

# 3 Population ageing, morbidity and disability

## 3.1 Mortality, morbidity and disability

Changes in mortality and morbidity can influence the prevalence of disability. Morbidity is defined as the level and type of sickness within a population. Morbidity indicators are commonly expressed in terms of the incidence and/or prevalence of specific diseases and other health-related events (e.g. injuries). Morbidity is an important predictor of disability. In conjunction with other factors (such as socioeconomic status) it can help predict or explain the prevalence and demographic pattern of disability in a community (Chamie 1995; Pol & Thomas 1992; United Nations 1988). Nevertheless, the relationships among mortality, morbidity and disability are complex.

The rapid decline in mortality and the increase in life expectancy in this century have chiefly been a result of the substitution of degenerative causes of death, such as heart disease and cancer, for deaths that were previously caused by infectious and parasitic diseases. This shift in disease pattern has been referred to as the epidemiological transition (Olshansky & Ault 1986).

Olshansky and Ault (1986) suggested that the United States has entered a new stage in the epidemiological transition—the era of delayed degenerative diseases. The general characteristics of the new stage include:

- the rapid decline in death rates and thus relatively rapid improvement in survival are concentrated mainly in advanced age groups; and
- the age distribution of deaths from degenerative causes is shifted progressively toward older ages.

This new stage of epidemiological transition is likely to have great impact on population ageing—increasing the size and proportion of the population in advanced age groups, and the health and vitality of older people (Olshansky & Ault 1986).

There is no dispute about the increase in size and proportion of the older population; the main debate focuses on the impact of greater longevity on trends in morbidity and disability. There is no clear resolution on this issue and contradictory evidence is presented in the international literature regarding recent and projected changes in levels and patterns of morbidity and disability. There are two schools of opinion on this issue, separated by differences in approach to measurement and underlying assumptions used.

Some authors suggest that improvements in health and medical care have delayed the onset of illness and resulted in a compression of morbidity into a short age range closer to the biological limit of life. The prevalence of disability could decrease as morbidity is compressed into the shorter span between the increasing age at onset of disability and the 'fixed' occurrence of death (e.g. Fries 1980, 1989).

In contrast, it is argued that the 'compression of morbidity is not near at hand' and that decline in mortality and increased longevity have resulted in more survivors who are frail

and suffer from chronic conditions; thus an increase in disability is observed. The longer life span has prolonged the period of life during which people perform their daily activities less efficiently as a result of increased exposure to non-fatal debilitating conditions such as arthritis (e.g. Verbrugge 1984, 1989; Hugo 1998).

Nevertheless, international studies generally suggest that increases in disability prevalence began in the late 1960s and 1970s when mortality rates at older ages began to decline significantly, but that these increases were confined to the less severe end of the disability spectrum. There is no evidence of expansion of morbidity based on measures of prevalence of more severe disability (Mathers 1998).

Recently emerging evidence from Europe and North America suggests that disability prevalence rates among older people may be starting to decline and we may actually be starting to see compression of morbidity in low-mortality populations (Mathers 1998). A number of recent studies have reported some evidence of a declining prevalence of disability among the older population in some countries in the Organisation for Economic Co-operation and Development (OECD) such as the United States (e.g. Manton et al. 1995). However, findings across data sets in the US suggest that there has been fluctuation rather than a clear ongoing trend in the prevalence of disability. Further evidence is needed before drawing conclusions on a trend of decline in disability prevalence among older population (Crimmins et al. 1997).

Data collected between 1989 and 1994 on people aged over 65 years in England and Wales showed a greatly increased prevalence of disability in the very old population, particularly women (Parker et al. 1997).

In Australia, the number of people reporting long-term health conditions increased from 6.2 million (45% of the total population) in the 1977–78 National Health Survey to 11.2 million (66% of the total population) in the 1989–90 survey and 13.5 million (75% of the total population) in the 1995 survey (ABS 1979, 1991, 1996; AIHW 1998a). Although there are some differences in the way conditions were identified and classified in the three surveys, it is clear that reported long-term morbidity in Australia has increased over the past two decades.

In the meantime, the Australian population experienced a decline in mortality and an increase in life expectancy (Table 3.1). However, the gain in life expectancy at birth in the 1980s mainly came from reduction of mortality in the 50–69 age group for males and in the age groups of 50–69 and 70 and over for females (Jain 1992). Mathers (1995) suggested that in Australia the extension of life expectancy has been accompanied by an increase in years lived with disability, although this is usually ‘mild or moderate’ disability; years lived with severe disability do not appear to have increased.

A study looking at trends in old age morbidity and disability in Britain concluded that the proportion of older people with severe disabilities in the population was remarkably stable over time (1980 to 1994–95) (Jarvis & Tinker 1999).

In Australia, a comparison of the four consecutive national disability surveys showed that the age-standardised rate of severe or profound core activity restrictions for people aged 65 and over increased from 16.2% in 1981 to 17.9% in 1988, declined marginally to 17.1% in 1993, and increased to 19.6% in 1998 (AIHW 1999a: 168). The increase was mainly in the 75-plus group, in particular very old people (Chapters 12 and 13). There is no sign of a clear declining trend in disability prevalence among older Australians, and this is particularly true for severe or profound core activity restrictions.

Comparative analysis of the three ABS disability surveys (1981, 1988, 1993) suggested that the age-standardised prevalence rates of severe or profound ‘handicap’, as defined by the

**Table 3.1: Mortality and life expectancy, Australia, 1986–1996<sup>(a)</sup>**

	Units	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
<b>Life Expectancy</b>												
Male life expectancy at birth	years	72.8	73.0	73.1	73.3	73.9	74.4	74.5	75.0	75.0	75.0	75.2
Female life expectancy at birth	years	79.1	79.5	79.5	79.6	80.1	80.4	80.4	80.9	80.9	80.8	81.1
Male life expectancy at 65 years	years	14.6	14.7	14.8	14.7	15.2	15.4	15.7	15.7	15.7	15.7	15.8
Female life expectancy at 65 years	years	18.5	18.6	18.7	18.7	19.0	19.1	19.2	19.5	19.7	19.5	19.6
<b>Mortality</b>												
Total number of deaths	'000	115.0	117.3	119.9	124.2	120.1	119.1	123.7	121.6	126.7	125.1	128.7
Crude death rate (per 1,000 population)	no.	7.2	7.2	7.2	7.4	7.0	6.9	7.1	6.9	7.1	6.9	7.0
Age standardised death rate (per 1,000 population)	no.	7.6	7.6	7.5	7.6	7.2	6.9	6.9	6.6	6.7	6.5	6.4
Infant mortality rate (per 1,000 live births)	no.	8.8	8.7	8.7	8.0	8.2	7.1	7.0	6.1	5.9	5.7	5.8
Perinatal mortality rate (per 1,000 live births and fetal deaths combined)	no.	11.5	10.6	10.7	9.9	10.3	9.6	9.4	8.2	8.0	8.1	8.5

(a) Reference periods: Data on health status are for the calendar year.

Source: Adapted from ABS 1998b: 48.

ABS, remained fairly steady between 1981 and 1993, while rates for disability increased and rates for less severe handicap varied (Wen et al. 1995). Preliminary estimates from the 1998 ABS disability survey indicate an increase in the proportions of people with a disability and specific restrictions (handicap), including severe or profound restrictions (ABS 1999). (Further analyses and discussions about the increases are presented in Chapters 12, 13 and 18.)

Possible factors contributing to the increase in reported disability and handicap prevalence levels, particularly at the less severe end of the spectrum, have been discussed (Otis & Howe 1991; Mathers 1991, 1996). Apart from the factors related to rising levels of long-term morbidity, other proposed explanations include changes in community perceptions of disability and handicap, and changes in strategies of medical prevention and intervention. Various factors affecting overall prevalence of disability in a population can be summarised as follows:

- changes in population age structures;
- changes in incidence of specific types of condition and disability;
- changes in age at onset of specific conditions and disabilities;
- changes in the diagnosis of disabling conditions;
- changes in the prevention and treatment of specific diseases (effects differ depending on nature of diseases, i.e. chronic non-fatal disease or highly fatal diseases);
- changes in mortality and life expectancy of the general population and among people with particular diseases, conditions or disabilities;
- changes in perception and awareness of disability and health;

- changes in social attitudes and economic incentives concerning sickness and disability;
- changes in personal behaviours and exposure to violence and environments that cause disease, injury or disability; and
- improvements in interviewing methods and survey design which may increase self-reported illness and disability.

There is little national data about the effects of trends in injury and its consequences on disability. However, mortality due to a number of significant external causes, such as transport and road injuries, has decreased in recent years (Abraham et al. 1995; Alessandri et al. 1996; Bordeaux & Harrison 1996). This could potentially result in increased disability prevalence, if people are surviving and living with disability rather than dying as a result of their injuries. Between 1979 and 1994, the overall number of injury deaths among children aged under 15 years declined by 51.3% while the decline has been smaller for people aged over 15 years (Moller & Kreisfeld 1997). Between 1988 and 1997, the age-standardised death rate due to all external causes of injury and poisoning fell by 21%, from 52 external caused deaths per 100,000 population in 1988 to 41 per 100,000 in 1997 (Bordeaux 1999).

The Australian Spinal Cord Injury Register has over 6,000 cases registered in its fourth year of operation, including about 4,000 cases carried over from a register that operated from 1986 to 1991. The age-adjusted incidence rate of persisting cases (people discharged from six Australian spinal units with a neurological deficit such as tetraplegia and paraplegia) was 1.52 per 100,000 in 1997–1998, as compared with 1.32 per 100,000 in 1996–1997. The number of persisting cases in 1997–1998 was higher than the average yearly figure for the combined years 1988–1990, 1995–1996 and 1996–1997 (O'Connor & Cripps 1998).

Perinatal data on the incidence of congenital malformations may also shed light on factors affecting trends in disability prevalence. The reported overall incidence of congenital malformations was higher in the late 1980s and the 1990s than that in the early 1980s, though the trend varied for different malformations (Abraham et al. 1995; Lancaster & Pedisich 1995; Lancaster et al. 1997; Hurst et al. 1999). The increase in the incidence of congenital malformations may partly reflect improved ascertainment due to new birth defect registers in some States and Territories (Abraham et al. 1995). Perinatal deaths due to congenital malformations declined from 35.9 per 10,000 births in 1973 to 15.6 per 10,000 births in 1996 (Hurst et al. 1999). Infant deaths due to congenital malformations also declined from 28.8 per 10,000 live births in 1980 to 14.8 per 10,000 live births in 1996 (Hurst et al. 1999) (also see Section 7.4).

For a person with a long-term or permanent disability, the duration of disability depends on age at onset of disability and longevity. There has been no specific study conducted on changes in age at onset of disability in Australia. It may be useful to examine the trends in age at onset of disability using the ABS disability survey data. However, since the disability surveys are cross-sectional rather than longitudinal, the analysis may be limited to generating some broad indicators. Chapters 14 and 15 contain analyses on pattern of age at onset of disability and needs for services and assistance of people with an early onset disability.

Looking at changes in age at onset of disability, it may be useful to examine not only changes relating to disability at aggregated levels—population with a disability in general—but also changes relating to particular disability groups, such as intellectual or physical disability.

## 3.2 Population ageing and prevalence of people with a disability

### Changes in prevalence between 1981 and 1993

A demographic decomposition study was carried out as part of a comparative analysis of the three consecutive ABS disability surveys (1981, 1988, 1993) to clarify two factors, population ageing and changing age-specific prevalence rates (which underlies the trends in reported overall prevalence of disability and handicap (Wen et al. 1995)).

The analysis demonstrated that the overall age-standardised prevalence rates of severe handicap were quite stable during the 1980s and early 1990s, remaining at a level of slightly over 4% for the population overall, about 2.5% for people aged 15 to 64 and around 17% to 18% for people aged 65 and over. In contrast, the age-standardised prevalence of disability and overall handicap increased substantially between 1981 and 1988, although they levelled out between 1988 and 1993 (Wen et al. 1995).

The analysis showed that the influence of changing prevalence rates within specific age groups was equal to or greater than that of population ageing in the early 1980s. However, the influence of changing prevalence rates within specific age groups diminished and actually fell below zero during the late 1980s and early 1990s. In contrast, the influence of the changing age structure was evident throughout the 12-year period. The influence of the ageing population was greater between 1988 and 1993, particularly affecting reported overall prevalence rates of severe handicap (Wen et al. 1995).

Decomposition analysis thus confirms that age structure is the dominant factor in changing reported prevalence rates of severe handicap. Between 1981 and 1993 increases in reported prevalence rates of severe handicap were largely accounted for by the ageing of the population rather than by changes in age-specific prevalence rates (Wen et al. 1995).

### Changes in prevalence between 1993 and 1998

The summary of findings from the 1998 disability survey indicates an increase in the proportions of people with a disability and specific restrictions (equivalent to handicap in previous surveys), in particular severe or profound activity restrictions, between 1993 and 1998 (ABS 1999). A preliminary comparison of the four disability surveys (1981, 1988, 1993 and 1998) showed that the overall age-standardised rate of severe or profound core activity restrictions has increased from 4.0% in 1993 to 5.5% in 1998, while the rate was relatively stable between 1981 and 1993 (ABS 1999).

In the comparison of the surveys, as far as possible, only screening questions common to all four surveys were used and prevalence rates were age standardised to the March 1998 population (ABS 1999). Nevertheless, there were a number of other changes in the 1998 survey design and interviewing methods (ABS 1993, 1999):

- The use of computer-assisted recording of responses allowed interviews to flow more smoothly, which may have affected the way people responded to survey questions.
- Questions about difficulty with tasks and need for assistance were re-ordered, to improve interview flow; this may have affected responses concerning core activities, which were used to identify severe or profound core activity restrictions.

- The SF-12 health status instrument (which included questions on activity) was used before questions about activity restrictions were asked.
- Both the profound and severe core activity restriction categories were applied to the cared accommodation component. In 1993 the severe handicap category of the previous two surveys was divided into profound handicap and severe handicap, but the severe handicap category was not applied to the establishment component (equivalent to the cared accommodation component in the 1998 survey).

It is difficult to control for these changes in a comparative analysis and to quantify their contribution to changes in estimated prevalence between 1993 and 1998.

It appears that the increase in age-adjusted rates of severe or profound restrictions may be mainly a result of changes in survey method and the attempt to increase case identification, rather than an increasing underlying prevalence. However, further investigation and analysis are needed to understand the increase in the severe or profound rates of core activity restrictions between 1993 and 1998, and other patterns of change between the two surveys (see Chapters 12, 13 and 18).