

The impact of socioeconomic status and
geographic location on Indigenous mortality
in Australia, 1997-99

John Glover, Sarah Tennant and Anthea Page

Occasional Paper Series No. 1

Public Health Information Development Unit

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National Library of Australia Cataloguing in Publication entry

Glover, John, 1945- .

The impact of socioeconomic status and geographic location on Indigenous mortality in Australia, 1997-99.

Bibliography.

ISBN 0 7308 9231 X.

1. Aborigines, Australian - Mortality - Statistics. 2. Mortality - Australia - Statistics. 3. Mortality and race - Australia - Statistics. I. Tennant, Sarah. II. Page, Anthea, 1970- . III. Public Health Information Development Unit (Australia). IV. Australia. Dept. of Health and Ageing. V. Title. (Series : Occasional paper series (Public Health Information Development Unit (Australia)); no. 1).

304.640899915

Public Health Information Development Unit, The University of Adelaide

This research was produced by the Public Health Information Development Unit (PHIDU), The University of Adelaide, South Australia. It was submitted to a review process in August 2002. The research was funded under a grant from the Australian Government Department of Health and Ageing. The views expressed in this report are solely those of the authors and should not be attributed to the Department of Health and Ageing or the Minister for Health and Ageing.

Suggested citation:

Glover J, Tennant S and Page A. (2004) *The impact of socioeconomic status and geographic location on Indigenous mortality in Australia, 1997-99*. Occasional Paper Series No. 1. Public Health Information Development Unit, Adelaide.

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This and other publications are available from the PHIDU website (www.publichealth.gov.au).

ISSN 1447-8803 Occasional Paper Series

Published by Public Health Information Development Unit, The University of Adelaide

Printed by Openbook Print

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Executive summary

Introduction

Australia's Aboriginal peoples and Torres Strait Islanders¹ have the poorest health of any group in Australia. This has been the case for many years. Given that Australia has not made the advances in Indigenous health achieved in comparable countries (such as Canada, the United States and New Zealand), it is likely to be the case for some time.

This report presents data describing one outcome of that poor health, namely premature death. It examines the high death rates experienced by Indigenous people in the context of socioeconomic disadvantage and geographic location (in particular, remoteness).

In doing so, attention is drawn to the varying levels of completeness of coverage of the Indigenous deaths data, both across and within jurisdictions. Further, the analysis is limited to those jurisdictions considered to have the most reliable data (that is, the most complete coverage), whose Indigenous deaths experience is not necessarily representative of all Indigenous people; these jurisdictions are Queensland, South Australia, Western Australia and the Northern Territory. It is also limited to the most recent years, as the completeness of coverage has only recently reached these levels and time-series trends are not yet considered to be reliable.

Key findings: Queensland, South Australia, Western Australia and the Northern Territory

The following is an overview of the key findings of the analysis; unless otherwise stated, rate ratios mentioned in the text are statistically significant.

By age

Almost three quarters (71.4%) of Indigenous deaths occur before 65 years of age; in contrast, more than three quarters (77.8%) of non-Indigenous deaths are of people aged 65 years and over (Figure 3 and Table 12).

Infant death rates (infant deaths per 1,000 live births) are substantially (3.1 times) higher for Indigenous than for non-Indigenous infants, with the largest differential recorded in the Northern Territory (a differential of 4.12) (Figure 7 and Table 18).

By socioeconomic disadvantage of area²

Indigenous death rates are substantially higher than those in the non-Indigenous population across all quintiles of socioeconomic disadvantage³, and in most age groups (Figure 10 and Table 21).

¹ Throughout this report Aboriginal peoples and Torres Strait Islanders are referred to as Indigenous people. However, it is noted that the Aboriginal peoples and Torres Strait Islanders are ethnically and culturally distinct peoples (Lindorff 2002).

² Limitations of area (of residence) as a measure of socioeconomic disadvantage for Indigenous populations are discussed in Section 2.5.

³ Quintiles of socioeconomic disadvantage are described in the Glossary, page xviii.

There is a gradient in death rates for both Indigenous and non-Indigenous people aged 0 to 64 years, from the lowest rate in the most well-off areas to the highest rate in the poorest areas – although the gradient is not continuous for the Indigenous population.

Infant death rates are substantially higher for Indigenous than for non-Indigenous infants in each quintile of socioeconomic disadvantage of area (Figure 13 and Table 24). Indigenous rates increase from 11.9 infant deaths per 1,000 live births in the high socioeconomic status areas to 18.6 infant deaths per 1,000 live births in the low socioeconomic status areas.

By accessibility/ remoteness⁴

The distribution of the Indigenous population by the ARIA+ measure of remoteness (described in Section 2.6, page 8) is markedly different from that of the non-Indigenous population. Indigenous people are far less likely to live in the Major Cities areas (with 30.1% of Indigenous people in these areas compared with 65.5% for the total Australian population), and much more likely to live in the remote areas (28.0% in the combined Remote plus Very Remote classes, compared with 3.0%) or in regional areas, in particular areas in the Outer Regional class (23.2% compared with 11.0%) (Figure 1 and Table 6).

The Indigenous population at ages 0 to 64 years has a higher death rate (generally two to four times higher) than the non-Indigenous population across all remoteness classes (Figure 14 and Table 25). Indigenous death rates generally increase with increasing remoteness, although not as a continuous gradient, with a differential between the rates in the most remote (Very Remote) and most accessible (Major Cities) areas of 1.8.

There is a clearer gradient in death rates by remoteness for non-Indigenous people aged from 0 to 64 years, from the most accessible areas (with the lowest death rates) to the Very Remote areas (with the highest rates) – although, again, the gradient is not continuous, with a lower rate in the Remote areas (Figure 14 and Table 25).

Infant death rates are higher for Indigenous than for non-Indigenous infants in all the remoteness classes, most substantially in the Very Remote areas (a rate of 23.7 infant deaths per 1,000 live births) (Figure 19 and Table 28). The overall differential between Indigenous rates in the most remote and most accessible areas is 2.54.

By socioeconomic disadvantage of area and remoteness

When examined by socioeconomic disadvantage of area within each of the remoteness classes, death rates of non-Indigenous people at ages 0 to 64 years generally increase with increasing socioeconomic disadvantage of area; with the exception of the Very Remote areas (Figure 20 and Table 29). A similar, although weaker, increase is evident across the remoteness classes within each quintile; with the notable exception of the most disadvantaged class (Figure 21).

Despite having substantially higher death rates overall, there is no consistent socioeconomic pattern in the Indigenous death rates by ARIA+ class, other than that the rates in Quintile 5 are higher than in Quintile 1, with the notable exception of the Remote areas (Table 30).

Given the lack of a consistent pattern in Indigenous death rates by socioeconomic disadvantage of area within the ARIA+ class, the data were re-grouped under the Experimental General Index (EGI, an Indigenous-specific index of socioeconomic disadvantage: see Glossary

⁴ The likely impact on death rates at a regional level as a result of variations between regions in the completeness of recording of Indigenous deaths is discussed in Section 2.3 and in Section 5.

and Section 2.5). Again, there is no consistent pattern by socioeconomic disadvantage of area within the ARIA+ class. However the EGI shows a stronger relationship between Indigenous death rates and disadvantage for all areas combined (last chart in Figure 22, Table 31) than was seen under the IRSD (last chart in Figure 20, Table 31).

Comparison of death rates by Indigenous status, by disadvantage and remoteness

The analysis also provides additional information as to the extent of the gap between death rates for Indigenous and non-Indigenous populations. For deaths before 65 years of age, Indigenous people in the most well off areas have death rates 2.34 times those of non-Indigenous people in the most disadvantaged areas (Table 37).

A comparison of death rates in the Major Cities ARIA+ class (generally the areas with the lowest death rates) and the remote areas (Remote and Very Remote classes – the areas with the highest death rates) adds to this evidence. Overall, death rates of Indigenous people in the Major Cities areas are over two and a half times higher (a rate ratio of 2.61) than those of non-Indigenous people in the remote areas. The differential is greater for males (2.84) than for females (1.92) (Table 38).

Conclusion

Despite the limitations of the Indigenous deaths data (in particular the varying levels of coverage between and within jurisdictions), this analysis confirms the substantially higher death rates of Indigenous people (relative to non-Indigenous people) that occur across the socioeconomic spectrum – whether within the largest cities or in regional and remote areas.

It also highlights the substantial gap that exists between the lowest Indigenous death rates and highest non-Indigenous death rates when examined by measures of socioeconomic status and remoteness.

We trust that this analysis will usefully inform the implementation of strategies to address the serious issues, conditions and inequities contributing to these unacceptably high death rates.

Acknowledgements

The authors wish to thank the following people and organisations:

- The Registrars-General of Births, Deaths and Marriages in the States and Territories who approved the release of the data for this analysis, and their staff, without whose work the analysis would not be possible.
- Peter Burke and staff, Australian Bureau of Statistics (ABS), Brisbane for arranging for the provision of the deaths data.
- Frank Blanchfield and staff, ABS, Canberra for details of composition of Indigenous areas (at Census Collection District level).
- Jennie Widdowson at Prometheus Information Pty Ltd who incorporated the deaths data into a HealthWIZ dataset and created geographic recodes to enable the production of death rates by accessibility/ remoteness and socioeconomic disadvantage of area. In addition, Jennie provided comments on the final draft of the report.
- David Jayne, National Centre for Aboriginal and Torres Strait Islander Statistics, Australian Bureau of Statistics for reading the final draft of the report and providing comments.
- Cara Ellickson, Public Health Information Development Unit for general comments and for the references in the introduction.

Prior to publication the report was reviewed by the Office of Aboriginal and Torres Strait Islander Health and Dan Black of the ABS, whose comments have also been of value.

Finally, we wish to emphasise that the views expressed in this report and the conclusions drawn are those of the authors, and not necessarily those of the people who have assisted with its production.

Glossary

Terminology

Causes of Death

Causes of death are classified to the World Health Organization's *International Statistical Classification of Diseases and Related Health Problems*, Tenth Revision, (ICD-10). The relevant codes for the cause of death variables included in Sections 3-5 of this report are listed in Table A1 in Appendix 1.

Census Collection District

The Collection District (CD) is the smallest area level in the Australian Bureau of Statistics' statistical geography and is primarily an area used in the five yearly population census.

Experimental General Index (EGI) of Indigenous socioeconomic disadvantage

The EGI is one of nine indexes produced by the ABS as a consultant to the Commonwealth Grants Commission (CGC) (ABS 2000). The aim of the consultancy was to assist the CGC in developing methods for measuring the relative needs of Indigenous people, across geographic regions, for certain key 'functional areas' of expenditure (namely, housing and infrastructure, employment and training, health, and education).

The indexes are intended to encapsulate the socioeconomic status of Indigenous people based on such criteria as income, educational level, occupation, and condition of dwelling. They are intended to reflect the deprivation of (or inability to command or access) economic resources and infrastructure which support participation in social and economic life.

The disadvantage indicators were derived from the 1996 Census of Population and Housing, the National Aboriginal and Torres Strait Islander Survey (NATSIS), and national perinatal data collected by the National Perinatal Statistics Unit of the Australian Institute of Health and Welfare. The indicators represent levels of education, income, housing, mobility, family structure, employment in low-paying occupations, health and access to community services. The particular index used in this report is a general index, based on data from the 1996 Census, the Experimental General Index: ABS 1996 Census (refined) (EGI).

The EGI was produced for the 692 Indigenous Areas (IA) in Australia (ABS 1998a) as well as for three levels of the Accessibility/ Remoteness Index of Australia (ARIA): the Accessible, Moderately Accessible and Remote/ Very Remote classes. ARIA is described below. Unlike the IRSD, higher EGI scores indicate greater relative disadvantage, and lower scores indicate lesser relative disadvantage. In this report the EGI has been presented in reverse order, to be consistent with the IRSD.

HealthWIZ

HealthWIZ is a statistical database product, which comprises comprehensive health statistics from Australia's hospital systems, death registries, population censuses, cancer registries, Medicare and income support system, as well as details of aged care and child care. It provides high level data management and analysis capability for policy related work such as the inbuilt facility to calculate age-adjusted rates. The deaths data were set up in HealthWIZ to allow for the production of numbers, rates and percentages by groups of areas.

Index of Relative Socio-Economic Disadvantage (IRSD)

The IRSD is one of five Socio-Economic Indexes for Areas produced by the Australian Bureau of Statistics at recent population censuses. Produced using Principal Components Analysis, it summarises information available from variables related to education, occupation, income, family structure, race (the proportion of Indigenous people), ethnicity (poor proficiency in use of the English language) and housing. The variables are expressed as percentages of the relevant population. The IRSD was calculated at the Census Collection District level and was then calculated for Statistical Local Areas by weighting the scores for the smaller CDs by their population. The IRSD is calculated to show the relativity of areas to the Australian average for the particular set of variables which comprise it. This average score is set at 1000. Scores below 1000 indicate areas with relative disadvantaged populations under this measure, and scores above 1000 indicate areas with relatively advantaged populations.

Jurisdictions

The combined area of Queensland, South Australia, Western Australia and the Northern Territory is referred to as the 'jurisdictions', or the 'combined jurisdictions'.

Other major urban centres

Other major urban centres include the major urban centres (cities with populations of 100,000 and over) other than the capital cities. These cities are Newcastle and Wollongong in New South Wales; Geelong in Victoria; and Gold Coast and Townsville–Thuringowa in Queensland.

Quintiles of socioeconomic disadvantage of area

The deaths registration data include, for each death, the age at death, sex and address of the usual residence of the deceased (the address is coded to SLA). A number of other variables are also recorded. In the absence of any direct measure of socioeconomic status in the deaths data, the socioeconomic status of the SLA of the address has been used as a proxy measure. As the number of deaths is generally too small to allow detailed analysis or mapping at the SLA level, SLAs have been grouped into quintiles of approximately equal population, based on the Index of Relative Socio-Economic Disadvantage (IRSD, see above) score for the SLA as calculated from data collected at the 1996 Population Census. Quintile 1 comprises SLAs with the highest IRSD scores (highest socioeconomic status, or most advantaged, areas) and Quintile 5 comprises SLAs with the lowest IRSD scores (lowest socioeconomic status, or most disadvantaged, areas).

While this approach to arranging the quintiles is used in the majority of the health literature, readers should note that some publications (eg., those produced by the ABS) present the quintiles in the reverse order (ie. with Quintile 1 comprising the most disadvantaged areas). Each quintile comprises approximately 20% of the total population in the jurisdictions in the analysis. Again, this is the approach generally adopted in the health literature, although quintiles can also be comprised of equal numbers of areas.

Rate ratios

Rate ratios are calculated in several cases, eg. for males and females; Indigenous and non-Indigenous; and for Capital cities/ other major urban centres and the Rest of State/ Territory areas. Rate ratios calculated by quintile of socioeconomic disadvantage show the extent of variation in age standardised rates between the quintile under analysis and Quintile 1, the areas

with the highest socioeconomic status (the ratio of the rate in the quintile under analysis and the rate in Quintile 1). For analysis by ARIA+, the rate ratios show the extent of variation in age standardised rates between the remoteness class under analysis and the Major Cities class. Areas with the same death rate as in Quintile 1 or the Major Cities class will have a rate ratio of one (1.0); areas with a higher death rate will have a rate ratio of more than 1; and areas with a lower death rate will have a rate ratio of less than one. Rate ratios are expressed as a ratio (eg., 1.25), or as a percentage (a rate ratio of 1.25 shows the death rate in the quintile or class to be 25% higher than that in Quintile 1 or the Major Cities class, respectively).

Rate ratios – statistical significance

Exact probabilities (Fisher's and mid-P) of the statistical significance of the rate ratios were calculated, showing the levels of significance as outlined in the '*Symbols used*' section, below. This method is particularly appropriate for datasets with small numbers of cases, as it takes account of the number of deaths and the total population within the appropriate group (eg. age, sex, area etc.).

Throughout the report the rate ratios mentioned in the text are statistically significant, unless otherwise stated. Statistical significance was not calculated for other comparative measures.

Remoteness

The most recent classification of areas across Australia by remoteness, commonly called ARIA+ (ie. ARIA plus), was developed by the Australian Bureau of Statistics (ABS 2001). ARIA+, described by the ABS as a Remoteness Structure, uses the Accessibility/ Remoteness Index for Australia (DHAC 2001), developed by the National Centre for Social Applications in GIS (GISCA), as the underlying methodology for the determination of remoteness. Five classes of remoteness have been identified within ARIA+⁵: Major Cities, Inner Regional, Outer Regional, Remote and Very Remote. This classification can be made at various levels of areas, from Census Collection Districts (CDs – see Glossary section above) to SLAs (see Glossary section below) and larger. Under ARIA+, no areas in Victoria are classified to the Very Remote class; no areas in Tasmania are classified to the Major Cities class (Hobart is classified as Inner Regional); and no areas in the Northern Territory are classified to the Major Cities or Inner Regional classes (Darwin is classified as Outer Regional). Almost all of the Australian Capital Territory is classified to the Major Cities class.

Statistical Local Area (SLA)

The Statistical Local Area (SLA) is the area based measure used in much of the Australian Bureau of Statistic's statistical geography. In the jurisdictions in the analysis the SLA is generally equivalent to a local government area, with additional codes allocated to areas outside local government areas (eg. unincorporated areas) and to local government areas split for statistical purposes. The exceptions to this general situation are Brisbane, Gold Coast and Townsville–Thuringowa, where SLAs are based on suburbs, and Adelaide, where SLAs are based on Local Government Areas or groupings of suburbs. SLAs cover the whole of Australia.

⁵ ARIA also had five classes, named Highly Accessible, Accessible, Moderately Accessible, Remote and Very Remote.

Symbols used

n.a. not available

.. not applicable

– nil, or less than half the final digit shown

not shown or not calculated, as there are fewer than 5 cases over the period shown

Statistical significance:

* Rate ratio differs significantly from 1.0 with $p < 0.05$

** Rate ratio differs significantly from 1.0 with $p < 0.01$

*** Rate ratio differs significantly from 1.0 with $p < 0.001$

1. Introduction

Australia's Aboriginal peoples and Torres Strait Islanders⁶ have the poorest health of any group in Australia. This has been the case for many years. Given that Australia has not made the advances in Indigenous health achieved in comparable countries (such as Canada, the United States and New Zealand), it is likely to be the case for some time (see Box 2, page 2).

This report presents data describing one outcome of that poor health, namely premature deaths of Indigenous people. It examines the higher death rates experienced by Indigenous people in the context of socioeconomic disadvantage and geographic location (in particular, remoteness). The measures of disadvantage and location are, themselves, a reflection of the continuing historical and cultural environment in which Australia's Indigenous people have lived since colonisation. As such they cannot fully explain why Indigenous death rates are as high as they are; nor can they explain why death rates for Indigenous people are so much higher than for the most disadvantaged non-Indigenous populations. To do that requires an understanding of the historical and cultural environment, a discussion which is beyond the scope of this report, but which has been addressed by others (HREOC 1997; PHAA Inc. 1997; Bartlett 1999). Data analysis can, however, inform our understanding of the extent and nature of differences in variations in Indigenous and non-Indigenous mortality.

Purpose

When data are presented to show differences in death rates between urban, regional and remote areas, the response is often to ask to what extent the figures do no more than reflect the high death rates of the Indigenous population. Such a response is not intended to suggest that high Indigenous rates are not a concern, but to identify whether there are similar variations in non-Indigenous death rates. It is important to identify the drivers in the data, and the population groups affected, in order to be able to address them from a policy perspective. This analysis addresses this and other issues.

The data in the study cover the years from 1997 to 1999, and are analysed by socioeconomic status and by a measure of accessibility/ remoteness (using a modified version of the Accessibility/ Remoteness Index of Australia (ARIA) – the ARIA+ version, described in Section 2.6, below). It also addresses the extent of variation in mortality by socioeconomic status within the levels of accessibility/ remoteness under ARIA+. The purpose of the analysis is to determine if:

- there are identifiable patterns, related to remoteness or socioeconomic status, in the Indigenous death rates;
- there are variations in death rates of non-Indigenous people by remoteness and socioeconomic status, once variations resulting from identified Indigenous deaths have been accounted for; and
- to compare (by socioeconomic disadvantage of area and remoteness) the lowest Indigenous death rates with the highest non-Indigenous death rates.

⁶ Throughout this report Aboriginal peoples and Torres Strait Islanders are referred to as Indigenous people. However, it is noted that the Aboriginal peoples and Torres Strait Islanders are ethnically and culturally distinct peoples (Lindorff 2002).

As discussed under *Quality and coverage of Indigenous data*, Section 2.3 below, the reporting of Indigenous deaths is less than complete. The major part of this analysis is therefore limited to data from Queensland, South Australia, Western Australia and the Northern Territory, as these jurisdictions are regarded as having the most complete coverage of Indigenous deaths. Despite this, the deaths reported as 'Indigenous' are likely to understate the true situation. Similarly, deaths shown in this report as 'non-Indigenous', calculated by subtracting deaths of the identified Indigenous population from total deaths, are likely to be over-estimated.

Box 1: Summary of Indigenous mortality, 1997 to 1999

(Using deaths registrations from Queensland, South Australia, Western Australia and the Northern Territory for the period 1997 to 1999, the ABS report (Edwards and Madden 2001) that:

Death rates among Aboriginal and Torres Strait Islander people were higher than those recorded in the general population for almost all causes of death and for every age group. In the age group 35-54 years, the Indigenous death rate was 5 to 6 times higher than expected.

The leading causes of death in both the Indigenous and non-Indigenous populations were diseases of the circulatory system, cancer and external causes. Together these accounted for 60% of all identified Indigenous deaths, affecting Indigenous people at younger ages than in the total Australian population. There were 7 to 9 times more deaths of Indigenous people than expected from endocrine and metabolic diseases (of which 88% were related to diabetes) based on rates for the total Australian population.

Indigenous women gave birth at younger ages than non-Indigenous women, with the data for 1996-98 showing over 80% of Indigenous mothers having babies before the age of 30. The comparable figure for non-Indigenous mothers was 54%. Babies of Indigenous mothers were nearly twice as likely as babies of non-Indigenous mothers to be of low birthweight, a factor affecting health in childhood and, as some evidence suggests, throughout adult life also. Babies of Indigenous mothers were twice as likely to die at birth and during the early post-natal phase.

Box 2: Summary of Indigenous mortality over time

Ring and Firman (MJA 1998) report that, despite declining mortality rates, life expectancy for the Aboriginal population has not changed, because of continued high adult mortality rates. Thus, as the health status of Australians as a whole has continued to improve, the gap, between death rates for the Aboriginal population and the total Australian population, has widened.

This pattern contrasts with that of the Indigenous people of Canada, the United States and New Zealand, where marked improvements in health have occurred. Mortality rates from all causes in Māori in New Zealand and Native Americans have fallen substantially since the early 1970s. Comparable mortality rates for Australian Aboriginals and Torres Strait Islanders in 1990-1994 were at or above the rates observed 20 years ago in Māori and Native Americans, being 1.9 times the rate in Māori, 2.4 times the rate in Native Americans, and 3.2 times the rate for all Australians. Circulatory diseases, respiratory diseases, injuries and endocrine diseases (mostly diabetes) are responsible for almost 70% of these excess deaths. Mortality rate trends in Indigenous populations in other countries suggest the feasibility of substantial and rapid reductions in mortality rates of Australia's Indigenous people.

2. Methods

2.1 Overview

Registered deaths of residents of Queensland, South Australia, Western Australia and the Northern Territory were analysed for the years 1997 to 1999. Age standardised rates were produced by indirect standardisation to allow comparisons of Indigenous and non-Indigenous death rates by age, sex, jurisdiction, socioeconomic disadvantage of area and accessibility/ remoteness. Details of the analysis undertaken and the methods used are provided below.

2.2 Data sources

Deaths data

Deaths data were purchased from the Australian Bureau of Statistics (ABS) who hold unit record data for all deaths registered in Australia. The ABS supply data to third parties, under a 'return to source' provision, upon approval of the Registrars-General of Births, Deaths and Marriages in the States and Territories. That is, while the Registrars-General are the data custodians, the provision of this service circumvents the need for them to maintain the resources necessary to respond to statistical requests. Such approval was granted to PHIDU for this analysis.

For the majority of the analysis, deaths are those registered in 1997, 1998 and 1999. In Section 6, *Deaths by socioeconomic disadvantage of area and remoteness*, deaths registered in 2000 have been included to provide additional numbers for the analysis by socioeconomic disadvantage of area within accessibility/ remoteness classes.

Deaths are registered in the State or Territory of the occurrence of the death; where the address of usual residence of the deceased is known to be in another State or Territory, it is coded to that State or Territory (and to the Statistical Local Area (SLA – see Glossary) of the address, if known). The data were coded to the tenth revision of the International Classification of Diseases (ICD-10 – see Appendix 1).

Population data

The population used for the total population is the Estimated Resident Population as at 30 June 1998 for the periods under analysis – either 1997 to 1999, or 1997 to 2000. The Indigenous population estimates used in calculating death rates are the Experimental Projections of the Aboriginal and Torres Strait Islander Population (ABS 1998b).

2.3 Quality and coverage of Indigenous data

Indigenous people are the group least well identified in statistical collections. For example, 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 records⁷.

⁷ 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.

Over the past few years only the Northern Territory, Western Australia and South Australia are considered to have had reasonably complete coverage (ABS 1999). Coverage in the other jurisdictions has not improved since the early 1990s, with the exception of Queensland, where coverage has improved since 1996 to a point where the ABS considered it to have ‘approached the level of coverage in the areas with traditionally high coverage’ (ABS 1999).

Between 1991 and 1996 there has also been a marked increase in the population of Indigenous people as recorded in the population censuses. This (largely unexplained) increase casts doubt on the estimates of the completeness of Indigenous birth and death notifications for those States and the Northern Territory which have in the past been labelled as ‘high’ completeness. When recalculated using 1996 Census-based expectancies, coverage seems, at levels of between 55% and 74% (Queensland, South Australia and Western Australia, Table 1), to be, at best, of ‘moderate’ completeness.

Table 1: Estimated¹ coverage of Indigenous deaths

Per cent

Year	NSW	Vic	Qld	SA	WA	Tas	NT	ACT	Aust
1996	19	23	29	63	75	-	73	28	39
1997	9	43	58	68	70	4	100	20	49
1998	47	56	63	64	74	10	88	14	61
1999	43	59	55	57	68	8	83	27	56

¹ Estimates based on a comparison of deaths registered and ‘expected’ deaths, using 1996 Census-based expectancies.

Source: Deaths, Australia. ABS Cat. No. 3302.0

Just as there are variations in completeness of coverage between the States and Territories, so there are variations within the States and Territories. It is likely that data for rural areas more accurately reflect the true situation for both population and deaths than do data for urban areas. Ross (1996) reports that over the last 30 years, the count of urban Aboriginal and Torres Strait Islander people increased nearly 12 times, in contrast to that of those living in rural areas which increased by just over one and a half times, which is similar to the magnitude of the increase in both urban and rural areas for the total population. The largest proportional increases in census counts for Indigenous people were found to be in the highly urbanised south-eastern states. These areas are linked by historically earlier European settlement than other areas. Longer contact between Indigenous and non-Indigenous people and higher rates of intermarriage resulted in a larger pool of persons of mixed ancestry than in areas where European settlement occurred later. It is this mixed ancestry group for whom it is likely that identification as Indigenous can be changed over time and in different situations.

Variations such as these affect regional analyses. The analyses in this report that are most likely to be affected are those in Section 5, by ARIA+⁸. The likely impact of such variations is noted in that section and expanded on in Section 7.4. Comment is also made as to the likely effect of such variations on the analysis by quintile of socioeconomic disadvantage of area (Section 4).

⁸ Although ARIA+ is not an ‘urban’ classification, the majority (98.2% at the 1996 Census) of Indigenous people living in the most accessible areas live in an urban setting as defined by the ABS; and 76.9% of those in the most remote areas live in a rural setting.

In recognition of these concerns, the following analysis is based on deaths of residents of the four jurisdictions of Queensland, South Australia, Western Australia and the Northern Territory. Together, they account for just over three quarters of all Indigenous deaths recorded in Australia from ages 0 to 64 years (77.3%), 0 to 74 years (77.2%) and at all ages (76.1%). While differences in the level of accuracy of population counts between the jurisdictions also influence death rates, the impact in these jurisdictions is likely to be small relative to differences in the completeness of coverage of deaths.

Readers should note that the Indigenous deaths experience in these four jurisdictions is not necessarily representative of all Indigenous people in Australia. For example, Table 2 shows that the estimated Australian death rate for registered Indigenous deaths (1,605 deaths per 100,000 population) is lower than the rates in Queensland and South Australia, and considerably lower than in the Northern Territory or Western Australia. Given the large Indigenous population in New South Wales, the Australian rate in Table 2 is unlikely to provide an accurate reflection of the true position. Note that the Indigenous death rate for Australia is included for illustrative purposes only: it is not a reliable figure.

Comparisons between Indigenous and non-Indigenous death rates are made at the level of the four jurisdictions. Comparisons could have been made between Indigenous death rates in the four jurisdictions and non-Indigenous death rates for Australia as a whole, as is often the case. To have done so would have increased the possibility of the 'non-Indigenous' rates being influenced by unidentified Indigenous deaths; this is more likely to be an issue for the analyses in this report than when data are being compared at the whole of Australia level.

Table 2: Comparison of death rates for all causes and all ages by Indigenous status, selected jurisdictions and Australia, 1997-99

Deaths per 100,000 population

State/ Territory	All persons	Non-Indigenous ¹		Indigenous	
	Rate	Rate	Difference (%) cf All	Rate	Difference (%) cf non-Indigenous
Queensland	685	675	-1.5	1,687	149.9
South Australia	673	668	-0.7	1,813	171.4
Western Australia	665	650	-2.3	2,020	210.8
Northern Territory	1,195	777	-35.0	2,596	234.1
Total of above	683	668	-2.2	1,980	196.4
Australia	684	789	-0.9	1,605	136.7

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² The Indigenous death rate for 'Australia' is included for illustrative purposes only: it is not reliable.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Indigenous deaths are often compared with total (Indigenous plus non-Indigenous) deaths, rather than with non-Indigenous deaths. This is acceptable practice where there are relatively fewer Indigenous deaths, so as to have little or no effect on the total number. For example, Table 2 shows that the non-Indigenous and 'All persons' rates are similar for the three States in the analysis, but that the non-Indigenous death rate in the Northern Territory is markedly lower than the 'All persons' rate. Comparing Indigenous death rates with the total rate for the Northern Territory therefore understates the relative difference in rates which exists between the Indigenous and non-Indigenous populations. This aspect of the analysis is discussed in more detail in Section 7, *A comparison of death rates for non-Indigenous and total (non-Indigenous and Indigenous) populations*.

It has not been possible to undertake this analysis over time, as the completeness of coverage of Indigenous deaths has only recently reached the current levels and time-series trends are not yet considered to be reliable.

2.4 Age group

In the majority of the analysis, deaths are at ages 0 to 64 years. Death before 65 years of age is considered as 'premature' for non-Indigenous people, where a girl born in 1997-99 could expect to live to 82 years and a boy could be expected to live to 76 years (ABS 1999), and provides a conservative 'standard' against which to compare Indigenous deaths. For Indigenous people, the 1997-99 based life expectancies at birth are much lower, at 56 years for males and 63 years for females. These life expectancies are, in fact, similar to those experienced among the total male population in 1901-1910 (55 years) and the total female population in 1920-22 (63 years).

In 1997-99, almost three quarters (71.4%) of Indigenous deaths in the four jurisdictions occurred before age 65 years, compared with less than one quarter (22.2%) for the non-Indigenous population (Table 3).

The proportion of deaths before 65 years of age for the Indigenous population in the Northern Territory (73.6%) is consistent with, albeit higher than, that in the other jurisdictions. However, the proportion of deaths for the estimated 'non-Indigenous' population is much higher (around two and a half times higher, 54.9%) than for the States for which data were analysed. This may reflect the actual situation in the Northern Territory, of higher non-Indigenous death rates at these ages than in the other jurisdictions in the analysis. It may also be that there are more unidentified Indigenous deaths in the Northern Territory than is suggested by the information presented in the section on coverage, above.

The proportion of the Indigenous population aged 0 to 64 years in each of the jurisdictions in the analysis is similar, being approximately 97% (Table 3). There is, however, more variation in the proportion of the non-Indigenous population aged 0 to 64 years, ranging from the lowest proportion in South Australia (85.6%) to the highest proportion in the Northern Territory (96.4%).

Table 3: Deaths (0 to 64 years) from all causes by Indigenous status in selected jurisdictions as a proportion of all deaths in each jurisdiction, 1997-99

Per cent

State/ Territory	Proportion of deaths at ages 0 to 64 years			Proportion of population at ages 0 to 64 years		
	All persons	Non-Indigenous ¹	Indigenous	All persons	Non-Indigenous	Indigenous
Queensland	24.3	23.2	68.8	88.7	88.4	97.4
South Australia	19.1	18.5	72.8	85.7	85.6	97.5
Western Australia	24.5	22.9	71.9	89.5	89.3	97.2
Northern Territory	64.2	54.9	73.6	96.7	96.4	97.4
Total	23.8	22.2	71.4	88.5	88.2	97.4

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.
Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

It would have been possible to increase the deaths included in the analysis to cover people aged under 75 years, rather than under 65 years. This would have strengthened the analysis by increasing the number of deaths and the death rates for both Indigenous and non-Indigenous populations, although with a far smaller increase in the number of Indigenous deaths (Table 4), as almost three quarters of this group die before age 65 years (Table 3). For this reason, and because deaths below that age are clearly premature in the Australian context, it was decided to stay with age 65 as the cut-off.

Table 4: Number and rate of deaths from all causes by Indigenous status, selected age groups, Qld, SA, WA and NT, 1997-99

Indigenous status	0-64 years	0-74 years	Per cent difference
Indigenous			
Number	3,126	3,765	20.4
Rate ¹	680.7	1106.2	62.5
Non-Indigenous²			
Number	29,235	55,984	91.5
Rate ¹	164.5	296.9	80.5
Persons			
Number	32,361	59,749	84.6
Rate ¹	177.5	311.3	75.4

¹ Rate is the number of deaths per 100,000 population.

² Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

2.5 Socioeconomic status

Index of Relative Socio-Economic Disadvantage

The deaths registration data include, for each death, the age at death, sex and address of the usual residence of the deceased (the address is coded to SLA). A number of other variables are also recorded. In the absence of any direct measure of socioeconomic status in the deaths data, the socioeconomic status of the SLA of the address of the deceased has been used as a proxy measure: that is, it is an area based measure. As the number of deaths is generally too small to allow detailed analysis at the SLA level, SLAs have been grouped into quintiles of approximately equal population, based on the Index of Relative Socio-Economic Disadvantage (IRSD) score for the SLA as calculated from data collected at the 1996 Population Census⁹. Quintile 1 comprises the SLAs with the highest IRSD scores (highest socioeconomic status, or most advantaged, areas) and Quintile 5 comprises the SLAs with the lowest IRSD scores (lowest socioeconomic status, or most disadvantaged, areas). Each quintile comprises approximately 20% of the total population in the jurisdictions in the analysis. There were a small number of areas for which the area of residence was not known: these comprise 1.9% of Indigenous deaths, 0.3% of non-Indigenous deaths and 0.5% of total deaths.

In light of the small proportion of Indigenous people in the population of any quintile, the appropriateness of an area based measure such as the IRSD as an indicator of disadvantage for Indigenous populations could be questioned. However, an examination

⁹ The IRSD is one of five Socio-Economic Indexes for Areas (SEIFA) produced by the Australian Bureau of Statistics from data collected in the 1996 Census. Further details of the construction of this index are in the Glossary.

of the association between disadvantage (as measured by the IRSD) and the proportion of Indigenous people in the population at the SLA level in the four jurisdictions studied in this report suggests otherwise. There are notable (inverse) correlations in the capital cities and other major urban centres and in the Rest of State/ Territory areas in these four jurisdictions, indicating a strong association between high proportions of Indigenous people and socioeconomic disadvantage at the SLA level (Table 5). These data show that the IRSD is, at the least, indicative of Indigenous disadvantage in the four jurisdictions in the analysis.

Table 5: Correlation coefficients: IRSD and proportion of Indigenous population by area of residence, Qld, SA, WA and NT, 1996

State/ Territory	Capital cities and other major urban centres	Rest of State/ Territory
Queensland	-0.75	-0.78
South Australia	-0.88	-0.44
Western Australia	-0.80	-0.71
Northern Territory	-0.54	-0.96

Source: A Social Health Atlas of Australia, 2nd Edition: Volumes 4, 5, 6 and 8 (Glover et al. 1999a; 1999b; 1999c; 1999d)

Notwithstanding these results, the deaths data have also been analysed by an Indigenous-specific index of disadvantage: this is described in the following section.

Indigenous index of socioeconomic disadvantage

An Indigenous-specific index of disadvantage, the Experimental General Index: ABS 1996 Census (refined) (ABS 2000) has been used in Section 6. Like the IRSD, the Experimental General Index (EGI) is an area based measure and is available for the 692 Indigenous Areas (IA) in Australia (ABS 1998a). These areas are based on Census Collection Districts (CDs). As the deaths data in this analysis were only available by SLA, the EGI was estimated for SLAs. A file containing a CD to IA concordance was obtained from the ABS. This was linked to a concordance of CD to SLA, to produce an IA to SLA concordance. Each CD was allocated an EGI score (the score applicable to the IA in which it lies) and then the EGI scores were summed (weighted by population at the CD level) to SLAs. The SLAs were then sorted into quintiles of approximately equal Indigenous population in the jurisdictions in the analysis, using the EGI.

Unlike the IRSD, high EGI scores indicate relative disadvantage and low scores indicate relative advantage. Further details of the construction of this index are in the Glossary.

2.6 Remoteness

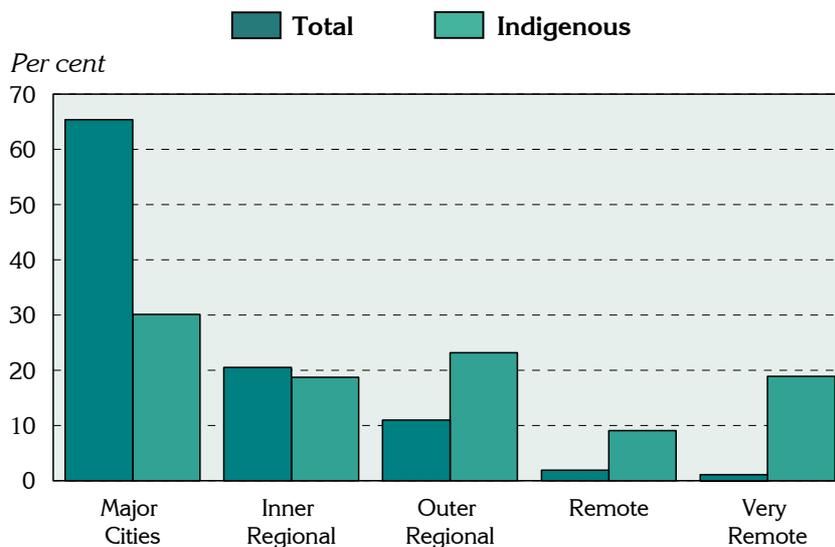
As noted in Section 2.3, *Quality and coverage of Indigenous data*, variations in the completeness of coverage of Indigenous deaths are likely to affect regional analyses. Analyses by remoteness are those most likely to be affected by such variations. The likely impact of such variations is noted in Section 5 and expanded on in Section 7.4.

The most recent classification of areas across Australia by remoteness, commonly called ARIA+ (ie. ARIA plus), was developed by the Australian Bureau of Statistics (ABS 2001). ARIA+, described by the ABS as a Remoteness Structure, uses the Accessibility/Remoteness Index for Australia (DHAC 2001), developed by the National Centre for Social Applications in GIS (GISCA), as the underlying methodology for the determination of

remoteness¹⁰. Five classes of remoteness have been identified within ARIA+: Major Cities, Inner Regional, Outer Regional, Remote and Very Remote¹¹. This classification can be made at various area levels, from Census Collection Districts (CDs – see Glossary) to SLAs (see Glossary) and larger. Under ARIA+, no areas in Victoria are classified to the Very Remote class; no areas in Tasmania are classified to the Major Cities class (Hobart is classified as Inner Regional); and no areas in the Northern Territory are classified to the Major Cities or Inner Regional classes (Darwin is classified as Outer Regional). Almost all of the Australian Capital Territory is classified to the Major Cities class.

Figure 1 and Table 6 show the distribution of the 1996 Census total and Indigenous populations across the five ARIA+ class¹².

Figure 1: Population by ARIA+ class, Australia, 1996



Source: Remote areas statistical geography in Australia (Glover et al. 2003)

Table 6: Population by ARIA+ class, Australia, 1996

ARIA+ class	Total population		Indigenous population	
	Number	Per cent	Number	Per cent
Major Cities	11,697,757	65.5	105,954	30.1
Inner Regional	3,671,401	20.5	66,011	18.7
Outer Regional	1,971,630	11.0	81,641	23.2
Remote	343,144	1.9	32,075	9.1
Very Remote	193,959	1.1	66,555	18.9
Total	17,877,891	100.0	352,236	100.0

Source: Calculated from data supplied by ABS (ARIA+ class by CD) and CDATE96 (population by CD)

¹⁰ The ARIA Index was developed for the Commonwealth Department of Health and Aged Care to compare information about populations based on their access, by road, to service centres (towns) of various sizes (DHAC 2001).

¹¹ A report by Glover and Tennant (2003) contains a brief demographic description of the ARIA+ areas.

¹² SLAs were allocated to ARIA+ classes using a concordance provided by ABS. The concordance allocates all or parts of an SLA to an ARIA+ class, based on the proportions of the SLAs 1996 population in each class at a CD level.

There are also some interesting variations in the characteristics of populations between the ARIA+ classes when examined by the ABS Section of State classification¹³ (Table 7). As would be expected, the majority (93.9%) of the population of the Major Cities class is classified as Major Urban, with 4.0% in Other Urban and 2.0% in Rural Balance. The largest concentration of population in the Inner Regional class is in Other Urban (65.6%), with a further 26.1% in Rural Balance. The areas classified as Outer Regional and Remote both have similar proportions of their populations in Other Urban (52.4% and 51.7%, respectively), with the bulk of the remainder in Rural Balance (33.2% and 35.0%, respectively). The population in the Very Remote class is the most evenly distributed, with 43.4% in Rural Balance, 36.5% in Other Urban and 20.2% in Bounded Locality.

Table 7: Population by ARIA+ class and Section of State, Australia, 1996

ARIA+ class	Section of State				Total		
		Major Urban	Other Urban	Bounded Locality	Rural Balance	Number	% of Total
Major Cities	No.	10,985,361	469,463	12,715	230,218	11,697,757	..
	%	93.9	4.0	0.1	2.0	100.0	65.4
Inner Regional	No.	126,118	2,408,127	178,158	958,998	3,671,401	..
	%	3.4	65.6	4.85	26.1	100.0	20.5
Outer Regional	No.	109,914	1,033,732	172,810	655,174	1,971,630	..
	%	5.6	52.4	8.8	33.2	100.0	11.0
Remote	No.	–	177,529	45,613	120,002	343,144	..
	%	..	51.7	13.3	35.0	100.0	1.9
Very Remote	No.	–	70,741	39,124	84,094	193,959	..
	%	..	36.5	20.2	43.4	100.0	1.1
Total	No.	11,221,393	4,159,592	448,240	2,048,486	17,877,891	..
	%	62.8	23.2	2.5	11.5	100.0	100.0

Source: Calculated from data supplied by ABS (ARIA+ class and Section of State by CD) and CDATA96 (population by CD)

While almost two thirds (65.4%) of the total Australian population live in areas classified as Major Cities, only 30% of those identifying as of Aboriginal or Torres Strait Islander origin live in such areas (Table 8). By contrast, 18.9% of the Indigenous population live in the Very Remote areas, compared with only 1.1% of the total population. Indigenous Australians in the Outer Regional and Remote areas are more likely than all Australians to live in the Other Urban Section of State categories, rather than in the Rural Balance areas where farming communities predominate. In the Very Remote areas they are more likely than all Australians to live in the small communities in the Bounded Locality areas than in the larger towns in the Other Urban areas.

¹³ Section of State is an urban/rural classification, reflecting the concentration of the population. It is comprised of Major Urban (urban areas with a population of 100,000 & over); Other Urban (urban areas with a population of 1,000 to 99,999); Bounded Locality (rural localities with a population of 200 to 999); and Rural Balance (the remainder of the State/ Territory).

Table 8: Indigenous population by ARIA+ class and Section of State, Australia, 1996

ARIA+ class	Section of State					Total	
		Major Urban	Other Urban	Bounded Locality	Rural Balance	Number	% of Indigenous
Major Cities	No.	98,388	5,635	112	1,819	105,594	..
	%	92.86	5.3	0.1	1.7	100.0	30.0
Inner Regional	No.	2,849	51,858	2,285	9,019	66,011	..
	%	4.3	78.6	3.5	13.7	100.0	18.7
Outer Regional	No.	5,385	55,616	6,993	13,647	81,641	..
	%	6.6	68.1	8.6	16.7	100.0	23.2
Remote	No.	–	20,620	5,786	5,669	32,075	..
	%	..	64.3	18.0	17.7	100.0	9.1
Very Remote	No.	–	15,414	22,813	28,328	66,555	..
	%	..	23.2	34.3	42.6	100.0	18.9
Total	No.	106,622	149,143	37,989	58,482	352,236	..
	%	30.3	42.3	10.8	16.6	100.0	100.0

Source: Calculated from data supplied by ABS (ARIA+ class and Section of State by CD) and CDATE96 (population by CD)

Over the 30 years from 1966 to 1996, the Indigenous population has become increasingly urbanised (Ross 1996). In 1966, 27% of Indigenous people in the Census lived in urban areas; 30 years later this had been completely reversed with only 27% of Indigenous people living outside urban areas.

Although the largest numbers of Indigenous people now live in urban areas (72.6%, 42.3% in Other Urban and 30.3% in Major Urban), they are half as likely as the total population to live in the Major Urban areas, and more than four (4.32) times as likely to live in the Bounded Locality areas (Table 9). They are also over-represented (in comparison with the total population) in the Other Urban (1.82 times higher proportion) and Rural Balance (1.44 times).

Table 9: Population by Section of State, Australia, 1996

Section of State	Total population		Indigenous population		Ratio of proportion of Indigenous to non-Indigenous
	Number	Per cent	Number	Per cent	
Major Urban	11,221,393	62.8	106,622	30.3	0.48
Other Urban	4,159,592	23.2	149,143	42.3	1.82
Bounded Locality	448,240	2.5	37,989	10.8	4.32
Rural Balance	2,048,486	11.5	58,482	16.6	1.44
Total	17,877,891	100.0	352,236	100.0	..

Source: Calculated from data supplied by ABS (Section of State by CD) and CDATE96 (population by CD)

Allocation of deaths to ARIA+ classes

Deaths have been allocated to the five classes within ARIA+ using the SLA of address. Where an SLA lies across more than one class of remoteness, the deaths in the SLA have been allocated to the separate classes on the basis of the proportion of the population of the SLA in each remoteness class (based on populations calculated at the CD level). This is an approximation and does not take account of variations in the age, sex or other characteristics of the population, or deaths, in SLAs with population in different remoteness classes. There were a small number of areas for which the area of residence

was not known: these comprise 1.9% of Indigenous deaths, 0.3% of non-Indigenous deaths and 0.5% of total deaths.

2.7 Analysis

Deaths data for the years 1997-99 and 1997-2000 are expressed as numbers, percentages, rates¹⁴ and rate ratios. Rates are expressed per 100,000 population, indirectly age standardised (using five year groups) to the relevant population at 30 June 1998 (Australian population, or sum of selected jurisdictions' population).

Rate ratios have been calculated by quintile of socioeconomic disadvantage of area and by remoteness. For analysis by quintile of socioeconomic disadvantage, the rate ratios show the extent of variation in age standardised rates between the quintile under analysis and Quintile 1, the areas with the highest socioeconomic status (the ratio of the rate in the quintile under analysis and the rate in Quintile 1). For analysis by remoteness, the rate ratios show the extent of variation in age standardised rates between the ARIA+ remoteness class under analysis and the Major Cities class. Areas with the same death rate as in Quintile 1 or the Major Cities class will have a rate ratio of one (1.0); areas with a higher death rate will have a rate ratio of more than 1; and areas with a lower death rate will have a rate ratio of less than one. Rate ratios are expressed as a ratio (eg., 1.25), or as a percentage (a rate ratio of 1.25 shows the death rate in the quintile or class to be 25% higher than that in Quintile 1 or in the Major Cities class, respectively).

Exact probabilities (Fisher's and mid-P) of the statistical significance of the rate ratios were calculated, showing the levels of significance as follows:

- * Rate ratio differs significantly from 1.0 with $p < 0.05$
- ** Rate ratio differs significantly from 1.0 with $p < 0.01$
- *** Rate ratio differs significantly from 1.0 with $p < 0.001$

This method is particularly appropriate for datasets with small numbers of cases, as it takes account of the number of deaths and the total population within the appropriate group (eg. age, sex, area etc.).

Throughout the report the rate ratios mentioned in the text are statistically significant, unless otherwise stated. Note that statistical significance was not calculated for other comparative measures.

The deaths and population data were loaded into HealthWIZ module datasets and configured to produce the numbers of deaths and age-adjusted death rates required for the analysis. These datasets were only used for this project. HealthWIZ incorporates the 1996 Census IRSD scores, which can be used to group SLAs into quintiles (or deciles) of socioeconomic disadvantage of area, to produce the numbers of deaths and age-adjusted death rates for these quintiles. It also incorporates an ARIA+ concordance, used to allocate SLAs to ARIA+ classes and produce the numbers of deaths and age-adjusted death rates by ARIA+ class.

¹⁴ The number of deaths is the total over the three year period from 1997 to 1999 (or four years from 1997 to 2000), and the rate reflects the average over the period.

3. Deaths by Indigenous status, sex, age and cause of death

3.1 Overview

Over the three years from 1997 to 1999, 3,126 deaths were recorded of Indigenous people aged from 0 to 64 years from Queensland, South Australia, Western Australia and the Northern Territory. Close to two thirds of the deaths were of males (1,909 deaths, 61.1%). The largest number of Indigenous deaths at these ages was recorded in Queensland (1,138 deaths), with 937 deaths in the Northern Territory, 777 deaths in Western Australia and 274 deaths in South Australia (Table 10).

Indigenous deaths accounted for 9.7% of all deaths in 1997 to 1999 of people aged from 0 to 64 years in the combined jurisdictions in the analysis (Table 10). This was just over twice the level recorded for all of Australia (4.7%), which, as noted above, is subject to high levels of under-identification of Indigenous deaths in New South Wales, Victoria, Tasmania and the Australian Capital Territory. The proportion of Indigenous deaths at these ages in the jurisdictions in the analysis ranges from 4.2% in South Australia to 57.2% in the Northern Territory.

Table 10: Number of deaths (0 to 64 years) from all causes by Indigenous status and sex, selected jurisdictions and Australia, 1997-99

State/ Territory	Males		Females		Persons	
	Number	Number	Number	Number	Number	Per cent
Indigenous						
Queensland	704	434	1,138			7.0
South Australia	172	102	274			4.2
Western Australia	496	281	777			9.8
Northern Territory	537	400	937			57.2
Total of above	1,909	1,217	3,126			9.7
Australia	2,507	1,536	4,043			4.7
Non-Indigenous¹						
Queensland	9,917	5,182	15,099			93.0
South Australia	4,064	2,259	6,323			95.8
Western Australia	4,694	2,418	7,112			90.2
Northern Territory	503	198	701			42.8
Total of above	19,178	10,057	29,235			90.3
Australia	52,814	28,772	81,586			95.3
Persons						
Queensland	10,621	5,616	16,237			100.0
South Australia	4,236	2,361	6,597			100.0
Western Australia	5,190	2,699	7,889			100.0
Northern Territory	1,040	598	1,638			100.0
Total of above	21,087	11,274	32,361			100.0
Australia²	55,321	30,308	85,629			100.0

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² The total of Indigenous deaths for Australia is an under-estimate: see text above.

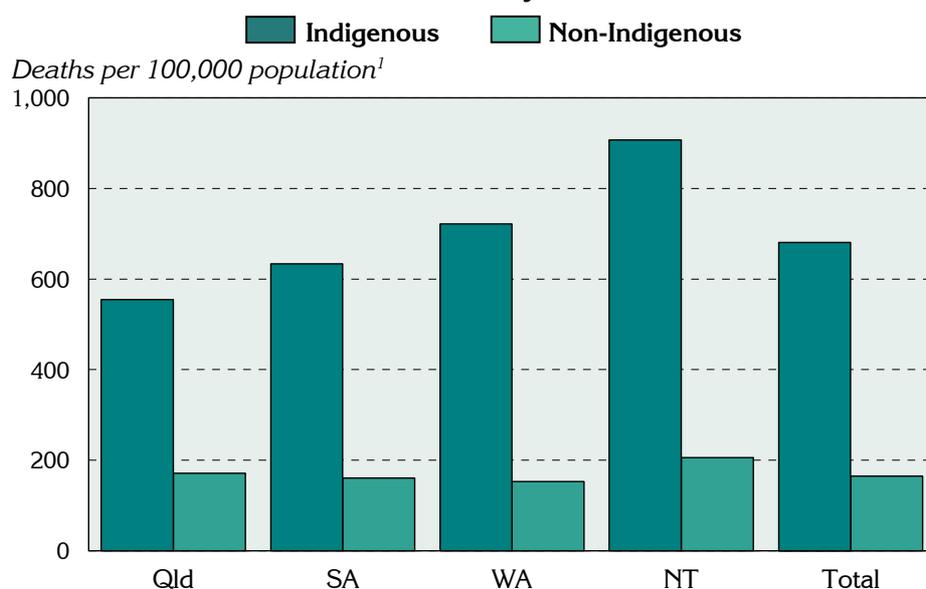
Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

3.2 Deaths by Indigenous status and State/ Territory

Figure 2 and Table 11 compare death rates for the Indigenous and non-Indigenous population aged 0 to 64 years for the three States and the Territory. Overall, Indigenous death rates in the four jurisdictions were just over four (4.1) times higher than in the non-

Indigenous population, a rate of 681 deaths per 100,000 population compared with 165 deaths per 100,000 population. The Northern Territory had the highest death rate (907 Indigenous deaths per 100,000 population) in the 0 to 64 age group and the second highest differential in Indigenous/ non-Indigenous death rates (4.4). The largest differential was recorded in Western Australia, where the Indigenous death rate was more than four (4.7) times the death rate recorded for the non-Indigenous population.

Figure 2: Death rates¹ (0 to 64 years) from all causes by Indigenous status and State/ Territory, 1997-99



¹ Indirectly age standardised.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

3.3 Deaths by Indigenous status and sex

Male death rates are higher, and often substantially so, than female death rates at ages 0 to 64 years for both Indigenous and non-Indigenous people in the jurisdictions in the analysis (Table 11).

The Northern Territory had the lowest ratio of Indigenous male to female deaths (1.44 male deaths for every female death, compared with the average for these jurisdictions of 1.68 male deaths for every female death) and the highest for non-Indigenous deaths (2.0 male deaths for every female death, compared with the average for these jurisdictions of 1.84 male deaths for every female death). The low ratio for Indigenous deaths reflects the high rate of Indigenous female deaths in the Northern Territory compared with the State rates, a death rate 47.0% higher than in the highest State (Western Australia): this compares with the male death rate in the Northern Territory which is only 13.8% higher than in the highest State (Western Australia). The differentials in Indigenous and non-Indigenous death rates for males and females were similar across the three States, with rates of 1.75 and 1.85, respectively, in Queensland, approximately 1.80 in South Australia, and 1.86 in Western Australia.

The ratio of Indigenous to non-Indigenous death rates is slightly higher for females (4.45 times higher) than for males (4.06).

Table 11: Death rates (0 to 64 years) from all causes by Indigenous status, sex and State/ Territory, 1997-99

Deaths per 100,000 population

State/ Territory	Males	Females	Persons	Rate ratio ¹
Indigenous				
Queensland	714	408	555	1.75***
South Australia	828	455	634	1.82***
Western Australia	947	508	722	1.86***
Northern Territory	1,078	747	907	1.44***
Total	862	512	681	1.68***
Non-Indigenous²				
Queensland	220	119	171	1.85***
South Australia	208	115	161	1.81***
Western Australia	197	106	153	1.86***
Northern Territory	264	132	206	2.00***
Total	212	115	165	1.84***
Persons				
Queensland	231	126	179	1.83***
South Australia	214	119	166	1.80***
Western Australia	214	115	165	1.86***
Northern Territory	432	295	369	1.46***
Total	228	126	178	1.81***
Rate ratio³	4.06***	4.45***	4.13***	..

¹ Rate ratio is the ratio of male to female death rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

² Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

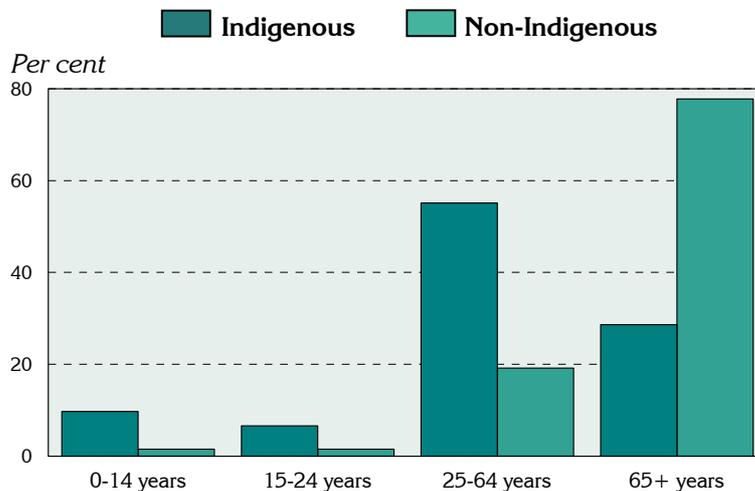
³ Rate ratio is the ratio of the total Indigenous death rate to the total non-Indigenous rate.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

3.4 Deaths by Indigenous status and age

The proportion of deaths in the four jurisdictions in each of the age groups in the analysis under 65 years was higher for Indigenous people than for non-Indigenous people (Figure 3 and Table 12). As noted earlier, almost three quarters (71.4%) of Indigenous deaths occurred before 65 years of age, whereas more than three quarters (77.8%) of non-Indigenous deaths occurred at ages 65 years and over.

Figure 3: Proportion of deaths by Indigenous status and age, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table 12: Number and proportion of deaths by Indigenous status, age and sex, Qld, SA, WA and NT, 1997-99

Age (years)	Males		Females		Persons	
	Number	Per cent	Number	Per cent	Number	Per cent
Indigenous						
0-14	241	9.6	182	9.8	423	9.7
15-24	210	8.3	79	4.2	289	6.6
25-64	1,458	58.0	956	51.3	2,414	55.1
65+	606	24.1	646	34.7	1,252	28.6
Total	2,515	100.0	1,863	100.0	4,378	100.0
Non-Indigenous¹						
0-14	1,182	1.7	811	1.3	1,993	1.5
15-24	1,461	2.1	529	0.9	1,990	1.5
25-64	16,535	23.5	8,717	14.2	25,252	19.2
65+	51,198	72.7	51,365	83.6	102,563	77.8
Total	70,376	100.0	61,422	100.0	131,798	100.0
Persons						
0-14	1,423	2.0	993	1.6	2,416	1.8
15-24	1,671	2.3	608	1.0	2,279	1.7
25-64	17,993	24.7	9,673	15.3	27,666	20.3
65+	51,804	71.1	52,011	82.2	103,815	76.2
Total	72,891	100.0	63,285	100.0	136,176	100.0

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths. Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

3.5 Deaths by Indigenous status, sex and age

Death rates for Indigenous males were higher across all age groups than those recorded for Indigenous females (Table 13), although the differentials are consistent with those for the non-Indigenous population. The largest differentials were in the 15 to 24 year age group, with the male death rate 2.67 times higher than for the female rate for Indigenous deaths and 2.58 times higher for non-Indigenous deaths. At these ages, injuries (including motor vehicle accidents) are a major cause of death, more so for Indigenous than non-Indigenous young people (Table 17, page 22).

Indigenous death rates were substantially higher, in each age group and for both males and females, than the rates recorded for the non-Indigenous population. Compared to non-Indigenous death rates, Indigenous death rates varied from almost double (1.8 times) among people aged 65 years and over (a rate of 7,639 per 100,000 Indigenous population compared to 4,301 per 100,000 non-Indigenous population) to more than four and a half (4.7) times higher in the 25 to 64 year age group (a rate of 1,120 per 100,000 Indigenous population compared to 237 per 100,000 non-Indigenous).

**Table 13: Death rates by Indigenous status, age and sex,
Qld, SA, WA and NT, 1997-99**

Deaths per 100,000 population

Age (years)	Males	Females	Persons	Rate ratio ¹
Indigenous				
0-14	155	122	139	1.27*
15-24	296	111	204	2.67***
25-64	1,436	839	1,120	1.71***
65+	8,615	6,907	7,639	1.25***
Total	2,488	1,553	1,980	1.60***
Non-Indigenous²				
0-14	56	40	48	1.40***
15-24	98	38	69	2.58***
25-64	305	166	237	1.84***
65+	5,174	3,682	4,301	1.41***
Total	818	552	668	1.48***
Persons				
0-14	63	46	55	1.37***
15-24	107	41	75	2.61***
25-64	326	180	254	1.81***
65+	5,199	3,703	4,324	1.40***
Total	837	563	683	1.49***
Rate ratio³	3.04***	2.81***	2.96***	..

¹ Rate ratio is the ratio of the male to female death rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

² Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

³ Rate ratio is the ratio of the total Indigenous death rate to the total non-Indigenous rate.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

3.6 Deaths by Indigenous status and area of residence

Death rate among Indigenous people aged from 0 to 64 years were higher in the Rest of State/ Territory areas than in the metropolitan areas in each of the jurisdictions in the analysis (Figure 4 and Table 14). As noted under *Methods*, variations between the jurisdictions in these differences are likely to be influenced by variations in completeness of recording of Indigenous deaths.

Figure 4: Indigenous death rates (0 to 64 years) by area of residence, 1997-99

■ Capital cities/ other major urban centres ■ Rest of State/ Territory

Deaths per 100,000 population



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

The differential in Indigenous death rates was around one and a half times in Queensland (1.6 times higher in the Rest of Queensland when compared with rates in Brisbane, Gold Coast and Townsville–Thuringowa), South Australia (1.5 times) and Western Australia (1.5 times) (Table 14). The much lower differential of 1.2 (not statistically significant) in the Northern Territory is largely a result of the lower death rate for females living outside of Darwin. Females in the Rest of the Northern Territory have a rate of 730 deaths per 100,000 females, a differential of 0.9 (not statistically significant), or 90% of the female death rate in Darwin.

The largest differential in death rates is for females in Queensland, with 67% more deaths outside of Brisbane, Gold Coast and Townsville–Thuringowa than in these metropolitan areas (a differential of 1.67).

Table 14: Number and rate of Indigenous deaths (0 to 64 years) by sex and area of residence, Qld, SA, WA and NT, 1997-99

Area	Males		Females		Persons	
	No.	Rate ¹	No.	Rate ¹	No.	Rate ¹
Capital cities/ other major urban centres						
Brisbane, Gold Coast, Townsville-Thuringowa	167	571	93	279	260	396
Adelaide	57	651	38	372	95	501
Perth	118	696	74	392	192	536
Darwin	62	775	75	831	137	805
Total	404	642	280	392	684	509
Rest of State/ Territory						
Queensland	532	774	338	467	870	617
South Australia	113	958	62	524	175	739
Western Australia	373	1,067	205	569	578	814
Northern Territory	465	1,136	310	730	775	927
Total	1,483	949	915	564	2,398	752
Area	Rate ratio ²		Rate ratio ²		Rate ratio ²	
Queensland	1.36***		1.67***		1.56***	
South Australia	1.47*		1.41		1.48**	
Western Australia	1.53***		1.45**		1.52***	
Northern Territory	1.47**		0.88		1.15	
Total	1.48***		1.44***		1.48***	

¹ Rate is the number of deaths per 100,000 population.

² Rate ratio is the ratio of the death rate in the Rest of State/ Territory area to the death rate in the Capital cities/ other major urban centres; rate ratios differing significantly from 1.0 are shown with * p < 0.05;

** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

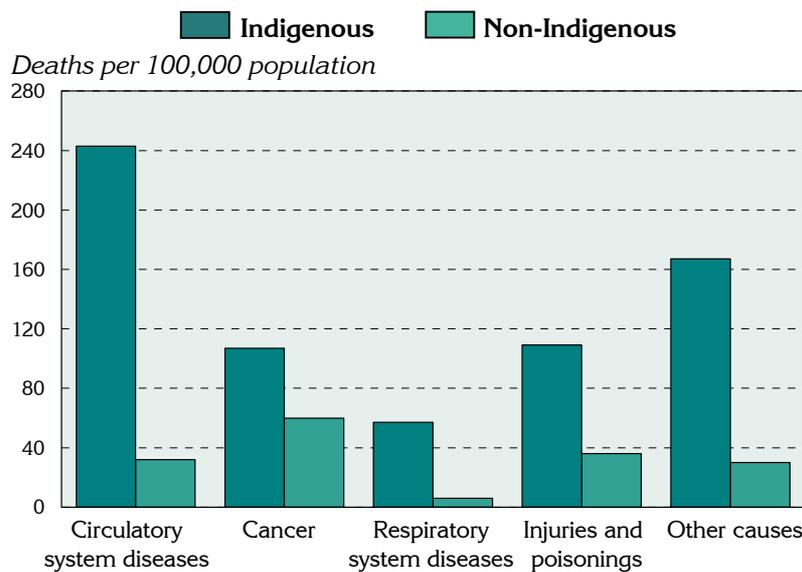
3.7 Deaths by Indigenous status and cause of death

The major causes of death of Indigenous people at ages 0 to 64 years over the years from 1997 to 1999 in the four jurisdictions in the analysis were (Figure 5 and Table 15):

- diseases of the circulatory system, a rate of 243 deaths per 100,000 population (two thirds of which are deaths from ischaemic heart disease);
- other causes¹⁵ (167 deaths per 100,000 population), the largest of which is deaths from diabetes mellitus (67 deaths per 100,000 population);
- the external causes of injuries and poisonings (109 deaths per 100,000 population); and
- cancer (neoplasms) (107 deaths per 100,000 population).

Death rates from these causes were all higher than in the non-Indigenous population. For example, deaths from diseases of the respiratory system were 9.5 times higher than in the non-Indigenous population (although there were fewer deaths from these causes than from the other major causes in the analysis), 7.6 times higher for diseases of the circulatory system and 5.6 times for the other causes group. Injuries and poisonings and cancer had the lowest differentials, with death rates in the Indigenous population 3.0 and 1.8 times higher, respectively, than in the non-Indigenous population.

Figure 5: Death rates (0 to 64 years) by Indigenous status and major cause, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

¹⁵ Other causes includes causes of death other than those listed at the major cause level of circulatory system diseases, cancer, respiratory system diseases and injuries and poisonings.

Table 15: Number and rate of deaths (0 to 64 years) by Indigenous status and selected cause, Qld, SA, WA and NT, 1997-99

Cause	Indigenous		Non-Indigenous ¹		Total		Rate ratio ³
	No.	Rate ²	No.	Rate ²	No.	Rate ²	
Circulatory system diseases							
Ischaemic heart disease	496	162	3,562	20	4,058	22	8.10***
Cerebrovascular disease (stroke)	105	31	906	5	1,011	6	6.20***
Other circulatory system diseases	198	52	1,151	7	1,349	7	7.43***
Total	799	243	5,619	32	6,418	35	7.59***
Cancer							
Cancer of trachea, bronchus & lung	95	33	2,170	12	2,265	13	2.75***
Other cancers	257	74	8,434	47	8,691	48	1.57***
Benign and unspecified cancer	7	2	121	1	128	1	2.00
Total	359	107	10,725	60	11,084	61	1.78***
Respiratory system diseases							
Chronic lower respiratory disease	110	33	759	4	869	5	8.25***
Other respiratory system diseases	104	22	330	2	434	2	11.00***
Total	214	57	1,089	6	1,303	7	9.50***
Injuries and poisonings							
Intentional self harm	203	35	2,568	14	2,771	15	2.50***
Motor vehicle transport accidents	186	27	1,640	9	1,826	10	3.00***
Other external causes	291	46	2,264	13	2,555	14	3.54***
Total	680	109	6,472	36	7,152	39	3.03***
Other causes							
Diabetes mellitus	217	67	439	3	656	4	22.33***
Perinatal conditions	125	10	559	3	684	4	3.33***
Sudden Infant death syndrome	65	6	210	1	275	2	6.00***
All other causes	667	118	4,122	23	4,789	26	5.13***
Total	1,074	167	5,330	30	6,404	35	5.57***
Total all causes	3,126	681	29,235	165	32,361	178	4.13***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the Indigenous death rate to the non-Indigenous rate; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

The difference in death rates at the major cause level for Indigenous males and females was most substantial for deaths resulting from injuries and poisonings (2.62 male deaths for each female death from these causes) and circulatory system diseases (2.03) (Table 16). Of the detailed causes, the male rate for intentional self-harm was over five times higher than that recorded for females (60 male deaths per 100,000 population, compared with 11 male deaths per 100,000 population). Indigenous male death rates for ischaemic heart disease and motor vehicle transport accidents were more than twice those for Indigenous females aged 0 to 64.

**Table 16: Number and rate of Indigenous deaths (0 to 64 years)
by sex and selected cause, Qld, SA, WA and NT, 1997-99**

Cause	Males		Females		Rate ratio ²
	No.	Rate ¹	No.	Rate ¹	
Circulatory system diseases					
Ischaemic heart disease	346	242	150	92	2.63***
Cerebrovascular disease (stroke)	57	36	48	27	1.33
Other circulatory system diseases	111	61	87	43	1.42*
Total	514	333	285	164	2.03***
Cancer					
Cancer of the trachea, bronchus & lung	56	42	39	25	1.68*
Other cancers	128	78	129	70	1.11
Benign and unspecified cancer	5	2	#	..	..
Total	189	119	170	95	1.25*
Respiratory system diseases					
Chronic lower respiratory disease	65	41	45	25	1.64**
Other respiratory system diseases	55	24	49	20	1.20
Total	120	67	94	47	1.43**
Injuries and poisonings					
Intentional self harm	169	60	34	11	5.45***
Motor vehicle transport accidents	128	38	58	17	2.24***
Other external causes	189	61	102	32	1.91***
Total	486	160	194	61	2.62***
Other causes					
Diabetes mellitus	109	72	108	63	1.14
Perinatal conditions	77	12	48	8	1.50*
Sudden Infant death syndrome	36	6	29	5	1.20
All other causes	378	136	289	100	1.36***
Total	600	188	474	146	1.29***
Total all causes	1,909	862	1,217	512	1.68***

¹ Rate is the number of deaths per 100,000 population.

² Rate ratio is the ratio of the male to female death rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

not shown, as there are fewer than 5 cases.

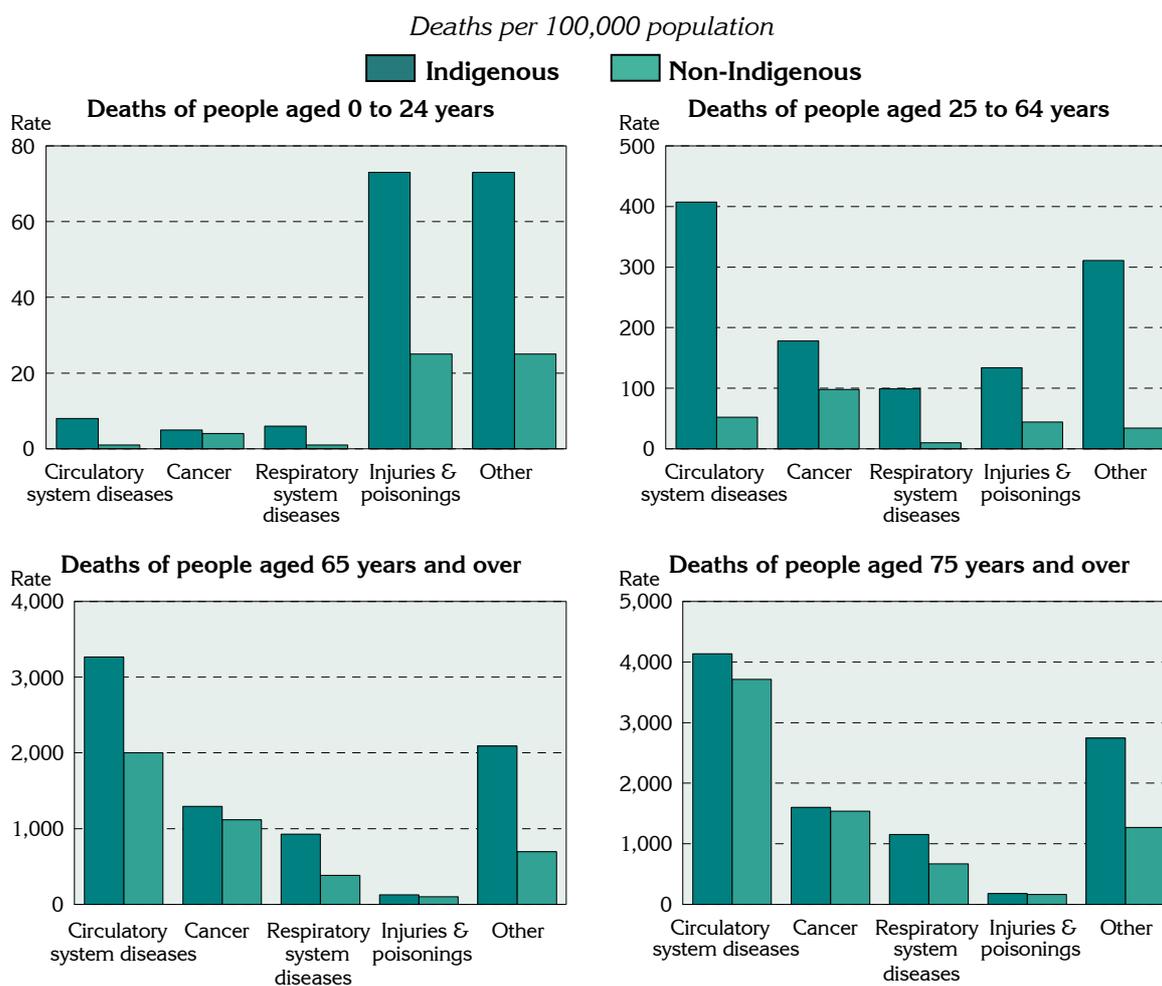
Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

3.8 Deaths by Indigenous status, cause of death and age

As the leading cause of death among Indigenous people, deaths from diseases of the circulatory system are also the predominant cause of death among adults at each of the ages in this analysis (Figure 6 and Table 17). The next highest rates are for cancer.

For Indigenous people aged 0 to 24 years, the leading causes of death were the 'other' causes and injuries and poisonings (both 73 deaths per 100,000 population) which is more than nine times higher than the next prevalent cause, circulatory system diseases (8 deaths per 100,000 population).

Figure 6: Death rates by Indigenous status, age and major cause, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Indigenous death rates for all major causes of death and across all age groups were substantially higher than those recorded in the non-Indigenous population. The difference is most striking for deaths at ages 25 to 64 years from respiratory system diseases, with almost ten times more Indigenous deaths, and from circulatory system diseases (almost eight times more).

The differential between Indigenous and non-Indigenous death rates for these causes, although still substantial, is lowest at older ages. For example, there are over four and a

half times more Indigenous than non-Indigenous deaths in the 25 to 65 year age group, compared with under one and a half times for people aged 75 years and over.

Table 17: Number and rate of deaths by Indigenous status, age and major cause, Qld, SA, WA and NT, 1997-99

Age and cause	Indigenous		Non-Indigenous ¹		Total		Rate ratio ³
	No.	Rate ²	No.	Rate ²	No.	Rate ²	
0 to 24 years							
Circulatory system diseases	31	8	97	1	128	2	8.00***
Cancer	23	5	300	4	323	4	1.25
Respiratory system diseases	28	6	74	1	102	1	6.00
Injuries and poisonings	276	73	1,787	25	2,063	28	2.92***
Other causes	354	73	1,725	25	2,079	28	2.92***
Total	712	164	3,983	57	4,695	63	2.88***
25 to 64 years							
Circulatory system diseases	768	407	5,522	52	6,290	58	7.83***
Cancer	336	178	10,425	98	10,761	99	1.82***
Respiratory system diseases	186	99	1,015	10	1,201	11	9.90***
Injuries and poisonings	404	134	4,685	44	5,089	46	3.05***
Other causes	720	311	3,605	34	4,325	40	9.15***
Total	2,414	1,120	25,252	237	27,666	254	4.73***
65 years and over							
Circulatory system diseases	519	3,267	47,782	2,003	48,301	2,012	1.63***
Cancer	228	1,295	26,638	1,118	26,866	1,119	1.16*
Respiratory system diseases	151	926	9,190	385	9,341	389	2.41***
Injuries and poisonings	21	125	2,352	99	2,373	99	1.26
Other causes	333	2,088	16,601	696	16,934	705	3.00***
Total	1,252	7,633	102,563	4,301	103,815	4,324	1.77***
75 years and over							
Circulatory system diseases	258	4,137	38,269	3,712	38,527	3,714	1.11
Cancer	100	1,603	15,864	1,539	15,964	1,539	1.04
Respiratory system diseases	72	1,154	6,915	671	6,987	674	1.72***
Injuries and poisonings	11	176	1,682	163	1,693	163	1.08
Other causes	172	2,774	13,084	1,269	13,256	1,278	2.19***
Total	613	9,828	75,814	7,353	76,427	7,368	1.34***
Total all ages and all causes	4,378	1,980	131,798	668	136,176	683	2.96***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the Indigenous death rate to the non-Indigenous rate; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

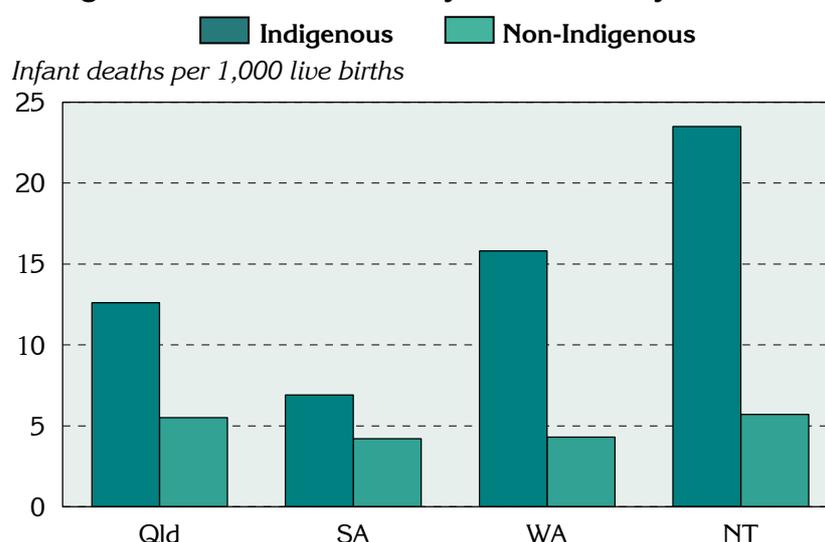
3.9 Infant deaths

Infant death rates¹⁶ are recognised internationally as an indicator of health status. Over the period from 1997 to 1999, there were 292 Indigenous infant deaths in the combined jurisdictions of Queensland, South Australia, Western Australia and the Northern Territory, a rate of 15.0 deaths per 1,000 live births. Infant death rates are substantially higher than for the non-Indigenous population in each of the jurisdictions, an overall differential of 3.06, with 15.0 Indigenous infant deaths per 1,000 live births compared with 4.9 non-Indigenous infant deaths per 1,000 live births) (Figure 7 and Table 18).

¹⁶ Infant deaths (deaths under 12 months of age) per 1,000 live births.

The largest differential was recorded in the Northern Territory (a differential in Indigenous and non-Indigenous rates of 4.1). Western Australia and Queensland had the next largest differentials, of 3.6 and 2.3, respectively. The South Australian Indigenous rate was substantially lower than the average, with 6.9 infant deaths per 1,000 births (a differential of 1.6, not statistically significant).

Figure 7: Infant death rates by State/ Territory, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

Table 18: Number and rate of infant deaths by Indigenous status and State/ Territory, 1997-99

State/ Territory	Indigenous		Non-Indigenous ¹		Total		Rate ratio ³
	No.	Rate ²	No.	Rate ²	No.	Rate ²	
Queensland	115	12.6	720	5.5	835	6.0	2.29***
South Australia	13	6.9	223	4.2	236	4.3	1.64
Western Australia	71	15.8	300	4.3	371	5.0	3.67***
Northern Territory	93	23.5	39	5.7	132	12.2	4.12***
Total	292	15.0	1,282	4.9	1,574	5.6	3.06***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of infant deaths per 1,000 live births.

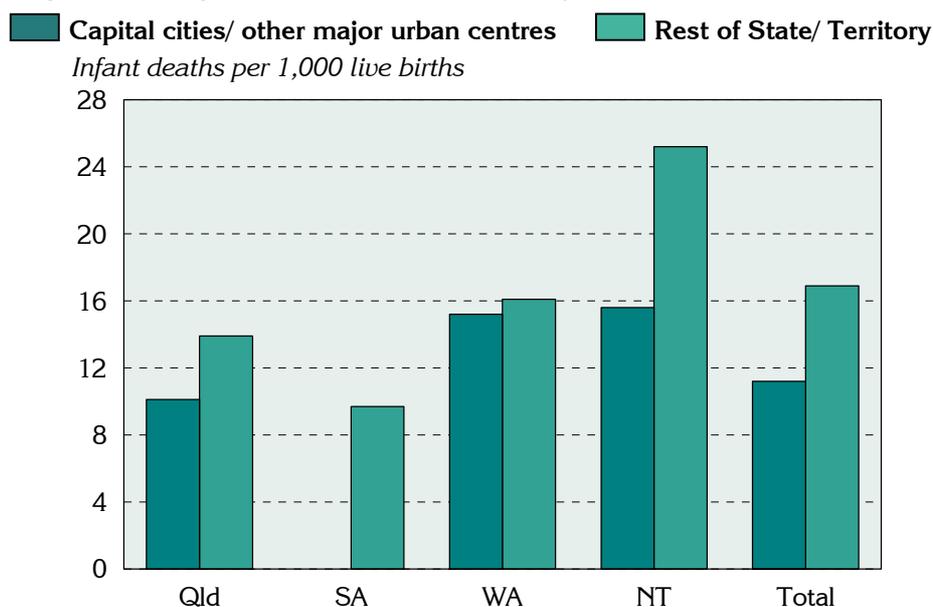
³ Rate ratio is the ratio of the Indigenous death rate to the non-Indigenous rate; rate ratios differing significantly from 1.0 are shown with * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

The Indigenous infant death rate was higher in the Rest of State/ Territory areas than in the metropolitan areas (capital cities and other major urban centres) in each of the jurisdictions in the analysis (Figure 8 and Table 19). The differentials in metropolitan/ non-metropolitan rates were: Northern Territory, 1.6; Queensland, 1.4; and Western Australia, 1.1, none of which were statistically significant.

The Indigenous infant death rate was also higher than that for non-Indigenous infants in all metropolitan and non-metropolitan areas. The largest differentials for the capital cities were in Perth (where the Indigenous infant death rate was 3.5 times the non-Indigenous rate) and Darwin (3.2 times). In the non-metropolitan areas the differentials were also greatest in the Northern Territory (where the Indigenous infant death rate was 3.8 times the non-Indigenous rate) and Western Australia (3.7 times).

Figure 8: Indigenous infant death rates by area of residence, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

Table 19: Number and rate of infant deaths by Indigenous status and area of residence, 1997-99

Area	Indigenous		Non-Indigenous ¹		Total		Rate ratio ³
	No.	Rate ²	No.	Rate ²	No.	Rate ²	
Capital cities/ other major urban centres							
Brisbane, Gold Coast, Townsville–Thuringowa	31	10.1	421	5.4	452	5.6	1.87**
Adelaide	#	..	160	4.2	164	4.2	..
Perth	26	15.2	215	4.3	241	4.6	3.53***
Darwin	11	15.6	19	4.9	30	6.6	3.18**
Total	..	11.2	815	4.8	887	5.0	2.33***
Rest of State/ Territory							
Queensland	84	13.9	299	5.6	383	6.4	2.48***
South Australia	9	9.7	63	4.4	72	4.8	2.20*
Western Australia	45	16.1	85	4.3	130	5.8	3.74***
Northern Territory	82	25.2	20	6.7	102	16.4	3.76***
Total	220	16.9	467	5.2	687	6.6	3.25***
Area	Rate ratio⁴		Rate ratio⁴		Rate ratio⁴		
Queensland	1.38		1.04		1.14		
South Australia	..		1.05		1.14		
Western Australia	1.06		1.00		1.26*		
Northern Territory	1.62		1.37		2.48***		
Total	1.51**		1.08		1.32***		

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of infant deaths per 1,000 live births.

³ Rate ratio is the ratio of the Indigenous death rate to the non-Indigenous rate; rate ratios differing significantly from 1.0 are shown with * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

⁴ Rate ratio is the ratio of the death rate in the Rest of State/ Territory area to the death rate in the Capital cities/ other major urban centres.

not shown, as there are fewer than 5 cases.

Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

4. Deaths by quintile of socioeconomic disadvantage of area

4.1 Overview

Death rates in this section have been calculated by quintile of socioeconomic disadvantage of area for the combined areas of Queensland, South Australia, Western Australia and the Northern Territory. The calculation of rates by quintile and the particular measure of socioeconomic disadvantage used (the IRSD) are described in the Glossary and in Section 2.5, *Socioeconomic status*. Readers should be aware of both the discussion in Section 2.5 on the appropriateness of the IRSD as a measure of socioeconomic disadvantage for Indigenous people; and the additional analysis in Section 6 using an alternative measure of Indigenous disadvantage, the Experimental General Index.

To the extent that the quintiles reflect a geographic split, then the results of the analysis by quintile of socioeconomic disadvantage of area may also be affected by regional variations in the completeness of coverage of Indigenous deaths. An analysis of deaths by the ABS Section of State classification (described in footnote 13, page 10) and quintile of socioeconomic disadvantage of area shows that 83.7% of deaths in Quintile 1 are of people living in urban areas; and that up to 73.1% of deaths in Quintile 5 are of people living in rural areas. That is, the majority of areas in Quintile 1 are 'urban' areas, and the majority of those in Quintile 5 are 'rural' areas.

Death rates vary between the areas of greatest socioeconomic disadvantage (Quintile 5) and those of least socioeconomic disadvantage (Quintile 1). Although the death rates in Quintile 5 are highest for both males and females in the 0 to 64 year age group, the extent of the variation differs, at times markedly, between age groups, by sex and by Indigenous status.

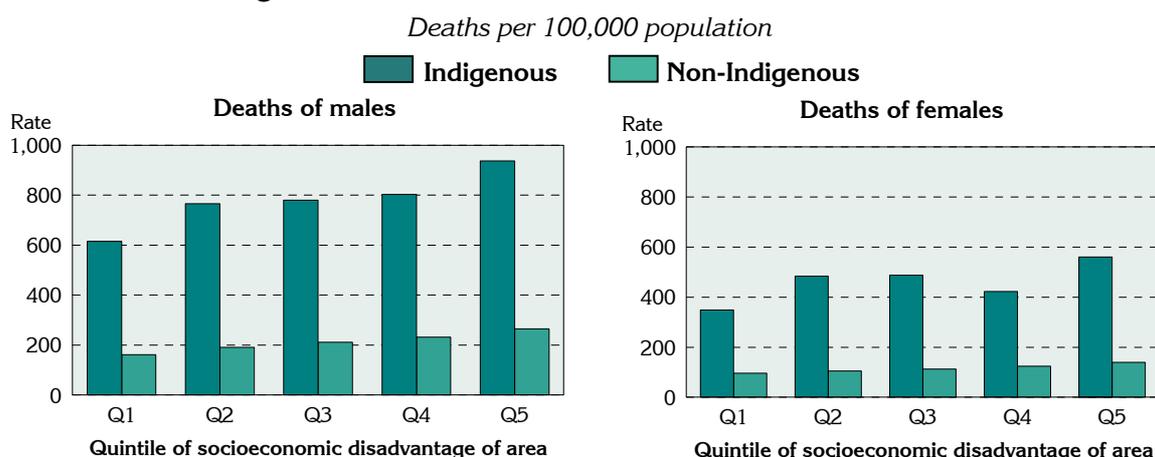
4.2 Deaths by socioeconomic disadvantage of area and sex

Male death rates are higher than female death rates for both Indigenous and non-Indigenous populations overall and in each quintile of socioeconomic disadvantage of area (Figure 9 and Table 20). The ratio of male to female death rates is higher in the non-Indigenous population than in the Indigenous population, both overall and in three of the five quintiles.

The differential between death rates in Quintile 5 and Quintile 1 for Indigenous males (a rate ratio of 1.52) is lower than for Indigenous females (1.61). However, for the non-Indigenous population, the differential is higher for males (a rate ratio of 1.63 for males, and 1.44 for females).

For the Indigenous population, there is no clear pattern across the quintiles. For the non-Indigenous population, however, the ratio of male to female deaths generally increases with increasing socioeconomic disadvantage of area.

Figure 9: Death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Indigenous status and sex, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table 20: Death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Indigenous status and sex, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

Quintile	Indigenous			Non-Indigenous ¹		
	Males	Females	Rate ratio ²	Males	Females	Rate ratio ²
1: Least disadvantaged	615	349	1.76***	162	97	1.67***
2	766	483	1.59***	191	105	1.82***
3	780	488	1.60***	212	112	1.89***
4	803	423	1.90***	232	124	1.87***
5: Most disadvantaged	937	560	1.67***	264	139	1.90***
Total	862	512	1.68***	212	115	1.84***
Rate ratio³	1.52***	1.61***	..	1.63***	1.44***	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of the male to female death rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

³ Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1.

Note: The numbers on which the rates in this analysis are based are in Table A2, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

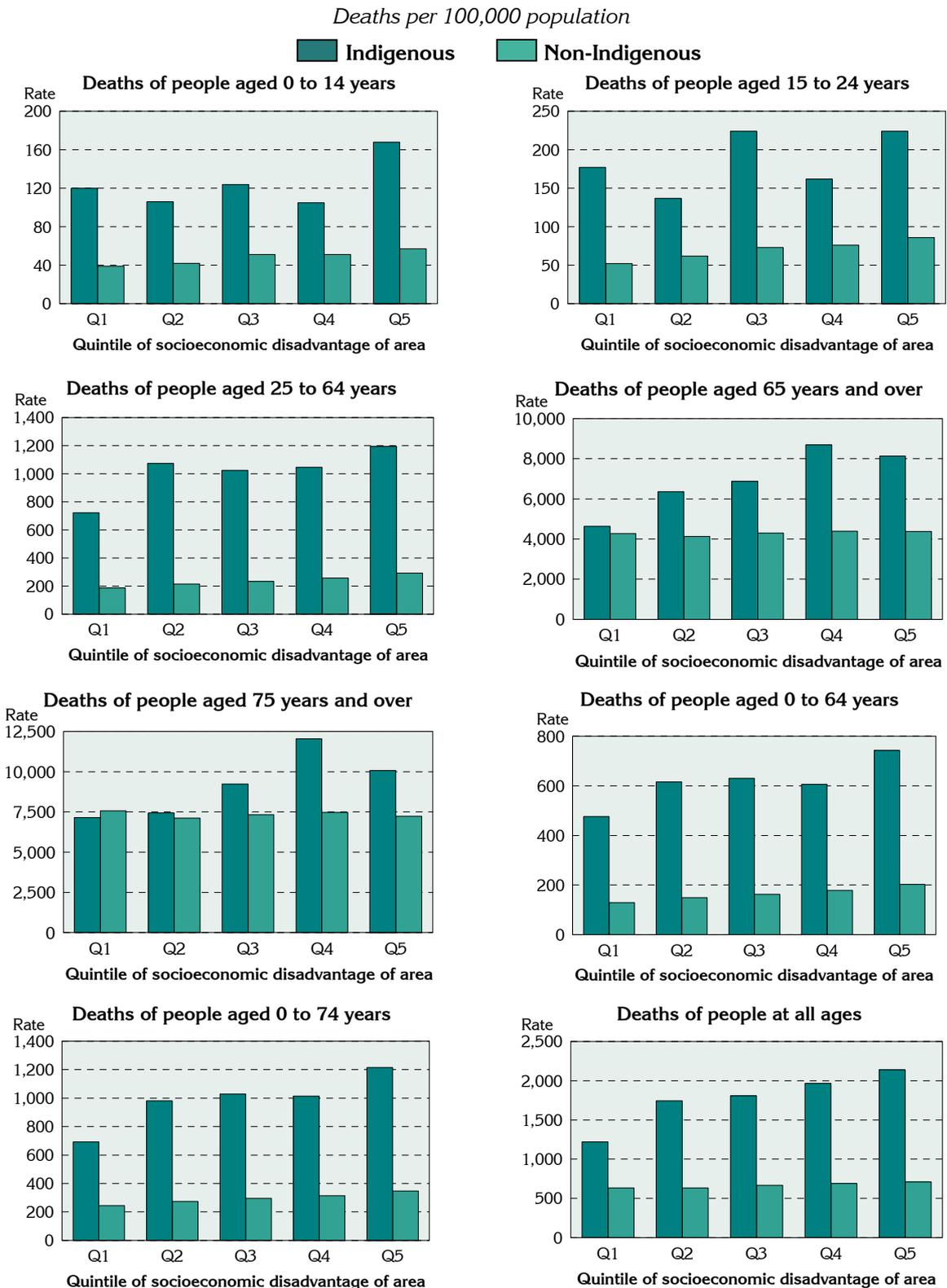
4.3 Deaths by socioeconomic disadvantage of area and age

The charts and table for death rates at 'all ages' (Figure 10 and Table 21) show death rates for the Indigenous population increasing markedly from Quintile 1 to Quintile 2; then increasing more steadily through to Quintile 5. There is a similar pattern for deaths at ages 0 to 64 years and 0 to 74 years (albeit with a very small drop in rates in Quintile 4, and a larger increase to Quintile 5). However, the pattern of death rates across the quintiles at the other age groups shown is far more variable. For example, there is no noticeable pattern across the quintiles for the 0 to 14 and 15 to 24 year age groups (although in both cases death rates in Quintile 5 are higher than in Quintile 1).

For the non-Indigenous population there is no increase in death rates at 'all ages' between Quintile 1 and Quintile 2, with relatively small increases to each of the next three quintiles.

At ages 0 to 64 and 0 to 74 years, the pattern is more like that for the Indigenous population, with the largest increases in death rates between Quintiles 1 and 2 and Quintiles 4 and 5. Non-Indigenous deaths in the 65 and 75 year and over age groups show the smallest variations across the quintiles.

Figure 10: Death rates by quintile of socioeconomic disadvantage of area, Indigenous status and age, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Indigenous death rates are substantially higher than those in the non-Indigenous population across all quintiles and in most age groups; the exception is for people aged 65 years and over. Death rates for Indigenous people in Quintile 1 aged 65 years and over were only 8.5% higher than those recorded in the non-Indigenous population, and were 5.4% lower in Quintile 1 for those aged 75 years and over.

Despite the markedly higher overall death rates experienced by the Indigenous population (a differential of 4.06, Table 11), the rate ratios for both the Indigenous and non-Indigenous populations in the 0 to 64 year age group are the same (1.56 times higher in Quintile 5 areas than in the Quintile 1 areas).

At ages 0 to 14 and 15 to 24 years the differentials between Quintile 5 and Quintile 1 areas are greater in the non-Indigenous population than in the Indigenous population, with the Indigenous differentials not statistically significant, although the non-Indigenous rates themselves are around one third of the Indigenous rates.

The rate ratio between Quintile 5 and Quintile 1 areas for the Indigenous population is largest for the age group 65 years and over (1.76), the same rate ratio as recorded for deaths at all ages; the second largest differential is in the 25 to 64 year age group (1.65). For the non-Indigenous population, the rate ratio between Quintile 5 and Quintile 1 areas is greatest at ages 15 to 24 years (1.65) and ages 25 to 64 years (1.56).

Table 21: Death rates by quintile of socioeconomic disadvantage of area, Indigenous status and age, Qld, SA, WA and NT, 1997-99

Quintile and age	Indigenous		Non-Indigenous ¹	
	Rate ²	Rate ratio ³	Rate ²	Rate ratio ³
0 to 14 years				
1: Least disadvantaged	120	..	39	..
2	106	0.88	42	1.08
3	124	1.03	51	1.31 ^{***}
4	105	0.88	51	1.31 ^{***}
5: Most disadvantaged	168	1.40	57	1.46 ^{***}
15 to 24 years				
1: Least disadvantaged	177	..	52	..
2	137	0.77	62	1.19 [*]
3	224	1.27	73	1.40 ^{***}
4	162	0.92	76	1.46 ^{***}
5: Most disadvantaged	224	1.27	86	1.65 ^{***}
25 to 64 years				
1: Least disadvantaged	723	..	187	..
2	1,074	1.49 ^{***}	214	1.14 ^{***}
3	1,024	1.42 ^{**}	232	1.24 ^{***}
4	1,047	1.45 ^{***}	257	1.37 ^{***}
5: Most disadvantaged	1,195	1.65 ^{***}	292	1.56 ^{***}
65 years and over				
1: Least disadvantaged	4,633	..	4,272	..
2	6,353	1.37 [*]	4,135	0.97 ^{***}
3	6,881	1.49 ^{**}	4,303	1.01
4	8,686	1.87 ^{***}	4,387	1.03 ^{**}
5: Most disadvantaged	8,132	1.76 ^{***}	4,376	1.02 [*]
75 years and over				
1: Least disadvantaged	7,156	..	7,567	..
2	7,441	1.04	7,112	0.94 ^{***}
3	9,244	1.29	7,335	0.97 ^{**}
4	12,050	1.68 ^{**}	7,470	0.99
5: Most disadvantaged	10,081	1.41 [*]	7,235	0.96 ^{***}
0 to 64 years				
1: Least disadvantaged	476	..	130	..
2	616	1.29 [*]	149	1.15 ^{***}
3	631	1.33 ^{**}	163	1.25 ^{***}
4	606	1.27 [*]	178	1.37 ^{***}
5: Most disadvantaged	743	1.56 ^{***}	203	1.56 ^{***}
0 to 74 years				
1: Least disadvantaged	693	..	245	..
2	981	1.42 ^{***}	273	1.11 ^{***}
3	1,029	1.48 ^{***}	297	1.21 ^{***}
4	1,015	1.46 ^{***}	314	1.28 ^{***}
5: Most disadvantaged	1,215	1.75 ^{***}	347	1.42 ^{***}
All ages				
1: Least disadvantaged	1,219	..	633	..
2	1,746	1.43 ^{***}	632	1.00
3	1,808	1.48 ^{***}	667	1.05 ^{***}
4	1,967	1.61 ^{***}	691	1.09 ^{***}
5: Most disadvantaged	2,140	1.76 ^{***}	710	1.12 ^{***}

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the rate in the quintile under analysis to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Note: The numbers on which the rates in this analysis are based are in Table A2, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

4.4 Deaths by socioeconomic disadvantage of area, sex and age

Male and female Indigenous death rates generally increase as the level of disadvantage increases (Table 22); exceptions are the 0 to 14; 15 to 24 and 75 years and over age groups.

For the non-Indigenous population, the differential across the quintiles was more pronounced for males in the majority of age groups. The highest differential for males was at ages 15 to 24 (1.82) and for females was at ages 0 to 14 (1.58). However, for females aged 65 years and over and males and females aged 75 years and over there was a lower death rate in the most disadvantaged areas. No gradient is apparent in the death rates in these older age groups.

Table 22: Death rates¹ by quintile of socioeconomic disadvantage of area, Indigenous status, sex and age, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

Quintile and age	Indigenous			Non-Indigenous ²		
	Males	Females	Persons	Males	Females	Persons
0 to 14 years						
1: Least disadvantaged	112	129	120	47	31	39
2	112	99	106	50	34	42
3	146	101	124	57	45	51
4	121	88	105	59	42	51
5: Most disadvantaged	187	148	168	65	49	57
Rate ratio³	1.68	1.15	1.40	1.38***	1.58***	1.46***
15 to 24 years						
1: Least disadvantaged	291	#	177	71	33	52
2	165	110	137	90	32	62
3	337	105	224	106	37	73
4	226	100	162	102	47	76
5: Most disadvantaged	332	115	224	129	40	86
Rate ratio³	1.14	..	1.27	1.82***	1.19	1.65***
25 to 64 years						
1: Least disadvantaged	953	521	723	232	141	187
2	1,393	809	1,074	274	153	214
3	1,249	820	1,024	302	159	232
4	1,424	710	1,047	336	177	257
5: Most disadvantaged	1,521	902	1,195	381	202	292
Rate ratio³	1.60***	1.73***	1.65***	1.64***	1.43***	1.56***
65 years and over						
1: Least disadvantaged	5,282	4,270	4,633	5,050	3,780	4,272
2	7,148	5,823	6,353	4,914	3,589	4,135
3	7,007	6,779	6,881	5,239	3,626	4,303
4	11,683	6,636	8,686	5,305	3,712	4,387
5: Most disadvantaged	8,871	7,531	8,132	5,299	3,677	4,376
Rate ratio³	1.68*	1.76***	1.76***	1.05***	0.97*	1.02*
75 years and over						
1: Least disadvantaged	6,790	7,317	7,156	8,653	6,946	7,567
2	7,143	7,619	7,441	8,148	6,458	7,112
3	9,167	9,306	9,244	8,510	6,563	7,335
4	14,493	10,497	12,050	8,601	6,708	7,470
5: Most disadvantaged	10,805	9,464	10,081	8,342	6,469	7,235
Rate ratio³	1.59	1.29	1.41*	0.96*	0.93***	0.96***
0 to 74 years						
1: Least disadvantaged	899	511	693	315	180	245
2	1,214	780	981	352	196	273
3	1,253	825	1,029	391	203	297
4	1,368	699	1,015	414	216	314
5: Most disadvantaged	1,521	942	1,215	453	241	347
Rate ratio³	1.69***	1.84***	1.75***	1.44***	1.34***	1.42***
All ages						
1: Least disadvantaged	1,626	937	1,219	748	551	633
2	2,190	1,402	1,746	765	530	632
3	2,165	1,495	1,808	825	542	667
4	2,671	1,388	1,967	852	564	691
5: Most disadvantaged	2,638	1,702	2,140	881	571	710
Rate ratio³	1.62***	1.82***	1.76***	1.18***	1.04**	1.12***

¹ The Total death rates for each age group, by Indigenous status and sex, are shown in Table A3 in Appendix 2.

² Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

³ Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

not calculated, as there are fewer than 5 cases.

Note: The numbers on which the rates in this analysis are based are in Table A2, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

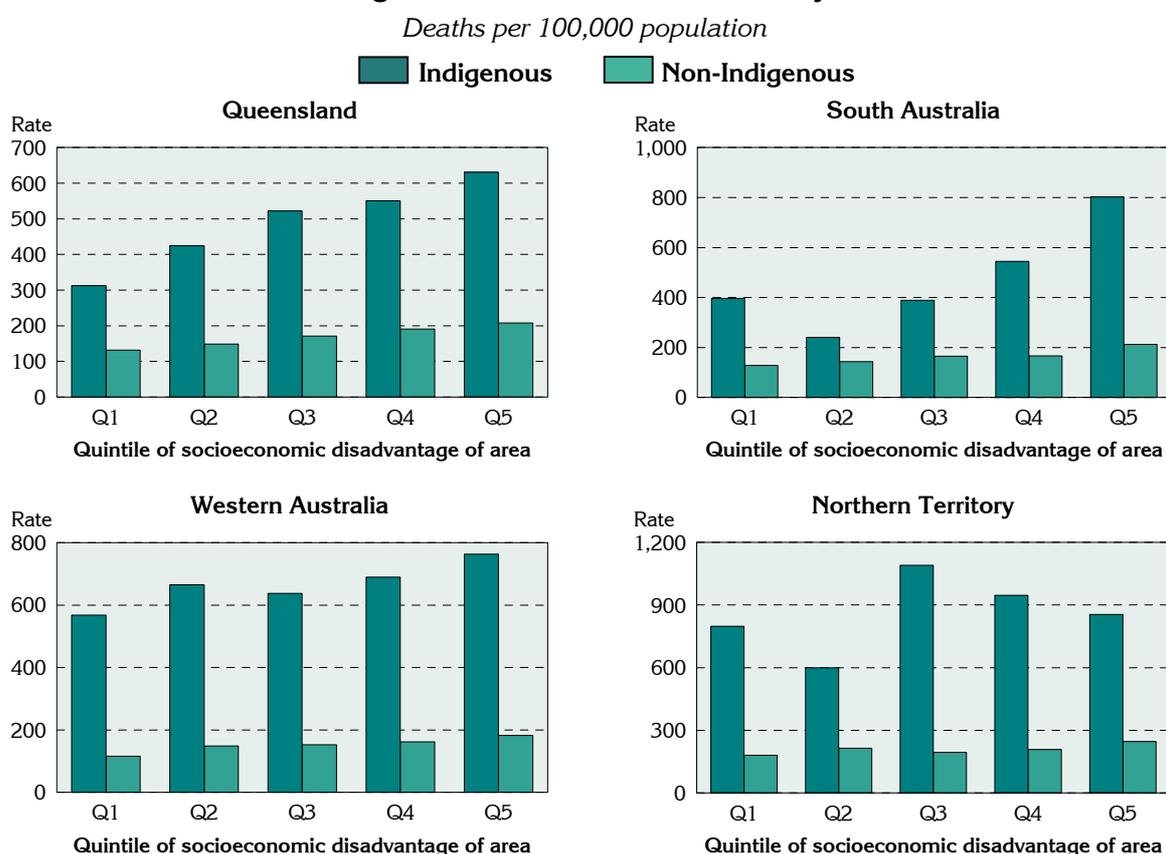
4.5 Deaths by socioeconomic disadvantage of area and State/ Territory

Figure 11 shows death rates per 100,000 population by quintile of socioeconomic disadvantage of area for the Northern Territory and the States in this analysis. The data on which the chart is based is in Table A4 in Appendix 2.

Indigenous death rates were at least twice (often three or four times) those for non-Indigenous deaths across all quintiles and in each of the States/ Territory, with the exception of Quintile 2 in South Australia where the Indigenous death rate was lower (and only 32% above the non-Indigenous rate).

The differential in death rates between Quintile 5 and Quintile 1 was higher for the Indigenous population than for the non-Indigenous population in both Queensland and South Australia, both with the differentials just over 2.0 for the Indigenous population; and between 1.50 and 1.70 for the non-Indigenous population (Table A4, Appendix 2).

Figure 11: Death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Indigenous status and State/ Territory, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

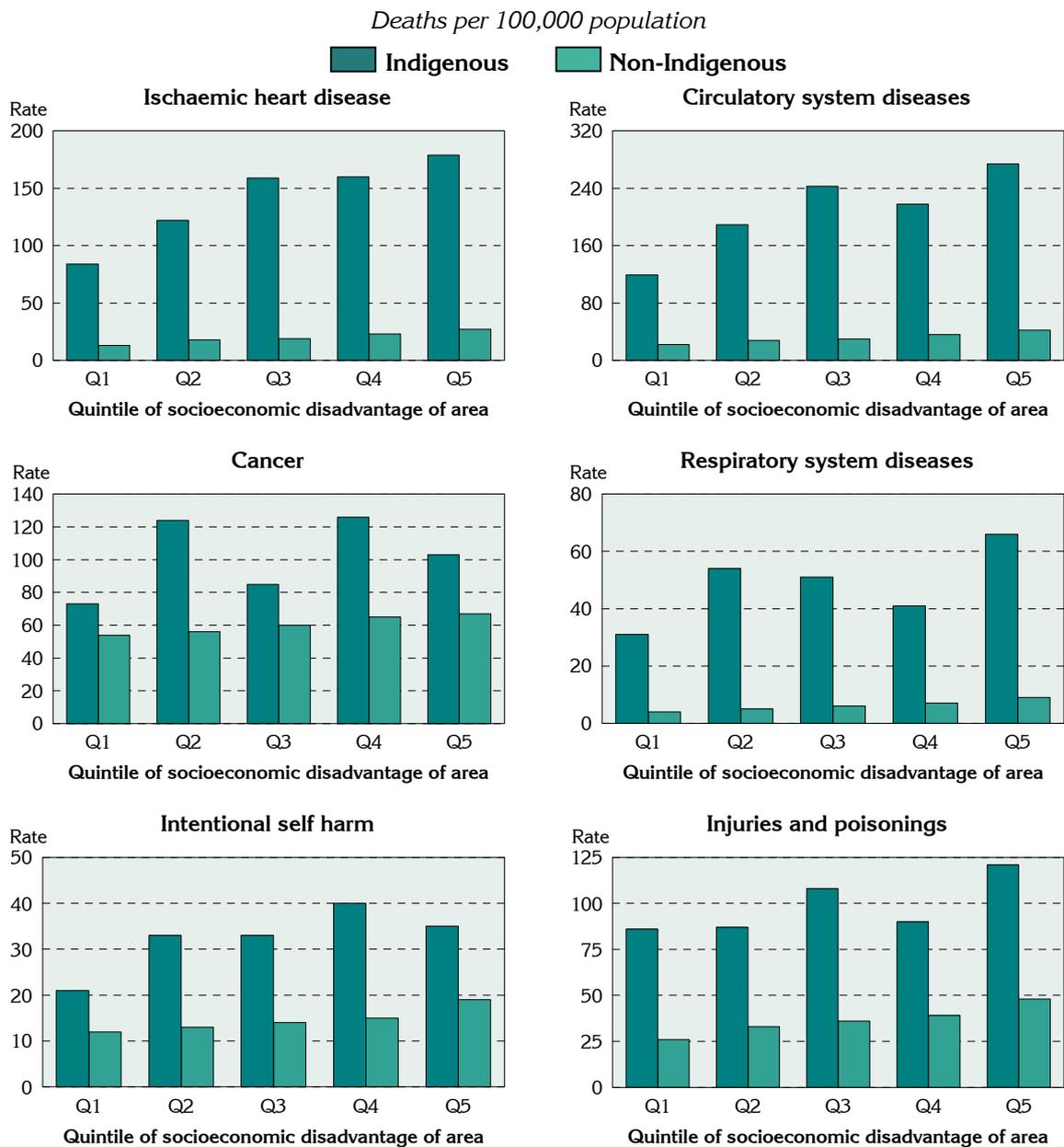
4.6 Deaths by socioeconomic disadvantage of area and cause of death

There is some variability across the quintiles in cause of death at ages 0 to 64 years (Figure 12 and Table 23); however, the pattern for the Indigenous population is generally for the highest socioeconomic status SLAs (those in Quintile 1) to have the lowest rates and for the most disadvantaged SLAs (those in Quintile 5) to have the highest rates. The exceptions are Indigenous deaths from cancer and intentional self-harm (with the highest rates recorded in Quintile 4 in both cases: note the similarly high death rate in Quintile 2

for cancer deaths). The largest differential in Indigenous death rates between Quintile 5 and Quintile 1 areas was recorded for deaths from circulatory system diseases, a differential of 2.30, with a differential of 2.13 for ischaemic heart disease (differentials by sex are described on page 37). For non-Indigenous people there is a gradient in death rates for all causes, with rates increasing as the level of disadvantage increases. The highest differentials recorded were for respiratory system diseases, a differential of 2.25, followed by ischaemic heart disease, a differential of 2.08.

The differential in both the Indigenous and non-Indigenous deaths rates from cancer is less marked than for the other causes of death. The Indigenous cancer rates ranged from 73 deaths per 100,000 population in Quintile 1 to 103 in Quintile 5 (a differential of 1.41, and not statistically significant), and from 54 to 67 among the non-Indigenous (1.24).

Figure 12: Death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Indigenous status and selected cause, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table 23: Death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Indigenous status, sex and selected cause, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

Quintile and cause	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
Ischaemic heart disease						
1: Least disadvantaged	103	68	84	21	5	13
2	195	63	122	29	6	18
3	227	97	159	30	7	19
4	253	78	160	36	10	23
5: Most disadvantaged	263	105	179	43	11	27
Total	242	92	162	32	8	20
Rate ratio²	2.56**	1.54	2.13**	2.05***	2.20***	2.08***
Circulatory system diseases						
1: Least disadvantaged	160	83	119	32	11	22
2	269	123	189	42	14	28
3	306	185	243	44	15	30
4	308	136	218	52	20	36
5: Most disadvantaged	376	183	274	61	23	42
Total	333	164	243	46	16	32
Rate ratio²	2.35***	2.19*	2.30***	1.91***	2.09***	1.91***
Cancer						
1: Least disadvantaged	94	55	73	54	53	54
2	151	101	124	58	53	56
3	101	70	85	66	54	60
4	151	104	126	75	54	65
5: Most disadvantaged	107	99	103	75	59	67
Total	119	95	107	66	55	60
Rate ratio²	1.13	1.82	1.41	1.39***	1.11*	1.24***
Respiratory system diseases						
1: Least disadvantaged	#	#	31	4	4	4
2	76	35	54	6	5	5
3	60	43	51	7	5	6
4	46	37	41	8	5	7
5: Most disadvantaged	77	56	66	10	8	9
Total	67	47	57	7	5	6
Rate ratio²	..	..	2.13	2.50***	2.00***	2.25***
Intentional self harm						
1: Least disadvantaged	37	#	21	19	5	12
2	51	17	33	21	5	13
3	58	#	33	22	5	14
4	74	9	40	23	6	15
5: Most disadvantaged	59	12	35	31	7	19
Total	60	11	35	23	6	14
Rate ratio²	1.51	..	1.67	1.63***	1.40*	1.58***
Injuries and poisonings						
1: Least disadvantaged	121	54	86	41	12	26
2	123	54	87	51	14	33
3	160	57	108	56	16	36
4	149	35	90	57	19	39
5: Most disadvantaged	173	71	121	74	22	48
Total	160	61	109	56	17	36
Rate ratio²	1.43	1.31	1.41	1.80***	1.83***	1.85***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

not calculated, as there are fewer than 5 cases.

Note: The numbers on which the rates in this analysis are based are in Table A5, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Variations across the quintiles of socioeconomic disadvantage of area in male and female death rates for selected causes of death at ages 0 to 64 years are shown in Table 23. The most substantial variation in the differentials in death rates for the Indigenous were for male deaths from ischaemic heart disease (a rate ratio of 2.56) and deaths from circulatory system diseases (2.35 for males; 2.19 for females); for some of the causes there were insufficient cases to include the results. For the non-Indigenous population, the variation in male and female death rates is not consistent, with males having larger socioeconomic differentials for cancer, respiratory system diseases and intentional self harm, and females having larger socioeconomic differentials (although based on much lower death rates than for males) for ischaemic heart disease, circulatory disease and injuries and poisonings.

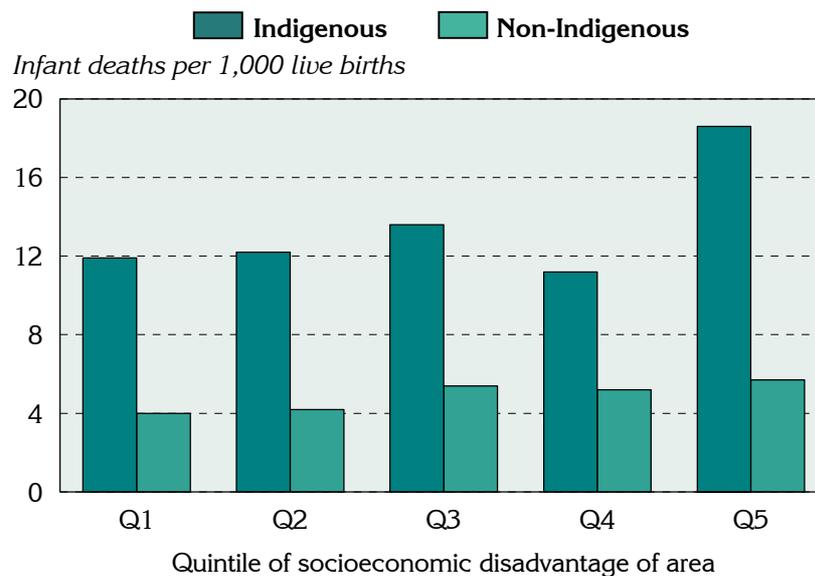
The gradients in male and female death rates across the quintiles of socioeconomic disadvantage of area are all continuous for the non-Indigenous population; however, this is not the case for the Indigenous population.

4.7 Infant deaths by socioeconomic disadvantage of area

Indigenous infant death rates (infant deaths per 1,000 live births) are higher than non-Indigenous death rates in each quintile of socioeconomic disadvantage of area (Figure 13 and Table 24). Indigenous rates increase from 11.9 infant deaths per 1,000 live births in the high socioeconomic status areas (Quintile 1) to 18.6 infant deaths per 1,000 live births in the low socioeconomic status areas (Quintile 5). The lower rate of 11.2 infant deaths per 1,000 live births in Quintile 4 breaks the pattern of increasing rates across the quintiles.

Infant death rates for the non-Indigenous population range from 4.0 infant deaths per 1,000 live births in Quintile 1 to 5.7 infant deaths per 1,000 live births in Quintile 5. This is less than half the rate for Indigenous infants in high socioeconomic status areas. There is a differential in non-Indigenous infant death rates between Quintile 1 and Quintile 5 areas of 1.43; the difference for the Indigenous infant death rate is higher, at 1.56, but is not statistically significant.

Figure 13: Infant death rates by quintile of socioeconomic disadvantage of area and Indigenous status, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

Table 24: Infant death rates by quintile of socioeconomic disadvantage of area and Indigenous status, Qld, SA, WA and NT, 1997-99

Quintile	Indigenous		Non-Indigenous ¹		Total	
	No.	Rate ²	No.	Rate ²	No.	Rate ²
1: Least disadvantaged	14	11.9	188	4.0	202	4.2
2	27	12.2	222	4.2	249	4.5
3	45	13.6	298	5.4	343	5.9
4	46	11.2	283	5.2	329	5.6
5: Most disadvantaged	160	18.6	291	5.7	451	7.6
Total	292	15.0	1,282	4.9	1,574	5.6
Rate ratio³	..	1.56	..	1.43^{***}	..	1.81^{**}

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of infant deaths per 1,000 live births.

³ Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

5. Deaths by the Accessibility/ Remoteness Index of Australia

5.1 Overview

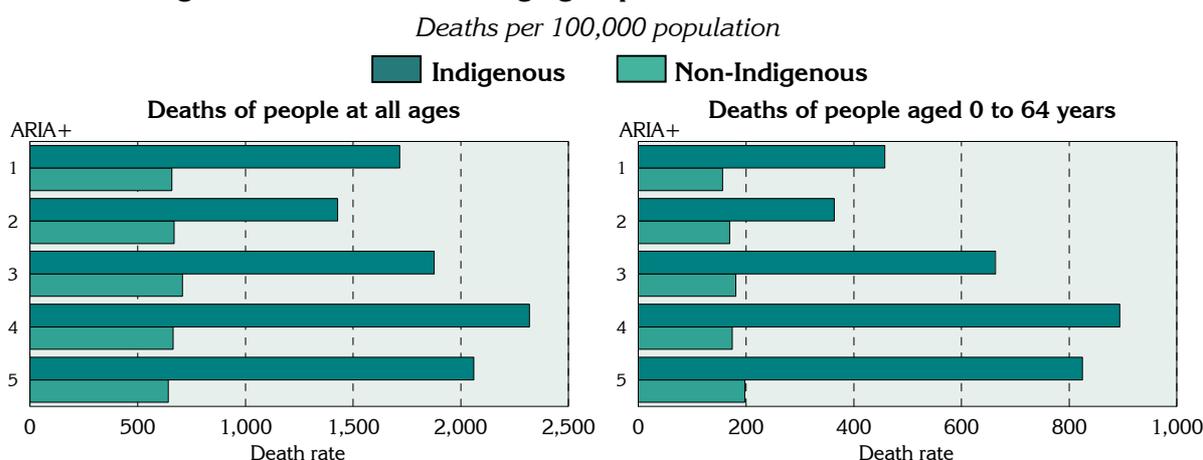
The distribution of death rates across Australia is shown in this section by remoteness, using the Accessibility/ Remoteness Index for Australia (ARIA+). Section 2.6, *Remoteness*, includes a description of ARIA+ and Figure 1 shows the distribution of the population by ARIA+ class.

As noted in Section 2.3, the completeness of coverage of Indigenous deaths varies across Australia. The greatest variations are believed to be between urban areas (generally those in the Major Cities ARIA+ class, which are believed to have lower coverage) and rural areas (those in the more remote areas, which are believed to have higher coverage). The authors of this report believe that such variations do not invalidate the comparisons made in this analysis between ARIA+ classes. This view is supported by the analysis in Section 7.4, which examines the likely impact on the results in each ARIA+ class of differentially increasing the number of Indigenous deaths across the remoteness classes.

Death rates for the total population at ages 0 to 64 years show a distinct gradient, from lower rates in the most accessible areas to higher rates in the most remote areas (see Figure 24 and Table 33, Section 7.3). When disaggregated by Indigenous status, the gradient is not evident for all deaths, and is not continuous (Figure 14 and Table 25). For example, while Indigenous death rates are substantially higher than non-Indigenous rates across the ARIA+ classes, they vary differently across the ARIA+ classes, being lowest in the Inner Regional areas (lower than in the Major Cities areas) and increasing steadily over the next two ARIA+ classes, before declining in the Very Remote areas. This is so both for all ages and for the 0 to 64 year age group. Although Indigenous death rates are lower in the Inner Regional areas, these 'lower' rates are still significantly higher than the highest non-Indigenous death rates, in the remote areas (this aspect is discussed further in Section 8.3).

The distribution of non-Indigenous rates across ARIA+ classes differs between 'all ages' and at ages 0 to 64 years (Figure 14 and Table 25). For deaths at all ages, rates increase from 659 deaths per 100,000 population in the most accessible areas to a high of 708 deaths per 100,000 population in Outer Regional, before declining to a low of 641 in the most remote areas (Very Remote). At ages 0 to 64 years, death rates increase across the ARIA+ classes from the lowest rates in the most accessible areas (157 deaths per 100,000 population) to the highest rates in the most remote areas (197 deaths per 100,000 population), although the rate in the Remote areas is a lower 174 deaths per 100,000 population.

Figure 14: Death rates by the Accessibility/ Remoteness Index of Australia (ARIA+) and Indigenous status; selected age groups, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table 25: Death rates by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status and sex; selected age groups, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

ARIA+	Indigenous			Non-Indigenous ¹			Rate ratio ² Persons
	Males	Females	Persons	Males	Females	Persons	
All ages							
Major Cities	2,312	1,287	1,717	804	554	659	2.61***
Inner Regional	1,958	1,019	1,427	818	545	689	2.07***
Outer Regional	2,307	1,513	1,876	871	566	708	2.65***
Remote	2,829	1,847	2,318	825	508	665	3.48***
Very Remote	2,555	1,620	2,061	788	458	641	3.22***
Total	2,488	1,552	1,980	818	552	668	2.96***
Rate ratio³	1.11	1.26***	1.20***	0.98	0.83***	0.97	..
0 to 64 years							
Major Cities	614	319	458	200	113	157	2.92***
Inner Regional	489	247	364	219	119	170	2.14***
Outer Regional	830	510	663	236	119	181	3.66***
Remote	1,099	697	894	223	114	174	5.14***
Very Remote	1,030	627	825	248	124	197	4.19***
Total	862	512	681	212	115	165	4.13***
Rate ratio³	1.68***	1.97***	1.80***	1.24***	1.10	1.25***	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of Indigenous to non-Indigenous death rate; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

³ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities.

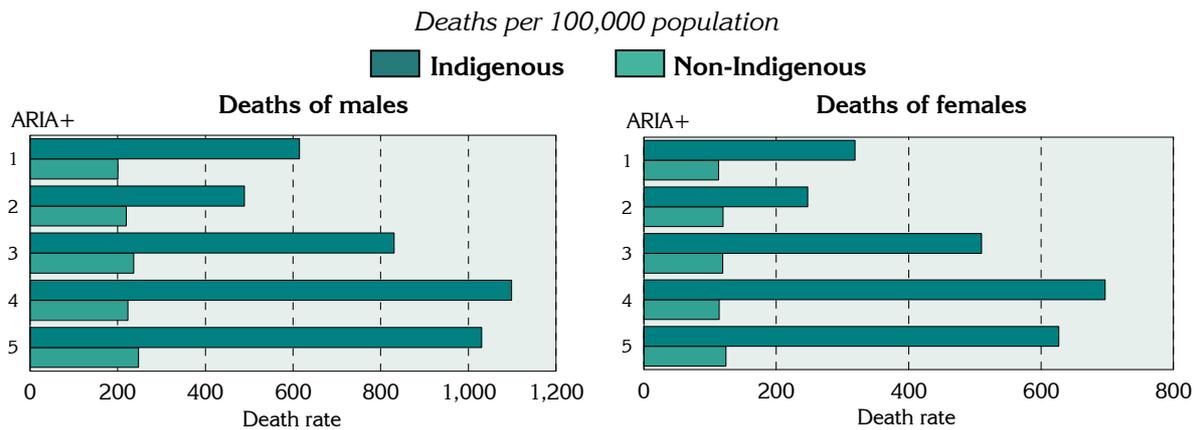
Note: The numbers on which the rates in this analysis are based are in Table A6, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

5.2 Deaths by ARIA+ and sex

Male and female death rates at ages 0 to 64 years show similar patterns across the remoteness classes, although for the Indigenous population the differential in female rates is the stronger (1.97) than for males (1.68); and for the non-Indigenous population the differential in male rates is the stronger (1.24 for males and 1.10, and not statistically significant, for females) (Figure 15 and Table 25).

Figure 15: Death rates (0 to 64 years) by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status and sex, Qld, SA, WA and NT, 1997-99



1 – Major Cities; 2 – Inner Regional; 3 – Outer Regional; 4 – Remote; 5 – Very Remote.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

5.3 Deaths by ARIA+ and age

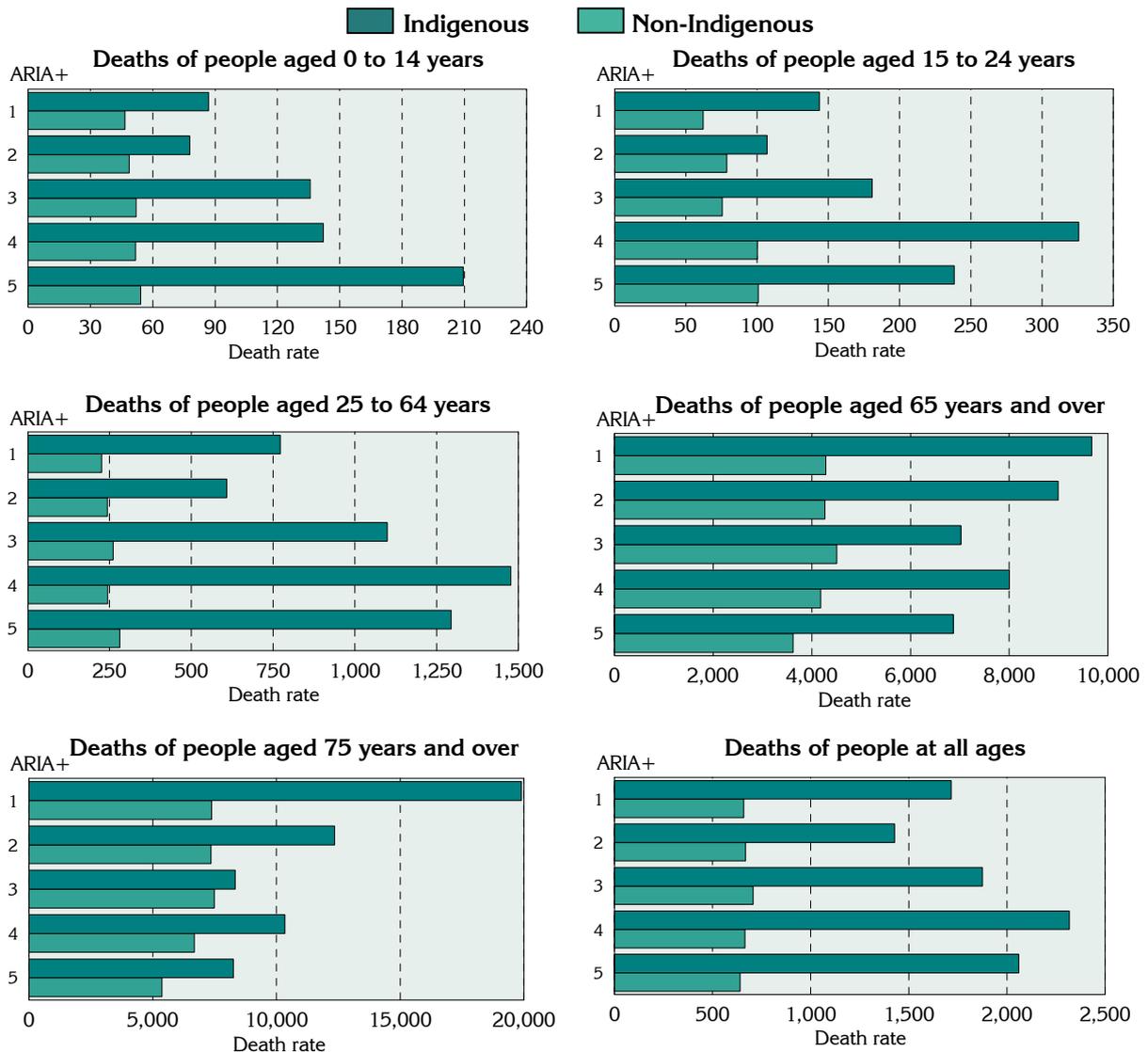
Death rates for Indigenous people at ages 15 to 24 and 25 to 64 years are lowest in the Inner Regional areas and increase steadily over the next two ARIA+ classes, before declining in the Very Remote areas (Figure 16 and Table 26). Indigenous death rates at ages 0 to 14 years are also lowest in Inner Regional areas, but rates then increase across the three remaining ARIA+ classes. The reverse is generally the case for Indigenous deaths at ages 65 years and over and 75 years and over, with the highest rates in the most accessible areas; that is, death rates decline with increasing remoteness.

For the non-Indigenous population, death rates generally increase across the ARIA+ classes at ages 0 to 14, 15 to 24 and 25 to 64 years. However, as for the Indigenous population, there is an inverse relationship for non-Indigenous deaths at ages 65 years and over and 75 years and over, with death rates declining in the Remote and Very Remote areas.

The highest remoteness differential in rates for the Indigenous population was at ages 0 to 14, with a rate ratio of 2.41; for the non-Indigenous it was at ages 15 to 24, with a rate ratio of 1.62 (Figure 16 and Table 26).

Figure 16: Death rates by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status and age, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population



1 – Major Cities; 2 – Inner Regional; 3 – Outer Regional; 4 – Remote; 5 – Very Remote.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

5.4 Deaths by ARIA+, sex and age

Indigenous male and female death rates increase with increasing remoteness for all but the oldest age groups (Table 26). There are larger differentials in death rates between the most remote and most accessible areas for females than males for the 0 to 14 year (3.0 for females compared to 2.0 for males) and 15 to 24 year (1.97 for females compared to 1.54 for males) age groups, as well as at all ages (1.26 for females compared to 1.11, which is not statistically significant, for males). The inverse relationship in death rates across the ARIA+ classes is more marked for males than for females for both the 65 year and over (0.63 for males and 0.72 for females) and the 75 year and over (0.20 for males and 0.51 for females) age groups.

For non-Indigenous deaths there is generally a smaller differential between the male and female rate ratios, with the largest differential being for the 0 to 14 year age group (1.28 for males and 1.02 for females; however neither of these differentials is statistically significant).

Table 26: Death rates¹ by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status, sex and age, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

ARIA+ and age	Indigenous			Non-Indigenous ²		
	Males	Females	Persons	Males	Females	Persons
0 to 14 years						
Major Cities	101	72	87	54	39	47
Inner Regional	104	50	78	56	41	49
Outer Regional	175	94	136	61	43	52
Remote	153	132	142	57	46	52
Very Remote	204	215	210	69	40	54
Rate ratio³	2.01***	3.00**	2.41***	1.28	1.02	1.16
15 to 24 years						
Major Cities	228	63	144	88	36	62
Inner Regional	190	25	107	114	42	79
Outer Regional	255	105	181	109	38	76
Remote	424	227	326	144	47	100
Very Remote	351	124	238	134	56	101
Rate ratio³	1.54*	1.97*	1.66**	1.52*	1.56	1.62**
25 to 64 years						
Major Cities	1,053	540	772	289	163	226
Inner Regional	791	445	608	314	171	243
Outer Regional	1,367	868	1,099	341	171	261
Remote	1,843	1,135	1,475	313	158	244
Very Remote	1,663	950	1,295	351	176	281
Rate ratio³	1.58***	1.76**	1.68***	1.21***	1.08	1.25***
65 years and over						
Major Cities	12,250	8,542	9,674	5,159	3,700	4,283
Inner Regional	13,039	6,949	8,993	5,119	3,602	4,266
Outer Regional	7,583	6,598	7,025	5,394	3,796	4,503
Remote	9,148	6,931	7,965	5,080	3,390	4,177
Very Remote	7,742	6,141	6,871	4,311	2,833	3,621
Rate ratio³	0.63**	0.72**	0.71***	0.84***	0.77***	0.85***
75 years and over						
Major Cities	43,249	15,385	19,896	8,518	6,680	7,374
Inner Regional	16,470	10,702	12,349	8,421	6,584	7,347
Outer Regional	7,775	8,792	8,336	8,524	6,744	7,484
Remote	12,458	8,552	10,338	7,810	5,819	6,680
Very Remote	8,841	7,772	8,261	5,956	4,752	5,365
Rate ratio³	0.20***	0.51***	0.42***	0.70***	0.71***	0.73***
All ages						
Major Cities	2,312	1,287	1,717	804	554	659
Inner Regional	1,958	1,019	1,427	818	545	669
Outer Regional	2,307	1,513	1,876	871	566	708
Remote	2,829	1,847	2,315	825	508	665
Very Remote	2,555	1,620	2,061	788	458	641
Rate ratio³	1.11	1.26***	1.20***	0.98	0.83***	0.97

¹ The Total death rates for each age group, by Indigenous status and sex, are shown in Table A3 in Appendix 2.

² Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

³ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Note: The numbers on which the rates in this analysis are based are in Table A6, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

5.5 Deaths by ARIA+ and State/ Territory

Indigenous death rates in Queensland increase sharply with increasing remoteness across the first four ARIA+ classes, from a low of 360 deaths per 100,000 population aged 0 to 64 years in areas in the Inner Regional class to 814 deaths per 100,000 population in areas in the Remote class (Figure 17 and Table A7 in Appendix 2). The Indigenous death rate decreased slightly in the Very Remote areas, to a rate of 689 deaths per 100,000 population.

Death rates of Indigenous people aged from 0 to 64 years vary markedly across the ARIA+ classes in South Australia. They decrease from a rate of 515 per 100,000 population in the Major Cities to a rate of 237 per 100,000 population in the Inner Regional areas, then increase to a rate of 733 per 100,000 population in the Outer Regional areas, before increasing substantially to a rate of 991 per 10,000 population in the Very Remote areas (with a lower death rate in the Remote areas).

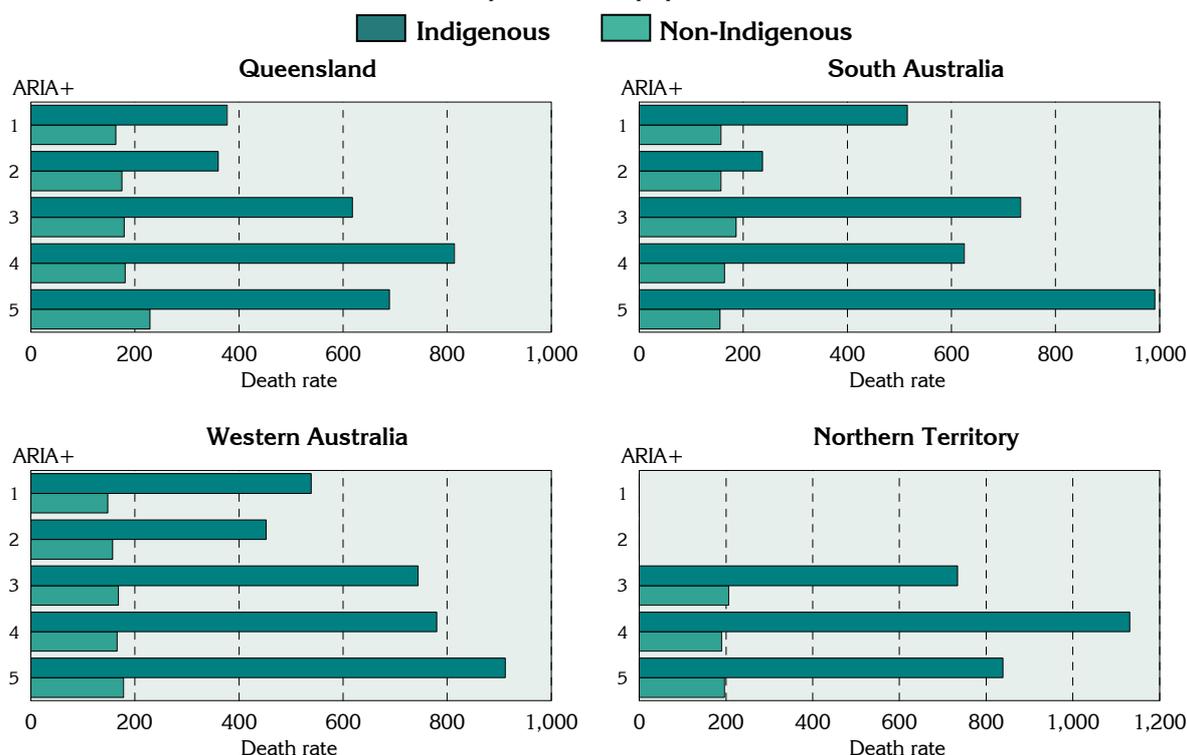
With the exception of the Inner Regional class, there was a steep gradient across the ARIA+ classes in Western Australia, with Indigenous death rates almost doubling between the Major Cities areas (a rate of 539 per 100,000 population) and Very Remote areas (912 per 100,000 population).

In the Northern Territory, the Indigenous death rates increased over the Outer Regional and Remote ARIA+ classes, before decreasing in the Very Remote regions. The lowest rate was recorded in the Inner Regional areas, a rate of 734 deaths per 100,000 population.

Death rates of non-Indigenous people aged 0 to 64 in Queensland and Western Australia generally increased as the level of remoteness increased. For South Australia, the highest death rate was recorded in the Outer Regional areas, thereafter decreasing in the Remote and Very Remote areas. There was no gradient in non-Indigenous death rates in the Northern Territory; however, the Territory recorded the second (and third and fourth) highest non-Indigenous death rates, with the highest rate in the Very Remote areas in Queensland.

Figure 17: Death rates (0 to 64 years) by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status and State/ Territory, 1997-99

Deaths per 100,000 population



1 – Major Cities; 2 – Inner Regional; 3 – Outer Regional; 4 – Remote; 5 – Very Remote.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

5.6 Deaths by ARIA+ and cause of death

As noted for deaths at all ages and at 0 to 64 years for all causes (Figure 14), death rates for Indigenous people aged 0 to 64 years from the major causes of circulatory system diseases, cancer and injuries and poisonings are lowest in the Inner Regional areas and then increase steadily over the next two ARIA+ classes before declining in the Very Remote areas (Figure 18 and Table 27).

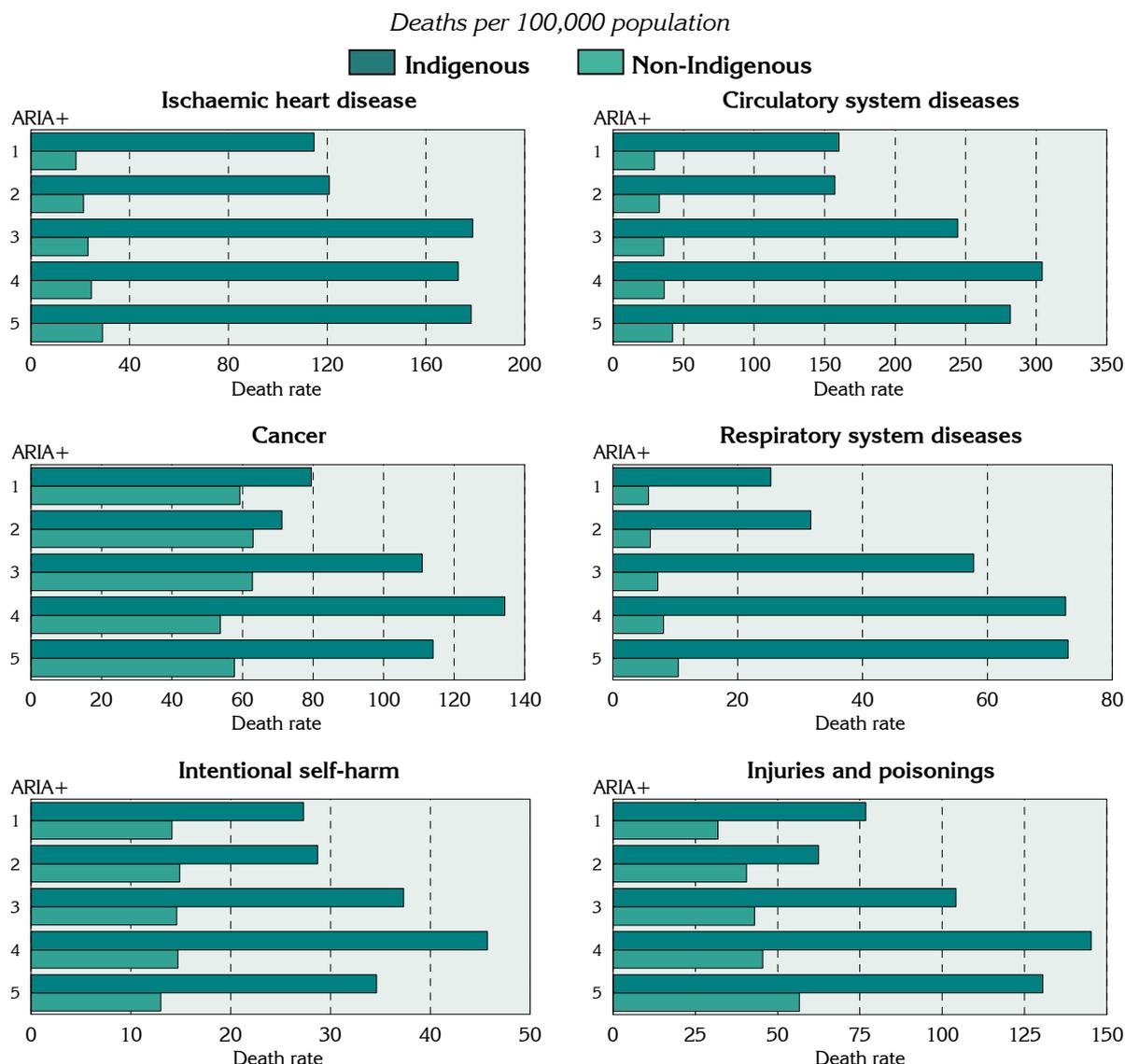
In contrast, the ARIA+ graph for deaths from respiratory system diseases shows a step increase in death rates among Indigenous people with increasing remoteness, from 25 deaths per 100,000 population in the Major Cities areas to 73 deaths per 100,000 population (almost three times higher) in the Very Remote areas. The rate in the Remote areas was also 73 deaths per 100,000 population. Rates of non-Indigenous deaths from respiratory system diseases also increased, with an 83% higher rate of deaths in the Very Remote areas than in the Major Cities areas (a rate ratio of 1.83).

Indigenous death rates for ischaemic heart disease were lowest in areas in the Major Cities class, with 115 deaths per 100,000 population, rising to rates of around 175 deaths per 100,000 population in the ARIA+ classes from Outer Regional to Very Remote.

Indigenous rates were substantially higher than those recorded for the non-Indigenous population across the ARIA+ classes for all of the causes of death analysed. The largest difference was recorded for deaths from circulatory system diseases (the second highest cause of death at these ages), with Indigenous death rates in the Remote category almost eight and a half times (8.44) higher than non-Indigenous rates. However the differential was

less marked for cancer, with Indigenous death rates ranging from 1.13 times higher (not statistically significant), than non-Indigenous rates in the Inner Regional areas to 2.48 times higher in the Remote areas.

Figure 18: Death rates (0 to 64 years) by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status and selected cause, Qld, SA, WA and NT, 1997-99



1 – Major Cities; 2 – Inner Regional; 3 – Outer Regional; 4 – Remote; 5 – Very Remote.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

For Indigenous males and females (both for all causes of death combined and for the selected causes of death), there is a pattern of increasing death rates, from the Inner Regional through to the Remote areas, with a decline in the Very Remote areas – except for the female ischaemic heart disease death rate (Table 27). The most notable variations between the male and female rate ratios are for deaths due to respiratory system diseases (males, a differential of 4.65 compared to females, 1.89) and injuries and poisonings (males, 1.41 compared to females, 2.67). The largest variation between the non-Indigenous male and female differentials is for ischaemic heart disease (males, 1.27, not statistically significant; females, 2.14).

Table 27: Death rates¹ (0 to 64 years) by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status, sex and selected cause, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

ARIA+ and cause	Indigenous			Non-Indigenous ²			RR ³
	Males	Females	Persons	Males	Females	Persons	Persons
All causes							
Major Cities	614	319	458	200	113	157	2.92 ^{***}
Inner Regional	489	247	364	219	119	170	2.14 ^{***}
Outer Regional	830	510	663	236	119	181	3.66 ^{***}
Remote	1,099	697	894	223	114	174	5.14 ^{***}
Very Remote	1,030	627	825	248	124	197	4.19 ^{***}
Rate ratio⁴	1.68^{***}	1.97^{***}	1.80^{***}	1.24^{***}	1.10	1.25^{***}	..
Ischaemic heart disease							
Major Cities	185	58	115	30	7	18	6.39 ^{***}
Inner Regional	160	85	121	34	8	21	5.76 ^{***}
Outer Regional	243	124	179	35	10	23	7.78 ^{***}
Remote	277	79	173	37	9	25	6.92 ^{***}
Very Remote	271	94	178	38	15	29	6.14 ^{***}
Rate ratio⁴	1.46*	1.62	1.55^{***}	1.27	2.14*	1.61^{***}	..
Circulatory system diseases							
Major Cities	234	100	160	44	15	29	5.52 ^{***}
Inner Regional	224	96	157	48	17	33	4.76 ^{***}
Outer Regional	308	190	244	52	19	36	6.78 ^{***}
Remote	423	195	304	51	18	36	8.44 ^{***}
Very Remote	389	183	282	55	23	42	6.71 ^{***}
Rate ratio⁴	1.66^{***}	1.83^{***}	1.76^{***}	1.25	1.53	1.45^{***}	..
Cancer							
Major Cities	92	69	80	63	56	59	1.36*
Inner Regional	79	64	71	71	55	63	1.13
Outer Regional	126	98	111	71	53	63	1.76 ^{***}
Remote	146	124	134	59	46	54	2.48 ^{***}
Very Remote	128	101	114	63	50	58	1.97 ^{***}
Rate ratio⁴	1.39	1.46	1.43*	1.00	0.89	0.98	..
Respiratory system diseases							
Major Cities	19	31	25	6	5	6	4.17 ^{***}
Inner Regional	31	33	32	7	5	6	5.33 ^{***}
Outer Regional	74	43	58	9	5	7	8.29 ^{***}
Remote	85	61	73	8	8	8	9.13 ^{***}
Very Remote	89	58	73	12	8	11	6.64 ^{***}
Rate ratio⁴	4.65^{***}	1.89*	2.92^{***}	2.00*	1.53	1.83^{**}	..
Intentional self harm							
Major Cities	47	10	27	22	6	14	1.93 ^{***}
Inner Regional	53	#	29	24	6	15	1.93*
Outer Regional	60	17	37	23	5	15	2.47 ^{***}
Remote	82	#	46	24	4	15	3.07 ^{***}
Very Remote	60	9	35	20	#	13	2.69 ^{***}
Rate ratio⁴	1.28	0.93	1.30	0.91	..	0.93	..
Injuries and poisonings							
Major Cities	129	30	77	49	15	32	2.41 ^{***}
Inner Regional	99	29	63	61	20	41	1.54 ^{**}
Outer Regional	152	59	104	65	18	43	2.42 ^{***}
Remote	204	87	145	69	18	46	3.15 ^{***}
Very Remote	182	80	131	84	19	57	2.30 ^{***}
Rate ratio⁴	1.41^{**}	2.67^{***}	1.70^{***}	1.71^{***}	1.27	1.78^{***}	..

¹ The Total death rates for each cause, by Indigenous status and sex, are shown in Table A8 in Appendix 2.

² Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

³ RR (rate ratio) is the ratio of the Indigenous to the non-Indigenous death rate; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

⁴ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities.

not calculated, as there are fewer than 5 cases.

Note: The numbers on which the rates in this analysis are based are in Table A9, Appendix 2.

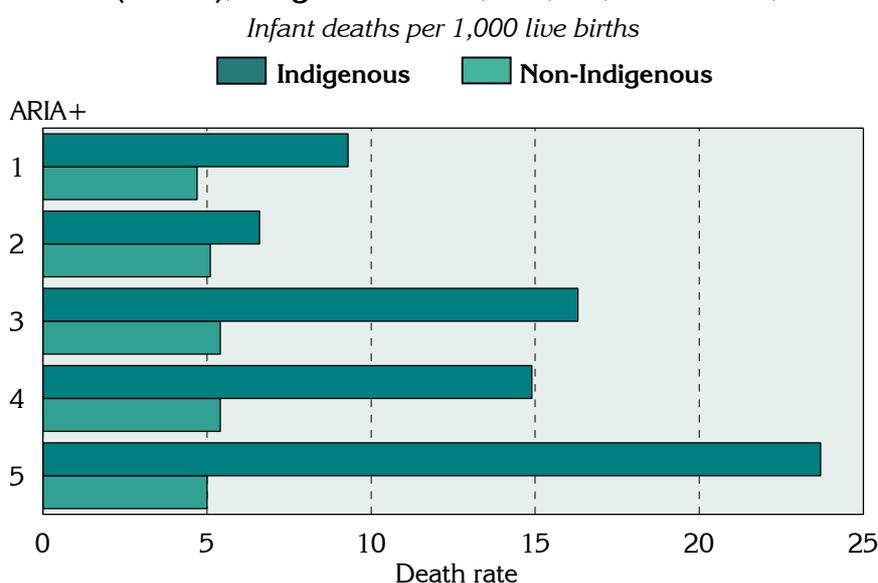
Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

5.7 Infant deaths by ARIA+

Infant death rates in the Indigenous population increase from a rate of 9.3 infant deaths per 1,000 live births in the Major Cities areas, to rates of 16.3 in the Outer Regional areas and 23.7 in the Very Remote areas (Figure 19 and Table 28). This is an overall differential of 2.5 times between rates in the most remote and most accessible areas. The lowest rate is in the Inner Regional areas, 6.6 infant deaths per 1,000 live births.

For the non-Indigenous population, infant death rates increased from a rate of 4.7 infant deaths per 1,000 live births in the Major Cities class to 5.4 in both the Outer Regional and Remote areas. A somewhat lower rate of 5.0 infant deaths per 1,000 live births was recorded for residents of the Very Remote areas.

Figure 19: Infant death rates by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status, Qld, SA, WA and NT, 1997-99



1 – Major Cities; 2 – Inner Regional; 3 – Outer Regional; 4 – Remote; 5 – Very Remote.

Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

Table 28: Infant death rates by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status, Qld, SA, WA and NT, 1997-99

ARIA+	Indigenous		Non-Indigenous ¹		Total	
	No.	Rate ²	No.	Rate ²	No.	Rate ²
Major Cities	46	9.3	720	4.7	766	4.9
Inner Regional	15	6.6	241	5.1	256	5.1
Outer Regional	80	16.3	236	5.4	316	6.5
Remote	37	14.9	61	5.4	98	7.1
Very Remote	114	23.7	23	5.0	137	14.6
Total	292	15.0	1,282	4.9	1,574	5.6
Rate ratio³	..	2.54***	..	1.06	..	2.98***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of infant deaths per 1,000 live births.

³ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and births data from ABS

6. Deaths by socioeconomic disadvantage of area and remoteness

6.1 Overview

One of the purposes of this analysis was to ascertain whether there were identifiable patterns, related to remoteness or socioeconomic status, in Indigenous and non-Indigenous death rates.

The results presented in the previous sections show that at ages 0 to 64 years:

- Indigenous death rates are higher than non-Indigenous rates for both socioeconomic status (as measured by quintile of socioeconomic disadvantage of area) (Section 4) and remoteness (under ARIA+) (Section 5);
- when examined by quintile of socioeconomic disadvantage of area there is a gradient in Indigenous death rates from the lowest rate in the most well-off areas to the highest rate in the poorest areas – although the gradient is not continuous, with a lower rate in Quintile 4 (Figure 10 and Table 21); and
- when examined by remoteness, Indigenous death rates are higher in the most remote areas than in the most accessible areas – although the highest and lowest rates are in the second most remote and second most accessible ARIA+ classes, respectively (Figure 14 and Table 25).

For the non-Indigenous population at ages 0 to 64 years, the results show that:

- when examined by quintile of socioeconomic disadvantage of area there is a gradient in death rates from the lowest rate in the most well-off areas to the highest rate in the poorest areas (Figure 10 and Table 21); and
- there is a gradient in non-Indigenous death rates by remoteness, from the most accessible areas (with the lowest death rates) to the most remote areas (with the highest rates) – although the gradient is not continuous, with a lower rate in the Remote areas than in the previous class (Outer Regional) (Figure 14 and Table 25).

It seemed appropriate as a next step to ascertain if there was a pattern in the death rates within the remoteness classes, in particular a pattern related to socioeconomic status. The results of this analysis, using the IRSD as used previously in this report, are shown in Section 6.2. In addition, the analysis has been repeated (Section 6.2) with an Indigenous index of disadvantage, the Experimental General Index: ABS 1996 Census (refined). This index is described in the Glossary, page xix. In using the analysis by Indigenous status and disadvantage (under the IRSD), readers should be aware that the Census variables used in the construction of the IRSD do not necessarily indicate the overall level of Indigenous disadvantage, nor the extent of variation in Indigenous disadvantage between the remoteness classes.

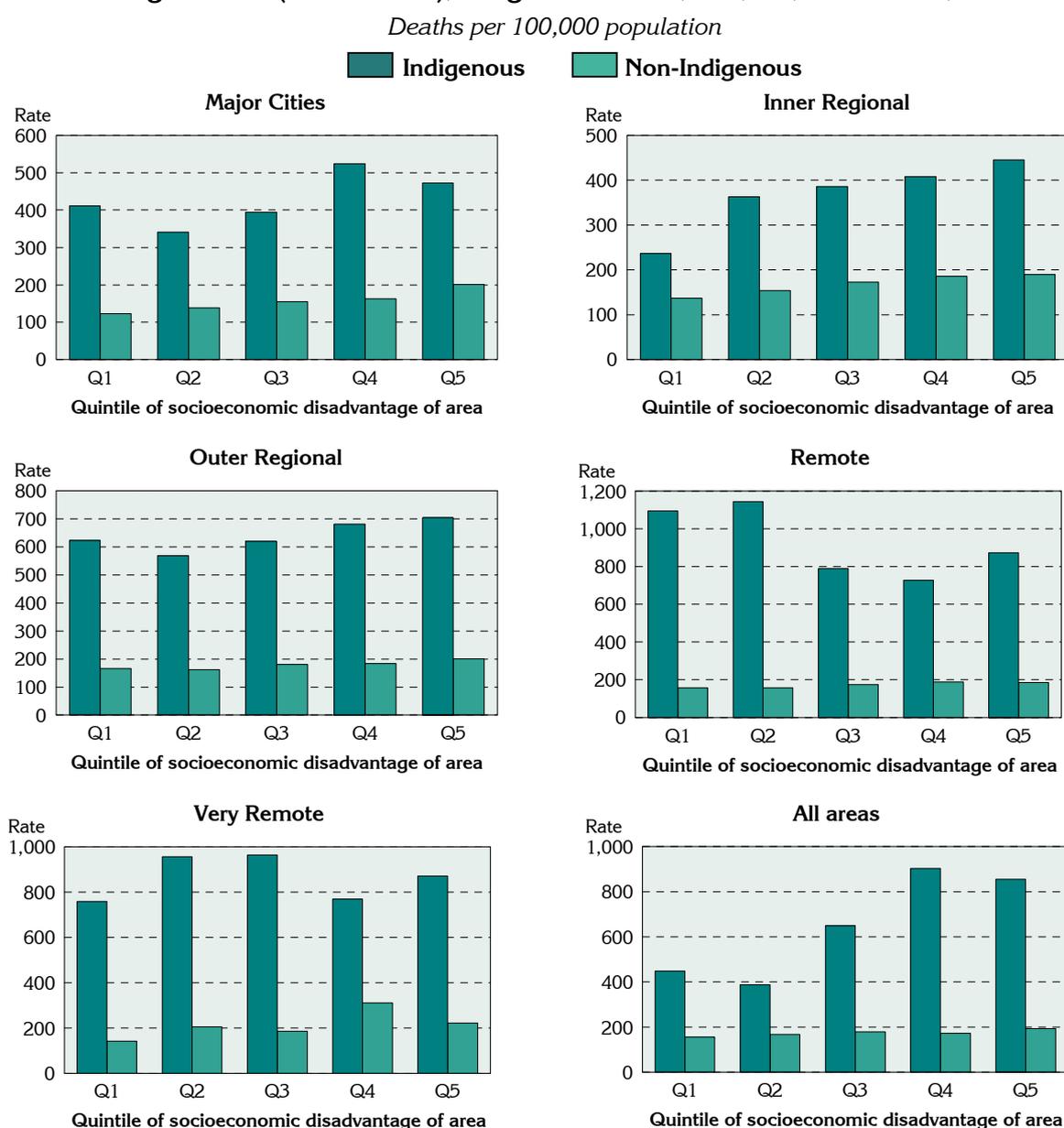
Data in the analysis in this section cover the four years from 1997 to 2000. Deaths registered in 2000 were added to those for 1997 to 1999 (used in the earlier analyses) to provide additional numbers for this analysis.

6.2 Disadvantage, as measured by the IRSD

For this part of the analysis, SLAs in the four jurisdictions studied were grouped by socioeconomic disadvantage of area within each of the five ARIA+ classes. The measure of disadvantage was the IRSD.

Despite being substantially higher, there is no consistent socioeconomic pattern in Indigenous death rates within the ARIA+ classes, other than that the rates in Quintile 5 are higher than in Quintile 1 (although not necessarily the highest in each remoteness class) (Figure 20 and Table 30). Death rates in the Inner Regional areas increase with remoteness, with similar, although less consistent, patterns in the Major Cities and Outer Regional ARIA+ classes. In the Very Remote and, in particular, the Remote areas, the highest rates are in the higher socioeconomic status quintiles.

Figure 20: Death rates (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area (under IRSD¹), Indigenous status, Qld, SA, WA and NT, 1997-2000



¹ Index of Relative Socio-Economic Disadvantage

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

There is a socioeconomic pattern in death rates at ages 0 to 64 years in the non-Indigenous population, with rates generally increasing by socioeconomic disadvantage of area within the remoteness classes. The most notable exception is in the Very Remote areas, where there is a lower death rate in the fifth quintile than in the previous quintile.

The rates graphed in Figure 20 for the non-Indigenous population are shown in Table 29. The main features are:

- the differential in Quintile 5 and Quintile 1 rates within each ARIA+ class, ranging from 63% in the Major Cities class to 18% in the Remote areas (as shown by the rate ratio in the last row of the table); note that the differential in the Remote areas is not statistically significant;
- the higher rates in the Very Remote ARIA+ class when compared with the Major Cities areas for Quintiles 1 to 5 (although only in Quintiles 2 and 4 are the rate ratios statistically significant);
- the continuous gradient in rates (with Quintile 5/ 1 differentials of 1.63 and 1.39, respectively) in the Major Cities and Inner Regional areas;
- the gradient in the Outer Regional areas, which is interrupted by a slightly (2.4%) lower rate in the Quintile 2 areas;
- the lack of a consistent pattern in the Remote areas, although the rate in Quintile 5 is higher than in Quintile 1; and
- the lack of a consistent pattern in the Very Remote areas – although Quintile 4 has the highest rate of any cell in the table and, despite a drop of over one third (28.4%), Quintile 5 has the second highest rate.

Table 29: Non-Indigenous¹ death rates (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area, Qld, SA, WA and NT, 1997-2000

Deaths per 100,000 population

Quintile	ARIA+ class					Rate ratio ²
	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote	
1: Least disadvantaged	123	137	166	157	142	1.15
2	139	154	162	157	205	1.47***
3	155	173	181	174	185	1.19
4	163	186	184	189	310	1.90***
5: Most disadvantaged	201	190	201	185	222	1.10
Total	156	168	179	173	194	1.24***
Rate ratio³	1.63***	1.39***	1.21***	1.18	1.56*	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

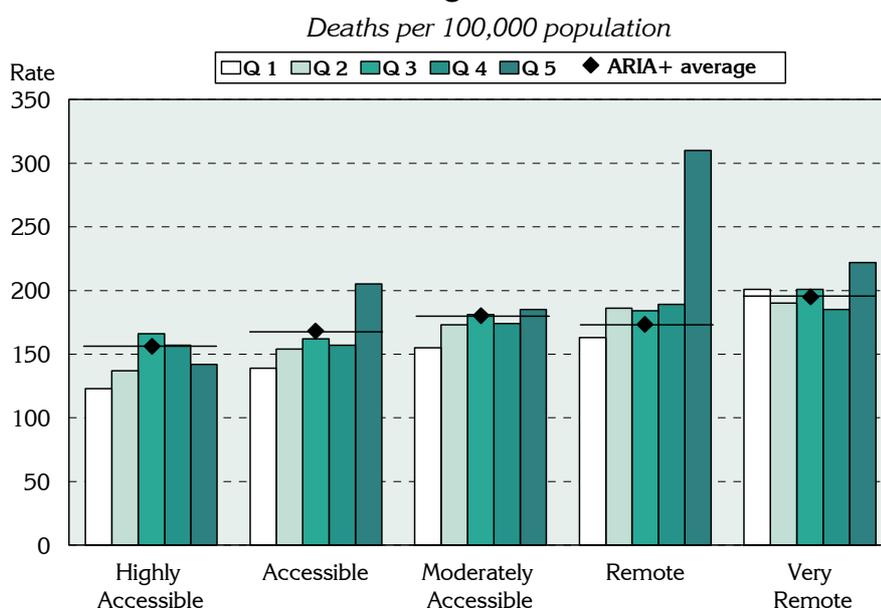
³ Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1.

Note: The numbers on which the rates in this analysis are based are in Table A10, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

These results can be arranged graphically to highlight the way in which the rates generally increase by socioeconomic disadvantage of area, both within and across the remoteness classes. Figure 21 shows the quintiles in each ARIA+ class as a cluster of bars, with each bar representing a quintile. The bars generally increase in size within each cluster (ie. with increasing disadvantage), and the average of each cluster (represented by a horizontal line) also generally increases across the ARIA+ classes (ie. with increasing remoteness).

Figure 21: Non-Indigenous death rates (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area, Qld, SA, WA and NT, 1997-2000



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

For the Indigenous population (Figure 20 and Table 30), the main features are:

- the substantially higher death rates evident for Indigenous people compared with non-Indigenous people (Table 29) in these same groupings of areas;
- the lack of a consistent pattern by socioeconomic disadvantage of area within the remoteness classes;
- the higher rates in Quintile 5 compared with Quintile 1 areas, with the notable exception of the Remote areas (20% lower in Quintile 5 than Quintile 1); and
- the differential across the ARIA+ classes within each quintile, with higher (but not necessarily the highest) rates in the Very Remote areas (as shown by the rate ratio in the last column of the table).

Table 30: Indigenous death rates (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area, Qld, SA, WA and NT, 1997-2000

Deaths per 100,000 population

Quintile	ARIA+ class					Rate ratio ¹
	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote	
1: Least disadvantaged	411	237	622	1,095	758	1.84**
2	341	363	568	1,144	956	2.80***
3	394	386	619	789	963	2.44***
4	524	408	681	727	769	1.47***
5: Most disadvantaged	472	445	704	872	871	1.85***
Total	449	387	649	903	855	1.90***
Rate ratio²	1.15	1.88*	1.13	0.80*	1.15	..

¹ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities; rate ratios differing significantly from 1.0 are shown with * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

² Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1.

Note: The numbers on which the rates in this analysis are based are in Table A10, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

The death rates for the total population (Indigenous and non-Indigenous) by remoteness and socioeconomic disadvantage of area, comparable with those above, are shown in Table A11 in Appendix 2.

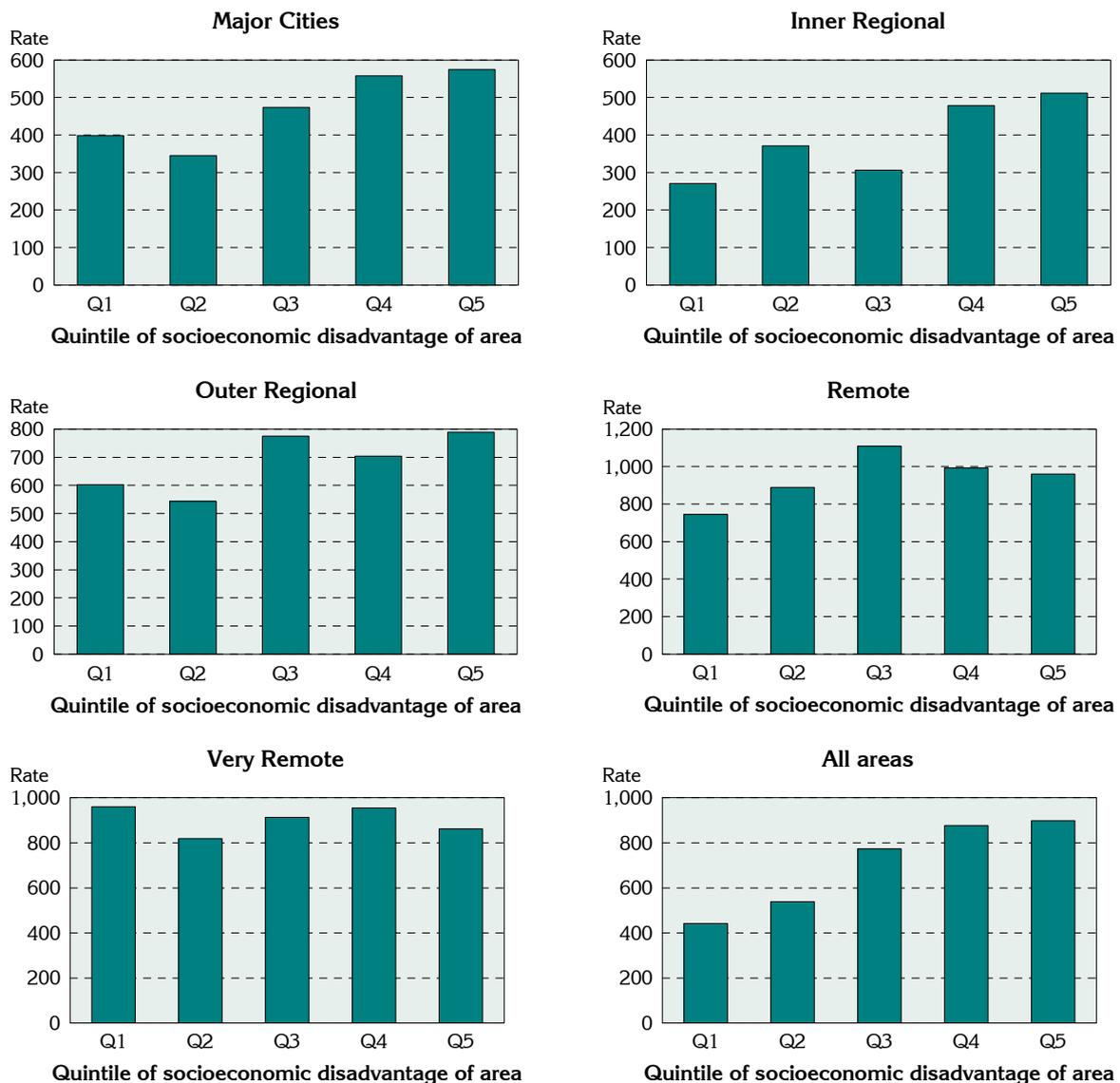
6.3 Indigenous socioeconomic disadvantage as measured by the EGI

Given the lack of a consistent pattern in Indigenous death rates by socioeconomic disadvantage of area within the ARIA+ classes under the IRSD, the data were re-grouped, this time using the Experimental General Index: ABS 1996 Census (refined) (EGI). This index is one of nine Indigenous socioeconomic disadvantage indexes developed by ABS for the Grants Commission. It was considered that using a measure of disadvantage designed specifically to categorise areas on the basis of Indigenous disadvantage might reveal patterns in the data that were not previously evident. Details of the EGI and the methods used to allocate deaths data to the Indigenous Areas for which the EGI is available are in Section 2.5, with additional information in the Glossary.

Using the EGI as the measure of disadvantage reveals a stronger relationship for the Indigenous population between death rates and disadvantage for all areas combined (last chart in Figure 22) than was seen under the IRSD (last chart in Figure 20).

Figure 22: Indigenous death rates (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area (under EGI¹), Qld, SA, WA and NT, 1997-2000

Deaths per 100,000 population



¹ Experimental General Index: ABS 1996 Census (refined)

Source: Death rates produced in HealthWIZ using deaths and population data from ABS: further analysis undertaken to produce rates by ARIA+ and socioeconomic disadvantage of area

The main differences in the analysis when using the EGI (Figure 22 and Table 31) rather than the IRSD (Figure 20 and Table 31) are:

- the rate ratio between Quintile 5 and Quintile 1 death rates is higher for the EGI for all but the Very Remote areas;
- the pattern of rates across the quintiles of socioeconomic disadvantage of area is noticeably different in the Remote areas; and
- for all areas combined, the EGI (last chart in Figure 22) shows a stronger relationship between death rates and disadvantage than is evident for the IRSD (last chart in Figure 20).

Table 31: Indigenous death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area under IRSD¹ and EGI², Qld, SA, WA and NT, 1997-2000

Deaths per 100,000 population

ARIA+ and index	Quintile					Rate ratio ³
	1	2	3	4	5	
Major Cities						
IRSD	411.4	341.1	394.3	523.6	471.9	1.15
EGI	398.5	345.0	473.7	557.7	574.7	1.44***
Inner Regional						
IRSD	236.7	363.3	386.1	407.6	445.1	1.88*
EGI	270.7	371.3	306.5	478.8	511.6	1.89**
Outer Regional						
IRSD	622.1	568.4	618.9	681.2	703.9	1.13
EGI	603.0	543.8	775.6	704.0	789.1	1.31**
Remote						
IRSD	1,094.8	1,143.9	789.1	726.7	872.1	0.80*
EGI	745.0	889.0	1,109.1	993.2	960.6	1.29
Very Remote						
IRSD	758.1	956.3	963.2	769.0	871.2	1.15
EGI	959.9	819.3	913.4	955.1	861.5	0.90
All areas						
IRSD	449.2	387.3	648.5	902.8	854.9	1.90***
EGI	442.1	539.2	773.7	876.8	898.9	2.03***

¹ Index of Relative Socio-Economic Disadvantage

² Experimental General Index: ABS 1996 Census (refined)

³ Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

7. A comparison of death rates for non-Indigenous and total (non-Indigenous and Indigenous) populations

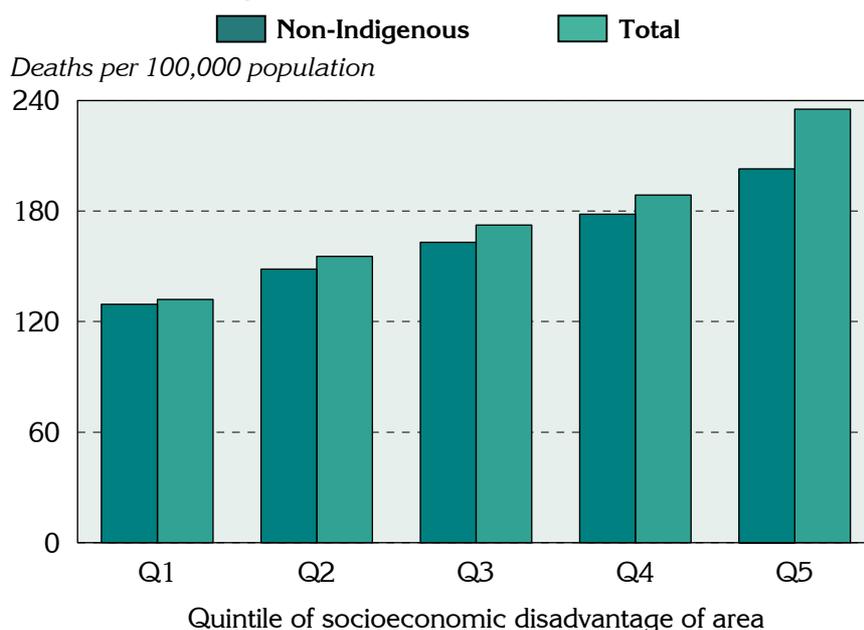
7.1 Overview

In many studies Indigenous events are compared with total (Indigenous plus non-Indigenous) events. This is acceptable practice where the Indigenous events are relatively small in number so as to have little or no effect on the total value. In Section 2.3, *Quality and coverage of Indigenous data*, the extent to which death rates for the total population are influenced by the higher death rates of Indigenous people is discussed. This analysis found that whilst there is a difference between 'non-Indigenous' and total death rates, it is only in the Northern Territory that this difference is substantial. In this section, the difference in death rates is examined according to socioeconomic status and remoteness. Death rates for the 'non-Indigenous' population are compared with death rates for the total (Indigenous and non-Indigenous) population by socioeconomic disadvantage of area and accessibility/ remoteness.

7.2 Non-Indigenous and total death rates by socioeconomic disadvantage of area

Death rates for the estimated non-Indigenous population are little different from those for the total population, increasing incrementally from Quintile 1 to Quintile 4. However, in the most disadvantaged areas (Quintile 5), the exclusion of identified Indigenous deaths produces a non-Indigenous death rate 13.8% lower than for the total population (Figure 23 and Table 32). Most of the reduction in rates occurs in the Rest of State/ Territory areas, where the exclusion of identified Indigenous deaths resulted in a 24.7% lower death rate, compared with just 3.0% lower in the capital cities and other major urban centres (Tables A12 and A13, Appendix 2).

Figure 23: Non-Indigenous and Total death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Qld, SA, WA and NT, 1997-99



Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Despite the increasingly lower rates, there is a gradient in non-Indigenous death rates across the quintiles, and a differential of 1.57 between the most disadvantaged and the most well-off areas (ie. death rates are 57% higher in the most disadvantaged areas) (Table 32).

Table 32: Non-Indigenous and Total death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

Quintile	All persons	Non-Indigenous ¹		Indigenous	
	Rate	Rate	Difference (%) cf All	Rate	Difference (%) cf non-Indigenous
1: Least disadvantaged	132	130	-1.9	476	267.4
2	155	149	-4.4	616	314.7
3	172	163	-5.4	631	286.7
4	189	178	-5.5	606	239.9
5: Most disadvantaged	235	203	-13.8	743	266.2
Total	178	165	-7.3	681	283.5
Rate ratio²	1.78***	1.57***	..	1.56***	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

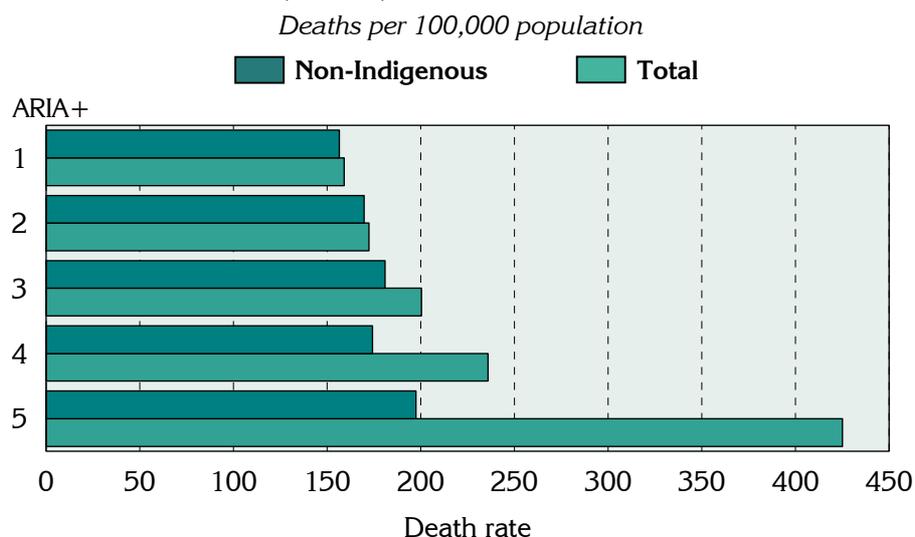
Note: The numbers on which the rates in this analysis are based are in Table A14, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

7.3 Non-Indigenous and total death rates by ARIA+

Removing identified Indigenous deaths has a substantial impact when rates are calculated by ARIA+, with non-Indigenous death rates in the Remote and Very Remote areas lower by 26.1% and 53.6%, respectively (Figure 24 and Table 33).

Figure 24: Non-Indigenous and Total death rates (0 to 64 years) by remoteness (ARIA+), Qld, SA, WA and NT, 1997-99



1 – Major Cities; 2 – Inner Regional; 3 – Outer Regional; 4 – Remote; 5 – Very Remote.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Despite these substantial reductions, there is a gradient in non-Indigenous death rates across the ARIA+ classes, although it is not constant, with a lower rate in the Remote areas than in the previous class (Outer Regional). The differential, of 1.26, is less than half that for the total population (2.67) (Table 33).

Table 33: Non-Indigenous and Total death rates (0 to 64 years) by remoteness (ARIA+), Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

ARIA+	All persons	Non-Indigenous ¹		Indigenous	
	Rate	Rate	Difference (%) cf All	Rate	Difference (%) cf non-Indigenous
Major Cities	159	157	-1.7	458	192.5
Inner Regional	172	170	-1.5	364	114.4
Outer Regional	200	181	-9.7	663	266.7
Remote	236	174	-26.1	894	412.7
Very Remote	425	197	-53.6	825	317.8
Total	178	165	-7.3	681	283.5
Rate ratio²	2.67***	1.26***	..	1.80***	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Note: The numbers on which the rates in this analysis are based are in Table A15, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

In light of the information presented earlier by socioeconomic disadvantage of area and by remoteness, it is not surprising that the effect of removing identified Indigenous deaths is generally most noticeable as remoteness and socioeconomic disadvantage increase (Table 34, based on data in Table A10, Appendix 2).

Table 34: Per cent difference between non-Indigenous¹ and Total death rates (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area, Qld, SA, WA and NT, 1997-2000

Per cent

Quintile	ARIA+ class				
	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote
1: Least disadvantaged	-0.8	-0.7	-9.8	-30.5	-17.4
2	-0.7	-1.9	-6.9	-28.3	-37.9
3	-0.6	-2.3	-7.2	-24.0	-49.5
4	-2.4	-1.6	-9.8	-18.9	-47.5
5: Most disadvantaged	-2.0	-1.6	-12.6	-31.0	-71.0
Total	-1.9	-1.8	-9.6	-26.4	-55.2

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

Note: The numbers on which the rates in this analysis are based are in Table A10, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

7.4 An illustration of the impact of the underestimation of Indigenous deaths

As noted in Section 2.3, it is generally accepted that Indigenous deaths are under-stated, and that this understatement varies regionally. The following analysis provides an illustration of the likely impact of such understatement on death rates by ARIA+ class.

For the purposes of this illustration, the number of Indigenous deaths at ages 0 to 64 years has been artificially inflated, by 50% in the Major Cities areas, 40% in the Inner Regional areas, 30% in the Outer Regional areas and by 20% in the Remote and 10% in the Very Remote areas (these proportions were applied uniformly across the quintiles within the ARIA+ classes). The application of a declining proportion at the ARIA+ class level is in line with the earlier statement that deaths data are more likely to accurately reflect the situation for remote than for accessible areas. The number of non-Indigenous deaths has been reduced by the equivalent numerical increase applied to Indigenous deaths in each ARIA+ class. The net effect has been an average increase across all areas in Indigenous deaths of 24.1% and a decrease in non-Indigenous deaths of 2.7%. Note that the Indigenous and non-Indigenous populations have been held unchanged in this example, so as to highlight the potential impact on death rates of the under reporting of Indigenous deaths. The choice of the level of the increase (ranging from 50% down to 10%) was largely arbitrary; however it is considered by the authors to be realistic for the purposes of this illustration.

Note that, as in Section 6, the following analysis is based on data for 1997 to 2000: comparisons with tables in other sections, where data are for 1997 to 1999, are likely to show different results.

Non-Indigenous

This adjustment has little impact on non-Indigenous death rates for 'All areas' (Table 35). However, there is an increasingly noticeable impact in the Outer Regional, Remote and Very Remote areas, with the non-Indigenous rate dropping substantially with increasing remoteness.

These data were examined by quintile of socioeconomic disadvantage of area within the remoteness classes: although the analysis has not been presented here, the socioeconomic pattern within the remoteness classes is still evident, despite the reduction in death rates.

Indigenous

Indigenous rates are clearly higher with the additional deaths allocated under this analysis (Table 35).

These data were also examined by quintile of socioeconomic disadvantage of area within the remoteness classes: although that analysis has not been presented here, there is no more clarity in the socioeconomic pattern for Indigenous death rates within the remoteness classes.

Table 35: Actual (registered) and estimated number and rate of deaths (0 to 64 years) by remoteness (ARIA+) and Indigenous status, Qld, SA, WA and NT, 1997-2000

Indigenous status		Major Cities	Inner Regional	Outer Regional	Remote	Very Remote	All areas	Rate ratio ¹
Actual (registered)								
Indigenous	No.	598	228	1,000	722	1,576	4,124	..
	Rate ²	449	387	649	903	855	687	1.90***
Non-Indigenous ³	No.	22,385	7,602	6,569	1,476	629	38,661	..
	Rate ²	156	168	179	173	194	164	1.24***
Estimated⁴								
Indigenous	No.	897	319	1,300	866	1,734	5,116	..
	Rate ²	675	540	842	1,048	919	829	1.36***
Non-Indigenous ³	No.	22,086	7,511	6,269	1,332	471	37,669	..
	Rate ²	154	166	171	156	147	159	0.95*

¹ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

² Rate is the number of deaths per 100,000 population.

³ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

⁴ The number of Indigenous deaths has been artificially inflated, by 50% in the Major Cities areas, 40% in the Inner Regional areas, 30% in the Outer Regional areas and by 20% in the Remote and 10% in the Very Remote areas (these proportions were applied uniformly across the quintiles within the ARIA+ classes).

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Summary

The effect of these artificial increases on the ratio of Indigenous death rates in the Very Remote areas to those in the Major Cities areas is of interest. This rate ratio drops from 1.90, using registered deaths, to 1.36, using the artificially inflated figures. Thus, despite an assumed 50% increase in registrations of Indigenous deaths in the Major Cities areas and a 10% increase in the Very Remote areas, the death rate in the Very Remote areas remains 36% higher than the rate in the Major Cities areas. To achieve parity with the Indigenous death rate in the Very Remote areas (based on the registered death rate of 855 deaths per 100,000 population), the number of registered Indigenous deaths in the most accessible areas in these jurisdictions would need to be almost double the level recorded (an increase of 1.9 times in the Major Cities areas and 2.2 times in the Inner Regional areas): this also requires no increase in the Indigenous population count.

We believe that such a level of understatement in death registrations in the three States in the analysis with areas in the Major Cities class is unlikely (the Northern Territory has no areas in this class). Even if death registrations were found to be understated to this extent, population data would also be likely to be understated: any increase in the population reduces the death rate for a particular number of deaths.

These findings are at variance with those of Cunningham (2002) that 'The apparent difference in Indigenous mortality in remote compared with urban areas is of a magnitude that could be explained by relatively modest regional differences in data quality'. She concludes that we are unable to distinguish between regional differences (in death rates) arising from differences in deaths and those arising from variations in data quality.

This is a complex issue, especially as the analyses are based on data which are incomplete and of inconsistent quality. However, we stand by the findings of this analysis, that Indigenous death rates are higher in the most remote areas than in the most accessible areas.

8. A comparison of death rates by Indigenous status

8.1 Overview

The National Aboriginal Community Controlled Health Organisation (NACCHO 2001) has expressed a view that death rates experienced by Aboriginal people living in urban areas are closer to those for Aboriginal people living in remote areas than they are to those for non-Aboriginal people in any area. The analysis presented here supports this view and provides additional information as to the extent of the gap between death rates for Indigenous and non-Indigenous populations.

The rate ratio (shown in bold type in Table 36) shows that the rate for Indigenous people aged 0 to 64 years in the most remote areas (as measured under ARIA+) is just under twice (1.8 times) the rate in the Major Cities areas. The rate ratio for Indigenous people in the Remote areas under ARIA+ (the areas with the highest Indigenous death rate) is higher, at 1.95. The differential in these death rates is, however, less than half the differential (across all areas) in Indigenous and non-Indigenous death rates, a differential of 4.13. Note that the differential in Indigenous and non-Indigenous death rates is as high as 5.14, in the Remote ARIA+ class, with the lowest differential being 2.14, in the Inner Regional class.

Table 36: Death rates (0 to 64 years) by remoteness (ARIA+) and Indigenous status, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

ARIA+	Indigenous	Non-Indigenous ¹	Rate ratio ²
Major Cities	458	157	2.92***
Inner Regional	364	170	2.14***
Outer Regional	663	181	3.66***
Remote	894	174	5.14***
Very Remote	825	197	4.19***
Total	681	165	4.13***
Rate ratio³	1.80***	1.25***	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of Indigenous to non-Indigenous death rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

³ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities class.

Note: The numbers on which the rates in this analysis are based are in Table A6, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Data presented earlier in the report have been drawn together in this section to provide additional information as to the extent of the gap between death rates for Indigenous and non-Indigenous populations by comparing:

- Indigenous death rates in the least disadvantaged areas with non-Indigenous death rates in the most disadvantaged areas (Section 8.2, Table 37); and
- Indigenous death rates in the Major Cities areas with non-Indigenous death rates in the Remote/ Very Remote areas (Section 8.3, Table 38).

8.2 Deaths by Indigenous status and socioeconomic disadvantage

For all deaths under 65 years of age, Indigenous people in the most well off areas have death rates 2.3 times those of non-Indigenous people in the most disadvantaged areas (Table 37)¹⁷.

Table 37: Death rates by quintile of socioeconomic disadvantage of area, Indigenous status¹, sex and age, Qld, SA, WA and NT, 1997-99

Quintile and age	Rate ²		
	Males	Females	Persons
Infant deaths²			
1: Least disadvantaged Indigenous	n.a.	n.a.	12
5: Most disadvantaged non-Indigenous²	n.a.	n.a.	6
Rate ratio³	..	..	2.09*
0 to 14 years			
1: Least disadvantaged Indigenous	112	129	120
5: Most disadvantaged non-Indigenous	65	49	57
Rate ratio³	1.72	2.63*	2.11**
15 to 24 years			
1: Least disadvantaged Indigenous	291	#	177
5: Most disadvantaged non-Indigenous	129	40	86
Rate ratio³	2.26*	..	2.06*
25 to 64 years			
1: Least disadvantaged Indigenous	953	521	723
5: Most disadvantaged non-Indigenous	381	202	292
Rate ratio³	2.50***	2.58***	2.48***
65 years and over			
1: Least disadvantaged Indigenous	5,282	4,270	4,633
5: Most disadvantaged non-Indigenous	5,301	3,680	4,379
Rate ratio³	1.00	1.16	1.06
75 years and over			
1: Least disadvantaged Indigenous	6,790	7,317	7,156
5: Most disadvantaged non-Indigenous	8,342	6,469	7,235
Rate ratio³	0.81	1.13	0.99
0 to 64 years			
1: Least disadvantaged Indigenous	615	349	476
5: Most disadvantaged non-Indigenous	264	139	203
Rate ratio³	2.33***	2.51***	2.34***
0 to 74 years			
1: Least disadvantaged Indigenous	899	511	693
5: Most disadvantaged non-Indigenous	453	241	347
Rate ratio³	1.98***	2.12***	2.00***
All ages			
1: Least disadvantaged Indigenous	1,626	937	1,219
5: Most disadvantaged non-Indigenous	881	571	710
Rate ratio³	1.85***	1.64***	1.72***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² For infant deaths, rate is the number of infant deaths per 1,000 live births; and for the other ages, rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the Indigenous to the non-Indigenous rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

not calculated, as there are fewer than 5 cases.

Note: The numbers on which the rates in this analysis are based are in Table A2, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

¹⁷ For the majority of age groups in the table, the Indigenous rates in the most well off areas (Quintile 1) are the lowest rates at those ages: the exceptions are infant deaths (see Table 24) and the 0 to 14 and 15 to 24 year age groups (see Table 22). The non-Indigenous rates in the most disadvantaged areas are either the highest, or very close to the highest, rates.

The differential is higher for females (2.51) than for males (2.33) for deaths at ages 0 to 64 years; for deaths at all ages the reverse is the case (Table 37).

When examined by age group, the largest differentials for persons are in the 25 to 64 (2.48, or two and a half, times higher) and 0 to 14 (2.11) year age groups; for males and females they are in the 0 to 14 year (females, 2.63) and 25 to 64 year age groups (females, 2.58 and males, 2.5).

At ages 65 years and over, male death rates for the Indigenous and non-Indigenous populations in these area groupings are almost the same, whereas female rates are 16% higher for Indigenous people, although this difference is not statistically significant. At ages 75 years and over, the situation is reversed, with the Indigenous death rate in the most disadvantaged area lower (but not statistically significantly lower) than the non-Indigenous rate in the most well-off areas; this is a reflection of the very high male death rates at younger ages.

There are more than twice as many infant deaths (deaths before age 12 months) per 1,000 live births for the Indigenous population in the most well-off areas than for the non-Indigenous population in the poorest areas.

8.3 Deaths by Indigenous status and remoteness

In this section, the lowest Indigenous death rates (generally those in the Major Cities areas) are compared with the highest non-Indigenous rates (generally those in the most remote areas). Death rates of Indigenous people of all ages in the Major Cities areas are more than two and a half times higher (a rate ratio of 2.61) those of non-Indigenous people in the remote areas (Remote and Very Remote classes). The differential is higher for males (2.84) than for females (1.92) (Table 38).

For all the age groups and for persons as well as males and females the death rates of Indigenous people in the Major Cities areas are higher, generally between one and a half (1.5) times and three and a half (3.5) times higher¹⁸, with the differentials all statistically significant, apart from in the 15 to 24 female age group. The largest differentials for persons are in the 75 and over (3.12, or over three, times higher) and 25 to 64 (3.03) year age groups; for males and females they are in the 75 years and over (males, 5.91) and 25 to 64 year age groups (females, 3.33 and males, 3.25).

There are more than one and a half (1.77) times as many infant deaths (deaths before age 12 months) per 1,000 live births for the Indigenous population in the most accessible areas than for the non-Indigenous population in the remote areas.

These comparisons highlight the substantial gap that exists between the lowest Indigenous death rates and highest non-Indigenous death rates when examined by measures of socioeconomic status and remoteness.

¹⁸ The Indigenous death rates in the Major Cities areas are often not the lowest rates for Indigenous people; and nor are the non-Indigenous rates in the most remote areas the highest for this group. Despite this, the data in the table is illustrative of the point that Indigenous death rates in the most accessible areas are far higher than non-Indigenous rates in the most remote areas. The full data from which this summary is drawn are in Table 28 (infants), Table 25 (all ages and 0 to 64 years) and Table 26 (other age groups).

Table 38: Death rates by remoteness (ARIA+), by Indigenous status¹, sex and age, Qld, SA, WA and NT, 1997-99

ARIA+ and age	Rate ²		
	Males	Females	Persons
Infant deaths²			
Major Cities Indigenous	n.a.	n.a.	9
Remote/Very Remote non-Indigenous	n.a.	n.a.	5
Rate ratio³	..	..	1.77**
0 to 14 years			
Major Cities Indigenous	101	72	87
Remote/Very Remote non-Indigenous	60	44	52
Rate ratio³	1.68*	1.64*	1.67***
15 to 24 years			
Major Cities Indigenous	228	63	144
Remote/Very Remote non-Indigenous	141	50	100
Rate ratio³	1.62*	1.26	1.44*
25 to 64 years			
Major Cities Indigenous	1,053	540	772
Remote/Very Remote non-Indigenous	324	162	255
Rate ratio³	3.25***	3.33***	3.03***
65 years and over			
Major Cities Indigenous	12,250	8,542	9,674
Remote/Very Remote non-Indigenous	4,874	3,268	4,044
Rate ratio³	2.51***	2.61***	2.39***
75 years and over			
Major Cities Indigenous	43,249	15,385	19,896
Remote/Very Remote non-Indigenous	7,312	5,592	6,368
Rate ratio³	5.91***	2.75***	3.12***
0 to 64 years			
Major Cities Indigenous	614	319	458
Remote/Very Remote non-Indigenous	230	116	181
Rate ratio³	2.67***	2.75***	2.53***
0 to 74 years			
Major Cities Indigenous	1,000	567	765
Remote/Very Remote non-Indigenous	415	215	328
Rate ratio³	2.41***	2.64***	2.33***
All ages			
Major Cities Indigenous	2,312	1,287	1,717
Remote/Very Remote non-Indigenous	815	669	659
Rate ratio³	2.84***	1.92***	2.61***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² For infant deaths, rate is the number of infant deaths per 1,000 live births; and for the other ages, rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the Indigenous to the non-Indigenous rates; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Note: The numbers on which the rates in this analysis are based are in Table A6, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

9. Conclusion

The purpose of the analysis was threefold. Firstly, it was to determine if there were identifiable patterns, related to remoteness or socioeconomic status, in Indigenous death rates. The results presented in the previous sections show that, at ages 0 to 64 years:

- when examined by quintile of socioeconomic disadvantage of area there is a gradient in Indigenous death rates from the lowest rate in the most well-off areas to the highest rate in the poorest areas – although the gradient is not continuous, with a lower rate in Quintile 4 (Figure 10 and Table 21); and
- when examined by remoteness, Indigenous death rates are higher in the most remote areas than in the most accessible areas – although the highest and lowest rates are in the second most remote and second most accessible classes, respectively (Figure 14 and Table 25).

Secondly, the analysis sought to determine if there were variations in death rates of non-Indigenous people by remoteness and socioeconomic status, once variations resulting from identified Indigenous deaths had been accounted for. The analysis shows that non-Indigenous death rates generally increase by socioeconomic disadvantage of area, both within and across the remoteness classes.

Thirdly, it sought to compare the lowest Indigenous death rates with the highest non-Indigenous death rates. The analysis confirms the substantial gap that exists between the lowest Indigenous death rates and highest non-Indigenous death rates when examined by measures of socioeconomic status and remoteness.

We trust that this analysis will usefully inform the implementation of strategies to address the serious issues, conditions and inequities contributing to these unacceptably high death rates.

Appendix 1: Classification of causes of death

Causes of death are classified to the World Health Organization's *International Statistical Classification of Diseases and Related Health Problems*, Tenth Revision, (ICD-10). The relevant codes for the cause of death variables included in Sections 3-5 of this report are listed below (Table A1).

Table A1: ICD-10 codes for cause of death variables

Cause of death	ICD-10 codes
Circulatory system diseases	L00-L99
Ischaemic heart disease	L20-L25
Cerebrovascular disease (stroke)	L60-L69
Other circulatory system diseases	L00-L19, L26-L59, L70-L99
Cancer (neoplasms)	C00-C37, D10-D48
Cancer of the trachea, bronchus & lung	C33-C34
Other cancers	C00-C32, C35-C37
Benign and unspecified cancer	D10-D48
Respiratory system diseases	J00-J99
Chronic lower respiratory disease	J40-J47
Other respiratory system diseases	J00-J39, J48-J99
Injuries and poisonings (accidents, poisonings or violence / external causes)	V01-V06, V09-99, W00-W99, X00-X99, Y00-Y98
Intentional self harm	X60-X84
Motor vehicle transport accidents	V02-V04, V09, V12-V14, V19-V87, V89
Other external causes	V01, V05-V06, V10-V11, V15-V18, V88, V90-V99, W00-W99, X00-X59, X85-X99, Y00-Y98
Other causes	A00-B99, D00-H99, K00-P96, Q00-R99
Diabetes mellitus	E10-E14
Perinatal conditions	P00-P96
Sudden Infant death syndrome	R95
All other causes	A00-B99, D00-E09, E15-H99, K00-O99, Q00-R94, R96-R99

Appendix 2: Supporting data

Table A2: Number of deaths by quintile of socioeconomic disadvantage of area, Indigenous status, sex and age, Qld, SA, WA and NT, 1997-99

Number of deaths

Quintile and age	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
Infants						
1: Least disadvantaged	8	6	14	117	71	188
2	17	10	27	133	89	222
3	27	18	45	175	123	298
4	26	20	46	168	115	283
5: Most disadvantaged	91	69	160	168	123	291
Total	169	123	292	761	521	1,282
0 to 14 years						
1: Least disadvantaged	9	9	18	180	111	294
2	21	18	36	216	138	354
3	36	24	60	257	193	450
4	39	27	66	258	177	435
5: Most disadvantaged	135	102	237	270	192	462
Total	241	182	423	1,182	811	1,993
15 to 24 years						
1: Least disadvantaged	12	#	15	249	114	363
2	12	9	21	267	87	354
3	36	12	48	314	103	417
4	30	15	45	294	126	420
5: Most disadvantaged	114	39	153	330	96	426
Total	210	79	289	1,461	529	1,990
25 to 64 years						
1: Least disadvantaged	57	36	93	2,586	1,545	4,131
2	156	108	264	2,955	1,581	4,536
3	198	144	342	3,225	1,623	4,848
4	276	156	432	3,687	1,899	5,586
5: Most disadvantaged	744	492	1,236	4,008	2,064	6,072
Total	1,458	956	2,414	16,535	8,717	25,252
65 years and over						
1: Least disadvantaged	27	39	66	9,513	11,280	20,793
2	54	66	120	8,628	9,012	17,640
3	84	99	183	9,762	9,324	19,086
4	117	99	216	11,808	11,232	23,040
5: Most disadvantaged	318	330	648	11,475	10,515	21,990
Total	606	646	1,252	51,198	51,365	102,563
75 years and over						
1: Least disadvantaged	12	27	39	6,861	9,630	16,491
2	18	33	51	5,816	7,306	13,122
3	45	54	99	6,426	7,533	13,959
4	51	57	108	7,791	9,033	16,824
5: Most disadvantaged	153	156	309	7,268	8,149	15,417
Total	280	333	613	34,162	41,652	75,814

... cont

Table A2: Number of deaths by quintile of socioeconomic disadvantage of area, Indigenous status, sex and age, Qld, SA, WA and NT, 1997-99 ... cont

Number of deaths

Quintile and age	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
0 to 64 years						
1: Least disadvantaged	78	48	129	3,015	1,773	4,788
2	189	135	324	3,438	1,806	5,244
3	273	177	450	3,795	1,920	5,715
4	348	195	543	4,239	2,202	6,441
5: Most disadvantaged	993	633	1,626	4,605	2,352	6,957
Total	1,909	1,217	3,126	19,178	10,057	29,235
0 to 74 years						
1: Least disadvantaged	96	60	156	5,667	3,423	9,090
2	225	168	393	6,252	3,510	9,762
3	312	225	537	7,131	3,708	10,839
4	414	237	651	8,258	4,402	12,660
5: Most disadvantaged	1,158	804	1,962	8,814	4,716	13,530
Total	2,235	1,530	3,765	36,214	19,770	55,984
All ages						
1: Least disadvantaged	105	87	195	12,528	13,053	25,581
2	243	201	441	12,068	10,816	22,884
3	354	279	633	13,556	11,242	24,798
4	465	294	759	16,047	13,434	29,481
5: Most disadvantaged	1,311	963	2,274	16,082	12,865	28,947
Total	2,515	1,863	4,378	70,376	61,422	131,798

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths. # not shown, as there are fewer than 5 cases.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A3: Death rates (0 to 64 years) by Indigenous status, sex and age, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

Age	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
0 to 14 years	155	122	139	56	40	48
15 to 24 years	296	111	204	98	38	69
25 to 64 years	1,436	839	1,120	305	166	237
65 years and over	8,614	6,896	7,633	5,174	3,682	4,301
75 years and over	10,546	9,297	9,828	8,458	6,641	7,353
0 to 64 years	862	512	681	212	115	165
0 to 74 years	1,394	850	1,106	388	208	297
All ages	2,488	1,552	1,980	818	552	668

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

Note: The numbers on which the rates in this analysis are based are in Table A2, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A4: Number and rate of deaths (0 to 64 years) by quintile of socioeconomic disadvantage of area, Indigenous status and State/ Territory, 1997-99

State/ Territory	Indigenous		Non-Indigenous ¹		Total	
	No.	Rate ²	No.	Rate ²	No.	Rate ²
Queensland						
1: Least disadvantaged	42	313	2340	132	2382	133
2	93	425	2631	149	2724	152
3	207	522	2994	171	3201	179
4	246	551	3387	191	3633	200
5: Most disadvantaged	543	631	3696	208	4239	227
Rate ratio³	..	2.02^{***}	..	1.58^{***}	..	1.71^{***}
South Australia						
1: Least disadvantaged	12	396	1113	128	1125	129
2	9	240	1230	144	1242	144
3	21	389	1140	165	1161	167
4	45	545	1293	166	1338	170
5: Most disadvantaged	183	803	1530	212	1713	230
Rate ratio³	..	2.03^{**}	..	1.66^{***}	..	1.78^{***}
Western Australia						
1: Least disadvantaged	21	568	1089	116	1110	117
2	81	665	1431	148	1515	155
3	111	638	1221	152	1332	162
4	117	690	1560	162	1677	171
5: Most disadvantaged	441	764	1791	182	2232	214
Rate ratio³	..	1.35	..	1.57^{***}	..	1.83^{***}
Northern Territory						
1: Least disadvantaged	45	798	168	181	213	218
2	36	600	180	214	216	241
3	108	1089	135	194	243	304
4	180	946	159	209	339	354
5: Most disadvantaged	534	854	45	246	579	719
Rate ratio³	..	1.07	..	1.36	..	3.30^{***}

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A5: Number of deaths (0 to 64 years) by quintile of socioeconomic disadvantage of area, Indigenous status, sex and selected cause, Qld, SA, WA and NT, 1997-99

Number of deaths

Quintile and cause	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
Ischaemic heart disease						
1: Least disadvantaged	9	6	15	392	91	483
2	30	12	42	521	106	627
3	51	24	75	536	115	651
4	69	24	93	663	174	837
5: Most disadvantaged	183	84	264	762	195	957
Total	346	150	496	2,880	682	3,562
Circulatory system diseases						
1: Least disadvantaged	15	9	24	585	204	789
2	45	24	69	759	231	990
3	75	48	123	783	249	1,032
4	90	45	135	960	354	1,314
5: Most disadvantaged	279	153	432	1,089	393	1,482
Total	514	285	799	4,188	1,431	5,619
Cancer						
1: Least disadvantaged	9	6	15	1,005	972	1,977
2	27	21	48	1,041	909	1,950
3	26	19	45	1,167	912	2,079
4	45	36	81	1,389	978	2,367
5: Most disadvantaged	83	85	168	1,326	1,023	2,349
Total	189	170	359	5,930	4,795	10,725
Respiratory system diseases						
1: Least disadvantaged	#	#	6	72	63	135
2	15	9	24	102	78	180
3	18	12	30	131	79	210
4	15	15	30	147	99	246
5: Most disadvantaged	66	54	120	183	135	318
Total	120	94	214	636	453	1,089
Intentional self harm						
1: Least disadvantaged	6	#	6	360	93	453
2	15	6	21	375	90	465
3	26	#	30	402	93	495
4	39	6	45	417	96	513
5: Most disadvantaged	78	18	96	510	114	624
Total	169	34	203	2,079	489	2,568
Injuries and poisonings						
1: Least disadvantaged	21	9	30	789	228	1,017
2	42	21	63	939	246	1,185
3	77	28	105	1,017	285	1,302
4	89	22	111	1,023	333	1,356
5: Most disadvantaged	252	108	360	1,218	348	1,566
Total	486	194	680	5,028	1,444	6,472

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths. # not shown, as there are fewer than 5 cases.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A6: Number of deaths by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status, sex and age, Qld, SA, WA and NT, 1997-99

Number of deaths

ARIA+ and age	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
Infants						
Major Cities	27	19	46	427	293	720
Inner Regional	11	#	15	139	102	241
Outer Regional	55	25	80	146	91	237
Remote	20	17	37	36	26	62
Very Remote	56	58	114	13	10	23
Total	169	123	292	761	521	1,282
0 to 14 years						
Major Cities	39	27	66	660	453	1,113
Inner Regional	18	9	27	231	162	393
Outer Regional	69	36	105	219	141	360
Remote	30	24	54	53	40	93
Very Remote	87	87	174	21	12	33
Total	241	182	423	1,182	811	1,993
15 to 24 years						
Major Cities	39	12	51	842	331	1,173
Inner Regional	12	#	15	276	96	372
Outer Regional	45	18	63	237	75	312
Remote	36	18	54	71	19	90
Very Remote	75	27	102	27	9	36
Total	210	79	289	1,461	529	1,990
25 to 64 years						
Major Cities	215	133	348	9,273	5,262	14,535
Inner Regional	74	46	120	3,239	1,750	4,989
Outer Regional	348	255	603	2,970	1,329	4,299
Remote	258	168	426	669	267	936
Very Remote	540	330	870	309	102	411
Total	1,458	956	2,414	16,535	8,717	25,252
65 years and over						
Major Cities	66	105	171	31,542	34,068	65,610
Inner Regional	39	39	78	10,557	9,534	20,091
Outer Regional	144	165	309	7,344	6,504	13,848
Remote	116	100	216	1,332	1,017	2,349
Very Remote	236	223	459	413	238	651
Total	606	646	1,252	51,198	51,365	102,563
75 years and over						
Major Cities	30	57	87	21,594	27,939	49,533
Inner Regional	15	21	36	6,938	7,639	14,577
Outer Regional	60	81	141	4,610	5,125	9,735
Remote	63	51	114	795	777	1,572
Very Remote	111	114	225	222	171	393
Total	280	333	613	34,162	41,652	75,814

... cont

Table A6: Number of deaths by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status, sex and age, Qld, SA, WA and NT, 1997-99 ... cont

Number of deaths

ARIA+ and age	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
0 to 64 years						
Major Cities	291	168	459	10,770	6,048	16,821
Inner Regional	105	57	162	3,747	2,007	5,754
Outer Regional	462	309	771	3,426	1,545	4,971
Remote	324	213	537	794	328	1,116
Very Remote	702	441	1,143	357	123	480
Total	1,909	1,217	3,126	19,178	10,057	29,235
0 to 74 years						
Major Cities	324	216	540	20,718	12,180	32,898
Inner Regional	129	75	204	7,365	3,903	11,268
Outer Regional	546	390	936	6,162	2,925	9,087
Remote	375	264	639	1,329	564	1,893
Very Remote	828	552	1,377	546	189	735
Total	2,202	1,497	3,696	36,120	19,761	55,881
All ages						
Major Cities	356	274	630	42,312	40,119	82,431
Inner Regional	144	96	240	14,301	11,541	25,842
Outer Regional	606	474	1,080	10,772	8,050	18,822
Remote	438	315	753	2,124	1,341	3,465
Very Remote	936	666	1,602	771	360	1,131
Total	2,515	1,863	4,378	70,376	61,422	131,798

¹Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths. # not shown, as there are fewer than 5 cases.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A7: Number and rate of deaths (0 to 64 years) by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status and State/ Territory, 1997-99

State/ Territory	Indigenous		Non-Indigenous ¹		Total	
	No.	Rate ²	No.	Rate ²	No.	Rate ²
Queensland						
Major Cities	180	377	7440	163	7620	165
Inner Regional	117	360	4146	175	4266	178
Outer Regional	444	618	2817	179	3261	199
Remote	141	814	432	181	576	225
Very Remote	246	689	213	229	459	356
Rate ratio³	..	1.83***	..	1.40***	..	2.16***
South Australia						
Major Cities	93	515	4410	157	4503	159
Inner Regional	9	237	744	157	756	157
Outer Regional	72	733	915	186	987	197
Remote	24	625	195	164	222	178
Very Remote	66	991	45	155	111	313
Rate ratio³	..	1.92***	..	0.99	..	1.97***
Western Australia						
Major Cities	186	539	4971	148	5157	152
Inner Regional	33	452	861	157	894	161
Outer Regional	111	744	768	168	879	187
Remote	150	780	339	166	489	219
Very Remote	288	912	156	178	444	373
Rate ratio³	..	1.69***	..	1.20*	..	2.45***
Northern Territory						
Major Cities	..	..	..	..	..	..
Inner Regional	..	..	..	..	..	..
Outer Regional	141	734	471	206	612	247
Remote	222	1131	147	190	369	378
Very Remote	543	839	66	197	609	621
Rate ratio³	..	1.14	..	0.96	..	2.51***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities (for the Northern Territory it is the ratio of the rate in the Very Remote class to the rate in Outer Regional); rate ratios differing significantly from 1.0 are shown with * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A8: Death rates (0 to 64 years) by Indigenous status, sex and selected cause, Qld, SA, WA and NT, 1997-99

Deaths per 100,000 population

Cause	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
Ischaemic heart disease	242	92	162	32	8	20
Circulatory system diseases	333	164	243	46	16	32
Cancer	119	95	107	66	55	60
Respiratory system diseases	67	47	57	7	5	6
Intentional self harm	60	11	35	23	6	14
Injuries and poisonings	160	61	109	56	17	36
All causes	862	512	681	212	115	165

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

Note: The numbers on which the rates in this analysis are based are in Table A9, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A9: Number of deaths (0 to 64 years) by the Accessibility/ Remoteness Index of Australia (ARIA+), Indigenous status, sex and selected cause, Qld, SA, WA and NT, 1997-99

Number of deaths

ARIA+ and cause	Indigenous			Non-Indigenous ¹		
	Males	Females	Persons	Males	Females	Persons
Ischaemic heart disease						
Major Cities	51	21	72	1,587	366	1,953
Inner Regional	21	12	33	600	147	747
Outer Regional	87	54	141	501	132	633
Remote	54	18	72	129	24	150
Very Remote	126	48	174	54	12	66
Total	346	150	496	2,880	682	3,562
Circulatory system diseases						
Major Cities	71	37	108	2,325	822	3,147
Inner Regional	33	15	48	849	300	1,149
Outer Regional	120	84	204	747	240	987
Remote	90	45	135	177	48	225
Very Remote	195	99	294	78	21	99
Total	514	285	799	4,188	1,431	5,619
Cancer						
Major Cities	30	27	57	3,354	2,988	6,342
Inner Regional	12	9	21	1,242	954	2,196
Outer Regional	51	45	96	1,035	681	1,716
Remote	33	30	63	207	126	333
Very Remote	66	57	123	90	45	135
Total	189	170	359	5,930	4,795	10,725
Respiratory system diseases						
Major Cities	8	13	21	336	270	606
Inner Regional	6	6	12	123	84	207
Outer Regional	35	22	57	129	69	198
Remote	21	15	36	30	21	51
Very Remote	51	36	87	18	6	24
Total	120	94	214	636	453	1,089
Intentional self harm						
Major Cities	30	6	36	1,236	312	1,548
Inner Regional	15	#	18	375	93	468
Outer Regional	42	12	54	336	63	399
Remote	30	#	33	87	12	99
Very Remote	51	9	60	32	#	36
Total	169	34	203	2,079	489	2,568
Injuries and poisonings						
Major Cities	89	22	111	2,700	810	3,510
Inner Regional	30	9	39	968	313	1,281
Outer Regional	114	48	162	939	240	1,179
Remote	81	36	117	249	54	303
Very Remote	168	75	243	129	21	150
Total	486	194	680	5,028	1,444	6,472

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths. # not shown, as there are fewer than 5 cases.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Note that the analysis in this table is based on data for 1997 to 2000: comparisons with analysis in tables, where data are for 1997 to 1999, are likely to show different results.

Table A10: Number and rate of deaths (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area, Indigenous status, Qld, SA, WA and NT, 1997-2000

ARIA+ and quintile	Indigenous		Non-Indigenous ¹		Total	
	No.	Rate ²	No.	Rate ²	No.	Rate ²
Major Cities						
1: Least disadvantaged	48	411	3,619	123	3,667	124
2	62	341	4,004	139	4,066	140
3	84	394	4,138	155	4,222	156
4	175	524	4,696	163	4,871	167
5: Most disadvantaged	230	472	5,928	201	6,158	205
Total	598	449	22,385	156	22,983	159
Rate ratio³	..	1.15	..	1.63***	..	1.65***
Inner Regional						
1: Least disadvantaged	12	237	1,187	137	1,199	138
2	35	363	1,473	154	1,508	157
3	69	386	1,482	173	1,551	177
4	50	408	1,691	186	1,742	189
5: Most disadvantaged	61	445	1,768	190	1,829	193
Total	228	387	7,602	168	7,830	171
Rate ratio³	..	1.88**	..	1.39***	..	1.40***
Outer Regional						
1: Least disadvantaged	178	622	1,154	166	1,331	184
2	132	568	1,172	162	1,305	174
3	152	619	1,344	181	1,496	195
4	204	681	1,311	184	1,515	204
5: Most disadvantaged	332	704	1,567	201	1,898	230
Total	1,000	649	6,569	179	7,568	198
Rate ratio³	..	1.13	..	1.21***	..	1.25***
Remote						
1: Least disadvantaged	143	1,095	262	157	405	226
2	134	1,144	271	157	405	219
3	132	789	296	174	428	229
4	113	727	336	189	449	233
5: Most disadvantaged	199	872	311	185	510	268
Total	722	903	1,476	173	2,197	235
Rate ratio³	..	0.80**	..	1.18*	..	1.19**
Very Remote						
1: Least disadvantaged	39	758	141	142	180	172
2	160	956	172	205	332	330
3	254	963	162	185	416	366
4	473	769	122	310	595	590
5: Most disadvantaged	651	871	32	222	683	766
Total	1,576	855	629	194	2,205	433
Rate ratio³	..	1.15	..	1.56	..	4.45***

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate is the number of deaths per 100,000 population.

³ Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A11: Total death rates (0 to 64 years) by remoteness (ARIA+) and quintile of socioeconomic disadvantage of area, Qld, SA, WA and NT, 1997-2000

Deaths per 100,000 population

Quintile	ARIA+ class					Rate Ratio ¹
	Major Cities	Inner Regional	Outer Regional	Remote	Very Remote	
1: Least disadvantaged	124	138	184	226	172	1.39***
2	140	157	174	219	330	2.36***
3	156	177	195	229	366	2.35***
4	167	189	204	233	590	3.53***
5: Most disadvantaged	205	193	230	268	766	3.74***
Total	159	171	198	235	433	
Rate ratio²	1.65***	1.40***	1.25***	1.19**	4.45***	

¹ Rate ratio is the ratio of the rate in the Very Remote class to the rate in Major Cities; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

² Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1.

Note: The numbers on which the rates in this analysis are based are in Table A10, Appendix 2.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A12: Non-Indigenous and Total death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Capital cities and other major urban centres, 1997-99

Deaths per 100,000 population

Quintile	All persons Rate	Non-Indigenous ¹		Indigenous	
		Rate	Difference (%) cf All	Rate	Difference (%) cf non-Indigenous
1: Least disadvantaged	121	119	-1.5	521	336.5
2	147	145	-1.8	447	208.8
3	161	158	-2.0	464	194.0
4	168	162	-3.2	567	249.3
5: Most disadvantaged	208	202	-3.0	539	166.6
Total	161	157	-2.5	515	228.6
Rate ratio²	1.72***	1.69***	..	1.03	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A13: Non-Indigenous and Total death rates (0 to 64 years) by quintile of socioeconomic disadvantage of area, Rest of State/ Territory areas, 1997-99

Deaths per 100,000 population

Quintile	All persons Rate	Non-Indigenous ¹		Indigenous	
		Rate	Difference (%) cf All	Rate	Difference (%) cf non-Indigenous
1: Least disadvantaged	163	147	-9.8	730	397.3
2	173	163	-5.3	597	265.2
3	187	174	-7.4	611	252.0
4	199	182	-8.4	693	281.0
5: Most disadvantaged	273	205	-24.7	783	281.3
Total	199	175	-12.5	721	313.2
Rate ratio²	1.68**	1.40***	..	1.07	..

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

² Rate ratio is the ratio of the rate in Quintile 5 areas to the rate in Quintile 1; rate ratios differing significantly from 1.0 are shown with * p < 0.05; ** p < 0.01; *** p < 0.001.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A14: Number of deaths (0 to 64 years) by quintile of socioeconomic disadvantage of area, by Indigenous status, Qld, SA, WA and NT, 1997-99

Number of deaths

Quintile	All persons	Non-Indigenous¹	Indigenous
1: Least disadvantaged	4,917	4,788	129
2	5,565	5,244	321
3	6,162	5,712	450
4	6,984	6,441	543
5: Most disadvantaged	8,583	6,957	1,626
Total	32,361	29,235	3,126

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

Table A15: Number of deaths (0 to 64 years) by remoteness (ARIA+), by Indigenous status, Qld, SA, WA and NT, 1997-99

Number of deaths

ARIA+	All persons	Non-Indigenous¹	Indigenous
Major Cities	17,280	16,821	459
Inner Regional	5,913	5,751	162
Outer Regional	5,739	4,971	768
Remote	1,653	1,116	537
Very Remote	1,623	480	1,143
Total	32,361	29,235	3,126

¹ Non-Indigenous deaths have been estimated by subtracting known Indigenous deaths from Total deaths.

Source: Analysis undertaken in HealthWIZ on deaths and population data from ABS

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