5 Health status

Introduction

Differences in social and economic circumstances have been illustrated in the previous chapters for areas of Victoria. The maps and analyses in this chapter illustrate differences in the health status of residents of these areas.

The mapping technique is particularly useful in highlighting differences in the health status of the population (as measured by the indicators available) in areas across Victoria, and in demonstrating associations with the socioeconomic status and health service utilisation patterns. The results of the correlation analysis (which shows the extent of interdependence between the measures when mapped) are included in the text to support these associations.

Background

Health has been defined by the World Health Organisation as 'a state of complete physical, mental and social well being and not merely the absence of disease or infirmity'. Health status "refers to the level of health experienced by an individual or a community by placing them along a continuum, from health through distress, disease and disability, to death" (SAHC 1988).

Data collected since early this century have shown a steady improvement in the health status of Australians, as measured by a range of indicators including life expectancy, infant mortality and overall death rates. However, as noted in the *Introduction* (page 1), there are overwhelming inequalities in health status for disadvantaged groups. For example, all cause mortality rates are, on average, around 50 per cent higher for people aged under 65 years and living in the lowest socioeconomic areas when compared to the population groups of the same age and sex living in the areas of highest socioeconomic status (**Table 5.1**).

These differentials exist for both males and females in all the age groups studied, for all cause mortality and for a number of selected causes.

Table 5.1: Health status indicators by socioeconomic disadvantage of area and sex, Australia, late 1980s
Note: First quintile is high socioeconomic status and fifth quintile is low socioeconomic status

Age group (years)		Rate ratio for quintile of socioeconomic disadvantage of area			
		Males		Females	
		1st quintile	5th quintile	1st quintile	5th quintile
Children (0 to 14 years):	Mortality	1.00	1.46***	1.00	1.63***
	Serious chronic illness	1.00	1.25	1.00	1.18
	Reduced activity	1.00	1.36***	1.00	1.03
	Not breastfed: 0 to 4 yrs	1.00	1.46*	1.00	1.09
Youth (15 to 24 years):	Mortality	1.00	1.46***	1.00	1.49***
	Serious chronic illness	1.00	1.03	1.00	1.03
	Reduced activity	1.00	0.74***	1.00	0.95
	Fair/poor health	1.00	1.33	1.00	1.40
	Inactivity	1.00	1.07	1.00	1.34**
	Smoking: 18 yrs & over	1.00	1.24*	1.00	1.22
Adults (25 to 64 years):	Mortality	1.00	1.67***	1.00	1.49***
	Serious chronic illness	1.00	1.12	1.00	1.22**
	Reduced activity	1.00	1.56***	1.00	0.98
	Fair/poor health	1.00	1.61***	1.00	1.67***
	Overweight/obesity	1.00	0.99	1.00	1.23***
	Inactivity	1.00	1.26***	1.00	1.17**
	Smoking	1.00	1.43***	1.00	1.53***
	Alcohol risk	1.00	1.44***	1.00	0.95
Older people (65 & over):	Mortality	1.00	1.13***	1.00	1.10***
	Serious chronic illness	1.00	1.06	1.00	1.06
	Reduced activity	1.00	1.08**	1.00	1.22***
	Fair/poor health	1.00	1.34**	1.00	1.30**
	Overweight/obesity	1.00	1.05	1.00	1.17
	Inactivity	1.00	1.25	1.00	1.27**
	Smoking	1.00	1.47*	1.00	1.32
	Alcohol risk	1.00	1.12	1.00	1.05
All ages :	Mortality	1.00	1.23***	1.00	1.23***
	Serious chronic illness	1.00	1.11*	1.00	1.13**
	Fair/poor health	1.00	1.50***	1.00	1.51***
	Overweight/obesity	1.00	1.01	1.00	1.20***
	Inactivity	1.00	1.23***	1.00	1.21***
	Smoking: 18 yrs & over	1.00	1.34***	1.00	1.44***
	Alcohol risk: 18 yrs & over	1.00	1.34***	1.00	0.98

Statistical significance: the greater the number of * the higher the level of significance : * $p < 0.05$: ** $p < 0.01$: *** $p < 0.001$
Source: Mathers, C. Health Monitoring Series Nos. 1 to 4, Australian Institute of Health & Welfare, Canberra, 1994

Young people and adults from the lowest socioeconomic areas are also more likely to report their health as being 'fair' or 'poor' (in comparison with 'excellent' or 'good') than those living in the areas of highest socioeconomic status. The largest differential is that for 25 to 64 year old females: a differential of 67 per cent. Most risk factors, for example smoking, are also highly elevated for both men and women in the 'young' (by 24 per cent for males and 22 per cent for females) and 'adult' (by 43 per cent for males and 53 per cent for females) age groups living in the most disadvantaged areas. Male adult residents of these areas are also at high risk of poor health from high levels of alcohol consumption.

Despite overall decline in mortality rates between 1985-87 and 1995-97 for the majority of conditions, the differentials observed in the earlier period were still evident a decade later (Mathers in press). For example, during 1995-97 infants and children living in the most disadvantaged areas experienced the highest mortality rates for perinatal conditions and sudden infant death syndrome, and for injury and poisoning (**Table 5.2**)[1]. Similarly, males and females aged from 25 to 64 years residing in the most

disadvantaged areas, experienced the highest death rates for all cause mortality; for specific causes such as circulatory, respiratory and digestive system diseases; and for selected causes, such as coronary heart disease and stroke, motor vehicle traffic accidents and pneumonia/bronchitis. Although data for the individual quintiles are not presented in the table, almost without exception, death rates for these quintiles exhibited a clear gradient from high to low socioeconomic status. These widening differentials give cause for concern.

For some conditions, the authors found an actual increase in the mortality rates over the decade. Among those aged 15 to 24, there was an increase in the rate of male suicide in the middle (third) and low (fifth) socioeconomic status quintiles, and a corresponding increase for females in the high (first) and middle socioeconomic status quintiles (and also in the rate ratio). Among males aged 25 to 64, mortality rates increased (or remained largely unchanged) for diabetes mellitus, suicide, and asthma/emphysema, and for females of the same age increases in death rates were evident for diabetes mellitus, lung cancer and asthma/emphysema.

Although not statistically significant, the large reductions in rate ratios for deaths of 15 to 24 year old males and females from causes of drug dependence may reflect an increase in deaths of residents of higher socioeconomic status areas from these causes.

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[1]Age standardised mortality rates were calculated for males and females in the first (least disadvantaged), third, and fifth (most disadvantaged) quintiles of the ABS SEIFA Index of Relative Socio-Economic Disadvantage. Only the rate ratio of the fifth quintile to the first quintile is shown in the table.

Table 5.2: Rate ratio of mortality inequality by socioeconomic disadvantage of area, 1985-87 and 1995-97

| Age group/Mortality type | Rate ratio [1] | | | |
| | Males | | Females | |
	1985-87	1995-97	1985-87	1995-97
0 to 14 years				
All Cause	1.50	1.62***	1.67	1.45***
Perinatal conditions	1.54	1.39***	1.90	1.41***
Sudden infant death syndrome	1.20	2.73***	1.69	3.24***
Injury and Poisoning	2.02	2.21**	1.84	1.75
MV Traffic Accident	1.53	2.49***	1.95	1.40***
15 to 24 years				
All Cause	1.49	1.78***	1.54	1.40***
Drug dependence	1.91	0.98	1.52	0.94
Injury and Poisoning	1.47	1.98***	1.66	1.49**
MV Traffic Accident	1.40	2.26***	1.56	1.83***
Suicide	1.35	1.75***	1.30	0.95***
25 to 64 years				
All Cause	1.68	1.64***	1.50	1.45***
Circulatory System	1.65	1.87***	1.97	2.01
Coronary HD	1.55	1.88***	2.22	2.34***
Stroke	2.10	2.07	1.71	1.70
Diabetes mellitus	1.73	2.07***	3.04	3.49***
Cancer	1.28	1.39***	1.10	1.14***
Lung cancer	1.60	1.98***	1.58	1.73***
Injury and Poisoning	1.96	1.76***	1.69	1.47***
Suicide	1.73	1.52***	1.42	1.15***
MV Traffic Accident	1.73	2.33***	1.66	2.21***
Respiratory System	2.31	2.49***	2.06	2.64***
Pneumonia, bronchitis	3.72	1.76***	4.24	2.80***
Asthma, emphysema	1.90	3.02***	1.43	2.94***
Digestive System	3.06	2.20***	2.26	2.21

[1]Ratio of Standardised Mortality Ratio for fifth quintile (low socioeconomic status) to first quintile (high socioeconomic status)
Note: Rate ratios of mortality inequality differ significantly from no inequality at significance level p<0.001
Asterisks indicate level of significance of the difference from the corresponding 1985-87 value: * p <0.05, ** p <0.01, *** p <0.001
Source: Mathers C. Australian Institute of Health and Welfare (in press)

Measurement of health status

Current situation

In the absence of accepted measures of good health as a positive entity, health status is largely indicated by measures of morbidity (sickness), mortality (death, in particular infant and other premature deaths, and life expectancy), disability, risk factors and, in some instances, utilisation of health services. Broader aspects of health, such as social and economic wellbeing, or of life satisfaction, are rarely measured in the administrative collections from which most health data are drawn. To be useful in describing health status at a local area level, datasets need to include descriptive information associated both with the particular event being recorded (eg. cause of death) and the person about whom it was recorded (eg. age, sex and place of usual residence).

The deaths' data collections undertaken by the Australian Bureau of Statistics (ABS) have provided one of the few datasets to include such detail at a local area level. Therefore, mortality data have been the major indicator of health status used over the years in small area analyses. Data on the extent of morbidity (illness or disease), disability and risk factors in the community have generally not been available at the local area level, apart from proxy measures such as hospital admissions and for some States and Territories, cancer incidence data.

Use of Synthetic Predictions

Information on the levels of morbidity in the community has been collected by the ABS since 1977 in the five-yearly National Health Survey (NHS) (prior to 1989 called the Australian Health Survey, AHS). In these surveys, a sample of the Australian population is asked to report on medical conditions, diseases, etc. experienced in the two weeks prior to being interviewed. Information is also collected on personal attributes (eg. age, sex, height, weight, income and occupation), and on a number of lifestyle and behavioural factors including smoking and alcohol consumption.

In the 1989 AHS and 1995 NHS, a sample of the Australian population was asked to indicate its perception of its own health status, on a scale of 'excellent', 'very good' (only asked in the 1995 NHS), 'good', 'fair' and 'poor'. The purpose of this question was to obtain information about health status in a more subjective way, in order to provide an alternate measure to that derived solely from statistics of illness, death, or service use.

As a further development, the 1995 NHS also included the SF-36 (Ware et al. 1993), a survey questionnaire designed to provide general self-reported health status profiles of the population. The SF-36 provides an indicator across eight dimensions of health and well being: physical functioning; role limitations due to physical health problems; bodily pain; general health; vitality (energy/fatigue); role limitations due to emotional problems; and mental health (psychological stress and psychological well being). Two summary measures, a Physical Component Summary and a Mental Component Summary[2], can be calculated from the eight dimensions.

Data from the NHS are generally available only at the State and Territory level, or for large regional areas such as State health regions. In recognition of the importance of local area level data, the ABS was contracted (as part of this national atlas project) to produce estimates for two variables (the self-assessed health status of the population and the Physical Component Summary of the SF-36) for SLAs across Australia, using the synthetic prediction technique. The variables and the synthetic prediction technique, are described on page 111.

This section also includes estimates of the number of people with a handicap, which were also produced using the synthetic prediction technique.

Data mapped

In this chapter, data have been mapped for a number of measures of health status. These include the measures, discussed above, from the NHS; the population with a handicap; premature deaths of males and females, selected causes of death and years of potential life lost; and the Total Fertility Rate. These variables are discussed in more detail in the introduction to the maps on each topic.

A comparison of the mapped distribution of these measures of health status with the distributions in other chapters indicates the possible extent of association at the local area level between health status, and socioeconomic status and health service use. The extent of association is supported by the results of the correlation analysis in Chapter 8.

Gaps and deficiencies in the data

Health status of Aboriginal and Torres Strait Islander people

Indigenous people have the poorest health of any group in Australia: they are also the group least well identified in statistical collections. **Table 3.2** in Chapter 3 documents problems in the counts of Indigenous Australians from the population Census. Data for the birth and death records for Indigenous people used in this chapter are similarly inaccurate.

Despite the inclusion of a question to identify Indigenous people on the death information statements and medical certificates of cause of death, they are under-reported in death records[3]. Over the past few years only the Northern Territory, Western Australia, South Australia and the Australian Capital Territory were considered to have had reasonably complete coverage. The coverage in other States has not improved since the early 1990s, with the exception of Queensland, which has been estimated to have moved close to complete coverage since 1996. However, between 1991 and 1996 there has been a largely unexplained increase in the population of Indigenous people: see pages 18 and 19 for further details. Thus, estimates of the completeness of Indigenous birth and death notifications for some States and Territories (which are, in part, based on Census counts) will need to be reviewed.

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[2]Preliminary investigations by the ABS found that it was not possible to obtain a model capable of reliably predicting the Mental Component Summary.

[3]The death information statement is authorised by a relative or other person who has knowledge of the deceased and is usually filled out by a funeral director; the medical certificate of cause of death is completed by a medical practitioner or coroner.

Cancer incidence and notifications of communicable diseases are other important collections of relevance to the measurement of health status which also inadequately identify Indigenous Australians.

The Australian Bureau of Statistics and the Australian Institute of Health and Welfare (ABS/AIHW 1999) have identified that "among the most important issues relating to data quality is: the estimation of the size and composition of the Indigenous population; the identification of Indigenous people in administrative data collections; and issues related to the collection of survey data about Indigenous people. The availability of data are also affected by the number of Indigenous people included in surveys and the regularity with which the surveys are conducted". The ABS, AIHW, State and Territory health authorities and the heads of Aboriginal and Torres Strait Islander health organisations are currently working together to reduce the long term issues related to the accurate and appropriate collection of an Indigenous people identifier for demographic and health collections.

Influence of deaths of Indigenous people on ARIA results

results

There has been considerable discussion on the extent to which high death rates in the non-metropolitan areas of Australia result from the much higher mortality experience of Indigenous populations. A Queensland study, using the Rural, Remote and Metropolitan Areas classification (RRMA) has shown that across most major classes of diseases remote areas had higher rates than urban areas. Once the Indigenous component was taken out of the analysis, the differences between the RRMA groups were greatly reduced for most diseases. Significant differences remained for diseases of the circulatory and genitourinary systems and all causes (Muller, Ring & Kennedy 1998 unpublished).

An initial examination of data for deaths in 1997 of Indigenous people aged from 15 to 64 years was undertaken by the new Accessibility/Remoteness of Australia (ARIA) as part of the atlas project. Data were examined for Western Australia, South Australia and the Northern Territory, which are considered to have the best identification of Indigenous people in their deaths statistics. Preliminary findings suggest that, for the Northern Territory, death rates for all of the ARIA categories are likely to be affected by deaths identified as Indigenous. In South Australia, the affect on death rates is substantial in the Very Remote category and is also likely (although to a much lesser extent) to impact on results for the Remote category. In Western Australia, the affect on death rates in the Very Remote category is again substantial, and is also likely to be significant in the Moderately Accessible category (driven by the impact of male deaths) and the Remote category (driven by the impact of female deaths).

As this analysis was undertaken as the first volume of the atlas went to print, the data on which these initial findings were based were not able to be incorporated in the printed version. The data are, however, available on the atlas World Wide Web site, at www.publichealth.gov.au. It is planned to extend the analysis to include more years of data, and to use age standardised rates, rather than the age-specific rates as used in this initial analysis.

Health status and socioeconomic status

As noted in Chapter 2 (*Measurement of socioeconomic status*), most collections of health statistics do not include data items which directly allow for analysis of socioeconomic status at the local area level. This is a major deficiency in Australian health information.

Even the death notification form, which requires the inclusion of the deceased person's occupation (a potential indicator of socioeconomic status), is of limited value. The data available are of questionable quality and is not published by the ABS.

The area of usual residence of the person is therefore used here as a proxy measure of socioeconomic status in the absence of any direct measures. The validity of using the area of usual residence in this way is discussed in Chapter 2, *Methods* under the heading *Usual residence*.

Health status and the physical environment

There is limited information on the impact on the health of Australians of environmental factors, such as air quality and soil and water contamination (Peach 1997). Overseas studies have found a relationship between the levels of several pollutants in the air, and death rates or signs of sickness (such as hospital admissions or use of medications for respiratory system disease). Some relate an increase in signs of poor health with increased levels of sulphur dioxide and total suspended particulate matter in the air (Dept. of the Environment, Sport and Territories 1996).

However recent developments in Australia provide the potential to improve the range and quality of data available. In February 1998 the National Environment Protection Council agreed to establish the National Pollutant Inventory. The National Pollutant Inventory (NPI) is the first of a series of National Environment Protection Measures to be developed in Australia. When fully developed, the NPI will provide a national database of pollutant emissions and will be available on the Internet.

Since 1 July 1998, larger Australian industrial facilities which use more than a specified amount of the chemicals listed on the NPI have been required to estimate and report annually their emissions for the NPI. Estimates of emissions from facilities using less than the specified amount of the chemicals listed on the NPI and emissions from the community (such as nutrient emissions to waterways and air emissions from motor vehicles, lawn mowers etc.) will also be made available. Information regarding the composition of substances listed on the NPI, their uses, and the associated risks to human health and the environment, will be included on the database. The data from the first year of reporting are now expected to be available in 2003. In the first two reporting years for the NPI, facilities will be required to report their emissions to air, land and water (from 36 of the 90 chemicals listed on the NPI). In late 1999, a review of the NPI will consider whether reporting requirements should extend to the full list of chemicals.

The establishment of this inventory and its promulgation using the Internet, will bring to a wide audience important data on pollutant emissions by type of emission and the location of the facility responsible for the emission. This spatial element will enable comparisons with data from other sources and will better inform the work in Australia on the impact of air quality and soil and water contamination on the health of Australians.

Other National Environment Protection Measures being developed include ambient air quality, movement of controlled waste across State and Territory borders and assessment of contaminated sites.

The homeless

Chamberlain (1999) has estimated that there were 105,000 homeless people in Australia on Census night in 1996. Where there are a disproportionately large number of homeless people in a city, a town or a regional area, they may also be represented disproportionately in the maps in this atlas. For example, if they are not captured in the population data for the same area of address that is given in administrative records following a hospital admission or a visit to a general medical practitioner, or on a death certificate, the rates for these events will be overstated for that area.

Rates of death and hospital admission in inner and near city SLAs in the capital cities are particularly likely to be affected, as many of those who live 'on the street' frequent these areas, and these SLAs are also the location of much of the sheltered accommodation and many of the low-cost boarding houses used by the homeless in general.

Other gaps and deficiencies

There are a number of important areas for which health status data are not available at the small area level. These include oral health, nutrition (including information on height and weight) and mental health and wellbeing, all of which are key areas affecting health status. Details of the incidence of cancer are also not available for all of Australia in a standard form suitable for mapping. For example, data are available for some States at the SLA level and for others at the postcode level. The National Cancer Statistics Clearing House has this small area data, although it has not been edited or used to date. Similarly, details

are available from the State and Territory operations of the National Cervical Screening Program and Breast Screen Australia. As yet small area data are not held nationally, although the National Screening Information Project will eventually hold such information.

Although small area data could have been obtained from the individual States and Territories, this was not done because, for a number of jurisdictions, the data would have to be converted from postcode to SLA for mapping. This is an inexact process (see page 10) and could well produce rates that overstate the true incidence of cancer in an SLA (and possibly overstate the rate many times). Given the concerns that high rates estimated from these datasets at the small area level would evoke in the community (when the rate may well be inaccurate), a decision was taken not to map this data.

Area mapped/Boundary issues

As noted in Chapter 2 under the heading of *Area mapped/Boundary issues*, adjustments have been made in a number of cases to the death's data to maintain comparability at the small area level and to enable the correlation analysis to be undertaken.

Data for deaths used in this chapter were registered over the four year period from 1992 to 1995. For statistical purposes, each death was allocated the code of the Statistical Local Area (SLA) of usual residence of the deceased. However, during the data collection period, substantial changes were made to SLA boundaries in Victoria. In many cases, changes in boundaries were accompanied by changes in SLA names. As a result, it has been necessary to merge some SLAs used in the analysis in Chapter 3 when presenting data for deaths which were registered over the period from 1992 to 1995.

Table 5.3: Generic names for merged Statistical Local Areas

Grouping of 1996 SLAs resulting from boundary changes	Generic name used in text
Melbourne	
Altona (C); Sunshine (C)	Altona/Sunshine
Essendon (C); Fitzroy (C); Melbourne (C); South Melbourne (C)	Essendon/Fitzroy/Melbourne/South Melbourne
Geelong	
Corio (S) [Part A]; Bannockburn (S) [Part A]	Corio-Inner
Victoria Rest of State	
Ballaarat (C)	Ballarat
Ballarat (C) - Central	Ballarat
Ballarat (C) - Inner North	Ballarat
Ballarat (C) – South	Ballarat
Gr Bendigo (C) – Central	Bendigo
Gr Bendigo (C) - Inner West	Bendigo
Gr Bendigo (C) - Inner East	Bendigo
Gr Bendigo (C) - Eagle hawk	Bendigo
Greater Geelong [Part B]; South Barwon-Inner [Part B]; Surf Coast (S) [Part A]	Greater Geelong (balance)

Source: Compiled from project sources

In describing these data in the text, groupings of merged SLAs have been assigned a generic name. The generic names of key SLA groupings, together with the SLAs which comprise the grouping, are shown in **Table 5.3**. These SLAs were grouped because of boundary changes in **Geelong**, Ballarat and **Melbourne**.

Readers are also referred to the comments on page 13 as to modifications made to the way in which the correlation analysis was undertaken for Victoria.

Synthetic predictions of selected health status measures

Introduction

As noted above (page 107), some important data in Australia are only collected in household surveys such as the 1995 National Health Survey (NHS) and the 1993 Survey of Disability and Ageing. Data from the these surveys are generally available only at the State and Territory level; in some instances (eg. for the largest States) they may also be available for large regional areas, such as State health regions. In recognition of the importance, for strategic planning and policy development, of local area level data for the measures included in these surveys, estimates were made for SLAs across Australia for selected variables from the NHS, using the synthetic prediction technique.

The variables are the self-assessed health status of the population and the Physical Component Summary of the SF-36. The ABS has previously produced estimates (using the synthetic prediction technique) at the SLA level of the number of people in the population with a disability and, of those, the number handicapped by that disability. The estimates of the population with a handicap are included in this section.

Description of the technique[4]

Synthetic predictions represent, in effect, a prorating of the Australian estimate (for the particular variable) across SLAs. The predictions are based on a model fitted to survey information, in which associations in the survey data for Australia are identified. For the purpose of the analysis, the survey data used in the model are limited to variables for which data are also available at the SLA level (these are the predictors). The model is then applied to the SLA counts of the predictors. The prediction is, effectively, the likely value for a typical area with those characteristics.

For example, in predicting the population with a disability (using data in the Survey of Disability and Ageing), the data variables were limited to those that were also available at the SLA level. These included variables from the 1991 Census, various socioeconomic (eg. unemployed, Indigenous) and demographic characteristics (age, sex, predominantly non-English speaking birthplace) and other sources (Disability Support Pensions). Relationships identified in the survey data (between levels of disability and age, sex, receipt of a Disability Support Pension) are then modelled in the SLA level data, and predictions produced of the number of a people with a disability.

The estimates were then age-sex standardised to remove variations (between SLAs) solely related to variations in age and sex.

Cautions

The synthetic predictions are intended as an indicator of regional distribution of the population with a handicap, where no other Australia-wide indicator exists (ABS 1996). Therefore, the extent to which the estimates reflect the number of people with a disability in any region will be, in part, dependent on the predictive value of the characteristics used in the model.

In making decisions based on the synthetic predictions, it is important to take into account any specific knowledge about a particular area (ie. the characteristics of its population) that is not incorporated into the model.

The synthetic predictions are also subject to sampling error because they are based on a model fitted to survey data. They are, however, fairly stable, most having sampling error comparable to the Australian estimates for the same variable from the survey (ie. lower than sampling error normally associated with survey estimates for small areas).

Users should note that the estimates will not necessarily agree with other (published) State estimates produced from the relevant surveys, as the predictions are based on Australian totals. Each of the surveys include people in institutions such as hospitals, specialised long-term accommodation for people with a disability, gaols, etc.

Variables mapped

Physical Component Summary of the SF-36

As noted on page 107, the SF-36 (the Rand Short Form, 36 questions) is one of a number of multi-dimensional or general health status profiles under development in the world (Ware et al. 1993). Although it is becoming widely used, questions remain as to its validity as a measure of health and wellbeing. There are also concerns as to its applicability to particular population groups (such as Indigenous populations, children, or the elderly) and, in particular, to older people born overseas in countries where English is not the predominant language.

It has, however, been included in a number of major studies in the health field in Australia. In 1995 it was incorporated in the NHS. In the light of this general acceptance, one of the summary measures from the SF-36, the Physical Component Summary (PCS), has been estimated at the SLA level (using the synthetic prediction technique) and included in this atlas. The PCS is derived from a subset of items that ask respondents to the NHS aged 18 years and over, about their general physical health and wellbeing. A higher score indicates a better state of physical health and wellbeing.

Self-assessed health status

Self-assessed health status refers to a person's perception of their general health status. In the 1995 NHS, the population aged 18 years and over was asked to indicate its perception of its own health status, on a scale of 'excellent', 'very good', 'good', 'fair' and 'poor'. In the following analysis, details are shown of that proportion of the population who reported their health as being fair or poor. The ABS report that how people rated their health was strongly related to their illness experience (ABS 1997). This is consistent with the finding by McCallum et al. (1994) that people rate their health as poor on the objective basis of illness and disability. For Indigenous people, the factors associated with reporting fair or poor health have been examined using data from

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[4]A more detailed description of the production of the synthetic estimates is in Appendix 1.5.

the 1994 National Aboriginal and Torres Strait Islander Survey (ABS/AIHW 1999). Among the factors most strongly associated with self-assessed health status were reported health conditions and recent health actions, age, main language spoken and labour force status (Cunningham, Sibthorpe & Anderson 1997).

Survey of Disability and Ageing

The 1993 Survey of Disability, Ageing and Carers (ABS 1993) provides estimates of the numbers of people with disabilities and those who were handicapped by the disability and who were living in private dwellings. The following definitions apply:

– a person was recorded as having a disability if he/she had one or more of a group of selected limitations, restrictions or impairments which had lasted, or was likely to last, for six months or more.

– a handicap results from a disability which limits a person's ability to perform certain tasks associated with daily living. The limitations must be in relation to one or more tasks of self-care, mobility, verbal communication, schooling or employment.

These definitions of disability and handicap are based on the *International Classification of Impairments, Disabilities and Handicaps* published by the World Health Organisation (1980).

It was estimated from the 1993 Survey of Disability, Ageing and Carers that 818,000 people in Victoria (18.3 per cent of the population) had a disability. Of these, 778,800 (17.5 per cent of the population) were living in 'households', with the remainder living in establishments such as nursing homes and hostels.

The majority (640,100, or 14.3 per cent of the population) of those with a disability had a handicap of varying levels of severity, ranging from profound (16.3 per cent of all people with a handicap), through severe (11.6 per cent) and moderate (17.3 per cent), to mild (39.6 per cent). The rate of disability per thousand population increased with age.

Following the release of the 1993 Survey results, the Australian Bureau of Statistics (ABS) produced a set of 'synthetic predictions' for the Heads of Disability Services of the Commonwealth and the States and Territories, for use as a component of assessing the demand for disability services at a regional level.

Estimates for the population with a disability and the number handicapped by that disability are included in the tables in Volume 3.1, however only the dataset for the population with a handicap has been mapped in this atlas.

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People reporting their health as fair or poor, 1995

Capital city comparison (Australia as the Standard)

The majority of Australians aged 18 years and over consider themselves to be in good health, with 83 per cent reporting their health status as good, very good or excellent (ABS 1997); similar proportions were reported by males and females. Self-assessed health status was, however, strongly related to age, with the proportion reporting their health as excellent or very good declining with age, and the proportion reporting fair or poor health increasing with age.

In 1995, the standardised ratios (SRs) recorded for people reporting their health as fair or poor, ranged from 109[**] in **Hobart** to 90[**] in **Perth**. The other capital cities with ratios below the level expected from the Australian rates were **Melbourne** (with an SR of 96[**]) and **Canberra** (98[**]). For the five cities with data recorded in both periods in **Table 5.4**, none of the changes in the ratios were very large. The largest changes were recorded in **Perth** (with a higher proportion reporting their health as fair or poor, relative to the Australian rate) and **Adelaide** (fewer people reporting their health as fair or poor, relative to the Australian rate).

Table 5.4: People reporting their health as fair or poor, capital cities

Standardised ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All capitals
1995	102[**]	96[**]	100	102[**]	90[**]	109[**]	105[**]	98[**]	99[**]
1989-90	104[**]	99[**]	97[**]	106[**]	85[**]	..	..	..	100

[1]Includes Queanbeyan (C)

Source: See *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Melbourne (Victoria as the standard)

An estimated 367,943 people aged 18 years and over reported their health as fair or poor (as distinct from those who reported their health as being good, very good or excellent) in **Melbourne** in 1995; this was at the level expected from the State rates (an SR of 100).

The estimated number of people reporting fair or poor health were more than 20 per cent above the level expected from the State rates in Footscray (an SR of 127), the City of Melbourne (126[**]), Richmond (124[**]), Collingwood (123[**]), Altona (122[**]), and Brunswick (120[**]). Relatively high ratios were also estimated for people in Preston, Dandenong and Broadmeadows (each with an SR of 117[**]), St Kilda (116[**]), South Melbourne, Port Melbourne and Northcote (each with an SR of 115[**]).

Fewer people than expected reported their health as fair or poor in half of the SLAs (49.1 per cent) in **Melbourne**. The lowest ratios generally occurred in higher socioeconomic status areas. Eltham and Camberwell (both with an SR of 81[**]) shared the lowest ratio, with 19 per cent fewer people reporting fair or poor health than expected from the State rates. Relatively low ratios were recorded in Sandringham and Brighton (both with 83[**]), Doncaster and Templestowe (84[**]), Malvern (85[**]), Waverley (86[**]), Kew and Diamond Valley (both with 87[*]).

In 1995, the largest numbers of people reporting their health as fair or poor were in Broadmeadows (estimated at 14,267 people), Keilor (13,106), Waverley (12,694), Preston (12,233), Moorabbin (12,210), Knox (12,145) and Sunshine (12,104).

The results of the correlation analysis revealed a positive association between people reporting their health as fair or poor and many of the indicators of socioeconomic disadvantage. The strongest of these were with the variables for unemployment (0.84), low income families (0.81) and poor proficiency in English (0.73). The inverse correlation of substantial significance with the

IRSD (-0.82) also indicates an association at the SLA level between high proportions of people reporting their health as fair or poor and socioeconomic disadvantage.
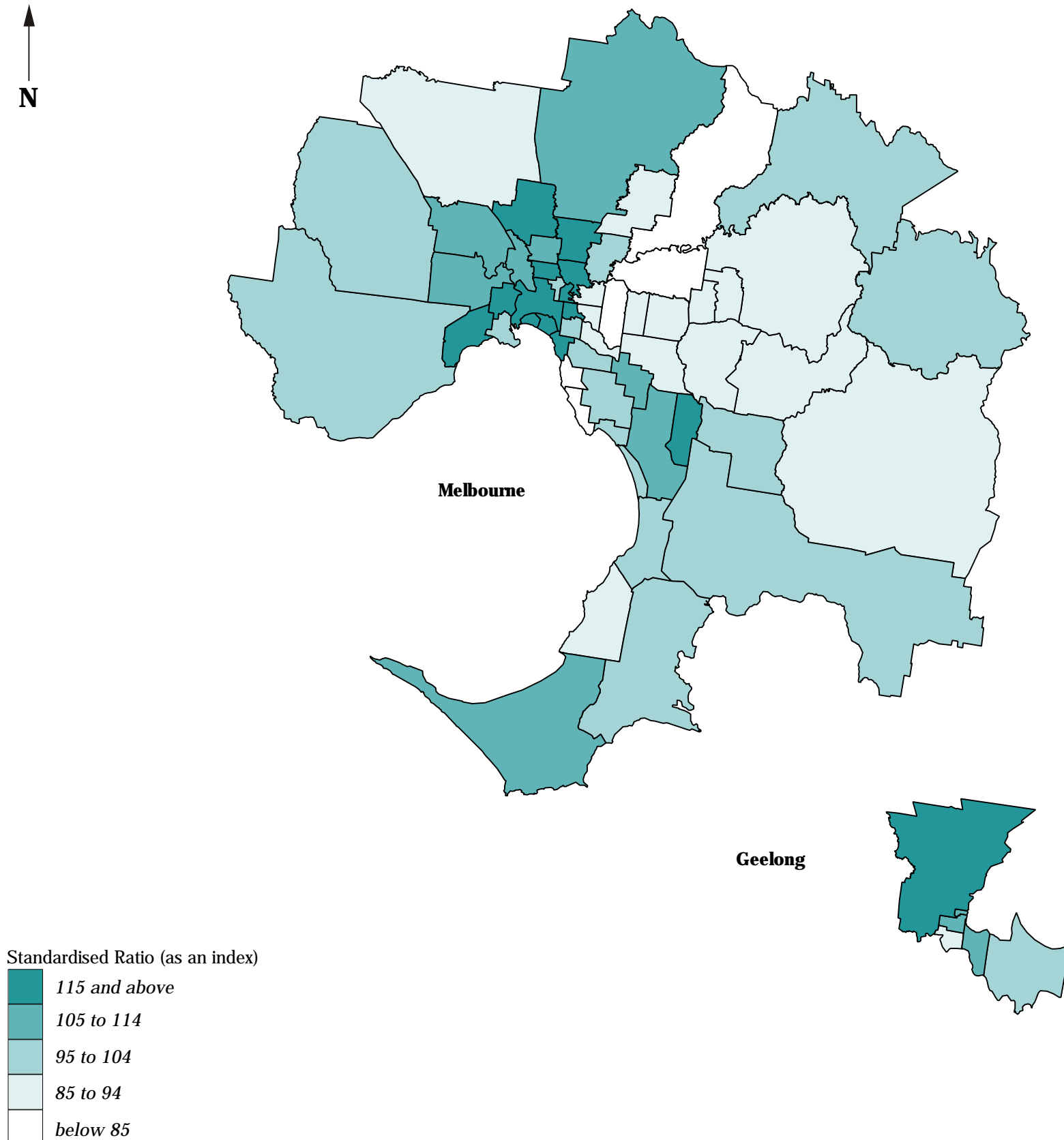
Geelong

There were 13,756 people reporting their health as fair or poor in **Geelong** in 1995, seven per cent more than expected from the State rates (an SR of 107[**]). In Geelong West, 19.0 per cent of the population reported fair or poor health, compared with 18.8 per cent in next ranked Corio-Inner. The standardised ratios for people reporting fair or poor health were elevated in all SLAs except Newtown (92[**]). The highest ratios were in Corio-Inner (an SR of 112[**]) and Geelong West (106[*]). In Corio-Inner, there were 6,830 people reporting their health as fair or poor, with 2,284 in Bellarine-Inner.

Map 5.1
People reporting their health as fair or poor, Melbourne and Geelong, 1995

Standardised Ratio: number of people in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Ratio (as an index)

- 115 and above
- 105 to 114
- 95 to 104
- 85 to 94
- below 85

[*]*Expected numbers were derived by indirect age-sex standardisation, based on Vic totals*

Source: See *Data sources,* Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

National Social Health Atlas Project, 1999

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People reporting their health as fair or poor, 1995

State/Territory comparison

There was little difference in the levels of fair or poor health reported by residents of the capital cities and the *Rest of State/Territory* areas for Australia as a whole (**Table 5.5**). The most highly elevated standardised ratios (SRs) for people reporting their health as fair or poor in the non-metropolitan areas of Australia were in Tasmania (with an SR of 115[**]) and the Northern Territory (111[**]). Only in Western Australia (91[**]) and Victoria (95[**]) were the ratios below the level expected from the Australian rates. Responses given by Indigenous people are particularly relevant in non-metropolitan areas. After adjusting for age, Indigenous people in these areas were about twice as likely as their non-Indigenous counterparts to report their health as fair or poor (ABS 1999).

For the five States with data recorded in both periods, none of the changes in the ratios were very large. As for the capital cities, the largest changes were recorded in Western Australia (with a higher proportion reporting their health as fair or poor, relative to the Australian rate) and South Australia (fewer people reporting their health as fair or poor, relative to the Australian rate). For both these States the differential in the ratios from the Australian rate was twice that in their capital cities.

Table 5.5: People reporting their health as fair or poor, State/Territory

Standardised ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1995									
Capital city	102[**]	96[**]	100	102[**]	90[**]	109[**]	105[**]	98[**,1]	99[**]
Other major urban centres[2]	108[**]	103[**]	103[**]	..	..	..	..	..	105[**]
Rest of State/Territory	103[**]	95[**]	103[**]	101	91[**]	115[**]	111[**]	–[3]	101[**]
Whole of State/Territory	103[**]	96[**]	102[**]	102[**]	90[**]	112[**]	108[**]	97[**]	100
1989-90									
Rest of State/Territory	104[**]	97[**]	103[**]	110[**]	82[**]	..	..	..	101[**]

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: See *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of State (Victoria as the standard)

There were an estimated 129,068 people reporting fair or poor (as distinct from those who reported their health as being good, very good or excellent) health in the non-metropolitan areas of Victoria in 1995, marginally fewer than expected from the State rates (an SR of 99[**]).

The majority of the one third (37.4 per cent) of SLAs with elevated ratios were located within 200 kilometres of **Melbourne** (**Map 5.2**).

The highest standardised ratios were in Surf Coast [Part A] (with an SR of 122[**]), Upper Yarra [Part B] (121), Morwell [Part A] (120[**]) and Talbot and Clunes (117[**]), all with ratios elevated by 15 per cent or more above the levels expected. Relatively high rates of people reporting fair or poor health were also recorded in Moe (with an SR of 113[**]), Daylesford and Glenlyon (111[**]), McIvor (111[*]), Maryborough and Mildura (both with 110[**]).

SLAs with at least 20 per cent fewer people reporting fair or poor health than expected from the State rates were recorded in Wimmera (with an SR of 74[**]), South Barwon-Inner (75[**]), Morwell [Part B], Shepparton [Part B] and Wangaratta (each with 78[**]) and Dundas (with an SR of 79[**]).

The largest numbers of people reporting fair or poor health in the non-metropolitan areas of Victoria, were estimated to be from the towns of Ballarat (8,680 people), Bendigo (8,166) and Shepparton (3,037),as well as from the rural SLAs of Greater Geelong (Balance) (3,631 people) and South Barwon-Inner (3,533).
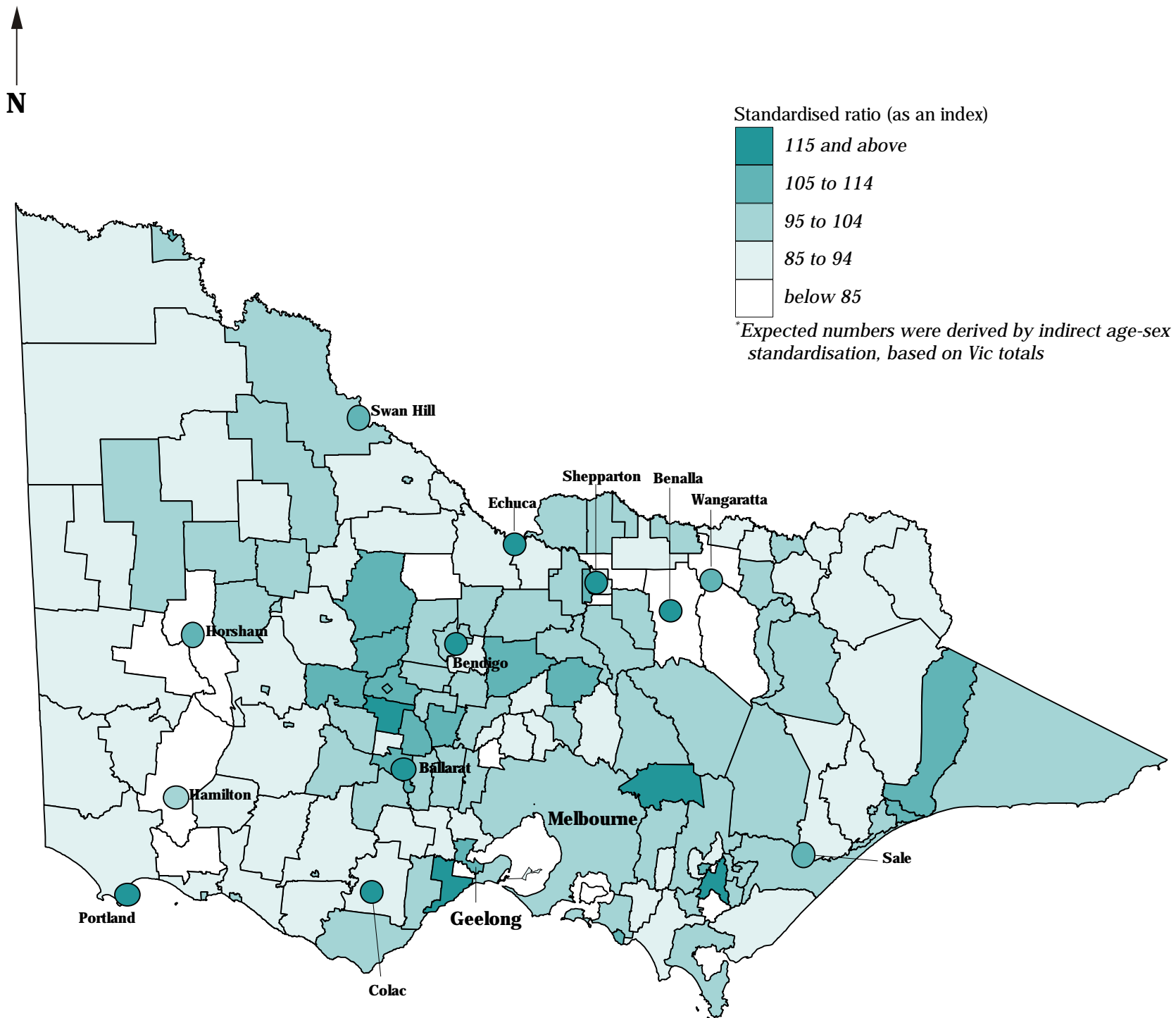
Of the towns mapped, the highest ratios were recorded in Shepparton (with an SR of 108[**]), Portland (107[*]), Ballarat (106[**]), Colac (106[*]) and Benalla (105). The lowest ratios were in Hamilton (95) and Horsham (99). Apart from Ballarat, Bendigo and Shepparton, the largest numbers of people reporting fair or poor health and living in a town were from Wangaratta (1,925 people), Horsham (1,525) or Sale (1,409).

The correlation analysis revealed a positive association with many of the indicators of socioeconomic disadvantage, the highest being with the variables for unemployment (0.66), single parent families (0.66) and dwellings without a motor vehicle (0.54). Inverse correlations of meaningful significance were also recorded with female labour force participation (-0.63) and managers and administrators, and professionals (-0.59). The inverse correlation of meaningful significance with the IRSD (-0.66) also indicates a positive association at the SLA level between high proportions of the population reporting their health as fair or poor and socioeconomic disadvantage. There was a substantially significant inverse correlation with the variable for fair or poor health status (-0.95).

Map 5.2
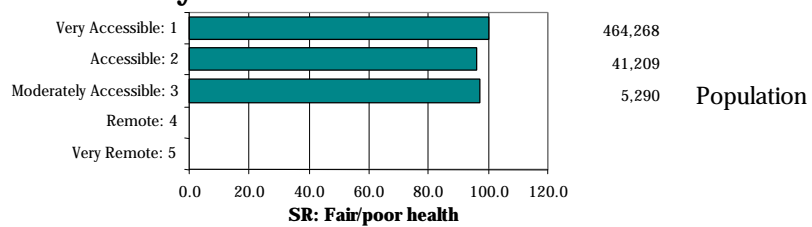# People reporting their health as fair or poor, Victoria, 1995

Standardised Ratio: number of people in each Statistical Local Area compared with the number expected[*]

N

Standardised ratio (as an index)

- 115 and above
- 105 to 114
- 95 to 104
- 85 to 94
- below 85

[*]Expected numbers were derived by indirect age-sex standardisation, based on Vic totals

Swan Hill

Shepparton Benalla

Echuca Wangaratta

Horsham

Bendigo

Ballarat

Hamilton

Melbourne

Sale

Portland

Geelong

Colac

Accessibility/Remoteness Index of Australia

	Population
Very Accessible: 1	464,268
Accessible: 2	41,209
Moderately Accessible: 3	5,290
Remote: 4	
Very Remote: 5	

0.0   20.0   40.0   60.0   80.0   100.0   120.0

SR: Fair/poor health

All three accessibility categories had similar ratios for people reporting their health as fair or poor. The most highly elevated ratio was in ARIA category 1 (with the same number of people reporting their health as fair or poor as was expected from the State rates, an SR of 100), with the lowest in ARIA category 2 (an SR of 96).

Physical Component Summary, SF-36, 1995

Capital city comparison (Australia as the Standard)

The Physical Component Summary (PCS) is expressed as a mean score, with higher scores indicating better physical health. The PCS score for the Australian population aged 18 years and over was 49.7, ranging from a high of 53.1 for 18 to 24 year olds and 53.0 for 25 to 34 year olds, to 50.0 in the 45 to 54 year age group, before declining at each subsequent ten year age group to a mean score of 38.5 for people aged 75 years and over (ABS 1997). Males had a marginally higher score than females (49.8 compared with 49.6). Scores for males and females were the same at ages 55 to 64 years (a PCS score of 46.6), and higher for males at ages under 55 years, and lower at older ages (in the 65 to 74 years and 75 years and over age groups). The PCS score also varies by employment status, with employed males recording the highest mean score (52.2), with lower scores for the unemployed (51.0) and those not in the labour force (47.4). The major difference for males and females was recorded for females not in the labour force, with a score of 49.8, higher than that for males, with a score of 45.1. There are also notable variations for people reporting selected illness conditions such as cancer (those with cancer had a PCS score of 44.6, compared with those with no cancer, 49.3), heart disease (40.3, compared with 48.3), diabetes (44.0, compared with 49.9), asthma (47.3, compared with 50.0) and injury (45.9, compared with 50.2). There was a striking gradient in the PCS score for people reporting no serious physical conditions (a mean score of 53.1), when compared with those with one serious physical condition (49.8) and two or more such conditions (44.8).

The capital city scores varied over a narrow range (**Table 5.6**), from 49.4 in **Adelaide** to 50.2 in **Melbourne**.

Table 5.6: Physical Component Summary, capital cities
Standardised score

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All capitals
49.8	50.2	49.8	49.4	49.7	49.9	49.5	50.1	49.9

[1]**Includes Queanbeyan (C)**
Source: See *Data sources*, Appendix 1.3

Melbourne (Victoria as the standard)

The PCS score recorded in **Melbourne** in 1995 was 50.2, which was at the level expected from the State rates for a population of this size and age/sex composition.

The distribution of PCS scores across **Melbourne** was similar to that recorded for many of the indicators of socioeconomic disadvantage, with the highest scores (indicating better physical health) located in the inner and middle eastern suburbs, and in south-east bayside locations, and the lowest in the western inner and middle industrialised areas (**Map 5.3**).

The highest PCS score was recorded for residents of Camberwell, with a mean score of 51.2. Relatively high scores were also recorded in Sandringham (a PCS score of 51.1) and Brighton, Eltham, Malvern, Kew and Hawthorn, each with a PCS score of 51.0. Doncaster and Templestowe had a PCS score of 50.9 while Fitzroy and Waverley both recorded 50.8.

The lowest PCS scores were recorded in Footscray (48.9), Altona (49.0), Preston and Broadmeadows (each 49.2) and Coburg (49.3).

The results of the correlation analysis revealed a positive association between high PCS scores (indicating better physical health) and many of the indicators of high socioeconomic status. The strongest of these were with the variables for female labour force participation (0.74) and high income families (0.73). Inverse correlations of substantial significance were recorded with the variable for unemployment and low income families (both -0.85). These results, together with the correlation of substantial significance with the IRSD (0.89), confirm the strong association at the SLA level between high PCS scores and high socioeconomic status.
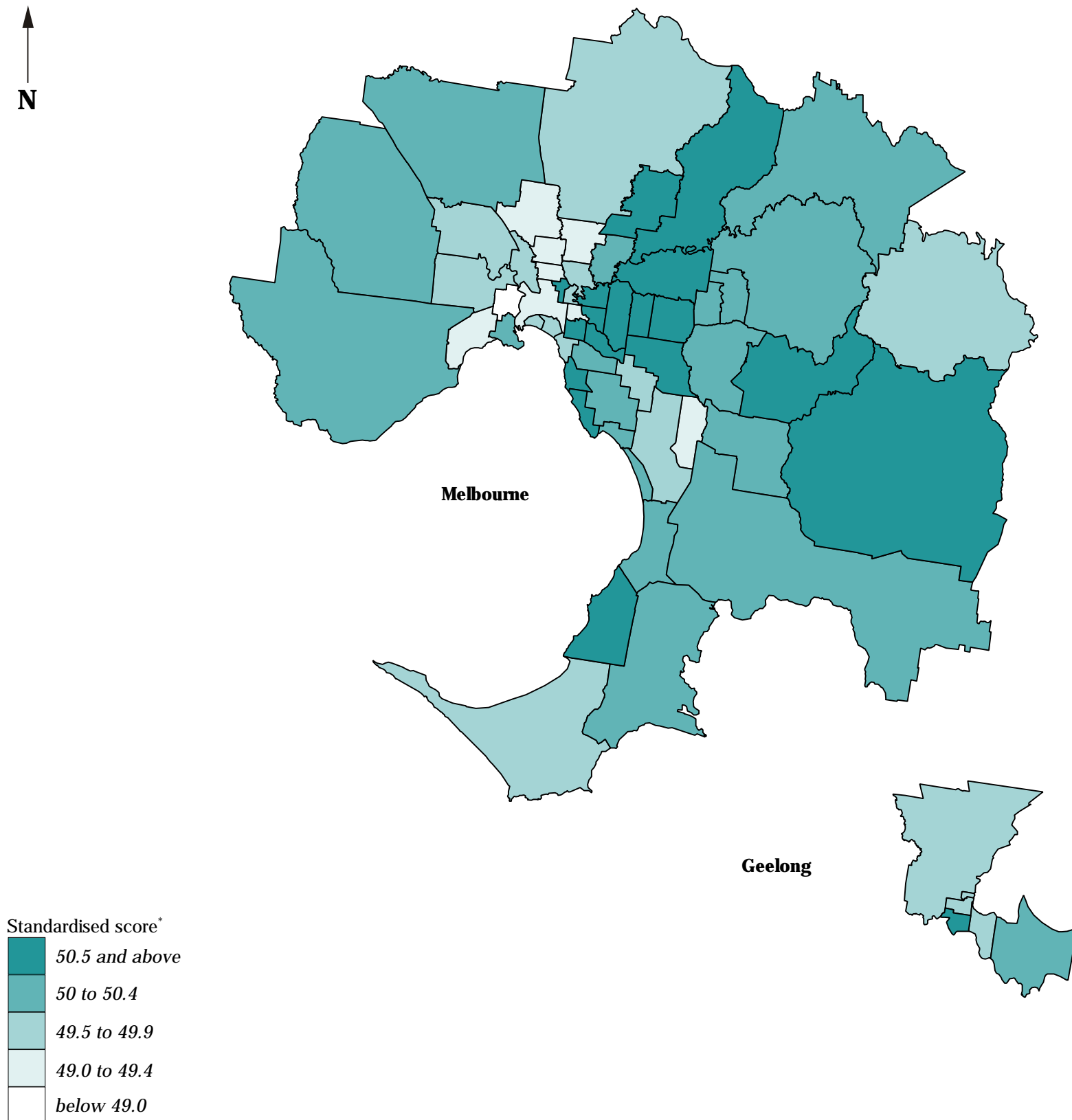
Geelong

The PCS score for residents of **Geelong** was 49.9. The highest PCS scores were in Newtown (50.6) and Bellarine-Inner (50.1), with the lowest in Corio-Inner (49.6).

Map 5.3
Physical Component Summary[*], SF-36, Melbourne and Geelong, 1995
mean Physical Component Summary (PCS) score[*] in each Statistical Local Area

N

Melbourne

Geelong

Standardised score[*]

- 50.5 and above
- 50 to 50.4
- 49.5 to 49.9
- 49.0 to 49.4
- below 49.0

[*]The PCS score has been age-sex standardised,
  based on Vic totals

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Physical Component Summary, SF-36, 1995

State/Territory comparison (Australia as the Standard)

The Physical Component Summary (PCS) is expressed as a mean score, with higher scores indicating better physical health. Details of variations in the PCS score by selected population characteristics are given on the previous page.

The scores in the non-metropolitan areas are all either the same as, or lower than, those in the capital cities (**Table 5.7**). The lowest PCS score was in the Northern Territory (a score of 49.3) and the highest in Victoria (50.2).

Table 5.7: Physical Component Summary, State/Territory, 1995
Standardised score

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	49.8	50.2	49.8	49.4	49.7	49.9	49.5	50.1[1]	49.9
Other major urban centres[2]	49.5	49.9	49.7	..	..	..	..	..	49.6
Rest of State/Territory	49.6	50.2	49.7	49.4	49.7	49.6	49.3	_[3]	49.7
Whole of State/Territory	49.7	50.2	49.7	49.4	49.7	49.8	49.4	50.1	49.8

[1]**Includes Queanbeyan (C)**
[2]**Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)**
[3] **Data included with ACT total**
Source: See *Data sources*, Appendix 1.3

Rest of State (Victoria as the standard)

The PCS score estimated for residents of the non-metropolitan areas of Victoria was 50.1, as expected from the State rates.

SLAs with the highest scores (indicating better physical health) were distributed throughout the State, particularly in a band some 150 to 200 kilometres from **Melbourne**, as well as in the north-west (**Map 5.4**).

Five SLAs recorded a PCS score of greater than 51.0: South Barwon-Inner (with a mean score of 51.5), Wimmera (51.4), Morwell [Part B] (51.3) and Shepparton [Part B] and Wangaratta (both 51.1). Gisborne, Dundas, Oxley and Arapiles each had a PCS score of 51.0, with scores of above 50.5 in a further 32 SLAs (20.4 per cent of all SLAs).

The lowest scores were also widely distributed throughout the State, but with a greater incidence in the eastern and western coastal areas. The lowest score (indicating poorer physical health) of 48.8 was recorded in Surf Coast [Part B], with similarly low scores in Talbot and Clunes (49.0), Morwell [Part A] (49.1), McIvor (49.3), Maryborough (both 49.4), Upper Yarra [Part B] (49.4) and Avoca, Daylesford and Glenlyon, Korong and Bet Bet (each with a PCS score of 49.5).
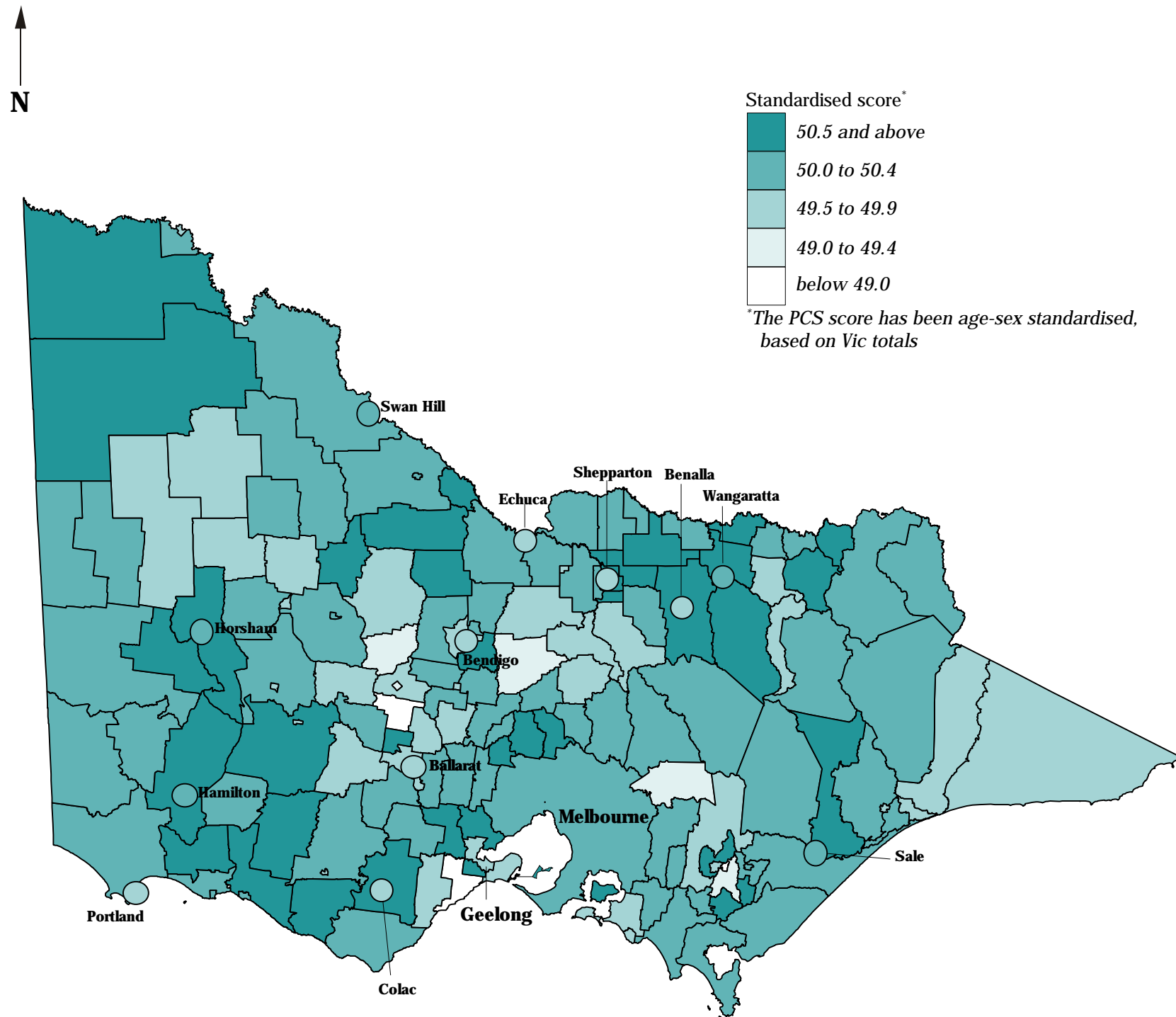
Of the towns mapped, the highest PCS scores were recorded in Shepparton (50.5), Hamilton (50.3), Sale (50.2) and Wangaratta and Swan Hill (both 50.1). The lowest PCS score was in Colac and Benalla (both with 49.7).

There were positive correlations with the indicators of high socioeconomic status, the highest being with the variables for high income families and female labour force participation (both 0.55). Inverse correlations of meaningful significance were recorded with the variables for low income families (-0.61) and unemployment (-0.57). These results, together with the correlation of meaningful significance with the IRSD (0.66), support the existence on an association at the SLA level between a high PCS score and high socioeconomic status.

Map 5.4
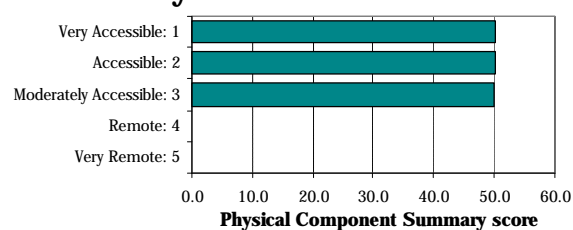# Physical Component Summary[*], SF-36, Victoria, 1995

mean Physical Component Summary (PCS) score[*] in each Statistical Local Area

N

Standardised score[*]

50.5 and above

50.0 to 50.4

49.5 to 49.9

49.0 to 49.4

below 49.0

[*]The PCS score has been age-sex standardised, based on Vic totals

Swan Hill

Shepparton Benalla

Echuca   Wangaratta

Horsham

Bendigo

Ballarat

Hamilton

Melbourne

Sale

Portland

Geelong

Colac

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia

Very Accessible: 1

Accessible: 2

Moderately Accessible: 3

Remote: 4

Very Remote: 5

0.0   10.0   20.0   30.0   40.0   50.0   60.0

Physical Component Summary score

There is virtually no difference in Physical Component Summary (PCS) scores across the ARIA categories. Both the Very Accessible and Accessible areas had PCS scores of 50.2, with a marginally lower score of 50.1 in the Moderately Accessible areas.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Estimated number of people with a handicap, 1993

Capital city comparison (Australia as the Standard)

The estimates presented below do not include people living in institutional accommodation but do include those living more independently in, for example, community or group housing.

Age-sex Standardised Ratios (SRs) calculated from the 1993 Survey of Disability and Ageing of the estimated number of people with a handicap ranged from 12 per cent lower than expected (in relation to the Australian rates) in **Sydney** (88[**]) and 8 per cent lower in **Darwin** (92[**]), to 10 per cent higher in **Adelaide** (110[**]). The ratios cover a wider range than those calculated from the 1988 Survey (**Table 5.8**). Most other capital cities had SRs in 1993 which were close to the level expected from the Australian rates.

Table 5.8: Estimated number of people with a handicap, capital cities

	Sydney	**Melbourne**	**Brisbane**	**Adelaide**	**Perth**	**Hobart**	**Darwin**	**Canberra[1]**	**All capitals**
1993	88[**]	102[**]	101[**]	110[**]	109[**]	102[**]	92[**]	98[**]	99[**]
1988	97[**]	100	93[**]	101[**]	104[**]	..	..	..	98[**]

Standardised ratios

[1]Includes Queanbeyan (C)
Source: See *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

The regional distribution of people with a disability (and who are handicapped by that disability) is likely to be affected by a number of factors associated with their disability, in addition to any association between a higher prevalence of disability and poorer socioeconomic status. Such factors include the location of dedicated therapeutic, educational and employment facilities, as well as the location of accommodation, both group or community housing and institutional accommodation. For example, people who have moved out of institutional accommodation into group or private housing often remain close to the institution in which they previously lived. This may reflect a choice to remain near to available services eg. day centre, education or employment services (which may be located with or near to the institution), or because group housing has been provided in the local area.

Another important influence is likely to be that people may have chosen to live in an area in which such therapeutic and educational services are available. While this may have been a more important influence in the past, when transport to these services was less readily available than it is now, such historical influences can remain for many years.

Melbourne (Victoria as the Standard)

There were an estimated 403,117 people with a handicap living in **Melbourne**, two per cent fewer than expected from the State rates (an SR of 98[**]). The highest ratios are in SLAs located in and around the city centre, and the lowest are in SLAs to the east (**Map 5.5**).

The highest ratios were recorded in the SLAs of Port Melbourne (with an SR of 116[**], 16 per cent more people with a handicap than expected from the State rates), Collingwood (113[**]) and St Kilda (110[**]). Ratios in the second highest range were recorded in Brunswick (109[**]), Northcote (108[**]), Footscray, Richmond and the combined SLAs of Essendon/Fitzroy/Melbourne/South Melbourne (each with 107[**]), and Flinders and Preston (both with 106[**]).

The lowest ratios were recorded in the eastern SLAs of Doncaster/Templestowe (with an SR of 88[**], 12 per cent fewer people with a handicap than expected from the State rates), Waverley (89[**]), Knox and Cranbourne (both with 91[**]) and in the western SLAs of Werribee and Bulla (both with 91[**]).

In 1993, the largest numbers of people with a handicap were estimated to live in Essendon/Fitzroy/Melbourne/South Melbourne area (20,657 people), and in Altona/Sunshine (17,671) and Waverley (14,741).

There were correlations at the SLA level with many indicators of socioeconomic status, including with the variables for dwellings without a motor vehicle (0.84), low income families (0.67), public rental housing (0.64) and unemployed people (0.62). These results, together with the inverse correlation with the IRSD (-0.46), support the existence of an association at the SLA level between the distribution of the population with a handicap and socioeconomic disadvantage. There was also a correlation of substantial significance with the variable for years of potential life lost (0.82).
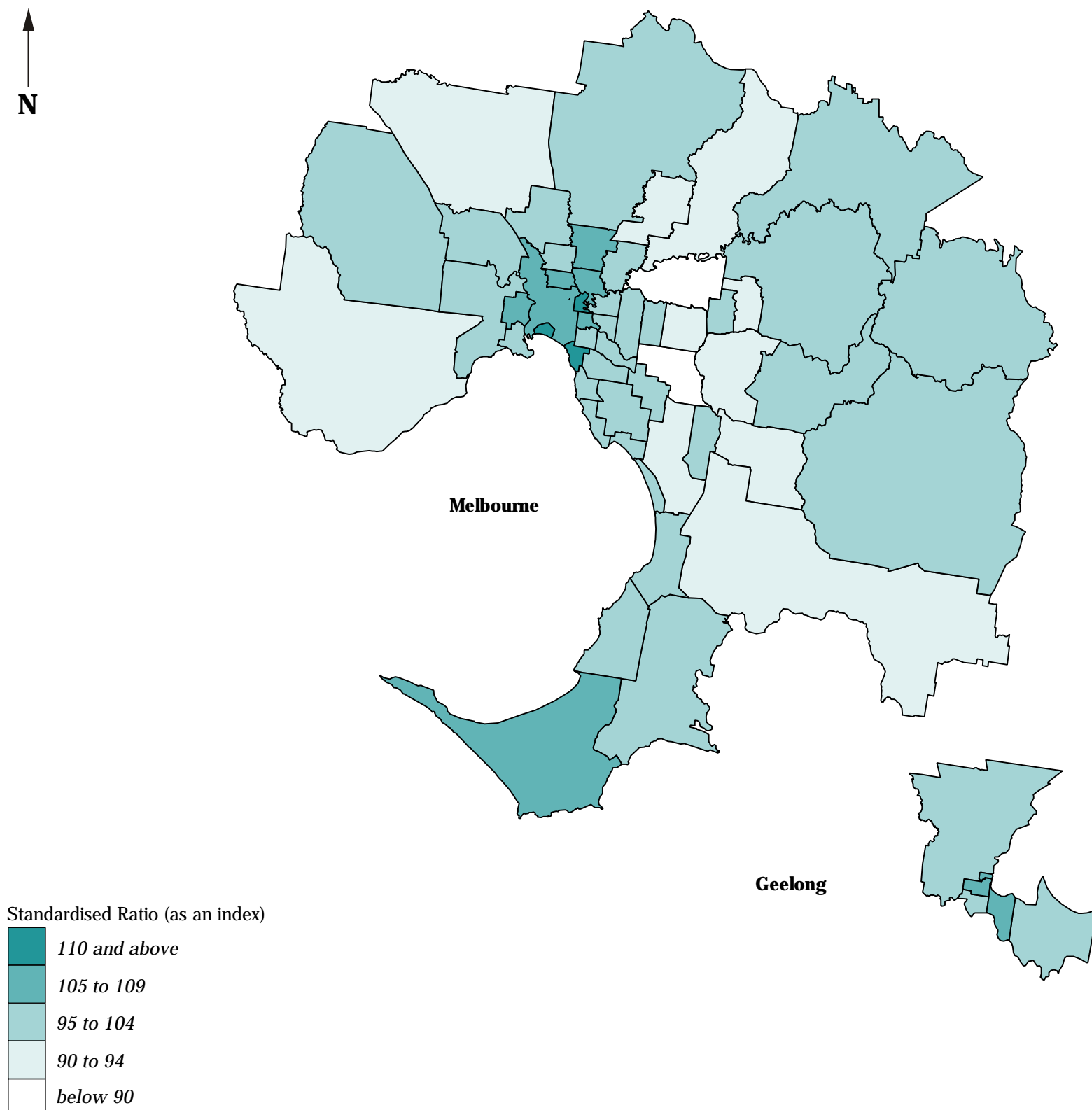
Geelong

In 1993, there were estimated to be 16,042 people with a handicap in **Geelong**, four per cent more people than expected from the Victorian rates (an SR of 104[**]), with elevated ratios ranging from an SR of 103[**] in Corio Inner to 107[**] in both Geelong West and Geelong. The lowest ratio (an SR of 100) was recorded in Bellarine-Inner. The largest number of people with a handicap was in Corio-Inner (7,444 people).

Map 5.5
Estimated number of people with a handicap, Melbourne and Geelong, 1993

Standardised Ratio: number of people in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Ratio (as an index)

- 110 and above
- 105 to 109
- 95 to 104
- 90 to 94
- below 90

[*]Expected numbers were derived by indirect age-sex
standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

National Social Health Atlas Project, 1999

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Estimated number of people with a handicap, 1993

State/Territory comparison

The estimates presented below do not include people living in institutional accommodation but do include those living more independently in, for example, community or group housing.

At the *Whole of State/Territory* level, standardised ratios (SRs) calculated from the 1993 Survey of Disability and Ageing of the estimated number of people with a handicap ranged from a high of 110[**] in South Australia and 109[**] in Western Australia to a low of 91[**] in New South Wales (**Table 5.9**). There was a similar range across the non-metropolitan areas of the remaining States and the Northern Territory.

The SRs in the *Rest of State/Territory* areas were less variable in the later period shown (when compared with those calculated from the 1988 survey), with the highest ratios occurring in South Australia and Western Australia and the lowest in New South Wales.

Table 5.9: Estimated number of people with a handicap, State/Territory
Standardised ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1993									
Capital city	88[**]	102[**]	101[**]	110[**]	109[**]	102[**]	92[**]	98[**1]	99[**]
Other major urban centres[2]	95[**]	109[**]	109[**]	..	..	..	..	..	100
Rest of State/Territory	95[**]	106[**]	104[**]	111[**]	110[**]	105[**]	102	_[3]	103[**]
Whole of State/Territory	91[**]	103[**]	104[**]	110[**]	109[**]	104[**]	97[**]	99[**]	100
1988									
Rest of State/Territory	98[**]	119[**]	96[**]	90[**]	99[**]	..	..	..	102[**]

[1]**Includes Queanbeyan (C)**
[2]**Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)**
[3] **Data included with ACT total**
Source: See *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of State (Victoria as the Standard)

In 1993, there were an estimated 163,995 people with a handicap in the non-metropolitan areas of Victoria, five per cent more than expected from the Victorian rates (an SR of 105[**]).

The majority (84.7 per cent) of SLAs in non-metropolitan Victoria had elevated ratios for this variable (**Map 5.6**) and the majority of SLAs mapped in the highest range were located in a group in the central region of the State. The highest ratios were recorded in Talbot and Clunes (with an SR of 119[*]), Southern Rural West (118[**]), Avoca (117[**]), Bet Bet (117[**]), Maryborough (117[**]), Tullaroop (116[**]) Daylesford and Glenlyon (115[**]) and St Arnaud (115[**]). Other SLAs with high ratios included Wonthaggi (113[**]), Nathalia (111[*]), Birchip (110) and Tambo [Part B] (110[*]).

Eleven SLAs had fewer people with a handicap than were expected from the State rates. Four of these SLAs are located on the western periphery of **Melbourne**: they are Gisborne (with the lowest SR of 94), Romsey (97), Kilmore (97) and Bacchus Marsh (99). Other SLAs with low ratios included Wimmera (97), Shepparton [Part B] (97), Morwell [Part B] (97) and Oxley (98).

Of the towns mapped, the highest ratios were recorded in Ballarat, Bendigo and Colac (all with an SR of 111[**]) and Shepparton and Echuca (both with a ratio of 114[**]). Echuca (109[**]) and Shepparton (108[**]) had nine and eight per cent more people with a handicap than were expected from the State rates respectively.
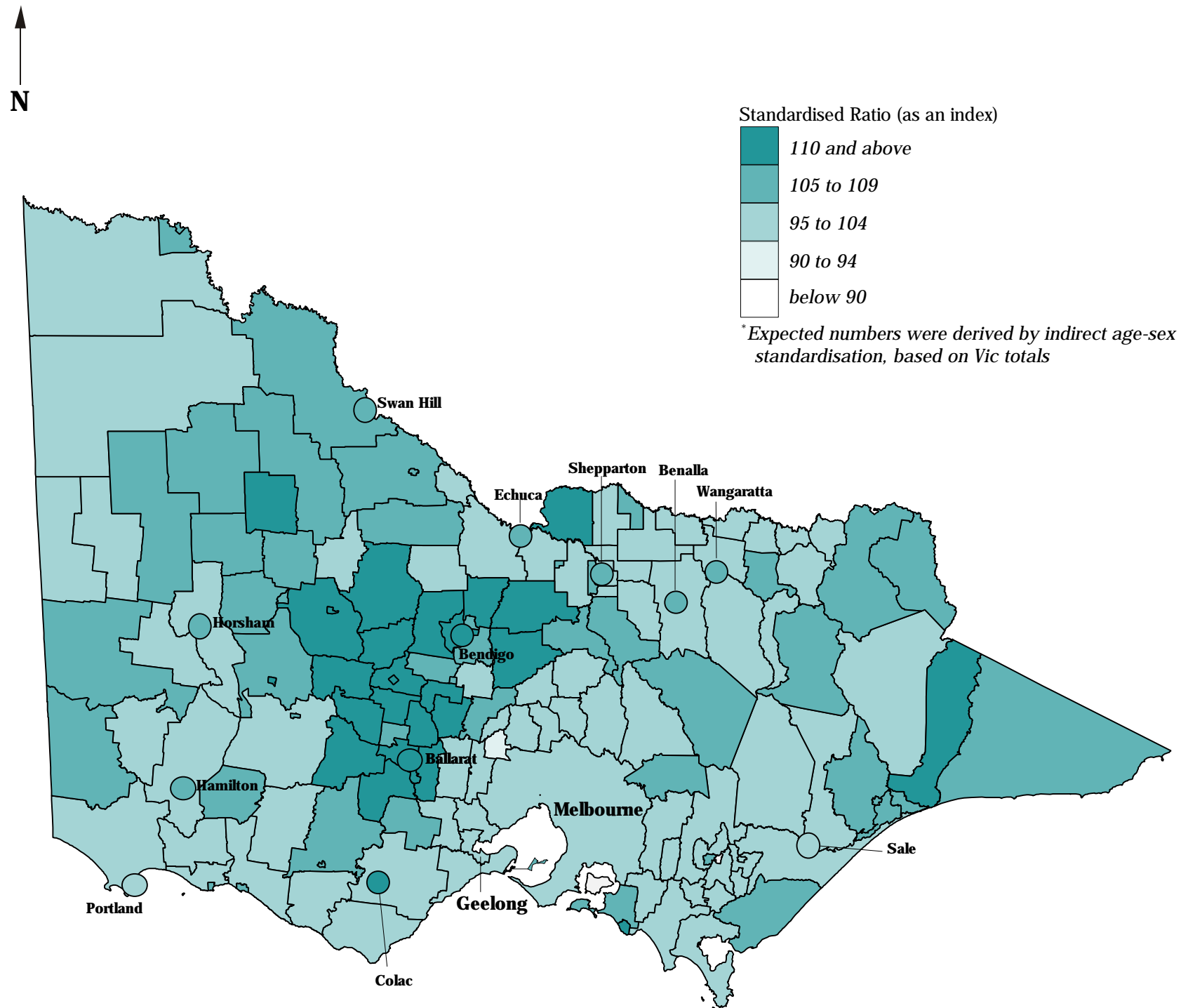
The largest estimated numbers of people with a handicap were in Ballarat (10,884 people), Greater Geelong Balance (10,748), Bendigo (9,960) and Shepparton [Part A] (3,720).

There was an association evident in the correlation analysis at the SLA level with indicators of socioeconomic disadvantage. The strongest correlations were with the variables for low income families (0.63) and high income families (an inverse correlation of –0.64). These results, together with the inverse correlation of meaningful significance with the IRSD (-0.59), suggest the existence of an association between high rates of people with a handicap and socioeconomic disadvantage. There were also correlations of meaningful significance with the variables for fair or poor health status (0.58) and the Physical Component Summary (an inverse correlation of –0.63).

Map 5.6
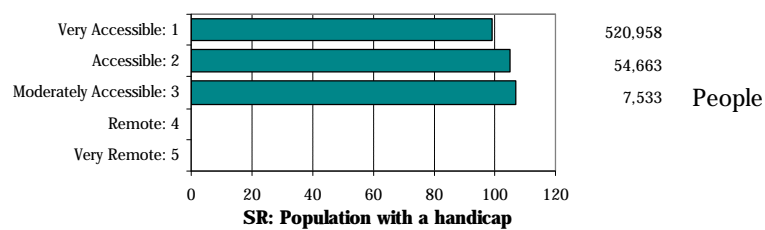# Estimated number of people with a handicap, Victoria, 1993

Standardised Ratio: number of people in each Statistical Local Area compared with the number expected[*]

N

Standardised Ratio (as an index)

- 110 and above
- 105 to 109
- 95 to 104
- 90 to 94
- below 90

[*]Expected numbers were derived by indirect age-sex standardisation, based on Vic totals

Swan Hill

Shepparton Benalla

Echuca Wangaratta

Horsham

Bendigo

Ballarat

Hamilton

Melbourne

Sale

Portland

Geelong

Colac

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

Accessibility/Remoteness Index of Australia

	SR: Population with a handicap	People
Very Accessible: 1		520,958
Accessible: 2		54,663
Moderately Accessible: 3		7,533
Remote: 4		
Very Remote: 5		

There are only minor variations across the ARIA categories in standardised ratios (SRs) for the estimated number of people with a handicap. The range is from an SR of 99 in the Very Accessible areas (with an SR of 99, one per cent fewer people with a handicap than expected from the State rates) to SRs of 105 (five per cent more than expected) and 107 (seven per cent more than expected) in the Accessible and Moderately Accessible categories, respectively.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

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Deaths

Introduction

Variations in death rates attributable to measures of equity (such as social class) are perhaps the most telling of all the indicators relevant to a social health analysis. The maps in this section include infant deaths and premature deaths of males and females, and by major cause of death. Details of years of potential life lost are also shown.

Variations in death rates by social class

Variations in death rates related to social class have been shown in a wide range of studies in overseas countries, and in some studies in Australia. The most detailed Australian work in this area is an analysis of deaths occurring in 1985, 1986 and 1987, undertaken for the National Health Strategy (1992) and published in more detail by the Australian Institute of Health and Welfare as part of their Health Monitoring Series (Mathers 1994) (**Table 5.1**). As noted above, Mathers has recently updated his work by adding the period 1995-97 (**Table 5.2**). Mathers' study is discussed in detail in Chapter 1 but shows that the differentials in mortality rates that were evident in 1985-87 have persisted over the decade. This analysis provides details of the extent of disparities in mortality rates according to the relative social disadvantage of the population, as measured by the ABS SEIFA Index of Relative Socio-Economic Disadvantage.

Both the NSW and Victorian governments have also recently released health reports that examine socioeconomic variations in death rates in some detail (NSW Health Department 1997; Department of Human Services Victoria, in press). In NSW, over the years from 1990 to 1994, premature deaths from all causes were inversely related (-0.59) to high socioeconomic status. Moreover, four out of the five areas with the highest mortality rates and the lowest socioeconomic status also had the highest percentage of Indigenous people. In Victoria in 1996, socioeconomic status was also found to be correlated with premature death, with socioeconomic disadvantage explaining 36 per cent of the variance in life expectancy of males and 30 per cent of the variance in females.

Changes in numbers and rates, 1986 to 1995

Australia

As Australia's population continues to grow and age, the number of deaths each year is expected to increase over the next several decades (AIHW 1998). Over the nine year period from 1986 to 1995 the number of deaths in Australia increased by 8.8 per cent, rising from 114,981 deaths in 1986 to 125,133 deaths in 1995. However, this trend was a reflection of the increased number of deaths experienced among people aged 65 years and over, which rose by 17.6 per cent over this period. In line with increasing life expectancy in Australia, the number of deaths declined in all other age groups. The most substantial decline was for infants (those aged under 12 months), for whom the number of deaths decreased by 32.7 per cent, from 2,154 deaths in 1986 to 1,449 deaths in 1995. This is largely due to a decline in deaths attributed to sudden infant death syndrome, which declined from

2.2 deaths per 1,000 live births in 1987 to 0.8 per 1,000 live births in 1996 (AIHW 1998). Deaths recorded for 15 to 64 year olds in Australia also declined, from 29,892 to 26,532 over this nine year period, a decrease of 11.2 per cent.

Death rates have declined over this nine year period for all ages and in the age groups under 12 months (deaths per 1,000 live births), 15 to 64 years and 65 years and over.

Victoria

The number of deaths in Victoria over the nine period from 1986 to 1995 increased by 7.5 per cent, rising from 30,175 deaths in 1986 to 32,425 deaths in 1995. Male deaths increased by 5.9 per cent, while a more substantial increase of 9.3 per cent was recorded for female deaths. Although there has been an overall increase in the number of deaths, this increase was evident only for people aged 65 years and over (an increase of 16.1 per cent). In 1995, there were 308 infant deaths (161 males and 147 females) recorded in Victoria, a decrease of 40.4 per cent since 1986. There was also a decrease in the number of deaths of people aged from 15 to 64 years, down by 13.6 per cent, from 7,424 deaths in 1986 to 6,412 deaths in 1995.

Death rates have declined for all ages and in the age groups under 12 months, 15 to 64 years and 65 years and over.

Changes in death rates by cause, 1986 to 1995

Australia

Over the period from 1986 to 1995, death rates of people aged from 15 to 64 years have declined for all major causes of death, with the largest decline occurring for deaths from circulatory system diseases, a decrease of 43.1 per cent (**Figure 5.1**). Other large decreases were recorded for deaths from respiratory system diseases (28.3 per cent); accidents, poisonings and violence (16.7 per cent); and cancer (13.1 per cent).
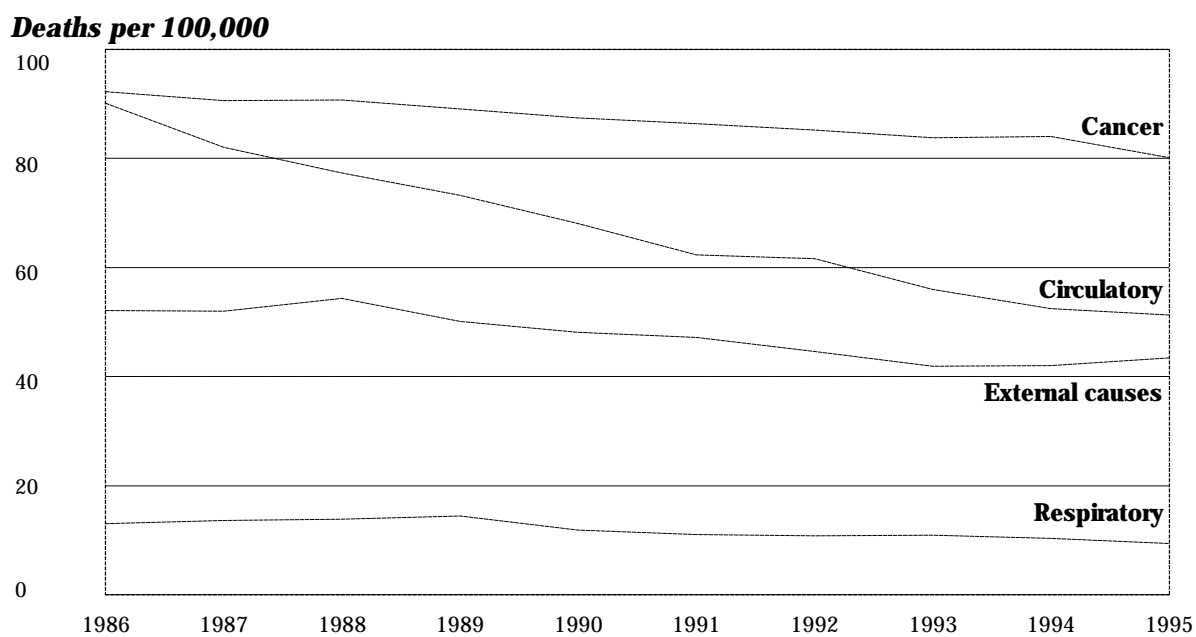
Victoria

In Victoria, death rates of people aged from 15 to 64 years have declined for all major causes of deaths, with the largest decline recorded for deaths from circulatory system diseases, a decrease of 43.0 per cent (**Figure 5.2**). Other large decreases were recorded for deaths from respiratory system diseases (36.6 per cent); accidents, poisonings and violence (21.2 per cent); and cancer (11.5 per cent).

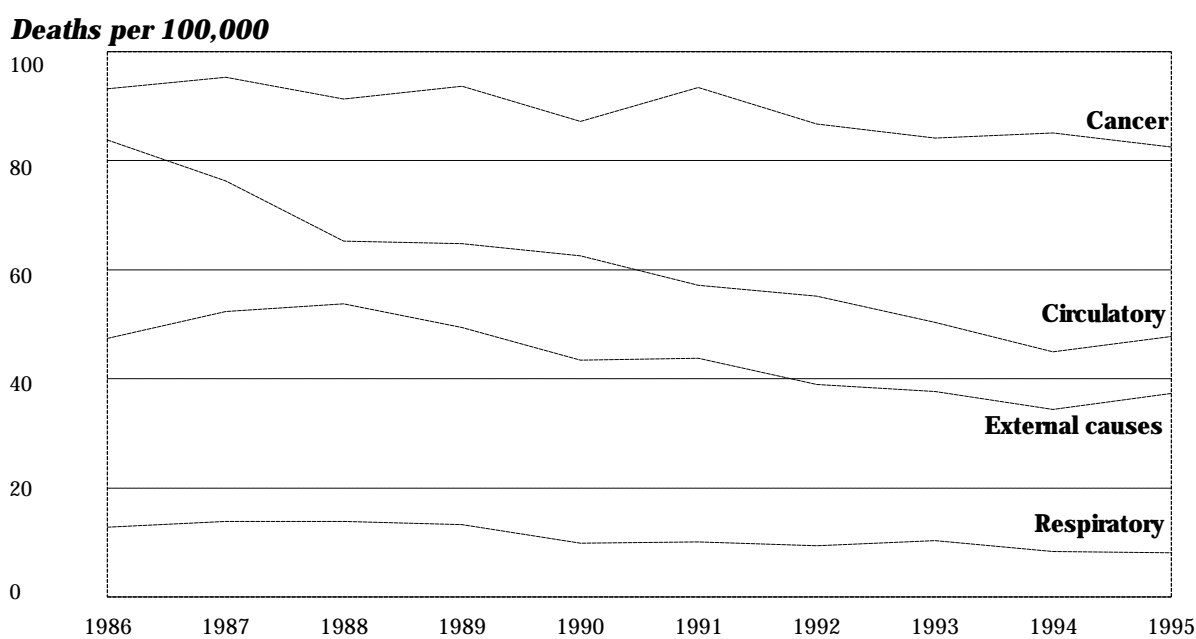## Changes in death rates by age group and sex, 1986 to 1995

Australia

Overall, premature death rates (ie. deaths of people aged from 15 to 64 years) declined at a greater rate for males (22.0 per cent fewer male deaths) than females (20.2 per cent fewer) over the years from 1986 to 1995. Male death rates from malignant neoplasms declined by 14.1 per cent over this nine year period, whereas female deaths from the same cause decreased by 11.7 per cent.

Figure 5.1: Death rates of people aged from 15 to 64 years, by cause, Australia

Deaths per 100,000

Figure 5.2: Death rates of people aged from 15 to 64 years, by cause, Victoria

Deaths per 100,000

Death rates of males and females from accidents, poisonings and violence were similar, with male deaths down by 16.4 per cent and females by 16.6 per cent over the years studied. Female death rates for circulatory system diseases declined at a greater than for males, with decreases of 46.1 per cent and 41.7 per cent, respectively.

The biggest differential in the rates of change recorded for males and females occurred for deaths due to diseases of the respiratory system. Between 1986 and 1995, death rates among 15 to 64 year olds from these diseases declined by 34.9 per cent for males. In contrast, female death rates over this same time period declined less substantially, from 9.5 deaths per 100,000 population in 1986 to 8.0 in 1995, a decrease of 16.4 per cent.

Victoria

In Victoria, premature death rates of males (down by 20.9 per cent) and females (18.8 per cent) declined at similar rates. Male deaths from malignant neoplasms declined at a rate of 12.2 per cent, while female deaths from these causes declined by 9.1 per cent, and male deaths from respiratory system diseases declined by 41.5 per cent compared with 27.3 per cent for females. Death rates recorded for diseases of the circulatory system over this nine year period showed the reverse of this pattern. Between 1986 and 1995, female deaths from diseases of the circulatory system decreased at a rate of 46.9 per cent, while male deaths decreased by a marginally lower rate of 40.8 per cent. Likewise, death rates from the combined causes of accidents, poisonings and violence decreased by 24.4 per cent for females compared to 19.1 per cent for males.

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Data mapped

Age range

There are two main reasons for basing the analysis on the death rates of the 15 to 64 year age group: these are outlined below.

The population aged from 15 to 64 years can be considered to be of 'working' age, and examined as a group. Although in recent years the lower age of the 'working' age population has been set at 20 years in some analyses, fifteen years of age has been retained here mainly for consistency with the first edition. Note however, that participation of 15 to 19 year olds in the labour force has declined over the ten years from 1986 to 1996, from 52.9 per cent to 47.0 per cent for males, and from 55.5 per cent to 47.7 per cent for females.

The exclusion of deaths of people aged 65 years or more (which account for three quarters of all deaths) is important not only because of the focus on prematurity. A significant proportion of people aged 65 years and over die while residents of nursing homes and other aged care facilities. Aged care facilities are unlikely to be located in the same area as the person's previous (domestic) home and are over-represented in capital cities compared with the non-metropolitan areas. Their inclusion would increase the rates for those SLAs in which nursing homes are largely concentrated and reduce the rates in other areas, thereby distorting the analysis. The concern is that deaths of people resident in aged care facilities may influence the rate for that socioeconomic profile, in which they would have lived throughout much of their life.

Residents of some nursing homes and other types of supported accommodation (such as hostels, boarding houses and shelters used by people with psychiatric conditions and community houses for those with an intellectual disability) are more likely than the population in general to die at ages below 65 years.

Since the mid-1980s (the period on which the analysis in the first edition of the atlas was based) the number of deaths occurring at ages from 15 to 64 years has declined, and the age of people dying in nursing homes has increased. It would have been possible, therefore, to increase the age range in this analysis to include deaths between the ages of 65 and 74 years (thereby increasing the number of cases and strengthening the analysis at the SLA level). To do so would, however, have reduced the possibility of comparison with the analysis in the first edition. On balance, it was considered to be more important to retain comparability than to boost the numbers.

Measure mapped

Age-sex standardised ratios (Standardised Death Ratios, SDRs) have been calculated and mapped for a range of causes of death, by place of usual residence, to illustrate the extent of variation in death rates between the populations in the areas mapped. A brief description of the technique of standardisation, its purposes, and method of calculation is in Appendix 1.3. For infant deaths, the more traditional infant death rate (infant deaths per 1,000 live births) has been mapped.

Readers should be aware that two standards have been used in this atlas. Standardised ratios calculated for the States, Territories, capital cities and other major urban centres have the Australian rates as the standard. Those ratios calculated for Statistical Local Areas are based on the rates applicable to the relevant State or Territory.

Thus, the text describing the variables refers to two standards: the discussion in the 'Capital city comparison' and 'State/Territory comparison' sections has Australia as the standard (as do the tables in this section), whereas the discussion describing 'Melbourne' or 'Rest of State' has Victoria as the standard. In this way the capital cities, States, etc., can be compared to each other against the Australian rates, and the smaller area data within each State and Territory can be compared with each other against the State/Territory rates.

Variables mapped

Only a selection of the total number of causes of death of the population aged from 15 to 64 years has been mapped. These include deaths from all causes (separately for females and males) and from four major cause groups – deaths from diseases of the circulatory system, diseases of the respiratory system, from all cancers (and separately for deaths from lung cancer) and from the external causes of accidents, poisonings and violence. **Table 5.10** shows the number of deaths for the age groups and causes for which data were analysed and mapped.

Table 5.10: Deaths by selected cause and age, Victoria, 1992 to 1995

Age at death	Cancers	Circulatory system diseases	Respiratory system diseases	Accidents, poisonings & violence	All other causes	Total deaths
Infant (under 1 year)	**14**	**7**	**22**	**25**	**1,277**	**1,345**
15 to 64 years	**10,225**	**5,916**	**1,091**	**4,438**	**4,037**	**25,707**
males	5,626	4,447	650	3,437	2,792	16,952
females	4,599	1,469	441	1,001	1,245	8,755
Other ages	**25,512**	**48,051**	**8,885**	**2,121**	**16,090**	**100,659**
All ages	**35,751**	**53,974**	**9,998**	**6,584**	**21,404**	**127,711**

Source: ABS Causes of Death bulletins, 1992 to 1995

Infant deaths are analysed separately as they are recognised internationally as a group with historically high mortality rates, and rates with marked socioeconomic differentials. The four cause of death groups mapped were chosen because they represent a large proportion of the deaths in the 15 to 64 year age group (85.7 per cent, compared to 87.4 per cent in the mid-1980s). They are also predominant among the causes for which people of lower socioeconomic status have been shown to have higher death rates than those of higher socioeconomic status. Importantly, they provide a sufficient number of deaths (by

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aggregating four years of data, from 1992 to 1995) to be analysed at the SLA level for presentation in the State and Territory atlases. Some other important causes of death which are of public concern (eg. deaths from suicide) and/or are important causes of death among the most disadvantaged in the population (eg. deaths from mental disorders) have insufficient numbers for the production of meaningful statistics for most areas at the local level. As the combined causes of accidents, poisonings and violence (which include suicides) are the major cause of death for young people, deaths from these causes have been mapped separately for the 15 to 24 year age group. A separate discussion on deaths from suicides is on page 132.

Table 5.11 shows the number of deaths for the causes mapped for **Melbourne** (the Melbourne Statistical Division) and **Geelong** and the *Rest of the State* (the remainder of Victoria).

### Table 5.11: Deaths by selected cause and area, Victoria, 1992 to 1995

Cause of death	Melbourne and Geelong	Rest of State	Total
Infant: all causes	**982**	**363**	**1,345**
15 to 64 years	**18,437**	**7,270**	**25,707**
Cancers	7,402	2,823	10,225
Circulatory system diseases	4,125	1,791	5,916
Respiratory system diseases	719	372	1,091
Accidents, poisonings & violence	3,100	1,338	4,438
15 to 24 years	**1,202**	**514**	**1,716**
Accidents, poisonings & violence	807	383	1,190
All ages	**89,915**	**37,796**	**127,711**

Source: See *Data sources*, Appendix 1.3

Figures 5.3 to **5.7** give a graphical presentation of death rates in Victoria by age and sex for each of the major causes analysed (apart from infant deaths). Please note that the scales for the rates per 100,000 are different for each figure.

Figure 5.3 highlights both the steeply rising death rates from age 50 years for males and from age 60 years for females, as well as the higher rates of deaths for males across the age groups.
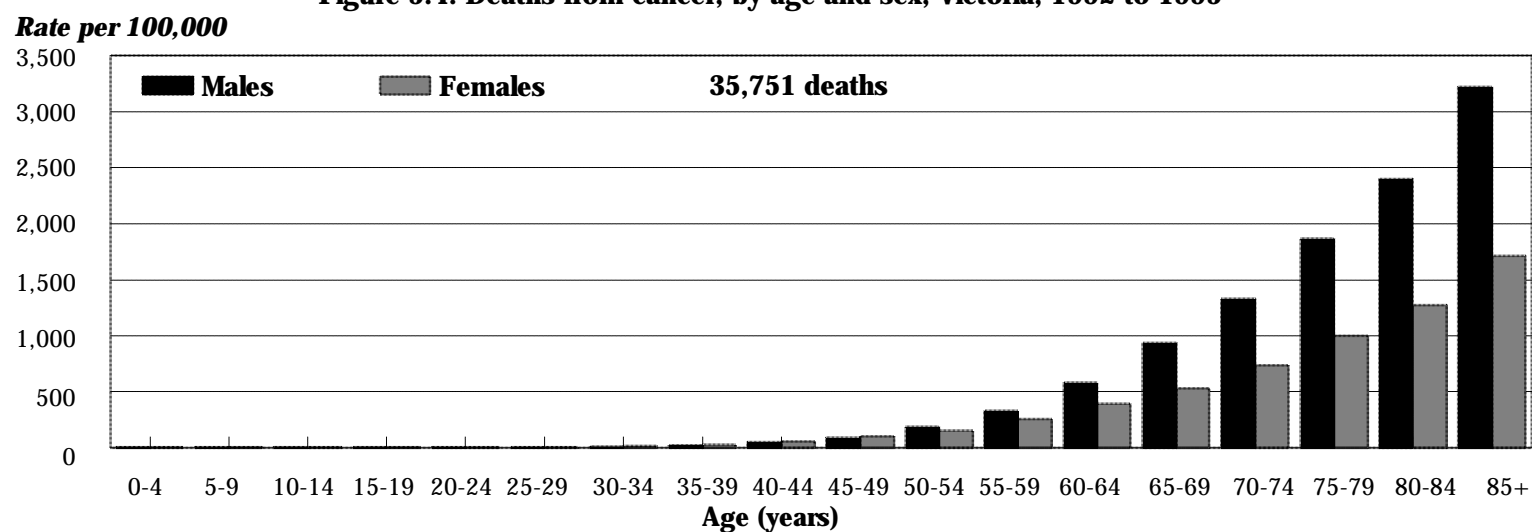
Figure 5.3: Deaths from all causes, by age and sex, Victoria, 1992 to 1995
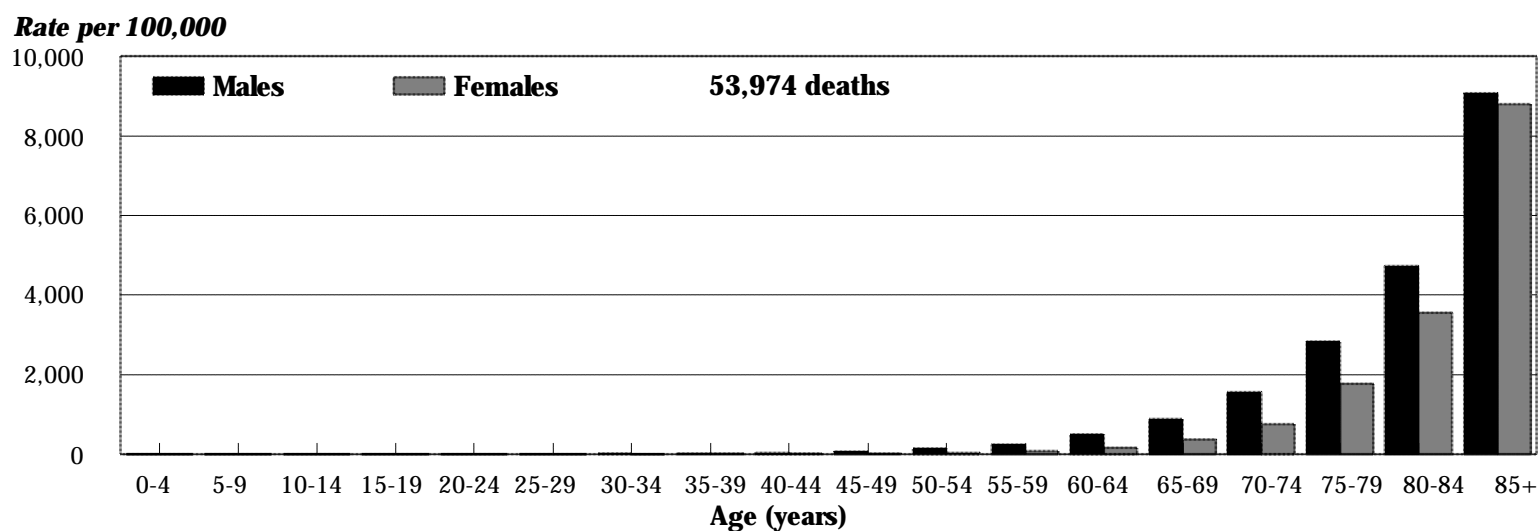

Source: See *Data sources*, Appendix 1.3

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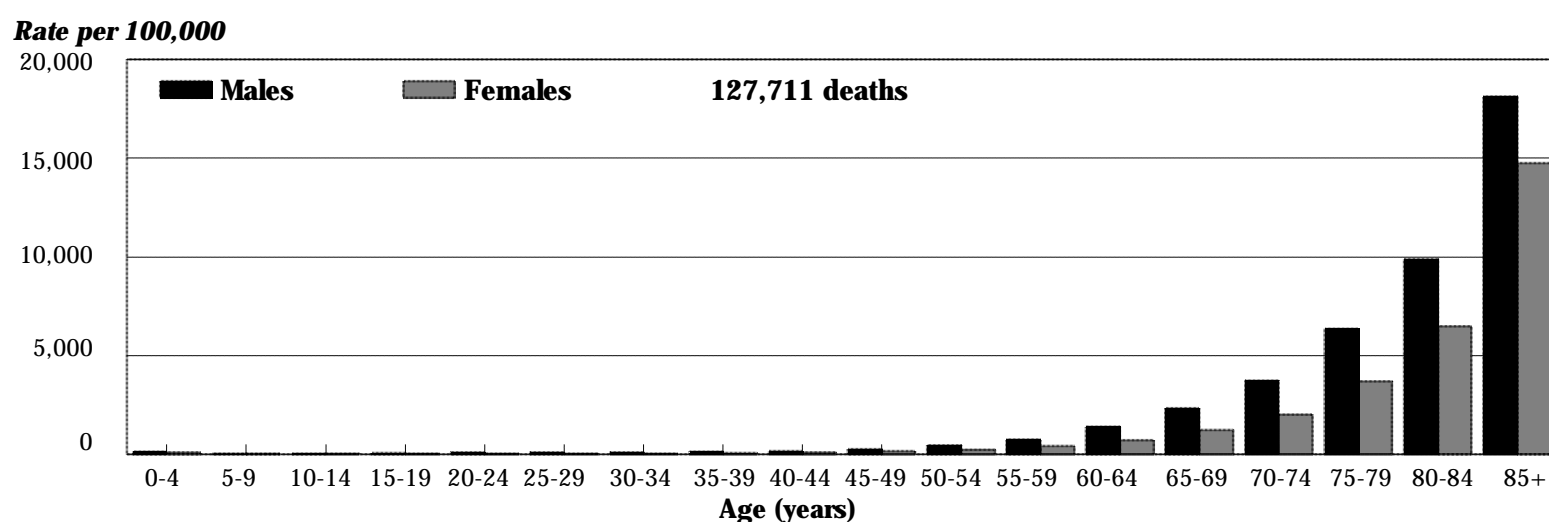
Figure 5.4 shows the predominance of males in deaths from cancer, whereas in **Figure 5.5** the similar pattern for deaths from circulatory system diseases is broken in the 85 years and over age group, where female death rates closely approximate those of males. Death rates from respiratory system diseases (**Figure 5.6**) reflect the 'all causes' pattern.

Figure 5.4: Deaths from cancer, by age and sex, Victoria, 1992 to 1995

Rate per 100,000
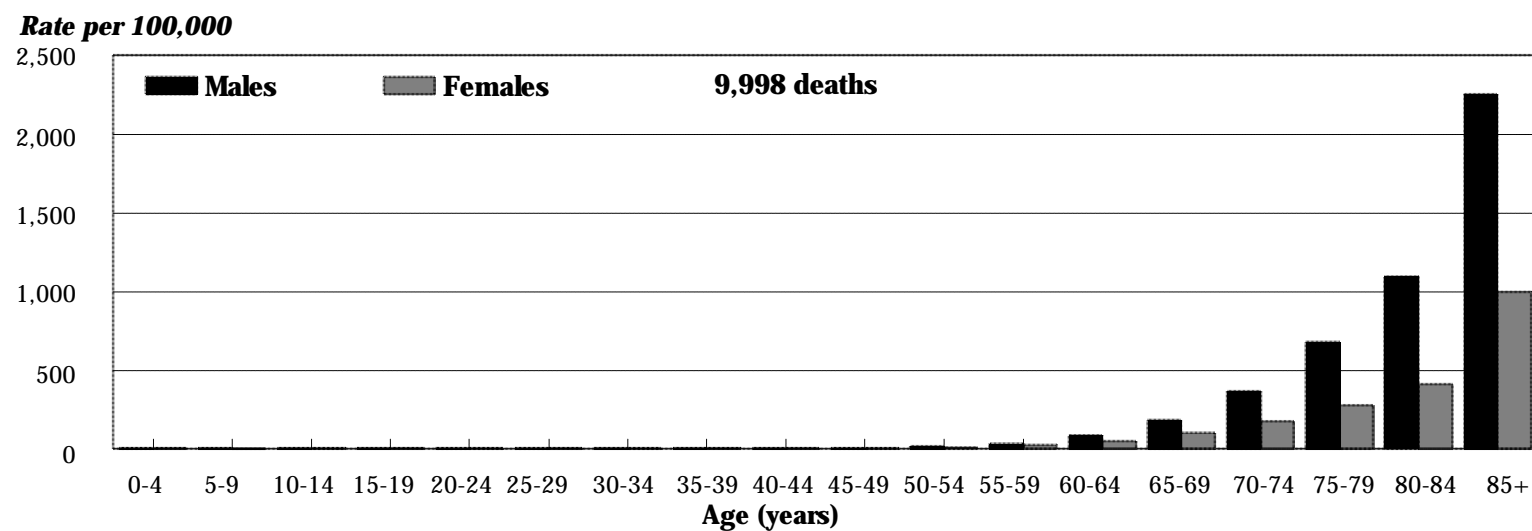

Source: See *Data sources*, Appendix 1.3

Figure 5.5: Deaths from circulatory system diseases, by age and sex, Victoria, 1992 to 1995

Rate per 100,000

Source: See *Data sources*, Appendix 1.3

Figure 5.6: Deaths from respiratory system diseases, by age and sex, Victoria, 1992 to 1995

Rate per 100,000

Source: See *Data sources*, Appendix 1.3

Deaths from the external causes of accidents, poisonings and violence (**Figure 5.7**) occur at earlier ages than is the case for other causes, and occur across all age groups. Again, males predominate across the age groups, with peaks at younger ages (from 15 to 29 years, where motor vehicle accidents and suicides are major causes), in middle age (60 to 69) and in the oldest age group shown (85 years and over).

Figure 5.7: Deaths from accidents, poisonings and violence, by age and sex, Victoria, 1992 to 1995

Rate per 100,000
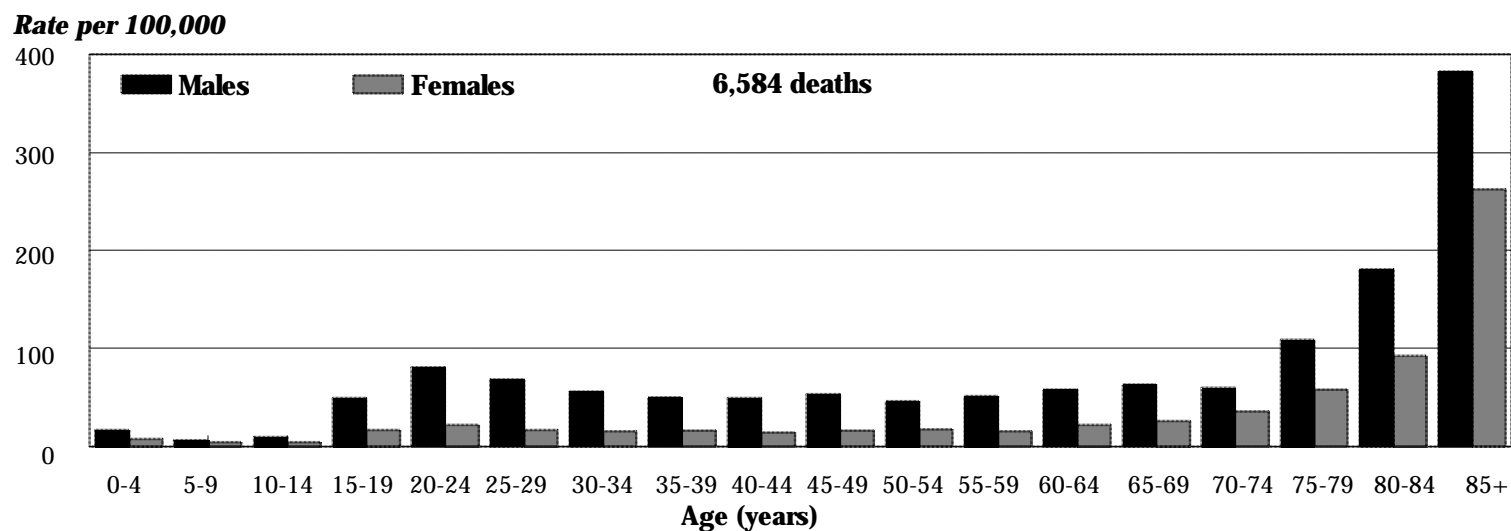
Source: See *Data sources*, Appendix 1.3

Deaths from suicide

Taylor et al. (1998) found that risks for suicide increased significantly with decreasing socioeconomic status in males, but not in females. An even stronger relationship existed when suicide rates were controlled for country of birth. When adjusted for age and country of birth, suicide rates were 66 per cent higher in the lowest socioeconomic status quintile compared to the highest quintile and 39 per cent higher in the 15 to 24 year age group (youth suicide). These findings suggest that socioeconomic status plays an important role in male suicide rates among Australians and residents from non-English speaking countries, and among young people.

Despite suicide being an important cause of death, in particular amongst young people[5], it has not been mapped in this chapter. As the number of recorded suicides is quite low at the SLA level there is a possibility that mapping them will lead to misinterpretation of results. The following is an overview of the deaths recorded for suicides over the period from 1986 to 1995 for Victoria as a whole, as well as separately for **Melbourne** and the *Rest of the State*.

In Australia, deaths are classified as self-inflicted by the coroner or a Government Medical Officer upon consideration of the evidence, but it is likely that the number of suicides is under-reported. A death intended as suicide may appear as the result of an unrelated cause, ie. a motor vehicle accident, and thus is not recorded as such by the coroner. For example, young male residents of country areas are over represented in single motor vehicle accidents.

There were 5,567 deaths of all ages from suicide in Victoria over the nine year period from 1986 to 1995. Of these, 85.6 per cent (4,765) were aged from 15 to 64 years and 19.4 per cent (1,078) were aged from 15 to 24 years at death. Over this time period

[5]Suicide is also an important cause of death at older ages.

there has been a 32.4 per cent increase in the number of deaths recorded for suicides at all ages, rising from 519 in 1986 to 687 in 1995. A similar increase was recorded among 15 to 24 year olds, where the number of suicides rose from 92 in 1986 to 138 in 1995, an increase of 50.0 per cent. While there has been a significant recent increase in suicide in the young, Goldney and Harrison (1998) have highlighted continuing reductions in suicide rates in middle aged and older Australians over the last hundred years.

Males predominated in these deaths, accounting for 77.0 per cent of suicides of all ages, 77.6 per cent of 15 to 64 year olds and 79.9 per cent of 15 to 24 year olds. However, research has suggested that females attempt suicide more often, but that males use more violent, and therefore more successful means, such as firearms (see box).

Attempted suicide

A study by the Health Department of Western Australia (1996) found that in the period from 1981 to 1993 attempted suicides rates were considerably higher among females than males, an age standardised rate of 162 compared to 105 per 100,000 person-years respectively. Female rates were highest in the 15 to 19 year age group (455 attempted suicides per 100,000 person-years), followed by those aged from 20 to 24 years (346 per 100,000). For males, rates were highest in the 20 to 24 year age group (273 per 100,000), with slightly lower rates among those aged 25 to 29 (228 per 100,000). Despite the overall higher rates recorded for females, over the years from 1981 to 1993 female rates declined by 2.4 per cent per year while male rates declined by only 0.2 per cent.

Numbers of suicides not only vary by age and sex, but also by place of residency. While there were more deaths from suicide of residents of **Melbourne** (3,800 deaths compared to 1,767 in the

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non-metropolitan areas of Victoria over the nine years from 1986 to 1995), because it contains a higher proportion of the State's population it is more informative to consider death rates.

In 1995, death rates from suicide among 15 to 64 year olds were 96.4 per cent higher in the non-metropolitan areas of Victoria than in **Melbourne**, a rate of 32.4 per 100,000 population compared to 16.5 per 100,000, respectively. The difference in 1995 was more substantial in the 15 to 24 year age group, with a death rate of 37.7 per 100,000 non-metropolitan residents, more than two and a half times the rate (of 14.8) for residents of **Melbourne**.

In the following charts, suicide rates are shown separately for the 15 to 24 and 25 to 64 year age groups. Among the older age groups (**Figure 5.8**) rates were higher for residents of the non-metropolitan areas than for **Melbourne** in all but the first year of the data analysed.

As for the older age group, suicide rates were higher for 15 to 24 year old residents of the non-metropolitan areas than for **Melbourne** in all but the first year of the data analysed (**Figure 5.9**). Although the overall rates were slightly higher for the older age group, the differentials in the capital city and non-metropolitan rates were more substantial among 15 to 24 year olds.

It is likely that the higher rates in country areas relate to factors such as a relative lack of job and training opportunities, the decline of many rural communities and the relatively larger numbers of Indigenous people in the population, a group which has higher suicide rates.

Figure 5.8: Suicide rates of people aged from 25 to 64 years, Melbourne and Rest of State

Deaths per 100,000
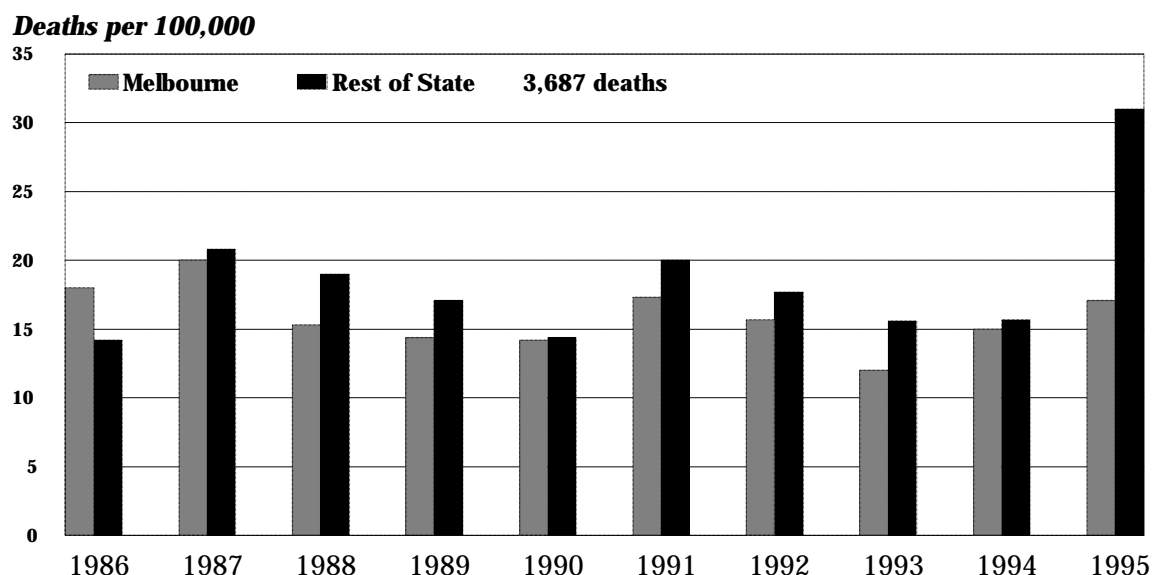
Source: Various issues, ABS Causes of Death bulletins

Figure 5.9: Suicide rates of people aged from 15 to 24 years, Melbourne and Rest of State

Deaths per 100,000

Source: Various issues, ABS Causes of Death bulletins

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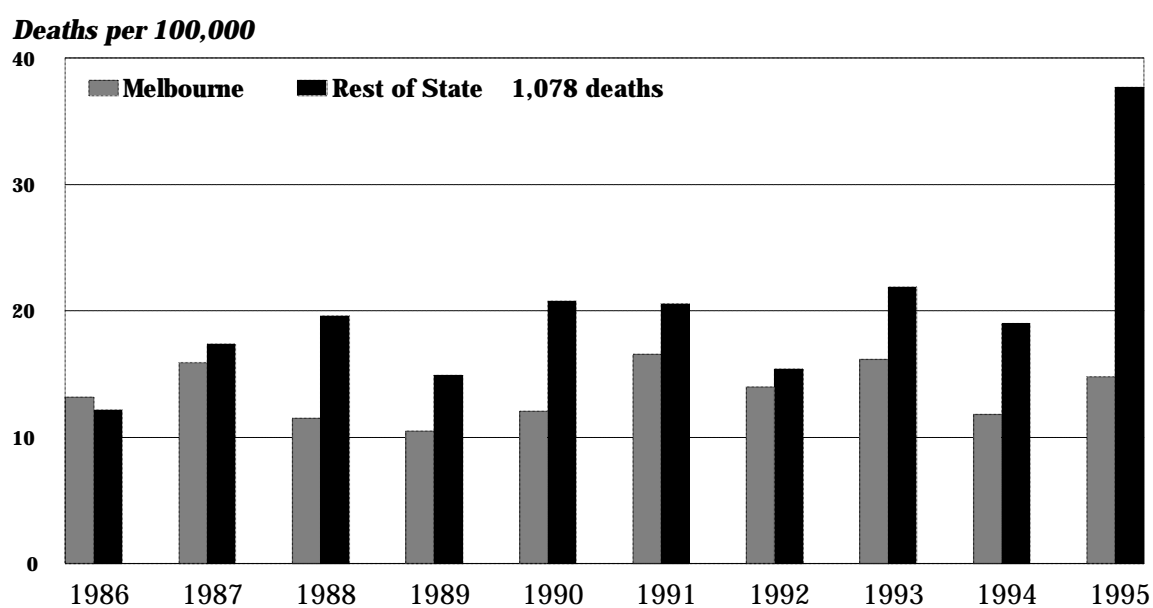
Infant deaths, 1992 to 1995

Capital city comparison

The infant death rate is calculated as the number of infant deaths (deaths under one year of age) per 1,000 live births. Over the years 1992 to 1995, the rate varied between the capital cities, from a high of 10.3** in **Darwin** to around half that level in a number of cities. **Hobart** had the second highest rate.

The *All capitals* infant death rate has declined by one third between the two periods for which data have been analysed (**Table 5.12**). As noted earlier (page 127), this is largely the result of the decline in deaths from sudden infant death syndrome. There were similar reductions in all of the capital cities other than **Darwin**, where the infant death rate rose, from 9.4 for the period 1985 to 1989, to 10.3** for the years 1992 to 1995. **Darwin** now has the highest infant death rate (10.3 infant deaths per 1,000 live births), followed by **Hobart** (7.5), a reversal of the ranking over the period from 1985 to 1989. All capital cities except these show significant improvements in the rate.

Table 5.12: Infant deaths, capital cities
Infant death rates per 1,000 live births

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All capitals
1992-95	6.1	5.2	6.7	5.2	5.3	7.5	10.3	5.9	5.8
1985-89[2]	9.3	8.2	8.9	7.5	8.4	9.5	9.4	8.3	8.7

[1]Includes Queanbeyan (C)
[2]For 1985-89 the rate was calculated per 1,000 children aged under 12 months plus infant deaths: this approximates live births
Source: See *Data sources*, Appendix 1.3

Over the years from 1992 to 1995, there were 1,345 infant deaths in Victoria. This represented a decline from an average 503 to 336 infant deaths per year between the two periods analysed.

Neonatal deaths (deaths of infants aged under 28 days) accounted for 67.8 per cent of all infant deaths. Neonatal deaths result mostly from the circumstances of the birth, or from pre-natal conditions resulting in disabilities at birth. The remaining (post-neonatal) deaths are related to infections, respiratory disorders, accidents and deaths attributed to Sudden Infant Death Syndrome and other causes.

Melbourne[6]

There were 952 infant deaths in **Melbourne** over the four year period from 1992 to 1995, a rate of 5.2 infant deaths per 1,000 live births.

By far the highest infant death rates were recorded in the inner SLAs of Port Melbourne and Box Hill, with 10.8 and 8.6 infant deaths per 1,000 live births respectively (**Map 5.7**). Relatively high rates also occurred in Springvale (with an infant death rate of 7.8), Upper Yarra [Part A] (7.6), Preston (7.5), Sherbrooke (7.4), Werribee (7.1), St Kilda (7.0) and Hastings (7.0).

Just over half (50.9 per cent) of the SLAs in **Melbourne** were mapped in the middle range, with rates ranging from 4.0 to 5.8 infant deaths per 1,000 live births. Within this range, the highest rates were recorded in Frankston (5.8 infant deaths per 1,000 live births) and Knox and Caulfield (both with 5.7), while the lowest were in Eltham, Lillydale, Waverley and Whittlesea (each with 4.1) and Prahran (4.0).

The lowest infant death rates were recorded in Mornington (2.5 infant deaths per 1,000 live births), Bulla (2.7) and Doncaster and Templestowe (2.8).

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[6]As there were relatively few areas with sufficient cases to analyse for this variable in the non-metropolitan areas of Victoria, the data have not been mapped. A summary of the main features is on page 171.

The SLAs of Werribee, Altona/Sunshine, Cranbourne and Knox each recorded 47 infant deaths over the four year period from 1992 to 1995, compared with 44 in Springvale, 40 in Broadmeadows and 38 in Essendon/Fitzroy/Melbourne/South Melbourne.

There was a weak association evident in the correlation analysis at the SLA level with the indicators of socioeconomic status.

Geelong

Infant death rates were marginally lower in **Geelong** than in **Melbourne**, with 4.6 compared to 5.2 infant deaths per 1,000 live births. However, only 30 infant deaths were recorded over the four year period from 1992. Corio-Inner was the only SLA to record more than five infant deaths, with 22 deaths and a rate of 6.7 infant deaths per 1,000 live births.

Map 5.7
Infant deaths, Melbourne and Geelong, 1992 to 1995

infant deaths per 1,000 live births in each Statistical Local Area
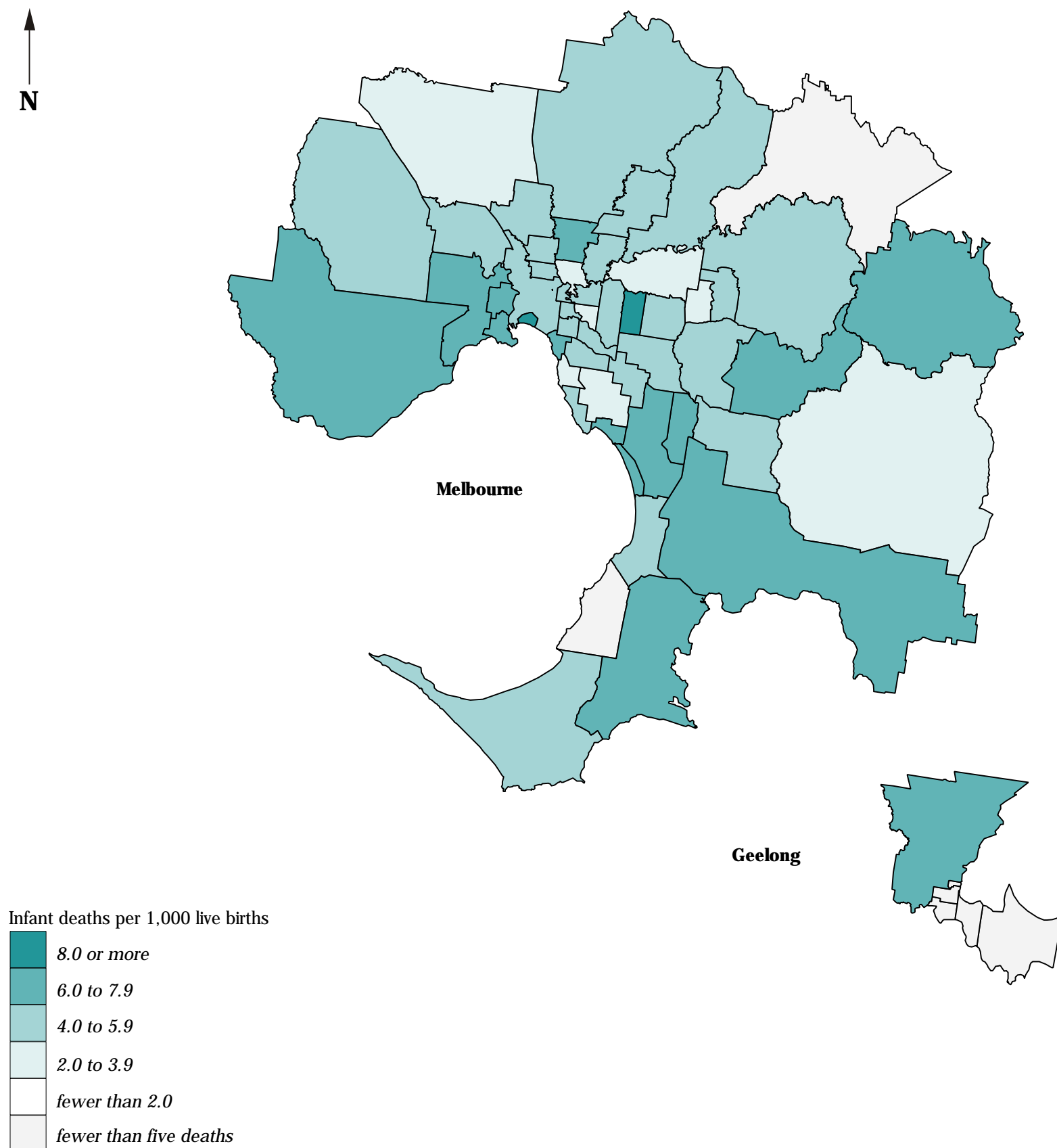
N

Melbourne

Geelong

Infant deaths per 1,000 live births

- 8.0 or more
- 6.0 to 7.9
- 4.0 to 5.9
- 2.0 to 3.9
- fewer than 2.0
- fewer than five deaths

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

National Social Health Atlas Project, 1999

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Deaths of males aged 15 to 64 years from all causes, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, Standardised Death Ratios (SDRs) for males aged from 15 to 64 years ranged from 81[**] in **Canberra** to 143[**] in **Darwin**. The other capital cities (except **Hobart** with an SDR of 103) had fewer deaths than expected.

There was a higher differential (from the Australian rates) in the SDR recorded for **Darwin** in the later period shown in **Table 5.13**. The higher SDR in this later period suggests a worsening (relative to the Australian rates) in the male death ratios from all causes between the periods analysed. The differential in the ratios for **Adelaide** between these periods also suggest a deterioration, while those in **Brisbane** and **Canberra** indicate a relative improvement.

Table 5.13: Deaths of males aged 15 to 64 years from all causes, capital cities

Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	99	92[**]	94[**]	93[**]	87[**]	103	143[**]	81[**]	94[**]
1985-89	100	92[**]	97[*]	89[**]	87[**]	101	124[**]	82[**]	94[**]

[1]Includes Queanbeyan (C)
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

There were 44,465 deaths of males in **Melbourne** over the period from 1992 to 1995, of which 11,621 (26.1 per cent) were of males aged from 15 to 64 years. Malignant neoplasms (cancer), diseases of the circulatory system and the combined external causes of accidents, poisonings and violence were the main causes of premature death (deaths between the ages of 15 to 64 years) for males over this period. Males most likely to die prematurely include Indigenous people; those who are homeless, or who live in sheltered accommodation or low-cost boarding houses; those earning low incomes; and those who are unemployed.

Melbourne (Victoria as the Standard)

There were 11,621 deaths of males aged from 15 to 64 years in **Melbourne** between 1992 and 1995, four per cent fewer than were expected from the State rates (an SDR of 96[**]).

Ten SLAs had 30 per cent or more premature male deaths than expected from the State rates. The most highly elevated ratios were recorded in Collingwood (with an SDR of 209[**]), St Kilda (188[**]) and Footscray (160[**]). The lowest ratios in this group were in the old SLAs of Chelsea (an SDR of 133[**]), Prahran (132[**]) and Williamstown (131[**]).

As **Map 5.8** shows, there were two clusters of SLAs with ratios falling within 15 per cent of the level expected from the State rates, one to the north and east of the city centre and the other to the east and south. There were 28 SLAs in this range, but only four had elevated ratios, and only in Altona/Sunshine (with an SDR of 112[**]) was the ratio statistically significant. Within the lower end of the range, statistically significant SDRs were recorded in Knox (89[*]), Werribee (88[*]), Whittlesea (86[**]), Berwick (86[*]), Ringwood (86) and Cranbourne (85[*]).

The lowest ratios for males aged from 15 to 64 years were recorded in Eltham (with an SDR of 54[**]), Doncaster and Templestowe (57[**]) and Sandringham (67[**]).

The correlation analysis showed there to be a generally weak association at the SLA level with the indicators of social disadvantage. There was a substantial correlation with dwellings with no motor vehicle (0.83) and meaningful correlations with single parent families (0.66) and housing authority dwellings (0.65). Weaker correlations were recorded with unemployment (0.59) and low income families (0.56). The inverse correlation with the IRSD (-0.42) confirms the weak association between high rates of male deaths and socioeconomic disadvantage.

Geelong

Standardised Death Ratios for deaths of males were 20 per cent higher than expected in **Geelong** over the four years to 1995 (an SDR of 120[**] and 497 deaths), with ratios of greater than 110 in each of the SLAs. The highest of these were in the City of Geelong (with an SDR of 138[**]) and Geelong West (132[*]).

Map 5.8
Deaths of males aged 15 to 64 years from all causes, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

130 and above

115 to 129

85 to 114

70 to 84

below 70

[*]Expected numbers were derived by indirect age
standardisation, based on Vic totals

Deaths of males aged 15 to 64 years from all causes, 1992 to 1995

State/Territory comparison (Australia as the Standard)

Standardised Death Ratios (SDRs) for males aged from 15 to 64 years over the years 1992 to 1995 were higher in the *Rest of State/Territory* areas than in the capital cities. At the *Whole of State/Territory* level, the Northern Territory (199**), Tasmania (110**) and New South Wales (104**) had more deaths than expected from the Australian rates. The Australian Capital Territory had the lowest ratio (an SDR of 78**).

Most States had similar differentials (from the Australian rates) in the SDR recorded for their non-metropolitan areas in the later period shown in **Table 5.14**. The major exceptions were Western Australia, with a higher SDR (suggesting an increase in death rates relative to the Australian experience), and the Northern Territory, with a lower SDR. While the SDR for males in the non-metropolitan areas of the Northern Territory was 7.1 per cent lower in this later period (suggesting a decline in death rates relative to the Australian experience), it continues to be substantially elevated, and more than twice the next highest ratio.

Table 5.14: Deaths of males aged 15 to 64 years from all causes, State/Territory

Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	99	92**	94**	93**	87**	103	143**	81**[1]	94**
Other major urban centres[2]	104*	114**	96	..	..	..	..	..	102
Rest of State/Territory	113**	103*	105**	108**	112**	114**	260**	–[3]	110**
Whole of State/Territory	104**	95**	100	98	94**	110**	199**	78**	100
1985 to 1989									
Rest of State/Territory	113**	105**	110**	106**	103	109**	280**	–[3]	111**

[1]**Includes Queanbeyan (C)**

[2]**Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)**

[3] **Data included with ACT total**

Source: see *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Over the four years from 1992 to 1995, the major causes of premature death for male residents of the non-metropolitan areas of Victoria were malignant neoplasms (cancer), circulatory system diseases and the combined external causes of accidents, poisonings and violence. There were 7,270 deaths in these non-metropolitan areas, 28.3 per cent of all death. Of these deaths, 4,834 deaths were of males aged from 15 to 64 years, 28.5 per cent of all male deaths.

Rest of State (Victoria as the Standard)

There were 4,834 deaths of 15 to 64 year old males resident in the non-metropolitan areas of Victoria, eight per cent more than expected from the State rates (an SDR of 108**). As many of the ratios in the map are very high, the ranges mapped have been changed to enhance the pattern of differentiation in the map. The highest and lowest ranges have been set at 60 per cent, rather than 30 per cent as used on the map for **Melbourne**.

SLAs with highly elevated rates of premature death were scattered throughout Victoria (**Map 5.9**). The most highly elevated ratio was in Belfast with an SDR of 688**, with 43 deaths when six were expected from the State rates. Other localities with very high death rates were Minhamite (with an SDR of 204**), Huntly [Part B] (222**), Tallangatta [Part A] (191**), St Arnaud (187**), Portland (182**), Ararat (173**) and Colac (170**).

SLAs in which ratios were between 30 and 60 per cent higher were similarly scattered throughout the State, with a number located along the River Murray, including Swan Hill, Echuca and Mildura. Others were located in coastal areas including Queenscliffe, Port Fairy, Glenelg, and Warrnambool.

SLAs with ratios falling within the range of 30 per cent above to 30 per cent below the expected level cover much of the State. However, of the 97 SLAs in this range, none recorded a ratio of statistical significance.

The lowest (although not statistically significant) ratio in the non-metropolitan areas of Victoria was recorded in Traralgon [Part B] (an SDR of 36) where only two deaths were recorded in the four year period from 1992 to 1995. Ratios of below 70 were mainly concentrated in SLAs in the Wimmera, Goulburn and Ovens-Murray areas. Those with statistically significant SDRs were in Avon and Warracknabeal (both with an SDR of 40*), Benalla Shire (41**), the town of Shepparton (43**), Newham and Woodend (52*), Kilmore and Seymour (both 64*) and Rodney [Part B] (65*).

The largest numbers of deaths of males aged from 15 to 64 years were recorded in the regional centres of Ballarat (319 deaths), Greater Geelong (Balance) (276), Bendigo (270) and Morwell [Part A] (124).

Of the towns mapped, and not previously mentioned, the highest SDRs were in Portland (182**; 64 deaths), Colac (170**; 57), Swan Hill (140*; 47) and Echuca (133*; 47).

There was a weak association evident in the correlation analysis at the SLA level with indicators of socioeconomic disadvantage. The weak inverse correlation with the IRSD (-0.21) also suggests the existence of an association between high rates of premature male deaths and socioeconomic disadvantage.

Map 5.9
Deaths of males aged 15 to 64 years from all causes, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Standardised Ratio (as an index)

160 and above

130 to 159

70 to 129

30 to 69

below 30

fewer than five expected deaths

[*]Expected numbers were derived by indirect age standardisation, based on Vic totals

Swan Hill

Shepparton   Benalla
Echuca   Wangaratta

Horsham

Bendigo

Ballarat

Hamilton

Melbourne

Sale

Portland

Geelong

Colac
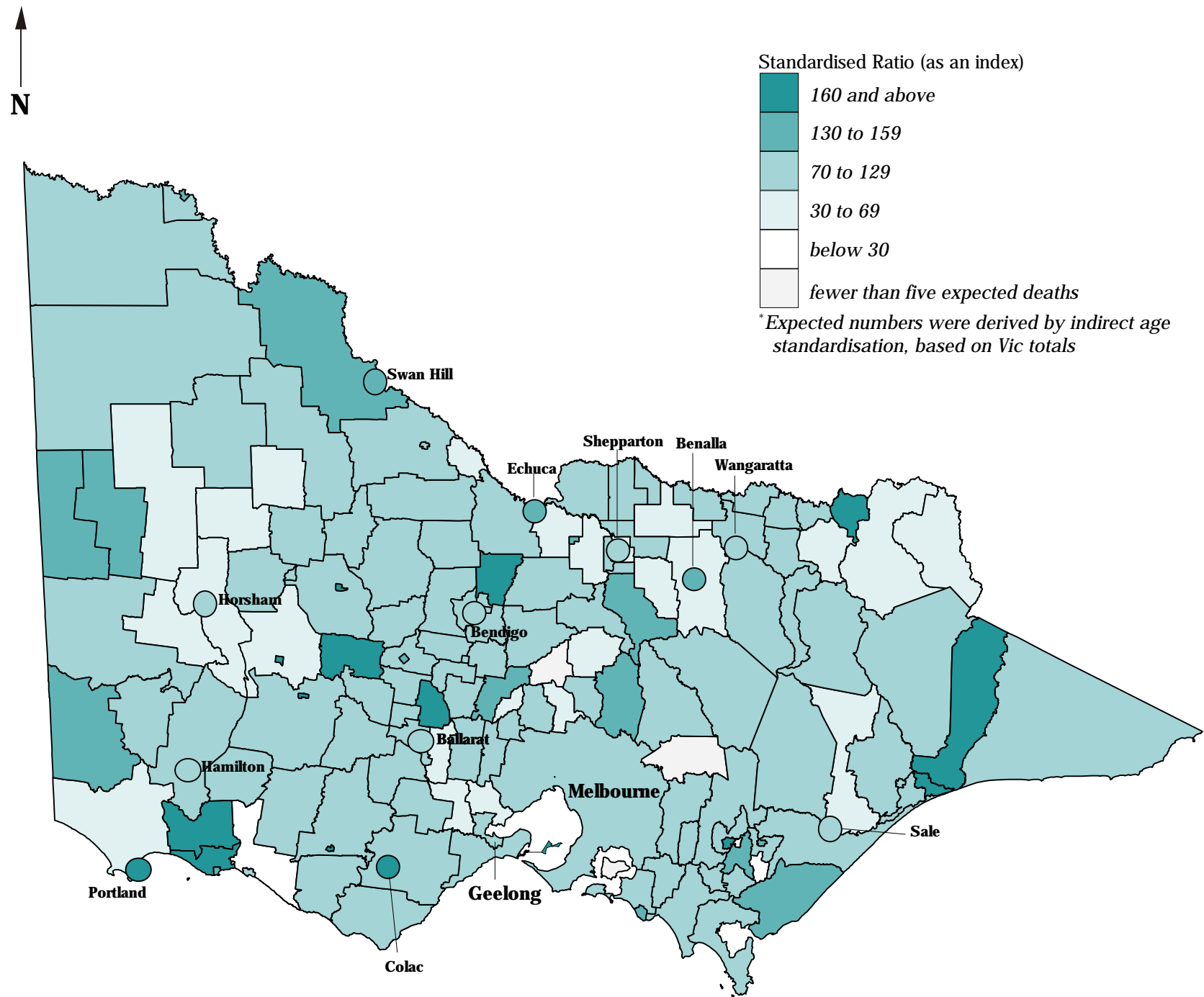
Source: Calculated on data from ABS 1996 Census   *Details of map boundaries are in Appendix 1.2*
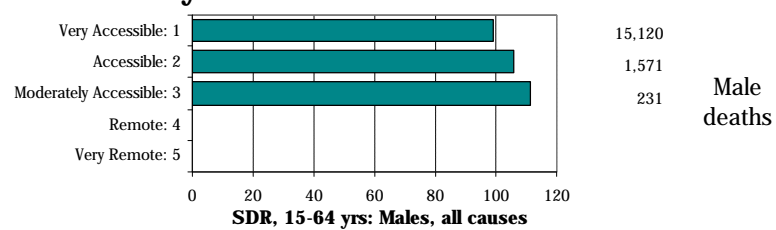
Accessibility/Remoteness Index of Australia

Very Accessible: 1	15,120
Accessible: 2	1,571
Moderately Accessible: 3	231
Remote: 4	
Very Remote: 5	

Male deaths

0   20   40   60   80   100   120
SDR, 15-64 yrs: Males, all causes

Standardised Death Ratios (SDRs) for premature deaths of males increase steadily across the ARIA categories. The lowest ratio is in the Accessible areas (an SDR of 99, one per cent fewer deaths of males aged from 15 to 64 years than expected from the State rates), with elevated ratios of 106 (six per cent more male deaths than expected) and 111 (11 per cent more) in the Accessible and Moderately Accessible areas, respectively.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Deaths of females aged 15 to 64 years from all causes, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, Standardised Death Ratios (SDRs) for females aged from 15 to 64 years ranged from 87[**] in **Canberra** to 115[**] in **Hobart** and 126[**] in **Darwin**. The other capital cities had ratios of below 100, indicating that there were fewer deaths than were expected from the Australian rates.

There was a higher differential (from the Australian rates) in the SDR recorded for **Darwin** in the later period (from 1992 to 1995) shown in **Table 5.15**. The higher SDR suggests a worsening (relative to the Australian rates) in the female death rates from all causes between the periods analysed. The remaining States and Territories experienced small increases (**Adelaide**, **Perth** and **Hobart**) or decreases (**Sydney**, **Melbourne**, **Brisbane** and **Canberra**) in their ratios.

Table 5.15: Deaths of females aged 15 to 64 years from all causes, capital cities
Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	98[*]	92[**]	96	98	90[**]	115[**]	126[**]	87[**]	95[**]
1985-89	100	95[**]	98	93[**]	86[**]	112[**]	112	88[**]	96[**]

[1]Includes Queanbeyan (C)
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

As for males, cancer was the main cause of premature death (deaths between the ages of 15 to 64 years) for females, followed by diseases of the circulatory system and the combined causes of accidents, poisonings and violence. Overall, there were 41,553 deaths of female residents in **Melbourne**, of whom 6,068 were of females aged from 15 to 64 years. The data that have been mapped for this variable therefore represents 14.6 per cent of all female deaths.

Females most likely to die prematurely include Aboriginal and Torres Strait Islander women; single mothers; those earning low incomes; and those who are unemployed.

Melbourne (Victoria as the Standard)

There were 6,068 deaths of females aged from 15 to 64 years in **Melbourne** between 1992 and 1995, three per cent fewer than expected from the State rates (an SDR of 97[*]).

Substantially higher than expected ratios were recorded in SLAs containing some of **Melbourne's** older established suburbs; the most highly elevated ratios were in the inner SLAs of St Kilda (an SDR of 155[**]), Footscray (135[**]), Richmond (131[*]), Coburg (129[**]) and Essendon/Fitzroy/Melbourne/South Melbourne (120[**]). Of the six SLAs with ratios of 115 or higher, only that for Ringwood (119) was not statistically significant.

The distribution of SLAs within 15 per cent of the level expected from the State rates was confined to three distinct corridors, stretching from the inner city to the west, the north and the south-east. Of these SLAs, only Waverley (87[*]) recorded a statistically significant SDR.

The lowest ratios in **Melbourne** were confined to two discrete areas, one in the north-eastern outer suburbs of Eltham (an SDR of 61[**]) and Healesville (69); and the other in coastal Sandringham (69[*]).

The SLAs of Essendon/Fitzroy/Melbourne/South Melbourne had the largest number of deaths of females aged from 15 to 64 years, with 310 deaths over the four years from 1992 to 1995.

Other high numbers of deaths were of females from the SLAs of Waverley (263 deaths), Altona/Sunshine (259) and Broadmeadows (256).

There were correlations of meaningful significance at the SLA level with the variables for dwellings with no motor vehicle (0.63) and unemployment levels (0.61), and weaker correlations with low income families (0.55), people born in non-English speaking countries resident for less than five years (0.54) and people with poor English proficiency (0.51). These results, together with the inverse correlation with the IRSD (-0.47), support the existence at the SLA level of an association between high rates of premature deaths of females and socioeconomic disadvantage.
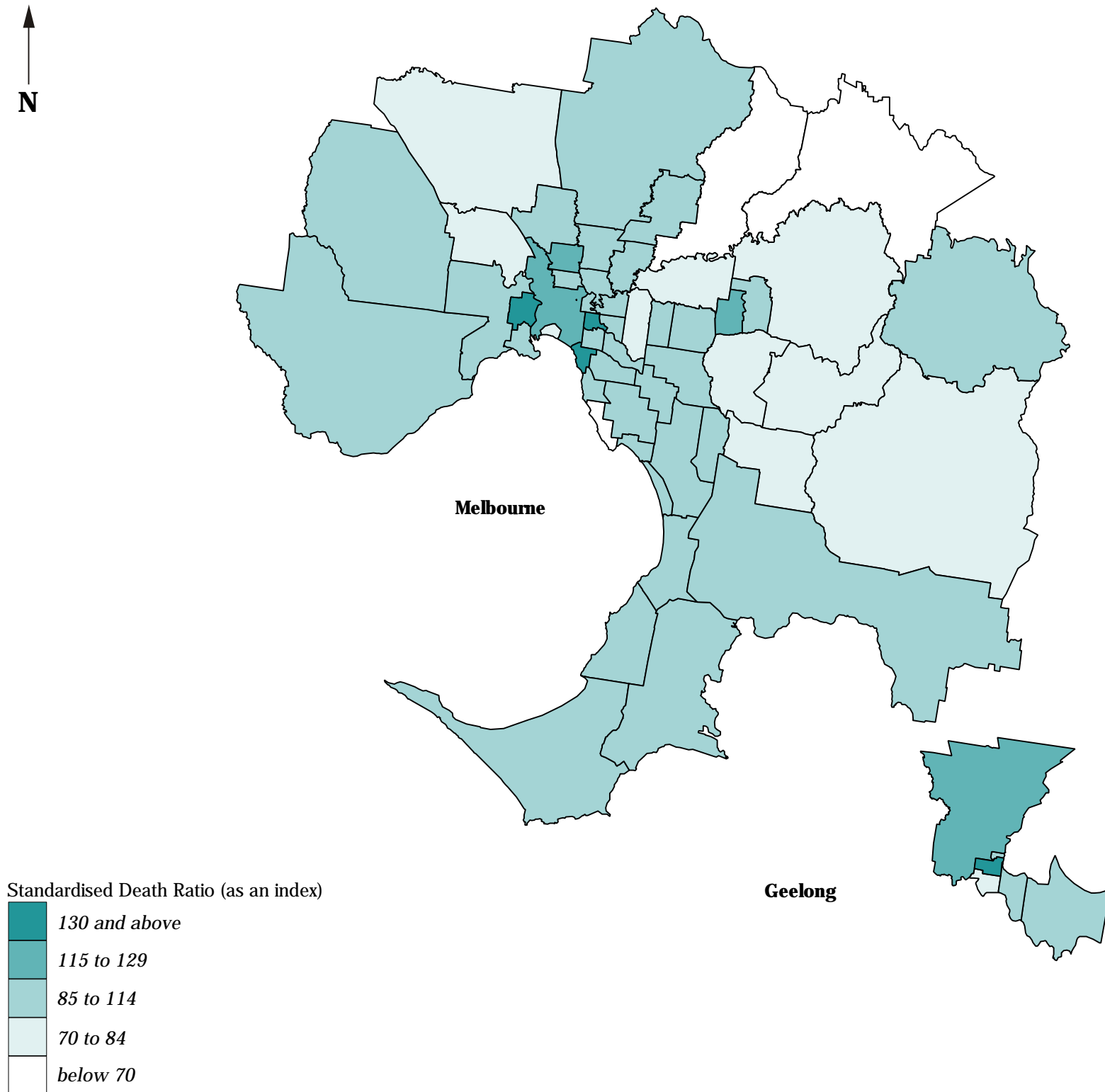
Geelong

Deaths of females aged from 15 to 64 years in **Geelong** were 15 per cent higher than expected from the Victorian rates (an SDR of 115[*]). The highest and the only statistically significant ratio was recorded in Geelong West, with 60 per cent more deaths than expected from the State rates (an SDR of 160[**]). Only Newtown recorded an SDR lower than expected (83).

Map 5.10
Deaths of females aged 15 to 64 years from all causes, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of people in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

130 and above

115 to 129

85 to 114

70 to 84

below 70

[*]Expected numbers were derived by indirect age
 standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

National Social Health Atlas Project, 1999

Deaths of females aged 15 to 64 years from all causes, 1992 to 1995

State/Territory comparison (Australia as the Standard)

Standardised Death Ratios (SDRs) for females aged from 15 to 64 years were higher in the *Rest of State/Territory* areas than in the capital cities, with the most highly elevated ratio being in the Northern Territory (an SDR of 289[**]). At the *Whole of State/Territory* level, only Tasmania (116[**]) and the Northern Territory (210[**]) had substantially more female deaths than expected from the Australian rates.

Most States had similar differentials (from the Australian rates) in the SDR recorded for their non-metropolitan areas in the later period shown in **Table 5.16**. The major exceptions were Tasmania, South Australia and Western Australia, with higher SDRs (suggesting an increase in death rates relative to the Australian experience); and the Northern Territory and New South Wales, with lower SDRs (suggesting a decline in death rates relative to the Australian experience). The SDR for females aged from 15 to 64 years in the Northern Territory, however, remains substantially elevated, at more than twice the next highest level.

Table 5.16: Deaths of females aged 15 to 64 years from all causes, State/Territory
Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	98[*]	92[**]	96	98	90[**]	115[**]	126[**]	87[**1]	95[**]
Other major urban centres[2]	109[**]	109	96	..	..	..	..	..	105[*]
Rest of State/Territory	108[**]	101	106[**]	109[*]	112[**]	117[**]	289[**]	—[3]	109[**]
Whole of State/Territory	102	94[**]	101	101	96[*]	116[**]	210[**]	86[**]	100
1985 to 1989									
Rest of State/Territory	113[**]	101	106[**]	96	105	106	328[**]	—[3]	108[**]

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

As with males living in the non-metropolitan areas of Victoria, the major cause of premature death among female residents was malignant neoplasms (cancer), followed by circulatory system diseases and the combined causes of accidents, poisonings and violence. The premature deaths mapped for this variable accounted for 14.0 per cent of all female deaths.

Rest of State (Victoria as the Standard)

There were 2,436 premature deaths of female residents of the non-metropolitan areas of Victoria, seven per cent more than expected from the State rates (an SDR of 107[**]). As many of the SDRs in **Map 5.11** are very high, the ranges mapped have been changed to enhance the pattern of differentiation. The highest and lowest ranges have been set at 60 per cent, rather than 30 per cent as used in the map for **Melbourne** for this variable.

The most highly elevated ratios for premature deaths of females were located in country towns. There were more than twice the number of deaths of females aged from 15 to 64 years than expected in Wonthaggi (an SDR of 210[**]), with similarly high ratios in Stawell (186[**]), Colac (184[**]) and Kyabram and Maryborough (both 175[**]).

A further 25 SLAs, based on 1991 boundaries, scattered throughout Victoria recorded ratios of between 30 per cent and 60 per cent higher than were expected from the State. The most highly elevated of these were in SLAs in the Loddon and Goulburn Valleys; in Bet Bet (with an SDR of 159), the town of Shepparton (156[**]) and Mansfield (155). Statistically significant SDRs were also recorded in Wangaratta (145[*]) and Morwell [Part A] (135[*]).

Nearly 60 per cent of SLAs had ratios within 30 per cent of the level expected from the State rates.

Moorabool West (with an SDR of 27[**]) and Shepparton [Part A] (34[*]) were the only SLAs with low ratios of statistical significance.

There were 157 premature deaths of females over the period from 1992 to 1995 in Ballarat, 150 in Greater Geelong (Balance), 129 in Bendigo and 78 in Shepparton. Of the towns mapped, but not previously mentioned, there were high SDRs in Portland (an SDR of 145; 26 deaths), Benalla [C] (131; 24) and Echuca (130;26).

There was a weak association evident in the correlation analysis at the SLA level with indicators of socioeconomic disadvantage. The weak inverse correlation with the IRSD (-0.31) also suggests the existence of an association between high rates of premature female deaths and socioeconomic disadvantage.

Map 5.11
Deaths of females aged 15 to 64 years from all causes, Victoria, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Standardised Death Ratio(as an index)

- 160 or more
- 130 to 159
- 70 to 129
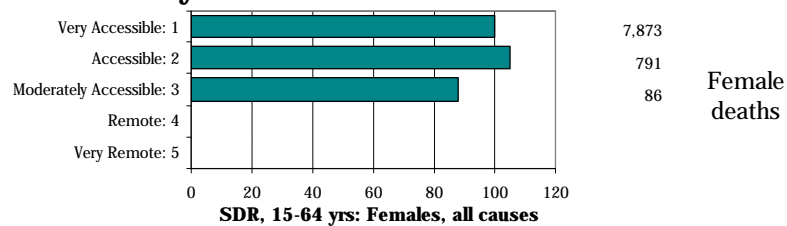- 40 to 69
- below 40
- fewer than five expected deaths

[*]Expected numbers were derived by indirect age standardisation, based on Vic totals

Swan Hill

Shepparton Benalla

Echuca Wangaratta

Horsham

Bendigo

Ballarat

Hamilton

Melbourne

Sale

Portland

Geelong

Colac

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

Accessibility/Remoteness Index of Australia

Very Accessible: 1	7,873
Accessible: 2	791
Moderately Accessible: 3	86
Remote: 4	Female deaths
Very Remote: 5	

0   20   40   60   80   100   120
SDR, 15-64 yrs: Females, all causes
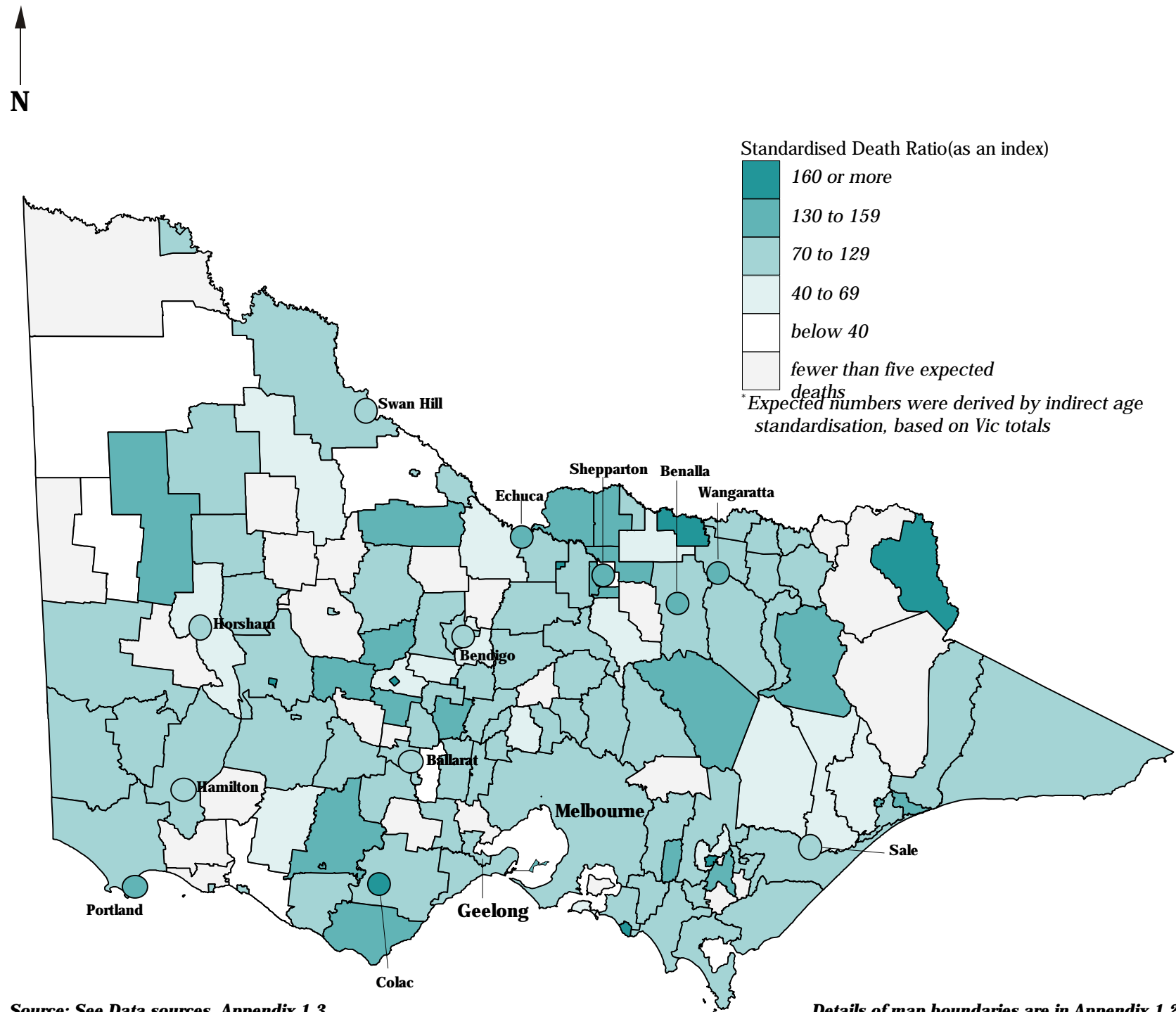
Standardised Death Ratios (SDRs) for females show a different pattern to that for males, increasing from an SDR of 100 in the Very Accessible areas (where females recorded the number of premature deaths expected from the State rates) to an elevated SDR of 105 in the Accessible areas (five per cent more deaths of females aged from 15 to 64 years than expected from the State rates). There was a notably lower ratio in the Moderately Accessible areas, an SDR of 88 (12 per cent fewer female deaths than expected).

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

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Deaths of people aged 15 to 64 years from cancer, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, **Darwin**, with a Standardised Death Ratio (SDR) of 117*, and **Hobart**, with an SDR of 112*, were the only capital cities with elevated ratios for deaths from cancer of people aged from 15 to 64 years. **Canberra** had the lowest ratio, with 9 per cent fewer deaths than expected from the Australian rates: ratios in the other capitals were close to the *All capitals* average.

Overall, the variations from the Australian rates in SDRs from cancer between the two time periods analysed (**Table 5.17**) were marginal, with the exception of **Darwin**, where there was a substantial differential (from the Australian rates) between the two periods. The higher SDR in the later period suggests a worsening (relative to the Australian rates) in the death rates for residents of **Darwin** from this cause.

Table 5.17: Deaths of people aged 15 to 64 years from cancer, capital cities
Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	99	100	98	97	95**	112*	117*	91*	98*
1985-89	100	102	100	96*	99	109*	96	92*	100

[1]Includes Queanbeyan (C)
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Deaths from cancer (malignant neoplasms) were the second most common cause of death of residents of all ages of **Melbourne**, accounting for 28.4 per cent of all deaths and 40.1 per cent of deaths of the 15 to 64 year age group.

Different cancers have different causes and are influenced by a range of risk factors, the most widely accepted being tobacco smoking (it is estimated that as many as one in three cancer deaths are caused by smoking and could therefore be prevented (AIHW 1998)) and dietary influences. Both the incidence and mortality of cancer are higher among males than among females, a fact largely attributed to their greater use of tobacco.

There is a strong association between socioeconomic status and certain types of cancer. Mathers (1994) has examined the extent of disparities in mortality rates, which are related to socioeconomic status of area of residence. Differentials in mortality rates from cancers were clearly evident for males aged from 25 to 64 years in the most socioeconomically disadvantaged areas: 28 per cent more male deaths than in the most advantaged areas, with the highest elevation being 60 per cent for lung cancer. Deaths of females in the most disadvantaged areas were less highly elevated (by 10 per cent over deaths in the most advantaged areas), although lung cancer rates were elevated by 58 per cent. In more recent work, Mathers (in press) has reported that the socioeconomic differentials in mortality rates related to cancer have persisted in 1995-97 (**Table 5.2**). In NSW in 1990-94 an inverse relationship was specifically found between high socioeconomic status and cervical cancer (-0.22) and lung cancer (-0.25) (NSW Health Department 1997). In Victoria in 1996 increased rates of (age standardised) years of life lost were found for mouth, stomach, lung and larynx cancer for males and lung cancer for females in the lowest compared to the highest socioeconomic quintiles of the population (Department of Human Services Victoria, in press).

Melbourne (Victoria as the Standard)

Over the period from 1992 to 1995, there were 7,097 premature deaths from cancer in **Melbourne**, two per cent fewer than expected from the State rates (an SDR of 98).

The most highly elevated ratios for deaths of 15 to 64 year olds from cancer were recorded in older, inner city areas such as Collingwood (with an SDR of 143*), Richmond (139**), Port Melbourne (137), Footscray (136**) and St Kilda (132**).

In almost two thirds of SLAs, the ratios were within 15 per cent of the level expected from the State rates. Relatively high ratios (all elevated by more than 10 per cent) were, however, recorded in the long established areas of Chelsea, Williamstown, Preston, Frankston, Coburg and the combined area of Essendon/Fitzroy/Melbourne/South Melbourne.

The lowest ratios of statistical significance were recorded in the SLAs of Sandringham (an SDR of 60**), Eltham (63**), Doncaster and Templestowe (76**).

The largest numbers of deaths from cancer in the 15 to 64 year age group were recorded in the combined area of Essendon/Fitzroy/Melbourne/South Melbourne (with 366 deaths over the four year period from 1992 to 1995), and in Waverley (330 deaths), Altona/Sunshine (292) and Broadmeadows (264).

There was a correlation of substantial significance with the variable for dwellings without a motor vehicle (0.71), and of meaningful significance with housing authority rented dwellings (0.63), low income families, single parent families and unemployment levels (all 0.52). The inverse correlation with the IRSD (-0.44) also indicates an association at the SLA level between high rates of premature deaths from cancer and socioeconomic disadvantage.

Geelong

There were 305 deaths from cancer in **Geelong,** 21 per cent more deaths of 15 to 64 year olds than expected from the State rates (an SDR of 121**). The highest ratios were recorded in Newtown (an SDR of 137), Geelong West (129) and Corio-Inner (127**); while the city of Geelong (90) was the only SLA to record fewer deaths from cancer than expected. There were 165 cancer deaths recorded in Corio-Inner and 49 in Bellarine-Inner.

Map 5.12
Deaths of people aged 15 to 64 years from cancer, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

	130 or above
	115 to 129
	85 to 114
	70 to 84
	below 70

[*]Expected numbers were derived by indirect age-sex standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

National Social Health Atlas Project, 1999

Deaths of people aged 15 to 64 years from cancer, 1992 to 1995

State/Territory comparison (Australia as the Standard)

The highest Standardised Death Ratio (SDR) for deaths from cancer of people aged from 15 to 64 years in the *Rest of State/Territory* areas was recorded in the Northern Territory (an SDR of 148**). The other States all had SDRs within 10 per cent of the level expected from the Australian rates. At the *Whole of State/Territory* level, only the Northern Territory (137**) and Tasmania (110**) had notably more deaths from cancer than expected from the Australian rates.

The non-metropolitan areas of New South Wales, Victoria and Queensland had similar differentials (from the Australian rates) in the SDR recorded in the later period shown in **Table 5.18**. The Northern Territory had the highest SDR (suggesting a worsening in death rates relative to the Australian experience); South Australia, Western Australia and Tasmania also had noticeably higher SDRs in the later period, although with much smaller increases than that for the Northern Territory.

Table 5.18: Deaths of people aged 15 to 64 years from cancer, State/Territory
Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	99	100	98	97	95**	112*	117*	91*1	98*
Other major urban centres²	106*	123**	99	..	..	..	..	..	105**
Rest of State/Territory	103	105**	100	96	93*	109*	148**	—³	102*
Whole of State/Territory	101	102	99	97	94**	110**	137**	91*	100
1985 to 1989									
Rest of State/Territory	103	104*	98	86**	87**	103	123**	—³	99

¹**Includes Queanbeyan (C)**
²**Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)**
³ **Data included with ACT total**
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

As for **Melbourne**, deaths from cancer (malignant neoplasms) were also the second most common cause of death of people of all ages in the non-metropolitan areas of Victoria, accounting for 27.2 per cent of all deaths (10,277 deaths) over the four year period from 1992 to 1995. Cancer was, however, the most common cause of premature death, accounting for 38.8 per cent of all deaths of people aged from 15 to 64 years. Although the largest number of cancer deaths were recorded for people aged 65 years and over, they accounted for only 24.8 per cent of deaths at those ages.

Rest of State (Victoria as the Standard)

In the non-metropolitan areas of Victoria, there were 2,823 deaths of people aged from 15 to 64 years from cancer between 1992 and 1995, three per cent more than expected from the State rates, an SDR of 103.

SLAs with ratios elevated by 30 per cent or more were scattered throughout the State (**Map 5.13**). Both Portland (with 38 deaths from cancer in this age group) and Wonthaggi (35 deaths) had a highly elevated SDR of 185**. Elevated ratios (and at least 10 expected deaths) were also recorded in Wannon (with an SDR of 182*; and 13 deaths), Maryborough (169**; 34), Moe (168**; 61), Colac (158**; 34), Rodney (156*; 26), Kyabram (155*; 22), Glenelg (154; 17), Creswick (153; 18) and Bright and Stawell (both with an SDR of 150 and 23 deaths).

The lowest rates of deaths of 15 to 64 year olds from cancer were recorded in SLAs in two locations; the larger numbers were in the north-west, with lesser numbers in the Western Districts and around Echuca, Shepparton and Tungamah. The lowest ratios (for SLAs with at least five expected deaths) were in Shepparton [Part A] (an SDR of 34*), Tungamah (35), Moorabool West (37*), Narracan [Part A] (37*) and Newham and Woodend (40*).

The largest numbers of deaths of 15 to 64 year olds from cancer over the four year period from 1992 to 1995 were recorded in the regional centres of Greater Geelong (Balance) with 208 deaths, Ballarat (172), Bendigo (165) and Warrnambool (66).

Of the towns mapped, but not previously discussed, the highest ratios were in Wangaratta (an SDR of 141*; 50 deaths), Echuca (133; 30) and Swan Hill (117; 25).

There was a weak association evident in the correlation analysis at the SLA level with indicators of socioeconomic disadvantage; the strongest of these was with the variable for private dwellings without a motor vehicle (0.52). The inverse correlation with the IRSD (-0.45) suggests the existence of an association between high rates of deaths from cancer and socioeconomic disadvantage.

Map 5.13
Deaths of people aged 15 to 64 years from cancer, Victoria, 1992 to 1995

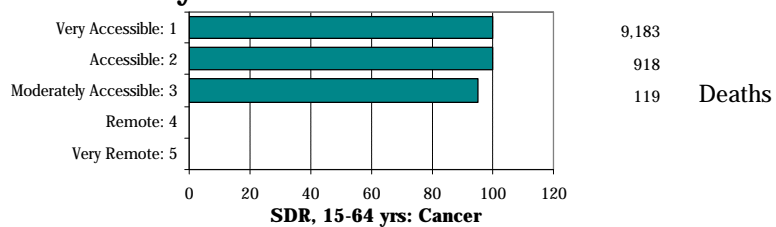Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Standardised Death Ratio (as an index)

- *130 and above*
- *115 to 129*
- *85 to 114*
- *70 to 84*
- *below 70*
- *fewer than five expected deaths*

[*]*Expected numbers were derived by age-sex standardisation, based on Vic totals*

Swan Hill

Shepparton · Benalla

Echuca · Wangaratta

Horsham

Bendigo

Ballarat

Melbourne

Hamilton

Sale

Portland

Geelong

Colac

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia

Very Accessible: 1	9,183
Accessible: 2	918
Moderately Accessible: 3	119	Deaths
Remote: 4	
Very Remote: 5	

SDR, 15-64 yrs: Cancer
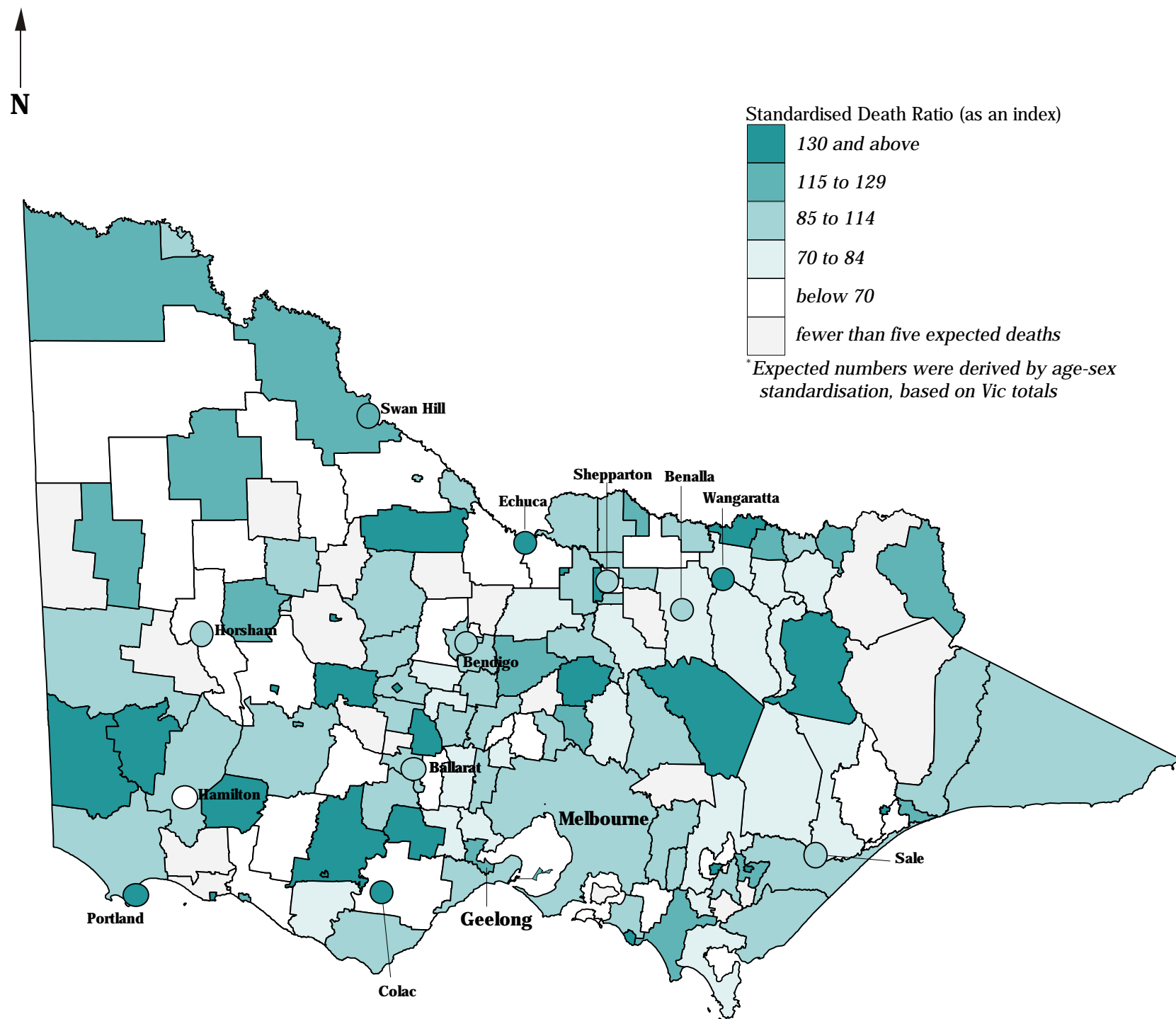
The Standardised Death Ratios (SDRs) for deaths of people aged from 15 to 64 years from all cancers are all close to the level expected from the State rates in all three ARIA categories in Victoria. Residents of areas in both the Very Accessible and Accessible categories recorded the number of premature deaths from cancer expected from the State rates (an SDR of 100), while those in the Moderately Accessible areas had five per cent fewer cancer deaths than expected (an SD of 95).

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

Deaths of people aged 15 to 64 years from lung cancer, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, **Darwin** with a Standardised Death Ratio (SDR) of 164[**], and **Hobart**, with an SDR of 120, had the most highly elevated ratios of the capital cities for deaths from lung cancer of people aged from 15 to 64 years. **Canberra** (77[*]) had the lowest ratio, with 23 per cent fewer deaths than expected from the Australian rates; ratios in the other capitals were close to the *All capitals* average.

Overall, the variations from the Australian rates between the two time periods analysed (**Table 5.19**) were relatively small, with the exception of ratios in **Darwin** and **Hobart**. In **Darwin**, the higher SDR in the later period suggests a worsening (relative to the Australian rates) in the death rates for residents from lung cancer between the periods analysed. This is in line with the rates for deaths from all cancers and all causes, recorded above. The lower SDR for **Hobart** suggests an improvement relative to the Australian deaths' experience.

Table 5.19: Deaths of people aged 15 to 64 years from lung cancer, capital cities
Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	102	94[*]	103	95	90[*]	120	164[**]	77[*]	98[*]
1985-89	101	99	108[*]	92[*]	99	134[**]	131	82[*]	100

[1]**Includes Queanbeyan (C)**
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

In **Melbourne**, deaths from cancer of the trachea, bronchus and lung (referred to here as lung cancer) accounted for 18.0 per cent of all cancer deaths among 15 to 64 year olds from 1992 to 1995. Although males account for around three quarters of these deaths, the rate among females has increased sharply since the 1970s, as a result of increased cigarette smoking since the 1950s. For example, the ratio of male to female mortality rates from lung cancer in the 1970s and 1980s was consistently above 5; however, in 1996 the ratio fell to an all time low of 2.9 (AIHW, 1998).

A relationship also exists between socioeconomic status and lung cancer. Standardised death rates from lung cancer for both males and females from low socioeconomic status areas were highly elevated in relation to those from high socioeconomic status areas (Mathers 1994). The rates were 60 per cent higher for males and 58 per cent higher for females.

Melbourne[7] (Victoria as the Standard)

There were an average of 320 deaths per year of 15 to 64 year olds from lung cancer in **Melbourne** over the four years from 1992 to 1995, compared to an average of 382 deaths per year in the period from 1985 to 1989. The number of deaths over the later period was two per cent lower than expected from the State rates (an SDR of 98).

The highest ratio was recorded in Footscray, an SDR of 173[**], indicating that there were 73 per cent more deaths of 15 to 64 year olds from lung cancer than expected from the State rates. Frankston, with an SDR of 159[**] and neighbouring Chelsea (155[*]) had the next highest ratios. Of the other SLAs with ratios elevated by 30 per cent or more, Preston had the only ratio of statistical significance (an SDR of 143[*]); the others in this group were Port Melbourne (with an SDR of 162), Richmond (157), St Kilda (145) and Cranbourne (136).

The lowest ratios were recorded in SLAs over an area extending from Sandringham (with an SDR of 29[**]) in the south to Eltham (with an SDR of 60) and Lillydale (62[*]) in the north. Other SLAs in this area are Malvern (53), Caulfield (60[*]), Doncaster and Templestowe (62[**]) and Camberwell (66[*]) in the south, and Ringwood (66) in the north-east.

Over the four year period from 1992 to 1995, 62 deaths of 15 to 64 year olds from lung cancer were recorded in both Broadmeadows and the combined area of Altona/Sunshine, with a further 60 deaths in Frankston and 59 in the combined area of Essendon/Fitzroy/Melbourne/South Melbourne.

There were correlations of meaningful significance at the SLA level with the variables for single parent families (0.60) and unemployed people (0.54). These results, together with the inverse correlation with the IRSD (-0.55), suggest the existence of an association at the SLA level between high rates of deaths from lung cancer and socioeconomic disadvantage.
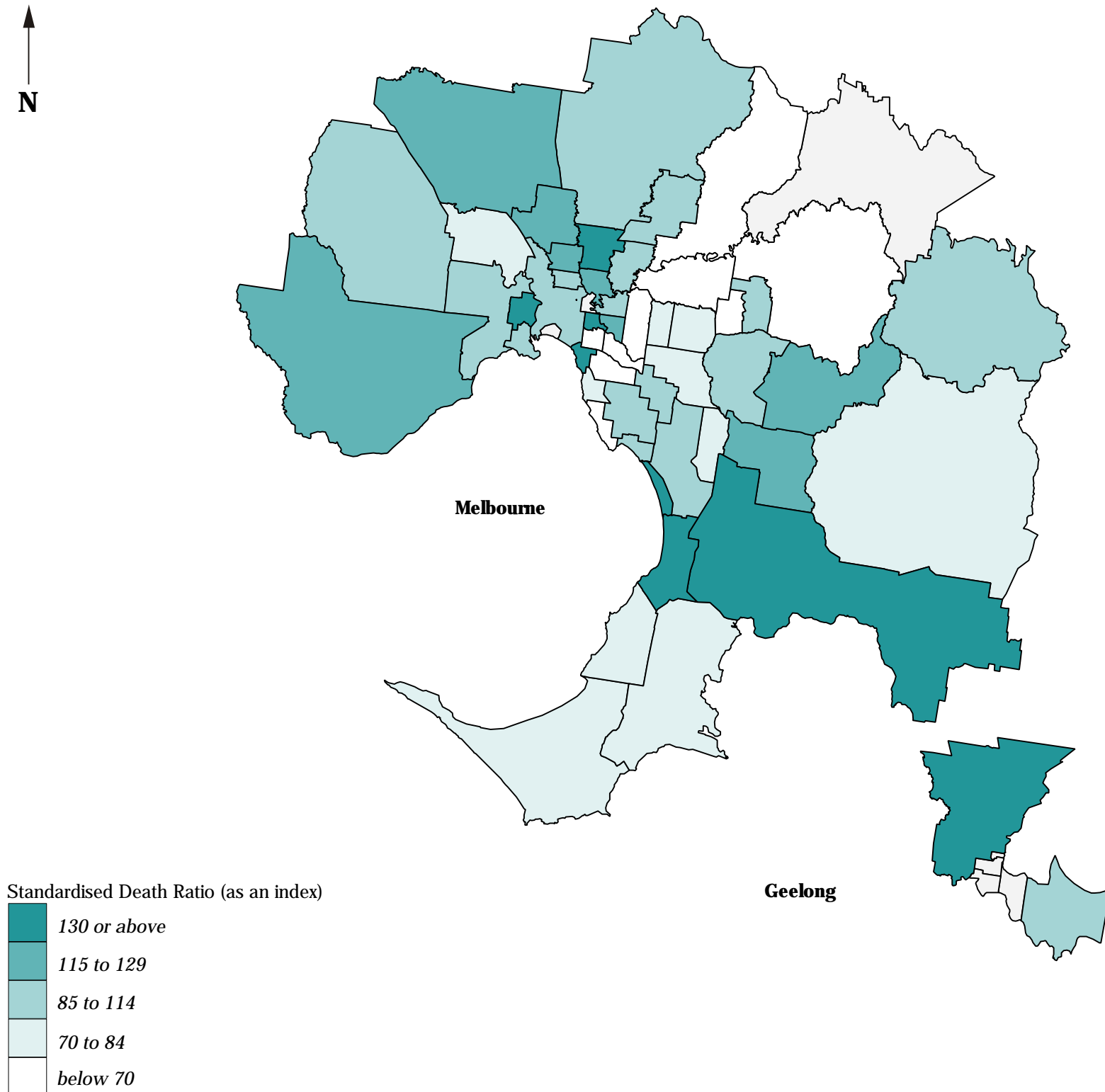
Geelong

Over the four years from 1992 to 1995, there was an average of 15 lung cancer deaths per year in **Geelong**, compared with 20 per year over the period from 1985 to 1989. In contrast to the lower than expected number of deaths in **Melbourne**, **Geelong** had 30 per cent more deaths from lung cancer than expected from the State rates (an SDR of 130[*]). However, only the ratio in Corio-Inner was elevated (an SDR of 168[**]). Of the three SLAs with fewer lung cancer deaths than expected, the lowest ratio was in Bellarine-Inner (86), with 14 per cent fewer deaths from lung cancer than expected from the Victorian rates.

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[7]As there were relatively few areas with sufficient cases to analyse for this variable in the non-metropolitan areas of Victoria, the data have not been mapped. A summary of the main features is on page 172.

Map 5.14
Deaths of people aged 15 to 64 years from lung cancer, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

130 or above

115 to 129

85 to 114

70 to 84

below 70

[*]*Expected numbers were derived by indirect age-sex*
standardisation, based on Vic totals

Deaths of people aged 15 to 64 years from circulatory system diseases, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, Standardised Death Ratios (SDRs) for deaths from circulatory system diseases of people aged from 15 to 64 years ranged from 77** in **Canberra** to 118 in **Darwin**. With the exception of **Hobart** (with an SDR of 105), the other capital cities had fewer deaths than expected from the Australian rates. **Perth** and **Melbourne** also had relatively low ratios, of 82** and 85**, respectively. There was a higher differential (from the Australian rates) in the SDR recorded for **Darwin** in the later period shown in **Table 5.20**, although neither of the SDRs was statistically significant. The higher SDR in this later period suggests a worsening (relative to the Australian rates) in rates of death from circulatory system diseases between the periods analysed. The movement in the ratios for **Brisbane** suggests an improvement in death rates relative to the Australian rates, although neither ratio was statistically significant.

Table 5.20: Deaths of people aged 15 to 64 years from circulatory system diseases, capital cities

Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	98	85**	96	94*	82**	105	118	77**	91**
1985-89	101	87**	103	94**	80**	104	94	77**	94**

[1]Includes Queanbeyan (C)

Source: see *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Circulatory system diseases (diseases of the heart and blood vessels) are the major cause of death in the population. In **Melbourne**, they accounted for 41.8 per cent of deaths of people of all ages (35,985 deaths) and 22.3 per cent of deaths (3,950 deaths) among people aged from 15 to 64 years over the period from 1992 to 1995. Overall, roughly equal numbers of males and females die from these causes, although it is an important cause of death for males at a much earlier age than for females. For example, the ratio of male to female deaths from this cause was 3:1 between the ages of 45 and 64, and it is only above age 75 years that it changes to 2:3 (male to female deaths).

The main causes of death within this group were heart disease (68.7 per cent) – in particular ischaemic heart disease – and cerebrovascular disease (stroke, 31.7 per cent). The AIHW (1994) reports that among people aged 35 to 69 years, men who were current smokers had 2.9 times the age-adjusted risk of a first coronary event (fatal or non-fatal) than non-smokers. For female current smokers the risk was 3.5 times that of non-smokers.

Melbourne (Victoria as the Standard)

In **Melbourne**, between 1992 and 1995, there were 3,950 deaths of people aged from 15 to 64 years from circulatory system diseases, five per cent fewer than expected from the State rates (an SDR of 95**).

Generally, areas with the most highly elevated SDRs for circulatory system deaths were near the city centre. Only Chelsea (with an SDR of 147**), and Cranbourne (115) were beyond this area. The highest ratios were recorded in Footscray (an SDR of 184**), Collingwood (182**), St Kilda (157**), Williamstown (156**) and Brunswick (149**). Of other SLAs with elevated ratios, only that in Altona/Sunshine (128**) was statistically significant.

The most striking observation from **Map 5.15** is the concentration of the lowest ratios over a broad span of SLAs in the eastern suburbs. These areas include some of **Melbourne's** most affluent areas, and each SDR was highly statistically significant. The lowest ratios (both in this group and overall)

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were recorded in Eltham (an SDR of 44**), Doncaster and Templestowe (51**), Kew (59*), Camberwell (67**) and Croydon (68*).

As the map shows, other areas to the east and south-east of **Melbourne** had relatively low ratios, with SDRs of between 15 and 30 per cent lower than expected. SLAs with ratios of statistical significance were Nunawading (with an SDR of 79*), Knox (79**), and Springvale (82*).

There were 234 deaths of 15 to 64 year olds from circulatory system diseases recorded in the combined area of Altona/Sunshine, with the next largest numbers in Essendon/Fitzroy/Melbourne/South Melbourne (193 deaths), Broadmeadows (164), Keilor (150) and Waverley (149).

There was a correlation of substantial significance with the variable for dwellings without a motor vehicle (0.71), and of meaningful significance with unemployment (0.68), low income families (0.62), single parent families (0.59) and migrants with poor proficiency in English (0.52). The inverse correlation of meaningful significance with the IRSD (-0.56) supports the existence of an association at the SLA level between high rates of circulatory system disease deaths and socioeconomic disadvantage.

Geelong

In **Geelong**, there were 175 deaths of people aged from 15 to 64 years from circulatory system diseases, 20 per cent more than expected from the State rates (an SDR of 120*). The highest ratio was in the City of Geelong (an SDR of 181** and 31 deaths), indicating that there were 81 per cent more deaths than expected from the State rates. Only Newtown, with an SDR of 90, had fewer deaths from circulatory system diseases than expected.

Map 5.15

Deaths of people aged 15 to 64 years from circulatory system diseases, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

130 or above

115 to 129

85 to 114

70 to 84

below 70

[*]Expected numbers were derived by indirect age-sex standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

National Social Health Atlas Project, 1999

Deaths of people aged 15 to 64 years from circulatory system diseases, 1992 to 1995

State/Territory comparison (Australia as the Standard)

Residents of the non-metropolitan areas of all States and the Northern Territory had higher Standardised Death Ratios (SDRs) from diseases of the circulatory system than those living in the capital cities. The largest differentials were in the Northern Territory and Western Australia, with the Northern Territory also recording the highest non-metropolitan SDR, of 289[**]. At the *Whole of State/Territory* level SDRs ranged from 26 per cent lower than expected in the Australian Capital Territory, an SDR of 74[**], to almost twice the number of deaths expected in the Northern Territory, an SDR of 191[**].

There was little difference in the SDRs for the two periods shown in **Table 5.21** for most States and Territories, although the higher SDRs in the later period for the Northern Territory, Tasmania and Western Australia suggest a worsening (relative to the Australian rates) in the death rates from these causes.

Table 5.21: Deaths of people aged 15 to 64 years from circulatory system diseases, State/Territory
Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	98	85[**]	96	94[*]	82[**]	105	118	77[**1]	91[**]
Other major urban centres[2]	120[**]	107	95	..	..	..	..	..	111[**]
Rest of State/Territory	121[**]	101	109[**]	117[**]	112[**]	127[**]	289[**]	—[3]	115[**]
Whole of State/Territory	107[**]	90[**]	101	101	90[**]	118[**]	191[**]	74[**]	100
1985 to 1989									
Rest of State/Territory	119[**]	99	105[**]	114[**]	103	120[**]	260[**]	—[3]	111[**]

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Over the four year period from 1992 to 1995, 43.1 per cent of deaths of people of all ages (16,291 deaths) in the non-metropolitan areas of Victoria were attributable to circulatory system diseases. These causes of death accounted for 24.6 per cent of deaths of people aged from 15 to 64 years and 48.4 per cent of deaths of people aged 65 years and over.

Deaths from circulatory system diseases were a more important cause of death for males at a much earlier age than for females. Between the ages of 45 and 64 years there were 1,233 male deaths and only 368 female deaths from these causes (over the years from 1992 to 1995). This relationship turned around at the age of 75 years and over, when the number of female deaths (6,417) exceeded the number of male deaths (4,565).

Rest of State (Victoria as the Standard)

Over the four years from 1992 to 1995, there were 1,791 deaths of people aged from 15 to 64 years from circulatory system diseases in the non-metropolitan areas of Victoria, 12 per cent more deaths than were expected from the State rates (an SDR of 112[**]).

Excluding SLAs with fewer than five expected deaths, the highest ratios were recorded in Tambo [Part B], with just over twice the expected number of deaths (an SDR of 211[*] and 11 deaths) and Euroa, with 98 per cent more deaths of 15 to 64 year old people from circulatory system diseases than expected (198[**]; 15 deaths).

Highly elevated ratios were also recorded for residents of the towns of Swan Hill (an SDR of 187[**]), Moe (183[**]), Portland (178[**]), Ararat (174[*]), Benalla (173[*]), Colac (170[*]), Stawell (165[*]), Maryborough (158[*]), Ballarat (152[**]), Mildura (149[*]), Warrnambool (145[*]) and Shepparton (137[*]). Other elevated ratios were recorded in Alberton (an SDR of 179[*]), Kyneton (176[**]), Creswick (163), and Bacchus Marsh (162[*]).

Areas with the lowest SDRs for premature deaths from circulatory system diseases were mainly recorded in SLAs in the Western Districts and southern Wimmera, in the Echuca and Upper Goulburn Valley region and in the Ovens-Murray and Bairnsdale areas (**Map 5.16**). However, within this group of 25 SLAs, only Seymour had an SDR of statistical significance, with 61 per cent fewer deaths than expected, an SDR of 39[*].

There were 137 deaths of 15 to 64 year olds from circulatory system diseases of residents of Ballarat, 94 from Bendigo (with and SDR of 111) and 88 from Greater Geelong (Balance) (78[*]).
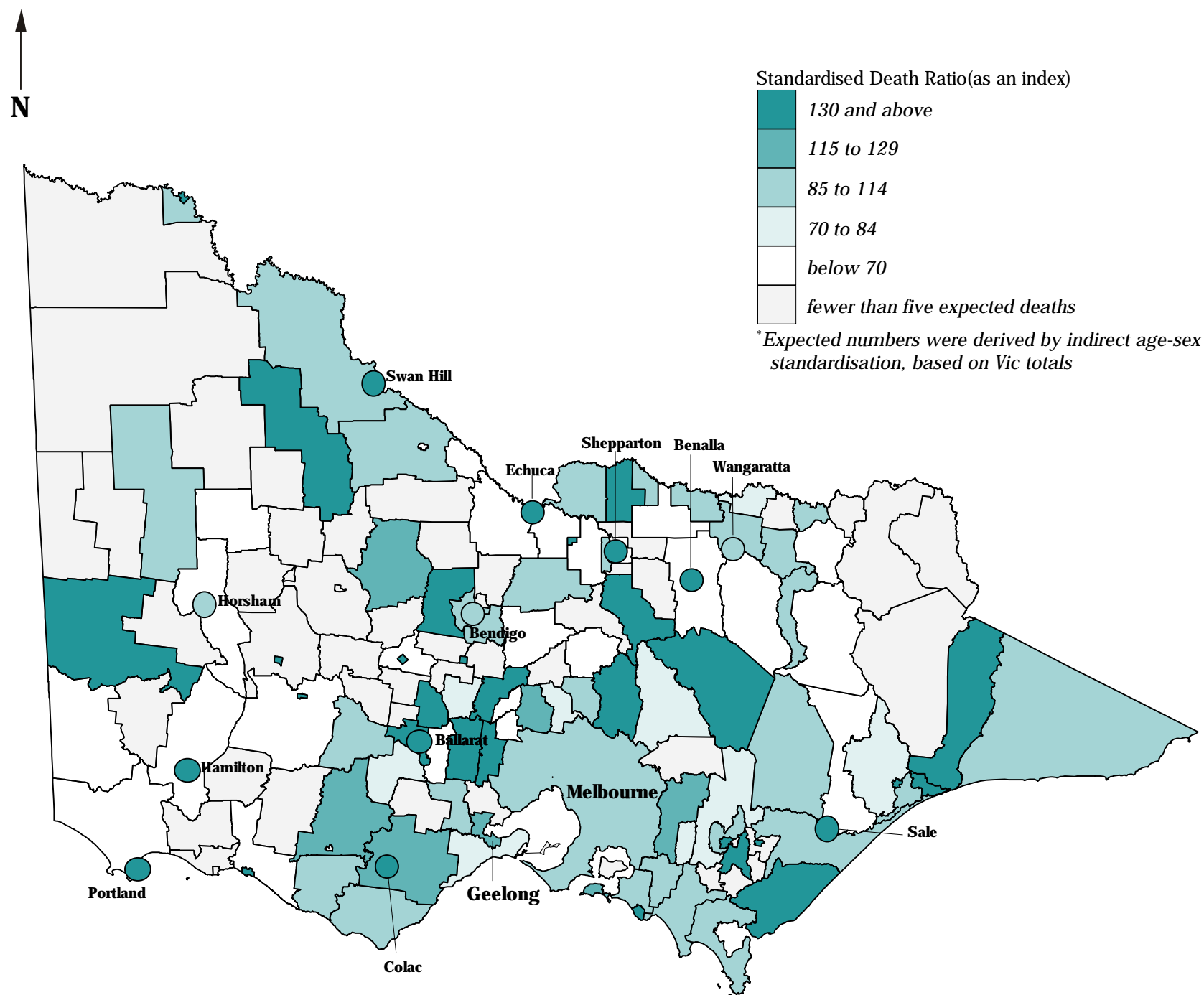
Among the towns mapped, but not previously mentioned, Echuca and Sale both had an SDR of 139, with 18 deaths in Echuca and 21 in Sale.

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Map 5.16
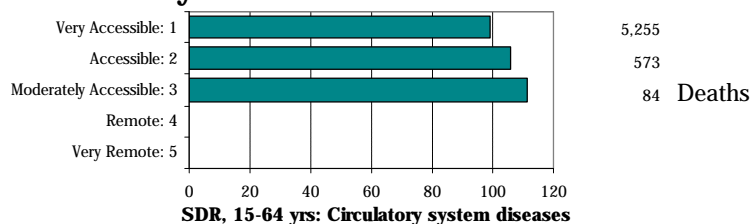# Deaths of people aged 15 to 64 years from circulatory system diseases, Victoria, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected*

N

Standardised Death Ratio(as an index)

- *130 and above*
- *115 to 129*
- *85 to 114*
- *70 to 84*
- *below 70*
- *fewer than five expected deaths*

Expected numbers were derived by indirect age-sex standardisation, based on Vic totals

Swan Hill
Shepparton Benalla
Echuca Wangaratta
Horsham
Bendigo
Ballarat
Hamilton
Melbourne
Sale
Portland
Geelong
Colac

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

Accessibility/Remoteness Index of Australia

Very Accessible: 1
Accessible: 2
Moderately Accessible: 3
Remote: 4
Very Remote: 5

5,255
573
84   Deaths

0   20   40   60   80   100   120
SDR, 15-64 yrs: Circulatory system diseases

Standardised Death Ratios (SDRs) for premature deaths from circulatory system diseases increase steadily across the ARIA categories. The lowest ratio was in the Very Accessible areas (an SDR of 99, one per cent fewer deaths of people aged from 15 to 64 years than expected from the State rates), with elevated ratios of 106 (six per cent more deaths than expected) and 111 (11 per cent more) in the Accessible and Moderately Accessible areas, respectively.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

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Deaths of people aged 15 to 64 years from respiratory system diseases, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, Standardised Death Ratios (SDRs) for deaths from respiratory system diseases of people aged from 15 to 64 years ranged from 64[**] in **Perth** to 193[**] in **Darwin**. With the exception of **Hobart** (with an SDR of 115), the other capital cities had fewer deaths than expected. There was a larger differential (from the Australian rates) in the SDR recorded in a number of the capital cities in the later period shown in **Table 5.22**, with the largest in **Darwin**. The higher SDR in this later period suggests a worsening (relative to the Australian rates) in rates of death from respiratory system diseases between the periods analysed. The movement in the ratios for **Perth** and **Melbourne** suggest a marked improvement in death rates relative to the Australian rates.

Table 5.22: Deaths of people aged 15 to 64 years from respiratory system diseases, capital cities
Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	94	79[**]	98	87[*]	64[**]	115	193[**]	79	87[**]
1985-89	90[**]	90[**]	101	74[**]	73[**]	98	124	71[**]	88[**]

[1]**Includes Queanbeyan (C)**
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

The organs of the respiratory system include the nose, pharynx, larynx, trachea, bronchi and lungs. There were 6,560 deaths from diseases of the respiratory system over the period from 1992 to 1995, 7.6 per cent of all deaths of residents of **Melbourne**. More than two thirds (68.2 per cent) of deaths from diseases of the respiratory system were from chronic obstructive pulmonary disease (largely deaths from bronchitis, emphysema and asthma), while 18.1 per cent were deaths from pneumonia and influenza. People aged from 15 to 64 years accounted for 10.5 per cent of these deaths.

There is a strong association between deaths from respiratory system diseases and socioeconomic status. Mathers (1994) noted substantial differentials in mortality rates from respiratory system diseases among working age Australians: men aged from 25 to 64 years living in areas of greatest socioeconomic disadvantage had death rates 2.3 times higher than those living in areas of least disadvantage (rates elevated by 130 per cent). For females the differential was just more than double (106 per cent). These differentials have persisted in 1995-97 (**Table 5.2**). In NSW, a marked correlation (-0.45) has been found between premature deaths from respiratory illness and socioeconomic status over the period 1990-94 (NSW Health Department 1997). Increased rates of (age standardised) years of life lost have also been found in the lowest socioeconomic quintile in Victoria in 1996 (Department of Human Services Victoria, in press).

Melbourne[8] (Victoria as the Standard)

Over the period from 1992 to 1995, there were 691 deaths from respiratory system diseases in **Melbourne**, ten per cent fewer deaths than expected from the State rates (an SDR of 90[**]).

Areas with ratios elevated by 30 per cent or more were generally confined to a sector extending from the city to the north-west periphery of the metropolitan area, with another concentration at the southern tip of the Mornington Peninsula (**Map 5.17**). The SLAs of Richmond (with an SDR of 238[**] and 12 deaths over the

four years) and Hastings (235[**]; 15 deaths) had death rates from respiratory system diseases of more than twice the levels expected. Other SLAs with statistically significantly elevated SDRs were Bulla (with an SDR of 178[*]), St Kilda (166[*]), Diamond Valley (157[*]) and the combined area of Essendon/Fitzroy/Melbourne/ South Melbourne (150[**]). Despite having elevated ratios in this range, the SLAs of Collingwood (10 deaths registered), Port Melbourne (4) and Upper Yarra (4) have been excluded from this analysis as fewer than five deaths were expected.

In contrast, SLAs with fewer than the expected number of deaths from respiratory system diseases were found, with the exception of Keilor, within a sector centred on Camberwell and extending north-east and east to the boundary of **Melbourne**. There were 73 fewer deaths than expected in Camberwell, an SDR of 27[**] and six deaths (when the State rates would indicate 22 deaths). Other SLAs with low ratios of statistical significance were Keilor (with an SDR of 32[**]), Doncaster and Templestowe (39[**]), Waverley (43[**]), Lillydale (51[*]), Nunawading (57[*]) and Knox (62[*]).

Over the period from 1992 to 1995, the largest number of premature deaths from respiratory system diseases were recorded in the Essendon/Fitzroy/Melbourne/South Melbourne area (47 deaths), Altona/Sunshine (44) and Broadmeadows (38).

There were correlations of meaningful significance with the variables for single parent families (0.67) and housing authority rented dwellings (0.63). These results, and the weak inverse correlation with the IRSD (-0.38) suggest the existence of an association at the SLA level between high rates of premature death from respiratory system diseases and socioeconomic disadvantage.

Geelong

Between 1992 and 1995 there were 28 deaths of 15 to 64 year olds from respiratory system diseases in **Geelong**, two per cent more than expected (an SDR of 102). Only Corio-Inner had sufficient deaths from this cause to be included in the analysis, recording an SDR of 85.

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[8]As there are relatively few areas with sufficient cases to analyse for this variable in the non-metropolitan areas of Victoria, the data have not been mapped. A summary of the main features is on page 173.

Map 5.17
Deaths of people aged 15 to 64 years from respiratory system diseases, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected*

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

- 130 and above
- 115 to 129
- 85 to 114
- 70 to 84
- below 70
- fewer than five expected deaths

*Expected numbers were derived by indirect age-sex
 standardisation, based on Vic totals

155
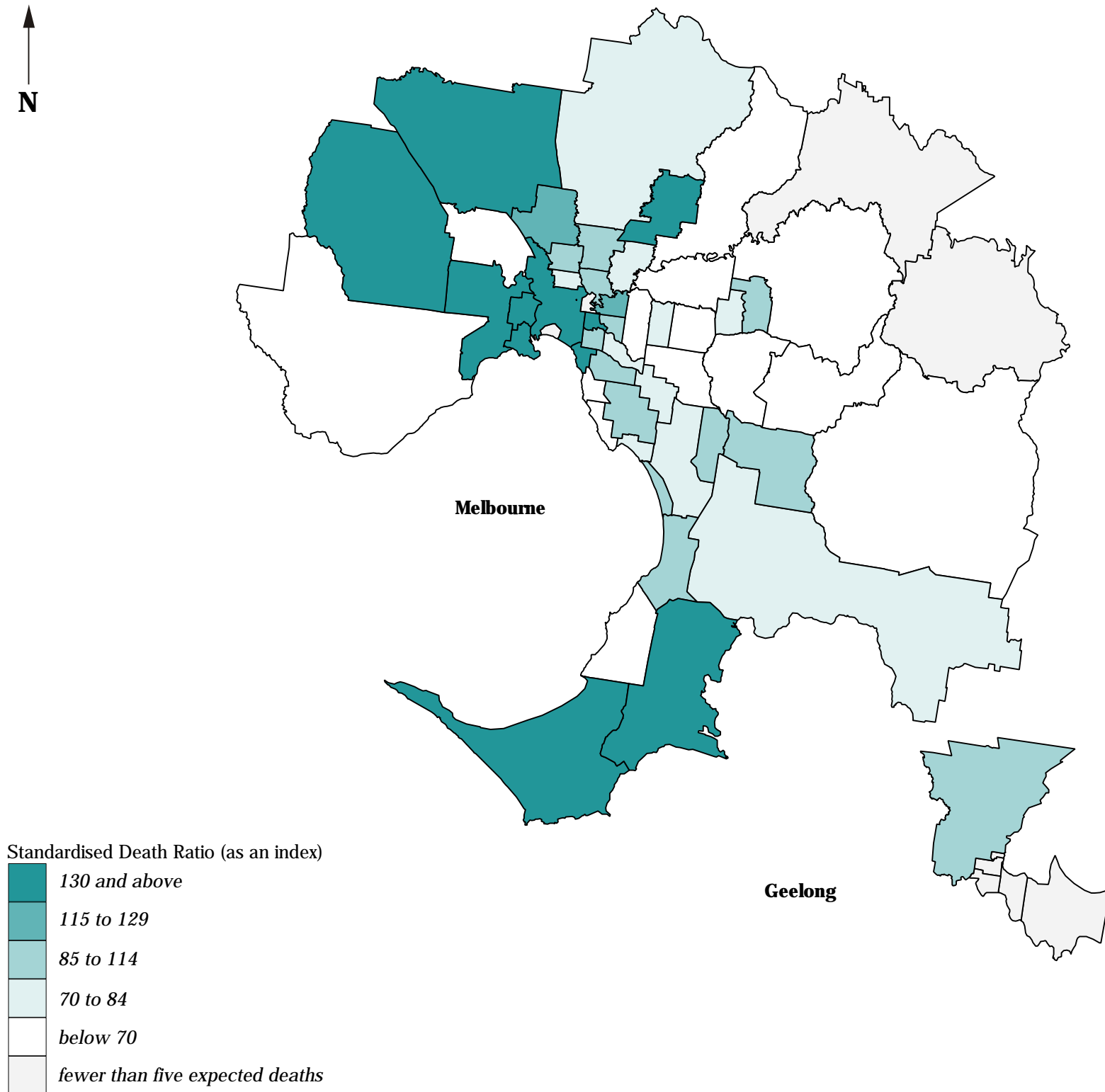
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Accidents, poisonings and violence as a cause of death

Introduction

Accidental and violent deaths are classified according to the external cause of death, that is, according to the circumstances of the accident or violent incident that produced the fatal injury, rather than the nature of the injury. This differs from the other causes of death analysed, which are classified according to the underlying disease or condition.

The main causes of death in this classification of accidents, poisonings and violence are comprised of the following:

- suicide (32.3 per cent);
- motor vehicle traffic accidents (26.9 per cent);
- accidental falls (15.0 per cent, mainly of elderly people);
- accidental drownings (4.0 per cent); and
- accidental poisonings (3.0 per cent).

Although representing only 5.2 per cent of deaths of people of all ages, deaths from the external causes of accidents, poisonings and violence are a major cause of premature death, accounting for 17.3 per cent of deaths in the 15 to 64 year age group. Among people aged from 15 to 64 years the major causes of death from external causes are as follows:

- suicide (41.4 per cent);
- motor vehicle traffic accidents (29.8 per cent);
- accidental poisonings (3.9 per cent); and
- assault without weapon or weapon not specified (3.8 per cent).

Over the period from 1992 to 1995 there were 1,190 deaths in Victoria from the combined external causes of accidents, poisonings and violence among people aged from 15 to 24 years, representing 69.3 per cent of all deaths in this age group. Motor vehicle traffic accidents and suicides accounted for the majority of these deaths (78.0 per cent in total: 42.3 per cent from motor vehicle traffic accidents and 35.7 per cent from suicides).

Males predominated in these causes of death, accounting for 77.4 per cent of deaths from these causes in the 15 to 64 year age group (ranging from 80.1 per cent of suicides to 73.0 per cent of motor vehicle traffic accidents) and 78.2 per cent of deaths among 15 to 24 year olds (see **Table 5.23**).

Table 5.23:Deaths from accidents, poisonings & violence, by cause, Victoria, 1992 to 1995

Age (years) and sex	Motor vehicle traffic accidents		Suicides		All accidents, poisonings & violence[1]	
	No.	%	No.	%	No.	%
15 to 24						
Males	380	75.5	347	81.6	930	78.2
Females	123	24.5	78	18.4	260	21.8
Total	**503**	**100.0**	**425**	**100.0**	**1,190**	**100.0**
15 to 64						
Males	965	73.0	1,470	80.1	3,437	77.4
Females	357	27.0	366	19.9	1,001	22.6
Total	**1,322**	**100.0**	**1,836**	**100.0**	**4,438**	**100.0**

[1] Includes other accidents, poisonings and violence.
Source: see *Data sources*, Appendix 1.3

As can be seen from **Table 5.24**, death rates from the combined causes of accidents, poisonings and violence were substantially higher, across all age groups, in the non-metropolitan areas of Victoria than in **Melbourne**. The biggest difference was recorded among males aged from 15 to 24 years, where the rates ranged from 87.8 per 100,000 population in the non-metropolitan areas to 58.8 per 100,000 population in **Melbourne**.

Table 5.24: Deaths from accidents, poisonings and violence, by area of residence, Victoria, 1992 to 1995

Age (years) and sex	Melbourne		Rest of Victoria		Total	
	No.	Rate	No.	Rate	No.	Rate
15 to 24						
Males	605	58.8	295	87.8	930	66.4
Females	169	16.8	88	28.3	260	19.3
Total	**774**	**38.1**	**383**	**59.2**	**1,190**	**43.3**
15 to 64						
Males	2,277	52.2	1,053	70.4	3,437	57.2
Females	686	15.7	285	19.6	1,001	16.8
Total	**2,963**	**33.9**	**1,338**	**45.4**	**4,438**	**37.1**
All ages						
Males	3,051	48.0	1,418	62.1	4,605	51.9
Females	1,362	21.1	562	24.0	1,979	21.9
Total	**4,413**	**34.4**	**1,980**	**42.9**	**6,584**	**36.8**

[1]Rate per 100,000 population of same age and sex.
Source: See *Data sources*, Appendix 1.3

Mathers (1994) noted substantial differentials in mortality rates from accidents, poisonings and violence among working age Australians, with men aged from 25 to 64 years living in areas of greatest socioeconomic disadvantage having death rates almost twice as high (96 per cent higher) as those living in areas of least disadvantage. For females the differential was 69 per cent. Similar differentials for males and females have persisted over the period from 1995 to 1997, with differentials for motor vehicle traffic accidents becoming substantially larger (**Table 5.2**).

The NSW Health Department (1997) found an inverse relationship (-0.23) between high socioeconomic status and death by accidents, poisoning and violence in 15 to 64 year olds over the period from 1990 to 94.

Indigenous people also have higher death rates from these causes. The ABS and AIHW (1999) report that for Indigenous men, the standardised mortality ratio (from accidents, poisonings and violence) was 3.2 times that expected from the overall Australian rates, and deaths from causes in this group were responsible for 19.3 per cent of the excess mortality experienced. For Indigenous women, the standardised mortality ratio was 3.6 times that expected, and deaths from causes in this group were responsible for 16.9 per cent of the excess mortality. These figures were derived from data for deaths of Indigenous people in SA, WA and the NT for the three-year period 1995-1997.

Years of potential life lost from accidents, poisonings and violence

Estimates have been made of the number of years of potential life lost (YPLL: see discussion on page 166 for additional details of this concept) from deaths from the external causes of accidents, poisonings and violence (Ginpil et al 1992). For people of 'working life' (ages 18 to 65 years) it is estimated that 180,234 years of (potential) life have been lost due to premature deaths from these external causes. This is 34.2 per cent of the total number of YPLL from all causes of death, of which 15.0 per cent were from road crashes, 8.9 per cent from suicides, 8.4 per cent from other accidents, and 1.9 per cent from violence. For males, 32.5 per cent of YPLL during their working life were from these external causes and, for females, 16.0 per cent.

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Deaths of people aged 15 to 64 years from accidents, poisonings and violence, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, Standardised Death Ratios (SDRs) for deaths from accidents, poisonings and violence, of people aged from 15 to 64 years ranged from 75[**] in **Canberra** to 149[**] in **Darwin**. With the exception of **Darwin**, and **Hobart** (an SDR of 114[**]), the other capital cities had fewer deaths than expected. **Melbourne** and **Sydney** also had relatively low ratios, of 80[**] and 84[**], respectively.

There was a higher differential (from the Australian rates) in the SDRs recorded for **Hobart** and **Darwin** in the later period shown in **Table 5.25**, suggesting a worsening (relative to the Australian rates) in rates of death from accidents, poisonings and violence between the periods analysed. The movement in the ratios for **Canberra** indicates an improvement in death rates relative to the Australian rates; similar, but smaller movements were evident in the ratios for **Sydney** and **Melbourne**.

Table 5.25: Deaths of people aged 15 to 64 years from accidents, poisonings and violence, capital cities
Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	84[**]	80[**]	99	96	95	114[**]	149[**]	75[**]	88[**]
1985-89	91[**]	86[**]	92[**]	86[**]	82[**]	98	141[**]	88[**]	89[**]

[1]Includes Queanbeyan (C)
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Within **Melbourne**, there were 4,413 deaths from the combined causes of accidents, poisonings and violence (67.0 per cent of all deaths from these causes). Some 67.1 per cent of these (2,963 deaths) were deaths of 15 to 64 year olds, and 76.8 per cent were of males. There were 18.6 per cent fewer deaths of 15 to 64 year olds residents in **Melbourne** from these external causes over the period from 1992 to 1995 than over the years from 1985 to 1989, declining from an average of 910 per year to 741 per year.

Melbourne (Victoria as the Standard)

There were nine per cent fewer deaths of people aged from 15 to 64 years from this group of external causes in **Melbourne** than were expected from the State rates, an SDR of 91[**].

Most of the seven SLAs, based on 1991 boundaries, with SDRs from these causes elevated by 15 per cent or more, were located near the inner city. The most highly elevated of these were in St Kilda (with an SDR of 164[**]), Footscray (131[*]), Northcote (128), Prahran (118) and the combined area of Essendon/Fitzroy/Melbourne/South Melbourne (118[*]). In the outlying areas of **Melbourne**, Upper Yarra [Part A] (with an SDR of 149) and Flinders (with an SDR of 139[*]) had similarly highly elevated ratios.

There were more areas with fewer than the expected number of deaths than there were areas where ratios were elevated (**Map 5.18**). SLAs with fewer than two thirds of the expected number of deaths of people aged from 15 to 64 years from this group of external causes were Brighton (with an SDR of 61[*]), Kew and Sandringham (both with an SDR of 65). Bulla, an area of similarly high socioeconomic status had a slightly higher SDR of 69[*] and Keilor, an area with middle-order socioeconomic status, had an SDR of 62[**].

Over the four years from 1992 to 1995, the largest numbers of deaths from this group of external causes were recorded in the combined SLAs of Essendon/Fitzroy/Melbourne/South Melbourne (185 deaths), Altona/Sunshine (135 deaths), Knox (120) and Broadmeadows (114).

The correlation analysis showed there to be a generally weak association at the SLA level with the indicators of social disadvantage. The strongest correlations were with the variables for low income families (0.58), unemployment (0.53) and dwellings without a motor vehicle (0.46). The inverse correlation with the IRSD (-0.42) supports the existence of an association between high rates of deaths from accidents, poisonings and violence and socioeconomic disadvantage.
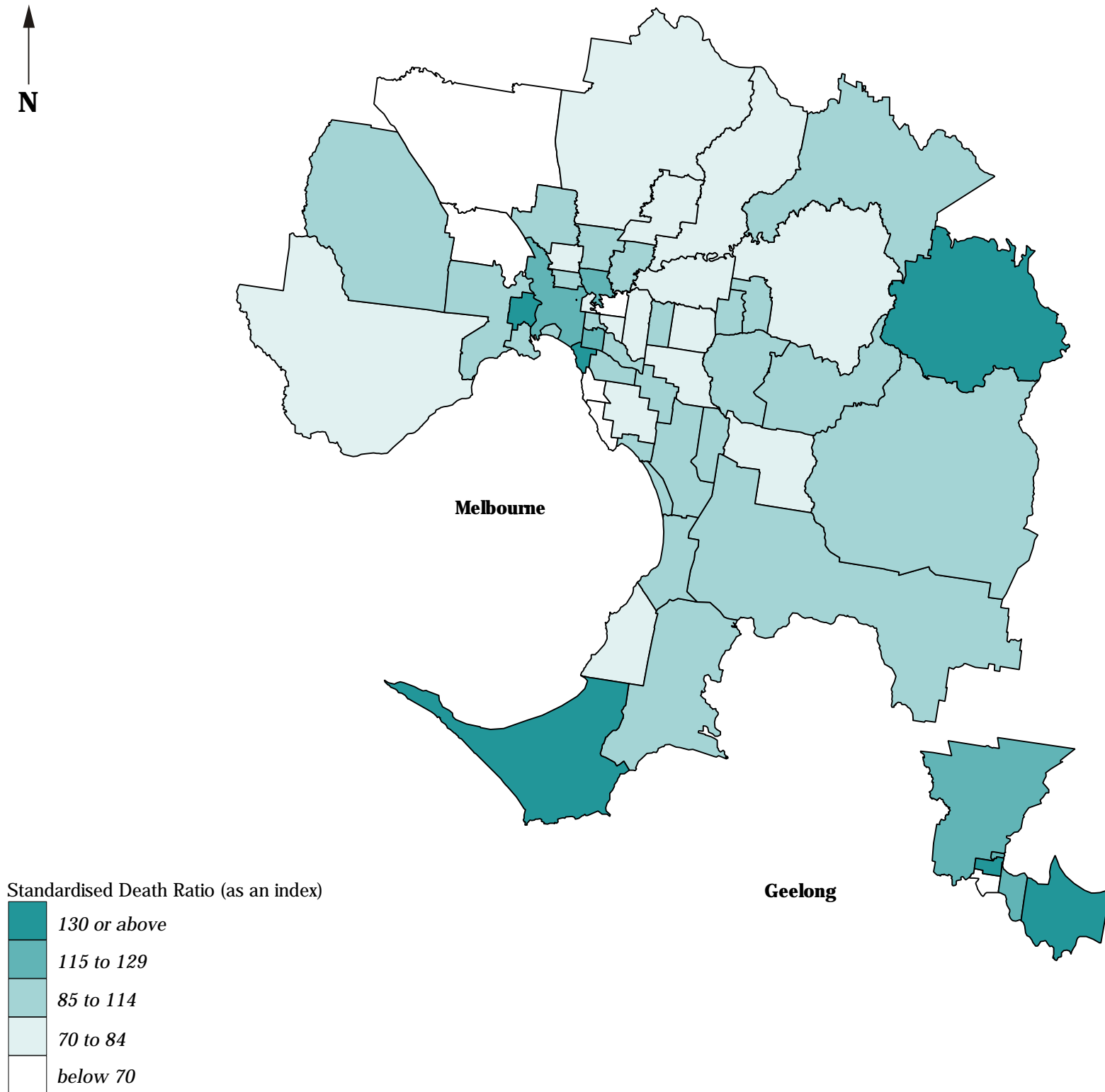
Geelong

In contrast to the experience in **Melbourne**, SDRs for deaths of people aged from 15 to 64 years from accidents, poisonings and violence in **Geelong** were elevated by 26 per cent above the level expected from the State rates (an SDR of 126[**] and 137 deaths in four years). Only in Newtown were there fewer deaths than expected. Geelong West (with an SDR of 157[*]) and Corio-Inner (129[*]) both had elevated ratios of statistical significance.

Map 5.18
Deaths of people aged 15 to 64 years from accidents, poisonings and violence, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

130 or above

115 to 129

85 to 114

70 to 84

below 70

[*]Expected numbers were derived by indirect age-sex
  standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

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Deaths of people aged 15 to 64 years from accidents, poisonings and violence, 1992 to 1995

State/Territory comparison (Australia as the Standard)

Residents of the non-metropolitan areas of all States and the Northern Territory had higher Standardised Death Ratios (SDRs) from the external causes of accidents, poisonings and violence than those living in the capital cities. Apart from Tasmania, the differentials were substantial, with the largest being in the Northern Territory: the Northern Territory also had the highest non-metropolitan SDR, of 254[**].

The main differences from the Australian rates in the SDRs for the two periods shown in **Table 5.26** were in Western Australia (the higher SDR in the later period suggesting a worsening, relative to the Australian rates, in the death rates from these external causes) and the Northern Territory, with a somewhat lower ratio, suggesting an improvement (relative to the Australian rates) in the death rates from these causes.

Table 5.26: Deaths of people aged 15 to 64 years from accidents, poisonings and violence, State/Territory

Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	84[**]	80[**]	99	96	95	114[**]	149[**]	75[**1]	88[**]
Other major urban centres[2]	95	111	108	..	..	..	..	..	101
Rest of State/Territory	121[**]	108[**]	131[**]	132[**]	152[**]	129[**]	254[**]	_[3]	127[**]
Whole of State/Territory	93[**]	87[**]	112[**]	104	109[**]	121[**]	202[**]	73[**]	100
1985 to 1989									
Rest of State/Territory	122[**]	120[**]	133[**]	126[**]	123[**]	116[**]	285[**]	_[3]	126[**]

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

There were 1,980 deaths in the non-metropolitan areas of Victoria attributable to accidents, poisonings and violence, representing 5.2 per cent of deaths of all ages. Unlike deaths from all causes, where the highest proportion is experienced among people aged 65 years and over, deaths from accidents, poisonings and violence are a major cause of premature death, of people between the ages of 15 and 64 years. Premature deaths accounted for 67.6 per cent of the 1,980 deaths recorded in the non-metropolitan areas of Victoria; in comparison only 26.8 per cent of these deaths occurred at the age of 65 years and over.

Rest of State (Victoria as the Standard)

There were 1,338 deaths of 15 to 64 year old non-metropolitan residents from the combined causes of accidents, poisonings and violence over the four years from 1992 to 1995. This was 23 per cent more deaths than expected from the Victorian rates, an SDR of 123[**].

As many of the SDRs in **Map 5.19** are very high, the ranges mapped have been changed to enhance the pattern of differentiation in the map. The highest and lowest ranges have been set at 60 per cent, rather than 30 per cent as used in the map for **Melbourne** for this variable. For over half the SLAs in the non-metropolitan areas of Victoria, fewer than five deaths were expected from the State rates; these areas are shown on the map as having no data, as they were considered to have too few cases to produce reliable results.

The distribution of SLAs with elevated ratios was scattered throughout Victoria, with 30 SLAs recording SDRs for deaths of 15 to 64 year olds from accidents, poisonings and violence elevated by 30 per cent or more. The highest ratios (all more than twice the level expected from the State rates) were in Alexandra (now Murrindindi East, with an SDR of 253[**] and 14 deaths from these causes), Oxley (now Milawa South and Alpine West; 233[**] and 12 deaths), Tambo [Part A] (now East Gippsland-Bairnsdale; 216[**] and 14 deaths) and Daylesford and Glenlyon (now Hepburn East; 210[*] and 11 deaths).

The largest numbers of deaths from external causes in this age group were recorded in Ballarat, with 82 deaths and Bendigo, with 61 deaths. There were 60 deaths in Greater Geelong (Balance), 43 in Wodonga and 38 in Morwell [Part A].
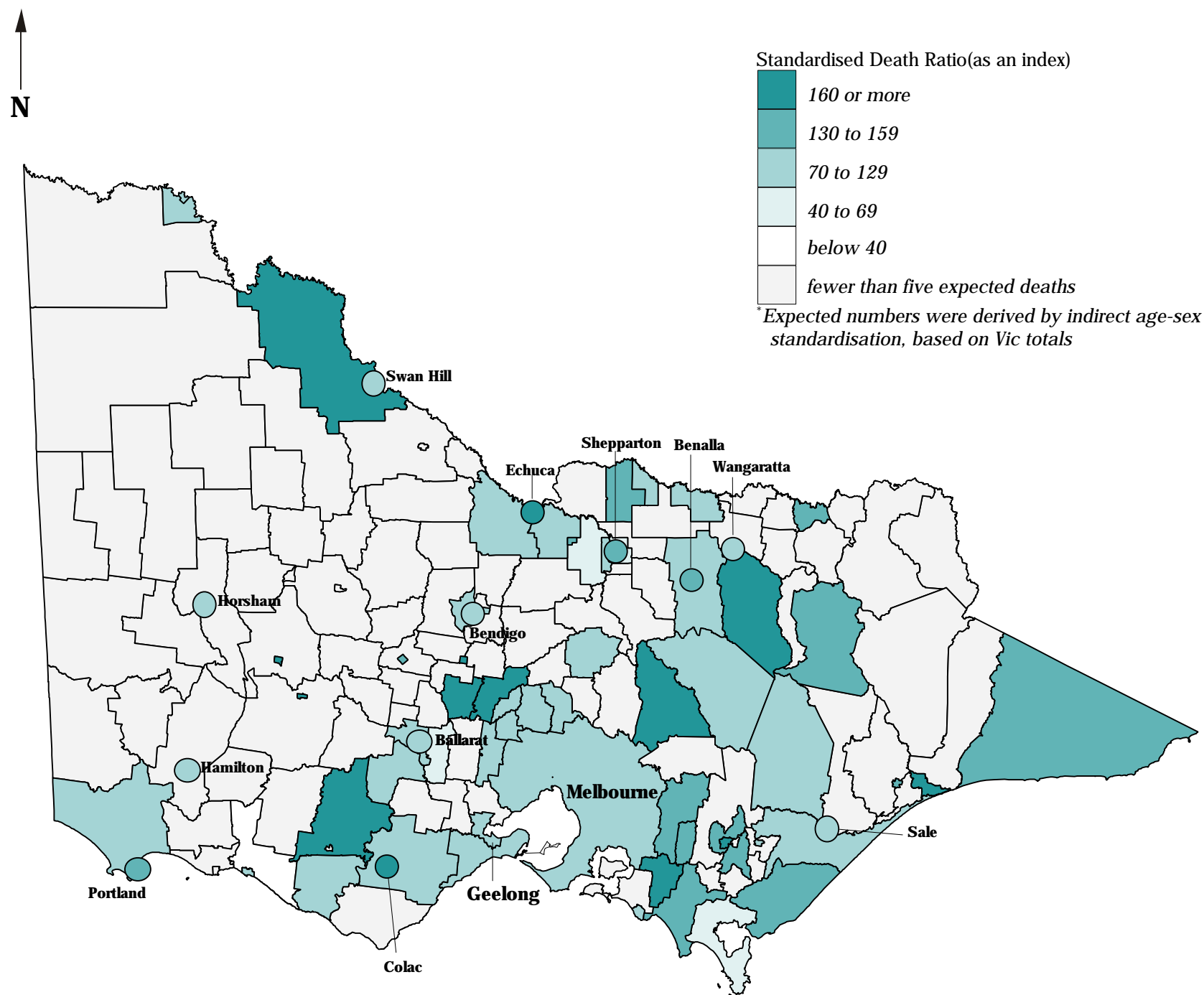
Of the towns mapped, the highest ratios were recorded for residents from Echuca (182[*]; 16 deaths), Colac (170[*]; 14), Benalla (159; 12), Shepparton (148[*]; 36) and Portland (130; 13).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Map 5.19
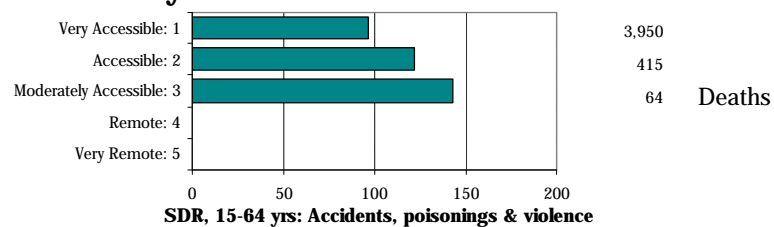# Deaths of people aged 15 to 64 years from accidents, poisonings and violence, Victoria, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected*

N

Standardised Death Ratio(as an index)

- 160 or more
- 130 to 159
- 70 to 129
- 40 to 69
- below 40
- fewer than five expected deaths

*Expected numbers were derived by indirect age-sex
standardisation, based on Vic totals

Swan Hill

Shepparton Benalla
Echuca Wangaratta

Horsham

Bendigo

Ballarat

Hamilton

Melbourne

Sale

Portland

Geelong

Colac

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

Accessibility/Remoteness Index of Australia

	SDR, 15-64 yrs	Deaths
Very Accessible: 1		3,950
Accessible: 2		415
Moderately Accessible: 3		64
Remote: 4		
Very Remote: 5		

SDR, 15-64 yrs: Accidents, poisonings & violence

Death rates of people aged from 15 to 64 years from the external causes of accidents, poisonings and violence increase across the ARIA categories by almost fifty per cent (47.4 per cent) from an SDR of 97 in the Very Accessible areas, to an SDR of 122 in the Accessible areas and to an SDR of 143 in the Moderately Accessible areas (with 43 per cent more premature deaths from these external causes than expected from the State rates, an SDR of 143).

Source: Calculated on ARIA classification, DHAC

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Deaths of people aged 15 to 24 years from accidents, poisonings and violence, 1992 to 1995

Capital city comparison (Australia as the Standard)

Over the four years from 1992 to 1995, Standardised Death Ratios (SDRs) for deaths from accidents, poisonings and violence of people aged from 15 to 24 years ranged from 65[**] in **Canberra** to 127[*] in **Hobart**. With the exception of **Darwin** (with an SDR of 124) and **Brisbane** (104), the other capital cities recorded fewer deaths than expected. **Sydney** and **Melbourne** also had relatively low ratios, of 76[**] and 78[**], respectively.

There was a higher differential (from the Australian rates) in the SDRs recorded for **Perth**, **Brisbane**, **Hobart** and **Darwin** in the later period shown in **Table 5.27**, suggesting a worsening (relative to the Australian rates) in rates of death from accidents, poisonings and violence between the periods analysed. The movements in the ratios for the other capitals (and in particular in **Canberra**) indicate an improvement in death rates relative to the Australian rates.

Table 5.27: Deaths of people aged 15 to 24 years from accidents, poisonings and violence, capital cities

Standardised death ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1992-95	76[**]	78[**]	104	85[**]	97	127[*]	124	65[**]	84[**]
1985-89	88[**]	81[**]	83[**]	89[*]	76[**]	95	112	97	85[**]

[1]Includes Queanbeyan (C)

Source: see *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Deaths from the external causes of accidents, poisonings and violence were the major cause of death for people aged from 15 to 24 years. Over the four year period from 1992 to 1995, they represented 67.0 per cent of all deaths in Victoria in this age group (71.3 per cent of male deaths and 55.1 per cent of female deaths) from these external causes. Males predominated, accounting for 78.2 per cent of all deaths. Almost half (40.9 per cent) of male deaths were from motor vehicle traffic accidents and more than one third (37.3 per cent) were from suicides.

Mathers (1994) examined the extent of disparities (related to socioeconomic status of areas of residence) in mortality rates according to the major cause of death. Differentials in mortality rates for deaths from injury and poisonings were clearly evident for both males and females (aged from 15 to 24 years) from the most socioeconomically disadvantaged areas - 47 per cent more deaths of males than in the most advantaged areas, and 66 per cent for females. This relationship was also evident between socioeconomic status and suicides, with 35 per cent more male deaths and 30 per cent more female deaths in the most socioeconomically disadvantaged areas than there were in the most advantaged areas. Mathers (in press) has recently reported an increase in the rates of male suicide in areas of low socioeconomic status over the decade from 1985.

Melbourne[9] (Victoria as the Standard)

There were 774 deaths of 15 to 24 year olds in **Melbourne** in the four years from 1992 to 1995, compared with 1,373 in the period from 1985 to 1989. In light of the relatively small number of deaths from these causes, particular care should be taken to refer to the absolute numbers published in Volume 3.1.

There were 13 per cent fewer deaths from these causes in **Melbourne** than were expected from the State rates, an SDR of 87[**]. As **Map 5.20** shows, rates of premature death from these

[9]As there are relatively few areas with sufficient cases to analyse for this variable in non-metropolitan Victoria, the data have not been mapped. A summary of the main features is on page 174.

causes were highest for young residents of the Mornington Peninsula, with the highest ratios in Flinders (an SDR of 173 and 10 deaths) and Hastings (139 and 11 deaths); neither of these ratios (nor any other elevated ratio) were statistically significant. The neighbouring SLA of Frankston recorded a similarly elevated ratio, of 134 (with 33 deaths in this age group). A second area with relatively high ratios was located in the eastern fringe areas embracing Pakenham (an SDR of 135 and 10 deaths) and Sherbrooke (124; 11). Nearer to the city centre, St Kilda and Brighton had SDRs from accidents, poisonings and violence among 15 to 24 year olds elevated by 33 per cent (with 15 deaths) and 28 per cent (10 deaths), respectively.

Four SLAs recorded lower than expected SDRs which were highly statistically significant. Of these, the lowest was in Nunawading (an SDR of 41[**] and 11 deaths), where there were 59 per cent fewer deaths than expected from the State rates. Low SDRs of Significance were also recorded in Waverley (an SDR of 59[**] and 23 deaths), Keilor (60[*]; 21 deaths) and in Essendon/Fitzroy/ Melbourne/South Melbourne (65[**]; 30 deaths).

The largest numbers of deaths of 15 to 24 year olds from these external causes were in Altona/Sunshine (39 deaths), Knox (35), Frankston (33) and Springvale (31).

There was only weak evidence in the correlation analysis of an association at the SLA level in non-metropolitan Victoria between high rates of deaths of 15 to 24 year olds from accidents, poisonings and violence and socioeconomic disadvantage.
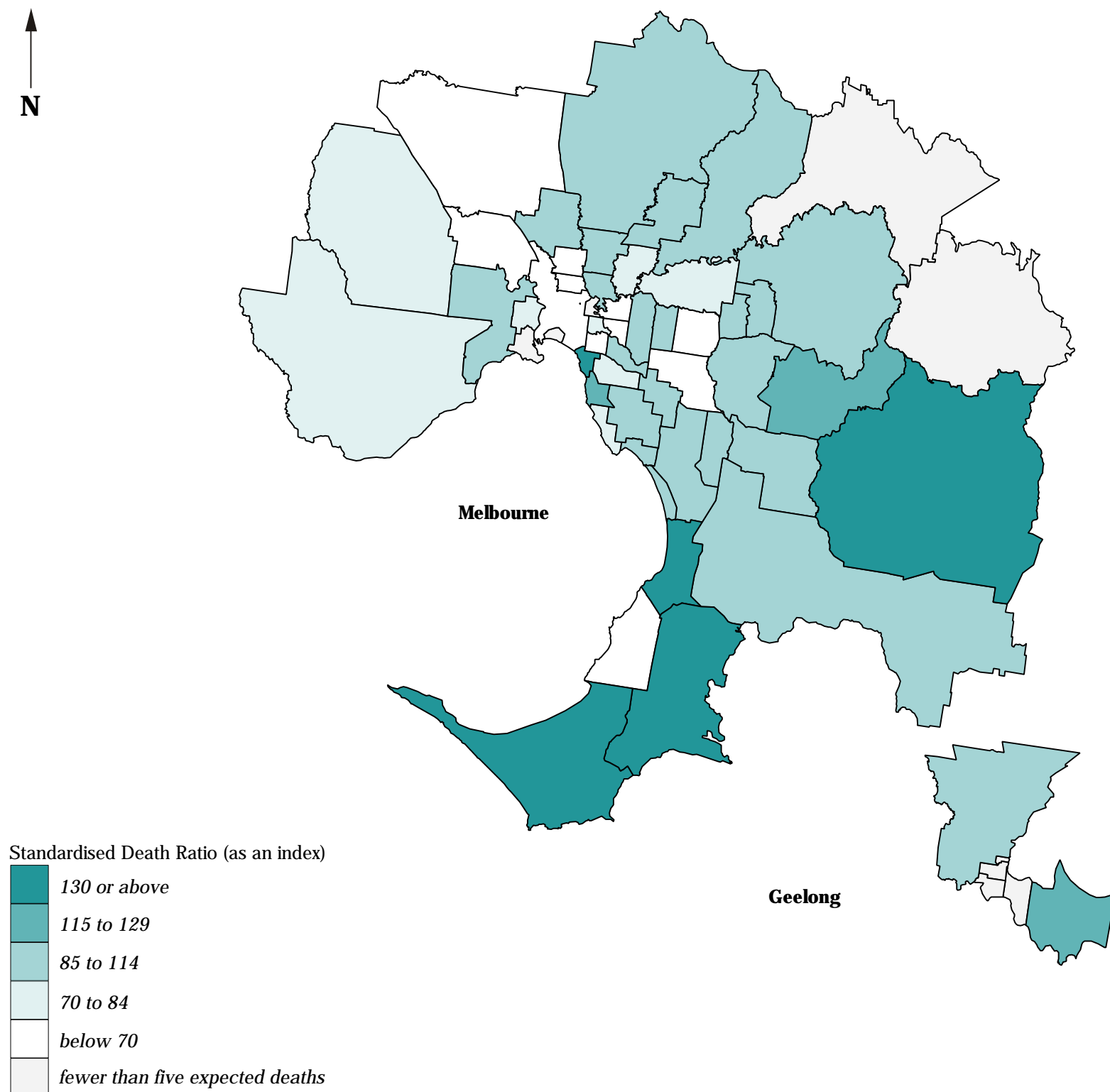
Geelong

Over the four years from 1992 to 1995, there were 33 deaths of 15 to 24 year olds in **Geelong** from accidents, poisonings and violence, six per cent more deaths from this group of causes than expected from the State rates (an SDR of 106). Only Bellarine-Inner (with seven deaths and an SDR of 124) and Corio-Inner (with 18 deaths and an SDR of 113) had more than five expected deaths.

Map 5.20
Deaths of people aged 15 to 24 years from accidents, poisonings and violence, Melbourne and Geelong, 1992 to 1995

Standardised Death Ratio: number of deaths in each Statistical Local Area compared with the number expected[*]

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

- 130 or above
- 115 to 129
- 85 to 114
- 70 to 84
- below 70
- fewer than five expected deaths

[*]*Expected numbers were derived by indirect age-sex standardisation, based on Vic totals*

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

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Deaths of people aged 15 to 64 years: years of potential life lost, 1992 to 1995

Capital city comparison (Australia as the Standard)

One measure of the impact of premature death is the number of potential years of life lost as a result of death before the age of 65 years. This measure is calculated as the sum of all the years of life that could potentially have been lived had people not died before the age of 65 years. The total number of years of potential life lost (YPLL) is calculated by assuming that people who died at 17 years of age would have otherwise lived to the age of 65 years (ie. 65 minus 17 years), or 48 years. In this analysis, deaths included were of people aged from 15 to 64 years. The results are expressed as rates per 100,000 population, and age standardised to the Australian population.

People in most capital cities had fewer years of potential life lost (YPLL) than were expected from the Australian rates, with the lowest standardised ratios (SRs) in **Canberra** (81**), **Perth** (89**) and **Melbourne** (90**) (**Table 5.28**). **Darwin** (with an SR of 137**) and **Hobart** (108**) had the only elevated ratios: the ratio of 137** in **Darwin** indicates that there were 37 per cent more YPLL by 15 to 64 year old residents of **Darwin** than would be expected from the Australian rates. Overall, ratios for females (95**) were generally higher than for males (94**), the exceptions being **Sydney** and **Darwin** (**Table 5.28**).

Table 5.28: Deaths of people aged 15 to 64 years: years of potential life lost, capital cities, 1992 to 1995

Standardised ratios

	Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
Males	99**	90**	93**	93**	88**	104**	144**	79**	94**
Females	96**	91**	97**	100	91**	114**	122**	84**	95**
Total	98**	90**	94**	96**	89**	108**	137**	81**	94**

[1]Includes Queanbeyan (C)

Source: see *Data sources*, Appendix 1.3

Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Melbourne (Victoria as the Standard)

Over the period from 1992 to 1995, there were an estimated 476,768 YPLL from deaths of residents of **Melbourne** aged from 15 to 64 years, four per cent fewer than were expected from the State rates (a ratio of 96**). Males accounted for almost two thirds (298,819 years, 62.7 per cent) and females for just over one third (177,949 years, 37.3 per cent) of the YPLL.

The distribution of standardised ratios (**Map 5.21**) produce a pattern consistent with that evident for many of the measures of socioeconomic status (Chapter 3). The highest ratios were generally in SLAs concentrated in the older inner suburbs adjacent to the city, as well as in the SLAs of Chelsea and Flinders on the Mornington Peninsula.

There were 21 SLAs (based on 1991 SLA boundaries) with elevated ratios for YPLL. The highest ratios were in St Kilda (an SR of 172**) and Collingwood (167**), with ratios elevated by around 70 per cent. Other ratios elevated by 20 per cent or more above the expected level were recorded in Footscray (an SR of 145**), Richmond (131**), Port Melbourne (129**), Chelsea (123**), Northcote and Prahran (both 121**).

Of those SLAs in which there were fewer YPLL than expected, the lowest ratio was recorded in Eltham (an SR of 61**), with 39 per cent fewer YPLL than expected from the Victorian State rates. Other SLAs with very low ratios were Doncaster and Templestowe (an SR of 69**), Sandringham (70**), Waverley (76**), Lillydale (78*) and Bulla (79**). Most SLAs with low ratios were located in the higher socioeconomic status areas of **Melbourne**.

The greatest impact of premature death (when measured by YPLL by the population aged from 15 to 64 years) was recorded for residents of Altona/Sunshine (22,422 years), Broadmeadows (17,678), Knox (17,002), Waverley (16,855) and Keilor (15,014).

There were correlations of significance at the SLA level with many indicators of socioeconomic disadvantage, including with the variables for dwellings without a motor vehicle (0.83), unemployed people (0.64), single parent families (0.63), low income families (0.62) and housing authority rented dwellings (0.58). These results, together with the inverse correlation with the IRSD (-0.46), suggest an association at the SLA level between high rates of YPLL from premature death and socioeconomic disadvantage.
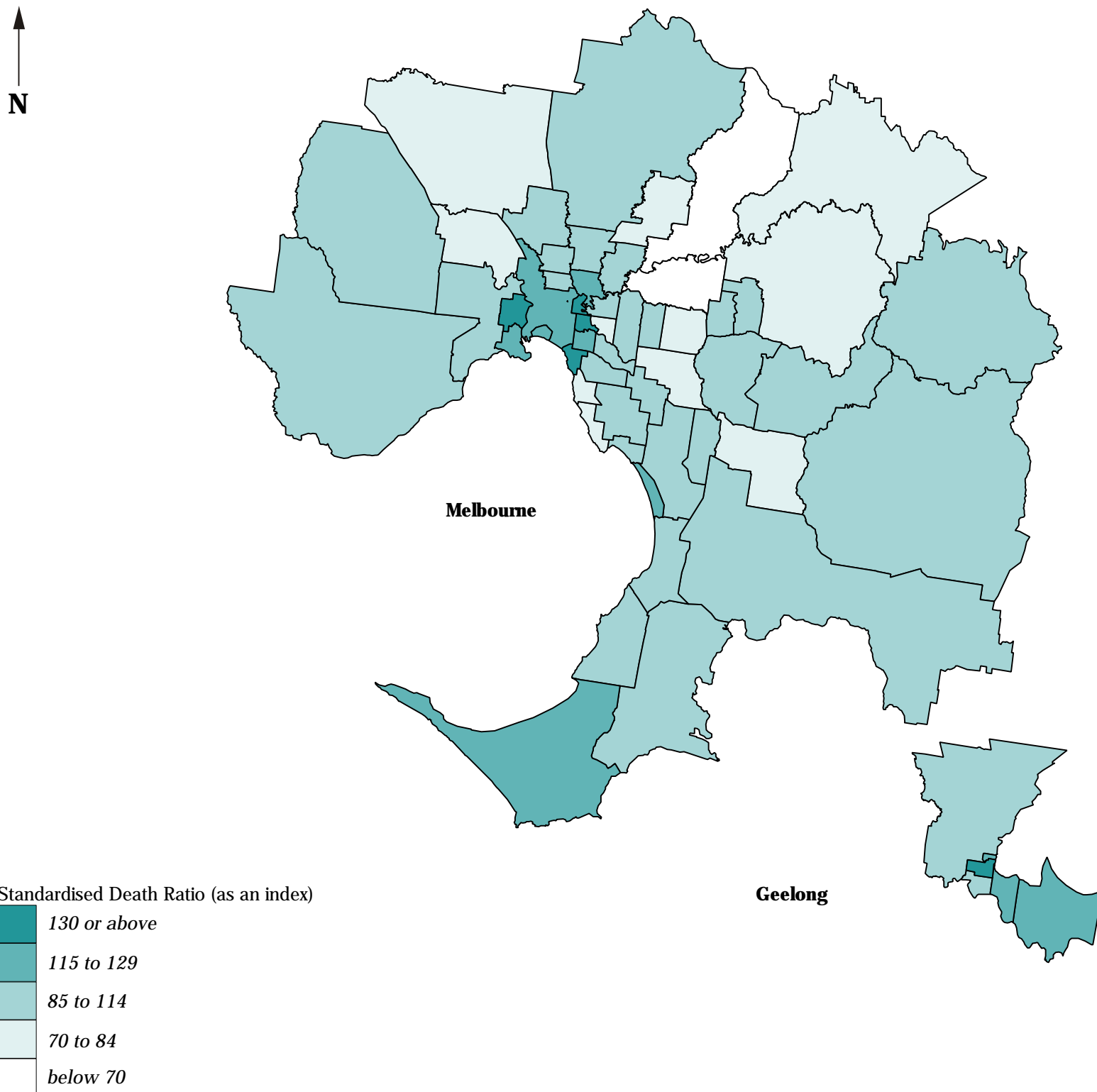
Geelong

There were an estimated 19,437 YPLL from deaths of residents of **Geelong** aged from 15 to 64 years, 16 per cent more than expected from the State rates (an SR of 116**). Males accounted for 63.0 per cent of these years. Only in Newtown were there fewer YPLL than expected (an SR of 93*). The highest ratios were recorded for residents in the SLAs of Geelong West (an SR of 143**) and Geelong (124**). The largest numbers of YPLL were estimated for residents in Corio-Inner (9,500 years) and Bellarine-Inner (3,455).

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Map 5.21
Deaths of people aged 15 to 64 years: years of potential life lost, Melbourne and Geelong, 1992 to 1995

Standardised Ratio: number of years of potential life lost in each Statistical Local Area compared with the number expected*

N

Melbourne

Geelong

Standardised Death Ratio (as an index)

130 or above

115 to 129

85 to 114

70 to 84

below 70

*Expected numbers were derived by indirect age-sex
 standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

National Social Health Atlas Project, 1999

Deaths of people aged 15 to 64 years: years of potential life lost, 1992 to 1995

State/Territory comparison (Australia as the Standard)

All of the *Rest of State/Territory* areas in **Table 5.29** had higher standardised ratios (SRs) for years of potential life lost (YPLL) than were calculated for the capital cities. The largest differential was in the Northern Territory, with more than twice the SR in the *Rest of State/Territory* areas than was calculated for **Darwin**; the next highest differential was in Western Australia. In contrast to the male and female rates recorded in the metropolitan areas, male rates (113**) were generally above those recorded for females (111**), with the exceptions being Queensland, the Northern Territory and Tasmania.

Table 5.29: Deaths of people aged 15 to 64 years: years of potential life lost, State/Territory, 1992 to 1995

Standardised ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	98**	90**	94**	96**	89**	108**	137**	81**	94**
Other major urban centres[2]	104**	108**	97**	..	..	..	..	..	102**
Rest of State/Territory	112**	102**	109**	112**	118**	117**	278**	—[3]	113**
Whole of State/Territory	102**	94**	101**	100	97**	113**	210**	79**	100
Rest of State/Territory									
Males	114**	103**	108**	112**	119**	117**	273**	—[3]	113**
Females	108**	102**	110**	112**	117**	117**	287**	—[3]	111**

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Rest of State (Victoria as the Standard)

There were an estimated 190,682 YPLL (from deaths of residents aged from 15 to 64 years) in the non-metropolitan areas of Victoria over the period from 1992 to 1995, nine per cent more than were expected from the State rates (a ratio of 109**). The elevated ratio is in contrast to the lower than expected ratio for metropolitan residents. Males accounted for 62.8 per cent of these years of potential life lost, the same proportion as in **Melbourne**.

A majority of SLAs were mapped in the middle range (with ratios within 30 per cent of the level expected from the State rates, many of which were elevated); SLAs with elevated ratios were scattered throughout the State, in both towns and rural areas; and relatively few SLAs recorded low ratios (**Map 5.22**).

Over half (56.6 per cent) of the SLAs in the non-metropolitan areas of Victoria had elevated ratios. The highest of these were in Belfast (an SR of 665**, with more than six and a half times more YPLL than expected from the State rates), and Upper Yarra [Part B] (an SR of 294**, with almost three times the expected number of YPLL). Highly elevated ratios were also recorded in Colac (191**), Stawell (182**), Minhamite (178**), Wonthaggi (171**), Yea (166**), Maryborough and Moe (each 165**), Camperdown and Kyabram (both 163**) and Tallangatta [Part A] (162**).

The lowest ratios were recorded in the widely separated SLAs of Avon (with an SR of 38**), Shepparton [Part A] (46**), Corio [Part B] (50**) and Pyalong, Tallangatta [Part B] and Wimmera (each 51**).

The greatest impact of premature death (when measured as YPLL by the population aged from 15 to 64 years) was recorded for

residents of Ballarat (12,769 YPLL), Greater Geelong (Balance) (11,040) and Bendigo (10,682). Other high numbers of YPLL were estimated for residents in the regional centres of Morwell [Part A] (5,250 years), the town of Shepparton (4,939), Wodonga (4,666) and Warrnambool (4,239).
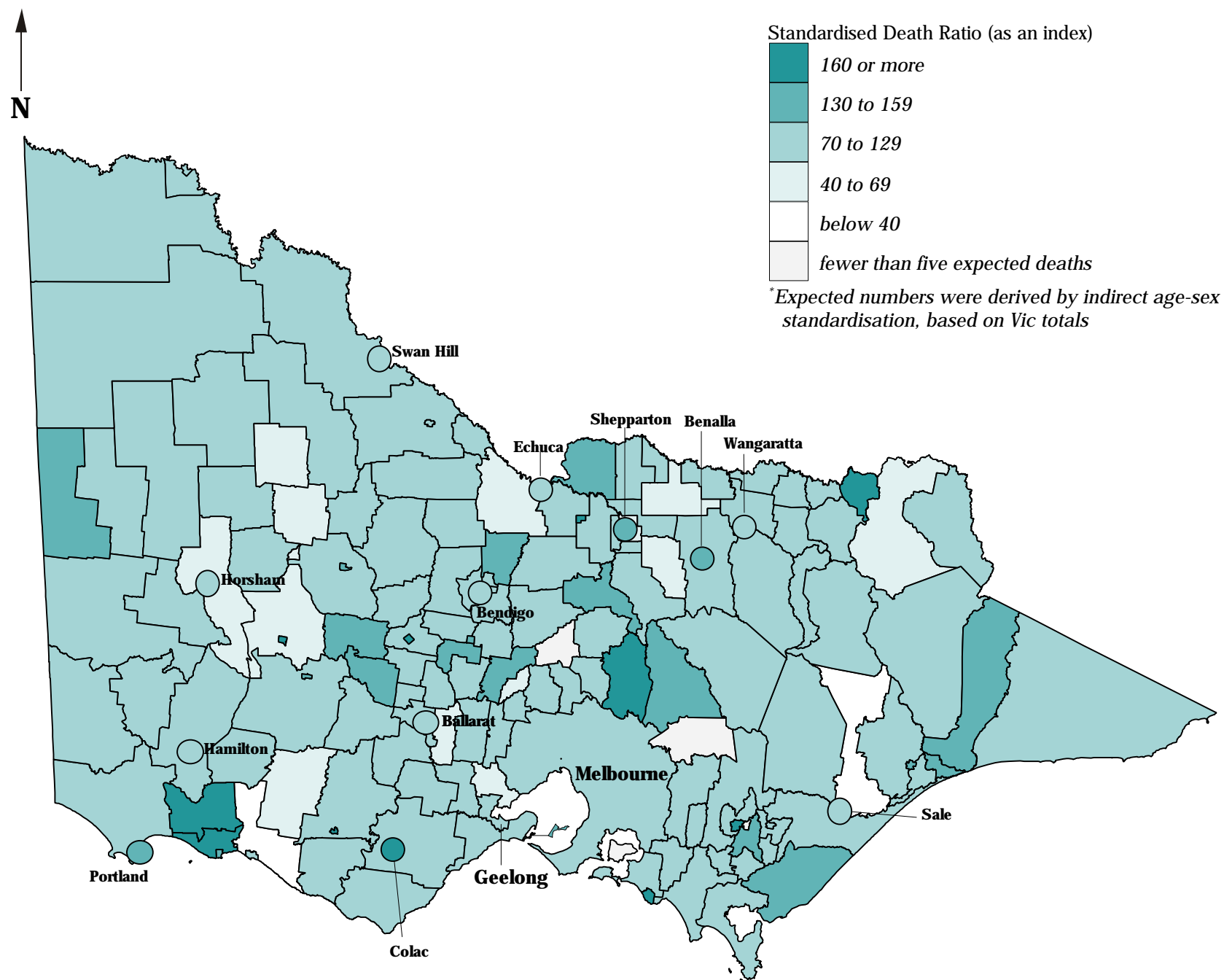
Of the towns mapped, the highest standardised ratios were in Colac (191**; 2,567 YPLL), Portland (154**; 2,262), Shepparton (131**; 4,939), Benalla (131**; 1,674) and Swan Hill (128**; 1,726).

There were weak correlations with most indicators of socioeconomic disadvantage; the strongest was an inverse correlation with the variable for female labour force participation (-0.25). These results, together with the weak inverse correlation with the IRSD (-0.24), suggest an association at the SLA level between high rates of YPLL from premature death and socioeconomic disadvantage.

Map 5.22
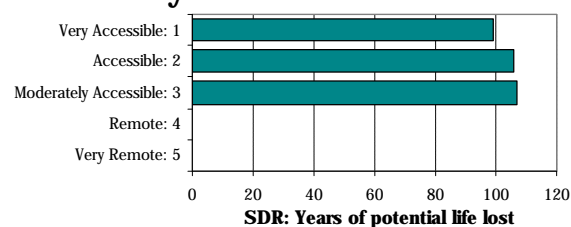# Deaths of people aged 15 to 64 years: years of potential life lost, Victoria, 1992 to 1995

Standardised Ratio: number of years of potential life lost in each Statistical Local Area compared with the number expected[*]

Standardised Death Ratio (as an index)

- 160 or more
- 130 to 159
- 70 to 129
- 40 to 69
- below 40
- fewer than five expected deaths

[*]Expected numbers were derived by indirect age-sex standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

Accessibility/Remoteness Index of Australia

	Years
Very Accessible: 1	618,159
Accessible: 2	59,570
Moderately Accessible: 3	8,047
Remote: 4	
Very Remote: 5	

SDR: Years of potential life lost

The ARIA graph of years of potential life lost (YPLL) from premature deaths highlights the overall impact of premature death seen in the previous graphs. The lowest ratio is in the Accessible areas (an SR of 99, one per cent fewer YPLL than expected from the State rates), with elevated ratios of 106 (six per cent more YPLL than expected) and 107 (seven per cent more) in the Accessible and Moderately Accessible areas, respectively.

Source: Calculated on ARIA classification, DHAC

National Social Health Atlas Project, 1999

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Infant deaths, 1992 to 1995

State/Territory comparison

The infant death rate is calculated as the number of infant deaths (deaths under one year of age) per 1,000 live births. The rate varied between the States and Territories, from a high of 13.9** in the Northern Territory to less than half that level in a number of States and the Australian Capital Territory. Rates in the *Rest of State/Territory* areas were similarly highest in the Northern Territory and were higher than the capital city rates for all but Queensland (where they were the same) and Tasmania (where they were lower).

Infant death rates in the *Rest of State/Territory* areas were 26.7 per cent lower over the years from 1992 to 1995 than over the years from 1985 to 1989 (**Table 5.30**). The largest reductions occurred in the non-metropolitan areas of Tasmania (down by 46.7 per cent) and the smallest in the Northern Territory (down by 10.4 per cent). Western Australia (22.8 per cent) and Queensland (24.4 per cent) experienced the next smallest reductions, with declines of around one third occurring in the remaining States.

Table 5.30: Infant deaths, State/Territory
Infant deaths per 1,000 live births

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	6.1	5.2**	6.7*	5.2*	5.3**	7.5	10.3**	5.9[1]	5.8**
Other major urban centres[2]	6.4	4.6	7.1	..	..	..	..	..	6.2
Rest of State/Territory	7.1**	5.4**	6.7**	5.9	7.1*	5.7	16.3**	—[3]	6.8**
Whole of State/Territory	6.4	5.3**	6.8**	5.4**	5.9	6.4	13.9**	5.1	6.2
1985 to 1989[4]									
Rest of State/Territory	9.3	8.3	9.0	9.0	9.2	10.7	18.2**	—[3]	9.3**

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
[4] For 1985-89 the rate was calculated per 1,000 children aged under 12 months plus infant deaths: this approximates live births
Source: See *Data sources*, Appendix 1.3

Although Aboriginal infant mortality has generally improved, rates remain high. The Australian Institute of Health and Welfare (1998) has published estimates of infant death rates in the Indigenous populations of SA, WA and NT, the only States and Territory with reliable data. In 1991-96 infant death rates were 19.2 per 1,000 live births in the Indigenous population compared to 6.1 per 1,000 in the non Indigenous population. The high rates for Aboriginal and Torres Strait Islander people are likely to influence the regional rates in areas with very high proportions of Aboriginal people in the population, in particular the remote areas of Australia.

Rest of State

Over the four year period from 1992 to 1995, there were 363 infant deaths recorded in the non-metropolitan areas of Victoria, a rate of 5.4 infant deaths per 1,000 live births.

The most highly elevated infant death rates were in Korumburra (16.1 infant deaths per 1,000 live births), Cobram (11.5), Stawell (11.4), Warragul (11.1) and Portland (9.6).

Mildura recorded the lowest infant death rate, with 3.9 infant deaths per 1,000 live births, compared with Mildura [Part A] (4.3), Wodonga and Geelong (both 4.6) and Warrnambool (5.2).

The largest number of infant deaths in the non-metropolitan areas of Victoria was recorded in Ballarat (28 deaths over four years). Relatively high numbers were also recorded in Bendigo (22), Greater Geelong (Balance) (19) and Morwell [Part A], Shepparton and Warragul (each with 10).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Accessibility/Remoteness Index of Australia
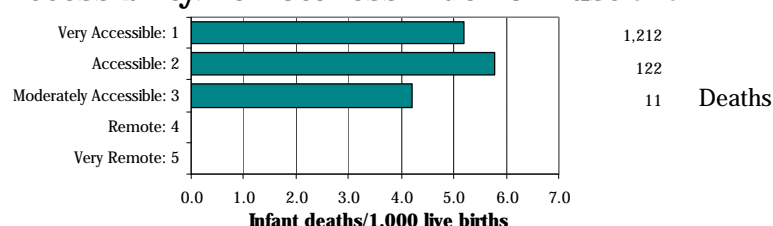
Infant death rates vary from a low of 4.2 infant deaths per 1,000 live births in the Moderately Accessible areas to a high of 5.8 infant deaths per 1,000 live births in the Accessible areas. There is a lower rate of 5.2 infant deaths per 1,000 live births in the areas in the Very Accessible ARIA category.

Source: Calculated on ARIA classification, DHAC

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Deaths of people aged 15 to 64 years from lung cancer, 1992 to 1995

State/Territory comparison (Australia as the Standard)

The highest Standardised Death Ratio (SDR) for deaths from lung cancer of people aged from 15 to 64 years in the *Rest of State/Territory* areas was recorded in the Northern Territory (an SDR of 258[**]). Apart from the relatively low ratio in South Australia (an SDR of 84[*]), the other States all had SDRs within 10 per cent of the level expected from the Australian rates. At the *Whole of State/Territory* level, only the Northern Territory (214[**]) had substantially more deaths from lung cancer than expected from the Australian rates.

Most States had similar differentials (from the Australian rates) in the SDR recorded for their non-metropolitan areas in the later period shown in **Table 5.31**. The major exception is the Northern Territory, with a markedly higher SDR (suggesting an increase in death rates relative to the Australian experience) between the periods analysed.

Table 5.31: Deaths of people aged 15 to 64 years from lung cancer, State/Territory
Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	102	94[*]	103	95	90[*]	120	164[**]	77[*1]	98[*]
Other major urban centres[2]	105	125	104	..	..	..	..	..	107
Rest of State/Territory	106	100	99	84[*]	96	107	258[**]	—[3]	102
Whole of State/Territory	104	97	102	92[*]	92[*]	113	214[**]	80[*]	100
1985 to 1989									
Rest of State/Territory	100	98	99	83[**]	94	112	165[**]	—[3]	99

[1] **Includes Queanbeyan (C)**
[2] **Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)**
[3] **Data included with ACT total**
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

In the non-metropolitan areas of Victoria, 19.4 per cent of all cancer deaths were from cancers of the trachea, bronchus and lung (referred to as lung cancer). This was a minor cause of death in the non-metropolitan areas, accounting for 5.3 per cent of deaths at all ages; 4.9 per cent of deaths of people aged 65 years and over; and 7.2 per cent of all deaths before age 65.

Rest of State (Victoria as the Standard)

There were 523 deaths from lung cancer of 15 to 64 year old non-metropolitan residents, three per cent more than expected from the State rates (an SDR of 103); this was the same as for all cancers.

Of SLAs where five or more deaths were expected from the State rates, in excess of one third had ratios elevated by 30 per cent or more. However, within this group only the SLAs of Moe (with an SDR of 230[**]) and Morwell [Part A] (199[**]) had ratios which were statistically significant. These highly elevated ratios indicate that there were around twice the number of deaths from lung cancer of 15 to 64 year old residents of these areas than were expected from the State rates.

Elevated ratios were also recorded in a number of nearby SLAs, including Traralgon (with an SDR of 159), Woorayl (now located within the SLAs of South Gippsland Central and Bass Coast Balance, 149) and Buln Buln located just to the west of Moe (134).
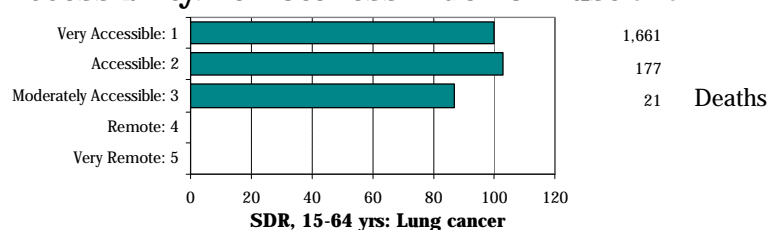
Areas with fewer than the expected number of lung cancer deaths of 15 to 64 year olds were more widely distributed than were areas with elevated ratios. Excluding SLAs recording fewer than five deaths, the lowest ratios were in Greater Geelong (Balance) (an SDR of 64[*]; 23 deaths) and Swan Hill [S] (71; four deaths).

The largest numbers of deaths over the four year period from 1992 to 1995 were recorded in the regional centres of Ballarat (36 deaths), Greater Geelong (Balance) (23), Bendigo (22) and Morwell [Part A] (20).

The highest ratios in towns mapped were recorded for Ballarat (an SDR of 126), Shepparton (89), Bendigo (83) and Wangaratta (78).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Accessibility/Remoteness Index of Australia

	Deaths
Very Accessible: 1	1,661
Accessible: 2	177
Moderately Accessible: 3	21
Remote: 4	
Very Remote: 5	

SDR, 15-64 yrs: Lung cancer

The Standardised Death Ratios (SDRs) for deaths from lung cancer are more differentiated than for all cancers, ranging from SDRs of 103 in the Accessible areas (three per cent deaths than expected from lung cancer of people aged from 15 to 64 years) to 87 in the Moderately Accessible areas (13 per cent fewer deaths than expected). The number of premature deaths from lung cancer in the Very Accessible areas was at the level expected from the State rates (100).

Source: Calculated on ARIA classification, DHAC

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Deaths of people aged 15 to 64 years from respiratory system diseases, 1992 to 1995

State/Territory comparison (Australia as the Standard)

Residents of the non-metropolitan areas of all States and the Northern Territory had higher Standardised Death Ratios (SDRs) from diseases of the respiratory system than those living in the capital cities. The largest differentials were in the Northern Territory, Tasmania and Western Australia, with the Northern Territory also recording the highest non-metropolitan ratio, an exceptionally high SDR of 908[**].

There were differences in the SDRs for the two periods shown in **Table 5.32** for all but Victoria; the higher SDRs in the later period for Tasmania, the Northern Territory, South Australia and Western Australia suggest a worsening (relative to the Australian rates) in the death rates from these causes.

Table 5.32: Deaths of people aged 15 to 64 years from respiratory system diseases, State/Territory

Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	94	79[**]	98	87[*]	64[**]	115	193[**]	79[1]	87[**]
Other major urban centres[2]	112	90	75[**]	..	..	..	..	..	98
Rest of State/Territory	116[**]	111[*]	118[**]	123[*]	134[**]	133[**]	908[**]	—[3]	128[**]
Whole of State/Territory	102	88[**]	104	97	82[**]	125[**]	511[**]	76	100
1985 to 1989									
Rest of State/Territory	127[**]	111[*]	129[**]	98	115	93	805[**]	—[3]	124[**]

[1]Includes Queanbeyan (C)
[2]Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

There were 3,147 deaths from diseases of the respiratory system over the period from 1992 to 1995 in the non-metropolitan areas of Victoria, 8.3 per cent of all deaths. The majority of these deaths (87.7 per cent, 2,760 deaths) were of people aged 65 years and over, with 11.8 per cent of deaths being of people aged from 15 to 64 years. Deaths from these causes represented 5.1 per cent of all deaths for this age group.

Rest of State (Victoria as the Standard)

There were 372 deaths from respiratory system diseases of 15 to 64 year old non-metropolitan residents, 26 per cent more than expected from the State rates (an SDR of 126[**]).

In most SLAs, there were fewer than five deaths recorded over the period from 1992 to 1995. Excluding these SLAs, only the towns of Shepparton (with an SDR of 231[**] and 14 deaths),

Warrnambool (151; nine deaths), Ballarat (129; 22 deaths) and Bendigo (101; 16 deaths), reported more deaths from respiratory system diseases than expected from the State rates. In Wodonga (an SDR of 100; six deaths), deaths were at the expected level, with lower ratios in Morwell [Part A] (84; 5), Mildura [Part A] (76; 4) and Greater Geelong (Balance) (66; 14).

The largest numbers of deaths of 15 to 64 year olds from respiratory system diseases were recorded in Ballarat (22 deaths), Bendigo (16), Greater Geelong (Balance) and Shepparton (both 14), Colac (13) and Portland (10).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Accessibility/Remoteness Index of Australia

SDR, 15-64 yrs: Respiratory system diseases
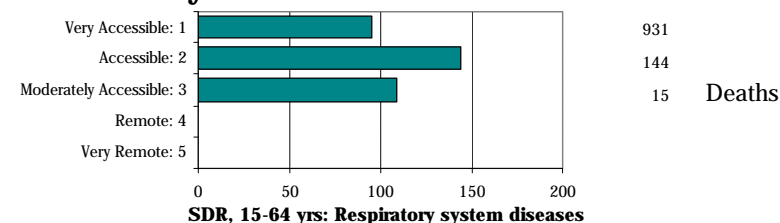
Death rates of people aged from 15 to 64 years from respiratory system diseases increase by more than fifty per cent (51.6 per cent) from the lowest ratio in the Very Accessible areas (an SDR of 95) to the highest ratio in the Accessible areas (with 44 per cent more premature deaths from circulatory system diseases than expected from the State rates, an SDR of 144). Areas in the Moderately Accessible ARIA category also had an elevated SDR, of 109.

Source: Calculated on ARIA classification, DHAC

Deaths of people aged 15 to 24 years from accidents, poisonings and violence, 1992 to 1995

State/Territory comparison (Australia as the Standard)

Residents of the non-metropolitan areas of all States and the Northern Territory had higher Standardised Death Ratios (SDRs) from the external causes of accidents, poisonings and violence than those living in the capital cities. In all cases the differentials were substantial, with the largest being in the Northern Territory, Western Australia and South Australia: the Northern Territory also had the highest non-metropolitan SDR, of 267[**].

The main differences from the Australian rates in the SDRs for the two periods shown in **Table 5.33** were in the ratios for Western Australia and the Northern Territory, with the higher SDRs in the later period suggesting a worsening, relative to the Australian rates, in the death rates from these causes.

Table 5.33: Deaths of people aged 15 to 24 years from accidents, poisonings and violence, State/Territory
Standardised death ratios

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
1992 to 1995									
Capital city	76[**]	78[**]	104	85[**]	97	127[*]	124	65[**1]	84[**]
Other major urban centres[2]	89	94	110	..	..	..	..	..	98
Rest of State/Territory	127[**]	123[**]	136[**]	158[**]	188[**]	144[**]	267[**]	–[3]	140[**]
Whole of State/Territory	89[**]	89[**]	117[**]	102	120[**]	137[**]	202[**]	66[**]	100
1985 to 1989									
Rest of State/Territory	135[**]	132[**]	132[**]	146[**]	139[**]	130[**]	235[**]	–[3]	136[**]

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: see *Data sources*, Appendix 1.3
Statistical significance: * significance at 5 per cent; ** significance at 1 per cent

Over the four year period from 1992 to 1995, there were 383 deaths of people aged from 15 to 24 years from this group of external causes in the non-metropolitan areas of Victoria. Although this was a relatively small number of deaths, they represented 74.5 per cent of all deaths in this age group - 77.8 per cent of all male deaths and 65.2 per cent of female deaths. The data analysed for this variable represented 19.3 per cent of deaths at all ages from this cause.

Rest of State (Victoria as the Standard)

There were 383 deaths of 15 to 24 year old non-metropolitan residents from the combined causes of accidents, poisonings and violence, substantially more than expected from the State rates (an SDR of 140[**]).

Only nine SLAs outside of **Melbourne** and **Geelong** were expected (on the basis of the State rates) to have five or more deaths from this cause. Of these, there were more deaths than expected in the SLAs of Morwell [Part A] (an SDR of 162), the town of Shepparton (153), Wodonga (152) and Bendigo (101). Fewer than expected deaths occurred in Mildura (99), Warrnambool (98), Ballarat (95), Greater Geelong (Balance) (86) and Traralgon (77).

Ballarat recorded the largest number of deaths from external causes over the period from 1992 to 1995 (22 deaths), marginally more than in Bendigo (20) and Greater Geelong (Balance) (17). Lower numbers were recorded in Wodonga (13), Morwell [Part A] (12) and Shepparton [C] and Moe (each with 10 deaths).

The correlation analysis was not undertaken as there were too many SLAs with small numbers of cases.

Accessibility/Remoteness Index of Australia

SDR, 15-24 yrs: Accidents, poisonings & violence
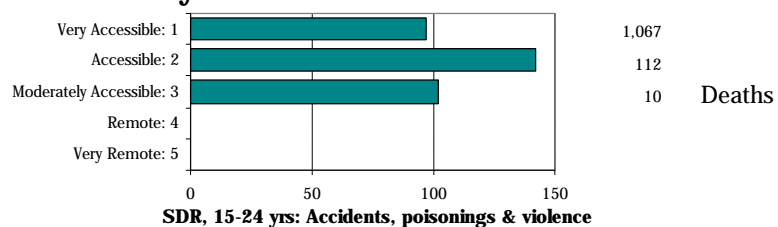
The distribution of SDRs for deaths of 15 to 24 year olds from accidents, poisonings and violence varies across the ARIA categories. Ratios in the Very Accessible (with an SDR of 97) and Moderately Accessible (102) areas are near the level expected from the State rates, with a much higher ratio in the areas in the Accessible category, with 42 per cent more premature deaths of 15 to 24 year olds from these external causes than expected from the State rates (an SDR of 142).

Source: Calculated on ARIA classification, DHAC

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Total Fertility Rate

Introduction

The Total Fertility Rate (TFR) is a measure of the production of children and is calculated from details of the age of the female population, the number of live births and the age of the mother at birth. It represents the mean number of children which females living right through their child-bearing period will (on average) bear, if they are subject to the fertility conditions holding in a particular area during the given period.

A TFR of 2.11 is the level at which a population replaces itself over the long term - ie. each woman has, on average, 2.11 births. In order to keep the ranges as simple as possible, the distribution mapped here has been split at 1.5 or 2.0 (and at intervals of 0.5 above and below), rather than at the replacement level figure of 2.11.

Details of the TFR are included in this chapter (rather than in Chapter 3 with the other demographic variables) because they have been compiled on the same boundaries as other data in this chapter. Common boundaries are important in enabling the correlation and cluster analysis to be undertaken, and to enhance the value of the maps in highlighting associations in the patterns of distribution.

The highest Total Fertility Rates (TFRs) in Victoria are those for females aged from 25 to 29 years living in areas outside of **Melbourne** (**Figure 5.10**). Females aged from 25 to 29 years and living in **Melbourne**, as well as those aged from 30 to 34 years and living in either **Melbourne** or the non-metropolitan areas of Victoria, had the next highest TFRs. The largest differences in TFRs between residents of **Melbourne** and the rest of Victoria were in the 20 to 24 year age group (85.9 per cent) and the 25 to 29 year age group (42.9 per cent).

Figure 5.10: Total Fertility Rates, Melbourne and Rest of State, 1992 to 1995

Total Fertility Rate

Source: See *Data sources*, **Appendix 1.3**

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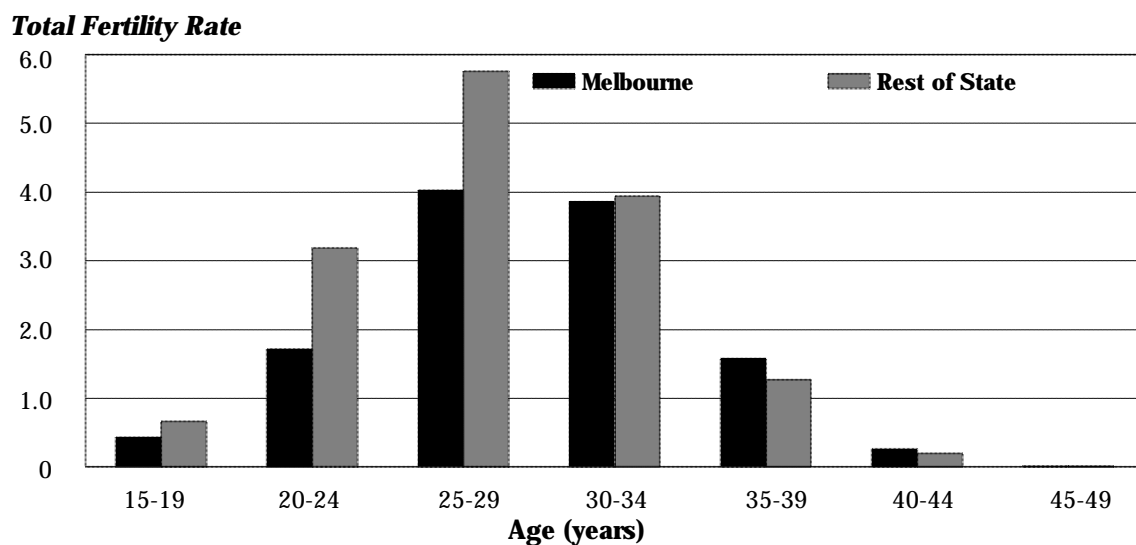
Total Fertility Rate, 1992 to 1995

Capital city comparison

The capital cities recorded similar Total Fertility Rates (TFRs) over the four years from 1992 to 1995 (**Table 5.34**), with the exception of a higher rate in **Darwin** (2.06). The lowest TFR was that in **Adelaide** (1.64).

Table 5.34: Total Fertility Rate, capital cities, 1992 to 1995

Sydney	Melbourne	Brisbane	Adelaide	Perth	Hobart	Darwin	Canberra[1]	All Capitals
1.81	1.70	1.73	1.64	1.76	1.79	2.06	1.72	1.75

[1]**Includes Queanbeyan (C)**
Source: see *Data sources*, Appendix 1.3

Areas with fewer than 20 births over this four year period have been excluded from the analysis.

Melbourne

The Total Fertility Rate (TFR) for **Melbourne** over the four year period from 1992 to 1995 was 1.70, slightly lower than the State rate of 1.79. The highest TFRs were recorded for women aged from 25 to 29 years (a TFR of 4.03), followed by those aged from 30 to 34 years (a TFR of 3.86) (**Figure 5.10**, previous page).

The majority of SLAs in **Melbourne** had TFRs of between 1.50 and 2.00, with none in the highest range (2.50 and above) and only one in the lowest (below 1.00).

There are two significant concentrations of high TFRs, located in the outer eastern and western suburbs (**Map 5.23**). The highest rates were recorded in Flinders (with a TFR of 2.45) and Hastings (2.37), which are both now included in the SLA of Mornington Peninsula South. The remaining seven SLAs mapped in this second highest range included Healesville and Pakenham (both with a TFR of 2.31), Yarra Ranges Central (2.26), Cranbourne (2.24), Sherbrooke (2.19) and Lillydale (2.00), located in the east; and Werribee (2.05), Melton East (2.02) and Footscray (2.01), in the west.

Just over half of the SLAs in **Melbourne** had TFRs of between 1.50 and 2.00. Rates in this range were generally distributed to the north and south-east of the city, with the highest rates being in Croydon (a TFR of 1.97), Bulla (now known as Craigieburn, Sunbury and Melton East) and Berwick (both with 1.97), Dandenong (1.95), Williamstown, Mornington Peninsula West and Broadmeadows (each with 1.93) and Knox (1.92).

However, SLAs located in the inner city region generally recorded the lowest TFRs, the lowest of these being in Prahran (with a TFR of 0.88), in the old SLAs of Essendon/Fitzroy/Melbourne/South Melbourne (1.31), Kew (1.25), Hawthorn (1.18) and St Kilda (1.03).

Over the four year period from 1992 to 1995, there were 181,637 births to mothers aged from 15 to 49 years, with the largest numbers in Knox (8,317 births), Cranbourne (7,740), and Altona/Sunshine (7,576). At the other end of the scale, fewer than 1,000 births were recorded to women in the SLAs of Collingwood (920 births), Healesville (803) and Port Melbourne (465).

As would be expected, there was a correlation of substantial significance at the SLA level between high TFRs and high proportions of children aged from 0 to 4 years (0.82). There were also correlations of substantial significance with the variable for early school leavers (0.75), and of meaningful significance with unskilled and semi-skilled workers (0.59). Inverse correlations were recorded with the variables for managers and administrators, and professionals (-0.71), high income families (-0.65) and female labour force participation (-0.56). These results, and the inverse correlation with the IRSD (-0.63), indicate an association at the SLA level between high Total Fertility Rates and socioeconomic disadvantage.
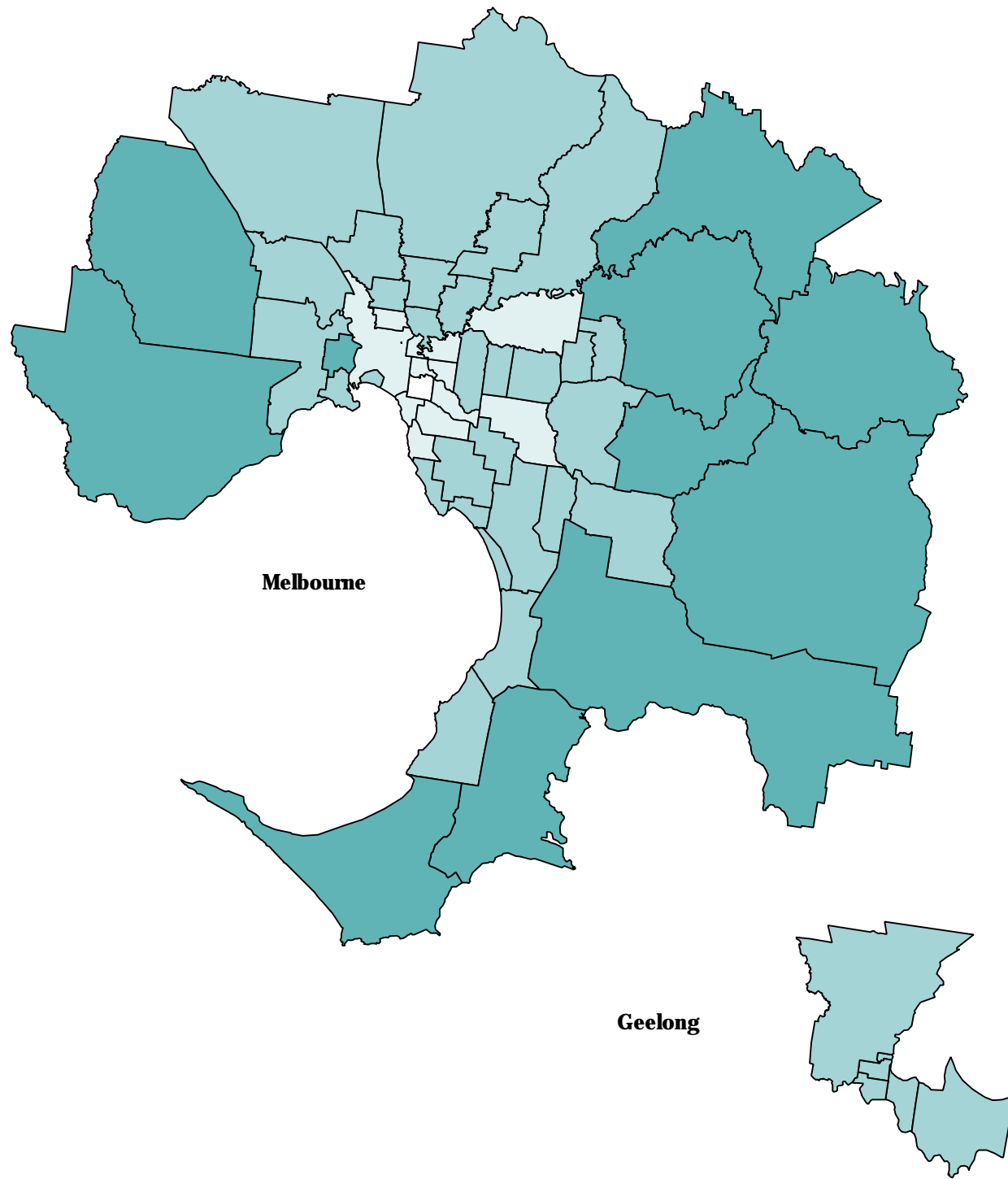
Geelong

The major urban centre of **Geelong** had a TFR of 1.86, with the highest rate in the 25 to 29 year age group (a TFR of 4.86). All SLAs were mapped in the middle range, with rates ranging from a TFR of 1.96 in Corio-Inner to 1.69 in the SLA of Geelong.
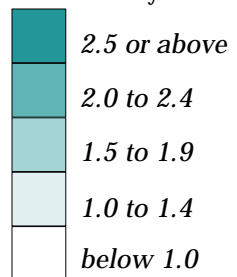
Map 5.23
Total Fertility Rate[*], Melbourne and Geelong, 1992 to 1995

Total Fertility Rate[*] in each Statistical Local Area

N

Melbourne

Geelong

Total Fertility Rate[*]

- 2.5 or above
- 2.0 to 2.4
- 1.5 to 1.9
- 1.0 to 1.4
- below 1.0

[*]*The Total Fertility Rate is a measure of the number of children*
a woman can expect to bear in her lifetime: it was derived
by indirect age standardisation, based on Vic totals

Source: See Data sources, Appendix 1.3

Details of map boundaries are in Appendix 1.2

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Total Fertility Rate, 1992 to 1995

State/Territory comparison

The Total Fertility Rates (TFRs) were higher in the non-metropolitan areas of Australia in each State and the Northern Territory (**Table 5.35**). The Northern Territory had the highest non-metropolitan rate, as did **Darwin** among the capital cities, although there was less difference between the rates than was evident for the capital cities. The lowest non-metropolitan TFRs were in Tasmania (2.06) and Queensland (2.07). At the *Whole of State/Territory* level, the Northern Territory again had the highest rate and the Australian Capital Territory and South Australia had the lowest rates.

Table 5.35: Total Fertility Rate, State/Territory, 1992 to 1995

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Total
Capital city	1.81	1.70	1.73	1.64	1.76	1.79	2.06	1.72	1.75
Other major urban centres		1.86		..	..	..	..	..	1.84
Rest of State/Territory	2.24	2.15	2.07	2.12	2.22	2.08	2.66	—[3]	2.16
Whole State/Territory	1.91	1.79	1.86	1.75	1.87	1.95	2.38	1.69	1.86

[1] Includes Queanbeyan (C)
[2] Includes Newcastle and Wollongong (NSW); Geelong (Vic); and Gold Coast-Tweed Heads and Townsville-Thuringowa (Qld)
[3] Data included with ACT total
Source: see *Data sources*, Appendix 1.3

Rest of State

The Total Fertility Rate (TFR) over the four year period from 1992 to 1995 for women resident in the non-metropolitan areas of Victoria was 2.15, well above the **Melbourne** TFR of 1.70. The highest rates were recorded for women aged from 25 to 29 years (a TFR of 5.76), followed by those aged from 30 to 34 years (a TFR of 3.94) (**Figure 5.10**).

As many of the TFRs in **Map 5.24** are relatively high, the ranges mapped have been changed (from those used in the map of **Melbourne**) to enhance the pattern of differentiation across the SLAs. The highest and lowest ranges have been set at 3.00 and less than 1.50 respectively, rather than 2.50 and 1.00 as in the map of **Melbourne** for this variable.

There was no notable pattern in the spatial distribution of TFRs across the State. The highest rates were recorded in the SLAs of Yarriambiack North (a TFR of 4.09) and Loddon South (3.15), located in the north-west; Shepparton [Part B] (4.05), in the north; and Camperdown (which is now included in Corangamite North, 3.19), in the south-west. Relatively high rates were also evident in Kerang (a TFR of 3.19), Yarra Ranges [Part B] (3.18) and Yea (3.04).

Generally speaking, there was little variation in TFRs across the areas mapped, with most SLAs (53.5 per cent) recording rates between 2.00 and 2.50. The highest rates in this range were recorded in the SLAs of Talbot-Clunes and Ararat, both with a TFR of 2.49, and Indigo [Part B] and Hampden (now included in Corangamite North), both with a TFR of 2.48. On the other hand, Avon (2.00), Traralgon, Mansfield, Creswick and Ripon (each with 2.02) had the lowest values in this range.

The lowest rate was recorded in Traralgon [Part B], with a TFR of 0.60. Kara Kara, the town of Shepparton and Wimmera also recorded low TFRs, with rates of 0.86, 0.87 and 1.08 respectively.
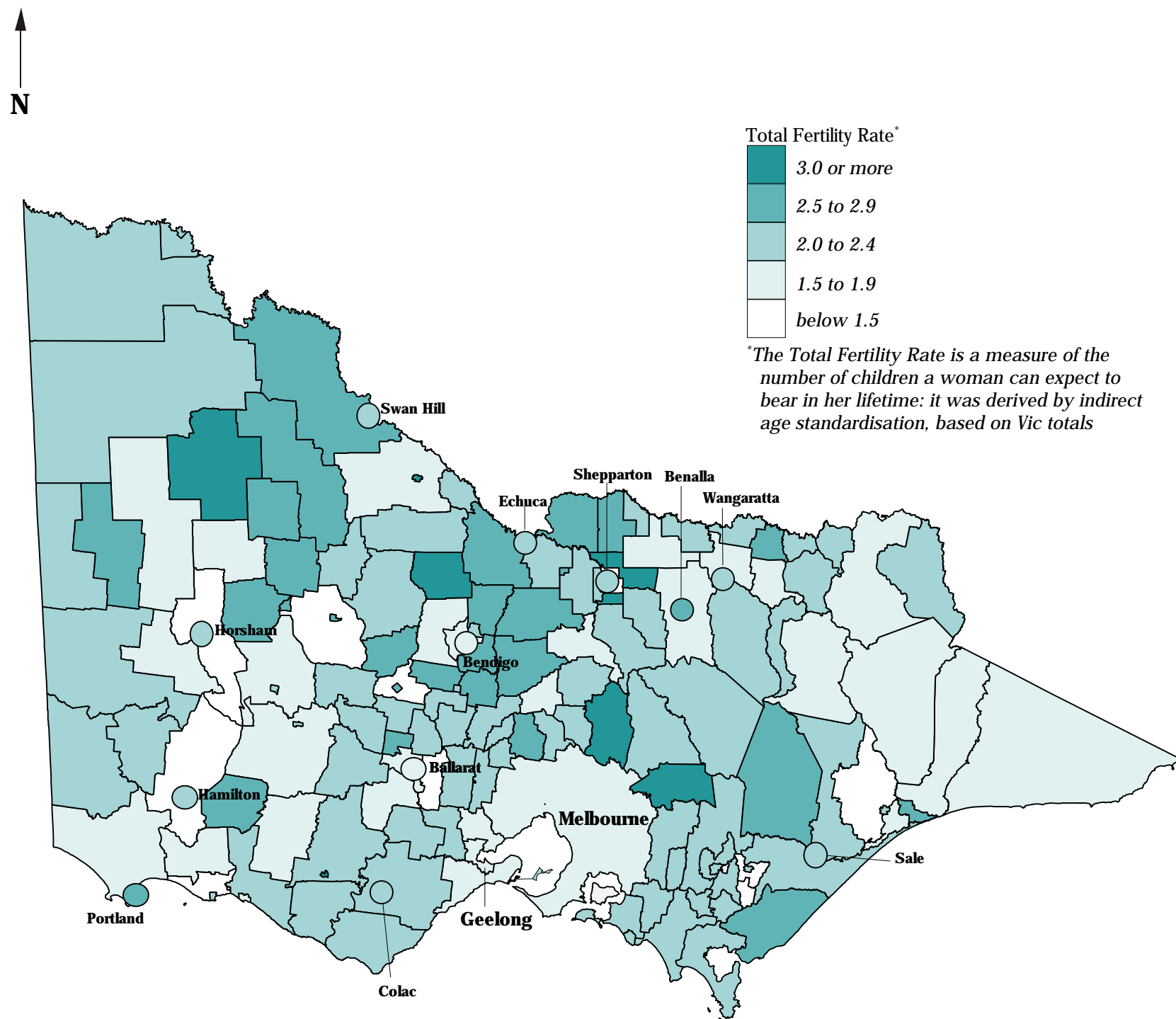
The highest Total Fertility Rates in the towns mapped, were recorded in Benalla (2.62), Portland (2.56) and Wangaratta (2.47). Rates below the *Rest of State* average were recorded in Ballarat (a TFR of 1.99) and Bendigo (1.87).

In the non-metropolitan areas of Victoria, the largest number of births over the four years from 1992 to 1995 to mothers aged from 15 to 49 years were recorded in Ballarat (4,502 births), Greater Geelong (Balance) (4,148) and Bendigo (3,901).

The correlation analysis showed there to be weak associations at the SLA level with the indicators of socioeconomic disadvantage, and weak inverse correlations with the indicators of socioeconomic advantage. These results, together with the weak inverse correlation with the IRSD (-0.26), support the existence of a weak association at the SLA level between high Total Fertility Rates and socioeconomic disadvantage.

Map 5.24
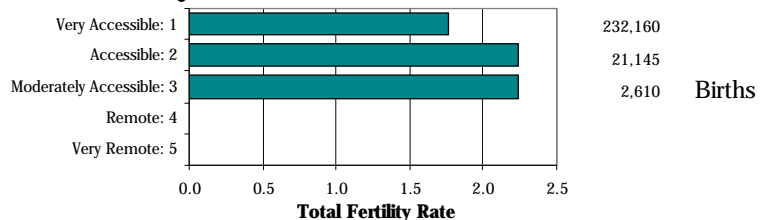# Total Fertility Rate*, Victoria, 1992 to 1995

Total Fertility Rate* in each Statistical Local Area

N

Total Fertility Rate*

- 3.0 or more
- 2.5 to 2.9
- 2.0 to 2.4
- 1.5 to 1.9
- below 1.5

*The Total Fertility Rate is a measure of the number of children a woman can expect to bear in her lifetime: it was derived by indirect age standardisation, based on Vic totals

Swan Hill

Shepparton   Benalla

Echuca   Wangaratta

Horsham

Bendigo

Ballarat

Hamilton

Melbourne

Sale

Portland

Geelong

Colac

Source: See Data sources, Appendix 1.3   *Details of map boundaries are in Appendix 1.2*

Accessibility/Remoteness Index of Australia

Very Accessible: 1	232,160
Accessible: 2	21,145
Moderately Accessible: 3	2,610 Births
Remote: 4	
Very Remote: 5	

Total Fertility Rate

0.0   0.5   1.0   1.5   2.0   2.5

The Total Fertility Rate increases by 25.0 per cent, from a low of 1.76 in areas in the Very Accessible category, to 2.2 in both the Accessible and Moderately Accessible ARIA categories.

Source: Calculated on ARIA classification, DHAC

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