


Regional health: trends in inequalities in health and wellbeing by remoteness, for South Australia

February 2017

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1. Introduction

Urban and rural differences in service distribution, access, and health outcomes are challenges in many countries, with outcome indicators generally worse in rural and remote regions.^{1,2} In Australia, such differences or inequalities between ‘the city and the bush’ have been evident for many decades.^{3,4,5,2} As health services have been centralised in regional and metropolitan centres, the need to fund and deliver specific rural services to combat locational disadvantage has increased, resulting in a number of inventive rural outreach and mobile services, multipurpose centres with pooled funding, transport arrangements, training and incentives for rural health practitioners, and e-health services such as telemedicine.¹ However, despite the introduction of these initiatives, the health needs of many Australian communities are still not fully met, and substantial differences in health outcomes for rural and remote populations remain.^{6,5}

The paper was prepared from data supplied by State, Territory and Commonwealth Government agencies and published by PHIDU over a number of years in the Social Health Atlases. It will be updated from time to time, as new data become available.

2. Purpose

This paper examines some of these inequalities in health and wellbeing, by identifying trends over time in a number of indicators over the life course for South Australia, by remoteness. The Remoteness Structure of the Australian Statistical Geography Standard (ASGS) identifies five Remoteness Area categories for Australia, ranging from Major Cities to Very Remote areas (see Section 3 for details of this remoteness classification).⁷ As at June 2015, 70.9% of the Australian population resided in Major Cities. By comparison, just 2.2% lived in Remote or Very Remote Australia. Geographically distant areas of Australia are disproportionately populated by Indigenous Australians, with 2015 estimates showing that almost half (44.8%) of all people in Very Remote areas and 17% in Remote areas were Indigenous compared with just 3% Indigenous representation in the total population. The higher proportion of Indigenous Australians in remote area populations contributes substantially to, but does not completely account for, the generally poorer health of people living in remote areas.⁴

At June 2015, the estimated resident population of South Australia was 1.7 million people, or 7.1% of Australia’s population. The population of Greater Adelaide was 1.3 million people, which represented over three quarters (77.5%) of the total South Australian population. Outside of Adelaide, only Mount Gambier (26,348), Whyalla (22,759) and Murray Bridge (20,971) had populations of 20,000 or more.

People in rural and remote (also referred to as Regional) South Australia have worse health outcomes than those living in cities, across a range of indicators. They are more likely to die prematurely, report greater difficulties accessing health care, have higher potentially avoidable hospitalisations, and have a higher burden of chronic disease than other residents. These health inequalities are largely preventable, as they are primarily the result of geographic isolation, greater socioeconomic disadvantage, lack of health care providers, lower levels of access to health services, fewer long-term employment opportunities, and greater exposure to injury risks.⁶

3. Methods

3.1 Remoteness

The Australian Bureau of Statistics’ (ABS) Australian Statistical Geography Standard-Remoteness Area (ASGS-RA) is a framework for statistical geography, which defines locations in terms of remoteness.^{8,7} Geographic remoteness is essentially a measure of a physical location’s level of access to goods and services.⁹ Large population centres tend to have a greater range of goods and services available than small centres. Typically, a population centre is not likely to provide a full range of goods and services until its population reaches around 250,000 people.^{8,9}

The measures of remoteness used by the ABS are based on population estimates obtained from the Census of Population and Housing, conducted every five years. Remoteness measures are calculated using Accessibility/Remoteness Index of Australia (ARIA+) scores, which are based on the distance of geographic locations from the nearest population centre in various size ranges.⁸ The lower the ARIA+ score for a location, the better its level of access to goods and services.⁹

Box 1: Classification of Remoteness Areas in Australia⁷

The ABS Australian Statistical Geography Standard (ASGS) Remoteness Structure allocates areas to one of six Remoteness Areas depending on their distance from urban centres, where the population size of the urban centre is considered to govern the range and types of services available. Remoteness Areas used in this report cover the following five categories: Major Cities of Australia, Inner Regional Australia, Outer Regional Australia, Remote Australia and Very Remote Australia; the sixth Remoteness Area covers populations in areas recorded as off-shore, migratory and shipping and is not of relevance to the data in this report.

The category Major Cities includes Australia's capital cities, with the exceptions of Hobart and Darwin, which are classified as Inner Regional and Outer Regional, respectively.

In this report older data, which precede the use of the ASGS, have been re-compiled to match the current (2011) Remoteness Areas published by the ABS.

Readers should note that the presentation of data by Remoteness Area is dependent on the recording of addresses in the various administrative data collections from which data in this report are drawn.

Indicators

Describing geographic variations in indicators of outcomes, and of inequalities in those outcomes, provides information which can be used to develop approaches and to support progress towards reducing such differences. The indicators selected for analysis in this paper are:

- women smoking during pregnancy;
- low birth weight babies;
- children aged less than 15 years living in jobless families;
- premature mortality; and
- bowel cancer screening participation.

They represent indicators for infant, child and adult health, avoidable health outcomes (premature mortality) and cancer screening. They are also indicators for which data are available that allow a comparison over time. A range of other indicators with similar characteristics are available online in the section, *Remoteness in Australia*, at <http://www.phidu.torrens.edu.au/social-health-atlases/graphs/remoteness-in-australia>.

Data are aggregated over a number of years for the majority of indicators to address the relatively small number of events for, e.g. low birth weight babies.

In this report, data are presented as percentages or age-standardised rates. Rate ratios show the ratio of the rate (i.e., the percentage or the standardised rate) in one area to that in another: in this report, it is the ratio of the Very Remote areas figure to the Major Cities figure which is used. More detailed data definitions, data sources and relevant notes are contained in Section 7.

The data are presented in charts; tables supporting the charts of smoking in pregnancy (Table 1) and low birthweight babies (Table 2) are in Section 9, rather than being interspersed throughout the document, as they are best presented in landscape mode.

Statistical significance

Statistical significance between rates over time was determined using two-tailed two-proportion z-tests. Statistical significance for rate ratios over time was determined by examining for overlapping confidence intervals of the rate ratios at the 95% and 99% confidence levels.

There may be large differences in rate ratios over time that are not statistically significant. In some cases this occurs because the small numbers of people in the Remote and Very Remote areas reduces the power of the statistical test.

Discussion of variations

In discussing the extent to which percentages or rates vary across the remoteness categories, the following terms are used:

- 'Notable', referring to a rate ratio from 1.10 to <1.20 (a difference of from 10% to <20%), or from 0.90 to <0.80 (a difference of from -10% to <-20%);
- 'Marked', referring to a rate ratio from 1.20 to <1.50 (a difference of from 20% to <50%), or from 0.80 to <0.50 (a difference of from -20% to <-50%);
- 'Substantial', referring to a rate ratio of 1.50 or above (a difference of 50% or more), or of 0.50 and below (a difference of greater than 50%).

Referencing

Data and commentary are referenced to the author(s) using Endnote; cross-references to previously referenced articles are also provided. Unreferenced statements are based on data published by PHIDU.

4. Findings

4.1 Women smoking during pregnancy

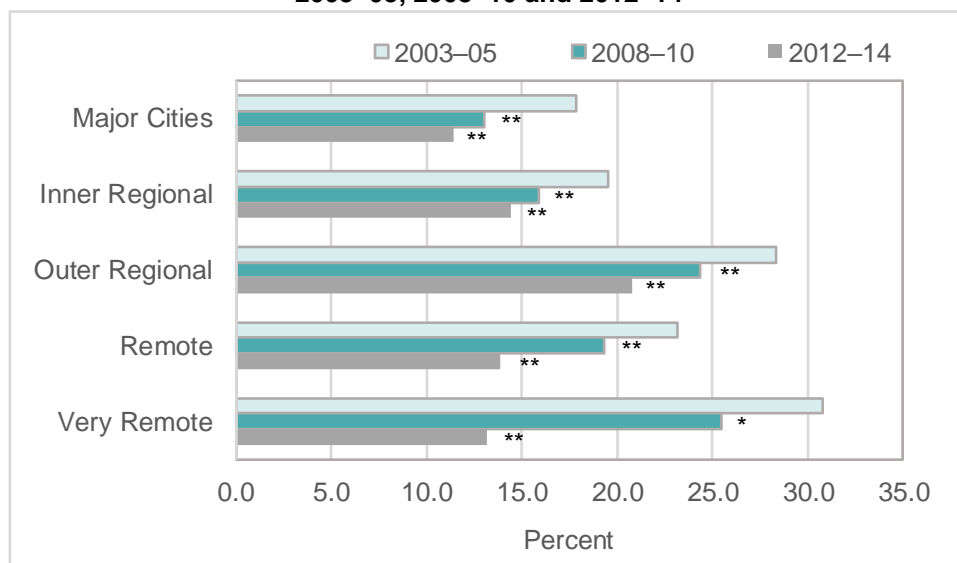
Maternal smoking during pregnancy is a major risk factor that can adversely affect infant health, increasing the likelihood of low birth weight, pre-term birth, fetal and neonatal death, and Sudden Infant Death Syndrome (SIDS).¹⁰

In 2003–05, in South Australia, one in five women (19.7%) smoked during pregnancy, varying from 17.8% in Adelaide, to 24.9% in Regional South Australia. By 2012–14 the rate of smoking among pregnant women in South Australia was down by one third, to one in eight pregnant women (12.9%), and in Adelaide had declined by over 50%, to 5.8%; in Regional South Australia, the rate had dropped by over one third, to 18.4%.

Rates among Aboriginal and Torres Strait Islander women reporting that they smoked during pregnancy in 2003–05, at 57.5% were, however, almost five times those of non-Indigenous women (whose rate was 11.8%, a rate ratio of 4.9). By 2012–14 this rate had declined, to 51.7%, and the gap compared with non-Indigenous women had also decreased, to four and a half times.

Compared to the period 2003–05, the change in the proportion of women in South Australia who smoked during pregnancy in 2012–14 is also evident across the Remoteness Areas, with declines of 25% or more in the rates in each of the remoteness categories; the largest declines from 2003–05 were in the Very Remote and Remote areas, at 57.2% and 40.0%, respectively (Figure 1 and Table 1). It is notable that the declines have occurred between each period.

Figure 1: Women smoking during pregnancy, by remoteness, South Australia, 2003–05, 2008–10 and 2012–14



*Change to 2008–10 (c.f. 2003–05) is statistically significant at the 95% confidence level

**Change to 2008–10 and to 2012–14 (both c.f. 2003–05) is statistically significant at the 99% confidence level

Source: Compiled by PHIDU based on data from the South Australian Department of Health and Ageing

The ratio between the proportion of women in South Australia smoking during pregnancy in the Very Remote areas when compared with the Major Cities areas increased over the first two periods, from 2.43 in 2003–05 to 2.61 in 2008–10, before declining to around half that level in 2012–14 (a rate ratio of 1.35); in each case the rate ratios were of statistical significance (Table 1).

The reduction of the smoking rate among pregnant women in all Remoteness Areas, and the narrowing of the gap between Very Remote and other areas suggests that public health campaigns and other preventive interventions to improve maternal health area are having an ongoing impact. However, the stubbornly high rates among Aboriginal and Torres Strait Islander women remains a major concern.

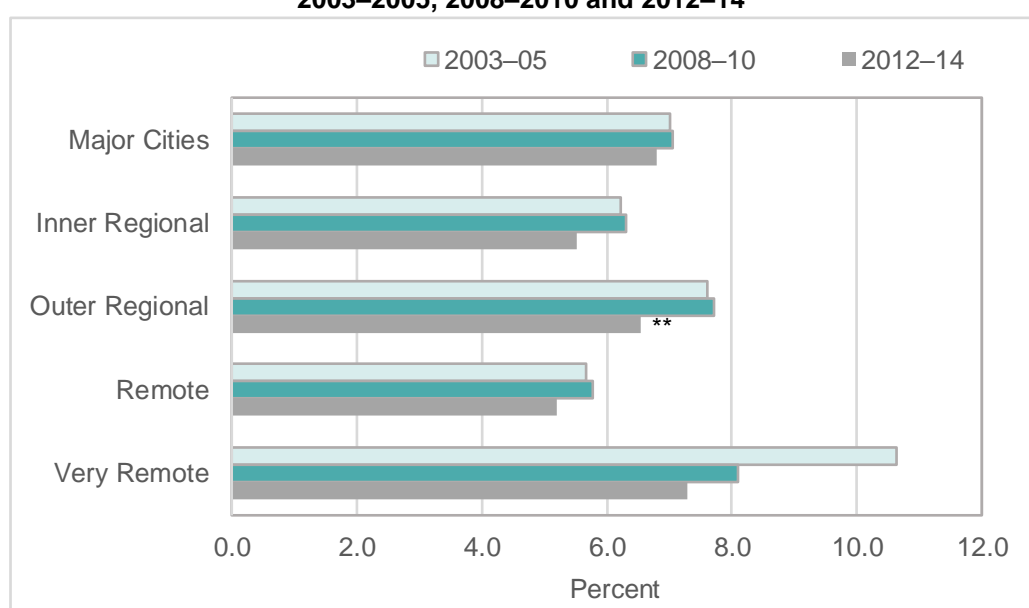
4.2 Low birth weight babies

Low birth weight is recognised to be associated with immediate and longer term consequences of ill-health. Immediate consequences include increased risk of hospitalisation and neonatal death. Over the longer term, low birthweight is considered a marker for chronic disease in adulthood, such as high blood pressure, coronary heart disease and type 2 diabetes.¹¹

In South Australia, over the period 2003–05, 16.6% of babies born to Aboriginal and Torres Strait Islander women were of low birthweight, compared to a substantially lower 6.7% of babies born to non-Indigenous women. By 2012–14, the proportions had declined, to 13.1% for Aboriginal and Torres Strait Islander women and to 6.4% for non-Indigenous women.

Compared to the period 2003–05, the proportion of babies who had a low birth weight in 2012–14 fell in most remoteness categories, with the largest decline in the Very Remote areas, where the rate fell by almost one third (31.6%); the only change of statistical significance was the decline of 14.0% in the Outer Regional areas (Figure 2 and Table 2).

Figure 2: Low birth weight babies, by remoteness, South Australia, 2003–2005, 2008–2010 and 2012–14



**Change to 2012–14 from 2008–10 is statistically significant at the 99% confidence level

Source: Compiled by PHIDU based on data from the South Australian Department of Health and Ageing

The ratio between the proportion of low birth weight babies in Very Remote and Major Cities areas in South Australia fell from 1.52 in 2003–05 (indicating the rate in the Very Remote areas was 52% higher than in the Major Cities areas), to 1.15 in 2008–10, before declining further to 1.07 in 2012–14 (Table 2).

These data suggest that public health campaigns and other preventive interventions to improve this aspect of maternal health are working relatively well in areas outside of the Major Cities, although the higher overall proportions for babies of Aboriginal and Torres Strait Islander women are of concern.

4.3 Children living in jobless families

Families where no parent is employed ('jobless families') not only experience substantial economic disadvantage but may also have reduced social opportunities that affect their wellbeing and health.

Children who live without an employed parent may be at higher risk of experiencing financial hardship and other disadvantage in the short to medium term. They may not have a role model of employment to follow, and the joblessness of the parent(s) can mean that such children are more likely to have outcomes such as welfare dependency in the longer term.¹¹ In some families, the reason the parent is without a job may be to care for children or to undertake study to try to improve the future economic prospects of the household. However, most of the children living without an employed parent live in lone-parent households with limited resources.¹²

Opportunities for secure employment in areas outside of the Major cities are generally fewer as people living in rural areas do not have the range of employment and career options that are available in the larger urban centres and cities, levels of job security and future employment prospects are lower, and there are often poorer employment conditions than in urban areas.¹³ The need for agricultural workers has also decreased as farms have become larger and more mechanised.¹³ Poverty in rural and regional Australia is characterised by generally lower incomes of those living in these regions; reduced access to services such as health, education and transport; declining employment opportunities; and distance and isolation.¹⁹ For the significant proportion of Aboriginal and Torres Strait Islander people who live outside the Major Cities and for those living on income support, this is often exacerbated by cultural and language issues and the intergenerational impacts of colonisation, such as trauma, racism, discrimination and dislocation from country and culture.^{14, 15, 16, 19-21}

Compared to the period 2006, the proportion of South Australia children aged less than 15 years living in families where no adult was employed in 2011 fell in the Major Cities and Inner Regional remoteness categories (with both reductions being of statistical significance), and increased in the Outer Regional and Very Remote areas (also of statistical significance); the largest change was in the Very Remote areas, up from 16.5 % to 19.1%, an increase of 16.3% (Table 3 and Figure 3).

Table 3: Children aged less than 15 years living in jobless families in South Australia, by remoteness, 2006 and 2011

Remoteness category	Time period				Statistical significance of change
	2006		2011		
	number	per cent	number	per cent	
Major Cities	30,255	16.3	29,530	15.2	**
Inner Regional	3,810	12.7	3,701	11.7	**
Outer Regional	6,732	17.7	6,763	18.7	**
Remote	895	10.6	891	10.9	
Very Remote	444	16.5	501	19.1	**
Rate Ratio#	..	1.01	..	1.26	..
Statistical significance**	..		..	**	..

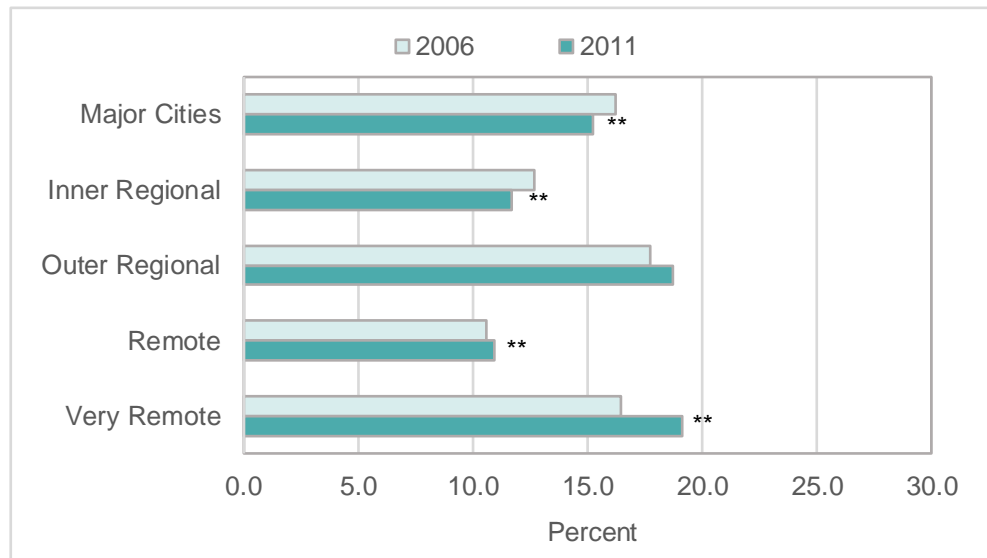
**Change from previous period/ difference between Very Remote and Major Cities areas is statistically significant at the 99% confidence level

#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Major Cities areas

Source: 2006 and 2011 data compiled by PHIDU based on data from the ABS Census, 2006 and 2011

As a result of the decrease in the proportion in the Major Cities areas (down by 6.2%), and the large increase in the Very Remote areas, the gap between the proportion of these children in the Very Remote and the Major Cities areas increased from just 1% to 26%, indicating a widening of the gap, and worsening inequality; this differential in proportions was statistically significant (Table 3).

Figure 3: Children aged less than 15 years living in jobless families in South Australia, by remoteness, 2006 and 2011



**Change (either increase or decrease) from previous period is statistically significant at the 99% confidence level

Source: 2006 and 2011 data compiled by PHIDU based on data from the ABS Census, 2006 and 2011

4.4 Premature mortality

Deaths before 75 years of age are described as ‘premature’. The upper age limit reflects current life expectancy of around 80 years in developed countries such as Australia.¹⁷ Malignant neoplasms (cancer), diseases of the circulatory system and the combined external causes of accidents, poisonings and violence are the main causes of premature death for Australians. Persons most likely to die prematurely include Aboriginal and Torres Strait Islander people, those earning low incomes, those who are unemployed, and residents of rural and remote areas.¹⁸

Premature mortality has economic and social costs. These include a decline in the size of the labour force, leading to lost productivity and economic output, as well as the loss of skills and experience.¹⁹ Social implications involve the emotional trauma experienced by family and friends due to the death of their family member, as well as the loss of social support and potential financial insecurity.

In South Australia, the overall premature mortality rate fell by 13.0% from an age-standardised rate of 292.9 deaths per 100,000 population in 1997–2001, to 255.0 deaths per 100,000 population in 2010–14; this is a notable fall over a 13-year period.

In addition, the premature mortality rate in 2010–14 was lower across all remoteness categories than in the period 1997–2001; the reductions ranged between 15% and 22%, other than in the Very Remote areas, where it was 7.3% (Table 4 and Figure 4). The reductions were statistically significant, other than for the smaller reduction in the rate in the Very Remote areas.

As a result of these differential reductions, the ratio of premature mortality rate in the Very Remote compared to the Major Cities areas increased, from 56% higher in 1997–2001 to 73% higher in 2010–14 (rate ratios of 1.56 and 1.73, respectively), indicating a widening of the gap, and worsening inequality; both of these differentials in rates were statistically significant (Table 4).

Table 4: Premature mortality in South Australia, by remoteness, 1997–2001 and 2010–14

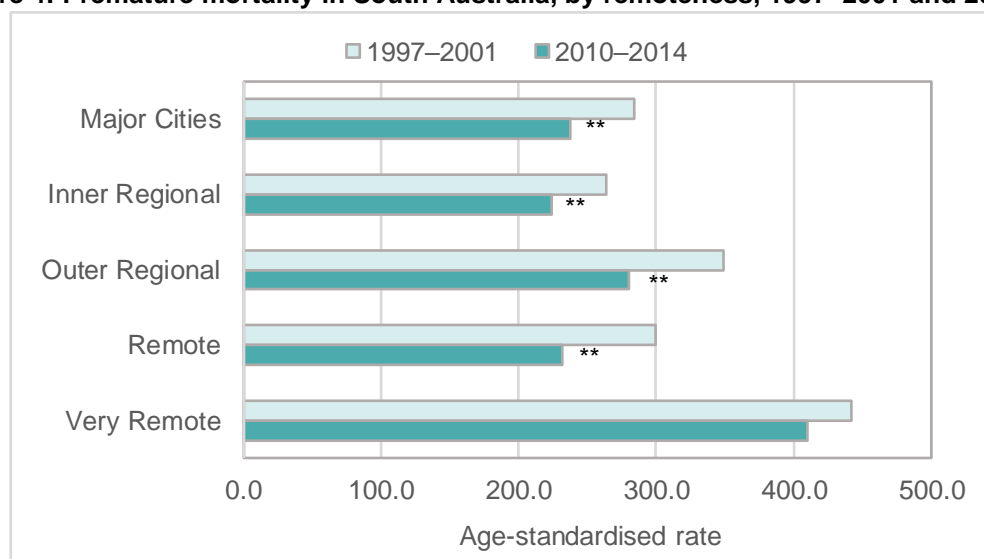
Remoteness category	Time period				Statistical significance of change
	1997–2001		2010–14		
	number	rate	number	rate	
Major Cities	15,634	284.2	13,823	237.5	**
Inner Regional	2,037	263.9	2,290	223.8	**
Outer Regional	3,666	348.7	3,105	280.4	**
Remote	634	299.5	551	231.8	**
Very Remote	299	442.3	288	409.8	
Rate Ratio#	..	1.56	..	1.73	..
Statistical significance	..	**	..	**	..

**Change from previous period/ difference between Very Remote and Major Cities areas is statistically significant at the 99% confidence level

#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Major Cities areas

Source: 1997 to 2001 data compiled by PHIDU from deaths data supplied by the ABS on behalf of the State and Territory Registrars of Births, Deaths and Marriages for 1997 to 2001; and the ABS Estimated Resident Population, 30 June 1997 to 2001; 2010 to 2014 data compiled by PHIDU from deaths data based on the 2010 to 2014 Cause of Death Unit Record Files supplied by the Australian Coordinating Registry, on behalf of the Registries of Births, Deaths and Marriages and the National Coronial Information System; and the ABS Estimated Resident Population, 30 June 2010 to 30 June 2014

Figure 4: Premature mortality in South Australia, by remoteness, 1997–2001 and 2010–14



**Change from previous period is statistically significant at the 99% confidence level

Source: 1997 to 2001 data compiled by PHIDU from deaths data supplied by the ABS on behalf of the State and Territory Registrars of Births, Deaths and Marriages for 1997 to 2001; and the ABS Estimated Resident Population, 30 June 1997 to 2001; 2010 to 2014 data compiled by PHIDU from deaths data based on the 2010 to 2014 Cause of Death Unit Record Files supplied by the Australian Coordinating Registry, on behalf of the Registries of Births, Deaths and Marriages and the National Coronial Information System; and the ABS Estimated Resident Population, 30 June 2010 to 30 June 2014

4.5 Participation in the National Bowel Cancer Screening Program

Colorectal cancer (CRC), also known as bowel cancer, is one of the commonest forms of cancer in Australia, with around 80 Australians dying each week from the disease. Bowel cancer can be treated successfully if detected in its early stages, but currently fewer than 40 per cent of bowel cancers are detected early. Screening has been shown in randomised trials to reduce the incidence of and mortality from CRC.^{20,21}

The National Bowel Cancer Screening Program (NBCSP) has operated since 2006, and aims to reduce the morbidity and mortality from bowel cancer by actively recruiting and screening the target population for early detection or prevention of the disease.²² The NBCSP uses a one-time immunochemical faecal occult blood test (FOBT) for people aged 50, 55 and 65 years. The second phase of the National Bowel Cancer Screening Program (NBCSP) commenced on 1 July 2008 and offered testing to people turning 50 years of age between January 2008 and December 2010, and those turning 55 or 65 between July 2008 and December 2010. Ongoing funding has meant the program has continued to operate, expanding to include those turning 60 years of age from 2013 and those turning 70 years of age from 2015. In 2017–18, the program will introduce biennial screening, which, once fully implemented, will be offered to all Australians aged between 50 and 74 years, as per the recommendations by the National Health and Medical Research Council for two-yearly screening.²² The NBCSP has been phased in gradually to help ensure that health services, such as colonoscopy and treatment options, are able to meet any increased demand.²³

In addition to the NBCSP, a variety of FOBT kits are available in Australia to screen for bowel cancer either available over the counter from pharmacies, through medical practitioners, or through other programs such as BowelScreen Australia, an education and screening initiative run by The Pharmacy Guild of Australia, and BowelCare, a community service project of various Rotary clubs and districts. The data contained within this report only represent participation within the NBCSP implemented by the Australian Government in partnership with the state and territory governments, not the programs operating within the community and described above. Aboriginal and Torres Strait Islander participants, participants who live in regional and remote locations, and participants who live in areas of lower socioeconomic status, continue to have higher rates of positive screening results, yet lower rates of follow-up colonoscopies than other participants.²³

In 2010, 41.4% of Adelaide residents invited to participate in the NBCSP did so, with a higher slightly higher proportion (43.1%) in Regional South Australia. Participation in 2012/13 was lower, at 37.3% and 38.5%, respectively. The lower rate of participation may be a consequence of the pause in the program between January and June 2011 leading to uncertainty over program continuation and reduced participant confidence.²⁴ The NBCSP recommenced gradually from 1 July 2011 following the Australian Government’s decision in the 2011–12 Budget to make the program ongoing.²⁴

Participation in 2012/13 was also lower in all remoteness categories, and all of the reductions were of statistical significance; the largest decreases were in the Very Remote (down by 20.2%) and Remote (down by 15.6%) areas (Table 5).

Table 5: NBCSP participation in South Australia, by remoteness, 2010 and 2012/13

Remoteness category	Time period				Statistical significance of change
	2010		2012/13		
	number	per cent	number	per cent	
Major Cities	24,281	41.4	20,077	37.2	**
Inner Regional	4,983	44.1	3,656	40.3	**
Outer Regional	4,527	42.4	3,753	37.7	
Remote	1,137	44.6	835	37.7	
Very Remote	262	34.3	148	27.4	
Rate Ratio#	..	0.83	..	0.74	..
Statistical significance	..	**	..	**	..

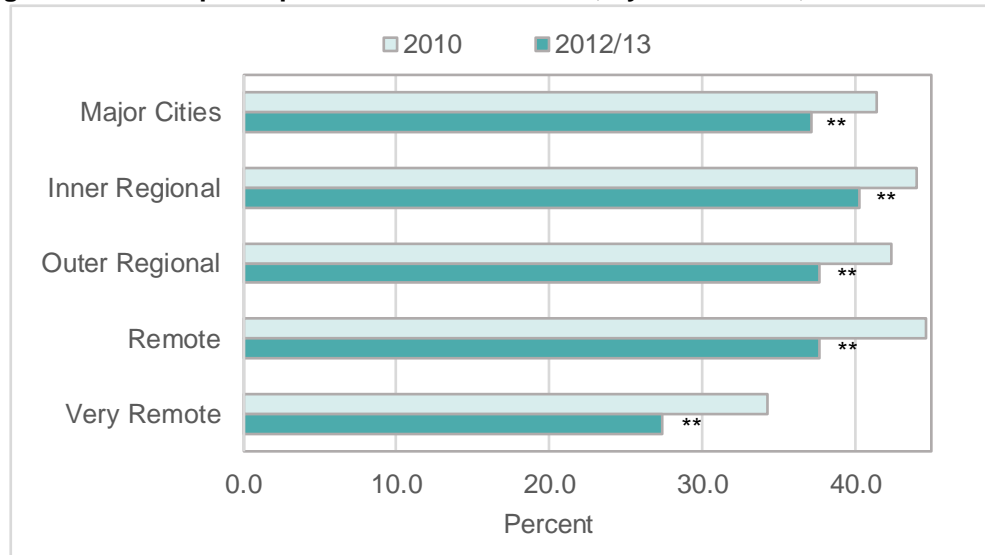
**Change from previous period/ difference between Very Remote and Major Cities areas is statistically significant at the 99% confidence level

#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Major Cities areas

Source: Data compiled by PHIDU based on data provided by the Department of Health from the National Bowel Cancer Screening Program, 2010 and 2012/13

Participation in the Very Remote areas was 17% lower than in the Major Cities areas in 2010 and 26% lower in 2012/13, and in both cases the difference was statistically significant (Table 5). The large and increasing gap in participation between people living in the Very Remote and the other Remoteness Areas presents a challenge to the delivery of this program, a challenge faced by many preventive health and service delivery programs in Australia.

Figure 5: NBCSP participation in South Australia, by remoteness, 2010 and 2012/13



**Change from previous period is statistically significant at the 99% confidence level

Source: Data compiled by PHIDU based on data provided by the Department of Health from the National Bowel Cancer Screening Program, 2010 and 2012/13

There is no discernible pattern by remoteness in the proportion of participants with a positive FOBT in 2012/13, other than the highest rate being found for those responding to the program who lived in the Outer Regional areas (Figure 6). PHIDU does not have these data for 2010.

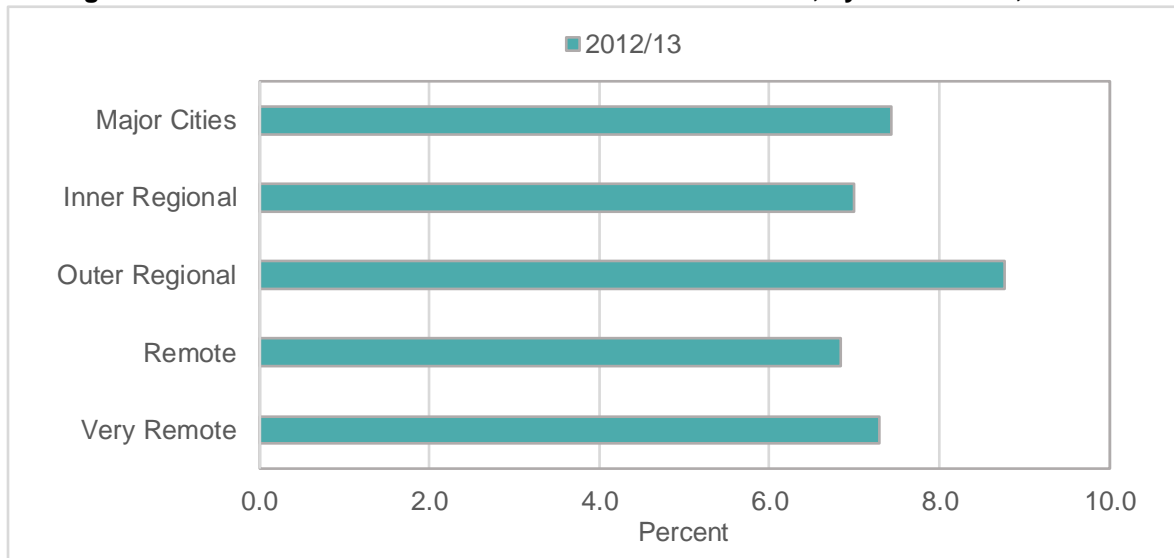
Table 6: FOBT results under the NBCSP in South Australia, by remoteness, 2010 and 2012/13

Remoteness category	Time period				Statistical significance of change
	2010		2012/13		
	number	per cent	number	per cent	
Major Cities	n.a.	..	1,493	7.4	..
Inner Regional	n.a.	..	256	7.0	..
Outer Regional	n.a.	..	329	8.8	..
Remote	n.a.	..	57	6.8	..
Very Remote	n.a.	..	11	7.3	..
Rate Ratio#	..	..	..	0.98	..
Statistical significance	..	..	..	..	..

#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Major Cities areas

Source: Data compiled by PHIDU based on data provided by the Department of Health from the National Bowel Cancer Screening Program, 2010 and 2012/13

Figure 6: FOBT results under the NBCSP in South Australia, by remoteness, 2012/13



Source: Data compiled by PHIDU based on data provided by the Department of Health from the National Bowel Cancer Screening Program, 2012/13

5 Conclusion

For a number of health-related outcomes there is a gradient evident across remoteness categories, with populations living in the most remote areas of South Australia having the poorest health and wellbeing compared to those living in Major Cities. While there have been some improvements in absolute differences over time, in a number of instances relative inequality, as evidenced by the gap between those who are the best off and those who are the worst off, has lessened.

It has been argued that relative measures are better for assessing progress in reducing inequalities because, in the context of overall health improvement, narrowing relative measures necessarily imply narrowing absolute measures when health is improving relatively faster among the people who are worse off.²⁵³⁰ The need to continue to improve health and wellbeing outcomes for those Australians who live in the nation's most remote areas remains an imperative if such inequalities are to be reduced.

6 Data notes, sources and definitions

Symbols used

n.a. not available

.. not applicable.

Smoking in pregnancy

The data comprise the women who reported that they smoked during a pregnancy, expressed as a proportion of the number of pregnancies. Note that the data may include women who were pregnant more than once during each time period (3 years).

Data compiled by PHIDU based on data from the South Australian Department of Health and Ageing.

Low birth weight babies

The data comprise the babies (live born) weighing less than 2500 grams at birth (data over 3 years), expressed as a proportion of the number of all live births.

Data compiled by PHIDU based on data from the South Australian Department of Health and Ageing.

Children aged less than 15 years living in jobless families

The data presented are the number of children aged less than 15 years living in families in which no parent is employed, expressed as a proportion of all children aged less than 15 years of age.

Data compiled by PHIDU based on the ABS Census 2006 and 2011 (unpublished) data.

Premature mortality

The data presented are the average annual indirectly age-standardised rates per 100,000 population (aged 0 to 74 years), based on the Australian standard.

1997 to 2001 data compiled by PHIDU from deaths data supplied by the ABS on behalf of the State and Territory Registrars of Births, Deaths and Marriages for 1997 to 2001; and the ABS Estimated Resident Population, 30 June 1997 to 2001.

2010 to 2014 data compiled by PHIDU from deaths data based on the 2010 to 2014 Cause of Death Unit Record Files supplied by the Australian Coordinating Registry, on behalf of the Registries of Births, Deaths and Marriages and the National Coronial Information System; and the ABS Estimated Resident Population, 30 June 2010 to 30 June 2014.

Participation in the NBCSP

The term participation is used to refer to participation in the screening test. Hence, the participation rate is the proportion of the eligible population invited who returned a completed Faecal Occult Blood Test (FOBT) kit for analysis.²⁹

Data compiled by PHIDU based on data provided by the Department of Health from the National Bowel Cancer Screening Program, 2010 and 2012/13.

FOBT results

The outcome indicator presented is referred to as a 'positive test result'; a positive FOBT result indicates that blood has been found in the sample provided.

Data compiled by PHIDU based on data provided by the Department of Health from the National Bowel Cancer Screening Program, 2010 and 2012/13.

7 Data quality statements (as available at 14 July 2016)

Smoking in pregnancy and low birth weight babies

<http://meteor.aihw.gov.au/content/index.phtml/itemId/624809>

Mortality data

<http://www.abs.gov.au/ausstats/abs@.nsf/Previousproducts/3303.0Quality%20Declaration02013?opendocument&tabname=Notes&prodno=3303.0&issue=2013&num=&view>

National Bowel Cancer Screening Program

<http://www.aihw.gov.au/publication-detail/?id=60129549725>: see page 40

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8 Data tables

Table 1: Women smoking during pregnancy in South Australia, by remoteness, 2003–05, 2008–10 and 2012–14

Remoteness Area	Time period						Statistical significance of	
	2003–05		2008–10		2012–14		change from 2003–05 to	
	Number	Per cent	Number	Per cent	Number	Per cent	2008–10	2012–14
Major Cities	6,876	17.8	5,732	13.0	5,060	11.4	**	**
Inner Regional	1,003	19.5	920	15.9	783	14.4	**	**
Outer Regional	2,098	28.3	1,838	24.4	1,385	20.8	**	**
Remote	377	23.2	332	19.3	224	13.9	**	**
Very Remote	148	30.8	117	25.5	41	13.2	*	**
Rate Ratio#	..	1.72	..	1.96	..	1.15	..	..
Statistical significance**	..	**	..	**	..		..	..

*Change from previous period is statistically significant at the 95% confidence level

**Change from previous period/ difference between Very Remote and Major Cities areas is statistically significant at the 99% confidence level

#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Major Cities areas

Source: Data compiled by PHIDU based on data from the South Australian Department of Health and Ageing

Table 2: Low birth weight babies in South Australia, by remoteness, 2003–05, 2008–10 and 2012–14

Remoteness Area	Time period						Statistical significance of	
	2003–05		2008–10		2012–14		change from 2003–05 to	
	Number	Per cent	Number	Per cent	Number	Per cent	2008–10	2012–14
Major Cities	2,700	7.0	3,083	7.1	3,032	6.8		
Inner Regional	319	6.2	362	6.3	303	5.5		
Outer Regional	563	7.6	578	7.7	440	6.5		**
Remote	92	5.7	99	5.8	85	5.2		
Very Remote	51	10.6	37	8.1	22	7.3		
Rate Ratio#	..	1.52	..	1.15		1.07	..	..
Statistical significance**	..	**	..		..		..	..

**Change from previous period/ difference between Very Remote and Major Cities areas is statistically significant at the 99% confidence level

#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Major Cities areas

Source: Data compiled by PHIDU based on data from the South Australian Department of Health and Ageing

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9 Sources of information

- ¹ Humphreys JS, Dixon J. Access and equity in Australian rural health services. In: Healy J, McKee M, editors. *Accessing healthcare: responding to diversity*. Oxford, UK: Oxford University Press; 2004.
- ² Bullock S. What we know and don't know about rural health in Australia. Paper presented at: 10th National Rural Health Conference; 2009 May 17-20; Cairns
- ³ Mooney G. The politics and economics of the rural health system: equity and efficiency. In: 3rd National Rural Health Conference; 1995 3-5 February; Mt Beauty; 1995.
- ⁴ Australian Institute of Health and Welfare (AIHW). *Australia's health 2014*. (AIHW Cat. no. AUS 178). Canberra: AIHW; 2014
- ⁵ Humphreys J, Wakerman J. *Primary health care in rural and remote Australia - achieving equity of access and outcomes through national reform*. Bendigo: Monash University; 2008
- ⁶ National Rural Health Alliance (NRHA). *The determinants of health in rural and remote Australia*, May 2011 (Fact sheet 28). [Internet]. Available from: <http://ruralhealth.org.au/sites/default/files/publications/factsheet-determinants-health-rural-australia.pdf>
- ⁷ Australian Bureau of Statistics (ABS). *Australian Statistical Geography Standard (ASGS): Volume 5 - Remoteness Structure*, July 2011. (ABS Cat. no. 1270.055.005). Canberra: ABS; 2013
- ⁸ Australian Population and Migration Research Centre (APMRC). *ARIA (Accessibility/Remoteness Index of Australia)*, 2013. [cited 2016 April 1]. Available from: http://www.adelaide.edu.au/apmrc/research/projects/category/about_aria.html
- ⁹ Australian Institute of Health and Welfare (AIHW). *Remoteness classification (ASGS-RA) N - METeOR*. [Internet; cited 2016 March 31]. Available from: <http://meteor.aihw.gov.au/content/index.phtml/itemId/531713/meteorItemView/long>
- ¹⁰ Laws PJ, Grayson N, Sullivan EA. *Smoking and pregnancy*. (AIHW Cat. no. PER 33). Sydney: Australian Institute of Health and Welfare (AIHW); 2006
- ¹¹ Hancock K, Edwards B, Zubrick S. *Echoes of disadvantage across the generations? The influence of long-term joblessness and separation of grandparents on grandchildren*. Melbourne, Vic.: Australian Institute of Family Studies, 2013
- ¹² Australian Bureau of Statistics (ABS). *Labour Force, Australia: labour force status and other characteristics of families*, June 2011. (ABS Cat. no. 6224.0.55.001). Canberra: ABS; 2011
- ¹³ Bureau of Rural Sciences, *Social Atlas of Rural and Regional Australia*, 2008
- ¹⁴ National Rural Health Alliance (NRHA), ACOSS. *A snapshot of poverty in rural and regional Australia*. Canberra: NRHA; 2013
- ¹⁵ Awofeso N. Racism: a major impediment to optimal Indigenous health and health care in Australia. *Australian Indigenous Health Bulletin* 2011; 11(3)
- ¹⁶ Jackson LR, Ward JE. Aboriginal health: Why is reconciliation necessary? *Medical Journal of Australia* 1999; 170: 437-40
- ¹⁷ Page A, Tobias M, Glover J, Wright C, Hetzel D, Fisher E. *Australian and New Zealand atlas of avoidable mortality*. Adelaide: Public Health Information Development Unit (PHIDU), The University of Adelaide; 2006
- ¹⁸ Glover J, Harris K, Tennant S. *A social health atlas of Australia [second edition] - volume 1: Australia*. Adelaide: PHIDU, The University of Adelaide; 1999
- ¹⁹ Zhang W, Bansback N, Anis AH. Measuring and valuing productivity loss due to poor health: a critical review. *Soc Sci Med*. 2011; 72(2): 185-192
- ²⁰ Towler B, Irwig L, Glasziou P, et al. A systematic review of the effects of screening for colorectal cancer using the faecal occult blood test, hemoccult. *BMJ* 1998; 317: 559-565
- ²¹ Atkin WS, Edwards R, Kralj-Hans I, et al; UK Flexible Sigmoidoscopy Trial Investigators. Once-only flexible sigmoidoscopy screening in prevention of colorectal cancer: a multicentre randomised controlled trial. *Lancet*. 2010; 375: 1624-33
- ²² Department of Health (DOH). *National Bowel Cancer Screening Program* [Internet]. N.d. [cited 2016 April 4]. Available

from: <http://www.cancerscreening.gov.au/internet/screening/publishing.nsf/Content/bowel-screening-1>

²³ Australian Institute of Health and Welfare. National Bowel Cancer Screening Program monitoring report: 2012–13. (Cancer series no. 84. Cat. no. CAN 81). Canberra: AIHW; 2014

²⁴ Australian Institute of Health and Welfare (AIHW). National Bowel Cancer Screening Program monitoring report: July 2011–June 2012. (Cancer series no. 75. Cat. no. CAN 71). Canberra: AIHW; 2013

²⁵ Low A, Low A. Importance of relative measures in policy on health inequalities. *BMJ* 2006; 332: 967-969.