

12 Population ageing and prevalence of disability

This chapter examines the impact of population ageing on prevalence of disability, focusing particularly on changes in prevalence of severe or profound core activity restriction. Changes in the number of people with a disability in a population may be attributable to a combination of two factors: change in underlying age-specific prevalence rates and population change. Population change can be broken into two components: changes in overall population size and disproportionate growth among different age groups. Population ageing is indicated by an increasing proportion of older people in the population, as a result of higher proportional growth in older age groups.

The chapter begins with an overview of the changes in age-standardised rates of disability prevalence over a period of nearly two decades, indicated by the four ABS disability surveys (1981, 1988, 1993 and 1998), followed by a comparative analysis of changes in estimated numbers of people with disability. A demographic decomposition method is then used to estimate the impact of population change and, in particular, population ageing on the number of people with disability.

12.1 Data sources for comparisons of the four surveys

Data in this chapter are from the four ABS disability surveys—generally from unpublished data tables. In order to conduct a comparative analysis, prevalence data for the four disability surveys 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 interviewing methods are difficult to control for, and it is difficult to assess their impact on reported disability prevalence (AIHW 1999a).

12.2 Comparison of age-standardised prevalence estimates

Prevalence of disability is highly age-related. Change in population age structure is one of the most important factors affecting the prevalence of disability. Hence, to assess changes in the underlying prevalence rate of disability, it is important to begin with controlling for the impacts of population change.

To examine changes over the 17-year period 1981–1998, estimated rates of disability and activity restrictions have been standardised using 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.

The age-standardised estimates indicate that, between 1981 and 1998, disability prevalence increased from 14.6% to 18.8%, and the prevalence of specific restrictions⁹ increased from 10.7% to 16.1%. The prevalence rate of severe and profound core activity restrictions was relatively stable between 1981 and 1993, but increased from 4.3% in 1993 to 5.5% in 1998 (Table 12.1).

The age-standardised prevalence rate allows meaningful comparison of underlying prevalence rates between the four surveys by controlling for changes in population age structure. However, it is worth noting that the age-standardised rate does not reflect actual prevalence. The rate is used only for comparison of relative prevalence over time or between different population groups (e.g. between States and Territories). Unstandardised rates should be used for estimating need or demand for disability services. Therefore, the next section looks at changes in the reported number of people with disability, especially with severe or profound core activity restriction.

⁹ In the 1998 disability survey, a specific restriction is defined as a restriction in core activities (self-care, mobility and communication), schooling or employment (ABS 1999: 72). This corresponds with the concept of 'handicap' used in the previous surveys. 'Handicap' was identified as a limitation in performing certain tasks associated with daily living in the areas of self-care, mobility and verbal communication, schooling or employment, due to disability (ABS 1993).

Table 12.1: Comparison of age-standardised prevalence rates of disability for 1981, 1988, 1993 and 1998, Australia^(a)

Year/sex	Severe/profound core activity restriction ^(b)					Specific restrictions ^(b)					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

(a) Disability data were re-derived using criteria common to the four surveys. Rates are age-standardised to the estimated resident population for March, 1998.

(b) Only people aged 5 years and over are included. The estimates of overall prevalence rates of severe or profound core activity restriction and specific restrictions in 1981, 1988, and 1993 are slightly different from the rates published by the ABS (1999: Table 7). The age standardised estimates for the 1981, 1988 and 1993 surveys were slightly higher than the ABS rates, by 0.3% for severe or profound core activity restriction and by 0.7% for specific restrictions. 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 and because of this project's focus on ageing, 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. The difference between estimates in this table and the rates published by the ABS may be due to inclusion of the population aged under 5 years in the denominator for ABS rates.

Source: AIHW analysis of the ABS 1998 Survey of Disability, Ageing and Carers unpublished data tables.

12.3 Changes in reported number of people with disability

The total number of people with a disability increased by 80% over the 17-year period 1981–1998. Much of this was associated with the increase in the size of the population, especially the older population. The numbers of people with specific restrictions and with a severe or profound core activity restriction in 1998 were more than twice the numbers in 1981. The increases in all three disability categories were higher over the most recent 5-year period (1993–1998) than in the previous 5-year period (1988–1993). Between 1993 and 1998, the number of people with a severe or profound core activity restriction increased by 43%; this was almost four times the rate of increase (11%) during the 1988–1993 period (Tables 12.2, A12.1 and Figure 12.1).

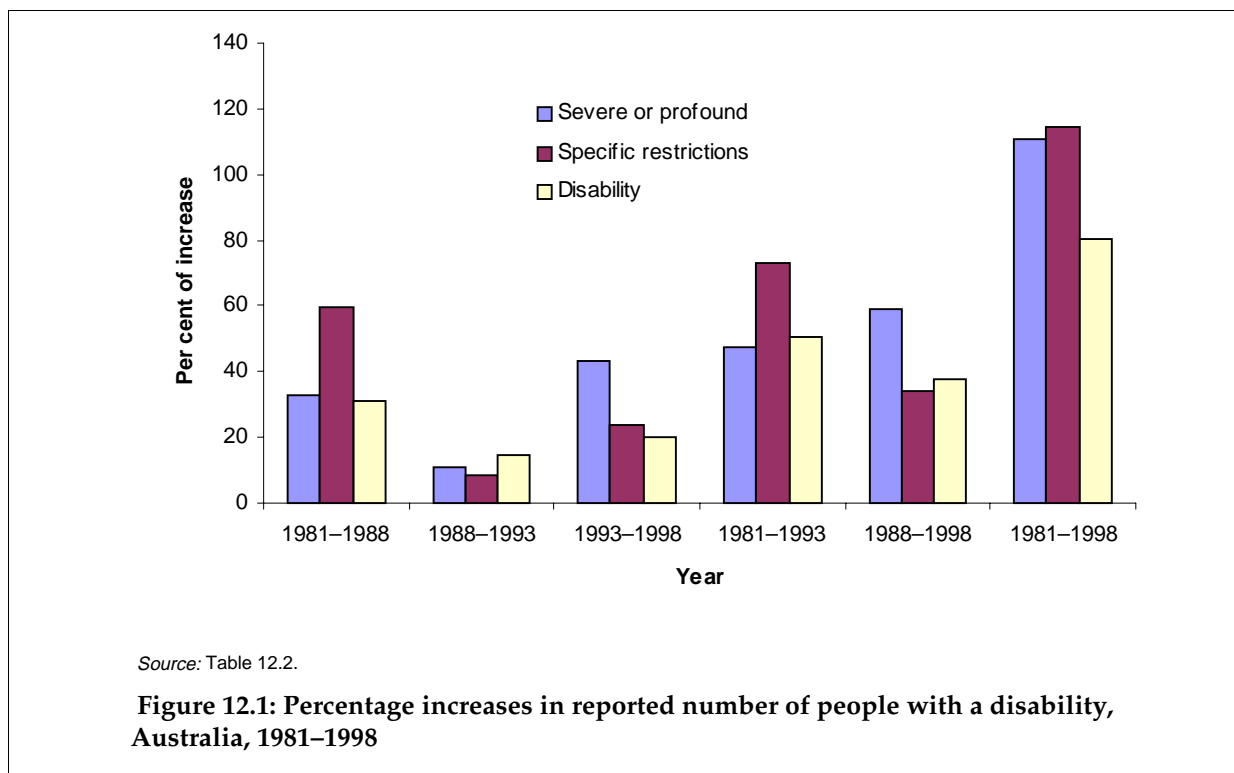
Table 12.2: Increases in disability prevalence, Australia, 1981, 1988, 1993 and 1998^(a)

Period	Age	Percentage increase in reported number of people		
		Severe or profound core activity restriction ^(b)	Specific restrictions ^(b)	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

(a) Disability data were re-derived using criteria common to the four surveys.

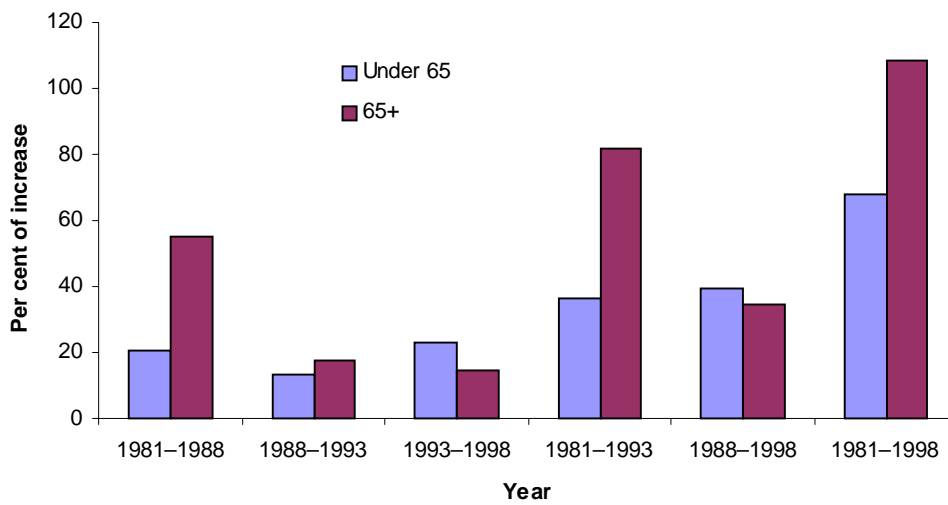
(b) Only people aged 5 years and over are included.

Source: AIHW analysis of the ABS 1998 Survey of Disability, Ageing and Carers unpublished data.



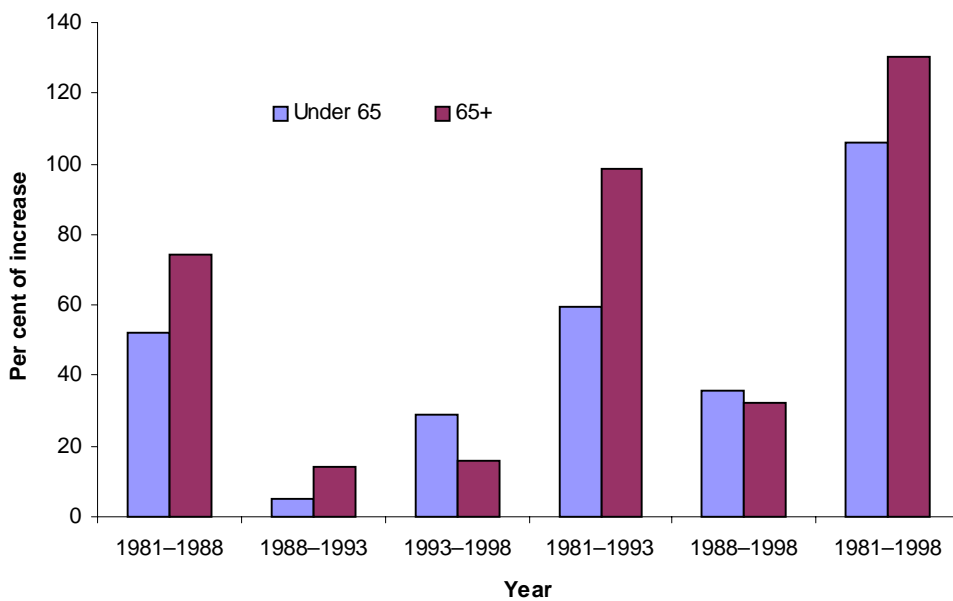
The rates of increase for people aged under 65 years were different from those for people aged 65 years and over. Overall, in the 17-year period 1981-1998, the number of people with a disability and all specific restrictions increased at a higher rate in the age group 65 years and over than in younger age groups. The rate of increase of severe or profound core activity restrictions, however, was slightly higher for people aged under 65 than for those aged 65 and over (Table 12.2, Figures 12.2, 12.3 and 12.4).

There were striking contrasts between the most recent 5-year period and earlier periods. For the periods between 1981, 1988 and 1993, the number of people with disability increased at consistently higher rates for those aged 65 years and over than for those aged under 65, in all three disability categories. However, the reverse pattern occurred between 1993 and 1998—bigger increases for people aged under 65 than for those aged 65 and over. This reverse pattern was particularly evident for severe or profound core activity restriction. This was largely attributable to a marked increase (55%) in the number of people with a severe or profound core activity restriction among those aged under 65 years between 1993 and 1998 (Table 12.2, Figures 12.2, 12.3 and 12.4).



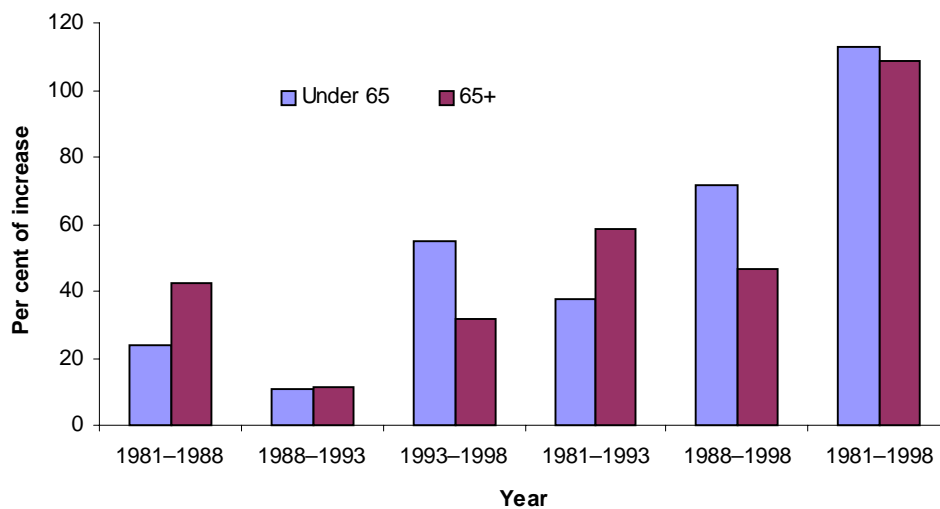
Source: Table 12.2.

Figure 12.2: Percentage increases in reported number of people with a disability by age, Australia, 1981-1998



Source: Table 12.2.

Figure 12.3: Percentage increases in reported number of people with specific restrictions by age, Australia, 1981-1998



Source: Table 12.2.

Figure 12.4: Percentage increases in reported number of people with a severe or profound core activity restriction by age, Australia, 1981-1998

12.4 Effects of population change on disability prevalence

The preceding two sections have discussed the trends in prevalence of disability, by controlling for population growth and ageing to estimate changes in underlying prevalence and by looking at the changes in reported numbers without controlling for population effects.

This section begins with an overview of population change. It then uses a demographic decomposition method to quantify the overall effect of population change on disability prevalence and to separate the overall effect into two components: change in population size and disproportionate growth among age groups (population ageing).

Population growth and changes in population age structure

Table 12.3 shows that, in contrast to a general population growth rate of 27% between 1981 and 1998, growth rates for the population aged between 35 and 54 years ranged from 48% to 76%, with the peak of 76% in the age group 45-49. This reflects the passage of the post-World War II baby-boom generation.

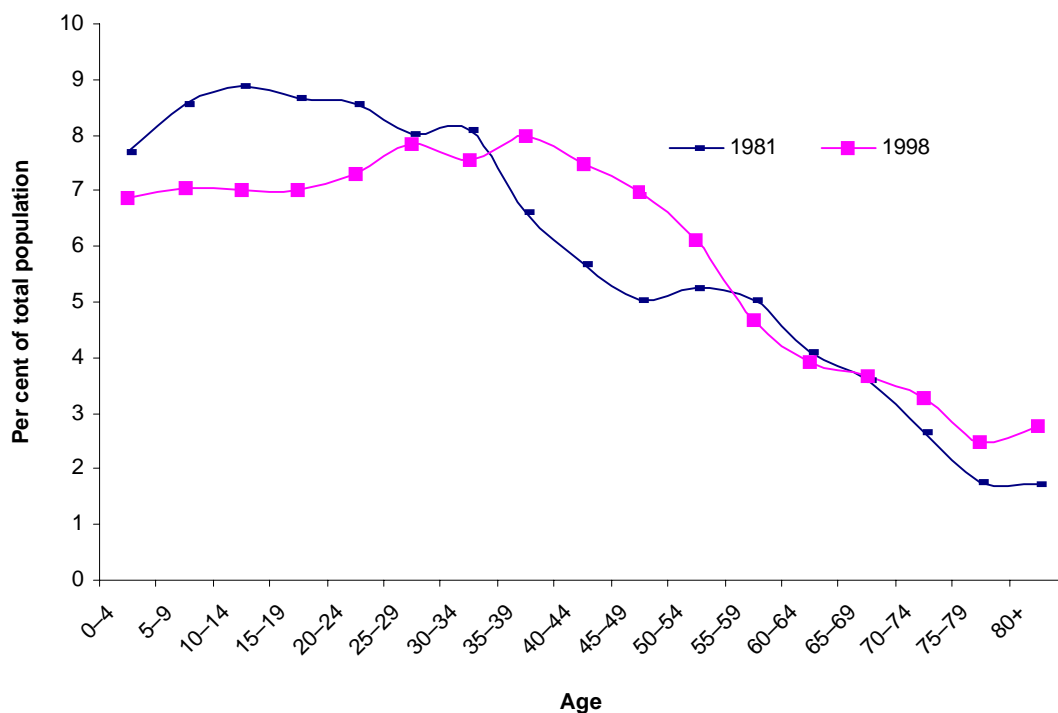
Growth rates for the population aged 70 years and over were even higher, ranging from 56% for the 70-74 age group to 102% for the 80 years and over age group. This was partly due to the increased survival rate of older Australians, as well as the large numbers of people born during the post-First World War period, and post-World War II immigrants who arrived in Australia in the 1950s as young adults, moving into the oldest age groups (see Chapter 2).

The disproportionate growth in certain age groups has resulted in changes in population age structure, resulting in a general pattern of population ageing between 1981 and 1998. The proportion of the population aged under 25 years has declined, while the proportion of the population aged between 35 and 54 years has increased substantially. There has also been a significant increase in the proportion aged 65 years and over (Figure 12.5 and Table 12.3). The next section will quantify the impact of these demographic changes on the prevalence of disability.

Table 12.3: Changes in population size and age structure, Australia, 1981–1993

Age	Population age structure (% of total population)				Population growth (%)
	1981	1988	1993	1998	1981–1998
0–4	7.7	7.5	7.3	6.9	13.6
5–9	8.6	7.4	7.2	7.1	4.6
10–14	8.9	7.6	7.1	7.0	0.2
15–19	8.7	8.4	7.4	7.0	2.5
20–24	8.6	7.9	8.2	7.3	8.2
25–29	8.0	8.4	7.8	7.9	24.2
30–34	8.1	8.0	8.3	7.6	18.8
35–39	6.6	7.7	7.7	8.0	53.2
40–44	5.7	7.0	7.4	7.5	66.6
45–49	5.0	5.4	6.5	7.0	75.6
50–54	5.3	4.7	5.0	6.1	47.8
55–59	5.0	4.5	4.3	4.7	17.6
60–64	4.1	4.5	4.1	3.9	21.5
65–69	3.6	3.8	3.9	3.7	29.4
70–74	2.7	2.9	3.1	3.3	56.1
75–79	1.8	2.1	2.2	2.5	79.2
80+	1.7	2.1	2.4	2.8	102.3
Total	100.0	100.0	100.0	100.0	27.0

Source: AIHW analysis of the ABS 1998 Survey of Disability, Ageing and Carers unpublished data tables.



Source: Table 12.3.

Figure 12.5: Comparison of population age structures, Australia, 1981 and 1998

Demographic decomposition

The demographic decomposition method enables us not only to estimate the overall impacts of population change but also to separate effects attributable to changes in total population size and those due to differential growth among age groups (population ageing) (Otis & Howe 1991).

The first stage of the method assesses the overall effect of population change on the number of people with a disability and specific activity restrictions.

The second stage separately examines the effects of the two components—change in population size and change in age structure. This allows us to determine the proportion of the increase due to population ageing. Population ageing is the effect of differential growth among age groups resulting, in Australia, in relatively higher growth in older age groups with higher age-specific prevalence of disability.

The effect of growth in total population size can be estimated by subtracting the impact of population ageing from the overall effects of population change.

The demographic decomposition method is explained in detail below.

Calculating total change

Step 1: Data from the four ABS surveys are used to calculate absolute increases in the reported number of people with a disability, specific restrictions and severe or profound core activity restrictions in the periods 1993–1998, 1988–1998 and 1981–1998.

Calculating the overall effects of population change

Step 2: Age-sex-specific prevalence rates for 1981, 1988 and 1993 are applied to the estimated resident population for March 1998, to estimate the expected numbers of people with a disability, specific restrictions and severe or profound core activity restrictions for 1981, 1988 and 1993, respectively, i.e. the numbers that would have been expected in 1981, 1988 and 1993 had the population size, age and sex structure in those years been the same as in 1998. This step produces estimates based on 'constant' prevalence rates.

Step 3: The actual numbers reported in 1981, 1988 and 1993 are then subtracted from the expected numbers, to give the change in numbers attributable to the overall effects of population change.

Step 4: The results of Step 3 (i.e. change due to population effects) are divided by the results of Step 1 (i.e. total change) to estimate the proportion of the change that can be explained by the overall effects of population change.

Calculating the effects of different components of population change

Step 5: The age and sex distribution of each of the 1981, 1988 and 1993 populations is applied to the total 1998 population. This gives three projected 1998 populations with the same age and sex composition as the 1981, 1988 and 1993 populations, respectively.

Step 6: The age–sex-specific prevalence rates of 1981, 1988 and 1993 are applied to the three projected 1998 populations, respectively, to estimate the expected numbers of people with a disability, specific restrictions and severe or profound restrictions. This step assumes not only constant prevalence rates (as for Step 2) but also constant population age and sex distributions of the 1981, 1988 and 1993 populations. Only total population size is changed, to that of the 1998 population.

Step 7: These results are then subtracted from the results of Step 2 to estimate changes in expected numbers due to disproportionate growth among age groups.

Step 8: The resulting numbers of Step 7 (i.e. changes due to population age and sex structure) are divided by the results of Step 1 (i.e. total change) to estimate the proportion of the change that can be explained by changes in population age and sex structure.

Step 9: The proportion of change due to the effects of change in total population size alone is calculated by subtracting the results of Step 8 (i.e. proportion of change due to changes in age and sex structure) from the results of Step 4 (i.e. proportion of change due to overall population change).

Data limitations

There are some specific limitations of the ABS unpublished data tables that affect analyses using the decomposition method:

- The available age-specific data use 10-year age groups for people aged under 55 years, 5-year age groups for people aged between 55 and 74 years, and one open-ended age group of 75 years and over. In the analysis, the impact of population ageing (disproportionate growth between age cohorts) may be underestimated for the older

working age population and for the population aged 75 years and over, due to the broad age groupings.

- The number of people with moderate core activity restriction increased from 278,100 in 1981 to 551,800 in 1988, dropped to 377,000 in 1993, and then jumped to 506,700 in 1998. This pattern is unlikely to reflect real changes in prevalence. Given that our focus is on severe or profound core activity restrictions, moderate and mild core activity restrictions are not presented as separate categories in the following comparative data tables (e.g. Table 12.4).

Results of the decomposition

The demographic decomposition analysis shows that, over the 17 years 1981–1998, the overall effects of population growth accounted for 50% of the increase in the number of people with a disability and 45% of the increase in severe or profound core activity restrictions (Table 12.4). This impact was more evident during the most recent 10 years (1988–1998). Between 1988 and 1998, the effects of population growth were almost equal to, or greater than, the effects of population growth over the entire 17 years (1981–1998), despite the fact that the impact of population change usually increases when a longer period is considered. Between 1988 and 1998, 56% of the increase in disability, 64% of the increase in specific restrictions and 43% of the increase in severe or profound core activity restrictions were due to population growth, as compared with 50%, 38% and 45% of the increases over the entire 17-year period (Figure 12.6 and Table 12.4).

As expected, the effects of population growth on the numbers of people with severe or profound core activity restriction differed markedly between people aged under 65 years and people aged 65 years and over (26% versus 67% during 1981–1998), and these differences also increased over the most recent 10 years (23% versus 73% during 1988–1998) (Figure 12.7 and Table 12.4).

Insight into the impact of differential growth among age groups (population ageing) on the number of people with a disability is provided by the separation of the two components of population change (change in overall population size, and change in population age- and sex-structure). Figures 12.8, 12.9, 12.10 and Table 12.4 show the disaggregated effects of disproportionate growth between age groups versus changes in population size. Over the entire 17-year period, increased population size appears to have contributed more to the increase in disability prevalence than have changes in population age structure (33.5% as against 16.6%). Nevertheless, the contributions of the two components were similar when only more severe disabilities were considered (24.4% versus 20.5%), suggesting that population ageing has had a strong impact on the prevalence of severe or profound core activity restriction.

When the most recent 10-year period is considered, as a striking contrast, the effects of population ageing were 1.3 times the effects of increase in population size for disability generally (32% versus 24%), 1.5 times for all specific restrictions (39% versus 26%) and 2.6 times for severe or profound core activity restrictions (31% versus 12%) (Table 12.4; Figures 12.8, 12.9 and 12.10).

Among people aged 65 years and over, over the 17-year period (1981–1998) population ageing accounted for 34% of the increase in disability (Table 12.4 and Figure 12.11). Again, the pattern for the most recent 10-year period (1988–1998) is markedly different—population ageing contributed 84% of the increase in disability between 1988 and 1998 for this age group. The contribution of population ageing to increases in all specific restrictions was 94% (1988–1998) versus 30% (1981–1998), and for severe or profound care activity restrictions,

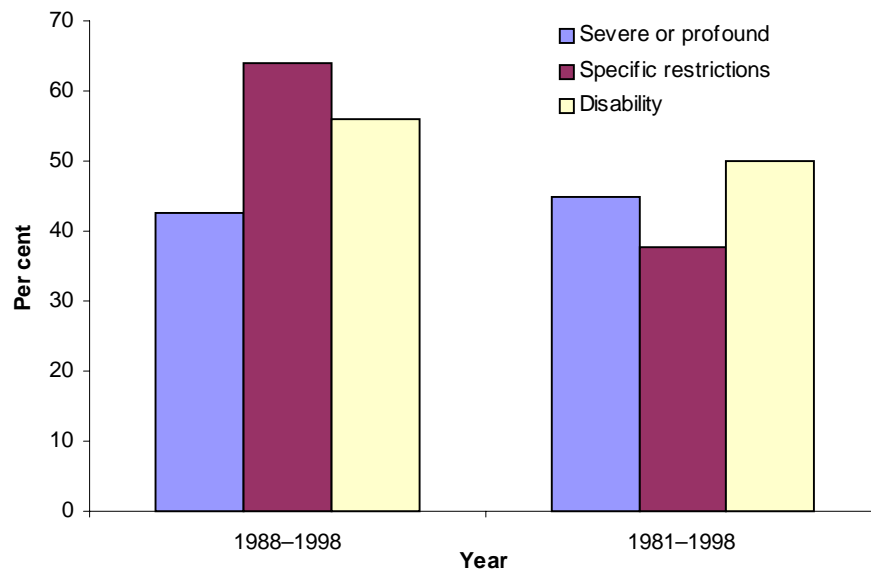
75% (1988–1998) versus 42% (1981–1998). This reflects an increasing effect of population ageing during the more recent period (Table 12.4).

Table 12.4: Effects of population growth on disability prevalence, Australia, 1981–1998^(a)

Period	Age	Severe or profound core activity restriction	Specific restrictions	Total with disability
% changes due to overall population growth				
1993–1998	Under 65	14.1	28.5	34.1
	65+	47.8	85.0	87.1
	Total	26.6	43.3	48.6
1988–1998	Under 65	22.7	46.7	40.6
	65+	72.5	95.9	86.7
	Total	42.6	64.1	56.0
1981–1998	Under 65	26.1	28.9	44.0
	65+	66.7	51.0	58.8
	Total	44.8	37.6	50.1
Decomposition of population effects—% changes due to:				
1988–1998	<i>Differential growth between age groups</i>			
	Under 65	1.9	8.1	5.8
	65+	74.7	94.3	84.1
	Total	31.0	38.6	31.9
	<i>Growth in population size alone</i>			
	Under 65	20.8	38.6	34.8
	65+	–2.2	1.6	2.6
	Total	11.7	25.5	24.1
	1981–1998	<i>Differential growth between age groups</i>		
Under 65		2.2	3.5	4.4
65+		41.8	30.3	34.0
Total		20.5	14.0	16.6
<i>Growth in population size alone</i>				
Under 65		23.9	25.4	39.6
65+		24.9	20.7	24.8
Total		24.4	23.6	33.5

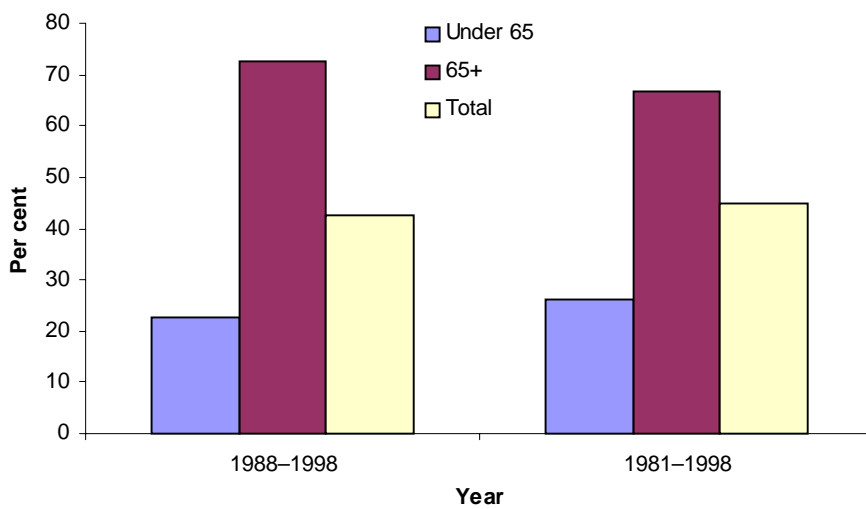
(a) This table summarises the results of demographic decomposition. Detailed illustrations of the method and calculation are in the previous section.

Source: AIHW analysis of the ABS 1998 Survey of Disability, Ageing and Carers unpublished data tables.



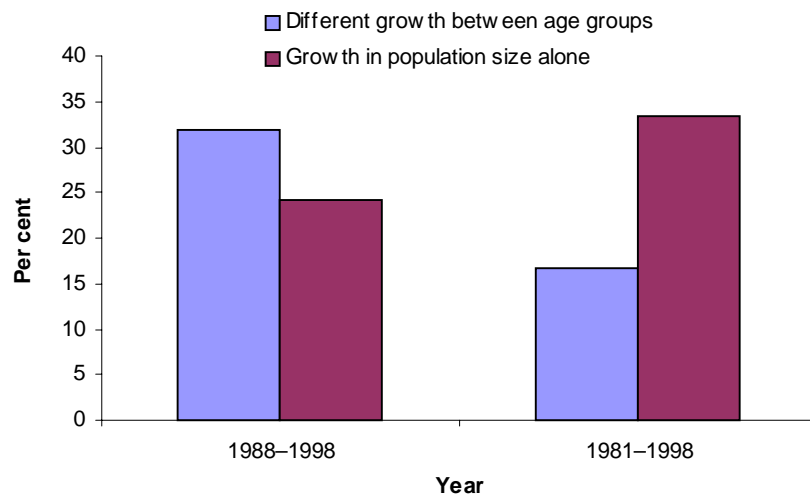
Source: Table 12.4.

Figure 12.6: Changes in prevalence of disability due to population growth, Australia, 1981-1998



Source: Table 12.4.

Figure 12.7: Changes in prevalence of severe or profound core activity restriction due to population growth, by age, Australia, 1981-1998



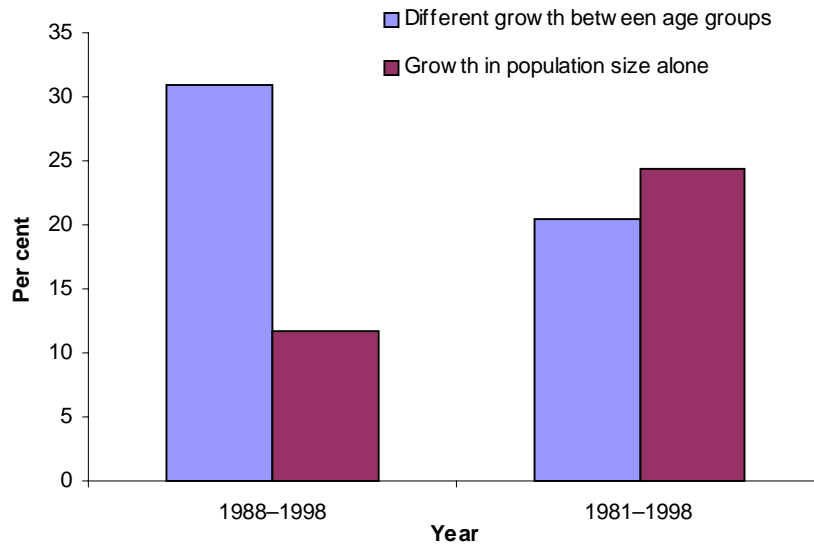
Source: Table 12.4.

Figure 12.8: Decomposition of population effects on prevalence of disability, Australia, 1981-1998



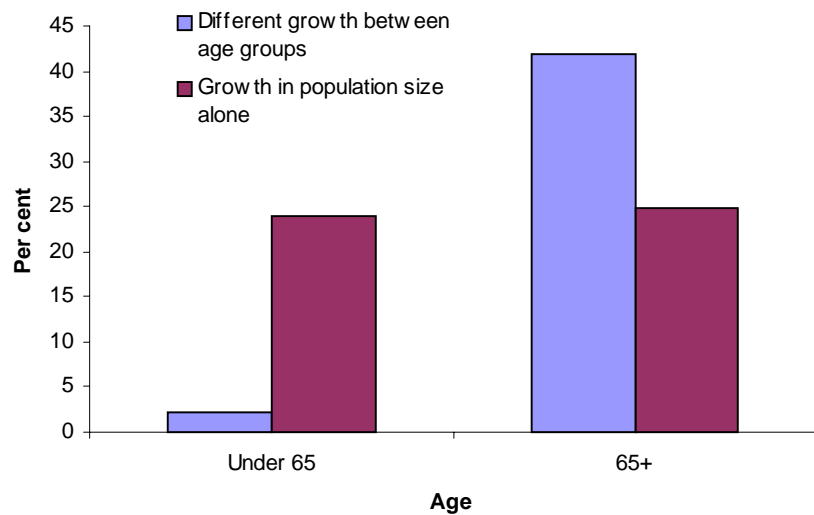
Source: Table 12.4

Figure 12.9: Decomposition of population effects on prevalence of specific restrictions, Australia, 1981-1998



Source: Table 12.4.

Figure 12.10: Decomposition of population effects on prevalence of severe or profound core activity restrictions, Australia, 1981-1998



Source: Table 12.4.

Figure 12.11: Decomposition of population effects on prevalence of severe or profound core activity restrictions, by age, Australia, 1981-1998

12.5 Summary

The comparative analyses of the four ABS disability surveys in this chapter reveal the following trends in population change and their impact on prevalence of disability:

- The comparison of age-standardised estimates showed that between 1981 and 1998 the disability prevalence rate increased from 14.6% to 18.8%, and the rate for all specific restrictions increased from 10.7% to 16.1%. The rate for severe or profound core activity restrictions increased from 4.3% in 1993 to 5.5% in 1998, though the rate was relatively stable between 1981 and 1993.
- Between 1981 and 1998, the total number of people with a disability increased by 80%, from 1,942,200 in 1981 to 3,503,700 in 1998. The number of people with a severe or profound core activity restriction in 1998 (954,900) was more than twice that in 1981 (452,900) (Table A12.1).
- 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%).
- During the 17-year period 1981–1998, population growth contributed about 50% of the increase in the number of people with a disability, and 45% of the increase in the number of people with severe or profound core activity restriction.
- Over the entire 17 years, increase in population size contributed more than population ageing to the increase in the number of people with a disability. However, the impact of population ageing was more evident during the most recent 10 years (1988–1998). Over that period, the effect of population ageing on the increase in disability prevalence was 1.3 times the magnitude of the effect of increasing population size, 1.5 times for all specific restrictions and 2.6 times for severe or profound core activity restriction.

The analyses suggest that population ageing has had a strong impact on the prevalence of severe or profound core activity restriction, and that effect has been particularly evident among people aged 65 years and over in the last decade.

The 1998 ABS disability survey indicated a substantial increase in the number of people with a severe or profound core activity restriction between 1993 and 1998. Although population factors, in particular population ageing, could explain a significant part of the increase, some change remains to be explained. Detailed discussions are presented in Chapters 13 and 18.