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

February 2017

PHIDU TORRENS UNIVERSITY AUSTRALIA
[public health information development unit]

Copyright

Please direct enquiries to PHIDU Enquiries

Contents

1. Introduction 1
2. Purpose 1
3. Methods 1
   3.1 Remoteness 1
4. Findings 4
   4.1 Women smoking during pregnancy 4
   4.2 Low birth weight babies 5
   4.3 Children living in jobless families 5
   4.4 Premature mortality 7
   4.5 Participation in the National Bowel Cancer Screening Program 8
5. Conclusion 11
6. Data notes, sources and definitions 12
7. Data quality statements (as available at 14 July 2016) 13
8. Data tables 14
9. Sources of information 16

List of Tables

Table 3: Children aged less than 15 years living in jobless families in Tasmania, by remoteness, 2006 and 2011 6
Table 4: Premature mortality in Tasmania, by remoteness, 1997–2001 and 2010–14 8
Table 5: NBCSP participation in Tasmania, by remoteness, 2010 and 2012/13 9
Table 6: FOBT results under the NBCSP in Tasmania, by remoteness, 2010 and 2012/13 10
Table 1: Women smoking during pregnancy in Tasmania, by remoteness, 2004–06, 2008–10 and 2012–14 14
Table 2: Low birth weight babies in Tasmania, by remoteness, 2004–06, 2008–10 and 2012–14 14

List of Figures

Figure 1: Women smoking during pregnancy in Tasmania, by remoteness, 2004–06, 2008–10 and 2012–14 4
Figure 2: Low birth weight babies in Tasmania, by remoteness, 2004–2006, 2008–2010 and 2012–14 5
Figure 3: Children aged less than 15 years living in jobless families in Tasmania, by remoteness, 2006 and 2011 7
Figure 4: Premature mortality in Tasmania, by remoteness, 1997–2001 and 2010–14 8
Figure 5: NBCSP participation in Tasmania, by remoteness, 2010 and 2012/13 10
Figure 6: FOBT results under the NBCSP in Tasmania, by remoteness, 2012/13 11

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 Tasmania, 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 (1.4%) or Very Remote (0.9%) 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 Tasmania was 516,586 people, or 2.2% of Australia's population. The population of Greater Hobart was 340,060, which represented almost two thirds (65.8%) of the total Tasmanian population. Tasmania does not have any areas in Major Cities, with Hobart classed as Inner Regional; the population distributions at June 2015 were estimated to be Inner Regional (65.8%), Outer Regional (32.2%), Remote (1.6%) and Very Remote (0.5%).

People in rural and remote (also referred to as Regional) Tasmania 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 Australia[7]

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 Inner Regional 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 instances, 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]

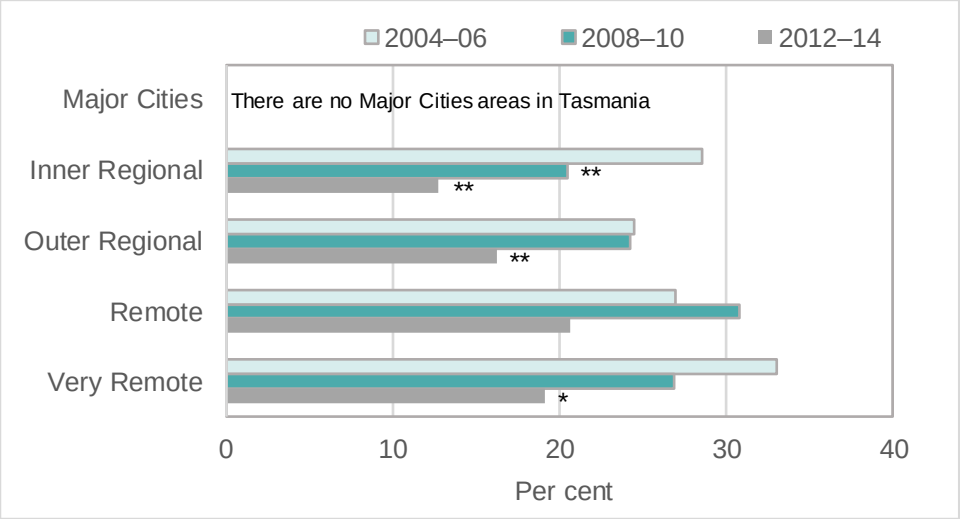
In 2004–06, in Tasmania, 26.4% of women smoked during pregnancy, varying from 35.3% in Hobart (the Statistical Division), to 24.9% in Regional Tasmania. These are very high smoking rates, with Hobart recording the highest rate of all the capital cities for which data were available (all other than Brisbane). In addition, Tasmania is the only jurisdiction in which the capital city rate is higher than the regional rate.

By 2012–14 the rate of smoking among pregnant women in Tasmania had almost halved, to 13.8%, with a larger decline in Hobart, where the rate of smoking was down by over two thirds, to 11.4%; in Regional Tasmania the rate was down by one third on the earlier level, at 16.0%.

Rates among Aboriginal and Torres Strait Islander women reporting that they smoked during pregnancy in 2004–06 were, at 53.4%, over twice those of non-Indigenous women (whose rate was 25.9%, a rate ratio of 2.1). Although by 2012–14 this rate had declined markedly, to 33.7%, the gap compared with non-Indigenous women had increased to over two and a half times (a rate ratio of 2.6).

Compared to the period 2004–06, the change in the proportion of women in Tasmania who smoked during pregnancy in 2012–14 is also evident across the Remoteness Areas, with the largest a reduction of 54% in the Inner Regional areas (Figure 1 and Table 1).

Figure 1: Women smoking during pregnancy in Tasmania, by remoteness, 2004–06, 2008–10 and 2012–14



*Change to 2012–14 from 2004–06 is statistically significant at the 95% confidence level
**Change to 2008–10 and to 2012–14 (both c.f. 2004–06) is statistically significant at the 99% confidence level

Source: Compiled by PHIDU based on data from the Tasmanian Department of Health and Human Services

The ratio between the proportion of women in Tasmania smoking during pregnancy in the Very Remote areas when compared with the Inner Regional areas increased over the three periods, from 16% in 2004–06, to 31% in 2008–10 and to 50% higher in the Very Remote areas in 2010–12, indicating a widening of the inequality gap (Table 1); only the first of these was statistically significant, in part as the numbers in the Very Remote areas were very small (Table 1).

The reduction of the smoking rate among pregnant women in all Remoteness Areas would suggest 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.

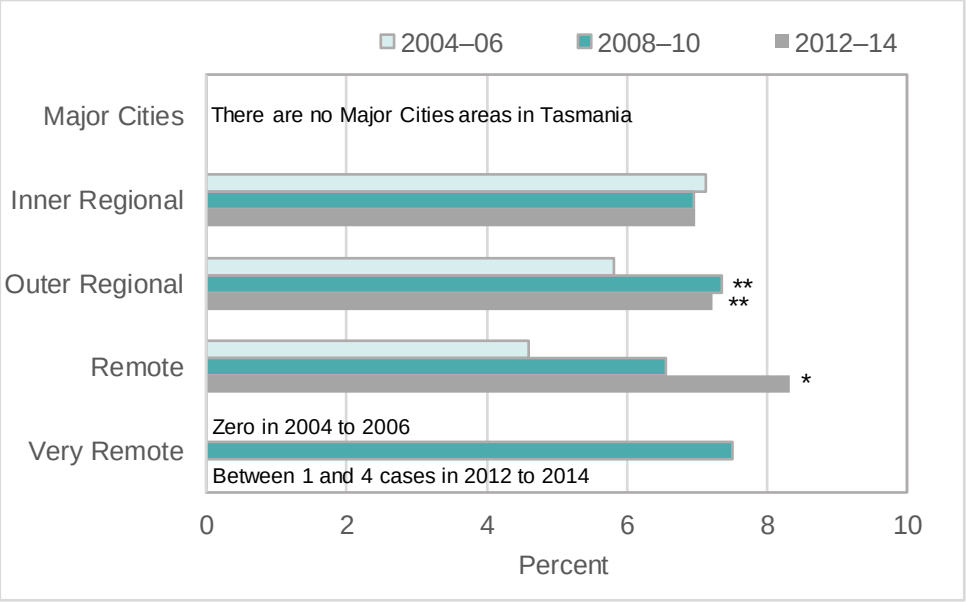
4.2 Low birth weight babies

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 Australia, over the period 2001–03, approximately 13% of babies born to Aboriginal and Torres Strait Islander women were of low birthweight, compared to 6% of babies born to non-Indigenous women.[12] PHIDU does not yet have these data for Australia for 2012–14; however, in Tasmania over 2012–14, the proportion for Aboriginal and Torres Strait Islander women was 11.8%, substantially higher than that for non-Indigenous women, of 6.8%.

Compared to the period 2004–06, the proportion of babies who had a low birth weight in 2012–14 increased in the Outer Regional and Remote areas (both statistically significant) declines of 20.5% in the Outer Regional and 4.8% in the Remote areas (Figure 2 and Table 2). The increase in Outer Regional between 2004–06 and 2008–10 was also statistically significant.

Figure 2: Low birth weight babies in Tasmania, by remoteness, 2004–2006, 2008–2010 and 2012–14



*Change to 2012–14 from 2004–06 is statistically significant at the 95% confidence level
**Change to 2008–10 and to 2012–14 (both c.f. 2004–06) is statistically significant at the 99% confidence level

Source: Compiled by PHIDU based on data from the Tasmanian Department of Health and Human Services

The ratio between the proportion of low birth weight babies in Very Remote and Inner Regional areas in Tasmania was only able to be calculated for the period from 2008–10, and the small difference, of 8%, was not statistically significant (Table 2).

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.[13]

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.[14] The need for agricultural workers has also decreased as farms have become larger and more mechanised.[14] 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 urban areas 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.[15,16,1719-21]

Compared to the period 2006, the proportion of Tasmanian children aged less than 15 years living in families where no adult was employed in 2011 remained relatively stable across the remoteness categories, other than an increase of 14.3% in the Very Remote areas (although this increase was not of statistical significance) (Table 3 and Figure 3).

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

Remoteness category	Time period				Statistical significance of change
	2006		2011		
	number	per cent	number	per cent	
Major Cities	..	..	..	..	
Inner Regional	10,138	17.8	10,320	17.8	
Outer Regional	5,781	19.4	5,706	19.6	
Remote	331	20.8	283	20.1	
Very Remote	19	4.9	18	5.6	
Rate Ratio#	**..**	**0.28**	**..**	**0.32**	**..**
Statistical significance	**..**	******	**..**	*****	**..**

*Difference between Very Remote and Inner Regional areas is statistically significant at the 95% confidence level
**Difference between Very Remote and Inner Regional 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 Inner Regional areas
Source: 2006 and 2011 data compiled by PHIDU based on data from the ABS Census, 2006 and 2011

The proportions were also similar across the remoteness categories, again other than in the Very Remote areas, with by far the lowest proportions, of less than one third of those in the Inner Regional areas; these rate ratios, of 0.28 and 0.32, were both statistically significant. This is the only jurisdiction with such a low proportion of this population group in the Very Remote areas when compared with the least remote areas.

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

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.[18] 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.[19]

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.[20] 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 Tasmania, the overall premature mortality rate fell by 13.5% from an age-standardised rate of 328.1 deaths per 100,000 population in 1997–2001 to 283.7 deaths per 100,000 population in 2010–2014; this is a notable fall over a 13-year period, although the rate remains the second highest in Australia, after that in the Northern Territory.

In addition, the premature mortality rate in 2010–2014 was lower across all remoteness categories than in the period 1997–2001; the reductions ranged between 11% and 16%, other than in the Very Remote areas, with the largest decline of almost one third (32.8%) (Table 4 and Figure 4). The reductions were statistically significant, other than for the marginal improvement in the Very Remote areas.

As a result of these differential reductions, the ratio of the premature mortality rate in the Very Remote compared to the Inner Regional areas decreased substantially, from a rate 6% higher in 1997–2001 to a rate 15% lower in 2010–2014 (rate ratios of 1.06 and 0.85, respectively). Neither of these differentials in rates was statistically significant (Table 4).

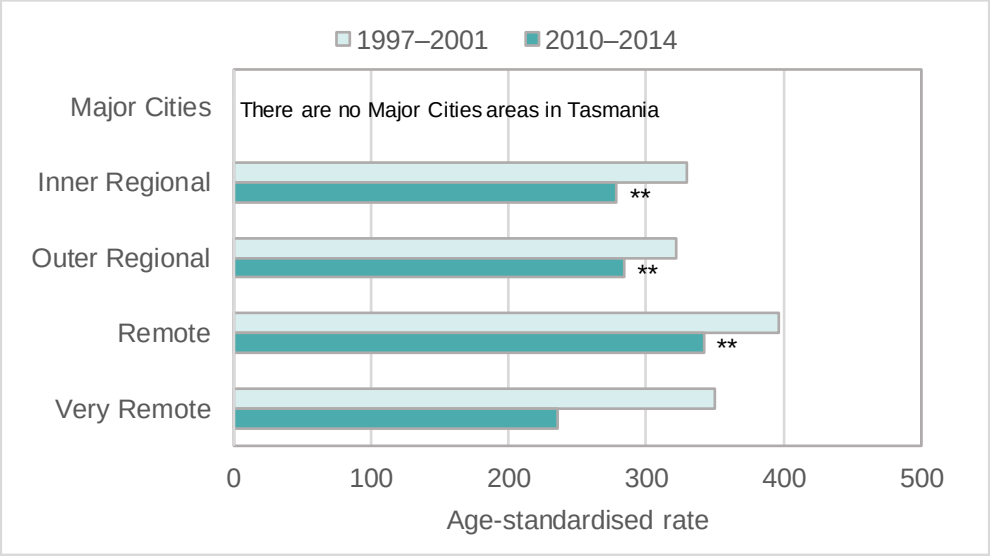
Table 4: Premature mortality in Tasmania, by remoteness, 1997–2001 and 2010–14

Remoteness category	Time period				Statistical significance of change
	1997–2001		2010–14		
	number	Rate	number	rate	
Major Cities	..	..	..	..	..
Inner Regional	4,934	329.3	4,667	277.9	**
Outer Regional	2,506	321.6	2,743	283.9	**
Remote	168	396.5	176	342.2	
Very Remote	45	350.1	36	235.4	*
Rate Ratio#	**..**	**1.06**	**..**	**0.85**	**..**
Statistical significance	**..**		**..**		**..**

**Change from previous period is statistically significant at the 95% confidence level
**Change from previous period 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 Inner Regional 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 Tasmania, 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.[21,22]

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.[23] 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.[23] 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.[24]

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.[24]

In 2010, 40.9% of Hobart residents invited to participate in the NBCSP did so, with a higher proportion (41.3%) in Regional Tasmania. Participation in 2012/13 was lower, at 35.7% and 36.9%, 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.[25] The NBCSP recommenced gradually from 1 July 2011 following the Australian Government's decision in the 2011–12 Budget to make the program ongoing.[25]

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

Remoteness category	Time period				Statistical significance of change
	2010		20012/13		
	Number	per cent	number	per cent	
Major Cities	..	..	..	..	..
Inner Regional	7,480	40.9	5,705	36.2	**
Outer Regional	4,304	41.5	3,133	36.8	**
Remote	182	40.8	143	34.8	*
Very Remote	58	36.9	39	42.8	
Rate Ratio#	**..**	**0.90**	**..**	**1.18**	**..**
Statistical significance	**..**		**..**		**..**

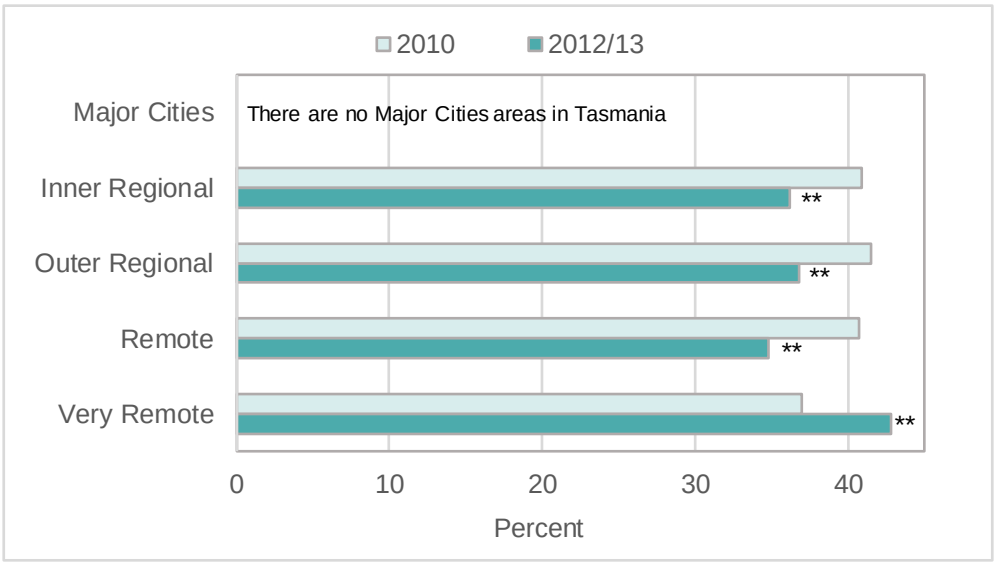
*Change from previous period is statistically significant at the 95% confidence level
**Change from previous period is statistically significant at the 99% confidence level
#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Inner Regional areas
Source: Data compiled by PHIDU based on data provided by the Department of Health from the National Bowel Cancer Screening Program, 2010 and 2012/13

When analysed by the remoteness categories, participation in 2012/13 was lower in the Inner Regional, Outer Regional and Remote areas (lower by between 11% and 15%, and all of statistical

significance); the increase in the Very Remote areas, of 16.0% when compared with 2010, was not statistically significant (Table 5).

As a result of the changes in the Major Cities and Very Remote areas, the ratio of participation in the Very Remote areas changed from 10% below in 2010 to 18% above, in 2012/13; however, neither of these differences was statistically significant (Table 5).

Figure 5: NBCSP participation in Tasmania, 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

By 2012/13, the gap in participation between people living in the Very Remote and the other Remoteness Areas had been reversed, with the highest participation rate in the Very Remote areas, a rate that is 18% above the Inner Regional rate (Table 5). However, neither of the differentials between the Very Remote and Inner Regional areas was of statistical significance.

There is no discernible pattern by remoteness in the proportion of participants with a positive FOBT in 2012/13 (Figure 6). PHIDU does not have these data for 2010.

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

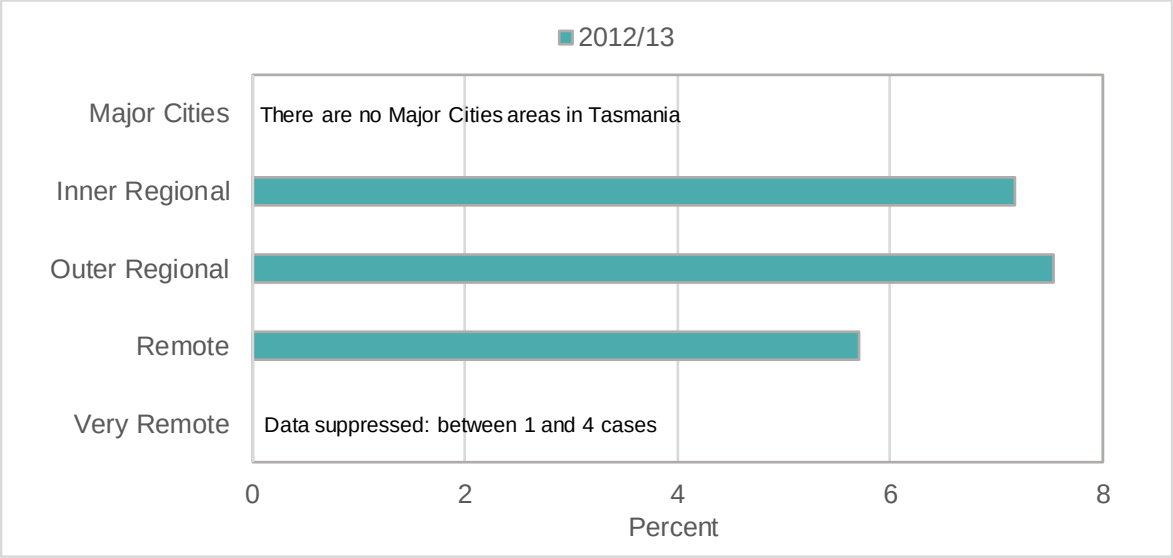
Remoteness category	Time period				Statistical significance of change
	2010		20012/13		
	number	per cent	number	per cent	
Major Cities	..	..	..	..	..
Inner Regional	n.a.	..	409	7.2	..
Outer Regional	n.a.	..	236	7.5	..
Remote	n.a.	..	8	5.7	
Very Remote	n.a.	..	~	..	..
Rate Ratio#	**..**	**..**	**..**	**..**	**..**
Statistical significance	**..**	**..**	**..**		**..**

~ replaces cells with between 1 and 4 cases

#The rate ratio shows the ratio of the percentage in the Very Remote areas to the percentage in the Inner Regional 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 Tasmania, 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 Tasmania having the poorest health and wellbeing compared to those living in Hobart and the other major urban centres. While there have been some improvements in absolute differences over time, relative inequality, as evidenced by the gap between those who are the best off and those who are the worst off, has not always improved.

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.[2630] 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 Tasmanian Department of Health and Human Services.

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 Tasmanian Department of Health and Human Services.

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

8. Data tables

Table 1: Women smoking during pregnancy in Tasmania, by remoteness, 2004–06, 2008–10 and 2012–14

Remoteness Area	Time period						Statistical significance of change from 2004–06 to	
	2004–06		2008–10		2012–14			
	Number	Per cent	Number	Per cent	Number	Per cent	2008–10	2012–14
Major Cities	..	..	..	..	..	..	..	..
Inner Regional	1,368	28.5	2,602	20.5	1,478	12.7	**	**
Outer Regional	1,663	24.5	1,307	24.2	746	16.2		**
Remote	61	27.0	105	30.8	46	20.6		
Very Remote	118	33.1	18	26.9	10	19.1		*
Rate Ratio#	**..**	**1.16**	**..**	**1.31**	**..**	**1.50**	**..**	**..**
Statistical significance	**..**	*	**..**		**..**		**..**	**..**

*Change from previous period/ difference between Very Remote and Inner Regional areas is statistically significant at the 95% confidence level
**Change from previous period 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 Inner Regional areas

Source: Data compiled by PHIDU based on data from the Tasmanian Department of Health and Human Services

Table 2: Low birth weight babies in Tasmania, by remoteness, 2004–06, 2008–10 and 2012–14

Remoteness Area	Time period						Statistical significance of change from 2004–06 to	
	2004–06		2008–10		2012–14			
	Number	Per cent	Number	Per cent	Number	Per cent	2008–10	2012–14
Major Cities	..	..	..	..	..	..	..	..
Inner Regional	843	7.1	899	7.0	811	7.0		
Outer Regional	316	5.8	403	7.3	333	7.2	**	**
Remote	14	4.6	23	6.6	19	8.3		*
Very Remote	-	..	5	7.5	~	..		
Rate Ratio#	**..**	**..**	**..**	**1.08**	**..**	**..**	**..**	**..**
Statistical significance	**..**	**..**	**..**		**..**	**..**	**..**	**..**

*Change from previous period is statistically significant at the 95% confidence level
**Change from previous period 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 Inner Regional areas
Note: - indicates zero cases; ~ indicates between 1 and 4 cases

Source: Data compiled by PHIDU based on data from the Tasmanian Department of Health and Human Services

This page intentionally left blank

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.Hobart.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 Institute of Health and Welfare (AIHW). Low birthweight infants - Health status and outcomes (Tier 1) - Aboriginal and Torres Strait Islander health performance framework 2006 report. Canberra: AIHW; 2006
[13] 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
[14] Bureau of Rural Sciences, Social Atlas of Rural and Regional Australia, 2008
[15] National Rural Health Alliance (NRHA), ACOSS. A snapshot of poverty in rural and regional Australia. Canberra: NRHA; 2013
[16] Awofeso N. Racism: a major impediment to optimal Indigenous health and health care in Australia. Australian Indigenous Health Bulletin 2011; 11(3)
[17] Jackson LR, Ward JE. Aboriginal health: Why is reconciliation necessary? Medical Journal of Australia 1999; 170: 437-40
[18] Page A, Tobias M, Glover J, Wright C, Hetzel D, Fisher E. Australian and New Zealand atlas of avoidable mortality. Hobart: Public Health Information Development Unit (PHIDU), The University of Hobart; 2006
[19] Glover J, Harris K, Tennant S. A social health atlas of Australia [second edition] - volume 1: Australia. Hobart: PHIDU, The University of Hobart; 1999
[20] 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
[21] 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

[22] 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

[23] 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

[24] 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

[25] 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

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