expands this further again, relating the impact of a hearing impairment on ability to perform other activities and to participate in the social and economic world (Table 5.3). This emphasis

on the disabling nature of a hearing impairment is also recognised in the definition of hearing disability given in the *National Community Services Data Dictionary*, where hearing disability is conceived as causing 'severe restrictions in communication, and in the ability to participate in community life' (AIHW 2003b).

Table 5.4: Severity of hearing impairment, WHO and Australian definitions

Grade of impairment	Corresponding audiometric ISO value	Performance
World Health Organization[(a)]		
No impairment	25 dB or better	No or very slight hearing problems. Able to hear whispers.
Slight impairment	26–40 dB	Able to hear and repeat words spoken in normal voice at 1 metre.
Moderate impairment	41–60 dB	Able to hear and repeat words using raised voice at 1 metre.
Severe impairment	61–80 dB	Able to hear some words when shouted into better ear.
Profound impairment (deafness)	81 dB or greater	Unable to hear and understand even a shouted voice.
Australia[(b)]		
Normal hearing	0–20 dB	No effects in good listening environment.
Mild hearing loss	25–30 dB	Understanding speech can be difficult. Has difficulty understanding in a noisy environment.
Mild to moderate impairment	40–60 dB	Has trouble hearing and understanding in ideal conditions. Unable to follow what is said in large open areas.
Moderate to severe impairment	56–70 dB	Communicates with significant difficulty under all conditions. Needs visual clues.
Severe hearing loss	71–90	Unable to hear normal speech, depends on visual clues such as speechreading or sign language.
Profound hearing loss (deafness)	91 dB or greater	May hear some loud sounds. Does not rely on hearing as primary channel for communication.

Sources: (a) WHO1991. (b) Adapted from *Rexton Guide to Better Hearing* (Stabb 1994).

Causes of hearing impairment

Hearing is related to factors such as age, heredity, noise exposure, infection and health status (Rosenhall et al. 1999). Loss of hearing is strongly correlated with age and sex (see discussion in later section) and extrinsic factors, including noise exposure, diseases and conditions such as tinnitus, Ménière's disease, otitis media, otosclerosis, and ototoxic drugs (e.g. Davis 1987; Nadol 1993). Lifestyle factors such as diet, alcohol and smoking have also been suggested as causes of hearing impairment (Cruickshanks et al. 1998; Dengerink et al. 1987; Fried et al. 1998; Stephens et al. 1991) although Parving (1995) warns that these associations remain controversial and under dispute.

Loss of hearing in children in developed regions such as Europe is largely attributable to prenatal causes (inheritance, foetal infection and malformation) and, to a lesser extent, postnatal (diseases such as otitis media and meningitis) and perinatal factors (Parving 1995). A study of the effect of such factors on hearing impairment in European children also found that 20% of cases were of unknown cause (Parving 1995). The proportion of 'unknown cause' in reports on hearing loss in European children ranged from 11% to 42% (see Parving 1995 for a review).

Definitions of speech impairment and disability

Speech disabilities affect how people speak and how others understand them. While the implications of a speech disability on a person's literacy, behaviour and social skills are duly recognised, speech disability is almost universally defined in terms of impairment.

Classification and terminology used to describe speech impairments are particularly fraught with inconsistency, in particular the use of different interpretations for the same terminology or different terminologies for the same meaning (Blum-Harasty & Rosenthal 1992; Enderby & Philipp 1986). Some of these problems reflect disagreement regarding what constitutes a speech impairment, and how severe a speech or language problem needs to be for it to be described as an impairment. Another issue is the differentiation between disorder and delay, which is critical for identifying, and estimating the prevalence of, speech impairments in children (Wake & Reilly 2001). A speech or language 'disorder' relates to those abilities considered to have developed in a manner distinct from what is considered 'usual' whereas a delay relates to abilities considered to be below that expected for a child's chronological age (Law et al. 1998).

No broad-scale classification exists for speech disability. Speech impairments are generally defined in terms of two broad aetiological groups—speech disorders and language disorders—and for this reason are often referred to as communication impairments or disorders. Speech and language disorders form a heterogenous group as they can be secondary to a variety of underlying medical and surgical problems or part of general or specific developmental disorders (Enderby & Philipp 1986).

Speech disorders are disorders of motor speech production and include stuttering, dysarthria, apraxia and voice disorders. In adults, speech disorders tend to be acquired, caused by stroke, degenerative diseases (e.g. Parkinson's disease, multiple sclerosis), infections or brain tumours. In children, speech disorders are often congenital or a symptom of conditions such as cerebral palsy or muscular dystrophy.

Language disorders affect the ability to produce language. Developmental language disorders or delays in children can be associated with hearing and cognitive impairments, autism or a physical disability. Acquired language disorders like aphasia may also be experienced by children but are more commonly caused by later damage to the part of the brain responsible for language function.

This broad grouping into speech and language disorders is, however, not always observed since speech impairments of phonology/articulation, fluency and voice are sometimes classified separately again (see, for example, Blum-Harasty & Rosenthal 1992). There has also been an increasing acceptance of an additional category 'pragmatic impairment', or impairment of linguistic knowledge, in the speech pathology field (Gallagher 1991). Pragmatic impairment may manifest itself as unusual language construction, or difficulty associated with using pragmatic cues in conversation, turn taking and comprehension. ICD-10 and ICF classifications of speech and language disorders cover most of these conditions although ICD–10 includes stuttering (and cluttering) under 'Mental and behavioural disorders' and differentiates language disorders into those experienced during childhood (classified under 'Disorders of psychological development') and those acquired in adult years.

While the categorisation of speech and language disorders described above focuses on the structures and functions of the body responsible for speech and language production, there is also an emphasis on the ability to produce and receive verbal communication. This ability

to speak, or understand spoken words, forms part of what the ICF defines as the activity of communication. Implicit in only some of these definitions, yet recognised by the ICF, is the individual's ability to converse, i.e. to start, sustain and end a conversation with one or more persons. Some diagnostic testing of speech and language disorders involves assessing conversation skills, but most tend to focus on actual production of sounds and the ability to string words into sentences. The ICF classifies the structures and functions associated with speaking, their impact on communicating, and hence an individual's ability to participate in the wider community. The importance of communication and participation is recognised in the *National Community Services Data Dictionary* definition of a speech disability (Table 5.5)

Table 5.5: Definitions and classifications of speech impairment and disability

Source	Definition
	Communication disorder (speech disorder/speech impairment)
Various authors e.g. Enderby & Philipp (1986); Blum-Harasty & Rosenthal (1992)	Communication disorders are a broad classification of disorders (or impairments) that affect speech and language production. Speech disorders are impairments of motor speech production and language disorders affect the ability to produce (and understand) language. These disorders affect the production of sounds and words, the sorting of words into sentences, and the ability to speak (and understand) those sentences.
	Speech disability
ICF (WHO 2001a)	Level of difficulty participating or performing activities related to a speech impairment (either structural or functional), in the presence or absence of assistance.
National Community Services Data Dictionary, version 3—Disability grouping (AIHW 2003b)	Speech disability encompasses speech loss, impairment and/or difficulty in communication, which can cause severe restrictions in communication, and in the ability to participate in community life.

Existing estimates of prevalence and patterns of sensory/speech disability

Blindness and visual impairment

Estimates of visual impairment and blindness are based on population survey data using either optometric examination or self-report methods to derive estimates. Different definitions of visual impairment and blindness are employed in studies relying on optometric examinations, which can compromise overall comparison of prevalence rates. Furthermore, clinical studies tend to focus specifically on the age group (above the age of 40 years) most commonly associated with declining vision.

International estimates: blindness

Prevalence estimates of blindness in different parts of the world are given in Table 5.6. While most of these estimates are based on the WHO/ICD–10 definition of blindness, three estimates derive from application of the US definition of legal blindness.

The prevalence of blindness in 'established market economies' (i.e. Western Europe, North America, Australia, Japan and New Zealand), based on the WHO/ICD–10 definition of blindness, is around 0.3% (Table 5.6; Thylefors et al. 1995). Individual developed countries, such as the Netherlands and the United States, have somewhat higher rates of blindness of 0.5% and 0.7% respectively (Klaver et al. 1998; Tielsch et al. 1990), although it must be noted that these population survey groups did not include children and young adults. Rates of blindness generally increase when the US definition of legal blindness is applied—to 0.8% in the Netherlands, and 0.5% and 1.2% in the United States. The UK estimate of 0.2% is

especially low but this was based on registers of blind people for access to social security payments and probably represents an underestimate of the true rate.

Table 5.6: Summary of existing estimates of prevalence rates of blindness, based on optometric examinations, international

Prevalence rate (%)	Regions	Age group	Data sources	Definitions and classifications
0.2	United Kingdom	16 years+	UK Register of Blind People: HMSO 1982 (cited in See et al. 1998)	WHO definition (ICD–10)
0.5	USA	40 years+	The Beaver Dam Eye Study: Klein et al. 1991	US definition of legal blindness
0.7	USA	40 years+	The Baltimore Eye Survey: Tielsch et al. 1990	WHO definition (ICD–10)
1.2	United States	40 years+	The Baltimore Eye Survey: *ibid*.	US definition of legally blind
0.6	USA	50 years+	The Framingham Study: Leibowitz et al. 1980	Visual acuity of less than 6/60
0.5	Netherlands	55 years+	The Rotterdam Study: Klaver et al. 1998	WHO definition (ICD–10)
0.8	Netherlands	55 years+	The Rotterdam Study: *ibid*.	US definition of legally blind
0.3	Established market economies[(a)]	All ages	Programme for the Prevention of the Blind: Thylefors et al. 1995	WHO definition (ICD–10)
0.3	Eastern Europe/Russia	All ages	Programme for the Prevention of the Blind: *ibid.*	WHO definition (ICD–10)
0.5	Latin America	All ages	Programme for the Prevention of the Blind: *ibid*.	WHO definition (ICD–10)
0.6	China	All ages	Programme for the Prevention of the Blind: *ibid.*	WHO definition (ICD–10)
0.7	Middle East	All ages	Programme for the Prevention of the Blind: *ibid*.	WHO definition (ICD–10)
0.8	Asia and Islands	All ages	Programme for the Prevention of the Blind: *ibid.*	WHO definition (ICD–10)
1.0	India	All ages	Programme for the Prevention of the Blind: *ibid*.	WHO definition (ICD–10)
1.4	Sub-Saharan Africa	All ages	Programme for the Prevention of the Blind: *ibid.*	WHO definition (ICD–10)

(a) Includes Western Europe, North America, Australia, Japan and New Zealand.

International estimates: visual impairment

Estimates of visual impairment (low vision and blindness combined)[5] are given in Table 5.7, based on self-report and optometric examination.

Self-reported visual impairment in New Zealand and Canada was estimated at 2.1% and 2.5% respectively of the population aged 15 years and over (Table 5.7). These were based on screening questions which asked the respondent if they had experienced, in the last 6 months or longer, any difficulty reading newsprint, or seeing a person standing 4 metres away. A much higher prevalence was found in the United States where around 9–10% of the survey population aged 18 years and over reported they had at least some trouble with their vision.

5 Published estimates of visual impairment generally do not separate blindness from low vision prevalence numbers.

When a much older population group (aged 70 years and over) was interviewed, 18%, or almost double the previous estimate, reported a visual impairment. These estimates were derived from respondents indicating they had experienced trouble seeing, even when wearing glasses or contact lenses.

Table 5.7: Summary of existing estimates of prevalence rates of visual impairment (including blindness), international

Prevalence rate (%)	Regions	Age group	Data sources	Definitions and classifications
Self-report				
2.1	New Zealand	15 years+	2001 Disability Survey: Statistics New Zealand 2002b	For a period of 6 months or more, experienced difficulty seeing ordinary newsprint or clearly seeing the face of someone from 4 metres away
2.5	Canada	15 years+	2001 Participation and Activity Limitation Survey: Statistics Canada 2002b	For a period of 6 months or more, experienced difficulty seeing ordinary newsprint or clearly seeing the face of someone from 4 metres
9.0	USA	18 years+	1998 National Health Interview Survey: Pleis & Coles 2002	Level of trouble with seeing (even when wearing glasses or contact lenses)
9.8	USA	18 years+	1997 National Health Interview Survey: Blackwell et al. 2002	Level of trouble with seeing (even when wearing glasses or contact lenses)
18.1	USA	70 years+	1994 National Health Interview Survey: Campbell et al. 1999	Level of trouble with seeing (even when wearing glasses or contact lenses)
Optometric examination				
4.5	USA	40 years+	Baltimore Eye Study: Tielsch et al. 1990	WHO (ICD–10 visual impairment categories 1 and 2)
4.7	USA	40 years+	Beaver Dam Eye Study: Klein et al. 1991	Visual acuity of between 20/40 to 20/63 (mild impairment) and 20/80 to 20/160 (moderate impairment)
1.4	Netherlands	55 years+	The Rotterdam Study: Klaver et al. 1998	WHO (ICD–10 visual impairment categories 1 and 2)
3.8	Netherlands	55 years+	The Rotterdam Study: *ibid*.	US definition of visual impairment
2.9	World	All ages	Programme for the Prevention of Blindness: Thylefors et al. 1995	WHO (ICD–10 visual impairment categories 1 and 2)

Prevalence estimates based on optometric testing focused on an older population group than the self-report measures. These estimates ranged from 1.4% in the Netherlands to 4.5% and 4.7% in the United States. While the number of estimates listed in Table 5.7 are too small to make any comment on the relationship between definition and prevalence rates, there is some indication that lower rates are derived if the WHO definition of low vision is applied. This is suggested by a higher prevalence rate of visual impairment among people 55 years and over in the Netherlands, from 1.4% when the WHO definition of visual impairment was applied to 3.8% when the US definition of visual impairment was used.

Australian estimates: blindness

The Melbourne Visual Impairment Project estimated the prevalence of bilateral blindness (i.e. blind in both eyes) in Victorians aged 40 years and over at around 0.2%, regardless of whether the WHO or a modified definition of blindness was employed (Taylor et al. 1997; Van Newkirk et al. 2001) (Table 5.8). When the US definition of legal blindness was applied, prevalence of blindness in the Victorian population rose slightly to 0.3%. This rate is lower than found in the Blue Mountains Eye Study, where it was estimated that 0.7% of the survey population were blind according to the US definition of legal blindness. This group were, on average, much older than the people tested in the Melbourne Visual Impairment Project.

Table 5.8: Summary of existing estimates of prevalence rates of blindness, based on optometric examinations, Australia

Prevalence rate (%)	Region	Age group	Data sources	Definitions and classifications
0.2	Melbourne	40 years+	Melbourne Visual Impairment Project: Taylor et al. 1997	WHO definition (ICD–10)
0.3	Melbourne	40 years+	Melbourne Visual Impairment Project: Taylor et al. 1997	US definition of legal blindness
0.7	Blue Mountains	49 years+	The Blue Mountains Eye Study: Attebo et al.1996	US definition of legal blindness
0.2	Victoria	40 years+	Melbourne Visual Impairment Project: Van Newkirk et al. 2001	Modified version of WHO definition: visual acuity of less than 3/60 in the better eye and/or a corresponding visual field loss of 5º or less
5.2[(a)]	Melbourne	40 years+	Melbourne Visual Impairment Project: Van Newkirk et al. 2000	Modified version of WHO definition: visual acuity of less than 3/60 in the better eye and/or a corresponding visual field loss of 5º or less

(a) This prevalence estimate was calculated from an insitutionalised population with an average age of 82 years.

Australian estimates: visual impairment

Self-reported rates of visual impairment, including blindness, in Australia were around 1% (Table 5.9). These estimates were based on reports of a sight problem that had lasted 6 months or more, and excludes any condition normally corrected by glasses or contact lenses. Optometric examination produced higher prevalence estimates of 4–5%, which may partly be due to the generally older population sample tested. These groups were aged at least 40 years whereas the self-report population covered all ages. The lowest estimate, as found for blindness, was based on the WHO definition but alternative definitions increased the prevalence rate by less than 1%.

Detailed research on the epidemiology of vision loss among Indigenous Australians is limited but available data indicate that Indigenous eye health is considerably worse than for other Australians (Taylor 1997, 2001). For example, the prevalence of cataract in Indigenous Australians is estimated at 3.6% compared to 0.8% of non-Indigenous Australians (National Trachoma and Eye Health Program Survey, as cited in Taylor 2001), and 31% of diabetic Indigenous Australians living in Western Australia have diabetic retinopathy, compared with 20% of non-Indigenous Australians with diabetes (Stanton et al. 1985).

Table 5.9: Summary of existing estimates of prevalence rates of visual impairment (including blindness), Australia

Prevalence rate (%)	Regions	Age group	Data sources	Definitions and classifications
Self-report				
0.7	Australia	All ages	1993 Survey of Disability, Ageing and Carers: ABS 1993	Loss of sight, not corrected by glasses or contact lenses—ABS screening question
1.0	Australia	All ages	1995 National Health Survey: ABS 1997	Long-term sight problems that can not be corrected by glasses or contact lenses
0.8	Australia	All ages	2001 National Health Survey: ABS 2002	Long-term sight problems that can not be corrected by glasses or contact lense.
Optometric examination				
3.9	Australia	40 years+	Melbourne Visual Impairment Project: Taylor et al. 1997	WHO (ICD–10 visual impairment categories 1 and 2)
4.2	Australia	40 years+	Melbourne Visual Impairment Project: Van Newkirk et al. 2001	Visual acuity of less than 6/12 to 6/18 and homonymous hemaniopia (Australian and US less than driving vision) to less than 6/60 to 3/60 and field between 10 and 5º constriction (severe impairment)
4.7	Australia	49 years+	Blue Mountains Eye Study: Attebo et al. 1996	Visual acuity of 20/40 or worse in the better eye.

Age and sex patterns of prevalence

The prevalence of low vision and blindness rises markedly with age. For example, the prevalence of visual impairment in persons participating in the Blue Mountains Eye Study was 0.8% for those aged 49–54 years, increasing to 42% of persons over the age of 85 years (Attebo et al. 1996). Similar marked increases in prevalence with age have been observed in other cited clinical studies and in population surveys. An increased risk in blindness is especially evident past the age of 65 years (Attebo et al. 1996; Klein et al. 1991; Tielsch et al. 1990).

Visual impairment tends to be more frequent in females, before and after adjusting for age, but some studies have failed to find such an association (e.g. Klaver et al. 1998; Tielsch et al. 1990). It has been suggested that females may be more susceptible than males to conditions leading to loss of vision (Attebo et al. 1996; Klein et al. 1991).

Hearing impairment

Hearing impairments are estimated to be the most prevalent disability in western countries (Wilson 1997). Furthermore, in the UK, hearing impairments top the disability league for number of years of a person's life affected (Haggard 1993, cited in Wilson et al. 1999). Published prevalence estimates of hearing impairment describe a broad range of hearing problems, and the majority of estimates listed in Table 5.10 are the sum of mild through to profound (i.e. deafness) impairment reported in different populations.

Data on the prevalence of hearing impairment are taken from a mixture of audiological examination and self-report methods (see below for a discussion of the validity of these approaches).

International estimates

For children, prevalence estimates are almost exclusively based on audiological examination. Data on the prevalence of childhood hearing impairment is scant and there has been an increasing call in Europe (and Australia) for a nationally coordinated approach to neonatal hearing screening (Parving 1999; Wake 2002). It has been estimated that bilateral, permanent hearing impairments are present in 1.2 to 5.7 per 1,000 live births (as cited in Yoshinaga-Itano et al. 1998). Estimates of hearing impairment in children in England, Denmark and northern Finland were somewhat lower, between 0.1 and 0.3% (Davis & Parving 1993; Mäki-Torkko et al. 1998) (Table 5.10).

Adult estimates come from both self-report surveys and audiological testing. In contrast to visual impairment, prevalence estimates of hearing impairment based on audiological examinations are generally lower than rates estimated from self-report methods (tables 5.10 and 5.11). Estimates based on audiological examinations and using the same audiological criteria ranged from 6% in a rural community in Denmark to 12% in Finland and 16% in the United Kingdom (Table 5.10).

Table 5.10: Summary of existing estimates of prevalence of hearing impairment, based on audiometric testing, international

Prevalence rate (%)	Region	Age group	Data sources	Definitions and classifications
Children				
0.1[(a)]	Finland (North)	Birth cohort: 1973–1992	Neonatal testing: Mäki-Torkko et al. 1998	dB hearing threshold of ≥40 or worse in the better-hearing ear
0.2[(a)]	England	Birth cohort: 1983–1988	Neonatal testing: Davis and Parving 1993	dB hearing threshold of ≥40 or worse in the better-hearing ear
0.3[(a)]	Denmark	Birth cohort: 1982–1987	Neonatal testing: Davis and Parving 1993	dB hearing threshold of ≥40 or worse in the better-hearing ear
Adults				
16.1	United Kingdom	15 years+	Davis 1989	dB hearing threshold of ≥25 or worse in the better-hearing ear
5.5	Denmark	31–50 years	Karlsmose et al. 1999	dB hearing threshold of ≥25 or worse in the better-hearing ear
12.0	Finland	45 years+	Uimonen et al. 1999	dB hearing threshold of ≥25 or worse in the better-hearing ear

(a) These rates are derived from neonatal hearing impairment screening conducted in the respective countries.

The range of self-report estimates is also considerable, from 10.7% in Sweden to 48.5% in the United States (Table 5.11). Some of this may again be due to the effect of different age cohorts but Rosenhall et al. (1999) have also argued that variation may be explained, in part, by differences in methodology. Particular issues concern the application of different definitions of 'hearing problem', and the methodologies employed in self-report–based studies, such as the administering of questions, type and expression of question(s) asked, and type and level of responses. The methodology summarised in Table 5.11 reflects this variation.

Table 5.11: Summary of existing estimates of prevalence of hearing impairment, based on self-report, international

Prevalence rate (%)	Region	Age group	Data sources	Methods
10.7	Sweden	16–84 years	Rosenhall et al. 1999	Q: 'Can you hear without difficulty what is said in conversation between several persons, with or without using a hearing aid?' R: Yes or no
14.0	Denmark	31–50 years	Karlsmose et al. 1999	Q: 'Have you experienced any hearing problems lasting more than one year?' R: Yes or no
18.2	USA	48 years+	Wiley et al. 2000	Hearing Handicap Inventory for the Elderly (Screening Version) (HHIE-S)
48.5	USA	50 years+	Wallhagen et al. 2001	Q: 'How much difficulty do you have, even with a hearing aid a) hearing and understanding words in a normal conversation; b) hearing words over the telephone; c) hearing well enough to carry on a conversation in a noisy room?' R: A great deal (3) Some (2) A little (1) None (0) Scores were summed for each of the three questions. A score of: 0 = no hearing impairment 1–3 = mild hearing impairment 4+ = moderate or more severe hearing impairment The estimate is a sum of the mild and moderate+ population.
33.2	USA	70 years+	1994 National Health Interview Study: Campbell et al. 1999	Q: 'Which statement best describes your hearing (with or without a hearing aid)?' R: (a) Good (b) a little trouble (c) lot of trouble or (d) deaf? Estimate is sum of positive responses to a little and a lot of trouble and deaf options.
17.0	USA	18+ years	1998 National Health Interview Survey: Pleis & Coles 2002	Q: 'Which statement best describes your hearing (with or without a hearing aid)?' R: (a) Good (b) a little trouble (c) lot of trouble or (d) deaf? Estimate is sum of positive responses to options b to d.
19.3	Sweden	75–80 years	Rosenhall et al. 1987	Q: 'Can you hear without difficulty what is said in conversation between several persons, with or without using a hearing aid?' R: Yes or no

Australian estimates

Self-reported rates of hearing impairment in Australia were somewhat lower than reported in other western countries (Table 5.12). The estimate derived from the 1993 Survey of Disability, Ageing and Carers is much lower (2.6%) than found in the 1995 and 2001 National Health Surveys (around 9–10%) and the South Australian Health Omnibus Survey (15%). This is probably due to the first estimate being based on the hearing impairment or related condition reported as a 'main disabling condition'.

Only two current estimates of hearing impairment based on audiological examination are published for Australia. The prevalence of hearing impairment in the South Australian population aged 15 years and over was estimated at 16.6%, much lower than the 39% found in the Blue Mountains Hearing Study. The latter population group, however, was on average much older than the South Australian population.

Table 5.12: Summary of existing estimates of prevalence of hearing impairment, Australia

Prevalence rate (%)	Region	Age group	Data sources	Definitions and classifications
Self-report				
15.3	South Australia	15 years+	Wilson et al. 1999	Screening question: trouble hearing what people say in a quiet room (speaking loudly, quietly, whispering or none of these)[(a)]
2.6	Australia	All ages	1993 Survey of Disability, Ageing and Carers: ABS 1996	Hearing impairment or related condition as main disabling condition
9.2	Australia	All ages	1995 National Health Survey: ABS 1997	Long-term hearing problems, such as deafness or hearing loss.
10.6	Australia	All ages	2001 National Health Survey: ABS 2002	Long-term hearing problems, such as deafness or hearing loss.
Audiological examination				
16.6	Australia (South Australia)	15 years+	South Australian Health Omnibus Survey: Wilson et al. 1999	dB hearing threshold of ≥25 or worse in the better-hearing ear
39.0	Australia (Blue Mountains)	55 years+	Blue Mountains Hearing Study: Mitchell 2002	dB hearing threshold of ≥25 or worse in the better-hearing ear

(a) Screening question from the South Australian Health Omnibus Survey.

Age and sex patterns of prevalence

The prevalence of hearing impairment, like visual impairment, increases with age (Mitchell 2002; Davis 1989; Karlsmose et al. 1999; Rosenhall et al. 1987, 1999; Uimonen et al. 1999; Wallhagen et al. 2001; Wiley et al. 2000; Wilson et al. 1999), particularly after the age of 50 years. In Sweden, for example, 2.4% of the population aged 16–24 reported a hearing impairment compared with 30% of the population aged 75 years and over.

Males are generally found to have higher rates of hearing impairment than females (Campbell et al. 1999; Karlsmose et al. 1999; Wallhagen et al. 2001; Wiley et al. 2000; Wilson et al. 1999), although this was only apparent for the under-55s in some populations (e.g. Rosenhall et al. 1999). If comparing rates for the worse ear, the prevalence of hearing impairment in South Australian males was double that of females (Wilson et al. 1999). No sex differentiation in prevalence of hearing impairment, however, was found for the UK population (Davis 1989).

Audiological examination versus self-report

The validity of audiological versus self-report techniques to gather information on hearing impairment has been contested in the literature. For some authors, the measurement of hearing impairment by application of pure-tone audiometery is the most appropriate procedure to follow since the application of self-report surveys is subject to potentially high levels of 'erroneous' reporting. For example, comparison made by Wilson et al. (1999) of self-reported prevalence rates with audiometric examinations results found both a high false positive and false negative rate. Other studies, however, determined reasonable or 'modest' correlations between rates derived from audiological and self-report methods (Davis 1989; Pedersen & Rosenhall 1991; Reuben et al. 1998; Rudberg et al. 1993; Ventry & Weinstein 1983; Wiley et al. 2000). Comparability of rates, however, for different degrees of hearing loss was not necessarily consistent from study to study. Wiley et al. (2000) reported that rates were most comparable when participants had a severe hearing impairment whereas Davis (1989) found that self-report rates correlated best with mild and moderate hearing impairments, arguing that self-assessed hearing is an efficient screen only for these levels of hearing impairment.

Nonetheless, the strength of self-assessed hearing impairment retains some acceptance in the hearing research community, as this method indicates not only the extent of the hearing impairment but, just as importantly, the level of restriction or limitation the impairment exacts on the individual (Rosenhall et al. 1999; Weinstein et al. 1995). Furthermore, a person who has been assessed audiologically as having a hearing impairment may not necessarily report the impairment as having a significant impact on their lives (Weinsten et al. 1995; Wiley et al. 2000).

Speech disability

Estimating the prevalence of speech disability is fraught with difficulty, based primarily on the absence of both a universally accepted or applied classification system (see previous and Beitchman 1985) and diagnostic techniques to identify speech and language disorders (Beitchman et al. 1986; Enderby & Philipp 1986; Healey et al. 1981, cited in Fein 1983). Many population estimates are underestimates since they specifically focus on speech disorder, thus preventing any count of the prevalence of language disorder, which is considered to have more serious psychosocial effects on children (and adults) than pure speech defects (Cantwell & Baker 1980).

Two additional factors compromise the attainment of accurate population estimates, particularly for the adult population. Most population estimates exclude institutional data, thus ignoring the 'significant' numbers of people living in institutions who have speech disabilities (Beitchman et al. 1986; Fein 1983). Furthermore, there is a tendency to report speech impairment in specific disability population groups, such as those who have suffered a stroke or an acquired brain injury (see Chapter 6), rather than the population as a whole.

With this in mind, the estimates given below represent the most inclusive data so far published.

International estimates

The majority of study on the prevalence of speech disability centres on children, particularly pre-school and primary school-aged children. The range of estimates is quite large (Table 5.13 and see Beitchman et al. 1986 and Blum-Harasty & Rosenthal 1992 for a review). Household interviews drawn from the US National Health Interview Survey give an

estimate of around 1–2% for children under the age of 18 years. These were based on the head of household reporting a child (or children) in the family currently stuttering, stammering or having some form of speech 'defect' (but see below: Australian estimates). Testing of speech and language disorders by speech clinicians presented much larger estimates. Around 4% of 6-year-old children in the Upper Midwest of the USA, 19% of five-year-old children in the Ottawa-Carleton region of Canada, and 38% of primary school-aged children in the United Kingdom were determined to have a speech disorder, language disorder or both. The wide range in these estimates might be due to the form of diagnostic testing used.

Adult estimates were all derived from the United States and self-report methods. Similarly for children, around 1% of adults in the National Health Interview Survey reported having a speech disability, as a stutter, stammer or other speech impairment. First-year university students reported a slightly higher prevalence, at 2%. These students were also assessed by clinicians through their ability to take part in conversation and read aloud without making mistakes.

Table 5.13: Summary of existing estimates of prevalence of speech disability, international

Prevalence rate (%)	Region	Age group	Data sources	Methods, definitions and classifications
Children				
0.9	USA	<5 years	1977 National Health Interview Survey: Fein 1983	Household head interview
19.0	Ottawa–Carleton (Canada)	5 years	Beitchman et al. 1986	Testing by speech clinician
3.8	Upper Midwest (USA)	6 years	Shriberg et al. 1999	Testing by speech clinician
37.8	UK	Grades 1–2, 4–6	O'Connor 1987, cited in Blum-Harasty and Rosenthal 1992	Testing by speech clinician
1.9	USA	5–14	1977 National Health Interview Survey: Fein 1983	Household head interview
4.6	USA	All grades	Diaz 1985	Questionnaire to school
1.8	USA	<18 years	1988 National Health Interview Survey: Shewan and Malm 1990	Household head interview
Adults				
2.4	USA	17–18	Culton 1986	Self-reported, conversation and reading aloud
0.8	USA	15 years+	1977 National Health Interview Survey: Fein 1983	Household interview
1.0	USA	15 years+	1981 National Health Interview Survey: Shewan and Malm 1990	Household interview

Australian estimates

Few Australian estimates of speech disability are available, and those that are come from self-report population surveys. The prevalence of speech disability in children under 14 years was estimated at 1.7%. For Australians overall, estimates were similar, around 1% (Table 5.14).

Wake & Reilly (2001) have questioned the prevalence rate of speech disability in children, arguing that the data used by Keating et al. (2001) cited in Table 5.14 do not differentiate between disorder and delay and, more importantly, are based on self-report methods which

are not necessarily accurate. Studies have shown that parents are accurate judges of some speech/language problems, such as language difficulties in young children, but are not so good at detecting similar problems in older children (Wake & Reilly 2001). Furthermore, the wording of questions affects how a parent will respond. For example, less than 2% of parents in the National Health Survey reported their child having a speech impairment but more than 20% of parents indicated positively to a question asking if they had concerns about how their child talks and uses speech sounds. It is conceivable that these sorts of question-wording issues flow into adult self-report where individuals may not so readily respond affirmatively to questions using words such as impairment.

Table 5.14: Summary of existing estimates of prevalence of speech disability, Australia

Prevalence rate (%)	Region	Age group	Data sources	Methods, definitions and classifications
1.7	Australia	0–14	1995 National Health Survey: Keating et al. 2001	Speech impediment or disability that has lasted or likely to last for six months or more
1.2	Australia	All ages	1993 Survey of Disability, Ageing and Carers: ABS 1996	Speech difficulties—ABS screening question
0.7	Australia	All ages	1995 National Health Survey: ABS 1997	Speech impediment or disability that has lasted or likely to last for six months or more

5.2 Estimates of prevalence of sensory/speech disability in Australia

Main data items and methods of estimation

Using the 1998 ABS disability survey data, this section provides estimates of sensory/speech disability using the four approaches: main disabling condition, all disabling conditions, all disabling conditions and activity limitations/participation restrictions, main/all disabling conditions and a severe or profound core activity restriction (see Section 2.4 for details of methods). A person is initially included in the sensory/speech disability group if:

- a positive response was made by or for them to one or more of the following screening questions: 'loss of sight (not corrected by glasses or contact lenses', 'loss of hearing where communication is restricted, or an aid to assist with, or substitute for, hearing is used', 'has speech difficulties'; and/or
- a positive response was made by or for them to one or more of the 17 screening questions and one or more sensory/speech impairments or disabling conditions was reported (for detailed codes for sensory/speech impairments and disabling conditions see Appendix 1).

The 1998 disability survey identified a more restricted population with hearing loss than did the 1993 survey. The 1993 survey screening question simply asked about whether the respondents had a loss of hearing. In the 1998 survey, a restriction criterion was added to the screening question to select people who had a loss of hearing and were restricted in communication or were using an aid to assist with hearing.

Estimates at national level

All disabling conditions

Estimates of the prevalence of sensory/speech disability using the four approaches are summarised in tables 5.15 and 5.16. Overall, in 1998, there were 1,404,600 people, or 7.5% of Australians, who had a sensory or speech impairment as a disabling condition. Of these, 1,286,900, or 6.9% of Australians, reported one or more activity limitations or participation restrictions and, of these, about 524,200, or 2.8% of the population, had a severe or profound core activity restriction (Table 5.15).

For people aged under 65 years, there were 685,700 people, or 4.2% of the population in that age group, with a sensory/speech disability. Hearing impairments were the predominant disabling condition (2.7%), followed by speech impairment (1.1%) (Table 5.16). For those under 65 years with a severe or profound core activity restriction, the prevalence of speech impairments was 0.7%, compared with 0.6% for hearing and 0.2% for visual impairments.

Table 5.15: Estimates of sensory/speech disability based on four approaches, by sex and age, as a percentage of the Australian population of that sex and age, 1998

	Males		Females		Persons	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	445.8	5.4	239.9	3.0	685.7	4.2
65+	347.2	35.0	371.7	29.1	718.9	31.7
Total	**793.0**	**8.5**	**611.6**	**6.5**	**1,404.6**	**7.5**
All disabling conditions and activity limitations and participation restrictions						
0–64	384.6	4.6	213.2	2.6	597.9	3.6
65+	324.4	32.7	364.6	28.6	689.0	30.4
Total	**709.0**	**7.6**	**577.9**	**6.2**	**1,286.9**	**6.9**
All disabling conditions and severe or profound core activity restrictions						
0–64	136.0	1.6	82.7	1.0	218.7	1.3
65+	111.7	11.3	193.8	15.2	305.5	13.5
Total	**247.7**	**2.7**	**276.5**	**2.9**	**524.2**	**2.8**
Main disabling condition						
0–64	155.5	1.9	80.3	1.0	235.8	1.4
65+	101.8	10.3	92.0	7.2	193.8	8.5
Total	**257.3**	**2.8**	**172.3**	**1.8**	**429.6**	**2.3**
Main disabling condition and severe or profound core activity restrictions						
0–64	25.0	0.3	13.6	0.2	38.2	0.2
65+	18.7	1.9	28.1	2.2	46.8	2.1
Total	**43.3**	**0.5**	**41.6**	**0.4**	**84.9**	**0.5**

Sources: Tables A5.1 and A5.2; AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Table 5.16: Estimates of type of sensory/speech disability, based on four approaches, by sex and age, as a percentage of the Australian population of that sex and age, 1998

	Males						Females						Persons					
	Visual		Hearing		Speech		Visual		Hearing		Speech		Visual		Hearing		Speech	
	'000	%	'000	%	'000	%	'000	%	'000	%	'000	%	'000	%	'000	%	'000	%
All disabling conditions																		
0–64	77.7	0.9	288.1	3.5	117.1	1.4	51.7	0.6	152.0	1.9	57.6	0.7	129.4	0.8	440.1	2.7	174.6	1.1
65+	81.5	8.2	293.4	29.6	29.8	3.0	138.8	10.9	268.1	21.0	39.6	3.1	220.3	9.7	561.5	24.8	69.3	3.1
Total	**159.2**	**1.7**	**581.5**	**6.3**	**146.9**	**1.6**	**190.5**	**2.0**	**420.1**	**4.5**	**97.1**	**1.0**	**349.8**	**1.9**	**100,1.6**	**5.4**	**244.0**	**1.3**
All disabling conditions and activity limitations and participation restrictions																		
0–64	63.7	0.8	246.3	3.0	108.0	1.3	45.6	0.6	136.4	1.7	52.1	0.6	109.3	0.7	382.7	2.3	160.0	1.0
65+	77.7	7.8	273.7	27.6	29.5	3.0	137.3	10.8	262.5	20.6	39.6	3.1	215.0	9.5	536.2	23.6	69.1	3.0
Total	**141.3**	**1.5**	**520.0**	**5.6**	**137.5**	**1.5**	**183.0**	**2.0**	**398.9**	**4.3**	**91.6**	**1.0**	**324.3**	**1.7**	**918.9**	**4.9**	**229.1**	**1.2**
All disabling conditions and severe or profound core activity restrictions																		
0–64	20.6	0.2	54.1	0.7	81.9	1.0	16.1	0.2	36.4	0.4	39.6	0.5	36.6	0.2	90.4	0.6	121.5	0.7
65+	42.8	4.3	78.7	7.9	25.7	2.6	87.4	6.8	126.3	9.9	37.0	2.9	130.1	5.7	205.0	9.0	62.7	2.8
Total	**63.3**	**0.7**	**132.8**	**1.4**	**107.6**	**1.2**	**103.4**	**1.1**	**162.7**	**1.7**	**76.6**	**0.8**	**166.7**	**0.9**	**295.4**	**1.6**	**184.2**	**1.0**
Main disabling condition																		
0–64	24.7	0.3	102.7	1.2	28.1	0.1	16.1	0.2	57.2	0.7	*7.0	*0.0	40.8	0.2	159.9	1.0	35.1	0.2
65+	27.7	2.8	73.6	7.4	**0.5	**0.3	44.8	3.5	47.1	3.7	**0.1	**0.1	72.5	3.2	120.7	5.3	**0.6	**0.0
Total	**52.4**	**0.6**	**176.3**	**1.9**	**28.6**	**0.3**	**60.9**	**0.6**	**104.3**	**1.1**	***7.1**	***0.1**	**113.2**	**0.6**	**280.6**	**1.5**	**35.7**	**0.2**
Main disabling condition and severe or profound core activity restrictions																		
0–64	*4.7	*0.1	*7.9	*0.1	12.0	0.1	**1.9	**0.0	9.0	0.1	*2.7	*0.0	*6.6	*0.0	16.9	0.1	14.7	0.1
65+	12.4	1.2	*6.3	*0.6	0.0	0.0	20.6	1.6	*7.4	*0.6	**0.1	**0.0	32.9	1.5	13.7	0.6	**0.1	**0.0
Total	**17.1**	**0.2**	**14.2**	**0.2**	**12.0**	**0.1**	**22.5**	**0.2**	**16.4**	**0.2**	***2.8**	***0.0**	**39.6**	**0.2**	**30.6**	**0.2**	**14.8**	**0.1**

Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Around 718,900 people aged 65 years and over, or 32% of Australians in that age group, reported having a sensory/speech disability. About half of these (305,500) also had a severe or profound core activity restriction. These people represented 14% of Australians aged 65 years plus. Prevalence rates were highest for hearing impairments, both for people with a disability in general (25%) and those with a severe or profound core activity restriction (9%). Visual impairments were the next most common impairment, reported by 10% of the population aged 65 years and over, and 6% of this population with severe or profound core activity restriction.

The prevalence estimate of sensory/speech disability using the approach 'all disabling conditions and activity limitations/participation restrictions', was 1,286,900 people, or 7% of the Australian population, in 1998. The prevalence of Australians aged under 65 years based on this approach was 3.6%, or 597,900 people; the prevalence for Australians 65 and over, 30% or 689,000 people. Hearing impairments were again the most reported sensory/speech disability but prevalence rates were markedly different between the two main age groups: 2% (under 65 years) compared with 24% (65 years and over).

Main disabling condition

In 1998, there were 429,600 people, or 2.3% of the Australian population, with a sensory/speech disability as a main disabling condition. Of these, 84,900, or 0.5% of the population, also had a severe or profound core activity restriction.

For people aged under 65 years, 235,800 people, or 1.4% of Australians in that age group, reported a sensory or speech main disabling condition (Table 5.15). More than half of this age group (159,900 people) had a hearing impairment (1.0% of the under 65 population) (Table 5.16). Around 40,800 had a visual impairment and 35,100 a speech disability, both accounting for 0.2% of the population in this age group.

A severe or profound core activity restriction was reported by 38,200 or 0.2% of people aged under the age of 65 years and with a sensory/speech disability as a main disabling condition. Again, hearing impairments were the most common disabling condition, with 16,900 or 0.1% of this population reporting such an impairment, but the prevalence of speech disabilities was also calculated at 0.1% of the population (14,700 people). Only 6,600 people under the age of 65 years reported a visual impairment.

For people aged 65 years and over, there were 193,800, or 8.5% of Australians in that age group, with a sensory/speech disability as a main disabling condition. The prevalence of hearing and visual impairments was greater for this age group compared with the under-65s. Most people 65 and over with a sensory/speech disability as a main disabling condition had a hearing impairment—120,700 people or 5.3% of the age group. Around 72,500 people had a visual impairment with a rate of 3.2%. Speech disabilities were considerably less common.

Around 46,800 people aged 65 years and over and with a sensory/speech main disabling condition also reported a severe or profound core activity restriction. This group accounted for 2.1% of the population in this age group. Over two-thirds of this group (32,900) had a visual impairment with a prevalence rate of 1.5%. A hearing impairment was reported by 13,700, or 0.6%, of Australians in this group.

5.3 Patterns of prevalence of sensory/speech disability in Australia

Age and sex patterns

The prevalence of sensory/speech disabilities generally rises as age increases, peaking at the age group 65 years and over with the highest rates of 32% based on all disabling conditions and 9% based on main disabling condition (tables A5.1 and A5.2). Children aged 5–14 years had higher rates of sensory/speech disabilities than people in any other age group under 45 years. Males and females showed similar age-related trends but males tended to have higher rates of sensory/speech disability than females for every age group. However, females aged 65 years and over with a severe or profound core activity restriction had slightly higher rates than males.

Rates of visual and hearing impairment as a main disabling condition and based on all disabling conditions also generally increased with age, peaking at the age group 65 years and over (tables A5.3 and A5.4). These rates, for both visual and hearing impairments, were higher using the 'all disabling conditions' approach, particularly for the older age groups. For example, 5% of people aged 65 years and over reported a hearing impairment as their main disabling condition whereas 25% of people of the same age group had a hearing impairment as a disabling condition. This could be attributed to a general loss of hearing as individuals get older.

All age groups reported speech impairments but this condition was mostly associated with children under the age of 14 years. Children 4 years and under had a rate of 0.5% based on main disabling condition and 1.7% based on all disabling conditions; rates for children aged 5–14 were 0.7% and 2.6% respectively.

Age at onset of main disabling condition

The age at onset of a main sensory/speech disability coincided with the very early and later years of life (Table 5.17). Nearly a quarter (23%) of people with a sensory/speech main disabling condition acquired the condition under the age of 4 years and another fifth (20%) after the age of 65 years.

Visual impairments tended to first occur either before the age of 4 (15%) or over the age of 65 (40%). Around 17% of hearing-impaired people also reported an age of onset at 4 years and under but no obvious age trend occurred past the childhood years, the exception being a somewhat higher onset at the ages 35 to 54 years compared with other adult age groups. The onset of speech impairments showed the most distinctive pattern. Of the people who reported having a speech impairment as their main disabling condition, all indicated that the age of onset was before the age of 18 years. The majority of these (87%) were under the age of 4 when they acquired their speech impairment.

Table 5.17: People reporting a sensory/speech main disabling condition, age when that condition identified, 1998

	Visual		Hearing		Speech		Sensory/speech	
Age at onset	**'000**	**%**	**'000**	**%**	**'000**	**%**	**'000**	**%**
0–4	16.6	15.4	46.8	17.1	31.1	87.2	94.5	22.6
5–9	*6.0	*5.6	15.4	5.6	*3.7	*10.5	25.2	6.0
10–14	*2.7	*2.5	9.8	3.6	**0.2	**0.4	12.7	3.0
15–19	**3.2	**2.9	*8.6	*3.2	**0.7	**1.9	11.8	2.8
20–24	*3.5	*3.2	15.5	5.7	—	0.0	19.0	4.5
25–29	*2.7	*2.5	13.0	4.7	—	0.0	16.3	3.9
30–34	**1.8	**1.6	13.4	4.9	—	0.0	15.2	3.6
35–39	**2.3	**2.2	21.9	8.0	—	0.0	24.3	5.8
40–44	*3.3	*3.1	21.0	7.7	—	0.0	24.3	5.8
45–49	*6.3	*5.8	13.6	5.0	—	0.0	20.0	4.8
50–54	*3.3	*3.1	24.5	9.0	—	0.0	27.8	6.7
55–59	*7.7	*7.1	13.7	5.0	—	0.0	21.3	5.1
60–64	*5.2	*4.8	15.9	5.8	—	0.0	21.2	5.1
65–69	11.0	10.2	16.3	5.9	—	0.0	27.3	6.5
70–74	13.0	12.0	9.5	3.5	—	0.0	22.5	5.4
75–79	11.5	10.6	9.0	3.3	—	0.0	20.4	4.9
80–84	*5.2	*4.8	*4.0	*1.5	—	0.0	9.2	2.2
85+	*2.7	*2.5	**1.9	**0.7	—	0.0	*4.5	*1.1
Total persons	**108.1**	**100.0**	**273.8**	**100.0**	**35.6**	**100.0**	**417.5**	**100.0**

Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Reported cause of main disabling condition

Around 25% of people with a visual impairment reported their condition had 'just come on'. Another 20% attributed their visual impairment to a disease, illness or hereditary condition and 17% to old age (Table 5.18).

The work environment was the leading reported cause of hearing impairment as a main disabling condition (29%), followed by disease, illness or hereditary condition (17%). Working conditions, type of work or overwork was the most important cause of hearing impairment in both the under-65 and over-65 age groups.

The majority of speech disabilities were reported as being either present at birth (33%) or having just come on (27%). However, 33% of people with a speech impairment as a main disabling condition reported not knowing the cause of their condition.

Table 5.18: People reporting a sensory/speech main disabling condition: cause of main disabling condition, by type of sensory/speech disability, 1998

	Visual						Hearing						Speech					
	0–64		65+		Total		0–64		65+		Total		0–64		65+		Total	
Reported cause of main disabling condition	**'000**	**%**	**'000**	**%**	**'000**	**%**	**'000**	**%**	**'000**	**%**	**'000**	**%**	**'000**	**%**	**'000**	**%**	**'000**	**%**
Main condition just came on	*8.0	*19.6	20.0	27.5	27.9	24.7	17.0	10.6	18.3	15.1	35.3	12.6	9.4	26.9	—	0.0	9.4	26.8
Disease, illness or hereditary	*8.0	*20.5	14.3	19.7	22.6	20.0	32.9	20.6	15.4	12.8	48.2	17.2	**0.7	**1.9	**0.0	**6.1	**0.7	**2.0
Accident/injury	*8.3	*20.4	**1.7	**2.4	10.1	8.9	*8.4	*5.2	*4.0	*3.3	12.4	4.4	—	0.0	—	0.0	—	0.0
Working conditions, work, overwork	**0.2	**0.4	**0.8	**1.1	**0.9	**0.8	44.4	27.8	37.0	30.6	81.4	29.0	**0.7	**2.0	—	0.0	**0.7	**2.0
Present at birth	9.0	22.2	**1.9	**2.6	10.9	9.6	22.9	14.3	**1.9	**1.6	24.8	8.8	11.0	31.2	**0.5	**86.0	11.5	32.6
Old age	**1.4	**3.3	17.9	24.7	19.2	17.0	*2.7	*1.7	14.0	11.6	16.7	6.0	—	0.0	—	0.0	—	0.0
Stress	**0.5	**1.3	**0.8	**1.1	**1.3	**1.2	—	0.0	**0.6	**0.5	**0.6	**0.2	**0.2	**0.4	—	0.0	**0.2	**0.4
Personal/family death	—	0.0	—	0.0	—	0.0	—	0.0	**0.0	**0.0	**0.0	**0.0	**0.7	**2.1	—	0.0	**0.7	**2.1
Allergy	—	0.0	**0.7	**0.9	**0.7	**0.6	**1.0	**0.6	—	0.0	**1.0	**0.3	—	0.0	—	0.0	—	0.0
Side-effect of medication/medical procedure	—	0.0	**1.3	**1.8	**1.3	**1.1	**0.7	**0.4	**0.9	**0.7	**1.6	**0.6	—	0.0	—	0.0	—	0.0
Smoking	—	0.0	**0.0	**0.1	—	0.0	—	0.0	**0.0	**0.0	—	0.0	—	0.0	—	0.0	—	0.0
Pregnancy/childbirth	—	0.0	0	0.0	—	0.0	**0.7	0.4	—	0.0	**0.7	**0.2	—	0.0	—	0.0	—	0.0
Cause by other factors NES	—	0.0	*4.4	*6.0	*4.4	*3.9	11.5	7.2	13.1	10.9	24.7	8.8	**0.8	**2.4	—	0.0	**0.8	**2.4
Do not know what caused condition	*5.0	*12.2	*8.8	*12.1	13.8	12.2	17.8	11.1	15.3	12.7	33.1	11.8	11.6	33.1	**0.0	**8.1	11.7	33.1
Not applicable	—	0.0	—	0.0	—	0.0	—	0.0	**0.1	**0.1	**0.1	**0.0	—	0.0	—	0.0	—	0.0
Total	**40.8**	**100.0**	**72.5**	**100.0**	**113.2**	**100.0**	**160.0**	**100.0**	**120.7**	**100.0**	**280.6**	**100.0**	**35.1**	**100.0**	**0.6**	**100.0**	**35.3**	**100.0**

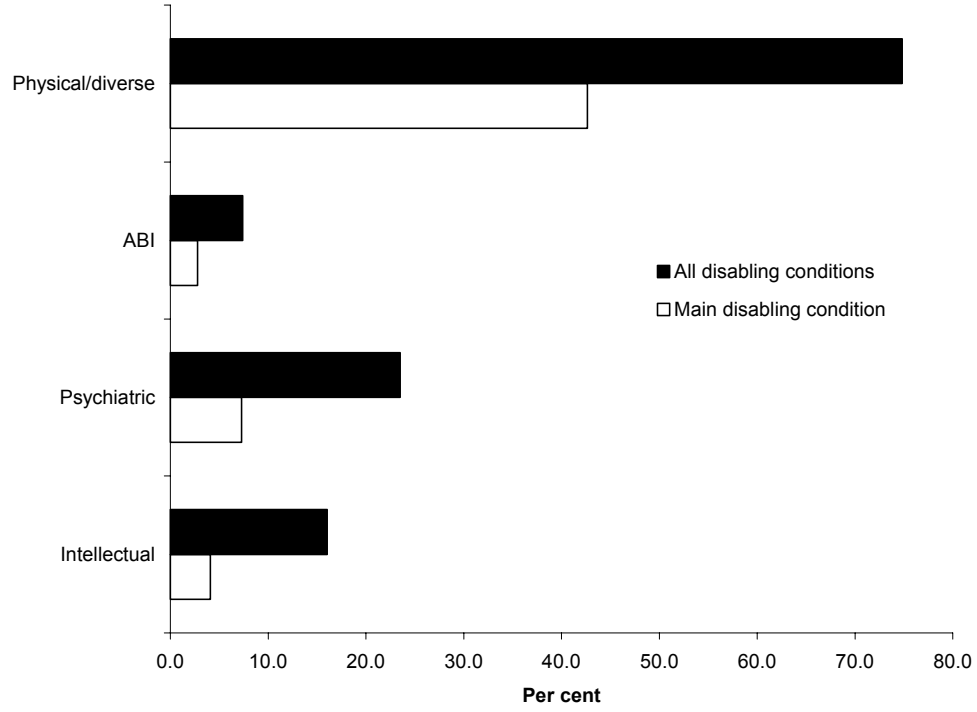
Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Associated disabilities

While physical/diverse disability (75%) was the most frequently associated disability for people with a sensory/speech disability based on all reported disabling conditions, around 24% also had a psychiatric disability and 16% an intellectual disability (Figure 5.1; Table A5.5). Among people with severe or profound restrictions, this association with psychiatric and intellectual disabling conditions rises to 25% and 17% respectively.

Physical/diverse disabilities were the most commonly associated disability (43%) with a sensory/speech main disabling condition. This was especially apparent for people with sensory/speech disabilities aged over 65 (65%) compared with people under the age of 65 years (24%).



Source: Table A5.5.

Figure 5.1: People reporting a sensory/speech disability (based on main/all disabling conditions), by reported other disabilities, 1998

Significant diseases or conditions

All disabling conditions

The prevalence of cataract (0.4%), retinal disorder (0.2%) and glaucoma (0.3%) was slightly higher when reported as a disabling, rather than a main disabling, condition. Again, people aged 65 years and over had a higher prevalence of these conditions (1–2%) than people aged under 65 years (0.1%). Females also reported a much higher prevalence of these conditions

compared with males. For example, the prevalence of cataract as a disabling condition was 3.3% of females compared with 2.2% of males.

As found for main disabling condition, noise exposure (1.8%) and 'other non-ear disease-related causes' (1.3%) had the highest prevalence of all hearing impairment-associated conditions. Increasing age parallelled an increase in the prevalence of these and other listed conditions, including congenital conditions. The greatest difference between the sexes in the prevalence of a specific hearing impairment-associated disease or condition was again noise exposure, at 3.3% for males and 0.3% for females. The difference between males aged under and over 65 years was even more marked—1.9% and 14.8% respectively.

The prevalence of speech impediments as a disabling condition was 0.4%. Again, speech impediments were most common for children aged 0–4 (0.7%) and 5–14 (1.3%), and for males rather than females, for each age group but especially so for those aged 5–14 (1% compared with 0.2%).

Main disabling condition

The prevalence of significant diseases associated with visual impairment i.e. glaucoma, retinal disorder and cataracts, were uniform, at 0.1%. While the prevalence of these diseases was largely the same for each sex, people over the age of 65 years had a higher prevalence of these conditions (around 0.7%) compared with people under the age of 65 years (<0.1%).

Noise exposure (0.4%) and 'other non-disease related causes' (0.6%) were the most prevalent of diseases and conditions associated with hearing impairment, followed by congenital conditions at 0.2%. The prevalence of noise-induced hearing impairment was particularly high in males compared with females, especially for the age groups 45–64 (1.3% compared with <0.1%) and 65 years and over (2.7% compared with 0.3%). A high prevalence of hearing impairment-related diseases and conditions was associated with older age, especially after the age of 45 years. The exception was congenital conditions, which was equally prevalent for each age group, at around 0.2–0.3%.

The prevalence of a speech impediment as a main disabling condition associated with a speech disability was 0.3%. Speech impediments were mostly reported by children aged 0–4 (0.4%) and 5–19 (0.9%) years. Males also reported slightly higher rates of speech impediment than females (0.2% to <0.1% respectively), and this was especially apparent in the age group 5–19 years (0.7% to 0.2%).

Place of residence and geographic location

The majority (>90%) of people with a sensory/speech disability, reported either as a main disabling condition or as an associated condition, resided in households (Table 5.19). The only marked difference was found for people aged 65 and over and with a severe or profound core activity restriction—65% of this group lived in household accommodation if they reported a sensory/speech disability as an associated condition.

Table 5.19: Estimates of sensory/speech disability based on four approaches, by place of residence, 1998

	Households		Cared accommodation		Total	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	672.0	98.0	13.7	2.0	685.7	100.0
65+	606.3	84.3	112.6	15.7	718.9	100.0
Total	**1,278.3**	**91.0**	**126.3**	**9.0**	**1,404.6**	**100.0**
All disabling conditions and activity limitations and participation restrictions						
0–64	584.2	97.7	13.7	2.3	597.9	100.0
65+	576.6	83.8	112.5	16.2	688.0	100.0
Total	**1,160.8**	**90.2**	**126.1**	**9.8**	**1,286.9**	**100.0**
All disabling conditions and severe or profound core activity restrictions						
0–64	205.3	93.9	13.3	6.1	218.7	100.0
65+	197.0	64.5	108.5	35.5	305.5	100.0
Total	**402.3**	**76.8**	**121.9**	**23.2**	**524.2**	**100.0**
Main disabling condition						
0–64	235.4	99.8	**0.4	**0.2	235.8	100.0
65+	185.3	95.7	*8.4	*4.3	193.7	100.0
Total	**420.7**	**97.9**	**8.9**	**2.1**	**429.6**	**100.0**
Main disabling condition and severe or profound core activity restrictions						
0–64	37.8	99.0	**0.4	**0.1	38.2	100.0
65+	39.5	84.5	*7.2	*15.5	46.8	100.0
Total	**77.3**	**91.0**	**7.7**	**9.0**	**84.9**	**100.0**

Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

In 1998, about 60% of people with a sensory/speech disability lived in capital cities, compared with 40% in other part of the states. This was consistent across all estimates of sensory/speech disability using all four approaches (Table 5.20).

Estimates at state and territory level

Tables 5.21 and A5.6 provides estimates of sensory/speech disability by states and territories. As discussed in Section 2.4, the estimates rely on underlying assumptions that each state or territory has the same age- and sex-specific prevalence rates as those of the national average and that the estimated numbers are not affected by factors other than demographic variations. Hence, the differences in the estimates across the jurisdictions are entirely due to their demographic variations. States with larger populations, therefore, had higher estimates than states with smaller populations. For instance, Victoria had an estimated 328,500 people with a sensory/speech disability. In contrast, Tasmania with its smaller population had an estimate of 34,200 people.

Table 5.20: Estimates of sensory/speech disability based on four approaches, by geographic location, 1998

	Capital city		Balance of state		Total	
	'000	%	'000	%	'000	%
All disabling condition						
0–64	405.2	59.1	280.5	40.9	685.7	100.0
65+	430.4	59.9	288.5	40.1	718.9	100.0
Total	**835.6**	**59.5**	**569.0**	**40.5**	**1,404.6**	**100.0**
All disabling conditions and activity limitations and participation restrictions						
0–64	352.4	58.9	254.4	41.1	597.9	100.0
65+	412.0	59.8	277.1	40.2	689.0	100.0
Total	**764.4**	**59.4**	**531.5**	**41.4**	**1,286.9**	**100.0**
All disabling conditions and severe or profound core activity restrictions						
0–64	128.8	58.9	89.9	41.1	218.7	100.0
65+	189.1	61.9	116.4	38.1	305.6	100.0
Total	**317.9**	**60.6**	**206.3**	**39.4**	**524.3**	**100.0**
Main disabling condition						
0–64	141.5	60.0	94.3	40.0	235.8	100.0
65+	114.6	59.1	79.2	40.9	193.7	100.0
Total	**256.1**	**59.6**	**173.5**	**41.4**	**429.5**	**100.0**
Main disabling condition and severe or profound core activity restrictions						
0–64	22.7	59.5	15.5	40.5	38.2	100.0
65+	28.2	60.3	18.6	39.7	46.8	100.0
Total	**50.9**	**60.0**	**34.1**	**40.0**	**85.0**	**100.0**

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Table 5.21: Estimates of sensory/speech disability (all conditions and activity limitations and participation restrictions) by states and territories, by sex and age, 1998 ('000)

	States and territories								
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Males									
0–64	131.7	95.2	71.9	38.1	30.7	9.8	*6.3	*4.0	387.8
65+	115.5	83.7	57.4	27.8	30.3	*8.8	*3.3	**1.0	327.8
Total	247.1	178.9	129.3	65.9	61.0	18.7	9.7	*5.0	715.6
Females									
0–64	73.1	53.8	39.5	20.9	17.2	*5.5	*3.6	**2.0	215.6
65+	130.8	95.8	61.2	30.5	34.9	10.0	*3.7	**0.7	367.7
Total	203.9	149.6	100.7	51.4	52.1	15.5	*7.3	*2.8	583.3
Persons									
0–64	204.7	149.0	111.4	59.0	47.9	15.3	10.0	*6.0	603.4
65+	246.2	179.5	118.6	58.3	65.2	18.8	*7.0	**1.7	695.5
Total	**451.0**	**328.5**	**230.0**	**117.3**	**113.1**	**34.2**	**17.0**	***7.7**	**1,298.9**

Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Sources: Table A5.6; ABS 1999b; AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

6 Acquired brain injury

6.1 A brief overview of existing definitions and estimates of prevalence

This section summarises some main issues and recent developments regarding the definition and prevalence of disabilities related to acquired brain injury (ABI). A comprehensive review of the definition, incidence and prevalence of ABI in Australia was presented in the previous report in this series (AIHW: Fortune & Wen 1999).

Issues relating to definitions and methods of estimation

Terms and definitions

The term 'acquired brain injury' is most widely used as an umbrella term to describe disabilities arising from any damage to the brain acquired after birth, regardless of cause. Brain injury acquired at birth or very early in life is sometimes included in the scope of ABI, but more often included within the intellectual disability group. A number of related terms are in common use, such as 'head injury', 'brain damage' and 'traumatic brain injury'. Throughout this chapter, the term ABI is used to cover all acquired damage to the brain, regardless of cause. The term 'traumatic brain injury' (TBI) is used to refer to acquired brain injury caused by a traumatic event. The term 'head injury' is used to mean injury to the head where brain damage is likely but cannot be ascertained.

ABI can result in the deterioration of cognitive, physical, emotional or independent functioning. Causes of ABI include traumatic accidents, neurological diseases, stroke and substance abuse. In international disability groupings, ABI is often mapped to the broad 'physical/diverse' group (see, for example, AIHW 2003b). However, ABI is recognised as a separate disability group in the disability field, and in legislative and administrative contexts in Australia. This in part reflects the fact that the needs and experience of people with ABI are recognised as being different from those of people with other types of disability. For example, people with ABI often experience a range of physical, social and emotional difficulties due to the complex nature of ABI (AIHW 2000a; AIHW: Fortune & Wen 1999).

Definitions of ABI used in different contexts vary. The *National Community Services Data Dictionary, version 3* defines ABI as being:

> used to describe multiple disabilities arising from damage to the brain acquired after birth. It can occur as a result of accidents, stroke, brain tumours, infection, poisoning, lack of oxygen, degenerative neurological disease etc. Effects include deterioration in cognitive, physical, emotional or independent functioning' (AIHW 2003b).

A similar definition of ABI is found in the *National Policy on Services for People with Acquired Brain Injury*:

> injury to the brain which results in deterioration in cognitive, physical, emotional or independent functioning. ABI can occur as a result of trauma, hypoxia, infection, tumour, substance abuse, degenerative neurological diseases or stroke. These impairments to cognitive abilities or physical functioning may be either temporary or permanent and cause partial or total disability or psychosocial maladjustment (Department of Human Services and Health 1994).

Both definitions are quite broad, covering brain injury resulting from a range of causes and leading to impairments that may be temporary or permanent and may result in disability. The *National Policy on Services for People with Acquired Brain Injury* states that its main concern is people with ABI who need personal assistance or supervision with activities of daily living. Some studies of brain injury in Australia have used this definition (e.g. Backhouse 1997).

Definitions associated with disability support services tend to be more specific with regard to the severity and duration of disability attributed to ABI, reflecting service eligibility criteria. The definition of disability in the 1998 Commonwealth/State Disability Agreement mentions ABI specifically as a disability group (CSDA 1998).

It is difficult to define the scope of the ABI group, as it can result from a variety of causes and lead to a range of types of disability. Individuals with ABI-related disability often have impairments in more than one domain (e.g. physical, cognitive and psychosocial). There is also scope for overlap between ABI and other disability groups (AIHW: Fortune & Wen 1999). For instance, disability related to some degenerative neurological diseases may be classified as ABI or as neurological disability in the physical/diverse group (see Chapter 7; AIHW: Wen & Fortune 1999). In Australia, people with brain injury acquired before, during or shortly after birth are more likely to be included in the intellectual disability group by service providers or representative organisations.

Operational definitions of ABI

Most studies of ABI incidence focus on morbidity and mortality, rather than disability. Many such studies are based on hospital data and use rates of hospitalisation (admissions or separations) as indicative of incidence. The operational definitions used in incidence studies often focus on diagnoses and symptoms associated with brain injury, rather than long-term effects, since information on the long-term effects of brain injury is not generally available at the time of occurrence of the injury.

The operational definitions used in studies of ABI incidence are often based on a list of selected diagnosis categories from the ICD. Variations in the list of categories result in different estimates of incidence. Differences may also reflect variations in methods of estimation. For example, some studies are based on information on the principal diagnosis only (the main diagnosis leading to the hospitalisation for ABI), while others are based on information on all diagnoses, that is, on hospitalisations for which the ABI-related condition was not the 'main' cause but may have contributed to the need for hospitalisation. Many other factors, such as different policies of hospital admission and rates of readmission for a single injury, can also cause variation in rates of hospitalisation, independently of any variation in incidence rates. (AIHW: Fortune & Wen 1999: Chapter 3).

In contrast to incidence studies, the prevalence of disability attributable to ABI is commonly estimated using data from population surveys. Operational definitions therefore effectively depend on the survey questions or definitions. For example, the 1998 ABS disability survey's definition of ABI includes head injury or brain damage—both present at birth or acquired after birth—reflecting the wording of the screening questions used to identify ABI. The three questions asked people whether they have 'ever had' a head injury, stroke or any other kind of brain damage (ABS unpublished 1998 Survey of Disability, Ageing and Carers Questionnaire). An example of a slightly different definition is found in the Canadian Health and Activity Limitation Survey, which only includes brain injury acquired after birth.

Existing estimates of incidence, prevalence and patterns of ABI

Estimates of the incidence of ABI

Estimates of incidence are largely based on hospital admission or separation data. However, while rates of hospitalisation may be indicative of incidence, they are not a true measure of incidence rates, because people with ABI who do not come into contact with hospitals are not captured by these data. Also, people who are admitted more than once for the same injury in a given period will be counted multiple times.

Estimates of ABI incidence from overseas studies available in 1999 ranged from 91 to 372 per 100,000 population (AIHW: Fortune & Wen 1999). Australian incidence estimates ranged from 57 to 377 per 100,000 population.

A narrower range of estimates is obtained by considering only estimates from the above set based on hospital data and excluding those studies that obtained data from only a single hospital. This gives a range of 100 to 270 per 100,000 population per year for estimates of incidence overseas and 100 to 377 per 100,000 per year for estimates of incidence in Australia (see AIHW: Fortune & Wen 1999: 34–35).

Some further ABI incidence estimates have been published more recently. An Italian study found rates of 314 per 100,000 population based on hospital admissions for head injuries (Servadei et al. 2002). A Korean study found a lower incidence rate for head injuries—236 per 100,000—based on analysis of motor accident data (Lee 2001). A study conducted in Scotland estimated that 100 to 150 people per 100,000 population experienced an ongoing disability one year after experiencing an acute head injury (Thornhill et al. 2000).

ABI-related hospital separations in Australia, 1996–97

In the previous report in this series (AIHW: Fortune & Wen 1999), ICD-9-CM codes were used to identify hospital separations with a diagnosis associated with ABI from the 1996–97 National Hospital Morbidity Database. These included TBI and five other subgroups (stroke, anoxic brain injury, alcohol-related brain injury, brain injury arising early in life and 'other' ABI). In 1996–97, it was found that there were 27,437 separations for TBI, at a rate of 149 per 100,000 population. The age-standardised TBI hospitalisation rates varied between states and territories—from 71 per 100,000 in the Australian Capital Territory to 211 per 100,000 in Queensland. Of the other ABI subgroups examined, stroke and 'other' brain injury accounted for the greatest number of hospital separations (280 and 362 per 100,000 respectively). 'Other' brain injury included organic psychotic conditions, mental disorders due to organic brain damage and other cerebral degenerative conditions.

Updated ABI-related hospital separation data, based on the 2000–01 National Hospital Morbidity Database and codes from the ICD–10–AM, are presented in Section 6.3.

Estimates of prevalence of ABI-related disability

There are relatively few existing estimates of the prevalence of long-term disability attributable to ABI, either in Australia or overseas.

International prevalence estimates reviewed in the previous ABI report range from 62 to 783 per 100,000 population (AIHW: Fortune & Wen 1999). The majority of these estimates were based on population surveys and limited to people living in households. Most Australian estimates reviewed were based on the ABS 1993 disability survey. These estimates are not directly comparable, due to marked differences in the methods of estimation.

In the previous report in this series, three broad approaches were used to estimate the prevalence of ABI-related disability using the ABS survey data. The lowest estimates were obtained using an approach based on reported main disabling condition only: 60,600 people, or 0.3% of the total population.

Using an approach based on 'all disabling conditions and activity limitations and participation restrictions' an estimated 338,700 Australians (1.9% of the total population) had an ABI-related disability in 1993. There were 160,200 people (0.9% of the total population) who reported an ABI-related disabling condition and always or sometimes needed personal assistance or supervision with activities of daily living (self-care, mobility or verbal communication).

Prevalence rates of ABI in 1993 based on 'all disabling conditions and activity limitations and participation restrictions' varied between jurisdictions, from 1.6% in Victoria and the Australian Capital Territory to 2.4% in Queensland. Age-standardised rates for Queensland (2.6%) and the Northern Territory (3.6%) were significantly higher than the national average (1.9%). No state or territory had a rate that was significantly below the national average.

Updated prevalence estimates, based on the 1998 ABS Survey of Disability, Ageing and Carers, are presented in Section 6.2 below.

6.2 Estimates of prevalence of ABI in Australia

Main data items and methods of estimation

In this section, four approaches are applied to the data from the ABS 1998 disability survey to provide estimates of disability associated with ABI in Australia (see Section 2.4 for details of the four approaches and methods). A person is initially included in the ABI disability group if:

- a positive response was made by or for them to the ABI-specific screening questions about whether they had 'any long-term effects as a result of a head injury that interfere with doing everyday activities', or 'any long-term effects as a result of any other kind of brain damage that interfere with doing everyday activities'; and /or
- a positive response was made by or for them to one of the 17 screening questions and one or more disabling conditions related to head injury or ABI was reported.

Prevalence estimates of ABI in the previous ABI report (AIHW: Fortune & Wen 1999) used data from the 1993 ABS disability survey that contained a screening question about head injury, stroke and brain damage with long-term effects. The data did not allow the effects of stroke to be separately identified from those of head injury and other brain damage. Hence, these previous estimates of ABI included disabilities related to the effects of stroke that may or may not be associated with brain damage. Although stroke is a common cause of brain injury, it does not always result in brain injury. Further, the group of people with ABI resulting from stroke is likely to have a different profile from those who have an ABI resulting from other causes. It is therefore desirable to identify the effects of stroke separately from those of head injury and other brain damage. ABS made changes to the 1998 disability survey questions so that disabilities related to stroke can be separately identified.

This section presents estimates of the prevalence of disability related to the effects of head injury and other brain damage only. These estimates do not include survey information about the long-term effects of stroke, which is classified as a physical/diverse disability associated with circulatory conditions (see Chapter 7). The changes in the 1998 survey methods have led to an increased identification of circulatory conditions between 1993 and 1998 (Chapter 8).

Estimates at national level

All disabling conditions

When considering all reported disabling conditions in 1998, 211,100 people (1.1% of the Australian population) reported ABI (Table 6.1). Those aged 65 years and over (2.3%) had a much higher rate of ABI than those under 65 years (1.0%).

When all conditions are considered in combination with activity limitations and participation restrictions, the estimate of people with ABI is 201,600, or 1.1% of the total population. This number includes 150,800 people under 65 years, or 0.9% of the population in that age group.

Around 113,300 people (0.6% of the population) had an ABI-related condition and a severe or profound core activity restriction. Of these, 75,200 were aged under 65 years (0.5% of the population in that age group).

Main disabling condition

Around 39,200 people (0.2% of the Australian population) reported an ABI-related main disabling condition in 1998 (Table 6.1). Of these, 35,700 were aged under 65 years, which represented 0.2% of the population in that age group.

There were about 12,900 people (0.1% of the overall population) who reported an ABI-related main disabling condition and also reported a severe or profound core activity restriction. Of these, 10,800 were under 65 years (0.1% of the under-65 population).

Comparison of 1998 and 1993 estimates

As explained above, estimates of ABI from the 1993 and 1998 surveys are not directly comparable due to changes in the survey questions. However, it is possible to combine ABI and stroke estimates as in Table A6.1. This table provides 1998 estimates of ABI-related

disability that can be compared with the 1993 estimates. These estimates include long-term effects of stroke as well as head injury and brain damage:

- In 1998, around 324,000 people (1.7% of the total population) reported one or more ABI-related disabling conditions. Of these, 314,300 people (1.7% of the total population) had at least one activity limitation or participation restriction. These estimates can be compared with the 1993 estimates of 370,700 people (2.1%) who had one or more ABI-related disabling conditions, and 338,700 aged 5 years and over (1.9% Australians of that age) who also had at least one activity limitation or participation restriction.
- Around 201,400 people in 1998 (1.1% of the total population) reported one or more ABI-related disabling conditions and had a severe or profound core activity restriction. In 1993, the estimate of people with one or more ABI-related disability and a severe or profound handicap aged 5 years or over was 160,200 people (0.9% Australians of that age).
- An estimated 102,700 people, or 0.6% of Australians of all ages, reported an ABI-related main disabling condition. Of these 62,000 people (0.3% of the total population) had a severe or profound core activity restriction. These figures can be compared with the 1993 estimates of 60,600 people (0.3%) who reported an ABI-related main disabling condition, of whom 24,900 people aged 5 and over (0.1% of Australians of that age)[6] had a severe or profound handicap.[7]

It should be noted that substantial changes in the 1998 ABS disability survey resulted in a great increase in the estimated number of people with a disability, especially those with a severe or profound core activity restriction (AIHW 2001a; ABS: Davis et al. 2001). Therefore, the comparison of estimates between 1993 and 1998 should be treated cautiously.

6.3 Patterns of ABI-related disability in Australia

Age and sex patterns

When all disabling conditions are considered, the prevalence rate of ABI-related disability was higher for males (1.3%) than females (0.9%) (Table 6.1). In the population aged 65 years and over, males reported ABI at a rate of 2.6% compared to 2.0% for females. For those aged under 65 years, males reported ABI at a rate of 1.2%, females 0.8%.

The rate of males reporting an ABI-related disability as their main disabling condition (0.3%) was similar to that of females (0.2%) (Table 6.1). Rates of ABI-related main disabling conditions and severe or profound core activity restrictions was 0.1% for both males and females.

6 In the 1993 disability survey, questions about activity limitations were not asked in respect of children aged 0–4 years.

7 This is equivalent to the concept of severe or profound core activity restriction in the 1998 survey.

Age at onset of main disabling condition

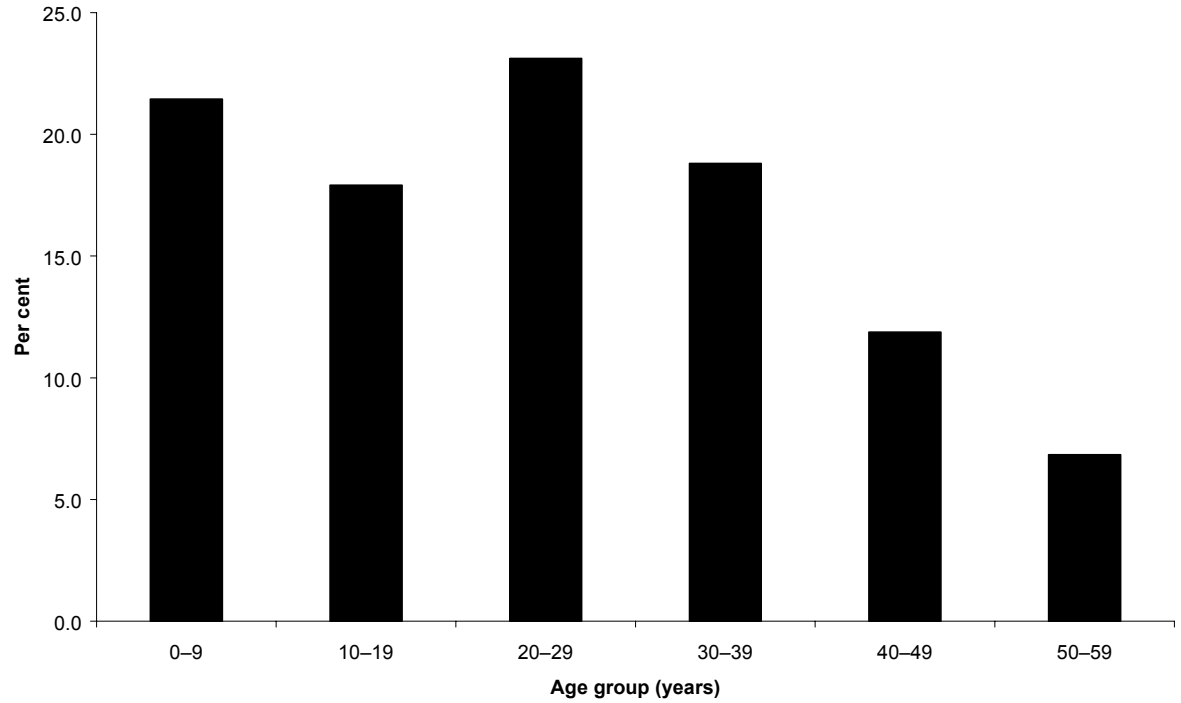
Around 39% of people with an ABI-related main disabling condition reported that their condition occurred before the age of 20 years (Figure 6.1; Table A6.4). A further 42% reported an age at onset of between 20 and 39 years.

Table 6.1: Estimates of ABI-related disability based on four approaches, by sex and age, as a percentage of the Australian population of that sex and age, 1998

	Males		Females		Persons	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	96.4	1.2	62.6	0.8	159.0	1.0
65+	26.3	2.6	25.8	2.0	52.0	2.3
Total	**122.7**	**1.3**	**88.4**	**0.9**	**211.1**	**1.1**
All disabling conditions and activity limitations and participation restrictions						
0–64	91.1	1.1	59.7	0.7	150.8	0.9
65+	25.2	2.5	25.6	2.0	50.8	2.2
Total	**116.3**	**1.3**	**85.3**	**0.9**	**201.6**	**1.1**
All disabling conditions and severe or profound core activity restrictions						
0–64	44.3	0.5	30.9	0.4	75.2	0.5
65+	19.6	2.0	18.6	1.5	38.2	1.7
Total	**63.8**	**0.7**	**49.5**	**0.5**	**113.3**	**0.6**
Main disabling condition						
0–64	21.9	0.3	13.8	0.2	35.7	0.2
65+	*1.4	*0.1	**2.1	**0.2	*3.5	*0.2
Total	**23.3**	**0.3**	**15.9**	**0.2**	**39.2**	**0.2**
Main disabling condition and severe or profound core activity restrictions						
0–64	*4.1	*0.0	*6.8	*0.1	10.8	0.1
65+	**0.7	**0.1	**1.4	**0.1	**2.1	**0.1
Total	***4.8**	***0.1**	***8.2**	***0.1**	**12.9**	**0.1**

Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.



Source: Table A6.4.

Figure 6.1: People reporting an ABI main disabling condition, age when that condition identified, 1998

Reported cause of main disabling condition

The majority of people with an ABI-related disability as their main condition (81%) reported that this condition was caused by an accident or injury (Table 6.2). A further 4% indicated that their main condition was caused by disease, illness or hereditary factors. A similar proportion of people with an ABI-related disability indicated that their main condition was caused by stress (3%) or was present at birth (also 3%).

Table 6.2: People reporting an ABI-related main disabling condition: cause of main disabling condition, 1998

Reported cause of main disabling condition	'000	%
Caused by disease, illness, hereditary	**1.7	**4.3
Accident/injury	31.6	80.7
Present at birth	**1.0	**2.6
Stress	**1.3	**3.4
Side effect of medication/medical procedure	**0.5	**1.3
Other causes	**2.2	**5.6
Not known/not applicable	**0.8	**2.1
Total	**39.2**	**100.0**

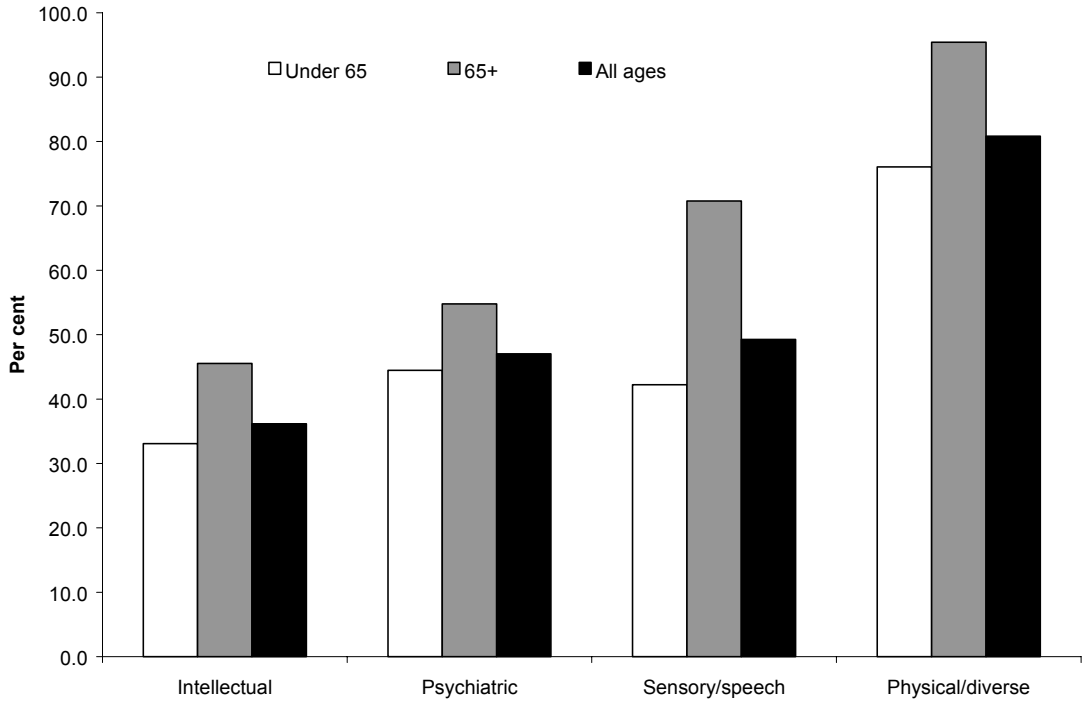
Notes

1. Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. These estimates should be interpreted accordingly.
2. 'Other causes' includes 'main condition just came on' and 'other cause NES'.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Associated disabilities

About four-fifths (81%) of those reporting a disabling condition of ABI also reported a physical/diverse disability (Figure 6.2; Table A6.5). This included almost all of those aged 65 years or more (95%). Just under half (49%) of all people with an ABI-related disabling condition reported a sensory/speech disability, 47% a psychiatric disability, and 36% an intellectual disability.



Source: Table A6.5.

Figure 6.2: People reporting an ABI-related disabling condition (all disabling conditions), by reported other disabilities, by age group, 1998

Place of residence and geographic location

Overall, 85% of people with an ABI-related disability as one of their disabling conditions lived in households (Table 6.3). People over 65 years of age (58%) had a lower proportion in households than those under 65 years (94%). People with an ABI-related disability as one of their disabling conditions were slightly more likely to be living in capital cities (56%) than the rest of their state (45%) (Table 6.4).

Table 6.3: Estimates of ABI-related disability based on four approaches, by place of residence, 1998

	Households		Cared accommodation		Total	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	150.0	94.3	9.1	5.7	159.0	100.0
65+	30.3	58.3	21.7	41.7	52.0	100.0
Total	**180.3**	**85.4**	**30.8**	**14.6**	**211.1**	**100.0**
All disabling conditions and activity limitations and participation restrictions						
0–64	141.7	94.0	9.1	6.0	150.8	100.0
65+	29.1	57.3	21.7	42.7	50.8	100.0
Total	**170.8**	**84.7**	**30.8**	**15.3**	**201.6**	**100.0**
All disabling conditions and severe or profound core activity restrictions						
0–64	66.6	88.6	*8.6	*11.4	75.1	100.0
65+	16.6	43.6	21.5	56.4	38.2	100.0
Total	**83.2**	**73.4**	**30.1**	**26.6**	**113.3**	**100.0**
Main disabling condition						
0–64	34.8	97.4	**0.9	**2.6	35.7	100.0
65+	*3.2	*91.2	**0.3	**8.8	*3.5	100.0
Total	**37.9**	**96.9**	****1.2**	****3.1**	**39.2**	**100.0**
Main disabling condition and severe or profound core activity restrictions						
0–64	10.0	92.4	**0.8	**7.6	10.8	100.0
65+	**1.8	**85.6	**0.3	**14.4	**2.1	100.0
Total	**11.8**	**91.3**	****1.1**	****8.7**	**12.9**	**100.0**

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Table 6.4: Estimates of ABI-related disability based on four approaches, by geographic location, 1998

	Capital city		Balance of state		Total	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	87.0	54.7	72.1	45.3	159.0	100.0
65+	30.1	57.8	21.9	42.2	52.0	100.0
Total	**117.1**	**55.5**	**94.0**	**44.5**	**211.1**	**100.0**
All disabling conditions and activity limitations and participation restrictions						
0–64	81.3	53.9	69.5	46.1	150.8	100.0
65+	29.6	58.2	21.2	41.8	50.8	100.0
Total	**110.9**	**55.0**	**90.8**	**45.0**	**201.6**	**100.0**
All disabling conditions and severe or profound core activity restrictions						
0–64	35.6	47.4	39.5	52.6	75.2	100.0
65+	21.5	56.3	16.7	43.7	38.2	100.0
Total	**57.1**	**50.4**	**56.2**	**49.6**	**113.3**	**100.0**
Main disabling condition						
0–64	15.4	43.2	20.2	56.8	35.7	100.0
65+	**2.4	**69.1	**1.1	**30.9	*3.5	100.0
Total	**17.8**	**45.6**	**21.3**	**54.4**	**39.2**	**100.0**
Main disabling condition and severe or profound core activity restrictions						
0–64	*2.9	*26.6	*7.9	*73.4	10.8	100.0
65+	**1.5	**70.8	**0.6	**29.2	**2.1	100.0
Total	***4.4**	***33.9**	***8.6**	***66.1**	**12.9**	**100.0**

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Estimates at state and territory level

Table 6.5 presents ABI estimates at state/territory level. These are based on assumptions that each state or territory has the same age- and sex-specific prevalence rates as those of the overall Australian population (see Section 2.4 for more details).

Table 6.5: Estimates of ABI-related disability (all disabling conditions and activity limitations and participation restrictions), by states and territories, by sex and age, 1998 ('000)

	States and territories								
	NSW	Vic	Qld	WA	SA	Tas	ACT	NT	Australia
Males									
0–64 years	31.0	22.5	17.0	*9.1	*7.2	**2.3	**1.6	**1.0	91.6
65+ years	*9.0	*6.5	*4.5	**2.2	**2.3	**0.7	**0.3	**0.1	25.5
Total	*40.0*	*29.0*	*21.5*	*11.3*	*9.6*	*3.0	*1.8	*1.1	*117.1*
Females									
0–64 years	20.3	15.0	11.1	*5.9	*4.7	**1.5	**1.1	**0.6	60.2
65+	9.2	*6.7	*4.3	**2.2	**2.4	**0.7	**0.3	**0.1	25.8
Total	*29.5*	*21.7*	*15.4*	*8.0	*7.2	**2.2	**1.3	**0.7	*86.0*
Persons									
0–64 years	51.3	37.5	28.1	15.0	12.0	*3.8	*2.6	**1.6	151.8
65+	18.2	13.2	*8.8	*4.3	*4.8	**1.4	**0.5	**0.1	51.3
Total	*69.4*	*50.7*	*36.8*	*19.3*	*16.8*	*5.2	*3.1	**1.7	*203.1*

Note: Estimates marked with ** have an associated relative standard error (RSE) of 50% or more. Estimates marked with * have an associated RSE of between 25% and 50%. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

6.4 ABI-related hospital separations in 2000–01

Hospital separations data are collected throughout Australia and collated at the national level as the National Hospital Morbidity Database. These data can be useful for looking at rates of hospitalisation associated with some subgroups of ABI. While it must be emphasised that rates of hospitalisation are not incidence rates, incidence is one of the factors that affects rates of hospitalisation. The data presented below give an indication of the number of admissions to hospital over a one-year period for conditions that may give rise to brain injury and/or indicate ABI.

Methods for identifying ABI hospital separations

The National Hospital Morbidity Database is a collection of confidentialised electronic summary records for patients admitted to Australian hospitals. Each record in the database relates to a 'separation', which refers to the episode of care. This can be a total hospital stay (from admission to discharge, transfer, or death), or a portion of a hospital stay, beginning or ending in a change of type of care (for example, from acute care to rehabilitation).

The National Hospital Morbidity Database was used to look at rates of ABI-related hospital separations in 2000–01. ICD–10–AM diagnosis codes were used to identify traumatic brain injury and six other subgroups of ABI: stroke and other cerebrovascular disease; anoxic brain injury; brain injury due to alcohol, other drugs and psychoactive substances; brain damage

arising before or at birth; brain infections; and dementia and organic psychiatric conditions. (See Table A6.7 for the specific ICD–10–AM codes used in each category.) Data used for the following analyses are based on the relevant codes reported as any diagnosis, that is, as either the principal diagnosis (the main diagnosis leading to the hospitalisation) and/or any additional diagnoses (other diagnoses associated with the hospitalisation).

Traumatic brain injury

There were 20,563 hospital separations with a diagnosis of TBI in 2000–01—a rate of 107 separations per 100,000 population (Table 6.6). The male rate (150 per 100,000) was more than double the female rate (65 per 100,000). Males aged 15–19 years had the highest separation rate (304 per 100,000), especially compared to females of the same age (less than a third the rate, at 99 per 100,000). For females, the highest rate was for those over the age of 65 (122 per 100,000), and the lowest rate was for those aged 45–64 years (36 per 100,000).

The number of TBI-related hospital separations per 100,000 population varied among the states and territories, ranging from 50 in the Australian Capital Territory to 135 in South Australia (Table 6.7). In all states and territories except South Australia, standardised rates were slightly lower for those aged under 65 years than for the total population.

The number of TBI separations fell between 1996–97 and 2000–01, from 149 per 100,000 population (AIHW: Fortune and Wen 1999) to 107 per 100,000. This fall in rates was consistent among the states and territories. Caution must be exercised in comparing data between these two time periods, because in 1996–97 ICD–9–CM codes were used to report diagnoses while in 2000–01 ICD–10–AM codes were used. Thus, ABI-related diagnoses could not be specified using a precisely equivalent set of codes for both years. When comparing codes between the two periods, the data suggest that the overall decrease in TBI-related hospital separations was mainly due to fewer separations with diagnoses of concussive injury and 'other' or 'unspecified' intracranial injury.

A decline in TBI rates has also been found in the United States. Lovasik et al. (2001) attributed the recent fall in US TBI hospitalisation rates to both successful injury prevention programs, and changes in hospital admission processes, where patients with mild TBI are treated as outpatients rather than being admitted. It is possible that one or both of these reasons may have also had some impact on the fall in TBI rates in Australian hospital data.

Table 6.6: Traumatic brain injury: hospital separations and separation rates per 100,000 population, by sex and age, Australia 2000–01

	Males		Females		Persons	
Age group	Number	Rate (/100,000)	Number	Rate (/100,000)	Number	Rate (/100,000)
0–4	823	125	566	91	1,389	109
5–14	1,996	145	803	61	2,799	104
15–19	2,060	304	643	99	2,703	204
20–29	3,159	229	920	68	4,079	149
30–44	2,720	125	982	45	3,702	85
45–64	1,963	90	773	36	2,736	63
65+	1,532	146	1,623	122	3,155	133
Total 0–64	12,721	150	4,687	56	17,408	104
Total	**14,253**	**150**	**6,310**	**65**	**20,563**	**107**

Source: AIHW analysis of 2000–01 National Hospital Morbidity Database.

Table 6.7: Traumatic brain injury: hospital separations, by state or territory of residence, age-standardised and unstandardised rates per 100,000 population, Australia 2000–01

	Ages 0–64			All ages		
State or territory	Number	Unstandardised rate (/100,000)	Standardised rate (/100,000)	Number	Unstandardised rate (/100,000)	Standardised rate (/100,000)
NSW	5,033	89	89	6,023	93	93
Vic	3,929	95	96	4,777	101	101
Qld	3,833	122	121	4,468	125	125
WA	1,939	116	115	2,205	118	117
SA	1,738	135	136	2,033	135	135
Tas	332	81	82	402	85	86
ACT	133	46	45	157	50	50
NT	242	128	122	248	127	124
Total	**17,408**	**104**	**104**	**20,563**	**107**	**107**

Note: Age-standardised rates were calculated using the age- and sex-specific rates for the Australian estimated resident population (for both under 65 years and all ages) for June 2000.

Sources: AIHW analysis of 2000–01 National Hospital Morbidity Database; ABS Estimated Resident Population as at June 2000.

Other ABI subgroups

ABI may also be caused by a range of other conditions. Presented below are hospital separation data for six other subgroups of ABI-related conditions (Table 6.8). The conditions included are listed in Table A6.7. These conditions have been selected because they may involve or cause brain injury, and may also give rise to long-term ABI-related disability. However, it must be noted that this will not always be the case. For example, brain infections such as meningitis can but do not always cause a long-term brain injury. Therefore the data in Table 6.8 should be interpreted as indicative of the numbers and rates of hospital separations with a diagnosis potentially associated with brain injury.

Of the subgroups presented in Table 6.8, dementias and other organic psychiatric conditions had the highest number of separations (74,248, or 388 separations per 100,000 population).

Rates for people aged 65 years and over (2,863 per 100,000) were much higher than for those aged under 65 years (36 per 100,000). Females had a higher rate than males for people aged 65 years and over (3,083, compared with 2,584), whilst males had a higher rate for those aged under 65 years (46 versus 27).

Stroke and other cerebrovascular disease had the next highest number and rate of separations overall (33,268, or 174 separations per 100,000). Male and female rates were similar in this group. For all other subgroups except brain infections, hospital separation rates were higher for males than females. A large sex difference was found for brain injury due to alcohol, other drugs and psychoactive substances—for males the rate was 22 per 100,000, while for females it was 5 per 100,000. The difference was even larger in this group for those aged 65 years or more (92 for males versus 16 for females).

Table 6.8: ABI subgroups: hospital separations and separation rates per 100,000 population, by sex and age, Australia 2000–01

	Males		Females		Persons	
	Number	Rate (/100,000)	Number	Rate (/100,000)	Number	Rate (/100,000)
Stroke and other cerebrovascular disease						
0–64	4,408	52	2,987	36	7,395	44
65+	12,234	1,168	13,639	1,024	25,873	1,087
Total	**16,642**	**175**	**16,626**	**172**	**33,268**	**174**
Anoxic brain injury						
0–64	590	7	298	4	888	5
65+	418	40	243	18	661	28
Total	**1,008**	**11**	**541**	**6**	**1,549**	**8**
Brain injury due to alcohol, other drugs and psychoactive substances						
0–64	1,106	13	301	4	1,407	8
65+	959	92	214	16	1,173	49
Total	**2,065**	**22**	**515**	**5**	**2,580**	**13**
Brain damage arising before or at birth						
0–64	3,162	37	3,004	36	6,166	37
65+	213	20	175	13	388	16
Total	**3,375**	**36**	**3,179**	**33**	**6,554**	**34**
Brain infections						
0–64	3,673	43	4,095	49	7,768	46
65+	386	37	569	43	955	40
Total	**4,059**	**43**	**4,664**	**48**	**8,723**	**46**
Dementias and other organic psychiatric conditions						
0–64	3,855	46	2,266	27	6,121	36
65+	27,076	2,584	41,051	3,083	68,127	2,863
Total	**30,931**	**325**	**43,317**	**449**	**74,248**	**388**

Source: AIHW analysis of 2000–01 National Hospital Morbidity Database.

7 Physical/diverse disability

7.1 A brief overview of existing definitions and estimates of prevalence

This section summarises some important issues concerning the definition, classification and prevalence of physical disability. It then discusses existing estimates of prevalence and patterns of physical disability and related long-term health conditions. A more detailed review of the definition and prevalence of physical disability was presented in a previous report of this series (AIHW: Wen & Fortune 1999).

Defining and classifying physical disability

'Physical disability' is commonly recognised as a disability group in the disability field, and in legislative and administrative contexts in Australia. People with physical disabilities represent a significant consumer group of disability support services in Australia, accounting for 12% of primary disability or 29% of all disabilities reported by consumers on a snapshot day in 2002 (AIHW 2003d). 'Physical disability' is often used as a broad category for all disabilities that are not 'mental disabilities', particularly in overseas literature. The terms 'physical impairment', 'physical disability', 'physical activity' and 'physical function' are in common use in the disability field in Australia, but are rarely clearly defined. The existing estimates of physical disability vary considerably, reflecting differences in conceptual and operational definitions, measurements, survey methods, data sources and geographic locations.

Overseas definitions and classifications

A number of US legislative and administrative documents relating to physical disability have used concepts or definitions adapted from the ICIDH, the predecessor of ICF. These documents are major sources of reference for similar documents in Australia.

The Americans with Disabilities Act defines disability, with respect to an individual, as 'a physical or mental impairment that substantially limits one or more of the major life activities of such individual; a record of such an impairment; or being regarded as having such an impairment' (42 USCA § 12102(2)). The scope of physical impairment in the definition of the Americans with Disabilities Act is very broad. It is basically a catch-all category, including all impairments other than mental or psychiatric disorders.

A United Nations expert report on the development of statistical concepts and methodology on disability for household surveys recommends a wide scope for 'physical impairments', including a sensory subcategory that could include impairments such as hearing or reading difficulties (Table 7.1; United Nations 1988a). The recommended scope of 'physical disability' consists of five of the nine 1980 ICIDH broad categories of disabilities: locomotor, communication, personal care, body disposition and dexterity (Table 7.1; United Nations 1988a).

In the United Nations Disability Statistics Data Base (DISTAT) the scope of 'physical impairments' covers visceral, skeletal and disfiguring impairments (Table 7.1; United Nations 1984, 1986, 1988b).

Two basic measures of activity limitation, the Activities of Daily Living (ADL) scale and the Instrumental Activities of Daily Living (IADL) scale, have been widely used in clinical settings and population surveys to define disability and assess the need for services. The ADL scale focuses on assessing ability to perform basic self-care activities, e.g. bathing, dressing, toileting, getting in and out of bed, continence and feeding. The IADL scale assesses ability to carry out activities central to independent functioning in the community, e.g. light housework, laundry, meal preparation, grocery shopping, outside mobility, travel, money management and telephoning (Fried et al. 1994; Katz & Akpom 1976; Katz et al. 1963; Lawton & Brody 1969; Manton et al. 1995). As ADL scales tend to focus primarily on physical activities or physical functions they are sometimes used to assess physical disability (e.g. Bruce et al. 1994; Fried et al. 1994; Ward et al. 1995). However, there is no universally agreed definition of what 'physical activities' are. Most activities of daily living have a physical component, but many also have a cognitive component (Johnson & Wolinsky 1993; Stewart & Kamberg 1992). Thus, a limitation in performing an activity may be due to mental or psychiatric impairment, rather than physical impairment.

Australian definitions and classifications

In Australian legislative definitions of disability, the terms 'physical impairment' and 'physical disability' are used but are not defined (AIHW: Wen & Fortune 1999).

The *National Community Services Data Dictionary, version 3* provides guidance on the use of the Australian national disability grouping of physical/diverse disability. The dictionary states that physical/diverse disability 'is associated with the presence of an impairment, which may have diverse effects within and among individuals, including effects on physical activities such as mobility' (Table 7.1; AIHW 2003b). The broad group of physical/diverse disability includes three detailed subgroupings, reflecting terms used in Australia by peak bodies, people with disabilities and disability administrations. The subgroup 'Physical disability' is used to describe conditions that are attributable to a physical cause or impact on the ability to perform physical activities (Table 7.1). The other two subgroups are 'Acquired brain injury' and 'Neurological disability'.

In this report, the *National Community Services Data Dictionary, version 3* is used as a guide in defining and estimating physical/diverse disability; 'acquired brain injury' is a separate category of the main disability group (Chapter 6), while 'neurological disability' is included in the broad category of 'physical/diverse disability'.

Table 7.1: Definitions of physical impairments/disabilities

Source	Definition
United Nations 1986 Development of Statistics of Disabled Persons: Case Studies.	Physical impairments include visceral, skeletal and disfiguring impairments—for example, amputations, paralysis, limping and lameness, deformity, and hunched back.
United Nations 1988a UN Expert Group on Development of Statistics of Disabled Persons: suggestions on topics concerning disability for use in household surveys.	Physical impairments are divided into two groups: 'sensory' (aural, language and ocular), and 'other physical impairments' (visceral, skeletal and disfiguring). Physical disabilities are disabilities in the areas of locomotion (includes ambulation and confining disabilities), communication (speaking, listening, seeing, and other disabilities), personal care (includes excretion, personal hygiene, dressing and feeding), body disposition (includes domestic disabilities, such as preparing and serving food and care of dependants, and body movement disabilities such as fingering, gripping and holding) and dexterity (includes daily activity disabilities, such as use of doors, domestic appliances and windows, and manual activity disabilities, such as fingering, gripping and holding).
Americans with Disabilities Act of 1990. 42 USCA § 12102(2) (West 1995); Pub L No 101–485, 267 (legislative history). These definitions are based on concepts of EEOC Title 1 Regulations and Interpretive Appendix (29 CFR 1630).	'Physical or mental impairment' means the following: (1) any physiological disorder or condition, cosmetic disfigurement, or anatomic loss affecting one or more of the body systems: neurological, musculoskeletal, special sense organs, respiratory (including speech organs), cardiovascular, reproductive, digestive, genitourinary, hemic and lymphatic, skin, and endocrine systems; or (2) any mental or psychological disorder, such as mental retardation, organic brain syndrome, emotional or mental illness, and specific learning disabilities. 'Disability' means, with respect to an individual, (a) a physical or mental impairment that substantially limits one or more of the major life activities of such individual; (b) a record of such an impairment; or (c) being regarded as having such an impairment.
National Community Services Data Dictionary, version 3 (AIHW 2003b)	Physical/diverse disability is associated with the presence of an impairment, which may have diverse effects within and among individuals, including effects on physical activities such as mobility. The range and extent of activity limitation and participation restriction will vary with the extent of impairment as well as with environmental factors. Environmental adjustments and support needs are related to areas of activity limitation and participation restriction, and may be required for long periods. Level of supports may vary with both life changes and extent of impairment. Physical/diverse disability included: *Physical disability* is used to describe conditions that are attributable to a physical cause or impact on the ability to perform physical activities, such as mobility. Physical disability includes may be associated with paraplegia, quadriplegia, muscular dystrophy, motor neurone disease, neuromuscular disorders, cerebral palsy, absence or deformities of limbs, spina bifida, arthritis, back disorders, ataxia, bone formation or degeneration, scoliosis etc. Impairments may affect internal organs such as lung or liver. *Acquired brain injury* is used to describe multiple disabilities arising from damage to the brain acquired after birth. It can occur as a result of accidents, stroke, brain tumours, infection, poisoning, lack of oxygen, degenerative neurological disease etc. Effects include deterioration in cognitive, physical, emotional or independent functioning.. *Neurological* disability applies to impairments of the nervous system occurring after birth, and may be associated with such conditions as epilepsy, organic dementias (e.g. Alzheimer's disease), multiple sclerosis and Parkinson's.

Sources: United Nations 1986; 1988a; Americans with Disabilities Act of 1990 PL101–338; AIHW 2003b.

Existing estimates of prevalence of physical disability

Relatively few overseas estimates of the prevalence of physical disability specifically have been published. Nevertheless, overseas data show that physical disability is the most commonly reported disability. For example, the 1987 national disability survey of Spain estimated that 60.2% of people with a disability reported physical impairments as their underlying condition (Chamie 1995). Data from the 1989 Survey of National Registry of Germany show that underlying physical conditions were reported by about 70% of all people with a severe disability receiving rehabilitation services (Chamie 1995).

Estimates of prevalence of physical disability in Australia vary, reflecting differences in operational definition, method and geographic location. Most existing estimates of physical disability are based on the ABS disability survey data. However, the methods used to obtain estimates from the survey data vary (Table 7.2). The estimates for South Australia are based on a statewide telephone survey of disability prevalence.

Table 7.2: Existing estimates of prevalence rates of physical disability in Australia

Prevalence rates (%)	Regions	Data sources and methods	Source
16.0	Australia	1993 ABS Survey of Disability, Ageing and Carers, based on main disabling condition, physical—ABS broad grouping, including sensory conditions	ABS 1993
10.3	Australia	1993 ABS Survey of Disability, Ageing and Carers, based on impairment, physical—ABS grouping of survey screening questions	ABS 1996
14.4	Australia	1998 ABS Survey of Disability, Ageing and Carers, based on main disabling condition, physical–ABS broad grouping, excluding sensory conditions.	AIHW 2002b
13.9	NSW	1988 ABS Survey of Disability, Ageing and Carers, based on main disabling condition, physical—ABS broad grouping, including sensory conditions	New South Wales Department of Family and Community Services 1990
16.0	Qld	1993 ABS Survey of Disability, Ageing and Carers, based on main disabling condition, physical—ABS broad grouping, including sensory conditions	Queensland Department of Families, Youth and Community Care 1997
12.6	WA	1993 ABS Survey of Disability, Ageing and Carers, based on main disabling condition, physical (excluding sensory conditions)	Alessandri et al. 1996 (WA Disability Services Commission)
11.9	SA	Musculoskeletal disability	South Australian Health Commission 1998
4.2		Musculoskeletal disability (main condition)	
0.7		Neurological disability	
0.4		Limiting neurological disability	

Sources: AIHW: Wen & Fortune 1999; AIHW 2000b.

The previous report of this series produced the following main prevalence estimates of physical disability using the ABS 1993 Survey of Disability, Ageing and Carers data (AIHW: Wen & Fortune 1999).

- Based on all reported conditions, about 2,350,300 people with a disability in 1993, or 13.3% of Australians of all ages, reported one or more physical disabling conditions. Of these, 2,099,600 people (11.9% of the total population) also reported one or more activity

limitations or participation restrictions, and of them 620,400 people, or 3.8% of Australians, also had a severe or profound handicap.

- An estimated 1,726,200 people with a disability, or 9.8% of the Australian population, reported a physical main disabling condition. Of these, 423,100 people, or 2.6% of the Australian population aged 5 years and over, also had a severe or profound handicap.[8]
- Arthritis was the most commonly reported physical main disabling condition, followed by other musculoskeletal disorders.

The overall prevalence of physical disability was higher for females than for males. This pattern was more marked for people with a severe or profound handicap and people aged 65 or more. Females had higher rates of arthritis than males across all age groups.

The overall prevalence rate of physical disability for people born in Australian (11.4%) was lower than for people born overseas—14.5% for people born in other English-speaking countries and 13.0% for people born in non-English-speaking countries (AIHW: Wen & Fortune 1999: Table 4.6). However, the age-standardised prevalence rates showed that Australian-born were more likely to report physical disability than those born overseas. Since the overseas-born are older on average, a greater proportion of them reported physical disability (AIHW: Wen & Fortune 1999: Tables 4.7 and 4.8).

In 1993, states with higher proportions of older people, such as South Australia, tended to have higher prevalence rates of physical disability than the national average. The Northern Territory and the Australian Capital Territory had a younger population age structure and correspondingly relatively low prevalence rates (AIHW: Wen & Fortune 1999: Table 4.16).

7.2 Prevalence estimates of physical/diverse disability in Australia

Main data items and methods of estimation

This section presents estimates of the prevalence of physical/diverse disability based on data from the 1998 disability survey and using four approaches described in Chapter 2 (see Section 2.4 for details of methods). A person is initially included in the physical/diverse disability group if:

- a positive response was made by or for them to one or more of the following screening questions: 'incomplete use of arms or fingers', 'incomplete use of feet or legs', 'difficulty gripping or holding things'; and/or
- a positive response was made by or for them to one or more of the 17 screening questions and one or more physical impairments or disabling conditions was reported; or
- a positive response was made by or for them to one of the following screening questions: 'shortness of breath or difficulty breathing', 'chronic or recurrent pain or discomfort', 'blackouts, fits, or loss of consciousness', 'disfigurement or deformity', 'restriction in physical activities or doing physical work', and the person's disability could not be

8 'Severe or profound handicap' is equivalent to 'severe or profound core activity restriction' in the 1998 Survey of Disability, Ageing and Carers.

assigned to any other disability group on the basis of answers to other screening questions or reported disabling conditions.

A full list of physical impairments and disabling conditions is presented in Appendix 1.

There are a number of changes in the 1998 survey compared with the 1993 survey that affect the prevalence estimates (see Chapter 8). Additional screening questions were added to separately identify people with chronic or recurrent pain or discomfort causing restrictions, and people with shortness of breath or breathing difficulties causing restrictions.

As with previous surveys, the number of people with a physical/diverse disability may be underestimated because of the episodic or seasonal nature of some disabling conditions such as asthma and epilepsy. The underestimation may also be caused by a lack of awareness of the presence of the condition, or a lack of knowledge or understanding of the correct medical terminology of the conditions (ABS 1999a).

Estimates at national level

All disabling conditions

Table 7.3 summarises the estimates of physical/diverse disability based on the four approaches (see Section 2.4). An estimated 3,028,500 people, or 16.2% of Australians, reported one or more physical/diverse disabling conditions. Of these, 975,400 people, or 5.2% of the total population, also reported a severe or profound core activity restriction.

Of those aged under 65, 1,903,900 people, or 11.6% of the total population, had at least one physical/diverse disabling condition. Of these, 517,200 people, or 3.2% of Australians in that age group, also had a severe or profound core activity restriction. The prevalence of one or more physical/diverse conditions among the working age (15–64) population was 14.1%, or 1,759,800 people. Of these, 448,000 also had a severe or profound core activity restriction.

Selecting people who reported one or more physical/diverse disabling conditions and one or more activity limitation or participation restrictions, an estimated 2,853,400 people, or 15.3% of Australians, had a physical/diverse disability. The prevalence of physical/diverse disability for those aged under 65 was 10.8%, or 1,771,200 people, as compared with 47.7%, or 1,082,200 people, for those aged 65 or more. The prevalence for the working-age population was 13.1% or 1,638,600 people.

Musculoskeletal conditions other than arthritis were the most commonly reported physical/diverse disabling conditions in 1998, followed by arthritis and circulatory conditions. This pattern was consistent in the estimates based on both main and all disabling conditions (tables A7.1, A7.2, A7.3 and A7.4).

It is noticeable that, in 1993, arthritis, rather than other musculoskeletal conditions, was the most commonly reported condition. An analysis of changes between 1993 and 1998 suggested that the increase in severe or profound core activity restriction could be partially associated with an increase in the prevalence of some physical/diverse conditions, especially musculoskeletal disorders (ABS: Davis et al. 2001). A new screening question about chronic pain in the 1998 survey could have contributed considerably to the increase in reporting of these conditions (Chapter 8).

Table 7.3: Estimates of physical/diverse disability based on four approaches, by sex and age, as a percentage of the Australian population of that sex and age, 1998

	Males		Females		Persons	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	965.7	11.6	938.2	11.6	1,903.9	11.6
65+	483.8	48.8	640.8	50.2	1,124.6	49.6
Total	**1,449.6**	**15.6**	**1,579.0**	**16.8**	**3,028.5**	**16.2**
Total 15–64	881.1	14.0	878.7	14.2	1,759.8	14.1
All disabling conditions and activity limitations and participation restrictions						
0–64	898.5	10.8	872.7	10.8	1,771.2	10.8
65+	455.1	45.9	627.1	49.1	1,082.2	47.7
Total	**1,353.6**	**14.6**	**1,499.8**	**16.0**	**2,853.4**	**15.3**
Total 15–64	818.6	13.0	819.9	13.2	1,638.6	13.1
All disabling conditions and severe or profound core activity restrictions						
0–64	248.9	3.0	268.3	3.3	517.2	3.2
65+	154.7	15.6	303.6	23.8	458.3	20.2
Total	**403.6**	**4.3**	**571.8**	**6.1**	**975.4**	**5.2**
Total 15–64	206.0	3.3	242.0	3.9	448.0	3.6
Main disabling condition						
0–64	867.2	10.5	842.5	10.4	1,709.7	10.4
65+	404.8	40.8	529.6	41.5	934.4	41.2
Total	**1,271.9**	**13.7**	**1,372.2**	**14.6**	**2,644.1**	**14.2**
Total 15–64	800.6	12.7	788.3	12.7	1,588.8	12.7
Main disabling condition and severe or profound core activity restrictions						
0–64	214.4	2.6	233.5	2.9	447.9	2.7
65+	120.1	12.1	236.4	18.5	356.5	15.7
Total	**334.5**	**3.6**	**469.9**	**5.0**	**804.4**	**4.3**
Total 15–64	182.1	2.9	211.2	3.4	393.3	3.2

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. These estimates should be interpreted accordingly.

Sources: Tables A7.1, A7.2, A7.3 and A7.4; AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Main disabling condition

About 2,644,100 people in 1998, or 14.2% of the Australian population, reported a physical/diverse main disabling condition. Of these, 804,400 people, or 4.3% of Australians, also had a severe or profound core activity restriction (Table 7.3).

An estimated 1,709,700 people aged under 65, or 10.4% of Australians in that age group, reported a physical/diverse main disabling condition. Of these, 447,900 people, or 2.7% of Australians in that age group, had a severe or profound core activity restriction (Table 7.3). About 1,588,800 people, or 12.7% of Australians of working age (15–64), reported a physical/diverse main disabling condition. Of these, 393,300 people, or 3.2% of working-age Australians, also had a severe or profound core activity restriction.

There were 934,400 people with a disability aged 65 or more, or 41.2% of Australians in that age group, reporting a physical/diverse main condition. Of these, 356,500 (15.7%) also reported a severe or profound core activity restriction.

7.3 Patterns of physical/diverse disability in Australia

Age and sex patterns

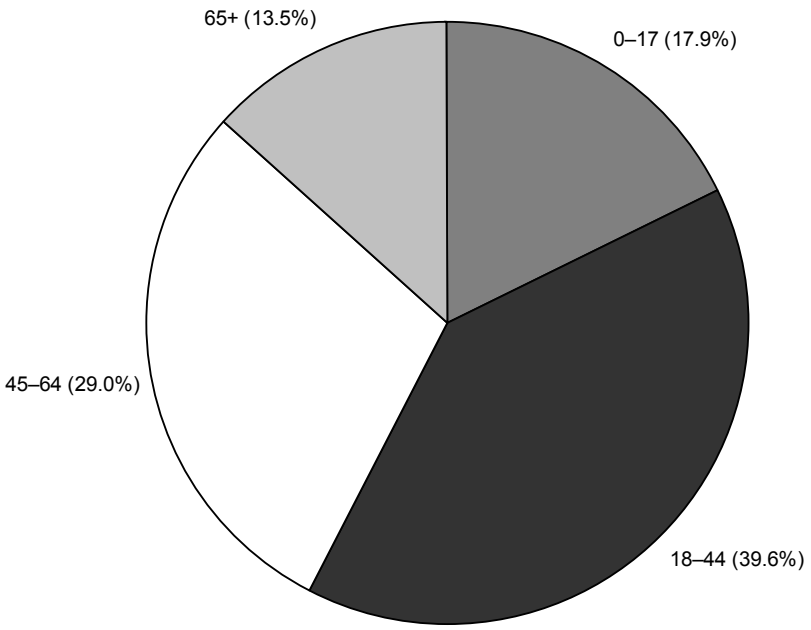
The overall prevalence rates of physical/diverse disability generally increased with age and the rates were particularly high for people aged 45 or more. This pattern was in contrast to the pattern of intellectual disability, in which the rates for adult population were considerably lower than the rates for children and adolescents (Chapter 3).

The overall prevalence of physical/diverse disability was higher for females than for males (Table 7.3). This difference was particularly evident among people who also had a severe or profound core activity restriction, and was most marked for those aged 65 and over.

Prevalence estimates for specific categories of disabling condition showed that females had higher rates of arthritis than males (tables A7.2 and A7.4). This pattern was consistent across all age groups. Rates of respiratory conditions were higher for children of school age than those for young adults in their 20s (AIHW: Wen & Fortune 1999: tables A4.7 and A4.8; AIHW analysis of the 1998 Survey of Disability, Ageing and Carers confidentialised unit record file).

Age at onset of main disabling condition

More than 80% of people with a physical/diverse main disabling condition reported first having that condition at age 18 or older. About 29% reported that the onset of their main condition occurred between the ages of 45 and 64, and 14% at age 65 or older (Figure 7.1; Table A7.5).



Source: Table A7.5.

Figure 7.1: People reporting a physical/diverse main disabling condition, age when that condition identified, 1998

Reported cause of main disabling condition

For people of all ages, the most commonly reported known cause for physical/diverse main disabling condition was accident or injury (22%). The second most common cause was disease, illness or heredity conditions (15%), followed by working conditions, work or overwork (13%) (Table 7.4).

For people aged 65 or older, disease, illness, or heredity was the most common known cause of physical/diverse disability (16%), followed by 'old age' (13%). However, for those aged under 65, accident or injury was the dominant known cause (28%), followed by working conditions, work or overwork (16%).

Table 7.4: People with a physical/diverse disability: cause of main disabling condition, by age, 1998

Reported cause of main disabling condition	0–64 years			65 years or more			All ages		
	'000	%	% of total known causes	'000	%	% of total known causes	'000	%	% of total known causes
Main condition just came on	309.4	18.1	20.3	260.1	27.8	31.9	569.5	21.5	24.3
Causes by disease, illness, hereditary	224.0	13.1	14.7	133.7	14.3	16.4	357.7	13.5	15.3
Accident/injury	425.2	24.9	27.9	98.0	10.5	12.0	523.2	19.8	22.4
Working conditions, work, overwork	246.1	14.4	16.1	67.6	7.2	8.3	313.8	11.9	13.4
Present at birth	113.5	6.6	7.4	*6.9	*0.7	*0.8	120.4	4.6	5.1
Old age	12.2	0.7	0.8	107.3	11.5	13.2	119.5	4.5	5.1
Stress	33.1	1.9	2.2	22.7	2.4	2.8	55.9	2.1	2.4
Personal/family problems, death	*3.8	*0.2	*0.2	**1.1	**0.1	**0.1	*4.9	*0.2	*0.2
Allergy (e.g. food, climate, medication and environment)	38.8	2.3	2.5	*4.1	*0.4	*0.5	42.8	1.6	1.8
Side effect of medication/medical procedure	20.2	1.2	1.3	11.5	1.2	1.4	31.7	1.2	1.4
Smoking	13.8	0.8	0.9	43.5	4.7	5.3	57.3	2.2	2.4
Pregnancy/childbirth	12.6	0.7	0.8	*3.2	*0.3	*0.4	15.8	0.6	0.7
Cause by other factors NES	71.8	4.2	4.7	55.5	5.9	6.8	127.3	4.8	5.4
Total known causes	*1,524.4*		*100.0*	*815.2*		*100.0*	*2,339.7*		*100.0*
Do not know what caused main condition	185.3	10.8		118.9	12.7		304.2	11.5	
Not applicable	—	0.0		**0.2	**0.0		**0.2	**0.0	
Total	**1,709.7**	**100.0**		**934.4**	**100.0**		**2,644.1**	**100.0**	

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Associated diseases or conditions

Physical/diverse disabilities were associated with various diseases or conditions. On the basis of all reported disabling conditions in 1998, some of the most commonly associated diseases or conditions were:

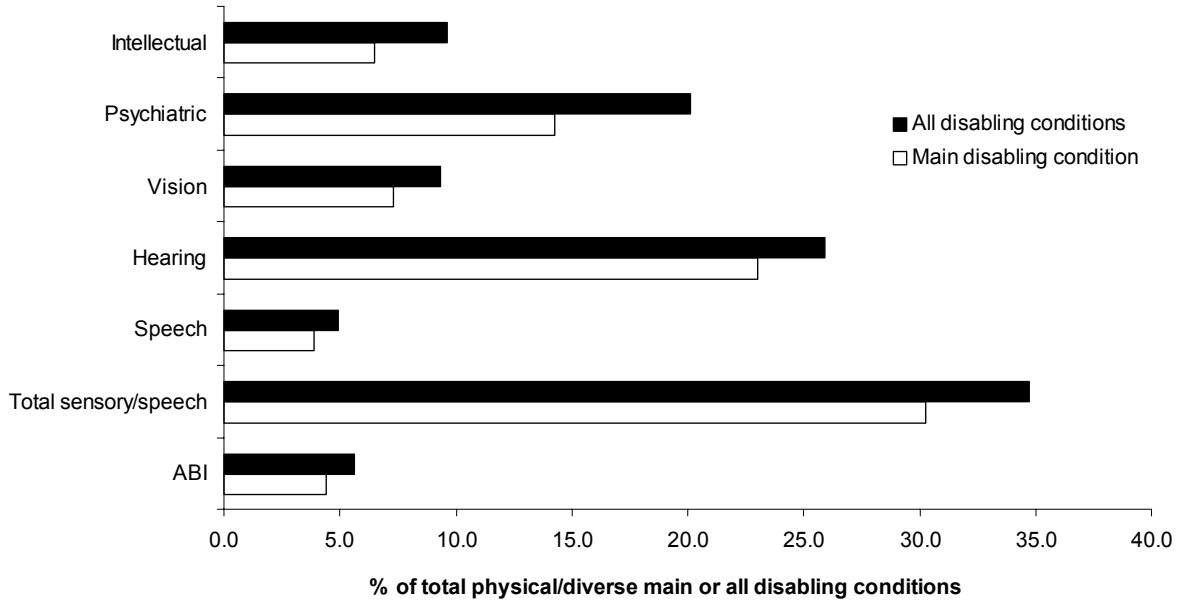
- More than one million people reported one or more heart diseases or related conditions. Around 638,200 people, or 3.4% of the total population, had hypertension.
- About 408,700 people, or 2.2% of the total population, had asthma-related conditions. Asthma was most commonly reported among children of school age (5–14), 66,000 people or 2.5% of children of that age.
- Back problems were the most commonly reported musculoskeletal conditions other than arthritis; 1,007,000 people, or 5.4% of the total population, reported these conditions. There were 72,500 people, or 0.4% of the total population, who reported having osteoporosis, mostly people aged 45 or older.
- There were 90,900 people (0.5%) who reported conditions associated with epilepsy and 55,000 (0.3%) reported conditions associated with migraines. About 31,100 people (0.2%), mostly among those aged 65 or more, reported conditions associated with Parkinson's disease.

- Around 22,300 people (0.1%), mostly among those aged under 65, reported conditions related to cerebral palsy. Conditions relating to paralysis were reported by 22,100 people, or 0.1% of the total population.

Associated disabilities

Sensory/speech (30%) was the most commonly associated disability for people with a physical/diverse main disabling condition, in particular hearing impairments (23%). Psychiatric disability (14%) was the second most commonly reported associated disability (Figure 7.2; Table A7.6).

The pattern was similar when all reported physical/diverse disabling conditions are considered. Sensory/speech was the most commonly associated disability (35%), followed by psychiatric disability (20%).



Source: Table A7.6.

Figure 7.2: People with a physical/diverse disability (based on main or all disabling conditions), by reported other disabilities, 1998

Place of residence and geographic location

Considering all reported physical/diverse disabling conditions, 16% of people with a severe or profound core activity restriction were living in cared accommodation. Of those aged 65 or more, 31% were living in cared accommodation (Table 7.5).

For people of all ages with a severe or profound core activity restriction and a physical/diverse main disabling condition, about 12% were living in cared accommodation in 1998 (Table 7.5). For those aged 65 or more, the proportion was 25%.

In 1998, about 60% of people with a physical/diverse disability lived in capital cities, and 40% lived in outside capital cities (Table 7.6). Compared with those aged 65 or more, a

slightly greater proportion of people aged under 65 with a physical/diverse disability lived outside capital cities.

Table 7.5: Estimates of physical/diverse disability based on four approaches, by place of residence, by age, 1998

	Households		Cared accommodation		Total	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	1,888.2	99.2	15.7	0.8	1,903.9	100.0
65+	977.9	87.0	146.7	13.0	1,124.6	100.0
Total	**2,866.1**	**94.6**	**162.4**	**5.4**	**3,028.5**	**100.0**
All disabling conditions and activity limitations and participation restrictions						
0–64	1,755.5	99.1	15.7	0.9	1,771.2	100.0
65+	935.7	86.5	146.5	13.5	1,082.2	100.0
Total	**2,691.2**	**94.3**	**162.2**	**5.7**	**2,853.4**	**100.0**
All disabling conditions and severe or profound core activity restrictions						
0–64	502.4	97.2	14.7	2.8	517.2	100.0
65+	317.0	69.2	141.3	30.8	458.3	100.0
Total	**819.4**	**84.0**	**156.0**	**16.0**	**975.4**	**100.0**
Main disabling condition						
0–64	1,700.2	99.4	9.5	0.6	1,709.7	100.0
65+	842.0	90.1	92.4	9.9	934.4	100.0
Total	**2,542.2**	**96.1**	**101.9**	**3.9**	**2,644.1**	**100.0**
Main disabling condition and severe or profound core activity restrictions						
0–64	438.8	98.0	9.1	2.0	447.9	100.0
65+	268.9	75.4	87.6	24.6	356.5	100.0
Total	**707.7**	**88.0**	**96.7**	**12.0**	**804.4**	**100.0**

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Table 7.6: Estimates of physical/diverse disability based on four approaches, by geographic location, 1998

	Capital city		Balance of state		Total	
	'000	%	'000	%	'000	%
All disabling conditions						
0–64	1,121.8	58.9	782.1	41.1	1,903.9	100.0
65+	686.9	61.1	437.8	38.9	1,124.6	100.0
Total	**1,808.7**	**59.7**	**1,219.9**	**40.3**	**3,028.5**	**100.0**
All disabling conditions and activity limitations and participation restrictions						
0–64	1,047.0	59.1	724.2	40.9	1,771.2	100.0
65+	662.1	61.2	420.1	38.8	1,082.2	100.0
Total	**1,709.1**	**59.9**	**1,144.3**	**40.1**	**2,853.4**	**100.0**
All disabling conditions and severe or profound core activity restrictions						
0–64	295.6	57.2	221.6	42.8	517.2	100.0
65+	289.9	63.3	168.4	36.7	458.3	100.0
Total	**585.5**	**60.0**	**389.9**	**40.0**	**975.4**	**100.0**
Main disabling condition						
0–64	1,004.7	58.8	705.0	41.2	1,709.7	100.0
65+	571.2	61.1	363.2	38.9	934.4	100.0
Total	**1,575.9**	**59.6**	**1,068.2**	**40.4**	**2,644.1**	**100.0**
Main disabling condition and severe or profound core activity restrictions						
0–64	249.7	55.7	198.2	44.3	447.9	100.0
65+	227.3	63.8	129.2	36.2	356.5	100.0
Total	**477.0**	**59.3**	**327.5**	**40.7**	**804.4**	**100.0**

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. These estimates should be interpreted accordingly.

Source: AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

Estimates at state and territory level

Table 7.7 presents estimates of physical/diverse disability by states and territories using the 1998 disability survey data. The estimates are obtained by applying national age- and sex-specific rates to state and territory population data, assuming that each state or territory has the same age- and sex-specific prevalence rates as those of the national average. Hence all the differences in estimates across the jurisdictions are due to their demographic variations.

Table 7.7: Estimates of physical/diverse disability (all disabling conditions and activity limitations and participation restrictions), by states and territories, by sex and age, 1998 ('000)

	States and territories								
	NSW	**Vic**	**Qld**	**WA**	**SA**	**Tas**	**ACT**	**NT**	**Australia**
Males									
0–64	306.8	222.4	167.3	89.1	71.6	22.7	15.0	9.4	904.5
65+	162.3	117.4	80.6	39.1	42.4	12.4	*4.8	**1.4	460.4
Total	*469.1*	*339.7*	*247.9*	*128.2*	*114.0*	*35.1*	*19.8*	*10.8*	*1,364.9*
Females									
0–64	299.2	220.8	161.2	85.1	70.8	22.4	15.0	*7.9	882.5
65+	225.2	164.6	105.6	52.5	59.6	17.2	*6.5	**1.4	632.6
Total	*524.4*	*385.4*	*266.8*	*137.7*	*130.3*	*39.6*	*21.5*	*9.3*	*1,515.1*
Persons									
0–64	606.0	443.2	328.6	174.3	142.4	45.1	30.0	17.3	1,787.1
65+	387.5	282.0	186.2	91.7	101.9	29.6	11.3	*2.8	1,093.0
Total	**993.5**	**725.1**	**514.8**	**265.9**	**244.4**	**74.7**	**41.2**	**20.1**	**2,880.0**

Note: Estimates marked with * have an associated relative standard error (RSE) of between 25% and 50%. Estimates marked with ** have an associated RSE of 50% or more. These estimates should be interpreted accordingly.

Sources: ABS 1999b; Table A7.7; AIHW analysis of ABS 1998 Survey of Disability, Ageing and Carers confidentialised unit record file.

8 Trends in disability prevalence

8.1 Introduction

Monitoring trends in disability prevalence can provide information on a range of issues relevant to social and economic policies, and service planning. Changes in disability prevalence may be examined using the following measures (AIHW 2000b):

- overall prevalence rates, age- and sex-standardised prevalence rates, and age- and sex-specific prevalence rates
- the number of people with a disability in the general population and in particular population age groups or disability groups

It is important to be aware that the above measures do not always show the same trends or the same magnitude of change in disability prevalence. Since disability is strongly related to age, the age-standardised prevalence rate is an important measure for monitoring changes in underlying prevalence by controlling for changes in population age structure.

Variations in overall disability prevalence rates and the number of people with a disability in a population can be attributable to changes either in population age structure or underlying age-specific rates, or both. Hence, population ageing could result in an increase in the overall prevalence rate and the number of people with disability in the population, even though underlying age-specific prevalence rates might remain constant or even decline slightly.

At any given time, the underlying prevalence of disability is determined by the combined effect of various factors, such as past and recent incidence, remission rates for diseases, rehabilitation rates, age at onset of disability, and survival rates of people with disability and of the general population. These factors may operate in a variety of ways. For example, a higher survival rate of people with long-term disability or disorders that cause disability could increase the prevalence while a higher rate of recovery from disabling conditions may lead to lower prevalence.

In addition to factors affecting the underlying prevalence of disability, there are factors that can lead to changes in reported prevalence, even when underlying real prevalence rates remain unchanged. These factors include changes in community perceptions and awareness of disability, changes in social attitudes and economic incentives concerning the reporting of sickness and disability, and changes in survey methodology. These factors are likely to have the most impact on the reported prevalence of mild disability, and less impact on the reported prevalence of more severe disability.

This chapter begins with a review of recent trends in the prevalence of disability and chronic conditions in some OECD countries, and then discusses possible explanations for those trends. The second part examines changes in population patterns of disability prevalence in Australia.

8.2 Changes in mortality and morbidity, and their impact on disability

Changes in mortality and morbidity affect the prevalence of disability. However, the relationships among mortality, morbidity and disability are complex. Currently there is a wide-ranging debate on the impact of greater longevity on trends in morbidity and disability. There are two extremes of opinion on this issue, separated by differences in approach to measurement and the underlying assumptions used. Some argue that increased longevity is accompanied by a longer period of disability in the later years of life, causing disability prevalence to increase (e.g. Verbrugge 1984, 1989). Others argue that the later onset of diseases means a compression of morbidity and disability into a shorter period at the end of the life span, resulting in lower disability prevalence in the population (e.g. Fries 1980, 1989). There has been no clear resolution of this issue and there is contradictory evidence in the international literature about recent change in levels and patterns of morbidity and disability.

Recent trends in disability prevalence

Recently reported evidence of a decline in disability prevalence in the older population of some OECD countries has been a subject of vigorous debate due to the relevance of this to social and economic policies. A growing number of studies have reported a decline in disability prevalence among the older population in some developed countries, in particular the USA (e.g. Robine et al. 1998; Waidmann & Manton 1999; Waidmann & Liu 2000; Manton & Gu 2001; Schoeni et al. 2001). However, mixed trends have also been reported across OECD countries (Jacobzone et al. 2000). Declines in disability prevalence have been reported for the United States, Germany, France and Japan. A moderate decline in disability was reported for Sweden. Mixed age patterns of prevalence were reported for Canada, with a clear decline for people aged 65–74 but an increase in most age groups over 75. No consistent decline in disability prevalence was reported in the United Kingdom and the Netherlands. In Australia, the latest population survey data indicated no decrease overall and a possible increase in disability prevalence among people aged 75 or older (AIHW 2001a; ABS: Davis et al. 2001).

Despite some countries reporting declines in age-standardised prevalence rates, it is generally agreed that the rapid growth of the older population may increase absolute numbers of people with a disability and thus the need for services. For instance, the number of Americans aged 65 and over with a disability increased from 26.9 million in 1982 to 34.1 million in 1996 (US National Institute on Disability and Rehabilitation Research 1998).

It is also important to consider the trends in disability prevalence for people aged under 65. Changes in the prevalence of people ageing with a disability acquired during childhood or early adulthood could affect future trends in disability among the older population as well as having implications for people and service provisions over the life span of these people. In the United States during 1990–1994, the rate of activity limitations for girls aged under 18 years increased from 4.2% to 5.6%, and from 5.6% to 7.9% for boys. Among Americans aged 18–44, the rate of people with activity limitations rose from 8.8% in 1990 to 10.3% in 1994, suggesting that 3.1 million more people of that age group had activity limitations in 1994 than in 1990 (US National Institute on Disability and Rehabilitation Research 1998). Increases in disability prevalence were also observed in the Australian population aged under 65 (see

Section 8.3 for detailed discussions on demographic patterns of disability prevalence in Australia).

Trends in the prevalence of chronic conditions

The reported falling disability rates in the older population in some OECD countries have been accompanied by increases in the reported prevalence of chronic diseases or conditions. Increases were also reported in countries where no consistent decline in disability, or a possible increase in disability was reported, such as Australia. Although changes in the prevalence of various diseases are not consistent and trends in the prevalence of chronic diseases vary by age, sex and types of disease, the bulk of evidence appears to indicate an increase in the presence of chronic conditions among the older populations. It appears that the reported decline in disability prevalence rates of the older population in some OECD countries cannot be attributed to a fall in the reported prevalence of chronic conditions.

In the United States, the reported prevalence of some diseases increased in recent years, with the largest increases being in the proportion of people with heart disease and cancer. Increases were also reported in some chronic conditions such as arthritis, osteoporosis and visual conditions. There has also been a decrease in the number of older Americans with no disease and an increase in the proportion of people with multiple conditions (Crimmins & Saito 2000; Freedman & Martin 2000). In France, the reported prevalence rates increased between 1981 and 1991 in almost all the main groups of chronic diseases among older people, in particular the most frequent diseases—cardiovascular and osteoarticular diseases. The proportion of older people with at least one chronic disease also increased, in particular among those aged 70 or over (Robine et al. 1998).

In Australia, the proportion of people reporting one or more 'long-term health conditions' increased from 66% in 1989–90 to 78% in 2001 (ABS 1991, 2002). For people aged 65 or more with a disability, the prevalence rates of most disabling conditions increased between 1988 and 1998 (see Table 8.4).

Prevalence increased in a number of leading chronic conditions in Australia (National Public Health Partnership 2001), for instance:

- Although mortality from cardiovascular conditions has declined, heart and vascular disease prevalence rates increased between 1989–90 and 1995 from 174 per 1,000 adults to 209 per 1,000 adults.
- The prevalence rate of diabetes has almost doubled since the early 1980s; numbers of people with diabetes are projected to pass one million over the next 15 to 20 years.
- The obesity rate increased from less than 8% in 1980 to nearly 20% in 1995; 56% of Australian adults were overweight or obese in 1995.

Many chronic diseases are preventable and appropriate prevention may reduce the disability associated with those diseases. However, the effect of the reduction of those diseases on overall morbidity and disability varies with the type of disease. A study of older Australians indicates that the elimination of chronic non-fatal diseases such as osteoarthritis, dementia, and eyesight and hearing problems may result in an increase in healthy years of life while total life expectancy remains unchanged, leading to a reduction in the number of years, and proportion of life, spent in ill-health or disability. However, elimination of fatal diseases such as cancer may result not only in an increase in healthy years but also in an even larger

increase in years with disability, resulting in a relative expansion of morbidity (Mathers 1999: 211).

Explanations for recent trends in the prevalence of disability and chronic conditions

A number of issues are crucial for understanding trends in disability prevalence:

- Why has a decline in reported disability prevalence occurred at the same time as an increase in the reported prevalence of chronic diseases in some developed countries?
- Why have different trends (increases and decreases) in disability prevalence been reported among the OECD countries?

Possible factors affecting recent trends in the prevalence of chronic conditions

The measurement and interpretation of changes in the prevalence of chronic diseases and conditions are affected by a number of factors. The most common explanations for the increase in the reported prevalence of chronic conditions are improvements in medical knowledge and diagnosis of those diseases (e.g. Crimmins & Saito 2000; Robine et al. 1998). The propensity of individuals to report disease may also have increased due to changes in community attitudes towards disease and illness. People's awareness of diseases can change with improvements in diagnosis. People have 'medicalised' some conditions that were once regarded as 'ageing' and not diseases. For instance, people may now be more likely than in the past to consider aches and pains to be arthritis. In the mental health area, in some situations, 'worry' has become anxiety and 'sadness' has become depression.

Increasing accessibility and use of health services could play a role in increased reporting of disease presence. Population cohorts who use more health care services are likely to be more knowledgeable about disease (Crimmins & Saito 2000).

Decline in mortality from some major diseases, such as heart disease, stroke, and vascular diseases and cancer, has resulted in an increase in the prevalence of those diseases (AIHW 2001b; AIHW: Dunn et al. 2002; Crimmins & Saito 2000).

Possible factors affecting recent trends in disability prevalence

Little empirical evidence has been presented to explain the reported decline in disability in some developed countries. Some proposed factors that may be associated with the decline are education and socioeconomic status, medical care improvements, increased use of aids and equipment, health-related behaviour changes, environmental supports, and reduction in disease and hazardous exposure (e.g. Cutler 2001; Schoeni et al. 2001).

A US study found that only the most educated group of older people (with more than 12 years of schooling) had recently experienced a decline in disability (Schoeni et al. 2001). Education level was considered as a broad indicator of socioeconomic status. It may influence disability via a number of pathways including access to medical care and patterns of medical care use, health-related behaviours, access to technology and assistive devices, and access to more facilitative environments when disability occurs.

Analyses of the mortality and disability experience of three older American cohorts (born 1887–1897, 1897–1907 and 1907–1917) found that the cohort differences in patterns of mortality and disability (likelihood of maintaining function) reflected their differences in

early life experience. This included differences in risk factor exposures, coverage of Medicare, improvements in nutrients affecting chronic disease morbidity and other socioeconomic changes (Manton et al. 1997).

It has been suggested that the increases in chronic conditions are largely limited to conditions that are less severe or less debilitating (Freedman & Martin 2000; Robine et al. 1998). Furthermore, advances in medicine and health care services have contributed to a slowing down in the rate of progression of chronic diseases or to a reduction in serious consequences of those diseases via more supportive and effective treatments or rehabilitation. Therefore, even if the prevalence of chronic diseases increase, the prevalence of functional limitations and need for help with daily activities may not necessarily increase at the same rate (e.g. Manton 1982 cited in Robine 1998; Moore et al. 1999).

Nevertheless, the explanations of recent trends in disability are far from adequate. As studies on disability trends among older Americans have indicated, the reported decline has only occurred in less severe disabilities and there is no consistent evidence suggesting a decline in more severe disabilities.

Little attention has been paid to the variations in survey measures and their effect on cross-nation comparison of trends in disability prevalence. Measurement issues are critical in identifying causes affecting the reported disability trends in different countries. For example, in Australia the marked increase in the prevalence rate of severe or profound restrictions between 1993 and 1998 is largely the result of changes in the 1998 survey methods, which 'captured' a larger number of people with a severe or profound restriction than the 1993 survey (AIHW 1999, 2000b; ABS: Davis et al. 2001).

A comparison of the United States and Australia

The international comparison of levels of disability prevalence is limited by differences in survey design and methods. However, could the trends in disability within each country be compared internationally on the basis of the existing survey data? As a number of recent studies on trends in disability are concentrated on older Americans we will use the United States as an example of a reported decline in disability with an increase in the reported prevalence of chronic conditions. Australia may be used as an example of a country with no consistent decline in disability prevalence but a trend of increase in the prevalence of chronic conditions.

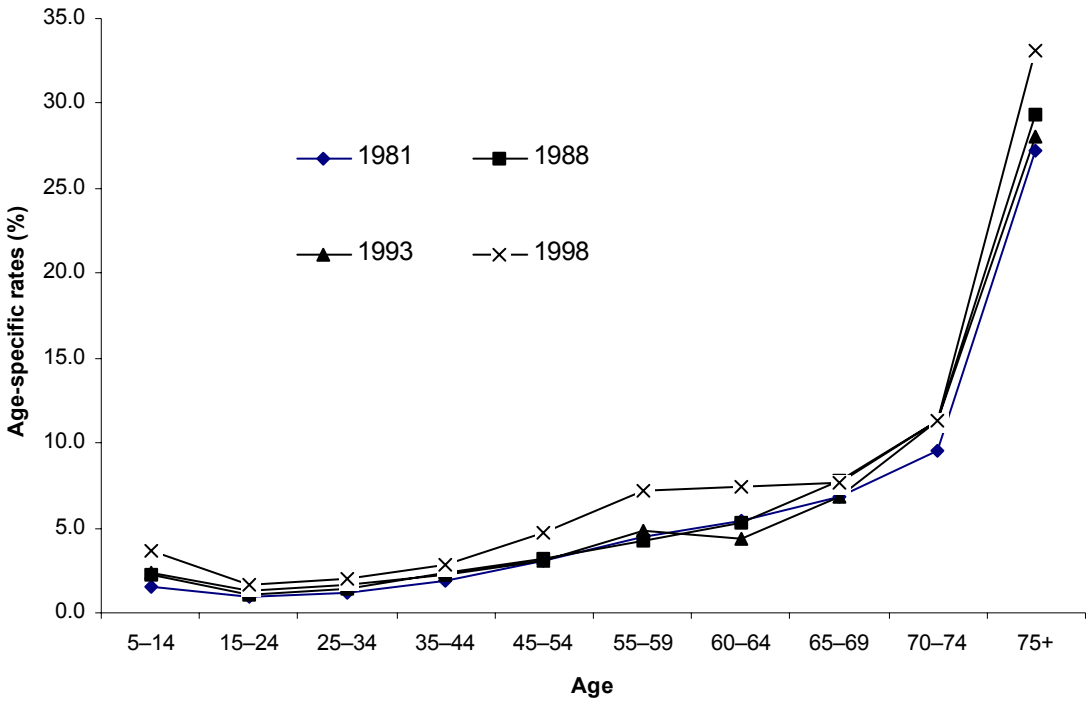
Differences in trends in reported disability prevalence

The evidence of a decline in disability among older Americans is based on data from a number of US surveys that differ in terms of concepts, definitions, collections, coverage and methods of estimation used. Most surveys either measure disability at a limited number of points in time or they cover a relatively short time span. The exception is the US National Health Interview Survey, which has collected disability information annually since 1982 and provides comparable data over a period of 15 years, 1982–1996 (Schoeni et al. 2001).

Schoeni et al. (2001) analysed the most recent data from the National Health Interview Survey and integrated its results with evidence from other United States national surveys. The analysis showed that the reported decline in disability prevalence did not persist throughout the entire 1982–1996 period. There were clear declines in disability prevalence between 1982 and 1986, but no improvements during 1986–1992. Disability began to decline

again more modestly around 1992, falling through to 1996 (the last year of available data). The analysis also indicates that the decline was driven by a decrease in the proportion of people who only needed help with routine care activities, such as household chores, doing necessary business, shopping and getting around. There was no change in the proportion of people with a more severe disability, i.e. those who needed help with personal care activities. The evidence was fairly consistent across five US national surveys (Schoeni et al. 2001: S217).

The ABS disability surveys provide cross-sectional data collected at four points in time (1981, 1988, 1993 and 1998) over a period of 17 years. For Australians aged 65 or more, the age-standardised rate for people with any specific activity restrictions increased markedly between 1981 (33%) and 1988 (45%) (Table 8.1). The rate increased slightly between 1993 and 1998, while the 1998 rate is similar to that reported in 1988. The rate of people aged 65 or over reporting a profound or severe core activity restriction increased from 16% in 1981 to 18% in 1988. The rate then declined marginally to 17% in 1993, but increased to 20% in 1998 (Table 8.1; AIHW 2000b). The increase was mainly in the 75 years and over group, in particular very old people (Figure 8.1). (For detailed analyses on changes in disability prevalence and related health conditions in Australia see Section 8.3.)



Source: AIHW analysis of unpublished data tables from the ABS 1981, 1988, 1993 and 1998 disability surveys.

Figure 8.1: Comparison of age-specific rates of severe or profound core activity restrictions, 1981 to 1998

Table 8.1: Comparison of age-standardised prevalence rates of disability for 1981, 1988, 1993 and 1998, Australia

	Severe/profound core activity restriction					All with specific restrictions					Total with disability				
	5–14	15–64	65+	Total 5–64	All ages	5–14	15–64	65+	Total 5–64	All ages	0–14	15–64	65+	Total 0–64	All ages
Males															
1981	2.0	2.1	11.6	2.1	**3.2**	5.0	8.9	29.4	8.1	**10.6**	6.2	13.5	42.0	11.8	**15.0**
1988	2.5	2.1	12.7	2.2	**3.4**	7.2	11.5	43.6	10.7	**14.5**	7.0	14.2	53.4	12.5	**16.8**
1993	2.7	2.3	12.4	2.4	**3.5**	7.3	11.4	44.3	10.7	**14.6**	7.6	15.3	56.9	13.4	**18.1**
1998	4.9	3.3	14.8	3.6	**4.9**	10.6	13.3	45.0	12.8	**16.6**	9.8	17.2	57.3	15.4	**19.9**
Females															
1981	1.2	2.2	19.7	2.1	**4.6**	3.0	7.4	35.6	6.6	**10.9**	4.2	11.2	43.6	9.6	**14.2**
1988	1.9	2.5	21.9	2.4	**5.3**	5.1	10.2	46.2	9.3	**14.7**	5.1	12.2	52.2	10.5	**16.2**
1993	1.8	2.4	20.8	2.3	**5.0**	4.5	9.8	44.9	8.9	**14.1**	5.1	12.5	51.2	10.8	**16.3**
1998	2.4	3.4	23.3	3.2	**6.1**	5.7	11.4	45.9	10.0	**15.6**	5.5	14.2	52.5	12.1	**17.6**
Persons															
1981	1.6	2.2	16.2	2.1	**3.9**	4.0	8.1	32.9	7.4	**10.7**	5.2	12.4	42.9	10.7	**14.6**
1988	2.2	2.3	17.9	2.3	**4.3**	6.2	10.9	45.1	10.0	**14.6**	6.1	13.2	52.7	11.5	**16.5**
1993	2.3	2.4	17.1	2.3	**4.3**	5.9	10.6	44.6	9.8	**14.3**	6.4	13.9	53.7	12.1	**17.2**
1998	3.7	3.3	19.6	3.4	**5.5**	8.2	12.4	45.5	11.7	**16.1**	7.7	15.7	54.6	13.8	**18.8**

Notes

1. Disability data were re-derived using criteria common to the four surveys. Rates are age-standardised to the estimated resident population for March 1998. The estimates from the previous three surveys were adjusted to show the prevalence rates that would have been expected in the 1981, 1988 and 1993 populations, if those populations had the same age and sex structure as the 1998 population.
2. Only people aged 5 years and over are included. Information on severity of core activity restriction among children aged under 5 years was collected in the 1998 survey but not in the previous surveys. For comparative purposes, information on activity restrictions among children under 5 is not included in the data presented here, and people aged under 5 years have been excluded from the total population used as the denominator to calculate the prevalence rates.

Sources: AIHW 2000b: Table 12.1; AIHW analysis of unpublished data tables from the ABS 1981, 1988, 1993 and 1998 disability surveys.

Some differences in survey methods and operational definitions of disability

It may be useful to look at some differences in the operational definition of disability and survey design between the United States and Australia to examine their possible impact on reported trends in disability prevalence. The comparisons will focus on the effects of the following aspects of the surveys on reported disability prevalence between the two countries:

- the focus of survey screening questions on particular ICF dimension(s)
- the coverage of people using aids and equipment and receiving assistance with activities
- duration requirement in defining a disability
- main purpose of the survey
- use of IADLs in the survey to define a disability.

In the US surveys, screening questions that define disability are mainly about Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs). People enter the survey via questions about activity limitations; information about diseases and conditions are often collected later in the survey. In the ABS surveys, respondents enter the survey via screening questions largely about impairments and long-term diseases or conditions restricting every day activities, or 'difficulty gripping or holding things' and 'whether is restricted in physical activities or in doing physical work'. In effect, the screening questions are the criteria for defining disability in the Australian disability surveys and the gateway to subsequent questions on activity limitations.

This difference may have partly contributed to the difference in the trends in the reported disability prevalence between the United States and Australia. Increase in the prevalence of chronic conditions restricting everyday activities may be less likely to be captured in surveys using activity limitations as the sole screen to define disability. In contrast, increases in the prevalence of chronic conditions could have more impact on the estimates of disability from surveys that include impairments and long-term conditions affecting everyday activity as part of the operational definition of disability.

For example, in the United States there has been a reported decline in the age-standardised prevalence rates of dementia (Manton et al. 1995), while in Australia the number of people with a main disabling condition of dementia has increased. This raises the question of whether the US survey screening questions that focus largely on ADLs and IADLs are adequate to pick up disabilities associated with these types of conditions. In the ABS survey, although classification of severity of disability is based on difficulty and assistance with core activities (self-care, mobility and communication), people with a disability associated with dementia are identified by the survey screening questions. Most of them are picked up as having a severe or profound disability by subsequent questions on needs for assistance with core activities.

Analyses of US population survey data have investigated the effects of using aids and equipment on reported disability prevalence. Individuals using aids and appliances who did not report activity limitations were not captured by surveys defining disability only based on activity limitations (Madans et al. 2002).

The ABS disability survey screens 'captured' all people reporting at least one restricting impairment or long-term condition, including people using any aids or equipment and reporting 'no difficulty' in response to subsequent survey questions about whether they had

a difficulty with core activities. An increase in the number of people using aids or equipment would be more likely to be included in the ABS surveys than were the surveys using activity limitations as the sole screen to define disability.

Like the effects of using aids and equipment, there might be people receiving assistance with activities who did not report activity limitation and, therefore, would not be captured by surveys using activity limitations as the sole screens to define disability.

The ABS disability surveys specify a duration of 6 months or more as a requirement in defining a disability. Most US surveys do not have a duration requirement for disabilities, except for the National Long-term Care Survey that limits disability to that of three months or more (Waidmann & Manton 1999). Without a duration limitation in survey definitions of disability, the estimated disabilities may include a large number of people with short-term difficulties or limitations, and thus may result in variations in the estimated disabilities over time.

The ABS disability surveys are specifically designed to collect comprehensive information about disability in the Australian population, covering different domains of the ICF. In the United States the collections of disability information are largely components of health and social surveys. Information collected in the Australian national disability surveys tend to be more comprehensive and result in higher prevalence of disabilities than those collected in other national health and social surveys.

It is also worth noting that most US surveys measured disability by focusing on dependence in ADLs and IADLs. About half of the recent OECD disability or health surveys include IADL items (Gudex & Lafortune 2000). It has been suggested that such measures, particularly IADLs, are highly influenced by socially defined roles and social, cultural and physical environment. Decline or increase in the reported disability prevalence could reflect the changes in people's expectations about their ability to function independently or changes in environmental modifications, instead of improvements in underlying physiological capacity (Freedman & Martin 1998).

Implications for survey design

In summary, it is important not only to measure the level of disability but also to monitor and understand trends in disability prevalence. There are increases in the reported prevalence of chronic conditions both in Australia and in the United States, and changes in morbidity may impact on disability prevalence. The examples of the United States and Australia indicate that the reported disability prevalence might be affected by whether the presence of any impairments and chronic conditions restricting everyday activities is included as part of the survey definition of disability. Increases in the reported prevalence of chronic conditions could have more impact on estimates of disability when the surveys include limiting impairments and chronic conditions in the operational definition of disability. This may affect the reported trends in disability prevalence and hence collection of information on these conditions in population surveys, including disability surveys, is important. To assist in collecting comparable data and monitoring the trends in disability prevalence, at least two general measures of disability need to be considered:

- one measure focusing on the activity/participation dimension(s) of the ICF
- another focusing on the body function dimension of the ICF.

The second measure would enable collections of data on impairment that result in restrictions in participation but no difficulty in any activities (for instance, if a person is HIV

positive, the person may be out of a job because of discrimination). People who use aids or equipment due to functional problems can be 'captured' by this measure even though they do not have difficulties in activities when using the assistive devices. Similarly, this measure can 'capture' people who do not have difficulties in activity when receiving assistance. The measure also meets the need for data on impairment or health conditions to get information about disabilities associated with specific types of conditions or impairments.

Focus on long-term and severe disability may increase the comparability of disability estimates from different countries, including estimates from time-series data.

8.3 Trends in population patterns of disability prevalence in Australia

This section first examines changes in overall disability prevalence in recent decades in Australia, focusing particularly on the prevalence of severe or profound core activity restriction. It then discusses trends in three broad age groups (under 15, 15–64 and 65 and over). Each of the groups has distinct patterns of prevalence, related factors and features of policy relevance.

Substantial changes in the 1998 survey methods have resulted in a greater identification of the number of people with a disability, especially with a severe or profound core activity restriction, than the 1993 survey (AIHW 2001a; ABS: Davis et al. 2001). For the purpose of comparison, data from the four ABS disability surveys (1981, 1988, 1993 and 1998) were re-derived using, as far as possible, only criteria common to all four surveys. However, there remain some variations between the surveys. In particular, changes in the 1998 survey design and interview methods are difficult to control for, and it is difficult to assess their impact on reported disability prevalence.

The discussion on trends in disability prevalence uses a number of measures: overall prevalence rates, age-standardised prevalence rates, age-specific prevalence rates, and estimated number of people with a disability in the general population and in specific age groups of the population (see Section 8.1 for discussions on these measures).

Changes in overall patterns of disability prevalence

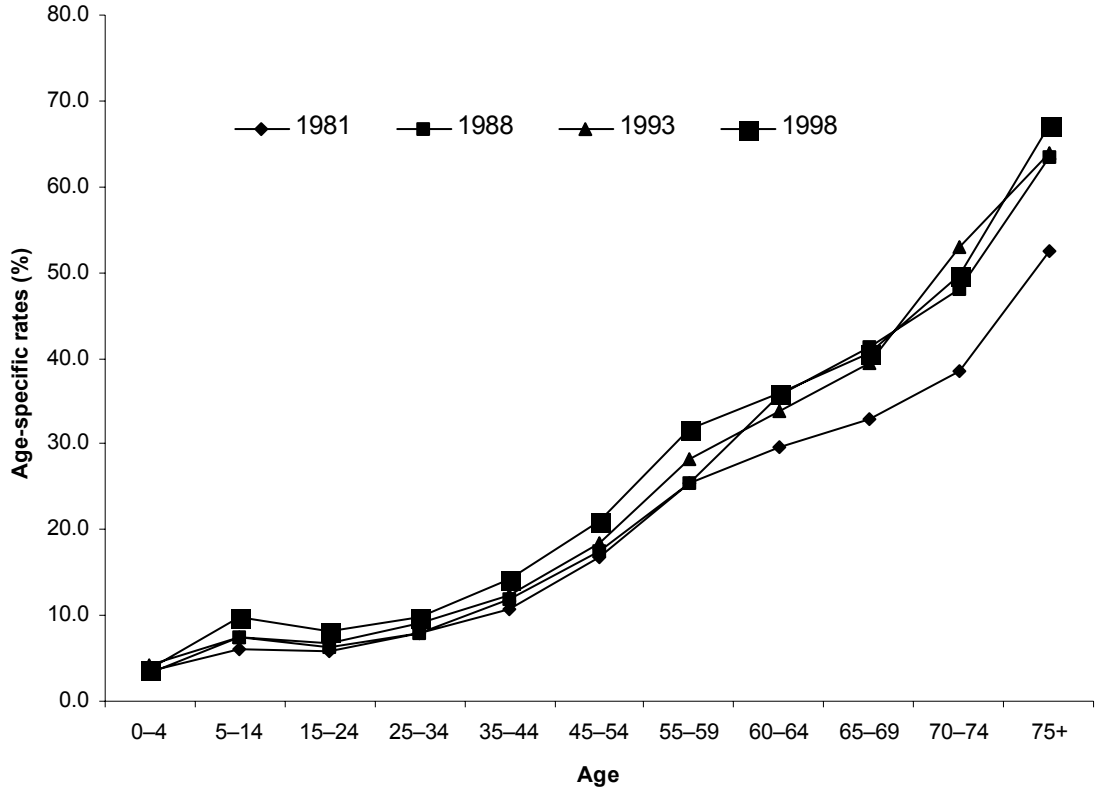
Changes in disability rates

To examine the changes in the prevalence of severe or profound core activity restrictions, it is useful to start with trends in disability rates over time. As discussed in Chapter 2, the ABS disability surveys first define the base 'disability' population using a set of screening questions (Box 2.1), and then ask questions about the severity of core activity restrictions among the base 'disability' population. Hence, an increase in the reported disability rates could result in an increase in the base disability population and then could further contribute to an increase in the rate of severe or profound core activity restrictions.

In Australia, there has been a consistent increase in the overall reported rate of disability for almost two decades. The age-standardised rate of disability increased from 15% in 1981, to 19% in 1998 (Table 8.1).

Comparison of age-specific rates of disability showed that the general patterns were similar across the four surveys, except for the age group of 60 or over. The 1988, 1993 and 1998 disability surveys consistently reported substantially higher rates across the older population groups than the 1981 survey (Figure 8.2). The disability rates for people aged 65 and over jumped from 43% in 1981 to over 50% in the later surveys (Table 8.1).

According to the ABS, the substantial increase in the rates of disability among people aged 60 or over in the three later surveys was largely because these surveys focused more on ageing. From the 1988 survey onwards, increased emphasis was placed on 'difficulty or restriction' rather than on a comparison with 'other people of the same age'. This emphasis would in particular have had an effect on the responses to the screening questions about 'physical activity/work' and 'long-term treatment/medication'. The renaming of the survey could in itself have had an impact, with the obvious inclusion of 'ageing' in the title and in all documentation including initial contact letters and verbal introductions by interviewers (ABS 2003, pers. comm.).



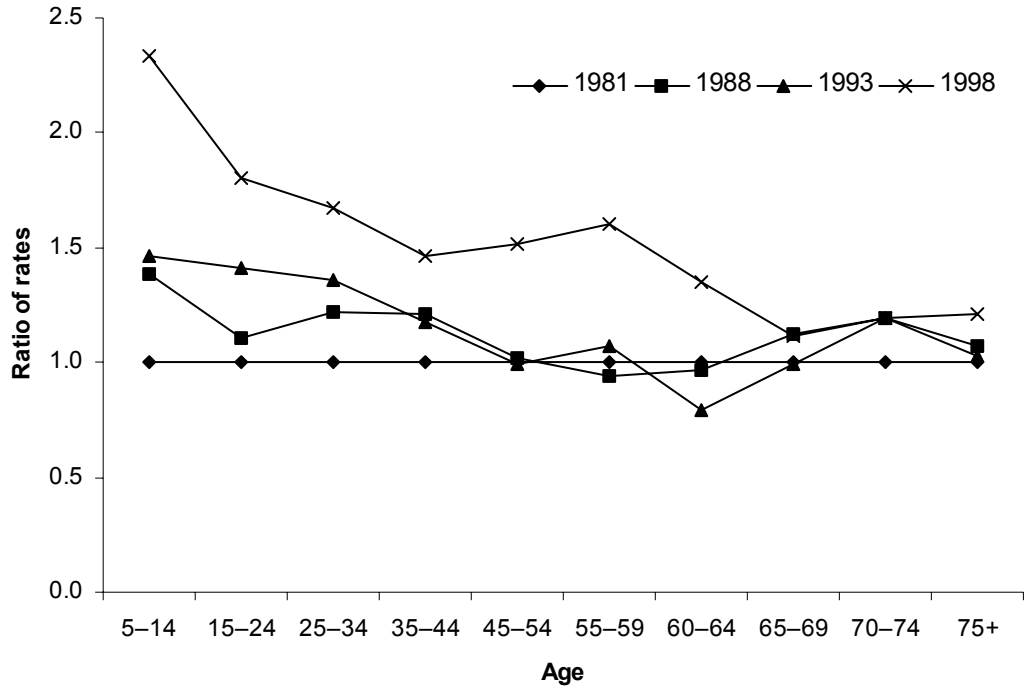
Source: AIHW analysis of unpublished data tables from the ABS 1981, 1988, 1993 and 1998 disability surveys.

Figure 8.2: Comparison of age-specific rates of disability, 1981, 1988, 1993 and 1998

Changes in the rates of severe or profound core activity restrictions

The age-standardised rates of severe or profound restrictions were relatively stable during the 1980s and early 1990s, remaining at around 4% of the Australian population (AIHW: Wen et al. 1995). However, between 1993 and 1998 the rate increased from 4.3% to 5.5% (Table 8.1). This marked increase was largely the result of changes in the 1998 survey methods, which brought more people with a disability into the scope of the survey (AIHW 2001a: 267–269; ABS: Davis et al. 2001).

To examine the differences in trends among various age groups, the age-specific prevalence rates of severe or profound core activity restrictions for each of the four ABS disability surveys have been compared.[9] The comparisons indicate that the rates for 1998 were higher in most age groups than those for the previous surveys (Figure 8.3). The increases were particularly marked among children aged 5–14, the older working-age population, and people aged 75 and over.



Source: AIHW analysis of unpublished data tables from ABS 1981, 1988, 1993 and 1998 disability surveys.

Figure 8.3: Ratio of the age-specific prevalence rates of severe or profound restrictions, 1981, 1988, 1993 and 1998

9 The comparison is based on the ratios of the age-specific prevalence rates of severe or profound restrictions for 1988, 1993 and 1998 to those for 1981. The ratio values of 1.0 indicate no change between the rates of 1981 survey and the rates of the three subsequent surveys, those over 1.0 indicate an increase in rates and those under 1.0 a decrease.

Changes in the number of people with a disability

Age-standardised prevalence rates are used to estimate changes over time but it is the actual number of people with a disability that is most relevant in service planning.

The total estimated number of Australians with a disability increased by 80% between 1981 and 1998. The number of people with any specific restrictions and with severe or profound core activity restriction in 1998 was more than twice that in 1981. Growth in the number of people with a severe or profound core activity restriction during the period 1993–1998 (43%) was almost four times that between 1988 and 1993 (11%) (tables 8.2 and A8.1; AIHW 2000b).

Demographic changes are also affecting the number of people with a disability—in particular the rapid pace of ageing of the working-age population, and the ageing of the aged population. Comparative analyses of disability prevalence over the period 1981–1998 suggest that such population ageing has had a strong impact on the prevalence of severe or profound core activity restriction, particularly in the decade to 1998 (AIHW 2000b).

Table 8.2: Increases in disability prevalence, Australia, 1981, 1988, 1993 and 1998

		Percentage increase in reported number of people		
Period	Age	Severe or profound core activity restriction	Specific restrictions	Total with disability
1981–1988	Under 65	24.0	52.1	20.4
	65+	42.2	74.2	54.9
	Total	*32.6*	*59.7*	*30.9*
1988–1993	Under 65	10.8	4.9	13.4
	65+	11.3	14.1	17.4
	Total	*11.1*	*8.4*	*14.8*
1981–1993	Under 65	37.4	59.6	36.5
	65+	58.4	98.8	82.0
	Total	*47.3*	*73.1*	*50.4*
1993–1998	Under 65	54.8	29.1	23.0
	65+	31.7	15.8	14.7
	Total	*43.2*	*23.9*	*20.0*
1988–1998	Under 65	71.6	35.5	39.5
	65+	46.7	32.2	34.7
	Total	*59.0*	*34.2*	*37.8*
1981–1998	Under 65	112.8	106.1	67.9
	65+	108.6	130.3	108.8
	Total	*110.9*	*114.4*	*80.4*

Notes

1. Disability data were re-derived using criteria common to the four surveys.
2. Only people aged 5 years and over are included.

Sources: AIHW 2000b; Table A8.1; AIHW analysis of unpublished data tables from the ABS 1981, 1988, 1993 and 1998 disability surveys.

Changes in the prevalence of long-term health conditions

Exploring the changes in the prevalence and patterns of long-term health conditions can shed light on changes in reported disability prevalence. A comparison of the four survey data shows that the overall prevalence of most disabling conditions increased during the

period 1981–1998 (Table 8.3). There were noticeable increases in the reported rates of diseases of the ear, circulatory diseases and musculoskeletal conditions, and marked increases in intellectual and psychiatric conditions over the period 1993–1998.

Table 8.3: People with a disability: prevalence rates (%) of all reported disabling conditions by type of condition, by sex, Australia, 1981, 1988, 1993 and 1998

Year/sex	Psychiatric	Intellectual	Diseases of eye	Diseases of ear	Nervous system diseases	Circulatory diseases	Respiratory diseases	Musculoskeletal disorders	All other diseases and conditions
1981									
Males	1.7	0.9	1.4	4.7	1.3	2.8	1.4	4.8	3.3
Females	2.9	0.6	1.8	3.6	1.4	3.2	0.9	5.1	3.3
Persons	2.3	0.7	1.6	4.2	1.4	3.0	1.2	4.9	3.3
1988									
Males	1.7	1.1	1.4	5.4	1.5	3.0	1.9	5.2	5.0
Females	2.4	0.8	1.8	3.7	1.5	3.4	1.4	6.5	4.8
Persons	2.1	1.0	1.6	4.5	1.5	3.2	1.6	5.8	4.9
1993									
Males	1.7	1.3	1.6	7.0	1.6	4.5	2.6	6.8	8.0
Females	2.7	0.8	1.8	4.5	1.6	4.8	2.5	7.6	7.0
Persons	2.2	1.0	1.7	5.7	1.6	4.6	2.6	7.2	7.5
1998									
Males	2.9	2.9	1.3	8.3	1.5	5.6	3.0	8.5	8.6
Females	4.4	1.6	1.6	5.6	1.9	5.9	2.8	9.1	8.3
Persons	3.6	2.2	1.5	6.9	1.7	5.8	2.9	8.8	8.4

Notes

1. Percentages have been standardised using the age and sex structures of the estimated resident population at March 1998. The estimates from the previous three surveys were adjusted to show the prevalence rates that would have been expected in the 1981, 1988 and 1993 populations, if those populations had the same age and sex structure as the 1998 population.
2. The 1993 and 1998 data were adjusted to the 1981 and 1988 definition of disability.

Sources: AIHW analysis of ABS 1993 and 1998 Surveys of Disability, Ageing and Carers confidentialised unit record files; ABS 1981 Survey of Handicapped Persons unpublished data table; ABS 1988 Survey of Disabled and Aged Persons unpublished data table.

Changes in disability prevalence among children aged under 15

There has been a substantial increase in the rates of severe or profound core activity restriction among children, in particular boys. Between 1993 and 1998, the rates for males aged 5–14 increased from 2.7% to 4.9%, more than twice the average increase for males aged 15–64 (Table 8.1).

A number of factors may have contributed to this trend. The high rates for children of school age may partly reflect the effect of the educational system on the identification of disability. Some disabling conditions such as intellectual/learning may have a particular impact on school performance. Between 1993 and 1998, the main area of increase in the prevalence of disabling conditions among children of school age was intellectual disabling conditions (from 1.7% to 3.6%) (Table 8.4).

According to the 1998 ABS disability survey, about 42,700 children aged 0–14 with a disability had ADHD, either as a main disabling condition or an associated disabling condition. Of these, 38,700 considered ADHD as their main disabling condition, which was equivalent to about 70% of the total number of intellectual/learning main disabling conditions reported by children of that age with a disability in 1993 (AIHW analysis of ABS 1993 and 1998 Surveys of Disability, Ageing and Carers confidentialised unit record files). While ADHD was not separately classified in the 1993 disability survey, it is likely that these reported numbers of ADHD in 1998 have contributed to an increase in reported intellectual disability in the 0–14 age group.

Both higher levels of diagnosis and heightened awareness among parents, educators and health professionals may have contributed to the increase in reporting ADHD. An increase in prescriptions for the most commonly prescribed drugs to treat ADHD may indicate an increase in the diagnosis of the disorder (AIHW 2001a; ABS: Davis et al. 2001).

The change of wording in the screening question from 'slow at learning or understanding' (1993 survey) to 'difficulty learning or understanding' (1998 survey) may have increased reporting of intellectual disability, in particular among males (Figure 8.4). The sharp increase in positive response rates to this screening question was notable in the 5–14 age group, and also among males aged 75 or older (which could be associated with dementia-related conditions).

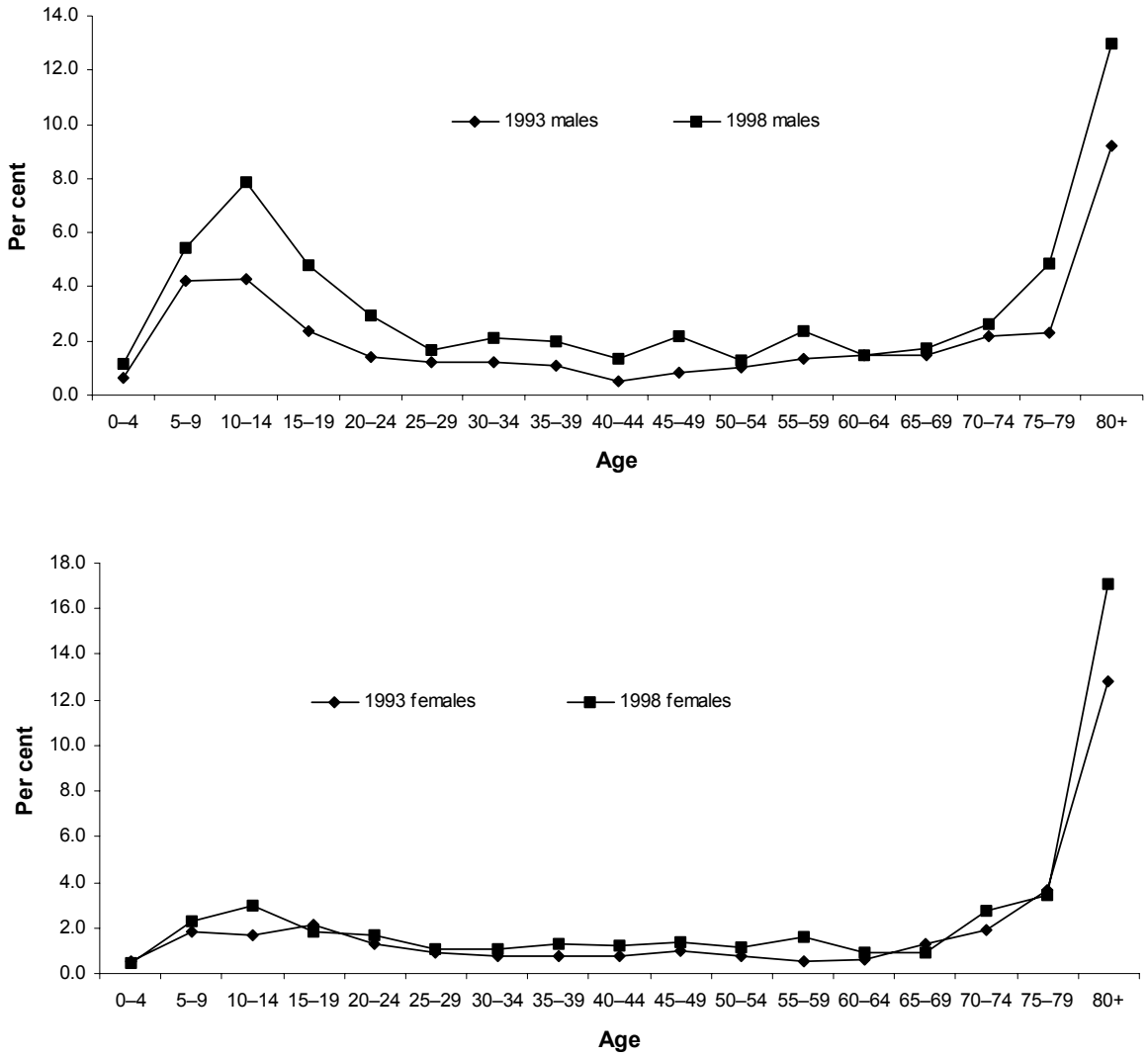
Table 8.4: People with a disability: prevalence rates (%) of all reported disabling conditions by type of condition, by age groups, Australia, 1981, 1988, 1993 and 1998

Year/sex	Psychiatric	Intellectual	Diseases of eye	Diseases of ear	Nervous system diseases	Circulatory diseases	Respiratory diseases	Musculoskeletal disorders	All other diseases and conditions
1981									
0–14	0.4	1.1	0.4	1.1	0.8	0.2	0.8	0.5	1.2
15–64	2.3	0.5	0.8	2.9	1.1	1.9	1.0	4.2	2.6
65+	6.0	1.3	8.1	16.2	3.5	13.7	3.1	16.7	10.6
1988									
0–14	0.4	1.2	0.3	1.0	0.9	0.1	1.7	0.4	1.7
15–64	1.8	0.6	0.7	2.9	1.2	1.8	1.2	4.9	3.6
65+	6.3	2.3	8.7	19.6	4.1	16.0	4.1	20.2	17.8
1993									
0–14	0.4	1.7	0.3	1.0	0.7	0.1	2.1	0.3	2.5
15–64	2.2	0.8	0.8	4.0	1.3	2.4	1.9	5.5	5.6
65+	5.9	1.4	8.9	23.3	4.5	24.9	6.7	28.6	26.6
1998									
0–14	0.3	3.6	0.2	1.1	0.6	0.2	2.2	0.2	2.0
15–64	3.4	1.7	0.6	4.7	1.6	3.0	2.2	7.5	6.6
65+	10.5	2.5	8.5	28.9	4.1	30.5	8.1	31.0	29.7

Notes

1. Percentages have been standardised using the age and sex structures of the estimated resident population at March 1998. The estimates from the previous three surveys were adjusted to show the prevalence rates that would have been expected in the 1981, 1988 and 1993 populations, if those populations had the same age and sex structure as the 1998 population.
2. The 1993 and 1998 data were adjusted to the 1981 and 1988 definition of disability.

Sources: AIHW analysis of ABS 1993 and 1998 Surveys of Disability, Ageing and Carers confidentialised unit record files; ABS 1981 Survey of Handicapped Persons unpublished data table; ABS 1988 Survey of Disabled and Aged Persons unpublished data table.



Source: AIHW analysis of ABS 1993 and 1998 Surveys of Disability, Ageing and Carers confidentialised record file.

Figure 8.4: Percentage of people reporting slowness (1993) or difficulty (1998) with learning or understanding things by sex and age, 1993 and 1998

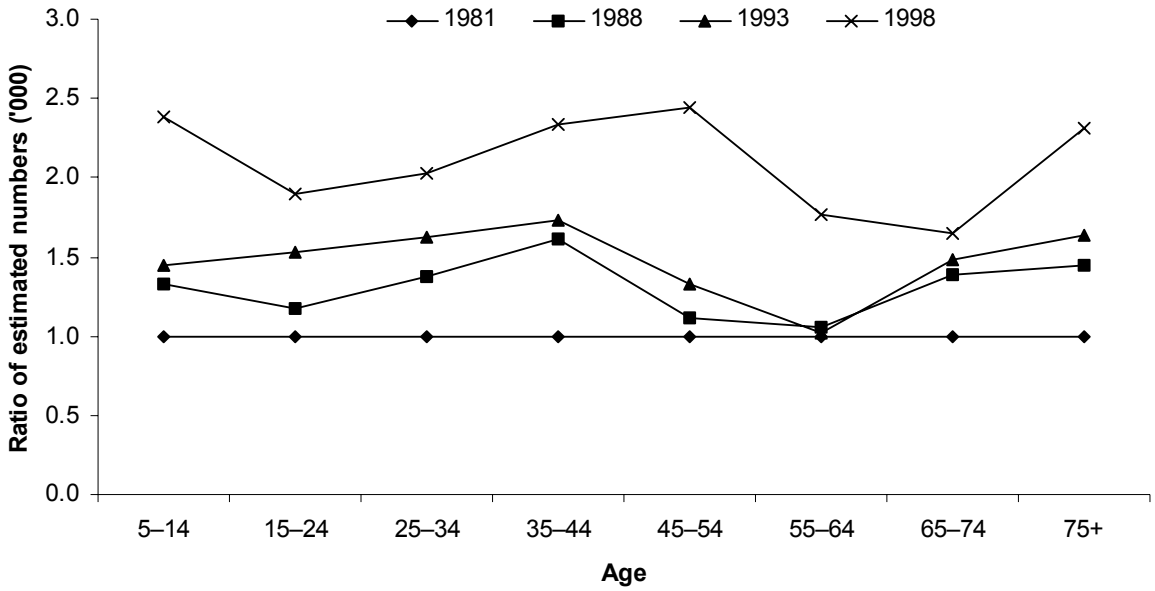
Changes in disability prevalence among the working-age (15–64) population

Among the working-age population, the age-standardised rate of severe or profound restrictions increased from 2.4% in 1993 to 3.3% in 1998, while the rates had been relatively stable at about 2.2% to 2.4% between 1981 and 1993 (Table 8.1). The increase in 1998 was particularly evident in the older working-age population, especially in the 55–59 age group (Figure 8.3).

Comparisons of age-specific prevalence rates factor out the effects of population growth and ageing. Comparisons of estimated numbers of people with a severe or profound restriction show the combined effects of population growth and age-specific prevalence rates. The ratio

of the estimated numbers of people with a severe or profound restriction (comparing 1998 to 1981) was highest at age 45–54, compared with 35–44 in 1993 (Figure 8.5). This shift mainly reflects the passage of the post–World War II baby-boom generation. The 'bulge' of the baby-boom generation is currently affecting the age profile of the working age population, as it moves progressively up the age pyramid. This demographic trend is expected to affect future disability prevalence, especially in the 55–64 year age group in the next ten years.

The 50–64 age group is the population group with the highest proportion of people receiving the Disability Support Pension. The large increase in the prevalence of severe or profound restriction among the older working-age population is likely to have some impact on the number of Disability Support Pension recipients.



Source: AIHW analysis of unpublished data tables from the ABS 1981, 1988, 1993 and 1998 disability surveys.

Figure 8.5: Ratio of the estimated numbers of severe or profound restrictions by age, 1981, 1988, 1993 and 1998

It is worth noting that there had been a large increase between 1993 and 1998 in the prevalence rate of physical/diverse conditions, in particular musculoskeletal disorders. The age-standardised rate of musculoskeletal conditions for people aged 15–64 with a disability increased from 6% in 1993 to 8% in 1998 (Table 8.4). Musculoskeletal disorders other than arthritis, particularly back problems and some soft tissue disorders, were most commonly reported for males aged 45–64 and females aged 45–54. The new screening question about chronic pain in the 1998 survey could have contributed considerably to the increase in reporting of these conditions. In 1998 a much higher proportion of the population with these conditions was classified as having a severe restriction than in previous survey years (ABS: Davis et al. 2001).

Changes in disability prevalence among the population aged 65 and over

The ageing of the aged population has had a strong impact on the prevalence of severe or profound restriction among the older population. Compared with the 1981 disability survey, the three later surveys reported substantially higher rates of disability for the older population (Figure 8.2). The rate of severe or profound restrictions for people aged 65 and over increased markedly between 1993 and 1998, from 17.1% to 19.6% (Table 8.1). The estimated number of people with a severe or profound restriction increased markedly among those aged 75 or over (Figure 8.5; AIHW 2000b: Table 13.2).

It has been suggested that about half of the increase in the rate of severe or profound restriction is due to changes in survey design and the other half is attributable to population ageing (ABS: Davis et al. 2001).

Changes in the 1998 survey screening question on learning and understanding things may have increased the number of people reporting conditions associated with dementia (Figure 8.4). The separate identification of head injuries, stroke and other brain injuries may have led to increased reporting of these conditions, especially stroke among the older population.[10] Comparative analysis indicated a large increase in the rate of psychiatric disabling conditions during 1993–1998, and sharp increases in the rate of circulatory diseases in both the 1993 and 1998 surveys (Table 8.4).

10 A screening question about head injury, stroke and brain damage with long-term effects was introduced in the 1993 survey screening questions. In 1998, the three components were separately identified, and stroke was directly coded in the circulatory conditions group (ABS: Davis et al. 2001).