

**Chronic disease and participation
in work**

Superseded
19/2/2009

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Contents

Acknowledgments	vi
Summary	vii
Key findings.....	vii
Other findings.....	vii
1 Introduction	1
2 Scope, definitions and data limitations	3
2.1 Scope	3
2.2 Definitions	4
2.3 Data limitations	5
3 Overview of chronic disease status and labour force status	7
3.1 Chronic disease status	7
3.2 Labour force status.....	8
4 Chronic disease and employment	10
4.1 The association between chronic disease and employment.....	10
4.2 The association between multiple chronic disease and employment.....	15
5 Chronic disease and absenteeism	17
5.1 Absenteeism.....	17
5.2 Occupation	18
5.3 Multiple chronic disease and absenteeism	19
6 Loss in workforce participation	20
6.1 Loss associated with reduced employment.....	20
6.2 Loss associated with absenteeism.....	23
6.3 Loss associated with death from chronic diseases	26
7 Discussion	28
Appendix 1: Data and methods	31
Data sources	31
Statistical methods	31
Appendix 2: Detailed tables	33
References	39

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Superseded
19/2/2009

Summary

Labour force participation and absenteeism are issues of primary interest in Australia, particularly with ageing of the population and increasing prevalence of chronic disease. This report provides a conservative estimate of the annual cost to the Australian economy in terms of decreased participation in full-time and part-time employment, and lost participation due to absenteeism for persons who reported having a chronic disease, and loss to the labour force due to death from chronic disease.

Key findings

- After adjusting for age and sex, people with chronic disease were 60% more likely to not participate in the labour force, were less likely to be employed full-time, and more likely to be unemployed, than those without chronic disease.
- Males with chronic disease were more than twice as likely to not participate in the labour force compared to males without chronic disease.
- People with chronic disease had, on average, 0.48 days off work in the previous fortnight due to their own illness, compared with 0.25 days for those without chronic disease.
- The annual loss in workforce participation from chronic disease in Australia was around 537,000 person-years of participation in full-time employment, and approximately 47,000 person years of part-time employment.
- Of the total loss in full-time employment, 40% was associated with arthritis, approximately 25% with depression, and around 10% each with asthma and chronic obstructive pulmonary disease.
- The overall loss to the workforce associated with the chronic diseases assessed here, amounts to around half a million person-years.

Other findings

- Of approximately 10.5 million Australians aged 25–64 years, about 33% reported at least one of the following chronic diseases in 2004–05: arthritis, asthma, coronary heart disease, chronic obstructive pulmonary disease, depression, diabetes, osteoporosis or cerebrovascular disease (stroke). The most commonly reported chronic diseases were arthritis, asthma and depression.
- Older people were more likely to have chronic disease than younger people (54% of 55–64 year olds compared with 21% of 25–34 year olds).
- Arthritis, asthma and depression were associated with 76% of the total loss due to days away from work (29% associated with depression, 24% with arthritis and 23% with asthma).
- For people participating full-time in the labour force, there was a loss of approximately 367,000 person-years associated with chronic disease, approximately 57,000 person-years in absenteeism associated with chronic disease and 113,000 person-years were lost due to death from chronic disease.

- For part-time participation, the losses were 14,000 person-years associated with chronic disease and 33,000 person-years due to death from chronic disease.
- Loss to the full-time labour force due to death ascribed 52% to cancers, 19% to coronary heart disease and 17% to depression.
- For loss in part-time employment, 42% was associated with arthritis and 23% with depression. For loss due to death, 64% was from cancer and about 12% each from depression and coronary heart disease.

Estimates of loss do not take into account lower performance while at work, nor do they incorporate the impact of morbidity due to cancer and renal disease. Furthermore, these estimates relate to people aged 25–64 years (excluding students who are not in the labour force). Similarly, the effect of loss from participation in the unpaid labour force (carers, parents and volunteers) has not been accounted for. The estimates, therefore, underestimate the loss in workforce participation associated with chronic disease.

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19/2/2009

1 Introduction

With ageing of the Australian population and increasing prevalence of some risk factors such as obesity, chronic disease prevalence is on the rise.

In the 2004–05 National Health Survey (NHS), 77% of all of Australians reported at least one long-term condition (for example, chronic disease, cancer, short- or long-sightedness). Some commonly reported major conditions were asthma (in 10% of the total population), osteoarthritis (8%), depression (5%) and diabetes (4%) (AIHW 2006). In the same survey, 33% of Australians aged 25–64 years (excluding full-time students not in the labour force) reported at least one of the following chronic diseases: arthritis, asthma, chronic obstructive pulmonary disease (COPD), coronary heart disease (CHD), depression, diabetes, osteoporosis or stroke.

Chronic disease can result in functional limitation and disability associated with ill health. Consequently, people with chronic disease may be limited in their ability to participate fully in the workforce (Musich et al. 2006, Popkin et al. 2006). Previous analysis of the 1989–1990, 1995 and 2001 National Health Surveys found that people not in the labour force were more likely to have long-term conditions compared with people in the labour force (Jose et al. 2004).

The 2001 NHS was used to assess the association between obesity and workplace absenteeism (AIHW 2005). This research suggested that older (55–64 years) obese persons were more likely to have days off due to illness or injury, and to have had, on average, longer absences.

Recent surveys of the Australian labour force suggested that 31% of people aged 45 years and over reported that they intended to retire between 45 and 64 years of age, and that ‘personal health or physical abilities’ would influence their decision regarding when to retire (ABS 2006a). The same report indicated that 28% of people aged 45–64 years who had retired within the last 20 years did so for reasons relating to ‘their own sickness, injury or disability’.

In this report, the 2004–05 NHS data have been used to assess the association between the presence of selected chronic diseases and participation in the workforce. Workforce participation is described using two measures:

- labour force participation
- absenteeism due to illness.

Labour force participation was also described according to the prevalence of multiple chronic diseases. As premature death also reduces the size of the labour force, years of life lost by persons aged 25–64 years due to death from chronic disease were estimated using the 2004 national mortality data. The overall loss to the workforce (full-time and part-time) associated with morbidity from chronic diseases, absence from work due to personal illness or injury and mortality from chronic diseases, was estimated in terms of annual person-years. This analysis emphasises the impact of chronic disease on the total potential Australian workforce.

This report highlights the loss in workforce participation associated with chronic disease. The findings may add to the impetus for national action to reduce the prevalence of chronic disease and create more work-enabling environments for people with chronic disease. This is particularly important in light of efforts to enable mature workers to remain in the workforce

(PMSEIC 2003). It also highlights the benefits for workplaces which engage in health-promoting activities.

Details of the scope and definitions are presented in the next section. Appendix 1 contains details of the data sources and methods. Appendix 2 contains additional statistical tables.

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2 Scope, definitions and data limitations

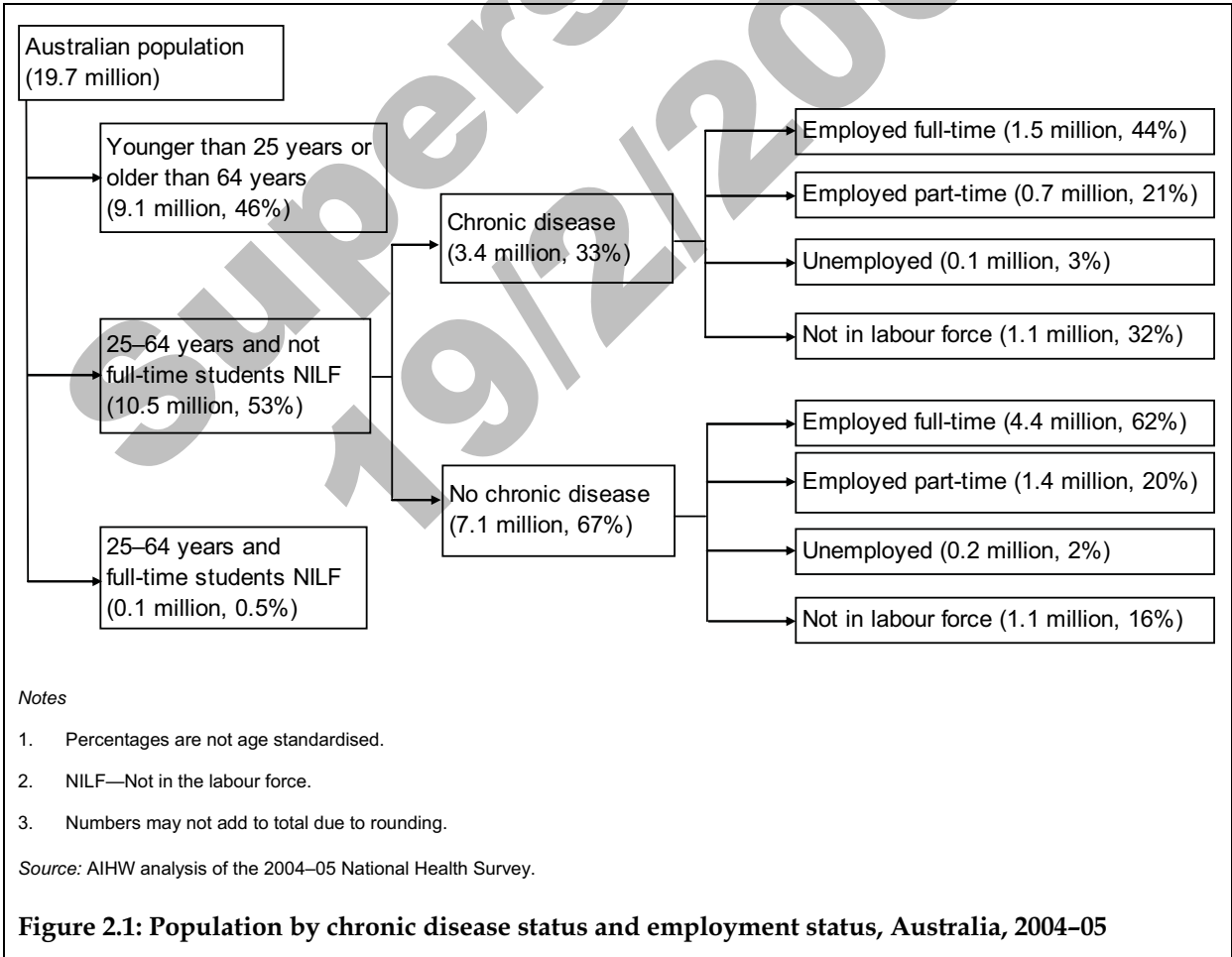
2.1 Scope

Population

The population used for this analysis comprised approximately 10.5 million Australians aged 25–64 years (Figure 2.1). Of these:

- approximately 8 million people (76%) were employed: 5.9 million (56%) full-time and 2.1 million (20%) part-time
- nearly 270,000 (3%) were unemployed
- around 2.3 million (21%) were not in the labour force.

Carers, parents, volunteers and others who were neither employed nor unemployed were retained in the analysis and counted as ‘not in the labour force’ (even though their activities contributed to productivity, there was no means of identifying them). The study population excluded approximately 82,000 full-time students who were not in the labour force.



2.2 Definitions

Employment status

In this analysis, employment status refers to a person's participation in full-time or part-time employment, engagement in searching for full-time or part-time employment or non-participation in the labour force. Full-time employment indicated that a person worked 35 hours or more in the week prior to the survey and part-time work suggested the person worked more than one hour and less than 35 hours in that week. People were classified as 'unemployed' if they were actively engaged in finding full-time or part-time work in the four weeks prior to interview and were available to start work, or were waiting to start work within the four weeks post-interview. People were classified as 'not in the labour force' (NILF) if they were neither employed nor unemployed (ABS 2006b).

Chronic disease

The NHS collected information about a range of long-term conditions. The analysis of morbidity in this report was restricted to selected priority chronic diseases highlighted by the Department of Health and Ageing and which could be identified using the NHS. These diseases were arthritis, asthma, chronic obstructive pulmonary disease (COPD), coronary heart disease (CHD), depression, diabetes, osteoporosis and stroke. Cancers and renal disease were excluded from the analysis of NHS data (due to data quality and non-collection, respectively), but were included in the analysis of mortality data where data quality was accurate and coverage complete.

Morbidity from chronic disease

Information relating to the presence of the selected conditions was self-reported. The selected conditions were all assumed to be long term, that is, had lasted or were expected to last six months or more. Arthritis, CHD (heart attack and/or angina), osteoporosis and stroke were indicated if the respondent alluded to currently having the condition regardless of whether or not they had been told they have the condition by a doctor or nurse. Diabetes refers to Type 2 diabetes and was indicated if the respondent currently had the condition, regardless of confirmation by a doctor or nurse. People were classified as having asthma if they had ever been told by a doctor or nurse that they have the condition and that the condition was current and long term. Depression was derived according to whether the respondent indicated feeling depressed and/or having other mood affective disorders. The presence of COPD was indicated if the respondent mentioned having bronchitis and /or emphysema.

Mortality from chronic disease

Deaths due to chronic disease were classified according to the rules and conventions of the International Classification of Diseases version 10 (ICD-10). In this report, deaths due to chronic disease refer to deaths where the recorded underlying cause of death was one of the chronic conditions specified. The estimates were based on deaths registered in 2004. Deaths due to depression were estimated as a proportion of suicide deaths attributed to depression according to burden of disease (Begg et al. 2007).

The ICD-10 categories (codes in brackets) for these causes of deaths are:

- Arthritis (M05, M06, M15–M16)
- Asthma (J45, J46)
- Cancer (C00–C97)
- CHD (I20–I25)
- COPD (J41–J44)
- Depression (a proportion of deaths coded to X60–X84)
- Diabetes (E10–E14)
- Osteoporosis (M80–M82)
- Renal disease (N17–N19)
- Stroke (I60–I69)

Age

Age refers to age in years of the survey respondent. For the purposes of this report, age was restricted to persons aged 25–64 years. Ten-year age groups (25–34, 35–44, 45–54 and 55–64) were used for presentation and age standardisation.

Absenteeism

Absenteeism refers to days away from work as a result of personal illness or injury. In the NHS information about absenteeism was ascertained for the fortnight (14 days) prior to the interview. A day away was defined as more than half of the working day. This information was self-reported. Self-reported days away from work have been shown to correlate well with company-reported absenteeism (Aldana & Pronk 2001).

Occupation

Occupation (or main job held at the time of the survey) was classified using the Australian Standard Classification of Occupation. See ABS 2006b for more detail.

2.3 Data limitations

The NHS data were obtained using self-report. As a result, chronic disease, labour force status and absenteeism were based on self-reported data.

A major limitation of this analysis is that it is based on cross-sectional data. As a result, only associations between participation in work and chronic disease can be determined. That is, there is no means of assessing whether presence of a chronic disease gives rise to a person's level of participation in work or whether participation in work depends upon their health status. All analyses presented in this report represent associations between workforce participation and chronic disease.

While it is unlikely that healthy people would misleadingly self-report chronic disease, it is known that many people with chronic disease are unaware of their condition, and consequently report not having the condition. For example, a substantial proportion of people live with diabetes while being unaware of their condition (AIHW 2008), resulting in

underestimation of the true prevalence of diabetes. In addition, there are limitations associated with identifying persons with COPD (here based on persons who report either bronchitis or emphysema) and depression (here based on those reporting either depression or other mood affective disorders) in the NHS. As a result, the total impact on participation in work associated with chronic disease is believed to be underestimated in this report.

The estimates are further limited due to:

- Restriction of the analysis to persons aged 25–64 years. This age range provides scope for reliable assessment of chronic disease prevalence. The age group 25–64 years also enables adequate assessment of the effects of chronic disease on the working population. However, it is recognised that there are persons with chronic disease outside of this age range and that younger and older people participate in the labour force.
- Exclusion of dwellings other than private homes in the NHS sample. For example, the true prevalence of chronic disease may be under-reported because the NHS sample excludes hospitals and other institutions where appreciable numbers of people with chronic disease may reside.
- Exclusion of certain chronic diseases. For example, self-reported information regarding all cancers was excluded from the analysis due to its susceptibility to misreporting (ABS 2006b). Information about renal disease was not collected in the 2004–05 NHS and is therefore not included in the morbidity analysis.
- Omission of the impact on the unpaid labour force associated with chronic disease. Clearly, many people who are not in the labour force contribute substantially to productivity (for example parents, carers and volunteers). Their exclusion reflects the difficulty in identifying this group rather than not recognising their contribution, and, as a result, this report assesses the association between chronic disease and participation in the paid labour force.
- Removal of the population of full-time students who were not in the labour force. This group were assumed to be not in the labour force as a result of their full-time engagement in study. Their exclusion may result in under-reporting of the prevalence of chronic disease.
- Exclusion of the association between absenteeism among carers of people with a chronic disease. It is likely that this led to an underestimate of the loss in workforce participation through absenteeism.
- Exclusion of the effect of ‘presenteeism’ on productivity in labour force participation. This analysis does not consider the reduction in productivity of people with chronic disease while at work (that is, presenteeism). ‘Time away from work’ captures only part of the impact of employee health on participation (Musich et al. 2006).

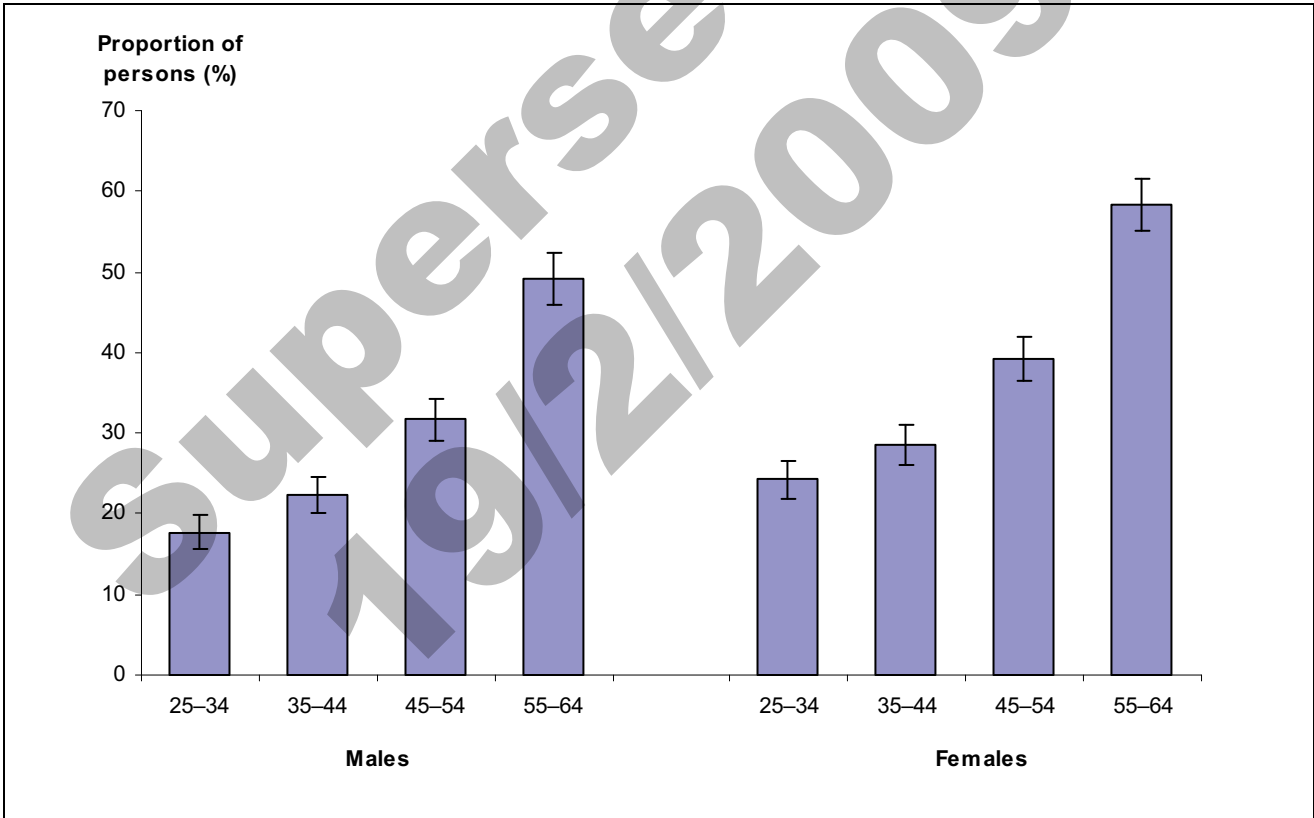
The extent of the underestimation of the association between chronic disease and labour force participation is unclear. However, this analysis does place a lower boundary on the cost of chronic diseases on paid work in Australia.

3 Overview of chronic disease status and labour force status

3.1 Chronic disease status

Based on results from the 2004–05 NHS, about one third (3.4 million) of the 10.5 million working-aged Australians self-reported one of the eight chronic diseases. Among these people, females were more likely than males to self-report chronic disease (35% compared with 28%). Older people self-reported chronic disease more than younger people – 54% of people aged 55–64 years compared with 21% aged 25–34 years.

These patterns were consistent by sex (Figure 3.1, Table A2.1). For example, among males, 49% aged 55–64 years reported chronic disease compared with 18% aged 25–34 years. The comparable figures for females were 58% and 24%, respectively.

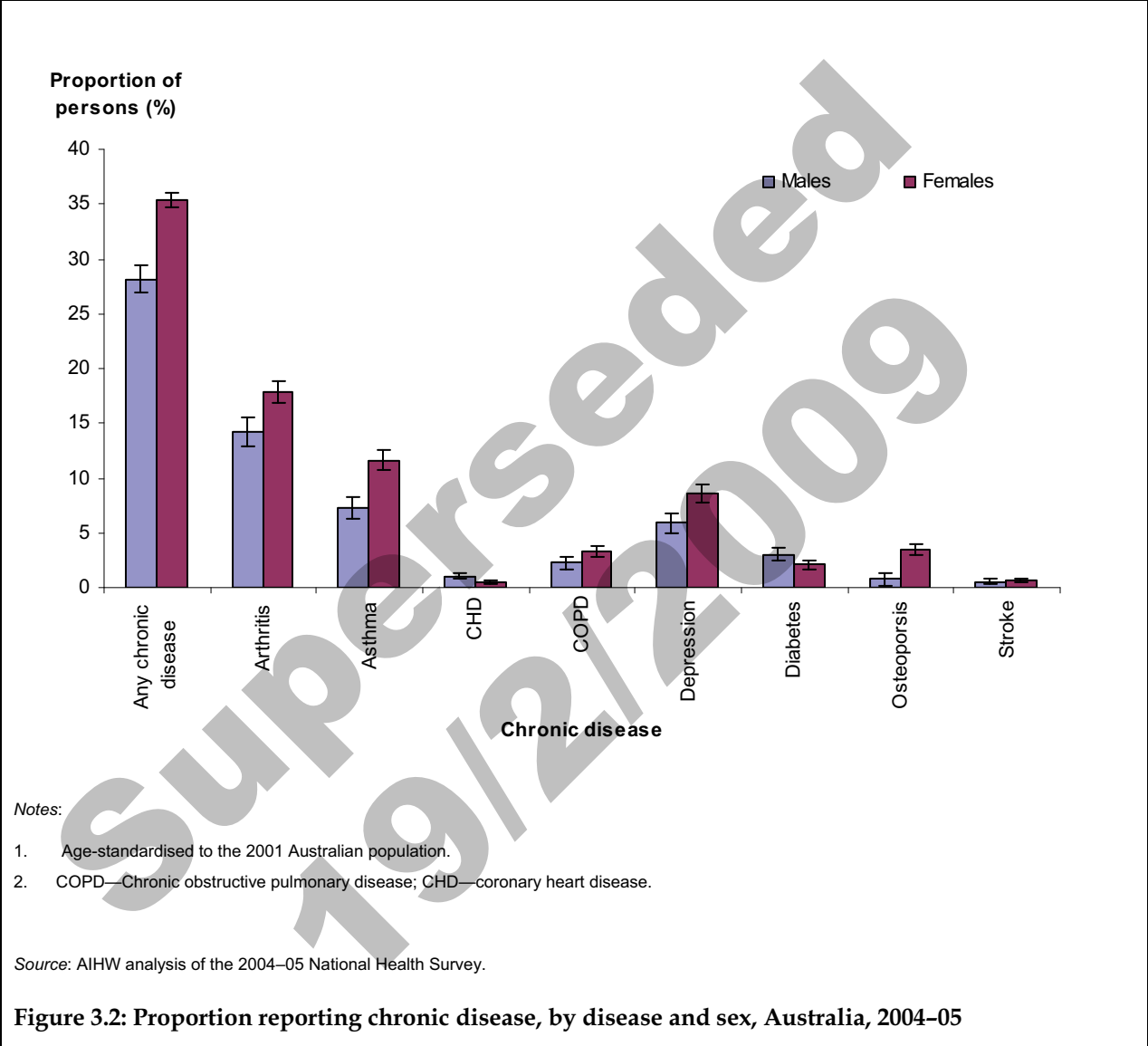


Source: AIHW analysis of the 2004–05 National Health Survey.

Figure 3.1: Proportion of the population aged 25–64 years reporting any of the selected chronic diseases, by sex and age group, Australia, 2004–05

The most commonly reported chronic diseases were arthritis (16%), asthma (9%) and depression (7%).

In particular, females were more likely to report arthritis (18%), asthma (12%), depression (9%) and osteoporosis (3%) than males (14%, 7%, 6% and 1%, respectively) (Figure 3.2, Table A2.2). Males were slightly more likely to report diabetes (3%) and CHD (1%) than females (2% and 1%, respectively).



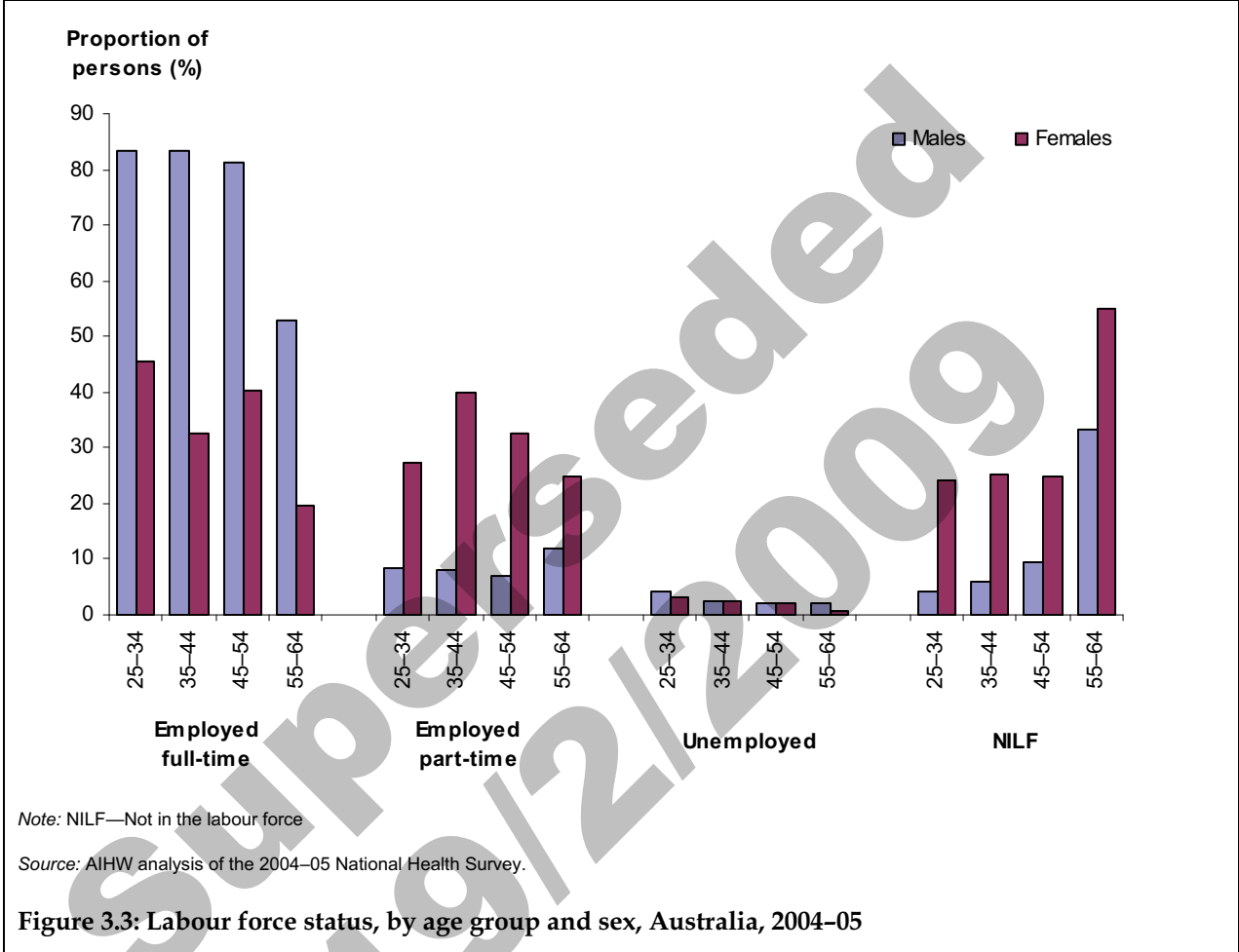
3.2 Labour force status

The majority (56%) of working-aged Australians were employed full-time, while approximately 20% were employed part-time, 3% were unemployed and 21% were not in the labour force.

Males were more likely to be employed full-time (77%) than females (36%). Females were more likely to report part-time employment (32%) and not being in the labour force (30%)

than males (9% and 11%, respectively). Males and females were equally likely to be unemployed (2.8% compared with 2.4%).

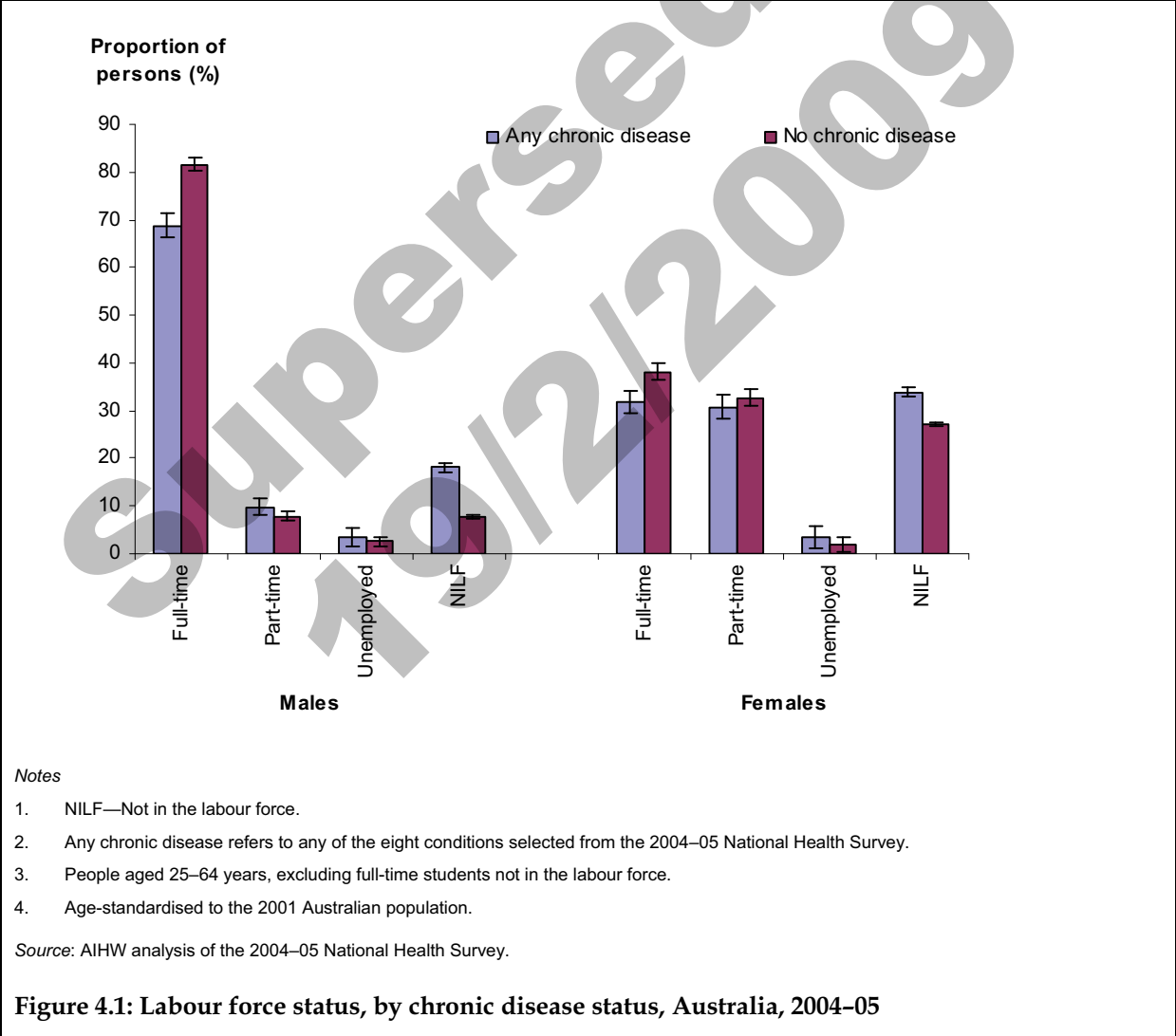
These patterns of labour force status by sex persisted over age (Figure 3.3, Table A2.3). For example, 83% of males aged 25–34 years were employed full-time compared with 45% of females. The same figures for 55–64 year-old males and females were 53% and 20%, respectively.



4 Chronic disease and employment

4.1 The association between chronic disease and employment

Overall, people without chronic disease were more likely to be in full-time employment than those with chronic disease (61% compared with 48%). The same pattern existed among males and among females (Figure 4.1, Table A2.4). For example, 82% of males without chronic disease were in full-time employment compared with 69% of those with chronic disease. For females, these figures were 38% and 32%, respectively. A greater proportion of males with chronic disease (18%) reported not being in the labour force than those without chronic disease (8%). For females the corresponding figures were 34% and 27%, respectively.



The association between specific chronic disease and labour force participation was assessed using rate ratios. The rate ratio indicates the relative difference between non-participation in work for people with specific chronic diseases and non-participation in work for people without any chronic disease.

For all persons, non-participation was greatest for those reporting CHD, depression and osteoporosis. People reporting these diseases were 3.2, 2.1 and 2.1 times, respectively, more likely to report not being in the labour force compared to people who did not report chronic disease (Table 4.1). For males, the chronic diseases mostly associated with non-participation were osteoporosis, depression and CHD and for females, CHD, diabetes and COPD.

Comparing non-participation in the labour force for people with and without chronic disease, those having (one or more) chronic disease were 60% more likely to not be in the labour force, compared with people who did not have chronic disease (27% versus 17%, respectively) (Table 4.1). Males with chronic disease were more than twice (2.3 times) as likely to not participate in the labour force compared to males without chronic disease, while for females the figure was 1.2 times.

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19/2/2009

Table 4.1: Rate ratios for reporting not in labour force, Australia, 2004–05

Chronic disease	Proportion reporting not in the labour force (%)	Rate ratio (compared with no chronic disease)	95% Confidence interval
Males			
No chronic disease	7.8	1.0	..
Arthritis	19.9	2.6	1.8–3.6
Asthma	16.6	2.1	1.4–3.2
CHD	27.1	3.5	1.7–7.1
COPD	22.1	2.8	1.8–4.5
Depression	30.3	3.9	2.8–5.5
Diabetes	13.4	1.7	1.1–2.7
Osteoporosis	39.1	5.0	2.0–12.4
Stroke	18.6	2.4	1.1–5.0
<i>Any chronic disease</i>	18.1	2.3	1.7–3.1
Females			
No chronic disease	27.2	1.0	..
Arthritis	35.2	1.3	1.1–1.5
Asthma	34.8	1.3	1.1–1.5
CHD	58.0	2.1	1.6–2.8
COPD	40.3	1.5	1.2–1.9
Depression	40.0	1.5	1.3–1.7
Diabetes	44.1	1.6	1.1–2.3
Osteoporosis	36.0	1.3	0.9–1.9
Stroke	35.2	1.3	0.9–1.9
<i>Any chronic disease</i>	33.8	1.2	1.1–1.4
Persons			
No chronic disease	17.0	1.0	..
Arthritis	28.2	1.7	1.5–1.9
Asthma	27.8	1.6	1.4–1.9
CHD	54.1	3.2	1.8–5.6
COPD	33.4	2.0	1.6–2.5
Depression	36.2	2.1	1.8–2.5
Diabetes	31.0	1.8	1.2–2.7
Osteoporosis	36.1	2.1	1.5–3.0
Stroke	27.1	1.6	1.1–2.3
<i>Any chronic disease</i>	26.9	1.6	1.5–1.7

.. Not applicable.

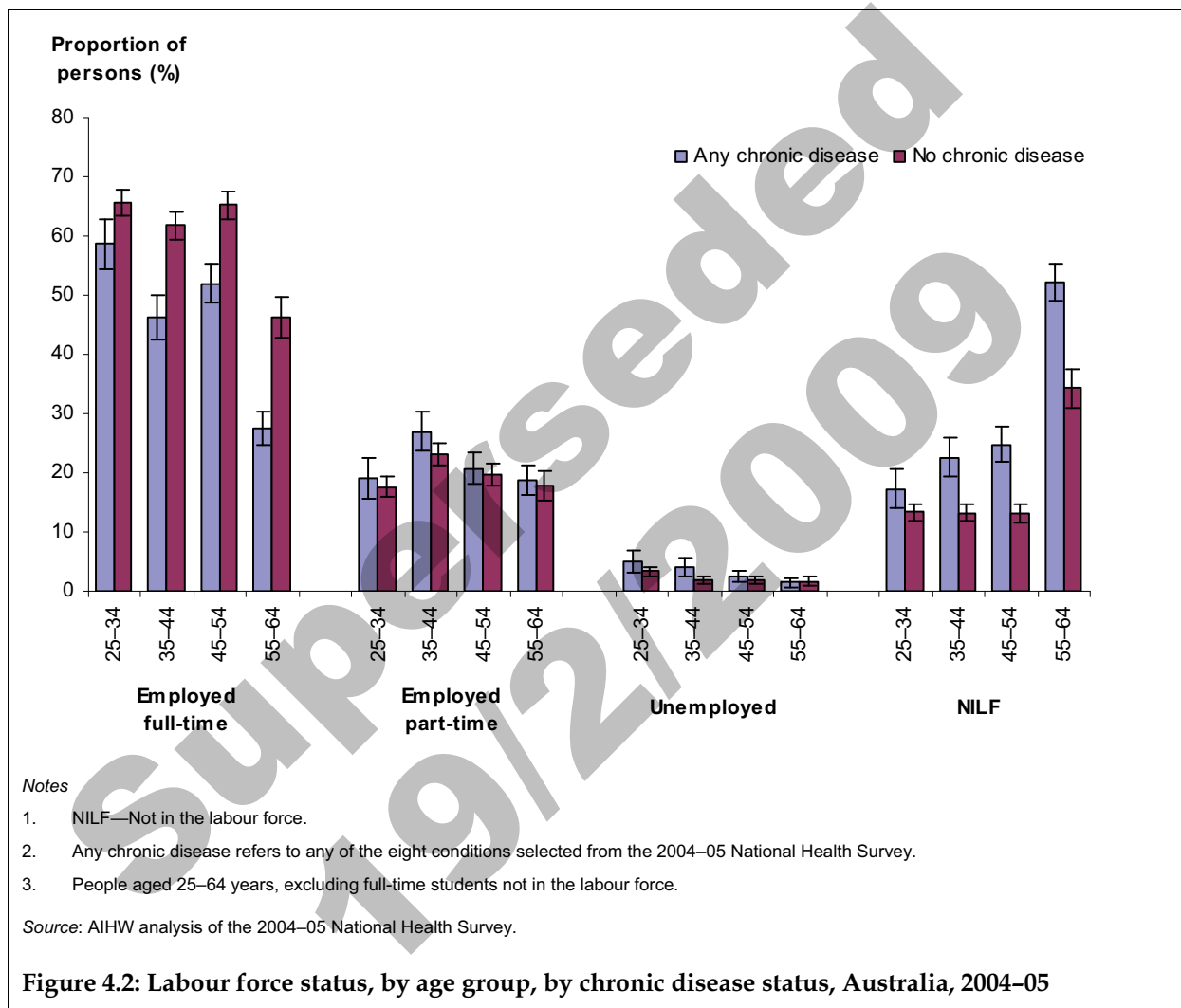
Notes

1. Proportions, rate ratios and confidence intervals are based on age-standardised estimates.
2. Any chronic disease refers to any of the eight conditions selected from the 2004–05 National Health Survey.
3. COPD—Chronic obstructive pulmonary disease; CHD—coronary heart disease.
4. People may have reported more than one chronic disease and may therefore be included in more than one of the proportions reporting 'not in the labour force'.
5. People aged 25–64 years, excluding full-time students not in the labour force.

Source: AIHW analysis of the 2004–05 National Health Survey.

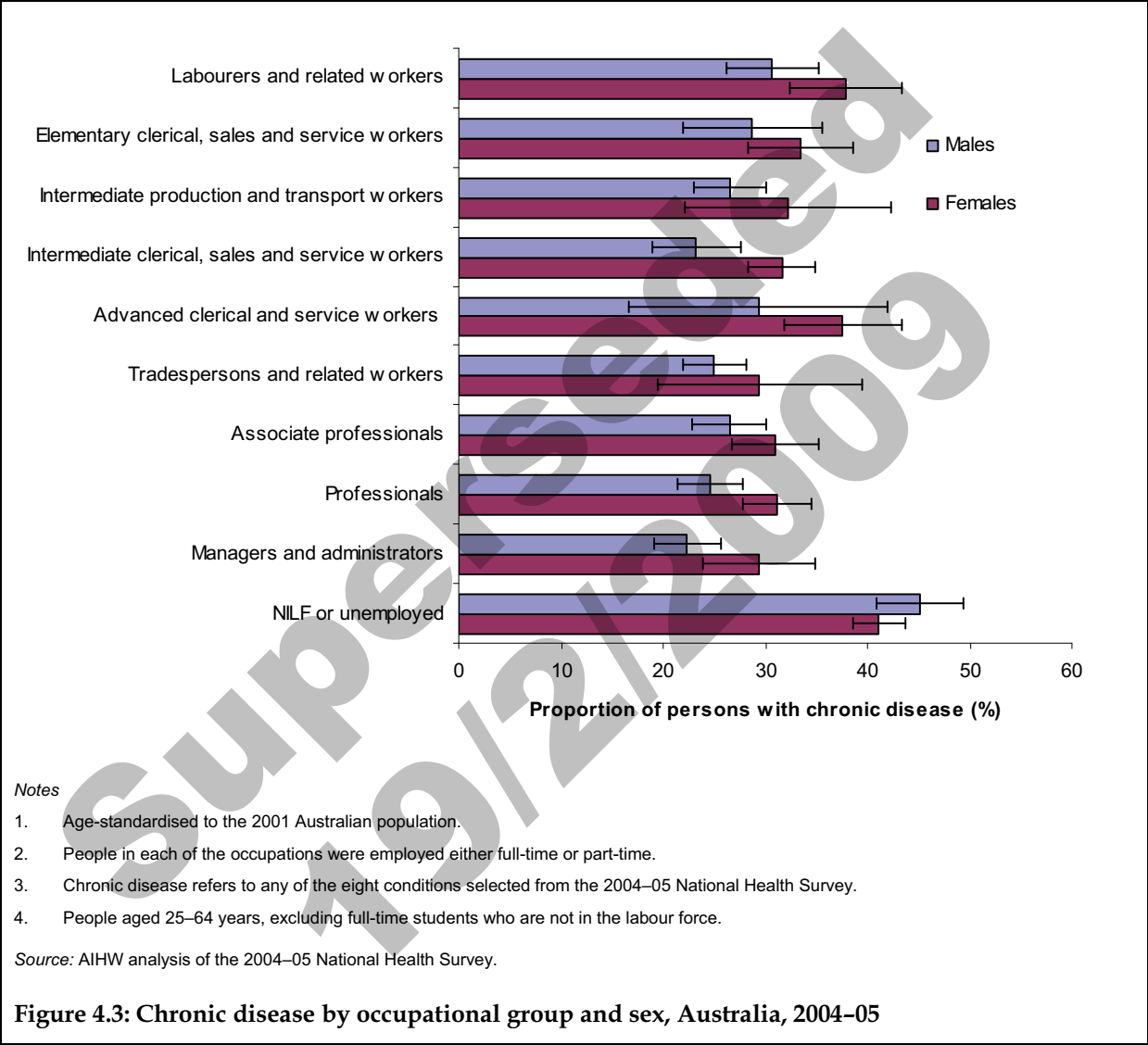
Across all age groups, people with chronic disease were less likely to be employed full-time, and more likely to not be in the labour force, than those without chronic disease (Figure 4.2, Table A2.5).

The difference in labour force participation was most noticeable for people aged 55–64 years. For example, 52% of 55–64 year olds with chronic disease were not in the labour force, compared with 34% without chronic disease. On the other hand, of those aged 25–34 years and not in the labour force, 17% reported chronic disease compared with 13% not reporting a chronic disease.



The prevalence of chronic disease was compared across occupational groups. Chronic disease prevalence was lower among all occupational groups than among those without an occupation (unemployed people and those not in the labour force).

Chronic disease prevalence was highest, for males and females, among labourers and related workers (31% and 38%, respectively) and among advanced clerical and service workers (29% and 38%, respectively) (Figure 4.3, Table A2.6). Managers and administrators showed the lowest prevalence of chronic disease among males and females (22% and 29%, respectively).



4.2 The association between multiple chronic disease and employment

The majority of working-aged Australians (67%) did not report chronic disease and 25% reported one chronic disease, resulting in an 8% prevalence of multiple chronic disease. Among people who reported chronic disease, 76% had one chronic disease, 19% had two and 6% had three or more chronic diseases (Table 4.2). Looking at the number of chronic diseases, a similar pattern is seen in each labour force category. That is, the majority of people with any chronic disease had only one disease.

Table 4.2: Percentage of people with chronic disease, by number of chronic diseases and labour force status, Australia 2004–05

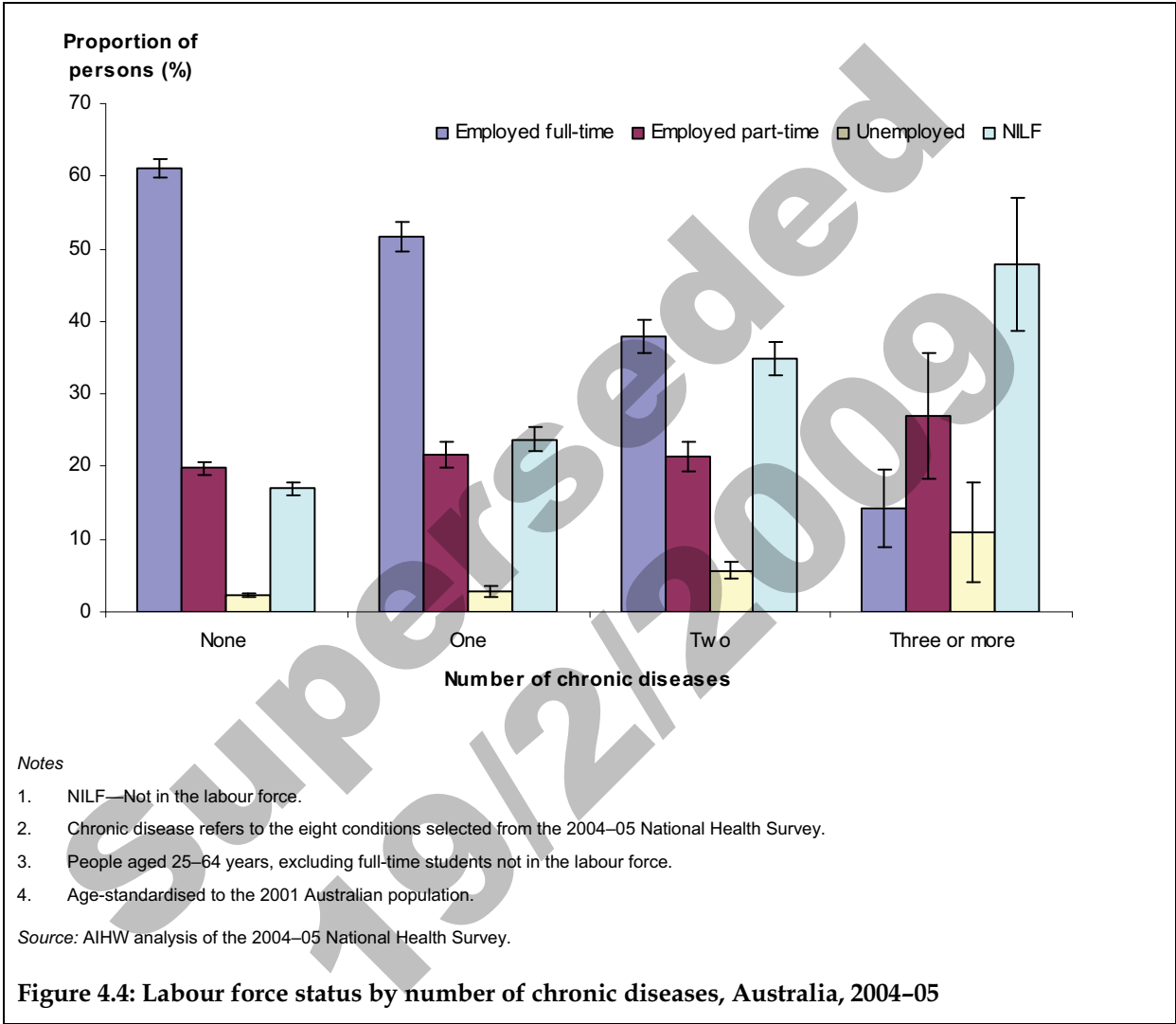
Number of chronic diseases	Employed full-time	Employed part-time	Unemployed	NILF	Total
One	84.2	76.3	65.7	64.2	75.6
Two	13.8	18.2	23.8	25.4	18.8
Three or more	2.0	5.5	10.5	10.4	5.7
Total	100.0	100.0	100.0	100.0	100.0

Notes

1. Chronic disease refers to the eight conditions selected from the 2004–05 National Health Survey.
2. NILF—Not in the labour force.
3. People aged 25–64 years, excluding full-time students who are not in the labour force.
4. Columns may not add to totals due to rounding.
5. The maximum number of concurrent chronic diseases reported by any person was four.

Source: AIHW analysis of the 2004–05 National Health Survey.

Looking at the labour force status, as the number of chronic diseases increased there was an associated decrease in the proportion engaged in full-time employment (Figure 4.4, Table A2.7). For example, among people with one chronic disease, 52% were employed full-time and of those with three or more chronic diseases, 4% were employed full-time. Multiple chronic disease had the opposite effect on non-participation in the labour force – among people with one chronic disease, 24% were not in the labour force and of those with three or more chronic diseases, 48% were not in the labour force.

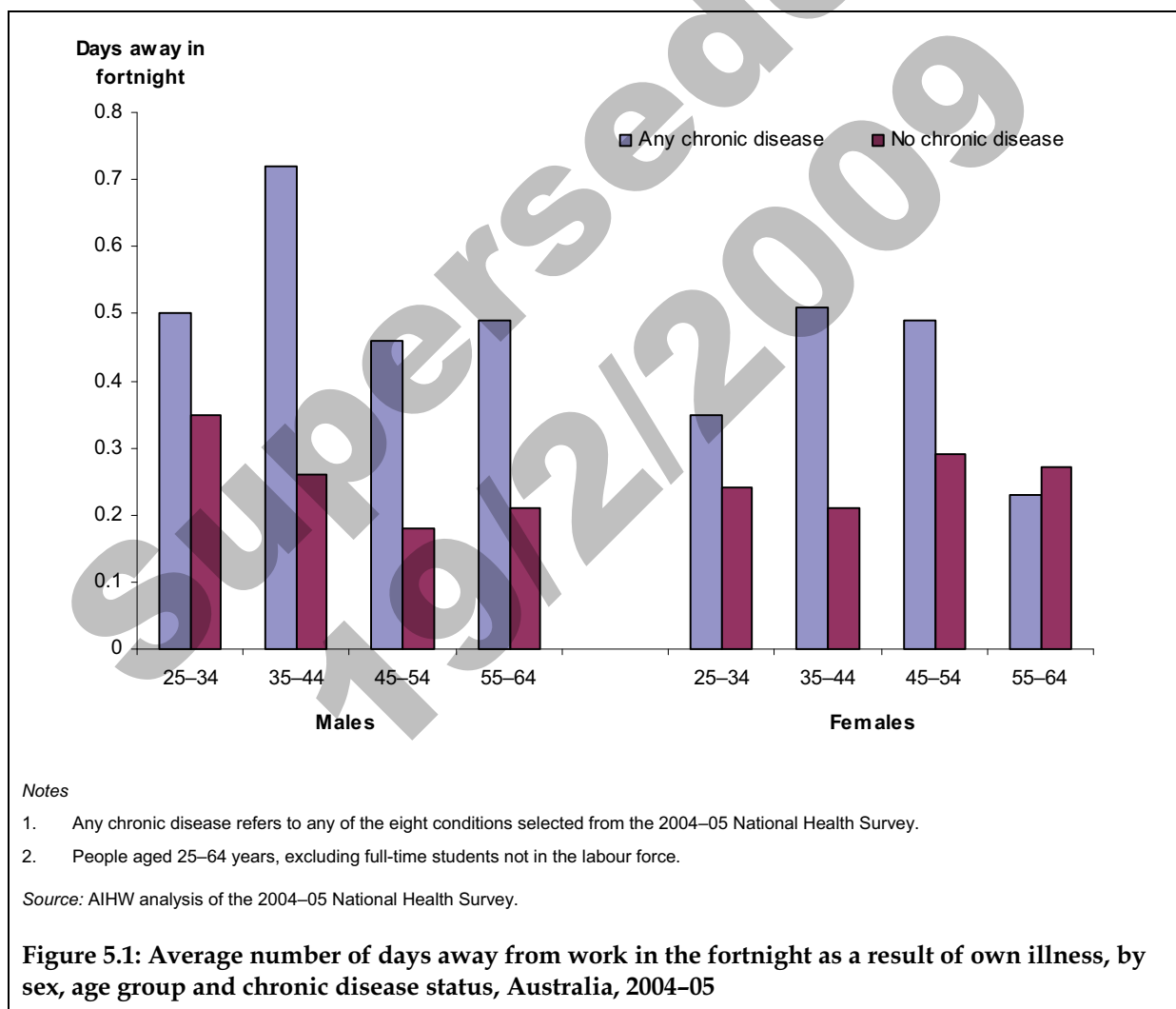


5 Chronic disease and absenteeism

5.1 Absenteeism

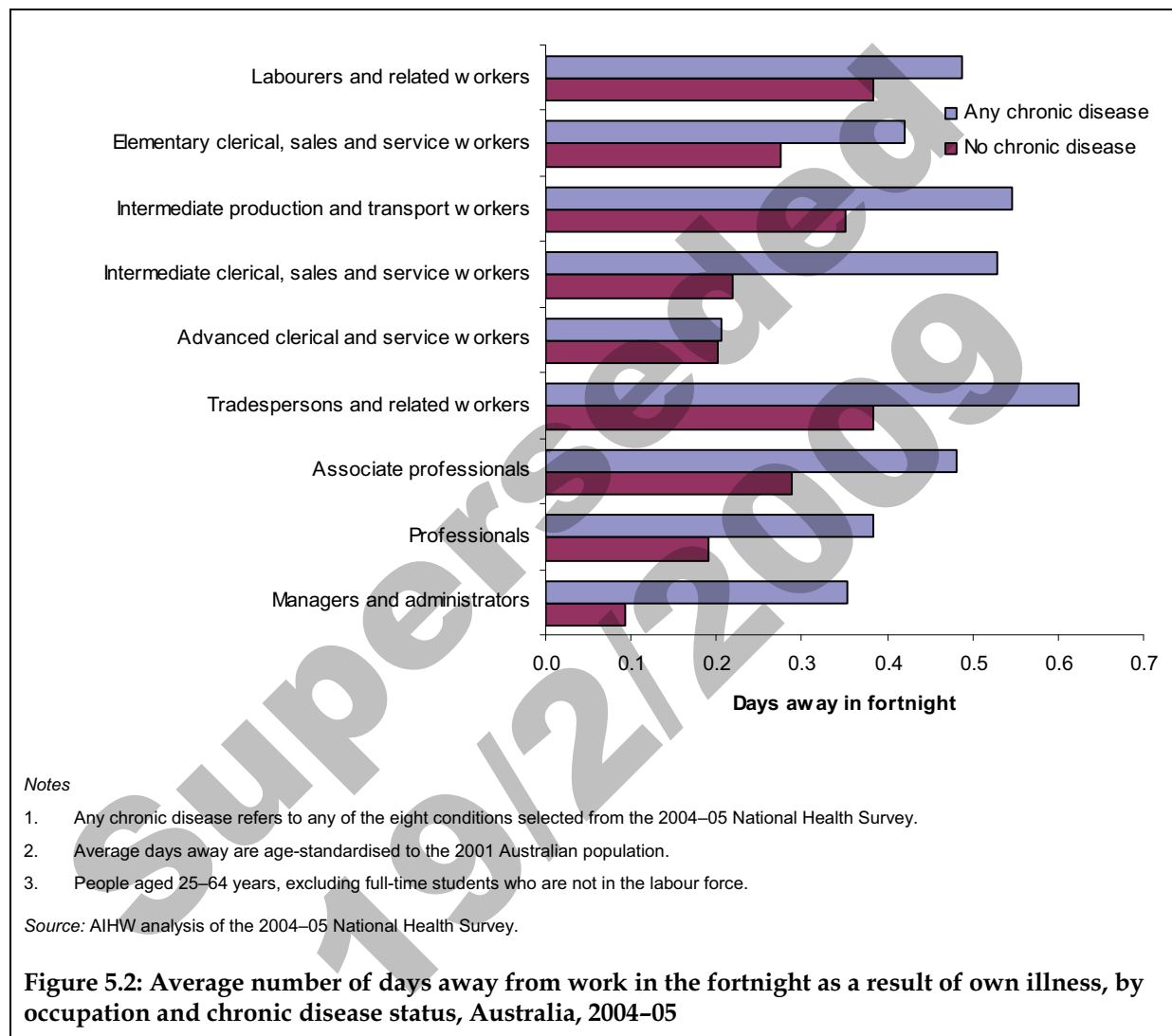
'Absenteeism' in this report refers to days off work due to own illness or injury, and not days off work to care for another person (regardless of the nature of their illness or injury).

People with chronic disease averaged nearly half a day (0.48) off work in the previous fortnight compared with a quarter of a day (0.25) for people without chronic disease. Overall, there were small differences between the sexes (males with chronic disease averaged 0.55 days away and females with chronic disease 0.41 days away) but there was no clear pattern by age (Figure 5.1).



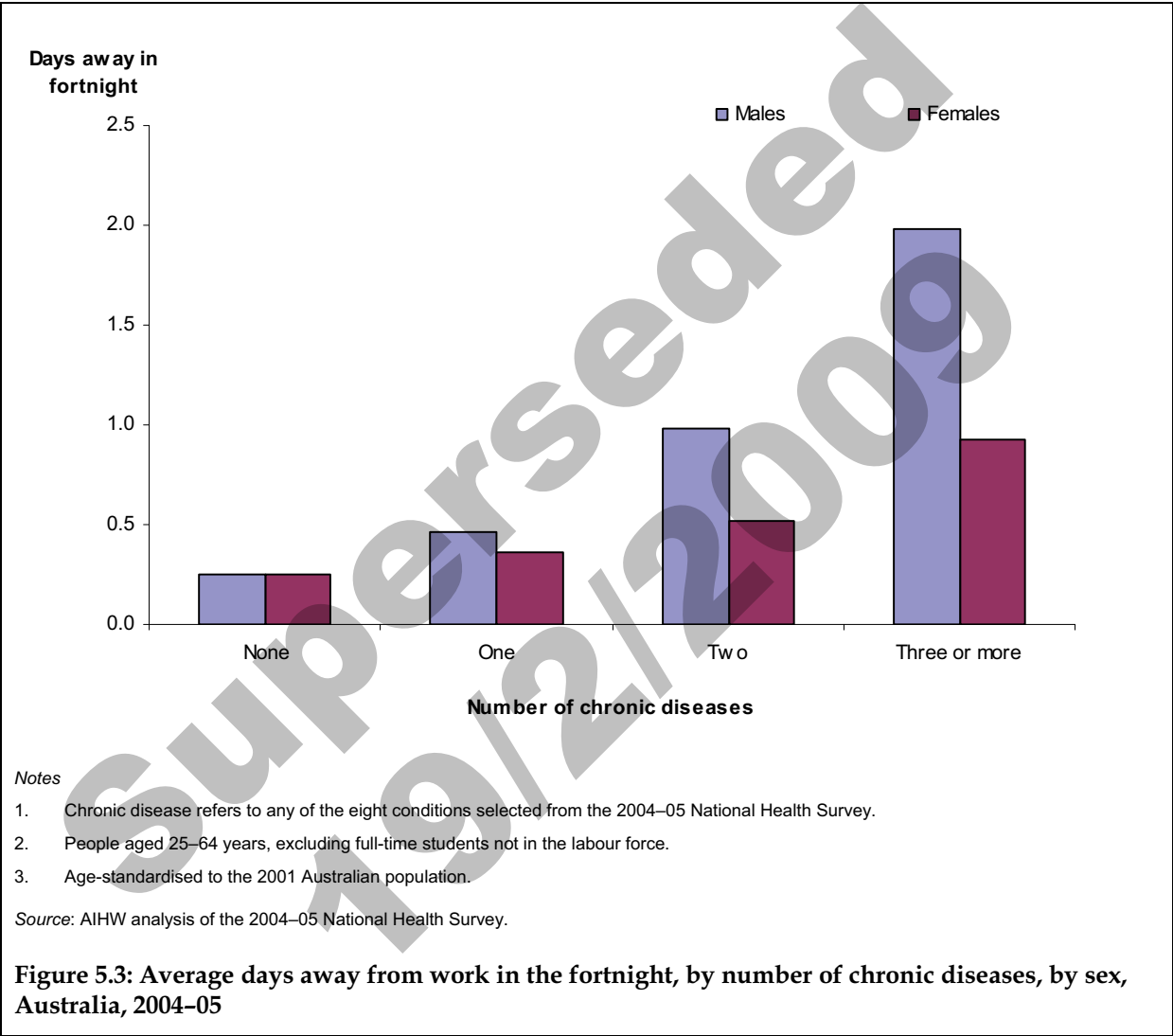
5.2 Occupation

The average number of days away from work for people with and without chronic disease was compared by occupation (Figure 5.2). In almost all occupations, persons with chronic disease had, on average, more days away per fortnight. The differences were more noticeable among tradespersons and related workers, intermediate clerical, sales and service workers, and managers and administrators.



5.3 Multiple chronic disease and absenteeism

People with multiple chronic diseases had, on average, more days away from work than people with no chronic disease or one chronic disease. Overall, people with three or more chronic diseases had, on average, 1.7 days away from work in the fortnight, compared with 0.4 days for people with one chronic disease. On average, males and females with three or more chronic diseases had 2.2 days and 1.2 days off, respectively, in the previous fortnight, compared with 0.5 and 0.4 days for those with one chronic disease (Figure 5.3).



6 Loss in workforce participation

This section estimates the loss in workforce participation as a result of:

- lower participation in employment
- absenteeism from work
- early death.

In estimating loss to the workforce, rates of labour force participation among people without chronic disease were assumed to apply if chronic disease was eliminated.

6.1 Loss associated with reduced employment

Loss to the labour force was estimated as the difference between actual labour force participation and expected labour force participation, should the participation rates for people without chronic disease apply to people reporting chronic disease. The difference between expected and actual labour force participation was calculated for chronic disease overall and for each specific chronic disease. The loss associated with specific chronic diseases was expressed as a percentage of the total loss for all specific chronic diseases.

Using this methodology, the estimated loss in full-time and part-time labour force participation was approximately 367,000 and 14,000 person-years respectively. The counter effect of this was an excess of 349,000 people not in the labour force (Table 6.1) and an excess 32,000 people unemployed.

Males contributed to more than half (55%) of the excess non-participation in the labour force – 192,000 person-years. More than half (52%) of the excess non-participation (179,000 person-years) was associated with being in the oldest age group, 55–64 years.

Table 6.1: Excess non-participation (loss) in the labour force associated with chronic disease, by age group and sex, Australia, 2004–05 ('000 person-years)

Age group	Males	Females	Persons
25–34	13.0	–2.4	10.6
35–44	26.1	32.2	58.3
45–54	50.0	50.2	100.2
55–64	102.7	76.8	179.5
Total 25–64	191.8	156.8	348.6

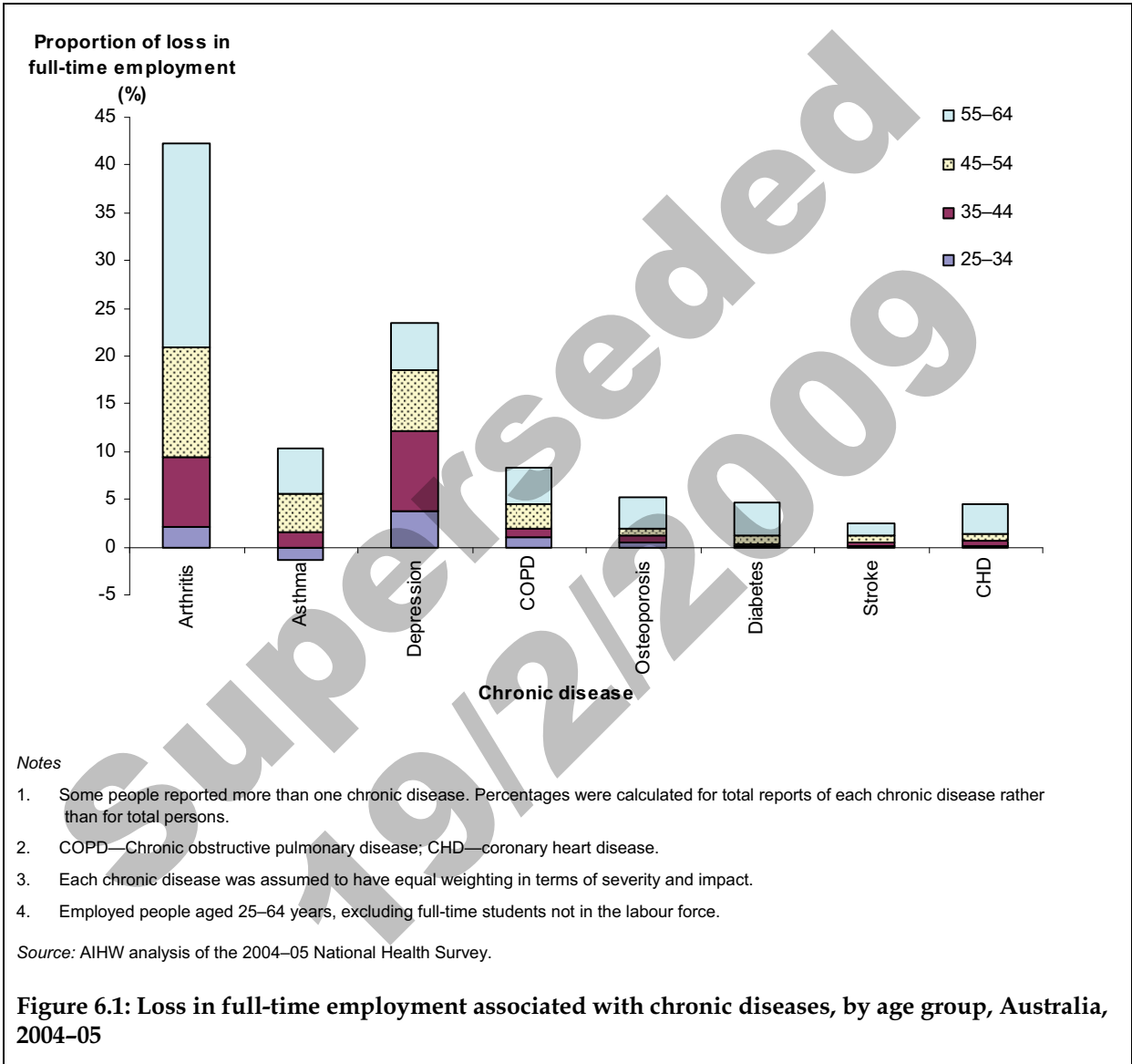
Notes

1. Loss (excess non-participation) in the labour force refers to the difference between observed participation and expected participation if the labour force rates for people without chronic disease applied to people who reported chronic disease.
2. Chronic disease refers to any of the eight conditions selected from the 2004–05 National Health Survey.
3. Positive numbers refer to loss. These values represent the number of additional people that would be in the labour force (employed full-time or part-time or unemployed) if they participated at the same rates as those without chronic disease. A negative number indicates the number of person-years of participation above expected if the participation rates of people without chronic disease applied.
4. These estimates exclude loss in labour force participation among the unpaid labour force (for example, parents, carers and volunteers).
5. Excludes loss due to absenteeism (sick leave), and due to reduced performance while at work (presenteeism).
6. People aged 25–64 years (excluding full-time students not in the labour force).
7. Excludes loss due to premature death.

Source: AIHW analysis of the 2004–05 National Health Survey.

Chronic disease was associated with loss in full-time employment for all chronic diseases and all age groups, except for asthma among people aged 25–34 years. This group comprised relatively small numbers of individuals.

Analysis of the loss associated with each chronic disease showed that arthritis was the major contributor and was associated with 42% of the total loss in full-time employment (Figure 6.1, Table A2.8). Other leading contributors were depression (23%), asthma (9%) and COPD (8%). The most substantial losses occurred among people aged 55–64 years.



6.2 Loss associated with absenteeism

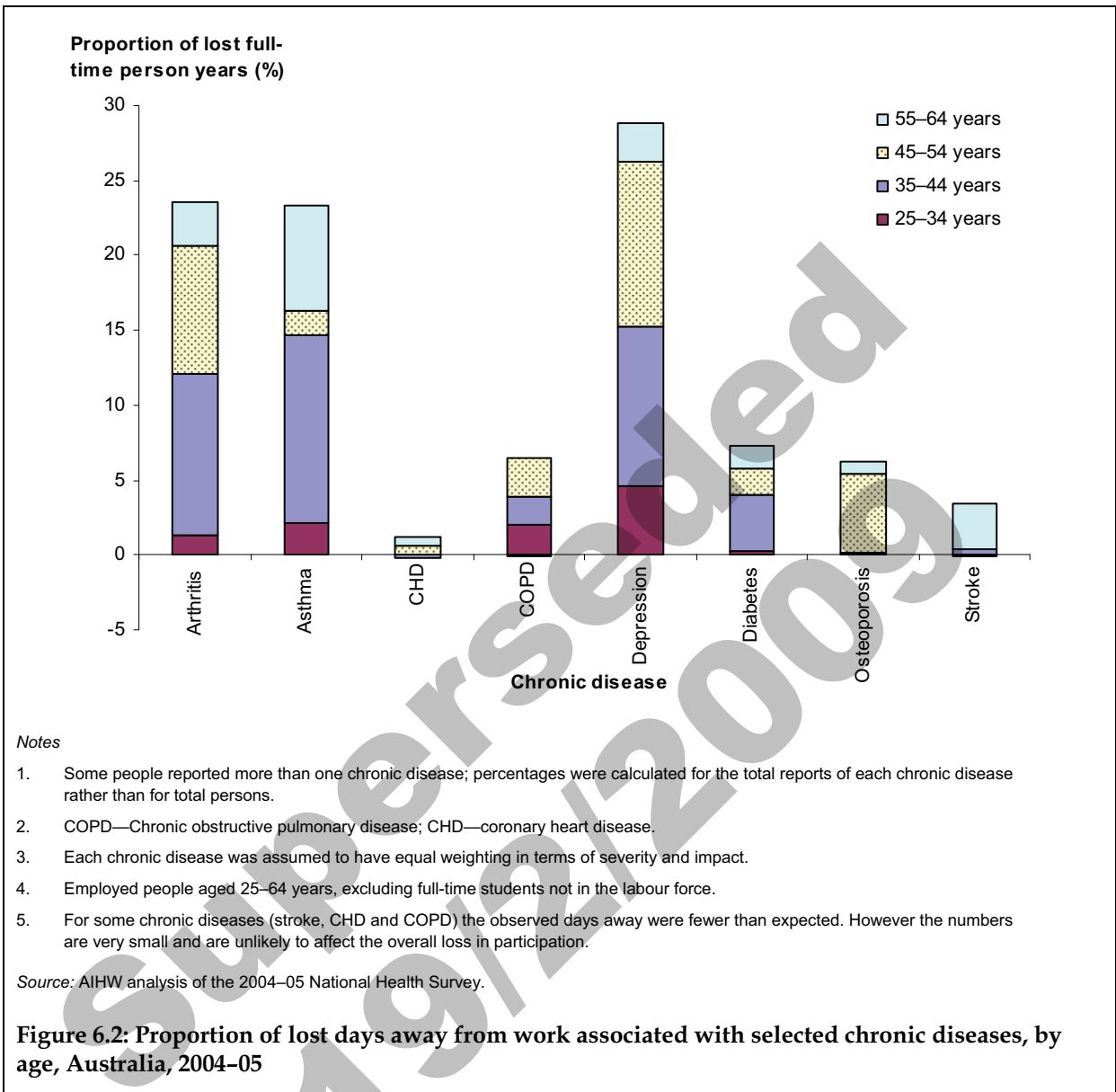
Loss due to absenteeism from full-time and part-time employment was calculated as the difference between the number of days off work for people with chronic disease, and the number expected if age and sex-specific rates of absenteeism among people without chronic disease applied.

The loss from absenteeism associated with chronic disease was approximately 500,000 days per fortnight. This was equivalent to approximately 13.2 million days per year or 57,000 person-years of full-time participation (assuming 48 working weeks of 5 days duration with 10 public holidays per year).

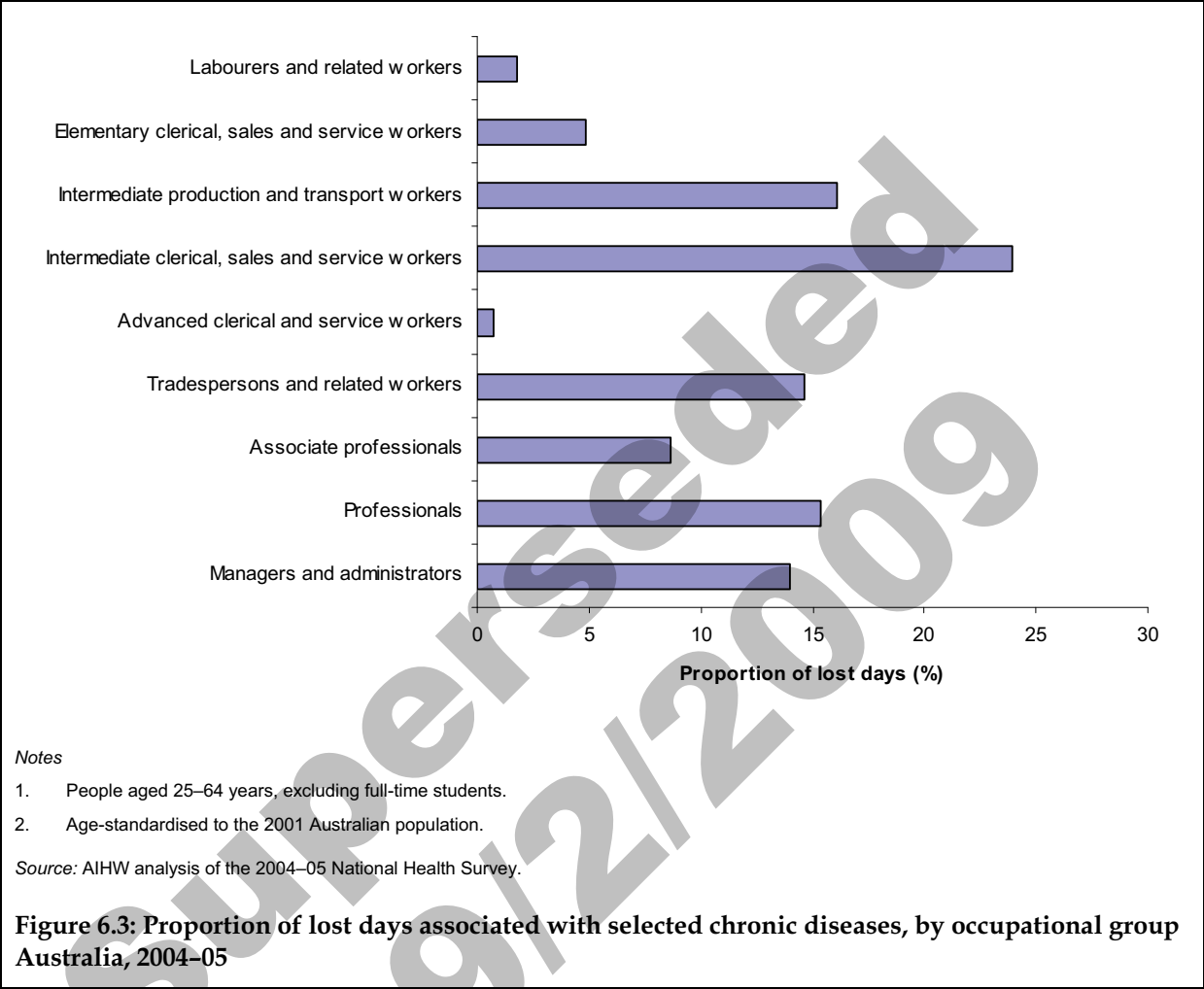
About two-thirds of this cost was carried by males, and people aged 35–44 and 45–54 years accounted for the majority (75%) of lost days.

Analysis of absenteeism by specific chronic disease showed that depression, arthritis and asthma were associated with around 76% of days away from work (Figure 6.2, Table A2.9).

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Age-standardised average additional days away by occupation were also calculated. The greatest proportion of excess days away was found among intermediate clerical, sales and service workers (Figure 6.3).



6.3 Loss associated with death from chronic diseases

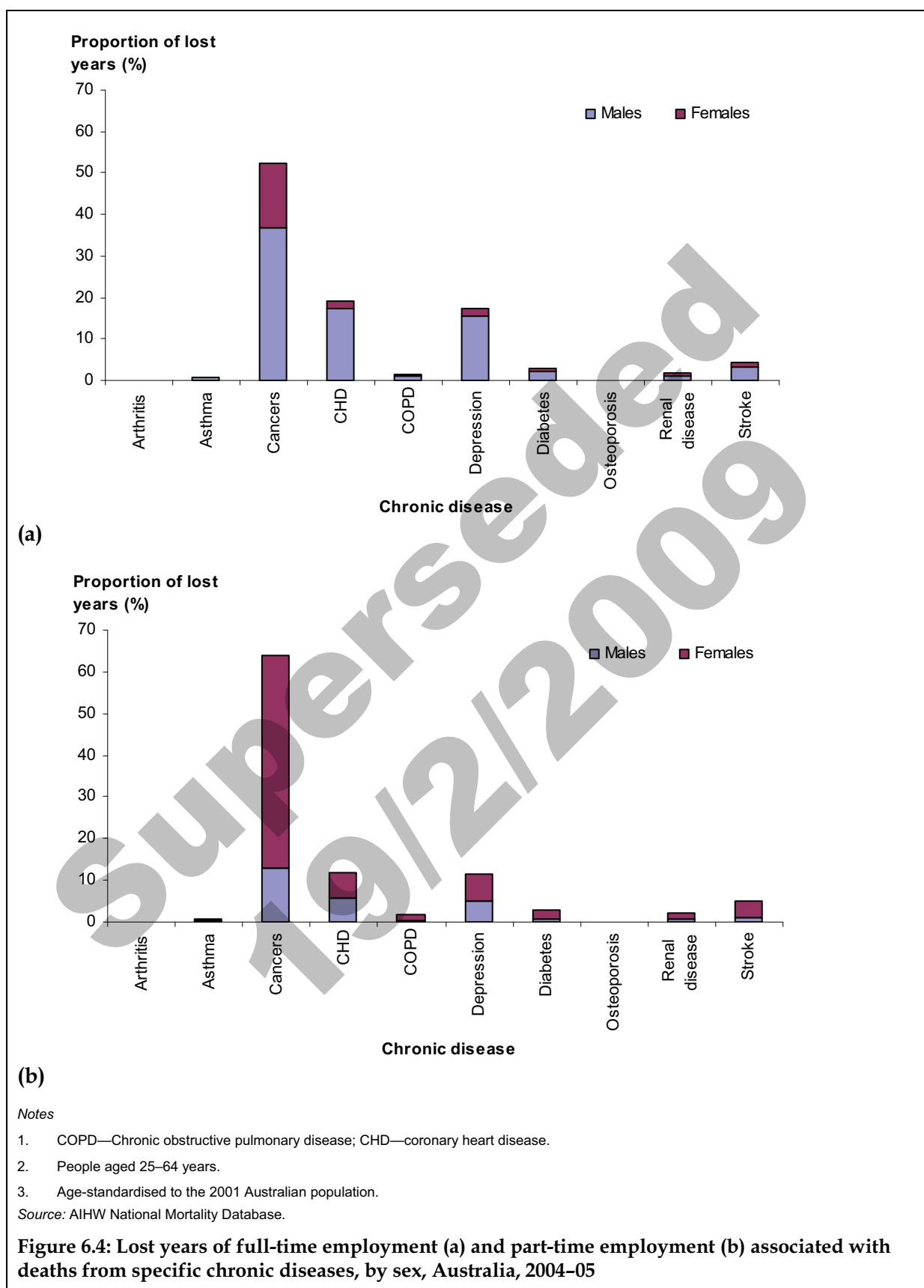
This section presents an analysis of loss to the workforce due to death from chronic disease including cancer and renal disease. Deaths from cancer represent a large proportion of all deaths in Australia. While deaths from renal failure are much lower, the condition is frequently reported as contributing to other causes of death (AIHW 2008). The quality of the mortality data is adequate for reporting on the selected chronic diseases, as well as cancer and renal disease. The AIHW National Mortality Database was used to assess the impact of death from chronic disease on participation in work.

Using mortality data for deaths registered in 2004, the age-specific labour force participation rates from the NHS were applied to age-specific deaths to determine the loss in labour force participation.

Overall, 113,000 person-years of full-time employment and 33,000 years of part-time employment were lost annually as a result of deaths among working-aged persons due to chronic disease. The full-time loss comprised 52,000 person-years due to death from the (eight) selected chronic diseases and 61,000 person-years due to death from cancer and renal disease. The corresponding figures for loss in part-time employment were 11,000 and 22,000 person-years, respectively.

Male deaths were associated with substantial losses in full-time employment, while female deaths contributed considerably to losses in part-time employment. All age groups contributed, with deaths of people aged 45–54 years contributing more than any other age group.

Figure 6.4 (and Table A2.10) presents these losses for full-time and part-time employment by the chronic disease cause of death. By far the major contributor was cancer, accounting for 52% and 64% of the loss in full-time and part-time employment, respectively. Other substantial contributors in both employment groups were depression (derived as a fraction attributed from suicide deaths according to Begg et al. 2003) and CHD.



7 Discussion

The analysis presented in this report supports previous studies showing that chronic disease has a negative impact on labour force participation (Lattimore 2007, Productivity Commission 2006, AIHW 2005).

Importantly, this work underestimates the magnitude of the loss in workforce participation for reasons stated at the beginning of this report. Furthermore, there are a range of factors that contribute to non-participation in work. Apart from the chronic diseases considered here, disability not associated with chronic disease, other illnesses or injury, or the need to care for another person, also contribute to reduced participation in the labour force.

Chronic disease defined in this report affects about one-third of the approximately 10.5 million working-aged Australians. People with chronic disease were less likely to participate full-time in the labour force and were nearly twice as likely to be 'not in the labour force' as those without chronic disease. People reporting chronic disease had 0.48 days off per fortnight due to sickness compared with 0.25 days for people without chronic disease.

Older working Australians reported higher levels of chronic disease than younger working Australians. The differential by chronic disease and labour force status was greatest among older Australians (55–64 years). These findings have significant implications for the Australian labour force, particularly as the population ages.

There were differences in chronic disease prevalence between occupation groups. These differences by occupation may arise from health-related aspects that prevent continued activity within specific occupations, or from characteristics typical of the occupation that give rise to, or maybe even prevent, the onset of chronic disease. For example, do tradespersons tend to have lower prevalence of chronic disease because the nature of their work involves greater physical activity thereby preventing obesity and its associated effects, or are tradespersons, having succumbed to a chronic disease, more likely to be out of the labour force?

This analysis also shows that loss in workforce participation is related to the number of chronic diseases reported. For example, people with three or more chronic diseases were less likely to be employed. Similarly, this same group had higher rates of absenteeism than people with only one chronic disease.

In this report chronic diseases were estimated to account for a loss to the workforce of around 367,000 full-time and 14,000 part-time person-years annually through non-participation, and approximately 57,000 full-time person-years as a result of absenteeism associated with chronic disease. The loss resulting from death due to one of the eight selected chronic diseases was around 52,000 full-time and 11,000 part-time person-years. An additional loss of 61,000 full-time and 22,000 part-time person-years were due to death from cancer and renal disease.

For non-participation in the workforce, the majority of the loss was associated with arthritis and depression, while the loss due to absenteeism was mainly associated with depression, arthritis and asthma. The main conditions contributing to loss due to death were cancer, depression and coronary heart disease.

These losses are underestimates because loss in participation through employment and absenteeism were not calculated for cancer and renal disease. Similarly, loss associated with lower performance while at work (presenteeism), loss among parents, carers, volunteers and

other unpaid workers, people younger than 25 and older than 64, and loss due to under-reporting of chronic disease, have not been factored into this analysis. These losses are difficult to quantify due to the inability to identify unpaid workers and measure workplace productivity for persons with and without chronic disease. It would be useful to identify which chronic diseases contribute the most to the loss in participation.

Many people reported more than one condition (25% of those reporting any condition), however it is difficult to apportion levels of debilitation arising from each specific condition. For example, where a person reports having asthma and depression, it was not possible to ascertain which of these was most debilitating and potentially had a greater impact on labour force participation. These analyses were undertaken without regard to multiplied effects (if any) from coexisting chronic disease. Consequently, the results in this report should be considered indicative.

Given that, in 2004–05, the Australian full-time workforce numbered 5.7 million, a loss of 0.5 million person-years represents nearly one-tenth of the full-time workforce. That is, if the chronic diseases specified in this report were completely eliminated, the full-time workforce, and hence productivity, could increase to about 6.2 million workers.

The inferred cost of chronic diseases assumes that the apparent differences in labour force participation and absenteeism between people with chronic diseases and those without is a consequence of their chronic disease. It is likely that the chronic disease contributes to some but not all of the loss. The analysis is offered here to stimulate debate and generate further research on health and economic production.

Estimates of the contribution of mortality to lost participation in 2004 were based on deaths that occurred in 2004. In reality, the loss in workforce participation that would have accrued by 2004 is the result of deaths in previous years, of people who would have been of working-age in 2004. However, the estimate based on deaths in 2004 is indicative of loss to future participation from premature deaths that occurred in that year.

The total inferred cost of the specified chronic diseases, in terms of loss to the labour force, is around 537,000 person-years per annum of full-time employment, and 47,000 person-years per annum of part-time employment as a result of lower labour force participation, absenteeism and premature death (Table 7.1).

Table 7.1: Summary of loss in workforce participation associated with chronic disease, Australia, 2004–05

Nature of loss	Loss (person-years)	
	Full-time employment	Part-time employment
Loss associated with chronic disease due to:		
Non-participation in the workforce	367,000	14,000
Loss due to absenteeism ^(a)	57,300	..
Loss due to death—selected chronic diseases ^(b)	52,100	11,100
Loss due to death—cancer and renal disease	61,000	21,900
(Minimum) Total loss	537,400	47,000

(a) Loss due to absenteeism is expressed as person-years and is equivalent to 57,300 full-time positions annually.

(b) Includes loss from deaths due to the eight chronic diseases selected from the 2004–National Health Survey, excluding cancer and renal disease.

.. Not applicable.

Notes:

1. People aged 25–64 years, excluding full-time students not in the labour force.
2. Mortality refers to deaths registered in 2004; other data refers to the 2004–05 National Health Survey.
3. Numbers rounded to the nearest 100.

Source: AIHW analysis of the 2004–05 National Health Survey and the AIHW National Mortality Database.

This report—albeit limited in scope—has identified the very large potential for economic benefit to be gained if the prevalence or impact of chronic disease were reduced. Further research would be valuable to refine and expand on this analysis.

A combination of rising prevalence of risk factors for chronic diseases (particularly overweight and obesity) and ageing of the population will have significant effects on the potential productive capacity of the future Australian workforce. The chronic conditions that were shown to provide the greatest contribution to loss in full-time employment were arthritis and depression. Given the diverse nature of these conditions, workplace responses to accommodate people with these conditions would necessarily be correspondingly diverse.

Appendix 1: Data and methods

Data sources

This report is based on analyses of data from the 2004–05 NHS and the AIHW National Mortality Database.

The 2004–05 NHS was conducted by the ABS using a sample of 28,000 people in 19,501 private dwellings across Australia from August 2004 to July 2005. The sample excluded residents of non-private dwellings such as nursing homes, hostels and hospitals, and remote areas. The NHS is the only national survey that collects detailed data on both health-related conditions and labour force participation. Analysis was carried out using survey data weighted to the estimated Australian population living in private dwellings in non-very remote areas as at 31 December 2004.

Analysis of the AIHW National Mortality Database was restricted to deaths registered in 2004. This data was compiled by the ABS. Quantification of deaths from depression were derived using attributable fractions for suicide deaths (Begg et al. 2007).

Statistical methods

Standard errors (SE) and confidence intervals (CIs) were calculated for all age-standardised rates (ASR) and relative risk ratios (RR).

Throughout, standard errors were based on the published standard error tables for the 2004–05 NHS (ABS 2006c).

Age-standardised percentages (rates)

All rates (unless age-specific) have been directly age standardised to the 2001 Australian population and expressed as percentages, unless specified.

Age-standardised means

All means (unless age-specific) have been directly age standardised to the 2001 Australian population, unless specified.

Rate ratios

A rate ratio was defined as the ratio of two rates, that is, 'rate A' divided by 'rate B'.

For example, in calculating the rate ratio for reporting 'not in the labour force':

- 'rate A' was the age-standardised rate of having a (specific) chronic disease and not being in the labour force, while
- 'rate B' was the age-standardised rate of not having any chronic disease and not being in the labour force.

Confidence intervals for rates

Standard errors for NHS were calculated as per ABS 2006c.

Confidence limit = $1.96 \times SE(ASR)$, where

$$SE(ASR) = \sqrt{\frac{\sum \text{Var}(X/Y)\% \times \text{Stdpop}^2}{\text{Auspop}^2}}$$

$\text{Var}(X/Y)\%$ = age-specific SE squared

Stdpop = age-specific Australian standard population, 2001

Auspop = total Australian standard population, 2001 (for ages 25–64 years).

Confidence intervals for rate ratios

An approximate 95% CI for the rate ratio for two age-standardised rates (ASR_1 and ASR_2) (based on Parkin et al. 1992) was calculated as $ASR_1/ASR_2^{1 \pm 1.96/\chi}$, where

$$\chi = \frac{ASR_1 - ASR_2}{\sqrt{SE(ASR_1)^2 + SE(ASR_2)^2}}$$

ASR_1 = the first age standardised rate and ASR_2 = the second age standardised rate.

Years of productivity lost as a result of death

The number of years of lost production due to chronic disease death was calculated in a number of steps:

1. For people who died between ages 25–64 years, the number of years of life lost prior to 65 years of age was estimated as the sum of the lost years in each 10 year age group between 25 and 64 years (for deaths registered in 2004 in the AIHW National Mortality Database).
2. Labour force participation rates (by age group and sex) of people who reported no chronic disease, were applied to the years of life lost to determine the proportion of these years that would have been spent employed, unemployed and not in the labour force.
3. Potential days away from work due to illness were subtracted from years of life lost, consistent with the age and sex absenteeism rates observed among people without chronic disease.

In calculating years of life lost in the workforce, it was assumed that people, had they not died of chronic disease, would not have died from another cause. Although it is likely that some of these people would have died from other causes, the effect would be small in comparison to the total loss.

Appendix 2: Detailed tables

Table A2.1: People aged 25–64 years reporting any of the selected chronic diseases, Australia, 2004–05

Age group	Males			Females		
	Number	Per cent	95% CI	Number	Per cent	95% CI
25–34	244,500	17.7	15.6–19.8	337,100	24.2	21.9–26.6
35–44	324,900	22.3	20–24.5	421,500	28.6	26.1–31.0
45–54	425,800	31.7	29–34.3	540,500	39.2	36.6–41.9
55–64	521,700	49.1	46–52.3	615,000	58.3	55.0–61.6
Total 25–64	1,517,000	28.2	26.9–29.4	1,914,100	35.4	34.1–36.7

Note: Total per cents are age-standardised to the 2001 Australian population.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.2: Chronic disease prevalence, by sex, Australia, 2004–05

Chronic disease	Males			Females		
	Number	Per cent	95% CI	Number	Per cent	95% CI
Arthritis	785,300	14.3	13.3–15.2	988,000	17.8	16.8–18.8
Asthma	378,900	7.2	6.5–8.0	611,200	11.6	10.7–12.5
CHD	60,100	1.1	0.8–1.3	27,200	0.5	0.3–0.6
COPD	123,300	2.3	1.9–2.7	175,200	3.2	2.7–3.7
Depression	309,700	5.9	5.2–6.6	451,700	8.5	7.7–9.4
Diabetes	168,800	3.0	2.6–3.5	118,900	2.1	1.7–2.5
Osteoporosis	42,100	0.8	0.5–1.0	196,300	3.5	3.0–4.0
Stroke	31,300	0.6	0.4–0.8	36,600	0.7	0.4–0.9
<i>Any chronic disease</i>	<i>1,517,000</i>	<i>28.2</i>	<i>26.9–29.4</i>	<i>1,914,100</i>	<i>35.4</i>	<i>2.3–4.4</i>

Notes

1. Per cents are age-standardised to the 2001 Australian population.
2. People aged 25–64 years, excluding full-time students not in the labour force.
3. COPD—Chronic obstructive pulmonary disease; CHD—coronary heart disease.
4. People may report more than one of the selected chronic diseases, therefore the total is less than the sum of individual diseases.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.3: Labour force status by sex and age group, Australia, 2004–05

Age group	Employed full-time		Employed part-time		Unemployed		NILF	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Males								
25–34	1,148,800	83.2	117,600	8.5	55,900	4.0	58,400	4.2
35–44	1,217,100	83.4	117,500	8.0	36,400	2.5	88,900	6.1
45–54	1,092,700	81.2	95,900	7.1	27,900	2.1	128,700	9.6
55–64	560,500	52.8	127,100	12.0	23,000	2.2	351,500	33.1
Total 25–64	4,019,100	77.4	458,100	8.6	143,200	2.8	627,500	11.2
Females								
25–34	631,300	45.4	379,400	27.3	46,100	3.3	333,900	24.0
35–44	479,400	32.5	587,700	39.8	37,900	2.6	370,300	25.1
45–54	555,800	40.3	450,100	32.7	30,100	2.2	341,500	24.8
55–64	206,200	19.6	260,500	24.7	9,000	0.9	578,900	54.9
Total 25–64	1,872,700	35.8	1,677,700	31.8	123,100	2.4	1,624,600	30.0

Notes

1. NILF—Not in the labour force.
2. Per cent refers to row totals.
3. Total per cents are age-standardised to the 2001 Australian population.
4. People aged 25–64 years, excluding full-time students not in the labour force.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.4: Labour force status by chronic disease status, by sex, Australia, 2004–05

Labour force status	Any chronic disease			No chronic disease		
	Number	Per cent	95% CI	Number	Per cent	95% CI
Males						
Full-time	949,300	68.7	66.2–71.2	3,069,800	81.6	80.3–82.9
Part-time	163,300	9.8	8.2–11.5	294,800	7.9	7.0–8.9
Unemployed	43,400	3.4	2.3–4.4	99,700	2.6	2.1–3.2
NILF	360,900	18.1	16.1–20.1	266,500	7.8	6.9–8.7
Total	1,517,000	100.0	..	3,730,700	100.0	..
Females						
Full-time	553,300	31.8	29.5–34.2	1,319,400	38.2	29.5–34.2
Part-time	561,800	30.8	28.5–33.2	1,115,900	32.8	28.5–33.2
Unemployed	57,000	3.6	2.6–4.5	66,100	1.9	2.6–4.5
NILF	742,100	33.8	31.5–36.1	882,500	27.2	31.5–36.1
Total	1,914,100	100.0	..	3,384,000	100.0	..

.. Not applicable.

Notes

1. NILF—Not in the labour force
2. Per cents are age-standardised to the 2001 Australian population.
3. People aged 25–64 years, excluding full-time students not in the labour force.
4. Per cents may not total to 100 due to rounding.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.5: Chronic disease status by labour force status and age group, Australia, 2004–05

Labour force status	Any chronic disease			No chronic disease		
	Number	Per cent	95% CI	Number	Per cent	95% CI
25–34						
Employed full-time	341,000	58.6	54.4–62.9	1,439,200	65.7	63.5–68.0
Employed part-time	110,900	19.1	15.6–22.5	386,100	17.6	15.9–19.3
Unemployed	29,600	5.1	3.2–6.9	72,400	3.3	2.5–4.1
NILF	100,100	17.2	14.0–20.5	292,100	13.3	11.8–14.8
Total	581,600	100.0	..	2,189,800	100.0	..
35–44						
Employed full-time	345,600	46.3	42.6–50.0	1,350,900	61.7	59.4–64.0
Employed part-time	201,200	27.0	23.6–30.3	504,100	23.0	21.2–24.9
Unemployed	30,800	4.1	2.7–5.6	43,500	2.0	1.4–2.6
NILF	168,900	22.6	19.5–25.8	290,300	13.3	11.8–14.8
Total	746,500	100.0	..	2,188,800	100.0	..
45–54						
Employed full-time	502,800	52	48.8–55.3	1,145,700	65.2	62.9–67.6
Employed part-time	200,100	20.7	18.0–23.4	345,800	19.7	17.7–21.7
Unemployed	24,000	2.5	1.5–3.5	34,000	1.9	1.3–2.6
NILF	239,400	24.8	21.9–27.7	230,700	13.1	11.5–14.8
Total	966,300	100.0	..	1,756,200	100.0	..
55–64						
Employed full-time	313,300	27.6	24.8–30.3	453,500	46.3	42.9–49.6
Employed part-time	212,900	18.7	16.3–21.1	174,700	17.8	15.3–20.4
Unemployed	16,100	1.4	0.7–2.1	15,900	1.6	0.8–2.4
NILF	594,500	52.3	49.2–55.4	335,900	34.3	31.1–37.5
Total	1,136,800	100.0	..	980,000	100.0	..

.. Not applicable.

Notes

1. NILF—Not in the labour force.
2. People aged 25–64 years, excluding full-time students not in the labour force.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.6: Prevalence of any chronic disease within each occupation, by sex, Australia, 2004–05

Occupation	Number	Per cent	95% CI
Males			
Labourers and related workers	119,800	30.7	28.3–33.0
Elementary clerical, sales and service workers	46,600	28.7	26.9–30.5
Intermediate production and transport workers	162,400	26.5	25.3–27.7
Intermediate clerical, sales and service workers	80,900	23.2	21.4–25.0
Advanced clerical and service workers	9,900	29.3	28.2–30.4
Tradespersons and related workers	201,500	25.0	22.2–27.9
Associate professionals	152,300	26.5	24.6–28.4
Professionals	186,800	24.6	22.7–26.4
Managers and administrators	152,500	22.4	19.6–25.1
NILF or unemployed	404,300	45.1	38.1–52.2
Females			
Labourers and related workers	110,000	37.9	36.6–39.2
Elementary clerical, sales and service workers	24,500	33.5	30.9–36.1
Intermediate production and transport workers	111,900	32.2	30.7–33.8
Intermediate clerical, sales and service workers	286,400	31.6	29.7–33.5
Advanced clerical and service workers	92,400	37.6	32.8–42.4
Tradespersons and related workers	21,700	29.4	26.8–32.1
Associate professionals	134,200	30.9	29.3–32.6
Professionals	259,200	31.2	25.8–36.6
Managers and administrators	74,800	29.4	26.9–31.9
NILF or unemployed	799,000	41.2	36.6–45.7

Notes

1. Any chronic disease refers to any of the eight conditions specified for this analysis.
2. Per cents are age-standardised to the 2001 Australian population.
3. People aged 25–64 years, excluding full-time students not in the labour force.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.7: Number of chronic diseases by labour force status, Australia, 2004–05

Number of chronic diseases	Employed full-time	Employed part-time	Unemployed	NILF
Number				
None	4,389,200	1,410,700	165,800	1,149,000
One	1,265,200	553,400	66,000	708,000
Two	207,900	131,900	23,900	280,400
Three or more	29,600	39,800	10,500	114,500
Per cent				
None	61.0	19.7	2.3	17.0
One	51.7	21.6	2.9	23.8
Two	37.9	21.4	5.7	34.9
Three or more	14.2	26.9	11.0	47.9

Notes

1. NILF—Not in the labour force.
2. Per cents are age-standardised to the 2001 Australian population.
3. People aged 25–64 years, excluding full-time students not in the labour force.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.8: Loss in full-time employment associated with chronic disease (per cent of total person-years), by age group, Australia, 2004–05

Chronic disease	25–34	35–44	45–54	55–64	Total
Arthritis	2.1	7.3	11.4	21.4	42.3
Asthma	-1.3	1.5	4.1	4.7	9.0
CHD	0.0	0.6	0.7	3.1	4.5
COPD	1.1	0.8	2.6	3.8	8.4
Depression	3.7	8.4	6.4	4.9	23.5
Diabetes	0.1	0.2	0.9	3.5	4.7
Osteoporosis	0.6	0.6	0.8	3.2	5.1
Stroke	0.1	0.3	0.7	1.4	2.5
Total	6.4	19.7	27.6	46.0	100.0

Notes

1. People aged 25–64 years, excluding full-time students not in the labour force.
2. Per cents may not total due to rounding.
3. COPD—Chronic obstructive pulmonary disease; CHD—coronary heart disease.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.9: Loss through absenteeism associated with the presence of chronic disease (per cent of total person-years), by age group, Australia, 2004–05

Chronic disease	25–34	35–44	45–54	55–64	Total
Arthritis	1.3	10.8	8.6	2.9	23.6
Asthma	2.1	12.6	1.6	7.0	23.3
CHD	0.0	-0.2	0.6	0.5	1.0
COPD	2.0	2.0	2.5	-0.1	6.3
Depression	4.7	10.6	11.0	2.6	28.8
Diabetes	0.2	3.8	1.8	1.5	7.3
Osteoporosis	0.2	0.0	5.2	0.9	6.3
Stroke	0.0	0.4	-0.1	3.1	3.3
Total	10.5	40.0	31.2	18.4	100.0

Notes

1. People aged 25–64 years, excluding full-time students not in the labour force.
2. Per cents may not total due to rounding.
3. COPD—Chronic obstructive pulmonary disease; CHD—coronary heart disease.

Source: AIHW analysis of the 2004–05 National Health Survey.

Table A2.10: Loss in full-time and part-time employment (per cent of total person-years) associated with deaths from chronic disease, by age group, Australia, 2004–05

Chronic disease	Employed full-time		Employed part-time	
	Males	Females	Males	Females
Arthritis	0.0	0.0	0.0	0.1
Asthma	0.6	0.2	0.2	0.6
Cancers	36.7	15.5	12.8	51.3
CHD	17.3	1.7	5.9	5.9
COPD	1.1	0.4	0.4	1.3
Depression	15.4	2.0	5.2	6.3
Diabetes	2.3	0.6	0.8	1.9
Osteoporosis	0.0	0.0	0.0	0.0
Renal failure	1.2	0.5	0.5	1.7
Stroke	3.3	1.2	1.1	4.0
Total	77.9	22.1	26.9	73.1

Notes

1. People aged 25–64 years, excluding full-time students not in the labour force.
2. COPD—Chronic obstructive pulmonary disease; CHD—coronary heart disease.

Source: AIHW National Mortality Database.

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