An atlas of respiratory conditions in South Australia:

Population patterns of prevalence, risk factors, service use and treatment

Produced for the

South Australian Department for Health and Ageing

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Government of South Australia
SA Health

PHIDU
[public health information development unit]
TORRENS UNIVERSITY AUSTRALIA

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However, the responsibility for the content of the report rests wholly with PHIDU.

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Introduction

In 2004-05, Australia spent $3.3 billion directly on the management of respiratory conditions. In 2007-08, general practitioners managed respiratory problems more than any other condition and in 2006 conditions of the respiratory system were the third most common underlying causes of death [1].

What are the aims of the atlas?

The atlas aims:

- to describe aspects of the population with respiratory conditions and the social and economic conditions in which they live, using indicators that reflect key influences on developing and living with these conditions across the life span; and
- by mapping these indicators, to provide information in a form that will identify significant differences or 'inequalities' across the South Australian community, and support discussion and action to remediate them.

The atlas provides a broad picture of health in South Australia. It combines socioeconomic and other risk factors associated with respiratory conditions with prevalence, treatment and service use data. It aims to assist communities, health practitioners, policy-makers and service planners, to better understand aspects of respiratory conditions at the community level.

The circumstances of communities across the State vary in different ways. By looking at respiratory conditions and their determinants at a small area level, decision-makers are better able to tailor and direct specific services to those who need them most.

The atlas presents data for, and maps of, the following indicators:

- selected socioeconomic variables;
- estimated levels of self-reported health status;
- selected health risk factors;
- estimated prevalence of respiratory conditions;
- selected services provided under the Medical Benefits Schedule;
- selected prescriptions dispensed under the Pharmaceutical Benefit Scheme for respiratory conditions
- Emergency Department attendances;
- admissions to public acute hospitals; and
- premature mortality.

Where possible, these indicators are presented by relevant demographic characteristics, including sex, age, and Indigenous status.

Methods

Data

Geography

All data included in this atlas are for usual residents of South Australia. Clients of services in South Australia who were residents of other States, Territories or countries are excluded from the analysis. Similarly, where address information was not provided, data have been excluded: these data made up a very small proportion of totals.

Throughout the atlas, geography refers to the residential address of the population in question rather than the location of the service. For example, rates in Playford - East refer to people who live in that area, even though they may have used a service in the Adelaide CBD.

Regional South Australia refers to that part of the State, which is not included in Adelaide as defined by the Adelaide Statistical Division.

The MBS and PBS datasets which were available for 2012/13 are not available by SA2. Instead, the data have been mapped by Statistical Local Area (SLA), an area under the pre-June 2011 Australian Standard Geographical Classification (ASGC).

Limitations

While this atlas attempts to provide a complete picture of service use in South Australia for people with respiratory conditions, outpatient data were not included, as they were unavailable. In addition, the data available as to care by general medical practitioners through the Medical Benefits Schedule is limited.

Nor was information as to outdoor air pollution available for sufficient sites to enable mapping in a way that would complement the other data mapped.

Modelled estimates

The atlas includes a number of indicators for which the data have been derived as 'modelled estimates' by the ABS. A modelled estimate can be interpreted as the likely value for a 'typical' area with those characteristics. The model used for predicting small area data is determined by analysing data at a higher geographic level, in this case, for Australia. The relationship observed at the higher geographic level between the characteristic of interest and known characteristics is assumed to hold also at the small area level. The estimates are made by applying the model to data on those known characteristics that can be reliably estimated at the small area level.

Rates

All rates other than the unemployment rate are age-standardised. Age-standardisation is a method of adjusting a crude rate to eliminate the effect of differences in population age structures: in this atlas, to allow comparisons between geographic areas.

Adjustments are undertaken for each of the populations being examined (or the study population) against a standard population: in these data, the standard is the South Australian population.

Where rates are age-standardised per 100 population (e.g., smoking rates), these have in some instances been referred to as 'percentages'.

Indigenous status

Note that the term, Aboriginal, is used throughout this atlas to denote persons identifying as being of Aboriginal and/or Torres Strait Islander origin.

Socioeconomic disadvantage

In the atlas, there is a focus on socioeconomic disadvantage as a determinant of respiratory conditions and wellbeing. Here, the term 'socioeconomic' refers to the social and economic aspects of a population where 'social' includes information about the community and its level of education, income support, housing, employment and so forth. It is not used in the context of 'social' as in 'social skills', 'social ability' or 'social behaviour' of community members. Therefore, an area described as having a 'high level of socioeconomic disadvantage' does not imply that the area has low social cohesion or lacks strength as a community; rather, it identifies a relative lack of resources or opportunities that are available to a greater extent in more advantaged communities. Thus, this lack of resources leads inevitably to avoidable differences in respiratory conditions and other outcomes for disadvantaged communities.

Identifying the communities whose residents are not faring as well as others may be perceived by some people as stigmatising. However, the purpose of the atlas is to highlight the extent of their disadvantage in order to provide evidence upon which community members and decision-makers can rely, and which can underpin advocacy for improvements in the health care system. If we avoid highlighting the most disadvantaged areas, we avoid providing the evidence that society is failing those who live there. Moreover, being complacent about their plight, and not publishing the evidence, makes us complicit in their poorer life outcomes.

Selected measures of inequality

Index of Relative Socio-economic Disadvantage (IRSD)

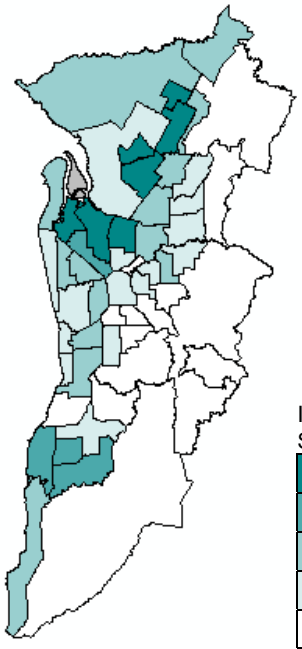
Context: ***The IRSD represents the socioeconomic status of Australian communities. The IRSD is a Socio-economic Index for Areas (SEIFA) produced by the Australian Bureau of Statistics (ABS), reflecting a range of population information including income, educational attainment, unemployment and occupation. The Index signifies the overall or average level of disadvantage, with low scores reflecting relatively greater average disadvantage and high scores reflecting a relative lack of disadvantage*** [2]***. As an average, the score is likely to reduce apparent and actual differences between individuals in an area, and between areas.***

In 2011, the South Australian average IRSD score of 983 was less than the Australian average of 1002, indicating higher levels of relative disadvantage in the State.

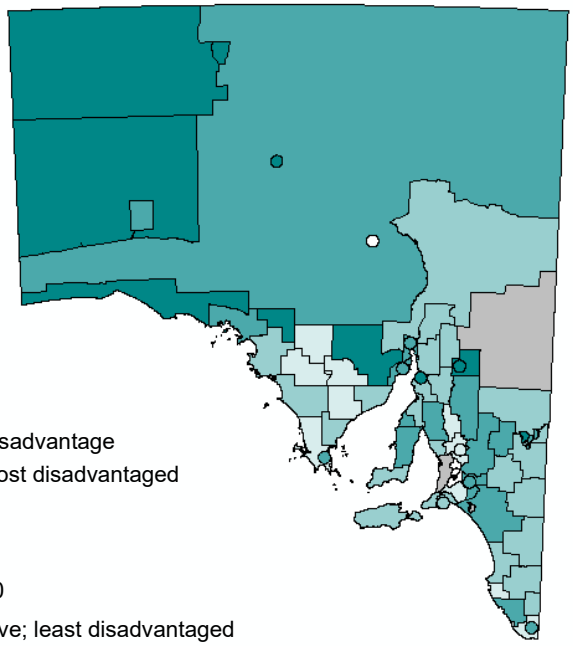
Overall, communities in Adelaide are less disadvantaged than those in Regional South Australia. However, clear geographic patterns of disadvantage can be seen within both of these areas.

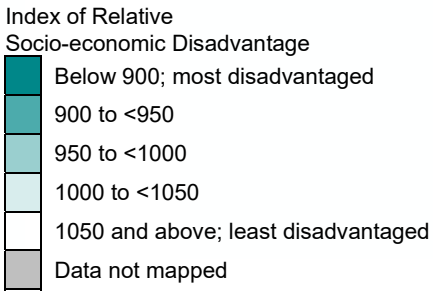
In Adelaide, there are three main clusters of SLAs with the greatest levels of disadvantage: the outer north (in Playford - Elizabeth, Playford - West Central, Salisbury - Central and Salisbury - Inner North); the outer south (Onkaparinga - North Coast/ Hackham / Morphett); and to the north and north-west (Port Adelaide Enfield - Park/ Inner /Port) (Map 1). The least disadvantaged areas are clustered to the east, south-east and north-east of Adelaide, and in the Adelaide Hills.

Map 1: Index of Relative Socio-economic Disadvantage, Adelaide, 2011



Map 2: Index of Relative Socio-economic Disadvantage, Regional South Australia, 2011





Map 2 shows that the most disadvantaged SLAs in Regional South Australia cover much of the Far North of the State, with the State's lowest score by far (a score of 593) in the Anangu Pitjantjatjara Yankunytjatjara Lands (referred to here as the APY Lands). Other very low scores were recorded for many of the towns, including Coober Pedy, Renmark, Peterborough and Port Pirie.

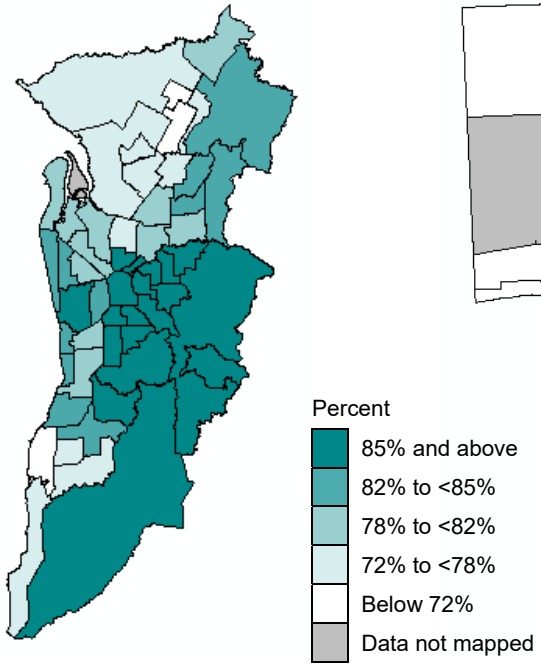
Learning or earning

Context: ***A connection between education level / employment status and health has long been recognised. Young people (15 to 19 years) who are not learning or earning can experience a deleterious effect on unhealthy behaviours*** [3]. ***For example, there is an association between indicators of disadvantage, encompassing unemployment and low educational attainment, and increased smoking prevalence among young Australians*** [4] [5].

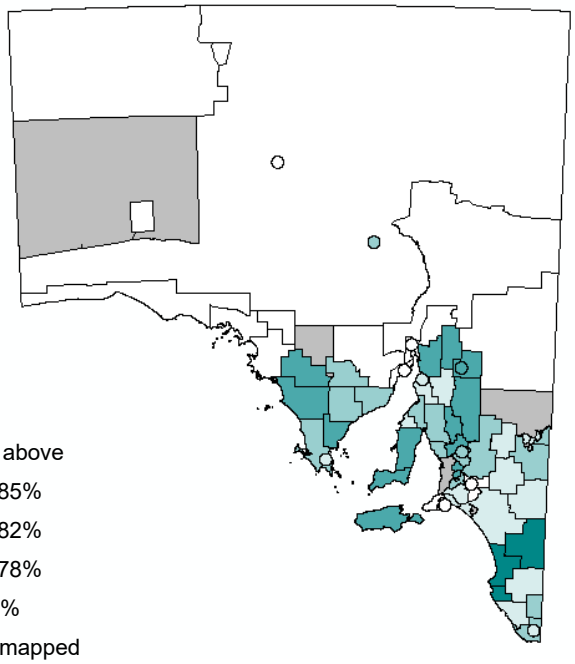
The proportion of 15 to 19 year olds who are engaged in school, work or further education/ training in 2011 was greater for Adelaide (80.9%) than it was for Regional South Australia (76.8%).

The highest levels of 15 to 19 year olds learning or earning were observed in the eastern suburbs of Adelaide, specifically, Burnside - South-West (90.5%) and North-East (90.0%), Mitcham - North-East (89.2%)/ West (88.6%)/ Hills (88.1%) and Unley - West (87.6%) and East (87.4%), as well as to the north of the CBD, in Norwood - West (88.7%) and East (87.3%), Walkerville (86.6%) and Prospect (86.6%) (Map 5). In the outer south, high proportions of learning and earning are also seen in Onkaparinga - Reservoir (86.7%) and Hills (86.3%). In Adelaide, the lowest proportion of 15 to 19 year olds learning or earning were observed in Playford and Salisbury in the outer north and Onkaparinga in the outer south with other areas having lower proportions than the Adelaide average learning or earning.

Map 3: Learning or earning, percent, Adelaide, June 2014



Map 4: Learning or earning, percent, Regional South Australia, June 2014



In Regional South Australia, the APY Lands had the lowest proportion of 15 to 19 year olds learning or earning (51.3%), followed by Ceduna (67.6%) (Map 6). The highest proportions of learning or earning were in Tatiara, Kingston and Robe (all at 85.2%).

Unemployment

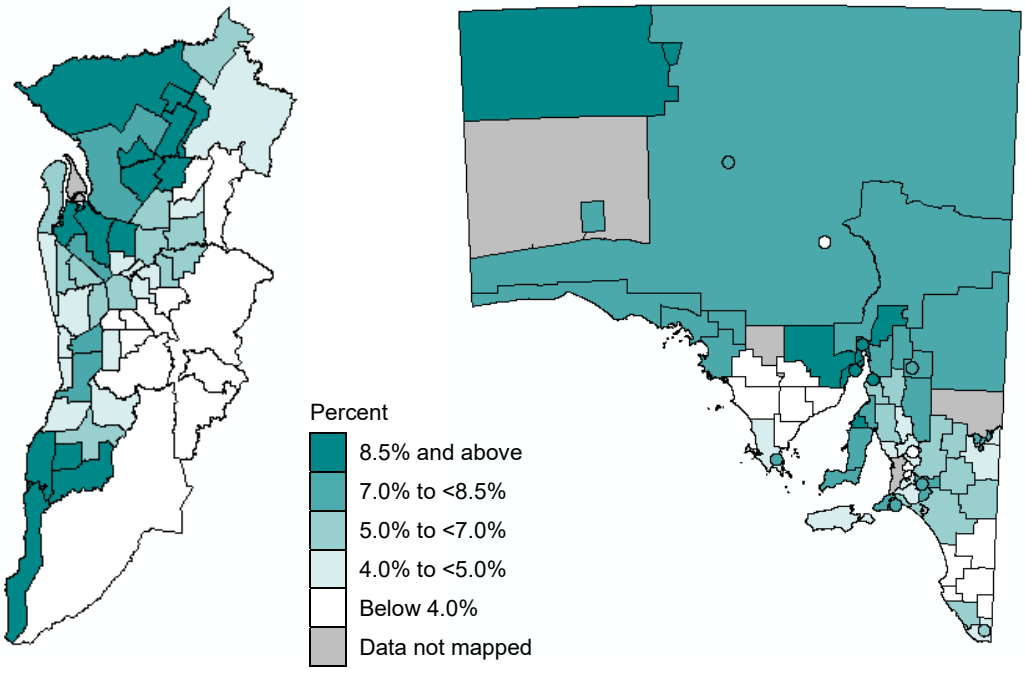
Context: ***The association between unemployment and health has long been studied and has been shown to work both ways. Unemployment has been linked with increased exposure to lifestyle related risk factors and chronic disease. It is important to note that the relationship between unemployment and negative health outcomes is complex as each individual will experience unemployment differently and a number of factors such as education, socio economic status, gender, age, social and family support, the health system and state support may be interacting with the effects that unemployment will have on health*** [6].

The unemployment rate for September 2014 in Adelaide was 6.8% and for Regional South Australia, it was 6.4%. The highest levels of unemployment are found in the north-west, outer north and outer south of Adelaide. Map 7 also shows that the lowest levels of unemployment were in the eastern suburbs.

In Adelaide, the highest unemployment rate was estimated for Playford - Elizabeth (22.5%) and West Central (20.9%), where the proportion unemployed was over three times the Adelaide average. Onkaparinga - North Coast (17.8%)/ Hackham (14.7%)/ Morphett (12.3%) in the outer south were also observed to have particularly high unemployment (Map 7). Many other areas had unemployment rates above the Adelaide average, including in the SLAs of Port Adelaide Enfield and Salisbury. Unemployment was lower in areas to the east, north-east and south-east of the city.

Map 5: Unemployment, percent, Adelaide, June 2014

Map 6: Unemployment, percent, Regional South Australia, June 2014



In Regional South Australia, the APY Lands had the highest unemployment (35.6%), followed by Port Pirie (14.4%) and the Copper Coast (10.9%) (Map 8). The lowest proportions of unemployment were in Roxby Downs (0.8%) and in Kimba, Franklin Harbour and Cleve (all at 2.4%).

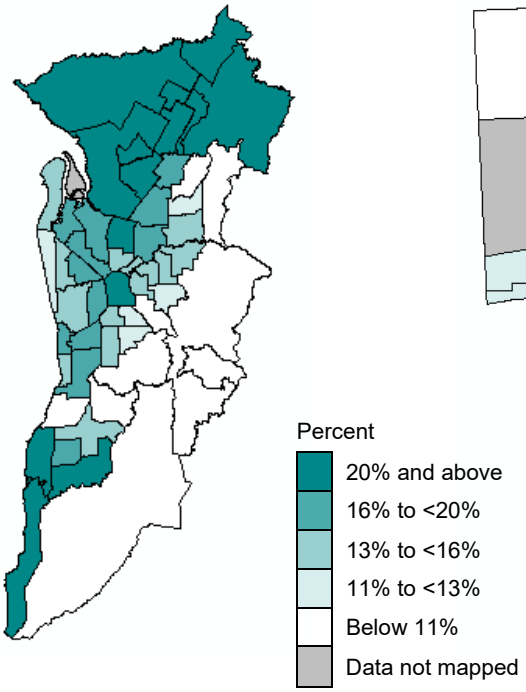
Households in dwellings receiving rent assistance

Context: ***Affordable, secure and safe housing is fundamental to one's health and wellbeing, employment, education and other life opportunities. Being in receipt of rent assistance is a measure of financial strain and is associated with negative effects on both physical and mental health*** [7].

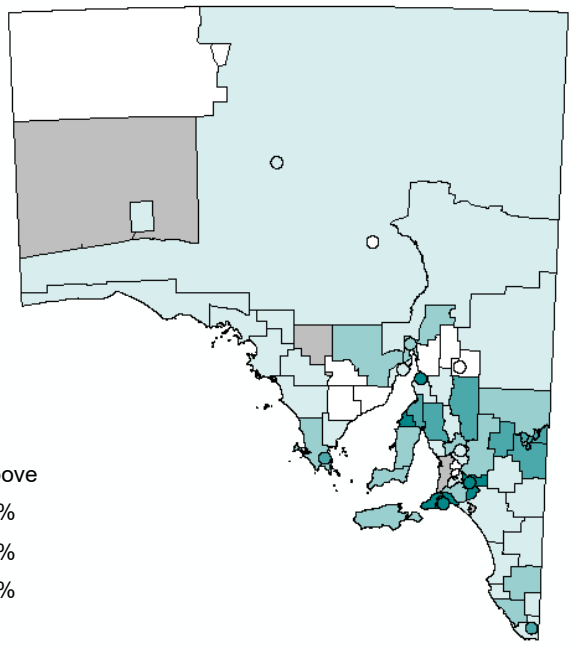
Adelaide (17.1%) has a higher percentage of households receiving rent assistance than Regional South Australia (16.2%).

The distribution across Adelaide of households receiving rent assistance highlights a striking social segregation and reflects what has been seen in the earlier maps. Playford - West Central (35.2%)/ Elizabeth (32.6%)/ East Central (31.8%)/ West (31.4%)/ Hills (29.6%) in the outer north and Onkaparinga - North Coast (26.1%) and South Coast (24.9%) in the outer south as well, as the Adelaide SLA (25.0%) have the highest proportion of households receiving rent assistance (Map 9). Areas to the east, north-east and south-east of Adelaide have the lowest proportions of people receiving rent assistance – particularly, the Adelaide Hills - Central (6.2%) and Ranges (6.5%).

Map 7: Households receiving rent assistance, percent, Adelaide, 2011



Map 8: Households receiving rent assistance, percent, Regional South Australia, 2011



In Regional South Australia, Victor Harbor (29.1%), Yankalilla (29.0%), Alexandrina - Coastal (26.8%) and Murray Bridge (22.9%) have the highest proportion of households receiving rent assistance (Map 10). The APY Lands has 0% receiving rent assistance although this is likely to reflect the living circumstances of the population.

People living in homes with no Internet connection

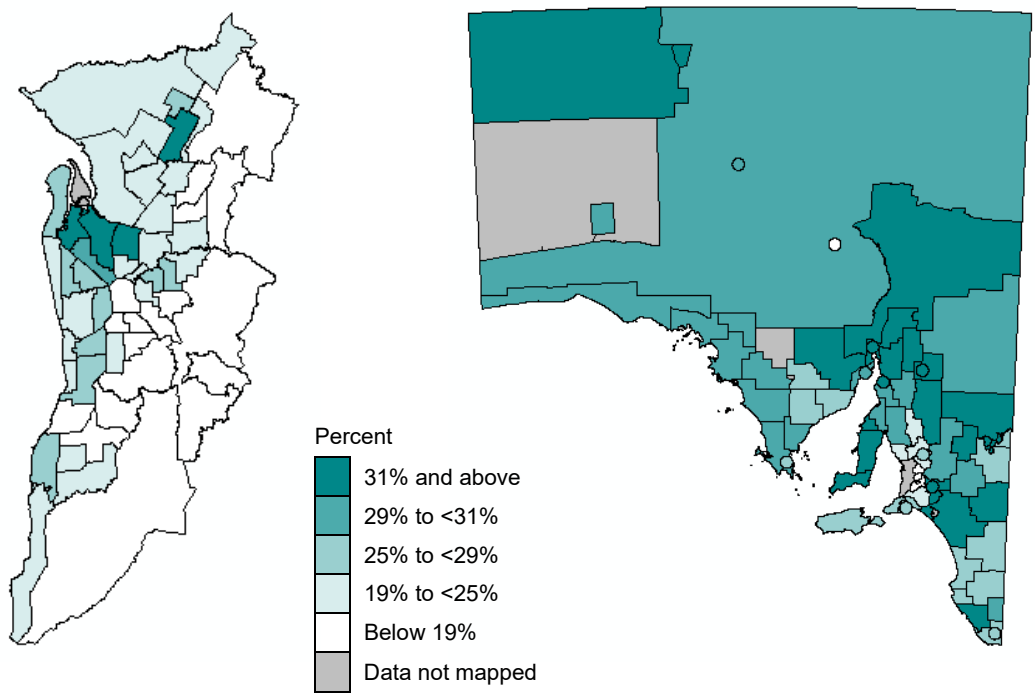
Context: ***Respiratory conditions can be chronic for which self-care (including ensuring regular medication intake, monitoring symptoms) can aid in its management. The Internet plays an increasing role in achieving this including through connecting to others with the same medical condition, provision of online respiratory condition education and support groups, and accessibility of high quality health information*** [8]. ***Furthermore, novel uses of e- and m-technology are expanding. Lack of access to the Internet is an indicator of socioeconomic disadvantage*** [9].

Regional South Australia has a higher percentage of people living in private dwellings with no Internet connection than Adelaide (27.8% v 21.9% respectively).

In Adelaide, the highest proportion were observed in the outer north in Playford - Elizabeth (33.2%) and the outer north west Port Adelaide Enfield - Park (33.0%)/ Port (33.0%)/ Inner (31.4%) and Charles Sturt - North-East (29.0%) and Inner West (28.6%) (Map 11). Marion - North (28.2%), to the south west of the CBD and Onkaparinga - North Coast (26.2%) in the outer south also have a high percentage of people living in private dwellings with no Internet connection. The lowest proportions are observed to the east, south-east and north-east.

Map 9: People living in homes with no Internet connection, percent, Adelaide, 2011

Map 10: People living in homes with no Internet connection, percent, Regional South Australia, 2011



In Regional South Australia, the APY Lands had the highest percentage of private dwellings with no Internet connection (70.8%) which is nearly double the proportion of Port Pirie (37.7%) which saw the next highest proportion (Map 12). A number of other areas saw more than one in three homes with no Internet connection including Peterborough (35.0%), Mount Remarkable (35.0%), Orroroo / Carrieton (34.9%) and Yorke Peninsula – North / South (both at 34.4%).

General health outcomes

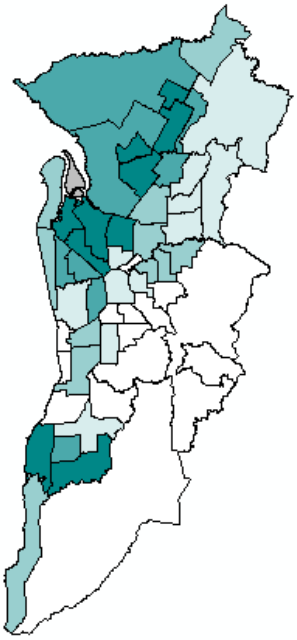
Self-assessed health status

Context: ***Self-assessed health status is commonly used as a proxy measure for actual health status; and how people rate their health overall is strongly related to their experience of illness and disability*** [10]. ***This includes being strongly associated with specific health problems, particularly serious and chronic conditions including respiratory conditions*** [10] [11]. ***Self-assessed health also shows a social gradient, with poorer self-assessed health associated with lower socioeconomic status*** [12].

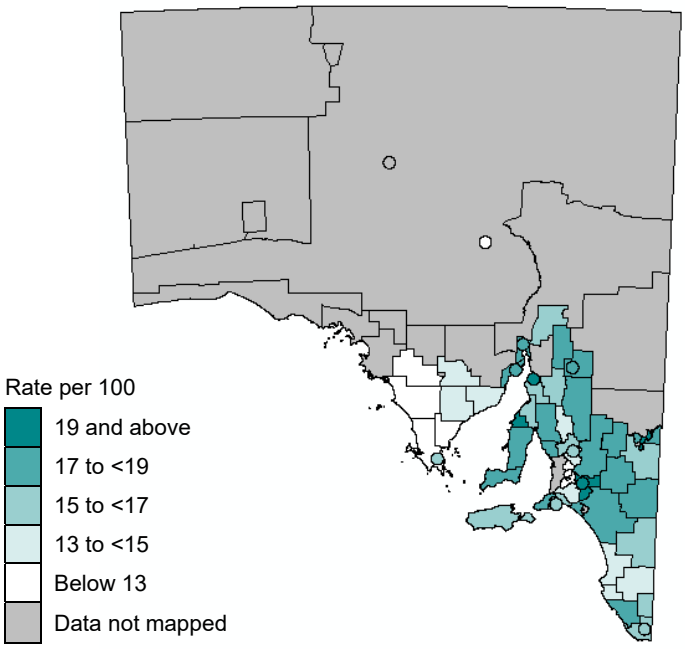
The estimated proportion of the population who assessed their health as fair or poor in South Australia was 15.8%. Adelaide had a comparable percentage to Regional South Australia, at 15.7% compared to 15.9%, respectively.

In Adelaide, the patterns of people estimated to have fair or poor health, based on their own assessment, are highly consistent with the pattern of relative socioeconomic disadvantage, with areas with higher disadvantage having higher levels of poor self-assessed health (Map 13). The highest percentages of the population with fair or poor health were estimated for Playford - Elizabeth (24.5%) and West Central (23.9%), Port Adelaide Enfield - Park (24.1%)/ Port (22.8%)/ East (20.8%), Salisbury - Inner North (21.9%) and Central (19.6%) and Charles Sturt - North-East (20.0%). In the outer south, Onkaparinga - North Coast (19.5%) and Hackham (19.1%) also saw a relatively high estimated proportion of the population who assessed their health as fair or poor. The lowest levels were in Adelaide Hills - Central (9.6%)/ North (9.9%), Burnside - South-West (9.9%)/ North-East (10.6%), Mitcham - Hills (10.1%)/ North-East (10.9%), Unley - West (11.3%)/ East (11.4%) and Walkerville (11.9%).

Map 11: Estimates of self-assessed health status as fair or poor, rate per 100, Adelaide, 2011-12



Map 12: Estimates of self-assessed health status as fair or poor, rate per 100, Regional South Australia, 2011-12



In Regional South Australia, the highest levels of fair to poor self-assessed health were estimated to be in Port Pirie (21.5%), Berri (20.0%), Renmark (19.8%), and the Copper Coast and Murray Bridge (both at 19.4%) (Map 14). The lowest percentages were estimated for people in Roxby Downs (8.2%) and Tumby Bay (11.0%).

Note that estimates were not produced for most of the SLAs in the Far North, as Very Remote areas, Aboriginal communities, or areas with a population of less than 1,000, were excluded from the estimates.

Health risk factors

Smoking

Context: ***Tobacco smoking is recognised as the largest single preventable cause of death and disease in Australia. Tobacco use is linked to diseases and/or injuries across a large number of disease groups. It contributed to the burden of five disease groups in 2011. The disease group tobacco use had the largest impact on was respiratory diseases*** [13]**.**

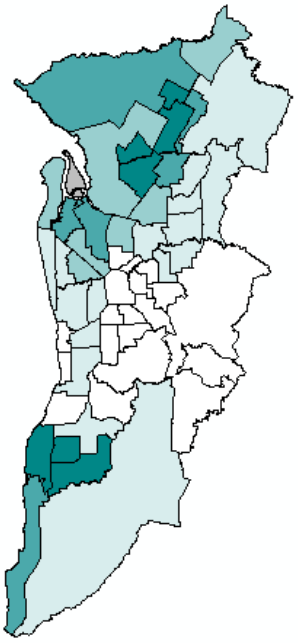
Overall, estimated smoking prevalence is 17.7% in South Australia. Estimated smoking prevalence is higher in Regional South Australia (19.6%) than Adelaide (17.0%). These estimates are based on self-

reported data gathered through the 2011-12 Australian Health Survey where respondents aged 18 years and over reported being "a current, daily or at least once weekly smoker".

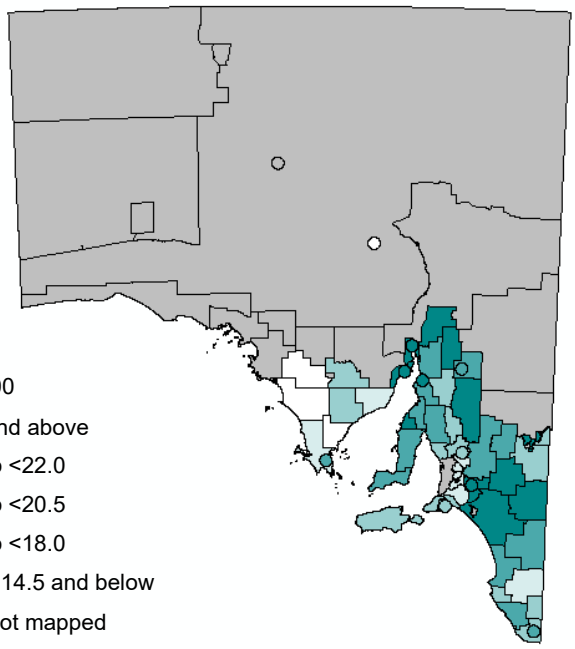
Geographic patterns of smoking are similar to geographic patterns of socioeconomic disadvantage. The highest proportions, all with over one in five of the adult population estimated to be current smokers, were in the outer north in Playford - Elizabeth (29.9%)/ West Central (29.0%)/ East Central (21.4%)/ West (21.0%) and Salisbury - Central (22.4%)/ Inner North (21.9%)/ North-East (20.9%); north west of Port Adelaide Enfield - Park (21.5%)/ Port (20.9%)/ Inner (20.1%); and the outer south in Onkaparinga - North Coast (25.4%)/ Hackham (24.0%)/ Morphett (22.2%)/ South Coast (20.5%) (Map 15). The area in Adelaide with the lowest estimated smoking prevalence is Burnside – North-East, at 10.0%.

In Regional South Australia, the estimated smoking prevalence was greater than one in four people for Flinders Ranges (25.9%) and Port Pirie (26.0%), and otherwise highest in Port Augusta (24.7%), Whyalla (23.9%), Barmera (23.7%) and Murray Bridge (23.7%) (Map 16). The lowest rate was estimated for Roxby Downs (12.8%), followed by Elliston (13.0%), Tumby Bay (13.9%) and Wudinna (14.0%).

Map 13: Estimates of current smokers aged 18 years and over, rate per 100, Adelaide, 2011-12



Map 14: Estimates of current smokers aged 18 years and over, rate per 100, Regional South Australia, 2011-12



Smoking while pregnant

Context: ***Maternal smoking during pregnancy results in higher risks of adverse outcomes for the baby before and after delivery, such as premature birth, miscarriage and perinatal death, poor intra-uterine growth and SIDS (Sudden Infant Death Syndrome). These problems may affect children through to adulthood, including a higher risk of disability and developmental delay, decreased lung function and increased respiratory illness. In 2006, smoking during pregnancy was more prevalent and heavier among Aboriginal women, with 54% smoking at the first antenatal visit compared with 17% of non-Aboriginal women in South Australia*** [14].

One in eight (12.9%) women in South Australia reported smoking while pregnant over the three years 2012 to 2014. The proportion was substantially (54%) higher in Regional South Australia (17.5%) than in Adelaide (11.4%).

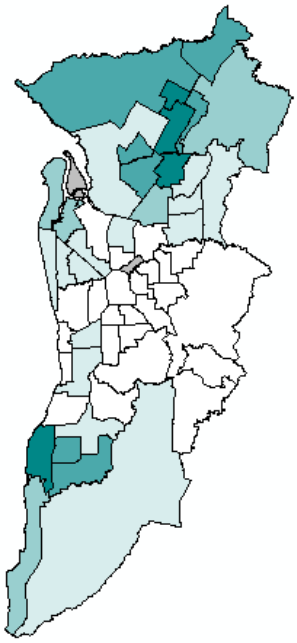
The highest rates were in SLAs in the outer north and outer south of Adelaide, in Playford - Elizabeth (with 27.7% of women reporting they smoked while pregnant), - West Central (25.8%), - East Central (20.3%), - West (17.3%) and - Hills (15.8%); Salisbury - North-East (21.1%), - Inner North (18.2%) and - Central (16.3%); Onkaparinga - North Coast (20.9), - Hackham (20.3%) and - Morphett (19.9%); and in Gawler (19.0%).

The lowest proportions, all associated with 21 or fewer women, were recorded for women in Mitcham North-East (3.1 %), Prospect (3.1%), Norwood Payneham St. Peters West and East (3.5% and 3.6%, respectively), Burnside North-East (3.5%) and Adelaide (3.7%).

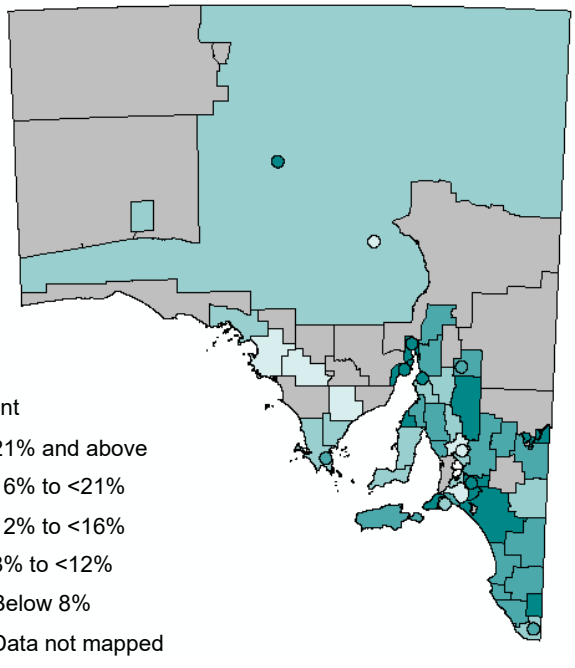
In Regional South Australia, the highest proportions of women who reported smoking while pregnant were in Port Pirie (29.8%), Goyder (28.9%), Barmera (26.8%), Whyalla (26.5%), Renmark Paringa - Paringa (25.9%) and Cobber Pedy (25.0%).

The lowest proportions were in Adelaide Hills Balance and - North (7.1% and 7.2%, respectively), Cleve (8.3%), Tanunda (8.3%), Wudinna (8.6%) and Roxby Downs (9.2%).

Map 15: Women who reported smoking while pregnant, percentage of all pregnancies, Adelaide, 2012-14



Map 16: Women who reported smoking while pregnant, percentage of all pregnancies, Regional South Australia, 2012-14



Estimated prevalence of respiratory system diseases

Estimated prevalence of all respiratory system diseases

Context: ***Respiratory system diseases affect the airways, including the lungs as well as the passages that transfer air from the mouth and nose into the lungs. They can be long lasting (chronic) or short term (acute) and can cause ill health, disability and death.***

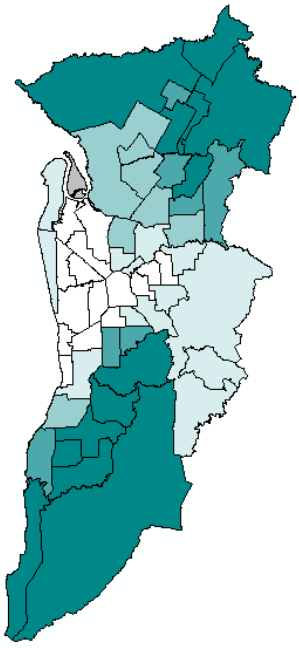
Chronic respiratory system diseases can be grouped together as obstructive lung diseases (diseases affecting the flow of air in and out of the lungs), such as asthma, chronic obstructive pulmonary disease and bronchiectasis, versus other respiratory system diseases, such as chronic sinusitis and occupational lung disease [15]**.**

Onkaparinga - Reservoir is estimated to have the highest rate of respiratory system diseases in Adelaide, a rate of 35.7 per 100 population. Overall, SLAs in the City of Onkaparinga account for seven of the top 14 rates, all with rates of over one third above the average State rate. Mitcham - Hills has the second highest rate (35.2 per 100 population), with the other SLAs with the top 14 rates being in the outer north, in Gawler (35.0), Tea Tree Gully - North (34.7) and four of the five Playford SLAs (with the highest rate in Playford - Hills (34.7)).

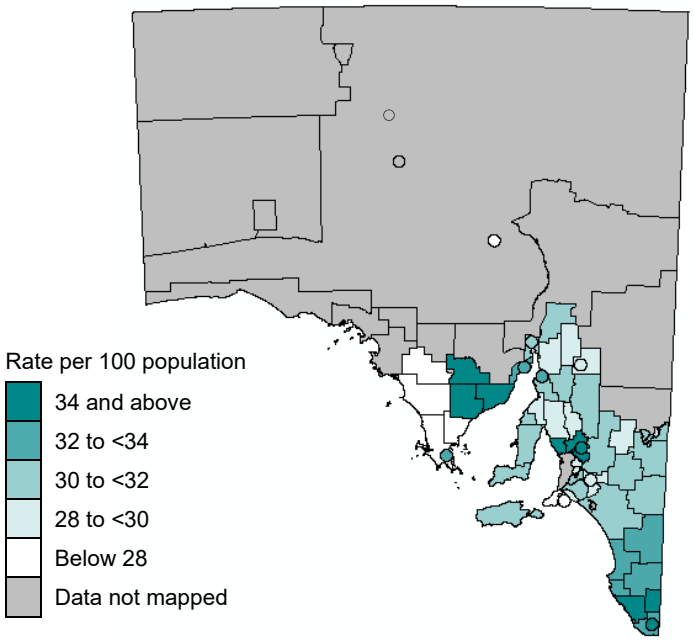
The lowest rates were estimated for the Adelaide SLA (20.7 per 100 population), Norwood Payneham St. Peters - West (24.3) and Port Adelaide Enfield - Park (25.0) and - Port (25.1).

In the rest of the State, four of the five highest rates were to the north of Adelaide, in the SLAs of Light, Barossa - Barossa, - Angaston and - Tanunda (with rates of 35.6, 35.4, 34.9 and 347 per 100 population). In the south-east, Wattle Range - West and - East and Mount Gambier were also estimated to have had high rates (with 35.3, 34.6 and 34.7 per 100, respectively). Cleve had the highest of a number of SLAs with high rates on the Eyre Peninsula (34.8 per 100).

Map 17: Estimates of the population with a respiratory condition, rate per 100, Adelaide, 2011–13



Map 18: Estimates of the population with a respiratory condition, rate per 100, Regional South Australia, 2011–13



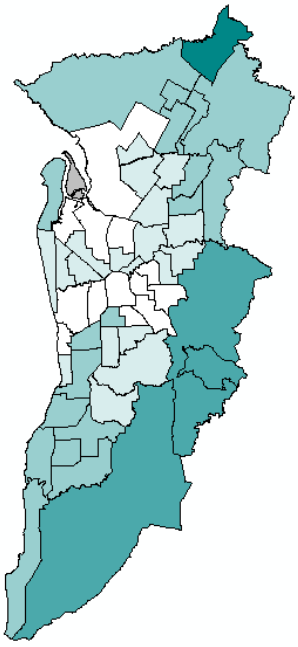
Estimated prevalence of asthma

Rates for asthma prevalence represented one third of the rate for all respiratory system diseases (10.0 per 100 compared with 30.2 population); despite this lower overall rate, there is some consistency in the distribution at the SLA level. For example, the highest rate is in Gawler (13.2 per 100 population), with other above-average rates in some SLAs in Onkaparinga and Playford. However, the second and third highest rates were in Adelaide Hills - Central and - Ranges (11.7 and 11.6 per 100, respectively), with a rate of 11.4 in Port Adelaide Enfield - Coast.

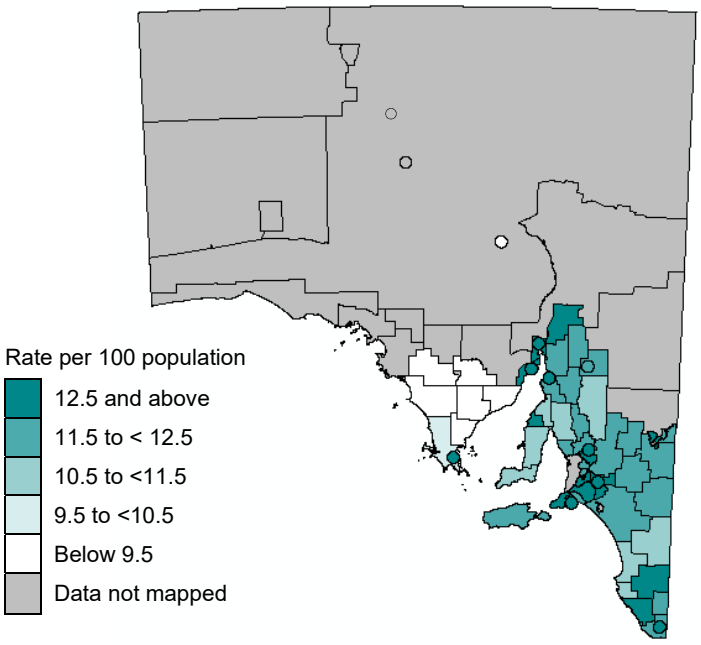
The lowest estimated prevalence rates for asthma were in Adelaide SLA (5.9 per 100 population) and the inner SLAs of Norwood Payneham St. Peters - West (7.7), Unley - East (8.0) and Burnside - North-East (8.5).

The highest rates in the rest of the State were estimated to be in the towns of Port Pirie (14.4 per 100 population), Mount Gambier (14.1), Tanunda (13.7), Port Lincoln (13.6), Whyalla (13.5) and Port Augusta (13.4). Excluding SLAs with no cases, the lowest rates were estimated to be in Roxby Downs (13.4 per 100 population) and a number of areas on Eyre Peninsula; these were Tumby Bay (8.5 per 100 population), Elliston (8.5), Franklin Harbour ((8.6), Wudinna (8.6), Kimba (8.7), Cleve (8.8) and Lower Eyre Peninsula (9.6).

Map 19: Estimates of the population with asthma, rate per 100, Adelaide, 2011–13



Map 20: Estimates of the population with asthma, rate per 100, Regional South Australia, 2011–13

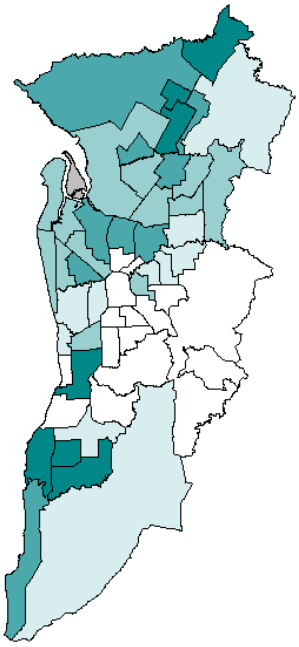


Estimated prevalence of chronic obstructive pulmonary disease

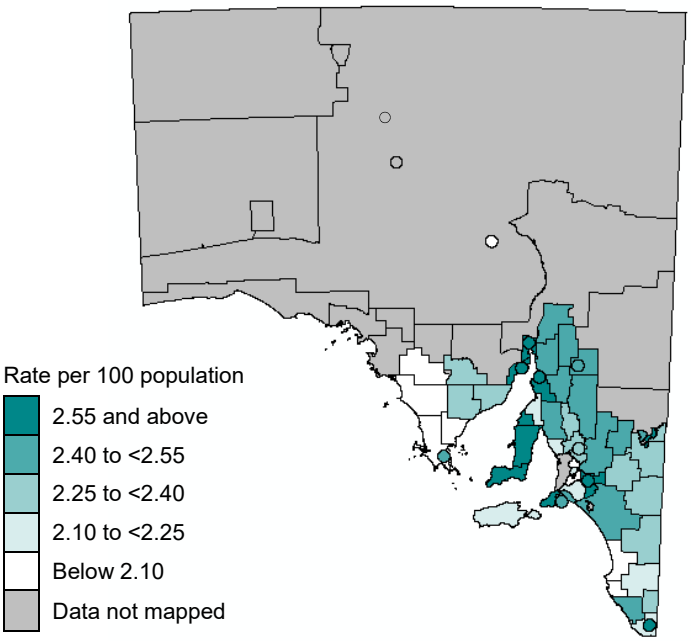
Chronic obstructive pulmonary disease (COPD) has a rate of 2.3 per 100 population in Adelaide, with an estimated distribution at the SLA level that is consistent with the pattern shown by indicators of socioeconomic disadvantage. The highest rates were in the outer north (Playford - Elizabeth and - West Central (3.3 and 3.2 per 100 population, respectively) and Gawler (2.6)); and the outer south (Onkaparinga - Hackham, - North Coast and - Morphett (2.9, 2.8 and 2.7, respectively)). The lowest rates were Adelaide SLA (1.7 per 100 population), nearby Mitcham - North-East and Walkerville (both 1.8), and Unley - West and - East (both 1.9), and in the Adelaide Hills SLAs of - Central and - Ranges (1.8 and 1.9 per 100, respectively).

Outside of Adelaide, the highest rates were found in a number of towns (Whyalla (3.2 per 100 population), Port Pirie (3.1), Port Augusta (2.8), Berri (2.7), Murray Bridge (2.7)) and regional areas (Copper Coast (2.8), Yorke Peninsula - North (2.7) and Port Pirie Districts Balance (2.7)).

Map 21: Estimates of the population with chronic obstructive pulmonary disease, rate per 100, Adelaide, 2011–13



Map 22: Estimates of the population with chronic obstructive pulmonary disease, rate per 100, Regional South Australia, 2011–13



Primary care services

Services provided under the Medical Benefits Schedule (MBS)

Context: ***Items provided under the Medical Benefits Schedule are those provided in primary health care and which attract a payment for the service.***

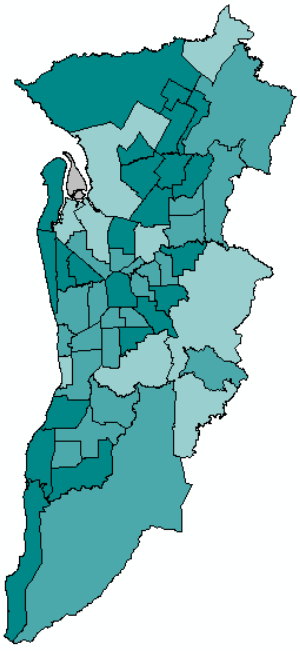
The items covered here are Respiratory function tests (MBS Item 11503) and Completion of annual asthma cycle of care (MBS Items 2546 - 2559 and 2664 – 2677).

Respiratory function tests

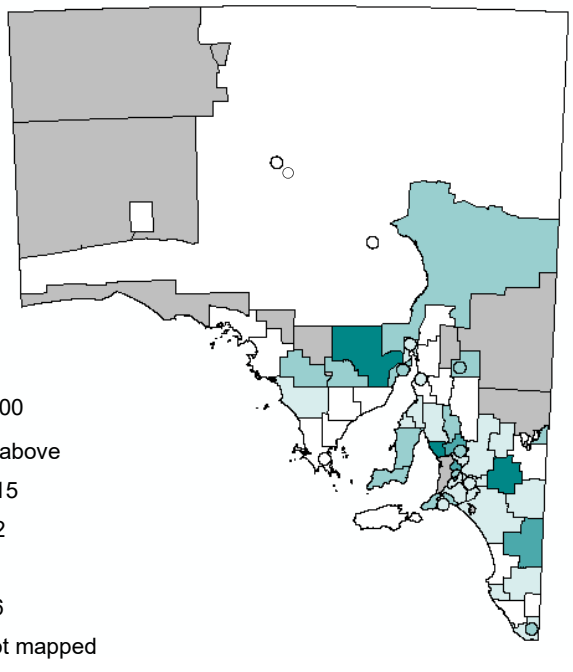
There were 21,337 services for respiratory function tests in South Australia in 2012/13, 15,002 (14.8 services per 1,000 population) in Adelaide, and 6,335 (8.2 per 1,000 population) in Regional South Australia.

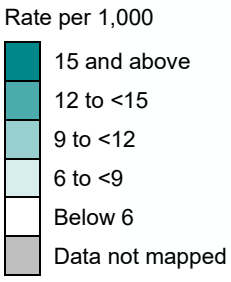
These services were provided across the whole of Adelaide, with the highest rates in the outer north and across a number of inner and middle suburbs. Playford - Elizabeth had clearly the highest rate, with 23.1 services per 1,000 population. Other high rates in the outer north and north-east were in Playford - West (19.0 services per 1,000 population), Tea Tree Gully - North (18.1), Playford - East Central and - West Central (both with 16.8 services per 1,000 population), and Salisbury - North-East (17.1). Adelaide SLA and Charles Sturt - Coastal had similar rates, with 17.8 and 17.4 services per 1,000 population, respectively. The lowest rate was in Salisbury Balance, with 9.3 service per 1,000 population.

Map 23: Respiratory function tests, rate per 1,000, Adelaide, 2012/13



Map 24: Respiratory function tests, rate per 1,000, Regional South Australia, 2012/13





High rates of these services were recorded in SLAs located across Regional South Australia, in Karoonda East Murray (with by far the highest rate, at 25.7 service per 1,000 population), Mallala (16.3), Mount Barker - Central (13.3), Light (12.9) and, in the south-east, in Tatiara (12.3) and Mount Gambier (11.2).

Completion of annual asthma cycle of care

There were relatively few services provided for completion of an annual asthma cycle of care in 2012/13, with 3,000 services, 1.9 services per 1,000 population in Adelaide, and 1.8 per 1,000 population in Regional South Australia; these data have not been mapped in this atlas but are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html.

Selected medicines provided under the Pharmaceutical Benefits Scheme (PBS) for treatment and prevention of respiratory disease

Context: ***The PBS provides access to necessary medicines for Australians. The PBS is part of the Australian Government's broader National Medicines Policy, the aim of which is to meet medication and related service needs, so that both optimal health outcomes and economic objectives are achieved.***

Under the PBS, the government subsidises the cost of medicine for most medical conditions. Most of the available medicines are dispensed by pharmacists, and used by patients at home.

The medicines covered in this section are allergy and asthma medications and smoking cessation medications.

Dispensing of inhaler preparations predominantly for asthma

Short-acting beta agonists

Short-acting beta-agonists (SABAs) are typically used as "rescue" medications to provide quick relief of asthma symptoms.

There were 135.8 prescriptions per 1,000 population dispensed for people living in Adelaide in 2012/13, and 162.4 per 1,000 population in Regional South Australia.

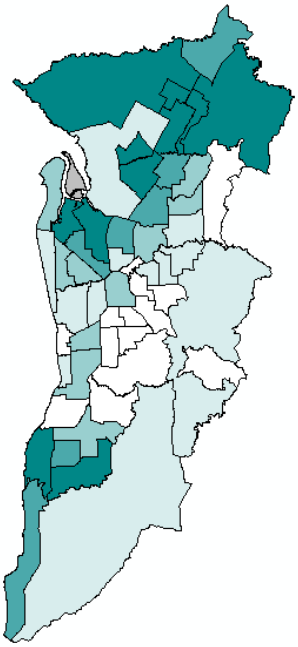
The distribution of prescriptions at the SLA level across Adelaide is highly consistent with the distribution of the population by socioeconomic disadvantage, with the highest rates in the outer north, outer south and north-west. The highest rate was in Playford - Elizabeth, with 343.8 prescriptions dispensed per 1,000 population for these items, followed by Salisbury - Inner North, with 304.4 prescriptions per 1,000 population. The next highest rates in the outer north were in Playford - West Central, - Hills, - East Central and - West (with rates of 278.1, 254.8, 246.1 and 225.4 prescriptions per 1,000 population, respectively), with a rate of 234.9 in Salisbury - Central. Onkaparinga - North Coast and - Hackham had the highest rates in the outer south, with 257.8 and 232.5 prescriptions per 1,000 population, respectively, while Port Adelaide Enfield - Port and - Park had the highest rates in the north-west, with 214.3 and 210.7 prescriptions per 1,000 population, respectively.

Of many low rates, the lowest were in the SLAs of Burnside - South-West and - North-East (50.4 and 60.6 prescriptions per 1,000 population, respectively), Adelaide Hills - Ranges and - Central (52.8 and 64.2 prescriptions per 1,000 population, respectively), Mitcham - North-East (54.8), Unley - East (55.6) and Walkerville (58.7).

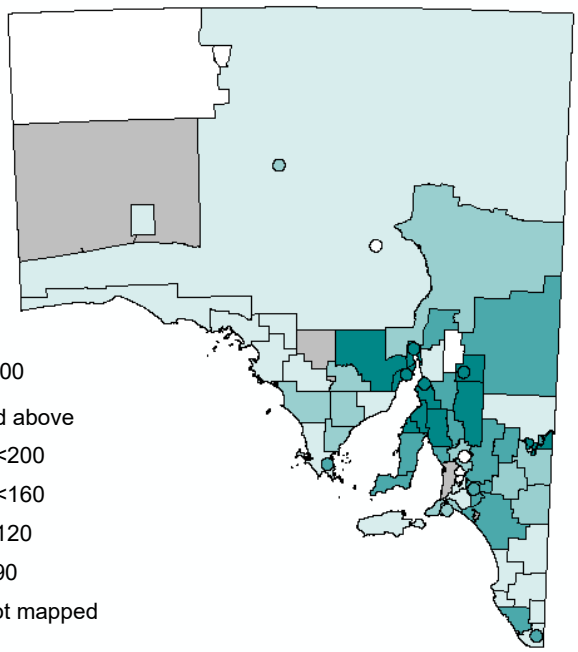
A majority of areas in Regional South Australia had some level of dispensing. The highest rate was in Unincorporated Whyalla (457.2 prescriptions per 1,000 population), although for just 110 prescriptions. Other very high rates were in several towns, including Berri (267.0 prescriptions per 1,000 population), Port Pirie (265.8), Barmera (253.8), Por Augusta (248.1), Peterborough (243.1) and Whyalla (209.5). Regional areas with the highest rates were Barunga West (225.3), Renmark Paringa – Paringa (213.2), Copper Coast (203.2), Goyder (202.9) and Wakefield (201.1).

The lowest rate of prescriptions dispensed for these items was in Anangu Pitjantjatjara (14.9 prescriptions per 1,000 population, and just 28 prescriptions), Roxby Downs, Orroroo/Carrieton (58.8), Adelaide Hills Balance (86.5) and Tanunda (87.7).

Map 25: Dispensing of short-acting beta agonists, rate per 1,000, Adelaide, 2012/13



Map 26: Dispensing of short-acting beta agonists, rate per 1,000, Regional South Australia, 2012/13



Short-acting muscarinic agonists

Short acting muscarinic antagonists (SAMAs), like SABAs, are used both in acute and chronic management. There were, however, small numbers of prescriptions for SAMAs compared with SABAs (5,530 compared with 238,750); these data have not been mapped in this atlas, but are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html.

Inhaled corticosteroids

Inhaled corticosteroids (ICS) act directly in the lungs to inhibit the inflammatory process that causes asthma; they are classed as preventers, rather than relievers (as are the SABAs).

There were 47,599 prescriptions dispensed for ICS, with a higher rate (30.7 prescriptions per 1,000 population) in Regional South Australia than in Adelaide (30.7).

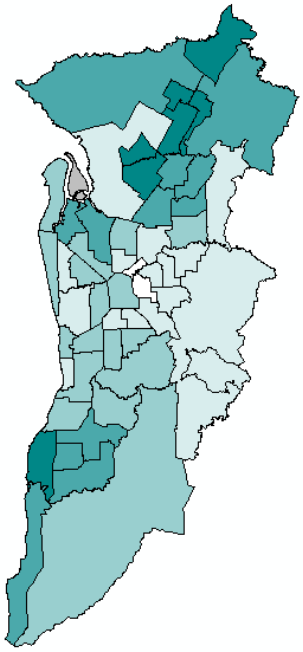
All but one of the SLAs with a rate in the top range mapped was in the outer north: the highest rates were in Salisbury - Central and Inner North (43.2 and 42.7 prescriptions dispensed per 1,000 population, respectively); Playford - East Central, - Elizabeth, - West Central, - West and - Hills (41.5, 39.2, 35.1, 34.9 and 34.6, respectively); and Gawler (38.9). The other SLA in this range was Onkaparinga - North Coast (36.1 prescriptions per 1,000 population).

Walkerville and Norwood Payneham St. Peters - West had the lowest rates, of 16.8 and 18.3 prescriptions dispensed per 1,000 population, respectively.

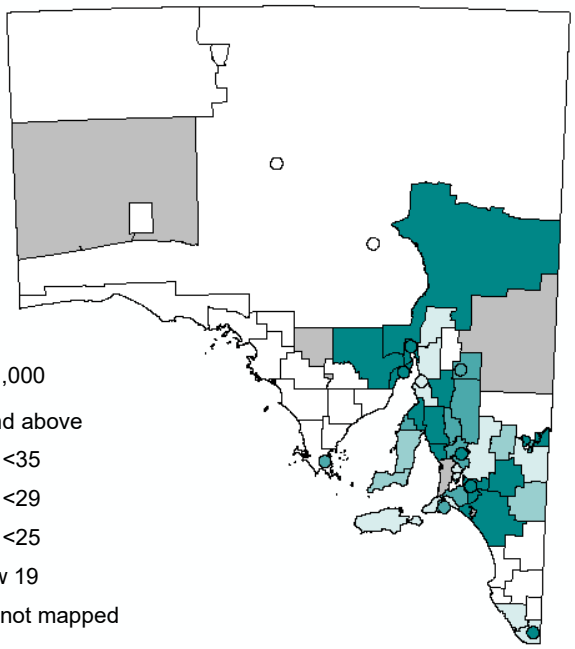
A number of SLAs in Regional South Australia, both towns and regional areas, had higher rates than in Adelaide. Some of the highest rates were found in an area from the Riverland, though the Murray Mallee and to the south-east of the State, and included the SLAs of Karoonda East Murray (56.5 prescriptions per 1,000 population), Renmark (52.0), Barmera (42.0), Mount Gambier (42.3), The Coorong (42.3), Renmark Paringa - Paringa (38.9) and Murray Bridge (37.2). Elsewhere there were high rates in Barunga West (50.8 prescriptions per 1,000 population), Mallala (48.8), Whyalla (46.3), Northern Areas (45.1) and Port Augusta (43.5).

Many areas had rates below 20 prescriptions per 1,000 population, although often with small numbers.

Map 27: Dispensing of inhaled corticosteroids, rate per 1,000, Adelaide, 2012/13



Map 28: Dispensing of inhaled corticosteroids, rate per 1,000, Regional South Australia, 2012/13



Dispensing of inhaler preparations predominantly for COPD

Long-acting muscarinic agonists

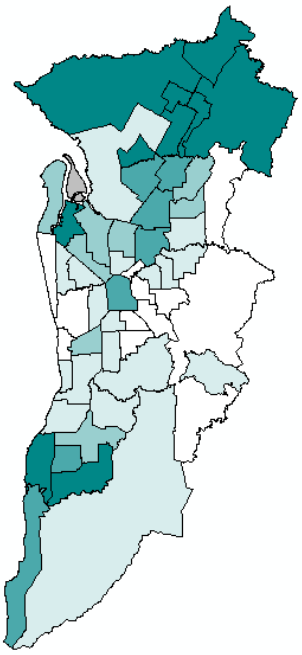
Long-acting muscarinic agonists (LAMAs) are medications generally considered as one of the options for maintenance therapy in patients that are symptomatic despite regular SABA use. There was a higher rate (96.8 prescriptions per 1,000 population) for these items in Regional South Australia than in Adelaide (83.0).

The highest rates in Adelaide were in SLAs in the outer north, followed by SLAs in the outer south and the north-west. In the outer north the SLAs were Playford - West Central (200.5 prescriptions per 1,000 population), - Elizabeth (166.3), - East Central (162.4), - Hills (155.3) and - West (147.2); Salisbury - Inner North (175.7) and Gawler (119.8). In the outer south Onkaparinga - Hackham and - North Coast had the highest rates (52.7 and 140.8 prescriptions per 1,000 population, respectively); Port Adelaide Enfield - Port (124.2) was the other SLA mapped in the highest range.

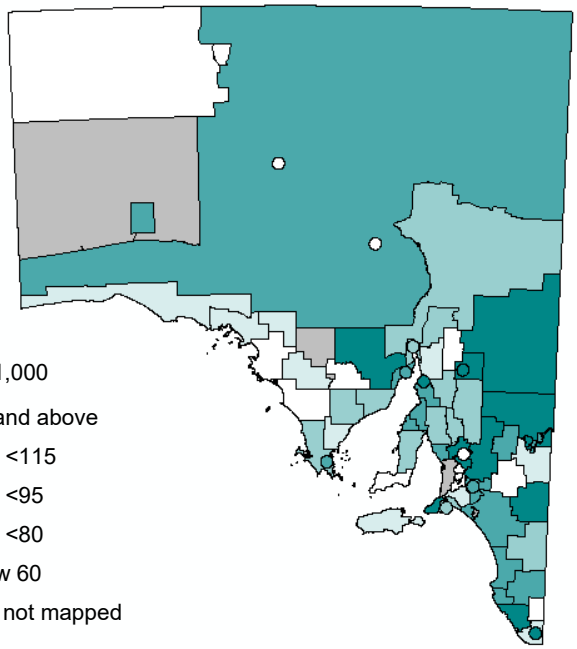
Many SLAs had rates of less than half those mentioned above, with the lowest of these in Tea Tree Gully - Hills (47.2 prescriptions per 1,000 population), Holdfast Bay - North (48.7), Walkerville (49.9) and Unley - East (50.8).

Of the SLAs in Regional South Australia with a least 50 prescriptions, the highest rates were in Unincorporated Whyalla (250.3 prescriptions per 1,000 population), Barmera (184.3), Wattle Range - West (145.7) and Peterborough (142.4); and the lowest were in Streaky Bay and Coober Pedy (both 43.8), Karoonda East Murray (52.1) and Yorke Peninsula - South and Adelaide Hills Balance (both 53.8).

Map 29: Dispensing of long-acting muscarinic agonists, rate per 1,000, Adelaide, 2012/13



Map 30: Dispensing of long-acting muscarinic agonists, rate per 1,000, Regional South Australia, 2012/13



Long-acting beta agonists

There were a relatively small number of prescriptions for long-acting beta agonists compared with LAMAs (13,960 compared with 144,972): these data have not been mapped in this atlas, although they are included in the indicator *Dispensing of all inhaler preparations for asthma and COPD*, below. They are also available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html.

Inhaled corticosteroids/long-acting beta agonists combinations

There were 345,673 prescriptions issued for inhaled corticosteroids/long-acting beta agonists combinations (ICS/LABA combinations), with rates of 204.5 prescriptions per 1,000 population in Adelaide and a higher 216.0 per 1,000 population in Regional South Australia.

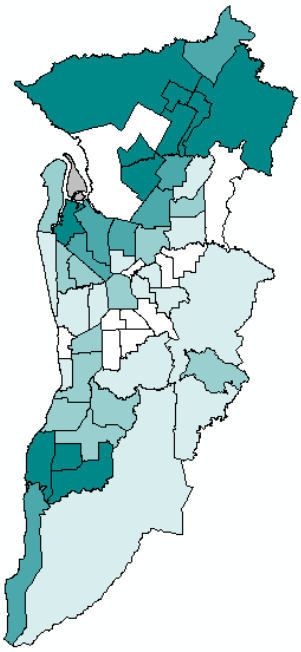
SLAs in the outer north and outer south again predominate in the ranking of highest rates in Adelaide. In the outer north, Salisbury - Inner North (339.0 prescriptions per 1,000 population) and - Central (257.9), and the Playford SLAs of - Elizabeth (303.6), Hills (302.1), - East Central (281.7), - West Central 279.0) and - West (267.7), had the highest rates. In the outer south it was the Onkaparinga SLAs of - North Coast (296.1), - Hackham (284.1) and - Morphett (257.9). In the north-west, Port Adelaide Enfield - Port and - Park also had very high rates, of 261.6 and 247.2 prescriptions per 1,000 population, respectively.

Several SLAs had rates well below the average for Adelaide, with the lowest in Burnside - South-West (138.1 prescriptions dispensed per 1,000 population), Tea tree Gully - Hills (143.9), Walkerville (145.8), Mitcham - North-East (147.2) and Holdfast Bay - North (152.8).

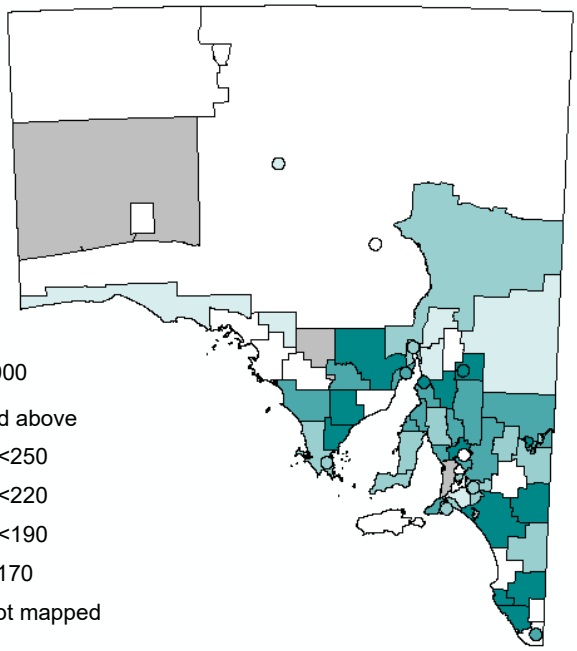
The majority of SLAs in Regional South Australia had relatively high rates of dispensing for these items. Rates in Unincorporated Whyalla (533.4 prescriptions per 1,000 population and 130 prescriptions dispensed) were the highest, with a rate of over twice the average across Regional South Australia; in Peterborough, Cleve and Barmera, rates were over 50% above, at 312.0, 307.5 and 302.2 prescriptions per 1,000 population, respectively.

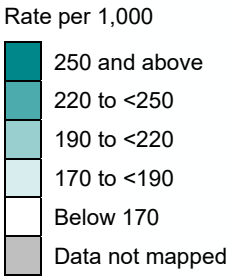
The lowest rate in Regional South Australia was in Anangu Pitjantjatjara (28.5 prescriptions per 1,000 population, with 49 scripts), with rates of 121.0 in Wattle Range - East and 129.3 in Streaky Bay.

Map 31: Dispensing of inhaled corticosteroids /long-acting beta agonists combinations, rate per 1,000, Adelaide, 2012/13



Map 32: Dispensing of inhaled corticosteroids/ long-acting beta agonists combinations, rate per 1,000, Regional South Australia, 2012/13





Dispensing of all inhaler preparations for asthma and COPD

The combined data show there to be a very strong correlation between socioeconomic disadvantage and high rates of dispensing of allergy and asthma medications at the SLA level across Adelaide (0.79) (Table 4[1]). This reflects the patterns seen in some of the previous maps of the components of this variable.

There were 796,484 prescriptions for these items dispensed in 2012/13, with a higher rate (518.3 prescriptions per 1,000 population) in Regional South Australia than in Adelaide (462.2).

Many areas in Adelaide had exceptionally high rates, with 22 SLAs with rates above the Adelaide average rate, and 32 below. The following SLAs had rates of 50% or more above the Adelaide average rate: Salisbury - Inner North (with a rate of 881.1 prescriptions per 1,000 population); the Playford SLAs of - Elizabeth (873.6), - West Central (803.4), - Hills (772.6) and - West (692.3); and Onkaparinga - North Coast (753.9) and - Hackham (713.7).

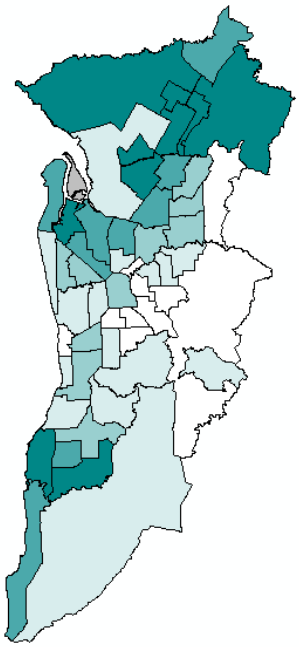
The lowest rates were in Burnside South-West (273.1 prescriptions per 1,000 population), Walkerville (276.7) and Mitcham North-East (293.2).

Outside of Adelaide, Unincorporated Whyalla had the highest rate in the State, with 1,333.5 prescriptions per 1,000 population, a total of 328 prescriptions dispensed). Other exceptionally high rates were recorded for people living in the towns of Barmera (800.7 prescriptions per 1,000 population), Peterborough (739.5), Port Pirie (695.3), Berri (651.7), Whyalla (630.4), Port Augusta (623.5) and Mount Gambier (619.9). Regional areas with similarly high rates are Wattle Range - West (622.2 prescriptions per 1,000 population), Barunga West (618.2), The Coorong (611.7), Northern Areas (610.4) and Renmark Paringa - Paringa (607.1).

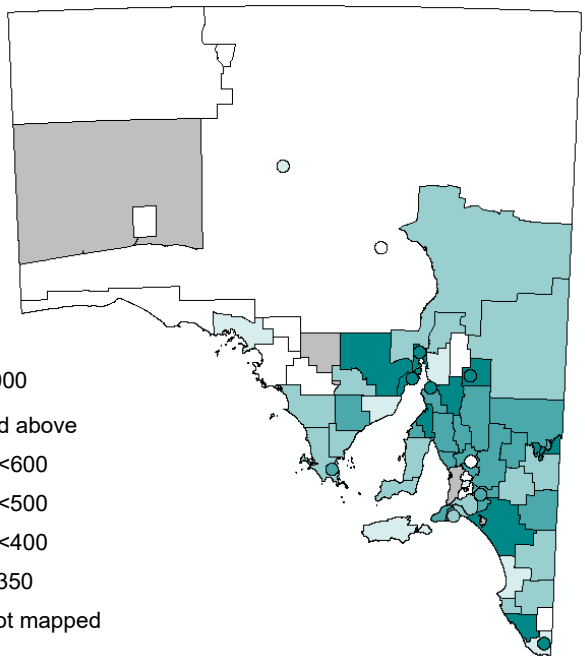
[1] The correlation with the measure of disadvantaged used (the Index of Relative Socio-economic Disadvantage (IRSD)) is -0.79, as the IRSD scores are constructed to show relative disadvantage as low scores, and relative advantage as high scores.

Anangu Pitjantjatjara had the lowest rate, with 65.8 prescriptions per 1,000 population, a total of 108 prescriptions dispensed. Other SLAs with low rates were Orroroo/ Carrieton (240.0 prescriptions per 1,000 population), Roxby Downs (258.5), Streaky Bay (273.2) and Wattle Range - East (293.9).

Map 33: Dispensing of all inhaler preparations for asthma and COPD, rate per 1,000, Adelaide, 2012/13



Map 34: Dispensing of all inhaler preparations for asthma and COPD, rate per 1,000, Regional South Australia, 2012/13



Dispensing of smoking cessation medications

The medicines described here are nicotine replacement therapy (10,581 prescriptions dispensed in 2012/13), varenicline (27,079 prescriptions) and bupropion (1,046 prescriptions).

Nicotine replacement therapy

Some 10,581 prescriptions for nicotine replacement therapy (NRT), as an aid to assisting motivated smokers to quit [16], were dispensed in 2012/13.

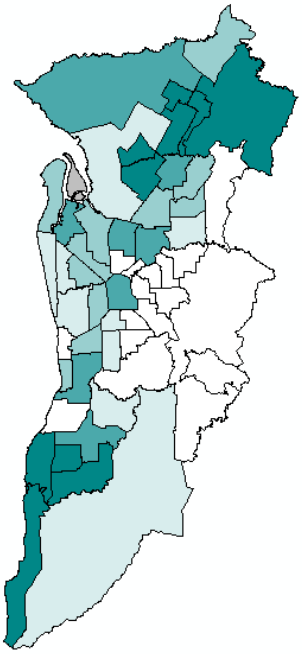
There were 6.3 prescriptions dispensed per 1,000 population in Adelaide, with the highest rates recorded for people living in the outer southern SLAs of Onkaparinga - North Coast (17.1 prescriptions per 1,000 population), - Hackham (14.3) and - Morphett (11.0); and in the outer northern SLAs of Playford - Elizabeth (16.0), - East Central (11.6), - West Central (11.0) and - Hills (10.3) and in Salisbury - Inner North (10.2) and - Central (10.1). These areas are generally those estimated to have the highest rates of smokers in their adult populations, and to have the highest rate of smoking by women while pregnant, as well as being areas of greater relative disadvantage. Walkerville (with 1.5 prescriptions dispensed per 1,000 population), Adelaide Hills - Ranges (1.6 prescriptions per 1,000 population) and - Central, Mitcham - North-East (1.9) and - Hills (2.4), Burnside - South-West (2.0) and - North-East (2.3) and Unley - East (2.7) had the lowest rates.

Although the overall rate in Regional South Australia was slightly higher than in Adelaide, at 6.6 prescriptions per 1,000 population, rates were more evenly distributed at the SLA level, and the highest rates were not as high. Barmera, Berri and Northern Areas had rates of 12.6, 12.3 and 12.0 prescriptions dispensed per 1,000 population, with rates over 10 per 1,000 population in Peterborough (11.6), Tumby Bay (10.5), Orroroo/ Carrieton (10.4), Copper Coast (10.3) and Elliston (10.1).

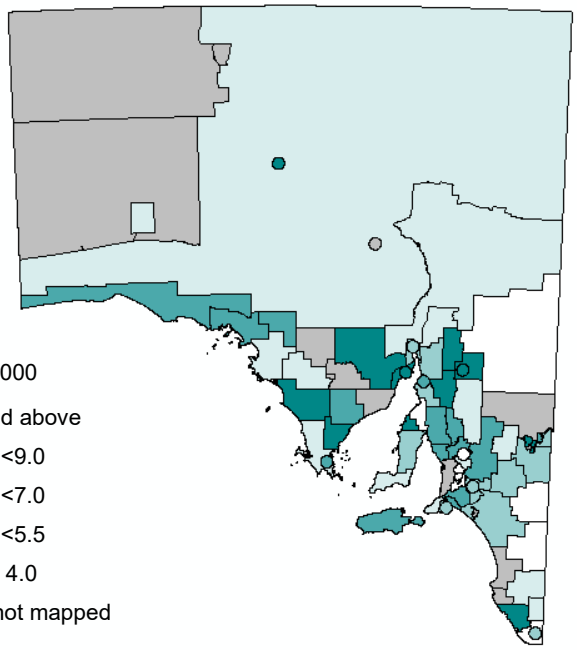
The lowest rate was in Barunga West (2.7 prescriptions dispensed per 1,000 population, to the north of Adelaide; in the south-east, Tatiara (3.0) and Grant (3.3) had the lowest rates; and, closer to the

metropolitan area, rates of 3.0, 3.1, 3.2 and 3.4 were recorded in Tanunda, Mount Barker Balance and Adelaide Hills - North and Balance.

Map 35: Dispensing of nicotine replacement therapy, rate per 1,000, Adelaide, 2012/13



Map 36: Dispensing of nicotine replacement therapy, rate per 1,000, Regional South Australia, 2012/13



Varenicline

Varenicline is a nicotinic receptor partial agonist drug for smoking cessation. It can more than double the chances of long-term quitting. In a network meta-analysis it was found to be more effective than bupropion, more effective than nicotine replacement therapy (NRT) monotherapy, and similar in effect to combination NRT (combining the nicotine patch with an oral form of NRT) [17]. There were over twice the number of prescriptions dispensed for varenicline (27,079) than for NRT (10,581).

Although the rates of dispensing of prescriptions for nicotine replacement therapy were similar for residents of Adelaide and Regional South Australia, rates for varenicline were substantially (48%) higher in Regional South Australia.

The SLAs with the highest rates in Adelaide are consistent with those mapped in the highest range for NRT. They are, in the outer north:

- Playford - Elizabeth (30.3 prescriptions dispensed per 1,000 population), - East Central (30.1), - West Central (25.0) and - Hills (22.2);
- Salisbury - Inner North (23.0), - North-East (21.5) and - Central (20.3); and
- Gawler (21.1).

In the outer south, the highest rates were in:

- Onkaparinga - Hackham (26.4 prescriptions per 1,000 population), - North Coast (26.0) and - Morphett (21.8).

Port Adelaide Enfield - Port had a rate of 21.0 prescriptions dispensed per 1,000 population.

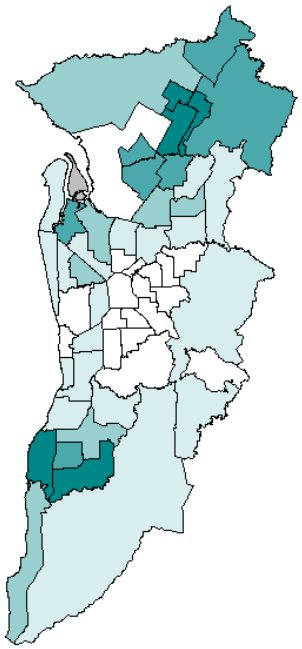
Walkerville had the lowest rate, with 5.9 prescriptions dispensed per 1,000 population, with rates of between 7 and 8 prescriptions dispensed per 1,000 population in inner SLAs of Norwood Payneham St Peters - East and - West, Burnside - South-East and - South-West and Unley - East.

Several areas in Regional South Australia had rates above the highest SLA rate in Adelaide, with rates of 25% or more above in Peterborough (43.4 prescriptions dispensed per 1,000 population), Coober

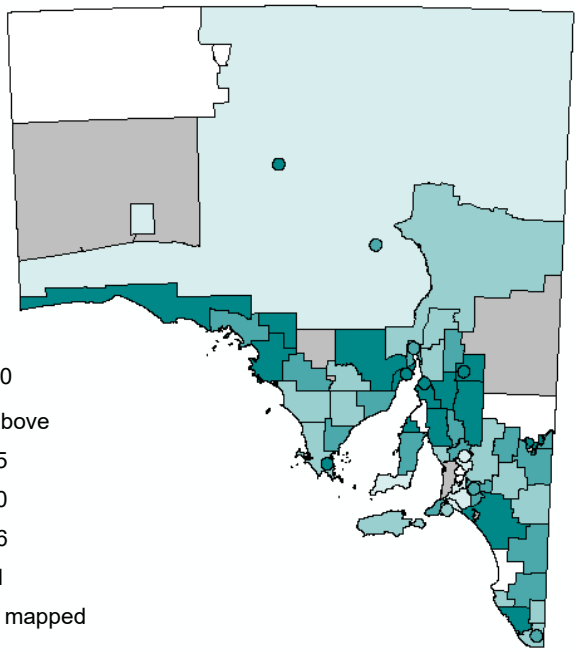
Pedy (39.4) and Port Lincoln (38.0). Berri (34.0 prescriptions dispensed per 1,000 population), Barmera (32.9) and Port Pirie (31.3) also had rates above that in Playford – Elizabeth (30.3).

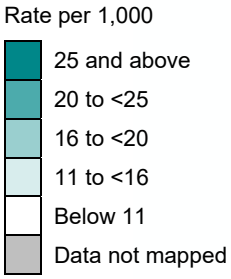
The lowest rate was in Anangu Pitjantjatjara, with 3.2 prescriptions dispensed per 1,000 population, although with only 8 prescriptions. Other very low rates were in Adelaide Hills Balance (7.4 prescriptions dispensed per 1,000 population), Kingston (8.8), Barunga West (8.7), Mount Barker (11.3), Tanunda (12.5) and Angaston (13.3).

Map 37: Dispensing of varenicline, rate per 1,000, Adelaide, 2012/13



Map 38: Dispensing of varenicline, rate per 1,000, Regional South Australia, 2012/13





Bupropion

Bupropion slow release is also an aid to assisting motivated smokers to quit [16]. However, as there were a relatively small number of prescriptions for bupropion (1,046), they have not been mapped in this atlas but are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html.

Dispensing of all smoking cessation medications

This variable includes the sum of prescriptions dispensed in 2012/13 for nicotine replacement therapy (10,581), varenicline (27,079 prescriptions) and bupropion (1,046 prescriptions).

There was a very strong correlation at the SLA level in Adelaide between high rates of prescriptions dispensed for smoking cessation medications and socioeconomic disadvantage (Table 3) and a weak correlation in Regional South Australia (Table 4).

Rates were higher in Regional South Australia (28.7 prescriptions dispensed per 1,000 population) than in Adelaide (21.2), reflecting the variation seen for varenicline medications.

The distribution at the SLA level is also heavily influenced by the distribution of varenicline, with the highest rates in the outer north and outer south. In the outer north, the SLAs are:

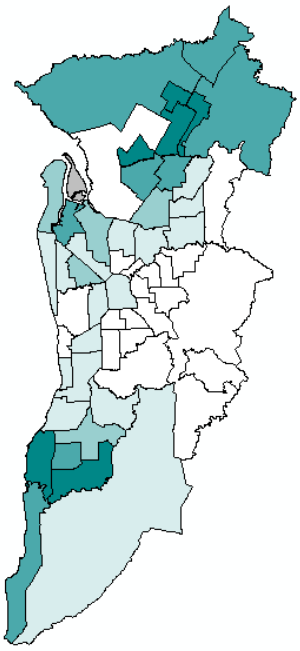
- Playford - Elizabeth (47.1 prescriptions dispensed per 1,000 population), - East Central (42.2), - West Central (37.1) and - Hills (32.8);
- Salisbury - Inner North (34.1), - Central (30.8) and - North-East (30.3).

In the outer south, the highest rates were in:

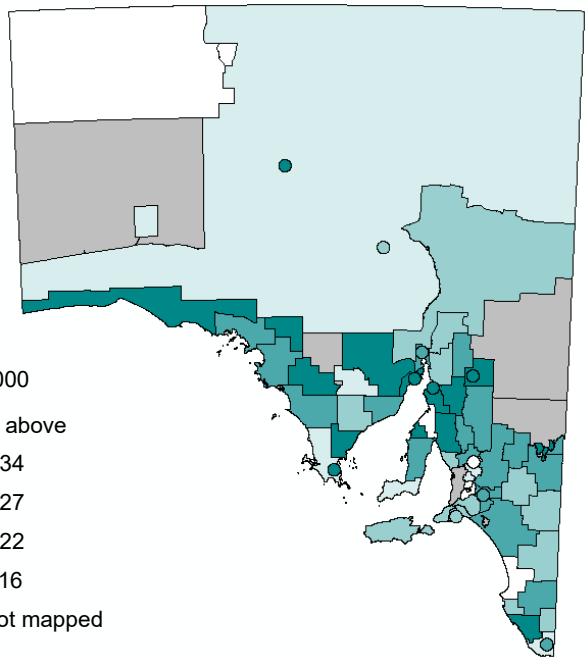
- Onkaparinga - North Coast (44.0 prescriptions per 1,000 population), - Hackham (41.3) and - Morphett (33.6).

The lowest rates were in the SLAs of Walkerville (7.8 prescriptions dispensed per 1,000 population), Burnside - South-West and - North-East (9.4 and 10.5, respectively), Unley - East (10.7) and Norwood Payneham St Peters - West (10.7).

Map 39: Dispensing of smoking cessation medication, rate per 1,000, Adelaide, 2012/13



Map 40: Dispensing of smoking cessation medication, rate per 1,000, Regional South Australia, 2012/13



Emergency Department attendances for respiratory conditions

Context: ***Hospital emergency departments (EDs) are designed for emergency responses and acute health care; and they play a role in treating respiratory emergencies. People with respiratory conditions may also present to EDs for urgent care due to complications of their condition. Ideally, close management may avoid the need to attend EDs for reasons related to respiratory conditions.***

The data are for the years 2011, 2012 and 2013.

It is important to note that service location may, at least in part, be driving service use. EDs are a case in point, in that they provide services, in particular specialised medical services, which are not always accessible elsewhere after hours. They also provide services to those people who are unlikely to use mainstream medical services, whether for reasons of cost, appropriateness, or because they would feel uncomfortable in doing so for cultural or other reasons.

Overall, for South Australia, there were 65,877 ED attendances in the period 2011/12 and 12/13, 3,979.7 attendances per 100,000 population. The rate in Adelaide of 4,614.2 attendances per 100,000 population was 2.3 times that in Regional South Australia, of 1,983.5. That almost three quarters (72.0%) of the ED attendances were from people living in Adelaide can be explained by the location of the ED departments attached to public hospitals (at the Flinders Medical Centre, Lyell McEwin Hospital, Modbury Hospital, Noarlunga Health Services, Royal Adelaide Hospital, The Queen Elizabeth Hospital, Women's and Children's Hospital) being in the metropolitan area.

The distribution of attendances at the SLA level in Adelaide is strongly correlated with socioeconomic disadvantage (Table 3). Rates in Onkaparinga - North Coast and - Hackham were over twice the Adelaide average, at 11,133.4 and 10,077.5 attendances per 100,000 population, respectively. SLAs with rates of 15% or more above the average for Adelaide were, in the outer north:

- Playford - Elizabeth (8,624.8 attendances per 100, 000 population) and - West Central (7,733.2); and
- Salisbury - Central (6003.9), - Inner North (5,585.8) and - South-East (5,350.6).

In the outer south, the highest rates were in:

- Onkaparinga - Morphett (8,332.7 attendances per 100,000 population) and - South Coast (6,652.3).

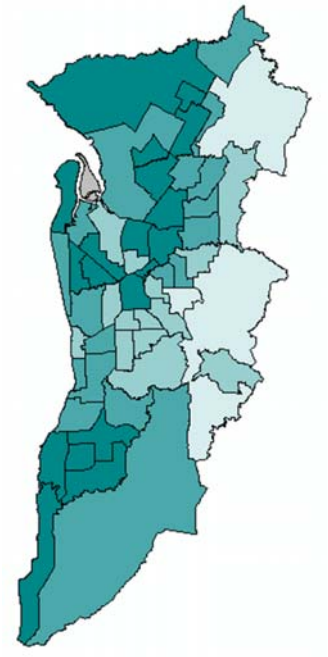
To the west of Adelaide, Charles Sturt - North-East and Port Adelaide Enfield - Inner had rates of 5,787.1 and 5,622 attendances per 100,000 population, respectively.

SLAs with rates of less than half the Adelaide average were Adelaide Hills - Ranges (1,754.5 attendances per 100,000 population) and - Central (2,137.4), Burnside - North-East (1,893.8) and - South-West (2,086.8) and Playford - Hills ((1,990.6).

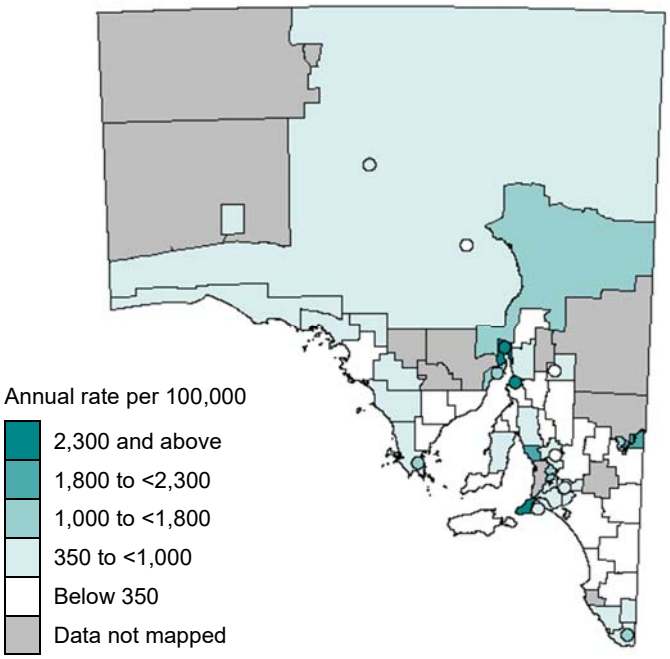
Relatively few areas in Regional South Australia had very high rates, when compared with SLAs in Adelaide, with the highest in Port Pirie (4,841.1 attendances per 100,000 population), Port Augusta (4,806.2), Yankalilla (4,798.5), Paringa (4,386.4) and Berri (4,360.7).

Very low rates, of below 400 attendances per 100,000 population, were recorded for people from Naracoorte and Lucindale, Port Pirie City and Districts Balance, Kingston, Flinders Ranges, Kangaroo Island, Barunga West, Streaky Bay and Northern Areas; of these LSAs, only Naracoorte and Lucindale had more than 20 attendances.

Map 41: Emergency Department attendances for respiratory conditions, rate per 100,000, Adelaide, 2011/12 and 2012/13



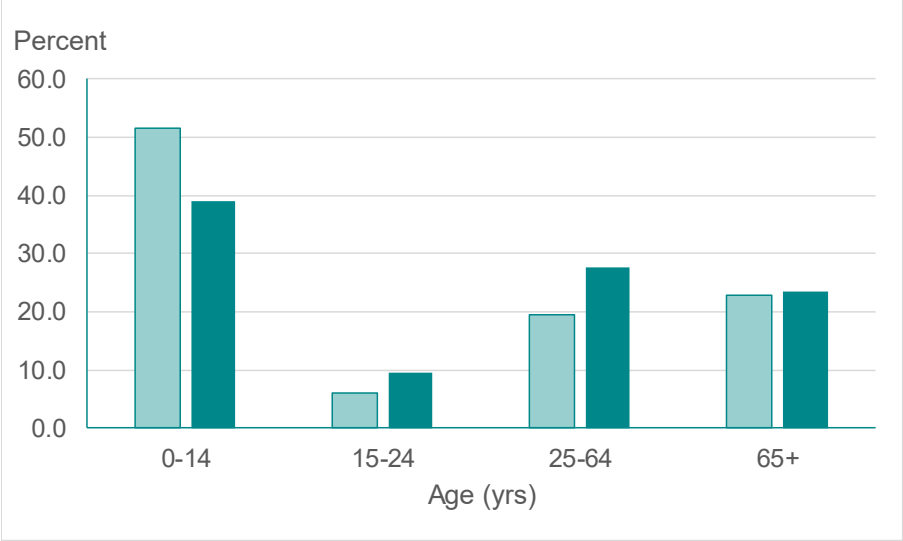
Map 42: Emergency Department attendances for respiratory conditions, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Attendances, by age and sex

Almost half (45.8%) of ED attendances for respiratory conditions were of children aged 0 to 14 years, with boys representing 60.1% of this age group.

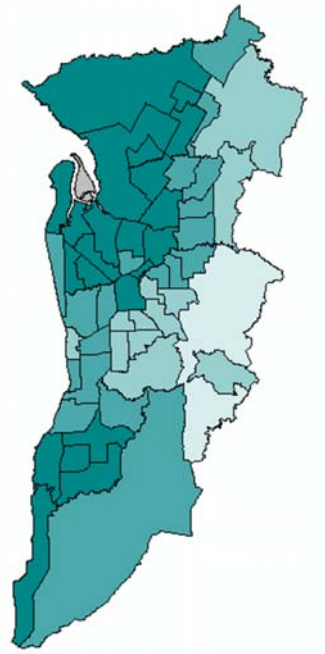
Figure 1: Emergency Department attendances for respiratory conditions, by age and sex, 2011/12 and 2012/13



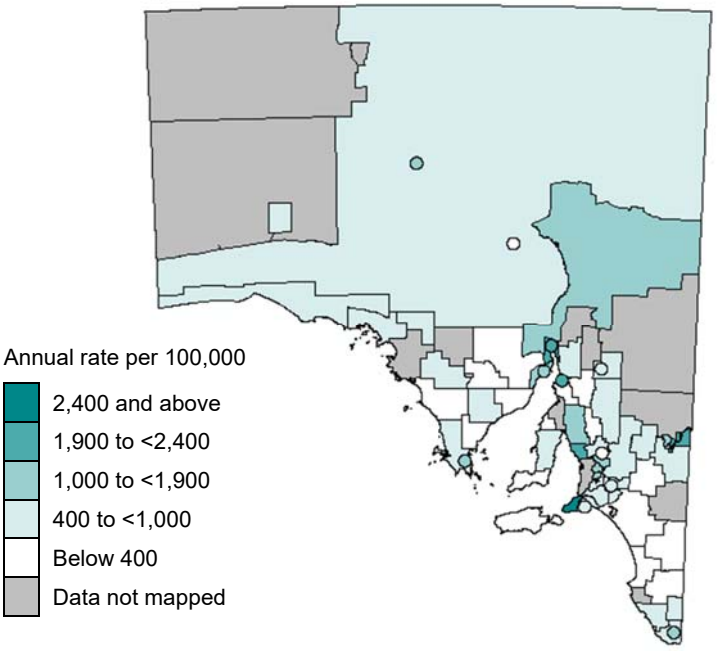
Although the overall rate of ED attendances for respiratory conditions for males in Adelaide is 44% higher than that for females, at the SLA level females have the twelve highest rates. The highest of these are in the outer south in the Onkaparinga SLAs, followed by Playford, Salisbury and Port Adelaide Enfield SLAs.

In Regional South Australia, where the male rate is 19% higher than that for females, at the SLA level rates for females in Berri, Port Augusta and Port Pirie are higher than the highest male rate, in Yankalilla.

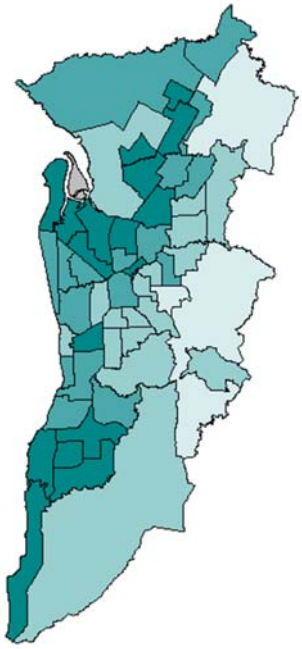
Map 43: Emergency Department attendances of males for respiratory conditions, rate per 100,000, Adelaide, 2011/12 and 2012/13



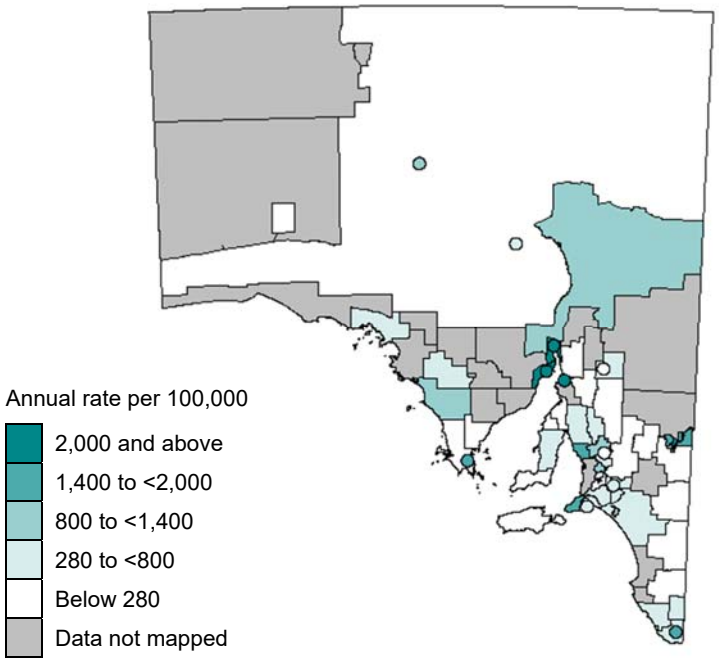
Map 44: Emergency Department attendances of males for respiratory conditions, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Map 45: Emergency Department attendances of females for respiratory conditions, rate per 100,000, Adelaide, 2011/12 and 2012/13



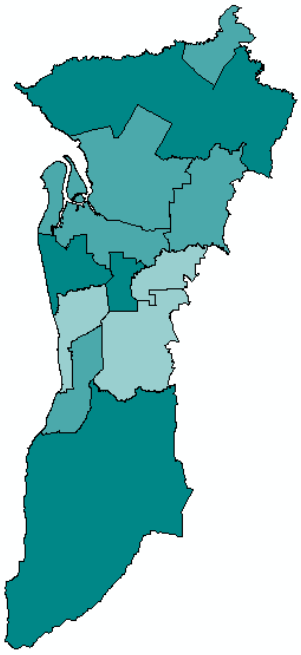
Map 46: Emergency Department attendances of females for respiratory conditions, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



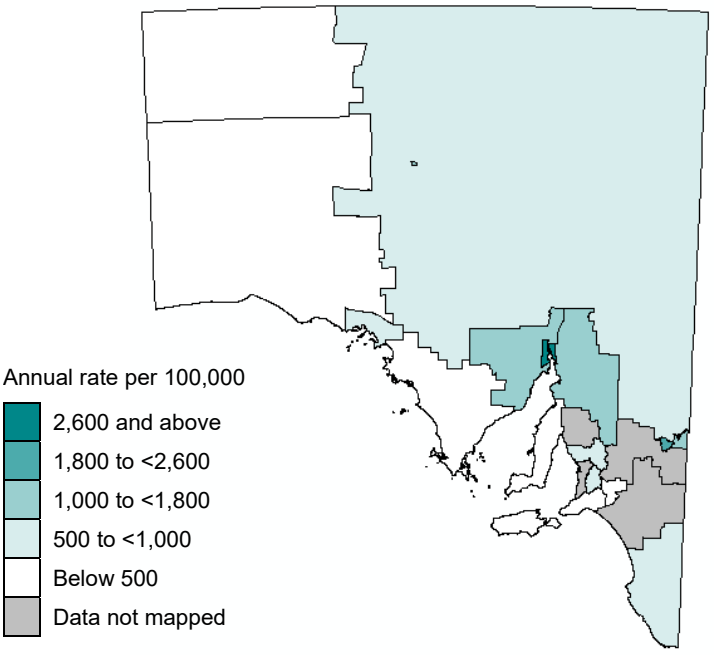
Attendances by the Aboriginal population

There were 2,808 ED attendances of Aboriginal people for respiratory conditions in the period 2011/12 and 2012/13, 3,676.3 attendances per 100,000 population, and lower than the rate for the whole population of 3,979.7 attendances per 100,000 population.

Map 47: Emergency Department attendances for respiratory conditions, Indigenous population, rate per 100,000, Adelaide, 2011/12 and 2012/13



Map 48: Emergency Department attendances for respiratory conditions, Indigenous population, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Rates above the State average were recorded in Indigenous Areas in both Adelaide and Regional South Australia. The highest in Adelaide were in Adelaide - Prospect - Walkerville (6,132.9), Charles Sturt (6,070.4), Playford (5,929.6) and Onkaparinga (5,669.8). The highest rates in Regional South Australia were in Port Augusta (5,996.7) and Berri - Barmera (3,930.4).

Admissions to a public acute hospital for respiratory diseases

Context: ***People who are admitted to hospital for a respiratory condition tend to be at the more serious end of the spectrum. For these patients, hospital facilities provide care and treatment.***

The atlas uses the term 'admission', a more familiar term rather than the official term of 'separation'. A separation indicates an episode of patient care, from admission until discharge, transfer or death. In this atlas, transfers of people admitted to one hospital, for example, in Regional South Australia, and transferred to another, perhaps in Adelaide, have been removed to avoid multiple counts for the same event.

The maps below present data for admissions over the two years 2011/12 and 2012/13 (combined) with all respiratory system diseases, then for the subsets of asthma, chronic obstructive pulmonary disease, pneumonia, sleep apnoea, lung cancer or influenza. Data are shown for the 29,997 (emergency or elective) admissions with a principal diagnosis of one of these diagnoses, and separately for 'all' admissions, i.e., those where the above-mentioned conditions are noted in any diagnosis (including the principal diagnosis), a total of 51,022 admissions.

Admissions with respiratory diseases as a primary diagnosis

Of the 29,997 (emergency or elective) admissions in the period 2011/12 and 2012/13 with a principal diagnosis of a respiratory disease, the rate per 100,000 population in Regional South Australia was 20% higher than in Adelaide, with rates of 1,014.2 and 843.5, respectively.

In Adelaide, rates of 1,000 admissions or more per 100,000 population were recorded in

- the outer north, in Playford - Elizabeth (2,039.3), - West Central 2,032.9), and - West (1,033.9); Salisbury - Central (1,376.9), - South-East (1,303.3) and - Inner North (1,249.1); and Gawler (1,347.8);
- the outer south, in Onkaparinga - North Coast (1,463.0), - Hackham (1,404.6) and - Morphett (1,168.3); and
- in the north-west, in Port Adelaide Enfield - Port (1,213.0) and - Inner (1,005.6) and Charles Sturt - North-East (1,057.8).

Several SLAs had rates under half the Adelaide rate; they were Adelaide Hills - Ranges (309.6 and - Central (390.9), Mitcham - North-East (317.0) and Burnside - South-West and - North-East (319.1 and 323.3, respectively).

A number of SLAs in Regional South Australia had the highest rates in the State, although with small numbers of admissions; they were Unincorporated West Coast (2,82.9 admissions per 100,000 population and 35 admissions), Coober Pedy (2,431.5, 88 admissions), Peterborough (2,143.1, 89 admissions) and Unincorporated Flinders Ranges (2,101.3, 37 admissions). Other very high rates were recorded for people living in Port Augusta (1,732.1 admissions per 100,000 population), Ceduna (1,498.8), Barmera (1,401.8), Port Pirie (1,395.2), Whyalla (1,362.1), Cleve (1,354.8), Southern Mallee (1,298.6) and The Coorong (1,296.8).

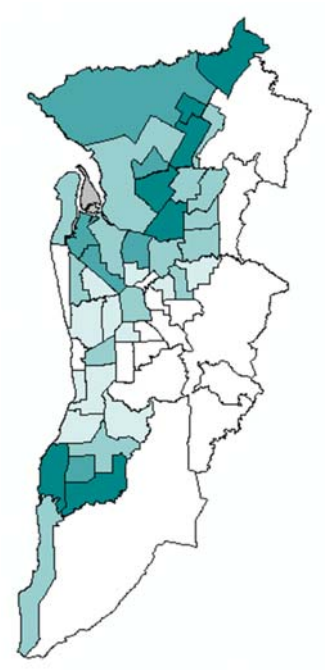
Kimba (with 245.1 per 100,000 population and 6 admissions), Mount Barker Balance (368.6, 61 admissions) and Robe (471.9, 15 admissions) had rates under half the Regional South Australian rate.

Admissions with respiratory diseases in any diagnosis

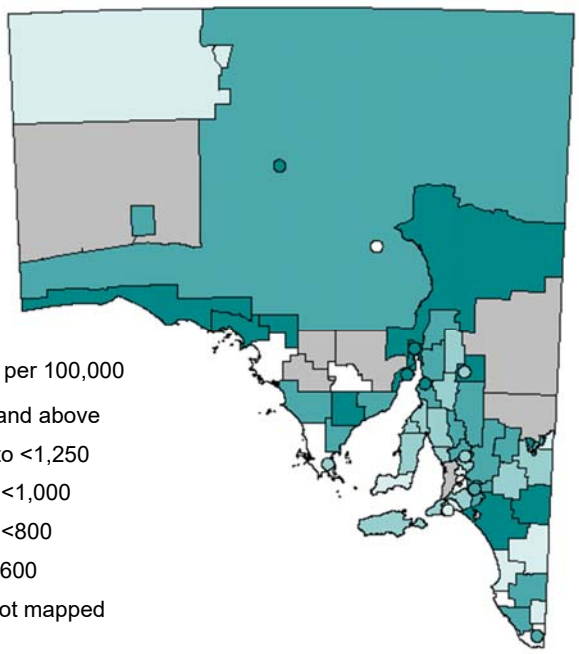
The rate of admissions of people living in Regional South Australia (1,612.1 admissions per 100,000 population) was 9% above the rate in Adelaide (1,475.3). However, the higher rates at the SLA level in Regional South Australia seen for admissions for respiratory disease are not in evidence for this variable.

As seen for admissions for respiratory disease as a primary diagniosis, SLAs in the outer north, outer south and north-west had the highest rates; and inner SLAs the lowest rates.

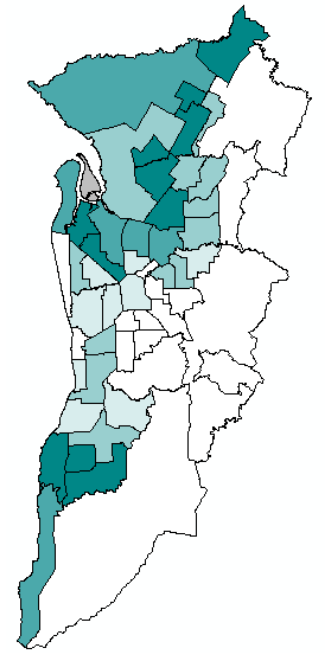
Map 49: Public hospital admissions with respiratory diseases as a principaldiagnosis, persons, rate per 100,000, Adelaide, 2011/12 and 2012/13



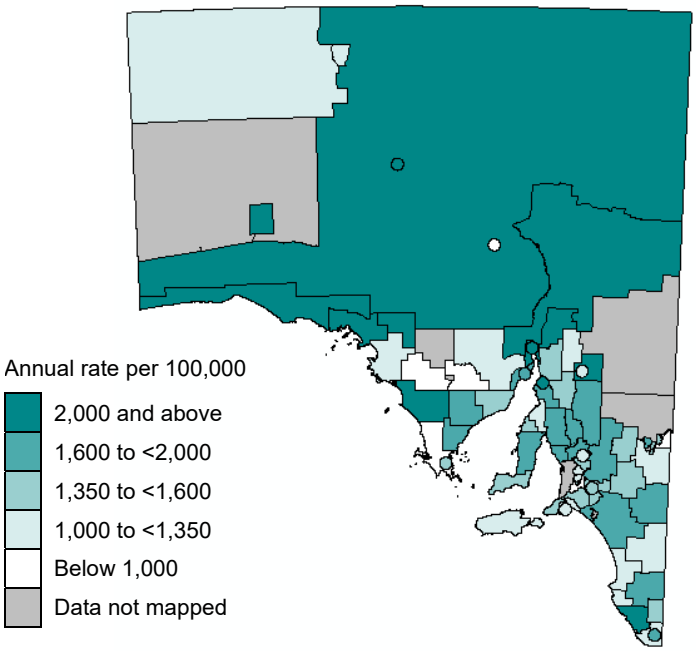
Map 50: Public hospital admissions with respiratory diseases as a principaldiagnosis, persons, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Map 51: Public hospital admissions with respiratory diseases in any diagnosis, persons, rate per 100,000, Adelaide, 2011/12 and 2012/13



Map 52: Public hospital admissions with respiratory diseases in any diagnosis, persons, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Asthma

Admissions with asthma as a principal diagnosis

Symptoms of asthma are generally evident in children by age five. There were 5,611 admissions for asthma as a primary diagnosis over the two years 2011/12 and 2012/13. Although the data have not been mapped in this atlas, they are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html. The pattern of rates at the SLA level in Adelaide and Regional South Australia is highly consistent with that shown below, for admissions with asthma in any diagnosis.

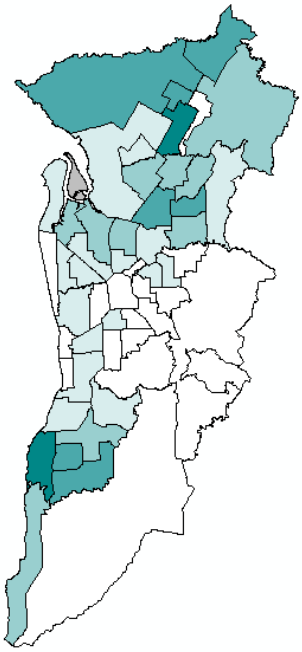
Admissions with asthma in any diagnosis

There were 7,397 admissions from asthma over the two years 2011/12 and 2012/13, with the rate in Regional South Australia (291.7 admissions per 100,000 population) higher than that in Adelaide (192.4). At the SLA level the twelve highest rates were also in Regional South Australia.

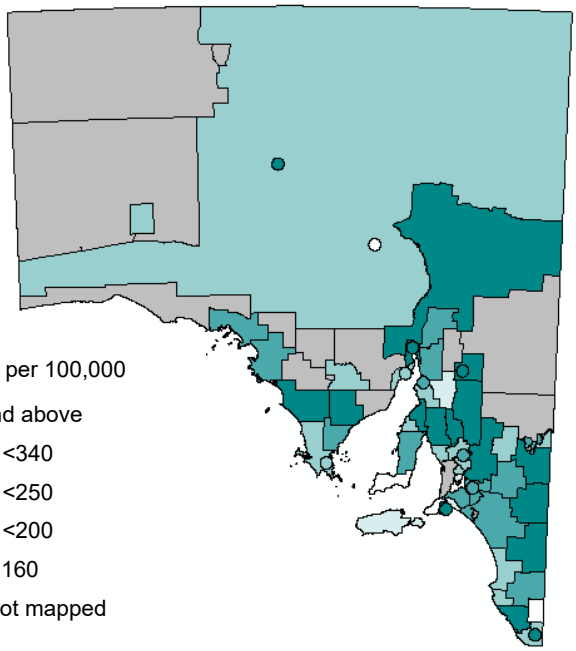
The highest rates in Adelaide for admissions were largely in the SLAs with the highest rates for all respiratory diseases, with the only variation being the inclusion in this group of some SLAs in Tea Tree Gully, and more SLAs in Port Adelaide Enfield.

Similarly, the lowest rates were as seen for all respiratory diseases, although with the addition of Onkaparinga - Hills and Holdfast - North and - South.

Map 53: Public hospital admissions with asthma in any diagnosis, rate per 100,000, Adelaide, 2011/12 and 2012/13



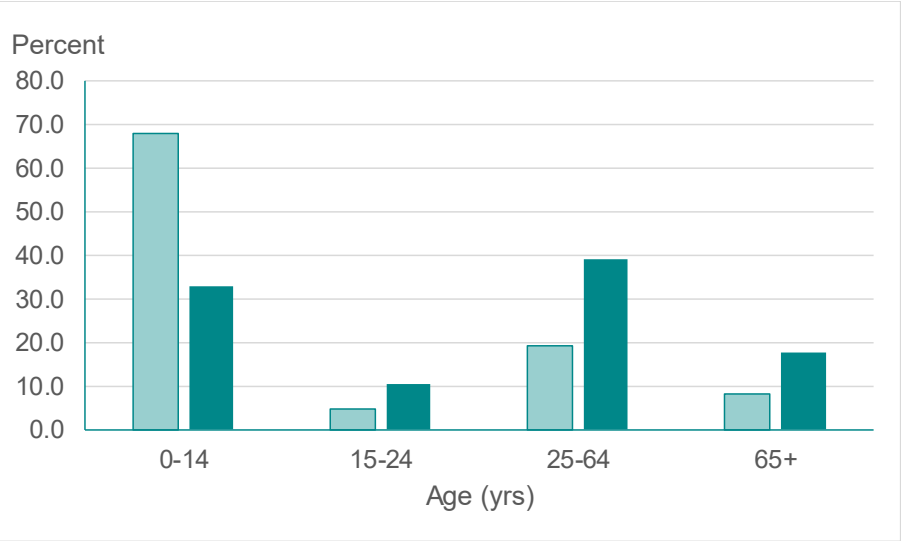
Map 54: Public hospital admissions with asthma in any diagnosis, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Admissions by age and sex

As noted above, symptoms of asthma are generally evident at an early age, with over two thirds (67.8%) of admissions of males at ages 0 to 14 years; the proportion for females was less than half that, at 32.8%.

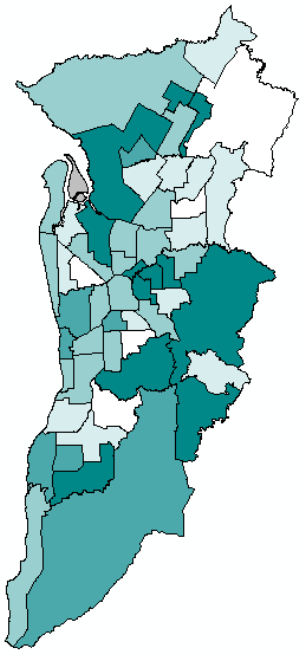
Figure 2: Public hospital admissions with a primary diagnosis of asthma, by age and sex, 2011/12 and 2012/13



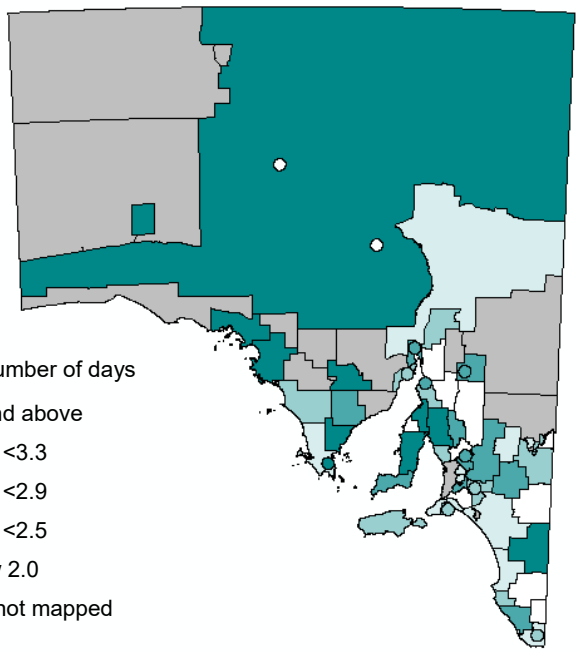
Length of stay

Unlike the other data presented for asthma, the length of stay has not been adjusted (age-standardised) to remove differences between SLAs in the age of people admitted to hospital. As such, variations at the SLA level are influenced by differences in the age of the population.

Map 55: Average length of stay for public hospital admissions for asthma in any diagnosis, persons, number of days, Adelaide, 2011/12 and 2012/13



Map 56: Average length of stay for public hospital admissions for asthma in any diagnosis, persons, number of days, Regional South Australia, 2011/12 and 2012/13



The average length of stay (ALOS) for admissions from asthma in any diagnosis diseases was 2.8 days. At the SLA level, the ALOS varies markedly from the map of admissions. Of the eleven SLAs with a length of 3.5 or more days, only three (Playford - West Central (third ranked on admission rate and ALOS), Onkaparinga - Hackham (sixth ranked on admission rate and seventh on ALOS) and Salisbury Balance (ranked 30 on admission rate and tenth on ALOS) had an admission rate ranked in the top 30.

The average length of stay was highest in Campbelltown - West (4.7 days), - Walkerville (4.6 day), Playford - West Central (4.2 days), Norwood Payneham St Peters West (4.2 days), Playford - East Central (4.1 days), Onkaparinga - Hackham (3.9 days), Norwood Payneham St Peters - East (3.8 days), Adelaide Hills - Ranges (3.7 days), Salisbury Balance (3.7 days) and Mitcham - Hills (3.5 days). People admitted from Playford - Hills, Tea Tree Gully - Central, Charles Sturt - Inner East, Onkaparinga-Reservoir, Mitcham - North-East, Port Adelaide Enfield - Port and Marion - South all had a length of stay of less than two days.

Chronic obstructive pulmonary disease (COPD)

Admissions with COPD as a principal diagnosis

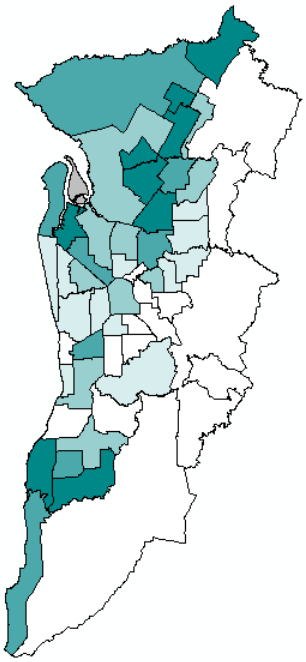
People with COPD usually don't get diagnosed until they are 40 or older, as the condition is often brought on by years of smoking, and is the result of the slow progression of the disease.

There were 9,223 admissions for COPD as a primary diagnosis over the two years 2011/12 and 2012/13. Although the data have not been mapped in this atlas, they are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html. However, the pattern of rates at the SLA level in Adelaide and Regional South Australia is highly consistent with that shown below, for admissions with COPD in any diagnosis.

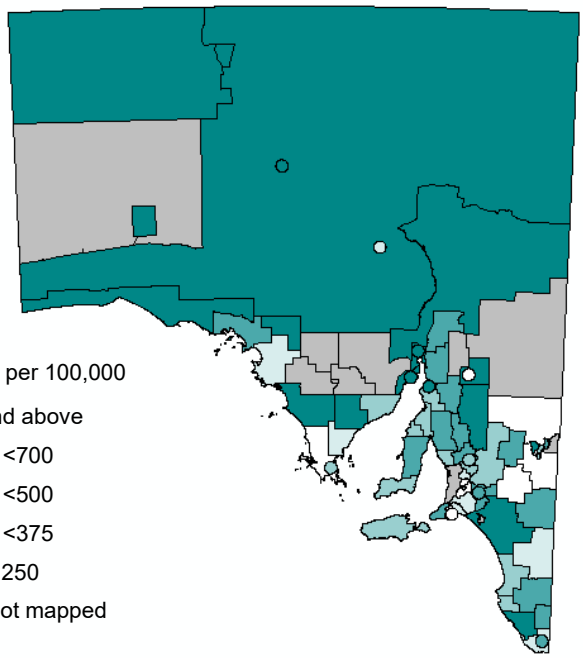
Admissions with COPD in any diagnosis

There were 15,866 admissions of people with COPD as a principal diagnosis, or in any diagnosis, with the rate for people living in Regional South Australia (531.8 admissions per 100,000 population) being 18% higher than that for people living in Adelaide (449.0).

Map 57: Public hospital admissions with chronic obstructive pulmonary disease in any diagnosis, rate per 100,000, Adelaide, 2011/12 and 2012/13



Map 58: Public hospital admissions with chronic obstructive pulmonary disease in any diagnosis, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Rates of 50% or more above the Adelaide rate were recorded for people living in Playford - West Central (1,752.3 admissions per 100,000 population) and - Elizabeth (1,567.3); Salisbury - Inner North (1,086.8), - Central (934.1) and – South-East (727.7); Onkaparinga - North Coast (1,065.3), - Hackham (935.0) and - Morphett (677.6); Gawler (853.6); and Port Adelaide Enfield - Port (772.8).

Adelaide Hills - North and - Central, Burnside - North-East and - South-West, and Mitcham - North-East all had rates below 150 admissions per 100,000 population.

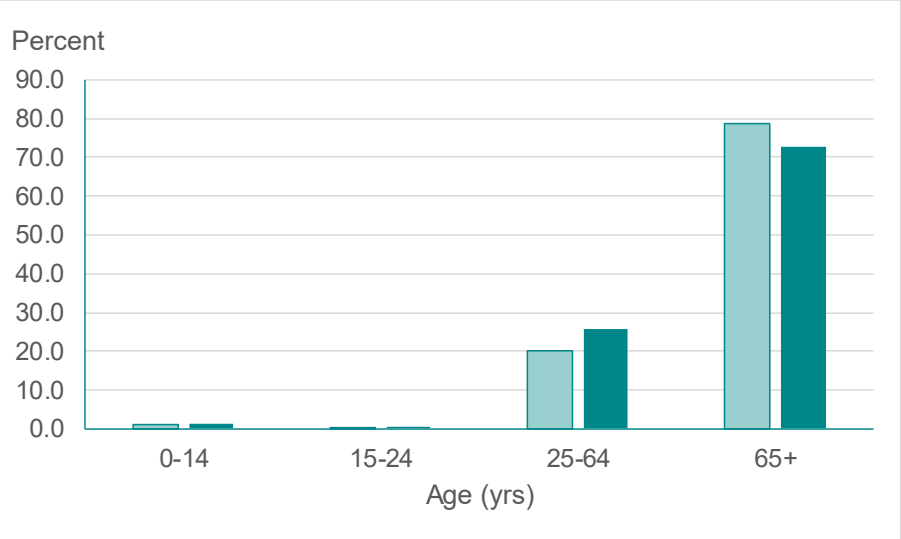
The highest rate in the State in the period 2011/12 and 2012/13 for COPD admissions in any diagnosis was recorded for people living in Unincorporated West Coast (2,376.8 admissions per 100,000 population, 27 admissions). Other high rates were in Peterborough (1,505.8, 71 admissions), Unincorporated Flinders Ranges (1,439.2, 20 admissions), Port Augusta (1,214.7, 311 admissions), Unincorporated Far North (1,197.6, 28 admissions), and Coober Pedy (1,196.1, 45 admissions).

A number of areas in Regional South Australia had rates of less than half the average rate; they were Mount Barker Balance (181.3 admissions per 100,000 population), Lower Eyre Peninsula (219.8), Victor Harbor (232.7), Loxton Waikerie - East (236.4), Adelaide Hills balance (237.6) and Grant (257.3).

Admissions by age and sex

Around three quarters of admissions for COPD in any diagnosis were for people aged 65 years and over – 78.7% for males and 72.6% for females.

Figure 3: Public hospital admissions with a primary diagnosis of COPD, by age and sex, 2011/12 and 2012/13



Length of stay

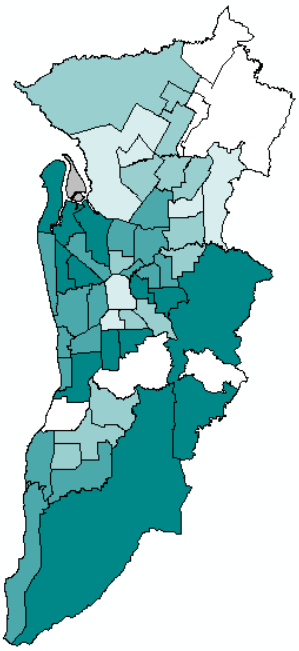
The average length of stay in the period 2011/12 and 2012/13 for admissions for COPD in any diagnosis was 6.8 days in Adelaide and 6.2 days in Regional South Australia. Unlike the other data presented for COPD, the length of stay has not been adjusted (age-standardised) to remove differences between SLAs in the age of people admitted to hospital. As such, variations at the SLA level are influenced by factors such as the age of the population, in particularly the very elderly and the frail aged and others in nursing homes who are among those likely to be more subject to COPD.

Similar to what was shown for asthma, the distribution at the SLA level for the average length of stay for people admitted for COPD varies from the map of admission rates. Of the 15 SLAs with the longest lengths of stay, only seven had an admission rate ranked in the top 30 – they were Port Adelaide Enfield - Park, - Port and - Coast; Charles Sturt - Inner East and - Inner West; Marion - Central; and Onkaparinga - Hackham.

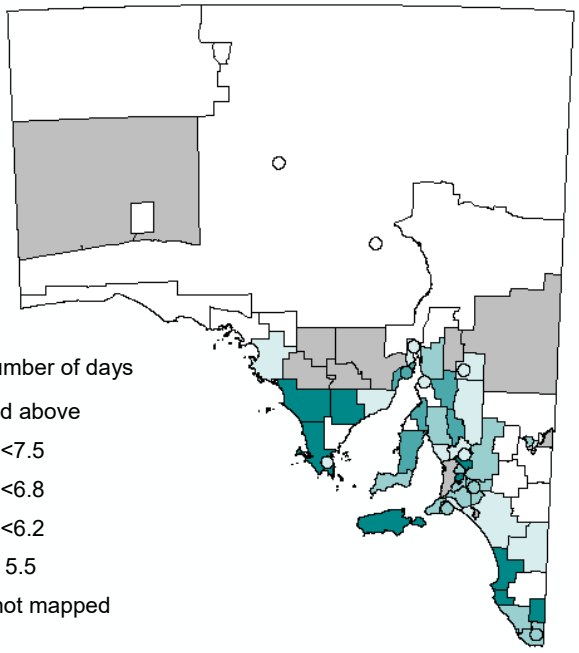
People living in Mitcham - North-East (9.0 days) and - West (8.0), Adelaide Hills - Ranges (8.8), Burnside - North-East (8.7), Port Adelaide Enfield - Park (8.3) and - Port (8.2) and Charles Sturt - Inner East (8.3) had the longest lengths of stay.

The longest length of stay in the State was for people from Cleve, an average stay of 15.2 days, related to 33 admissions. Other long stays for admissions from COPD were recorded for people from Kingston (9.5 days), Robe (8.9 days), Wattle Range East (8.9 days), Elliston (8.9 days) and Adelaide Hills Balance (8.0 days). Stays of fewer than four days were recorded in several SLAs in Regional South Australia.

Map 59: Average length of stay for public hospital admissions for COPD in any diagnosis, persons, number of days, Adelaide, 2011/12 and 2012/13



Map 60: Average length of stay for public hospital admissions for COPD in any diagnosis, persons, number of days, Regional South Australia, 2011/12 and 2012/13



Pneumonia

Admissions with pneumonia as a principal diagnosis

There were 9,704 admissions for pneumonia as a primary diagnosis over the two years 2011/12 and 2012/13. Although the data have not been mapped in this atlas, they are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html. However, the pattern of rates at the SLA level in Adelaide and Regional South Australia is highly consistent with that shown below, for admissions with pneumonia in any diagnosis.

Admissions with pneumonia in any diagnosis

There were 16,952 admissions of people with pneumonia, with the rates for people living in Adelaide and Regional South Australia being similar, at 505.2 and 494.5 admissions per 100,000 population, respectively.

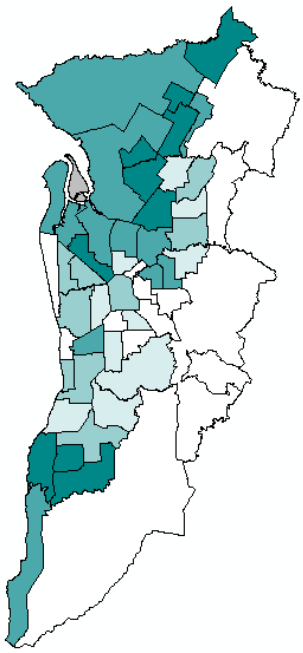
Both Playford - West Central and - Elizabeth had more than twice the Adelaide average level of admissions for pneumonia in the period 2011/12 and 2012/13, with 1,202.1 and 1,040.6 admissions per 100,000 population, respectively. Other SLAs with highly elevated rates were Salisbury - Central (853.2 admissions per 100,000 population), - Inner North (852.8) and - South-East (748.8); Onkaparinga - Hackham (820.2), - North Coast (788.0) and - Morphett (701.8); Charles Sturt - North-East (748.7); and Gawler (730.6).

Rates of less than half the Adelaide average were recorded for people living in Burnside - North-East (213.2 admissions per 100,000 population) and - South-West (253.4), Mitcham - North-East (214.4) and Adelaide Hills - Central (231.1).

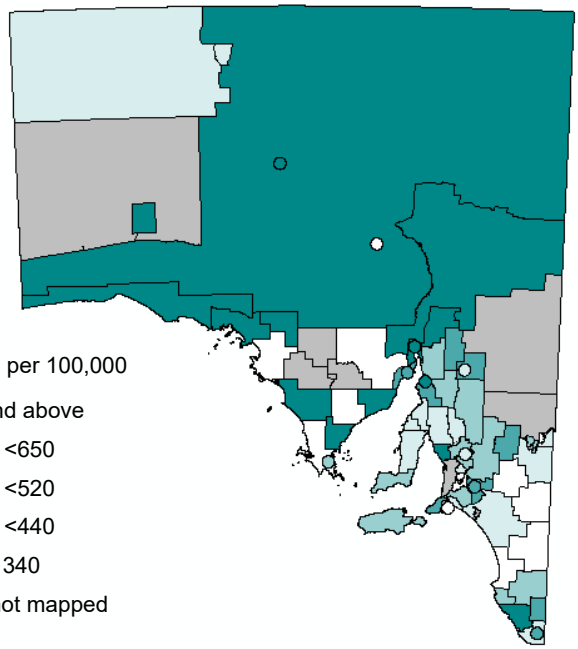
In Regional South Australia, rates of over twice the average were recorded for residents of Unincorporated Flinders Ranges (1,458.2 admissions per 100,000 population), Unincorporated West Coast (1,282.5) and Coober Pedy (1,079.1), although with relatively few admissions (22, 15 and 36 admissions, respectively). SLAs with rate 50% or more above the Regional South Australia average were Ceduna (944.6), Elliston (829.4), Unincorporated Far North (817.4), Port Augusta (769.9), Tumby Bay (747.5) and Port Pirie (744.2).

The lowest rates of admission for pneumonia in the period 2011/12 and 2012/13 were in the South-East, in Kingston (249.2 admissions per 100,000 population) and Tatiara (290.0); on Eyre Peninsula, in Streaky Bay (257.5) and Lower Eyre Peninsula (294.3); adjacent to Adelaide, in Mount Barker Balance (268.4) and Adelaide Hills Balance (287.7); and in the far north, in Roxby Downs (249.2).

Map 61: Public hospital admissions with pneumonia in any diagnosis, rate per 100,000, Adelaide, 2011/12 and 2012/13



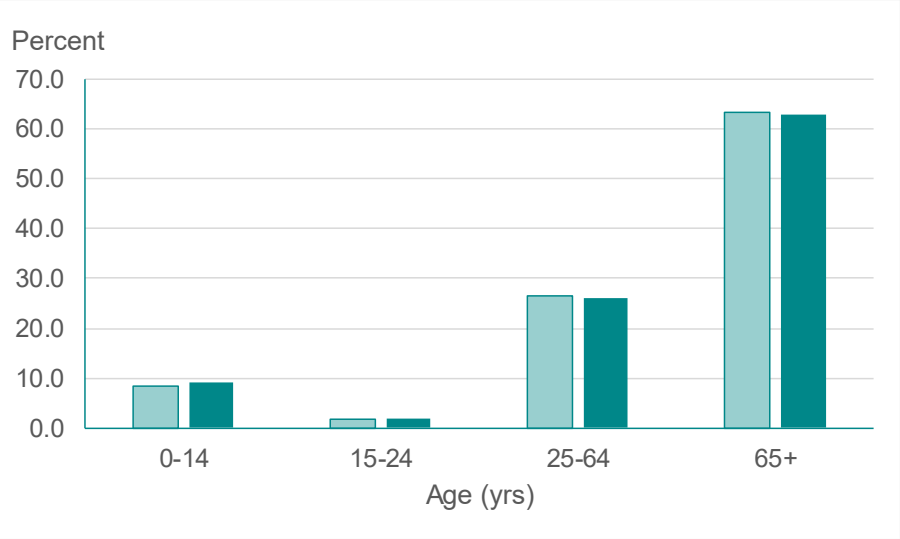
Map 62: Public hospital admissions with pneumonia in any diagnosis, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Admissions by age and sex

For both males and females, around two thirds of admissions for pneumonia were for people aged 65 years and over; a further 25% were aged 25 to 64 years.

Figure 4: Public hospital admissions with a primary diagnosis of pnuemonia, by age and sex, 2011/12 and 2012/13

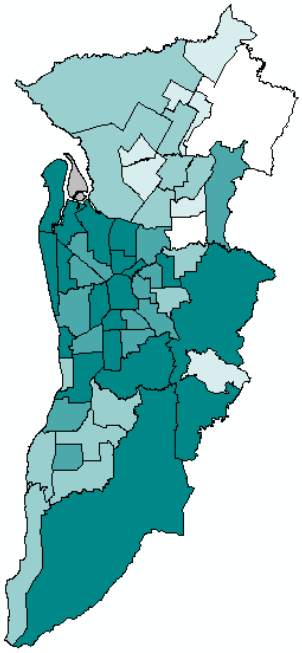


Length of stay

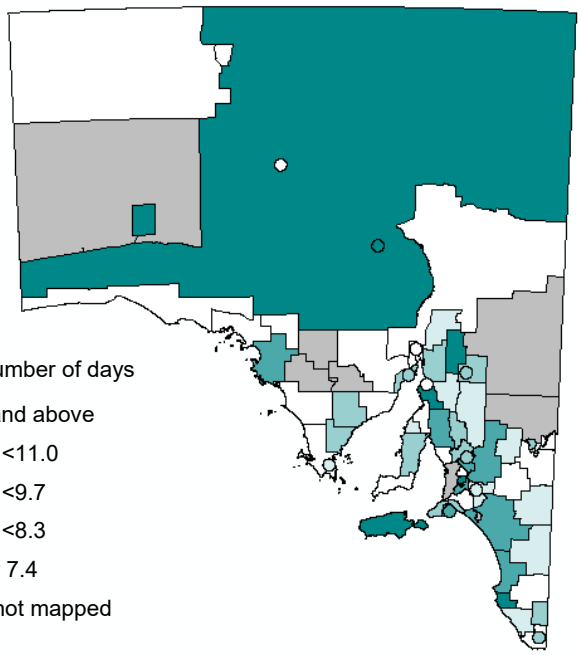
As noted above for COPD, unlike the other data presented for pneumonia, the length of stay has not been adjusted (age-standardised) to remove differences between SLAs in the age of people admitted to hospital. As such, variations at the SLA level are influenced by factors such as the age of the population, in particularly the very elderly and the frail aged and others in nursing homes who are among those likely to be more subject to pneumonia.

The average length of stay for hospital admissions with pneumonia in any diagnosis for people living in Adelaide was 10.0, and for those in Regional South Australia it was 8.1.

Map 63: Average length of stay for public hospital admissions with pneumonia in any diagnosis, persons, number of days, Adelaide, 2011/12 and 2012/13



Map 64: Average length of stay for public hospital admissions with pneumonia in any diagnosis, persons, number of days, Regional South Australia, 2011/12 and 2012/13



Sleep apnoea

Admissions with sleep apnoea as a principal diagnosis

There were 2,825 admissions with sleep apnoea as a principal diagnosis over the two years 2011/12 and 2012/13. Although these data have not been mapped in this atlas, they are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html. However, the pattern of rates at the SLA level in Adelaide and Regional South Australia is highly consistent with that shown below, for admissions with sleep apnoea in any diagnosis.

Admissions with sleep apnoea in any diagnosis

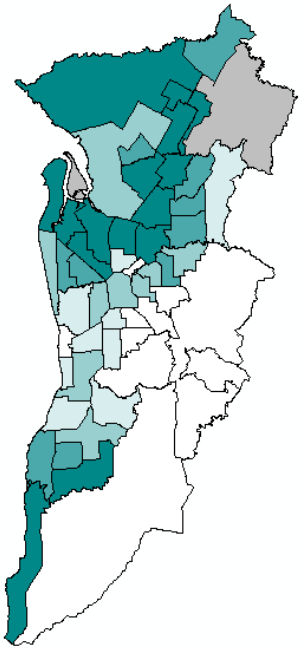
There were 5,373 admissions with sleep apnoea in any diagnosis in the period 2011/12 and 2012/13, with a rate of 169.1 admissions per 100,000 population in Adelaide, 28% above the rate of 132.6 admissions per 100,000 population in Regional South Australia.

There is a strong correlation at the SLA level between admissions with sleep apnoea and socioeconomic disadvantage (Table 3). The highest rates were in the outer north and the north-west of Adelaide, as were all of the SLAs with rates of 25% or more above the Adelaide average. These SLAs are Playford - West Central (439.4 admissions per 100,000 population), - Elizabeth (357.8), - West (287.5) and - East Central (240.3); Port Adelaide Enfield - Port (359.0), - Park (281.1) and - Coast (233.7); Charles Sturt - North-East (270.5); and Salisbury - South-East (245.8) and - Central (236.8).

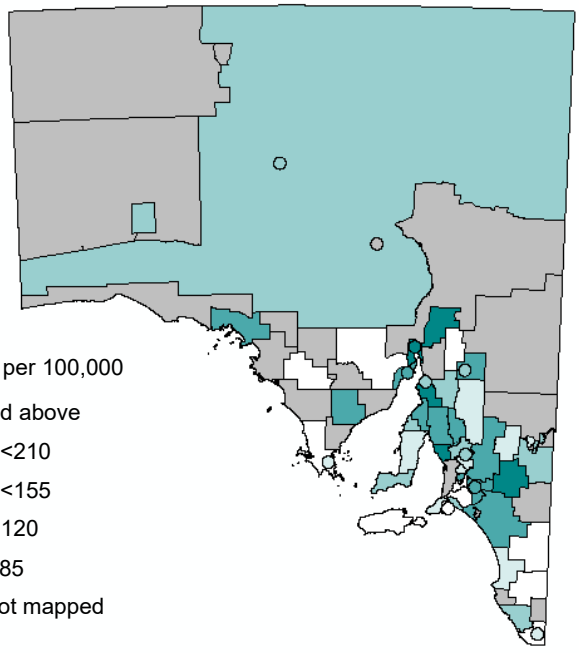
There were few of these admissions for people living in a number of SLAS of higher socioeconomic status, including Burnside - North-East (43.0 admissions per 100,000 population) and - South-West (59.4), Mitcham - Hills (48.5), Adelaide Hills - Central (50.7) and - Ranges (54.9), Holdfast Bay - North (57.6) and Walkerville (60.9).

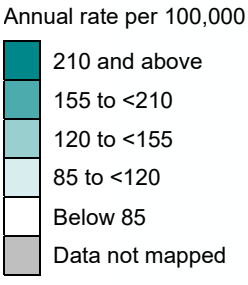
SLAs in Regional South Australia with rates above average by 25% or more were Port Pirie City and Districts Balance (584.4 admissions per 100,000 population), Flinders Ranges (358.4), Port Augusta (244.8), Mallala (231.4), Karoonda East Murray (222.1), Peterborough (206.2), Ceduna (204.0), Clare and Gilbert valleys (184.6), Barunga West (184.5), Adelaide Hills Balance (180.5), Murray Bridge (176.9) and Angaston (171.8). The data were suppressed (not mapped) for the many areas that had between one and four admissions.

Map 65: Public hospital admissions with sleep apnoea in any diagnosis, rate per 100,000, Adelaide, 2011/12 and 2012/13



Map 66: Public hospital admissions with sleep apnoea in any diagnosis, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



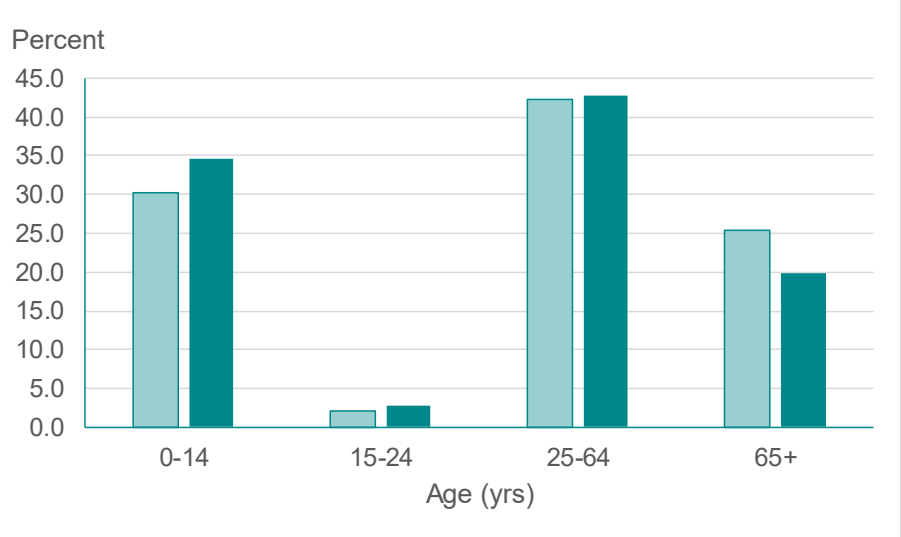


There were no admissions from Orroroo/Carrieton or Wudinna and low rates in a number of SLAs, with the lowest in Lower Eyre Peninsula (46.2 admissions per 100,000 population and just 5 admissions), Mt Barker (58.0, 11), Victor Harbor (63.1, 21), Naracoorte and Lucindale (69.3, 12) and Tatiara (71.7, 10).

Admissions by age and sex

Males accounted for almost two thirds (63.5%) of the admissions, with some 42% of admissions of both males and females for people aged 25 to 64 years. A further 30.2% of male admissions were aged 0 to 14 years and 25.4% aged 65 years and over; for females, the proportions were 34.6% aged 0 to 14 years and 19.9% aged 65 years and over.

Figure 5: Public hospital admissions with aprimary diagnosis of sleep apnoea, by age and sex, 2011/12 and 2012/13



Length of stay

The average length of stay for admissions with sleep apnoea in any diagnosis was 4.2 days.

Whereas many SLAs had stays of around the Adelaide average of 4.2 days, admissions from a number of SLAs were for much longer periods, the longest of which were an average of 28.3 days for people living in Walkerville, 11.2 days for people living in Adelaide and 8.9 days for people living in Marion - Central. Other lengthy average stays were recorded for people living in Charles Sturt - Inner East (7.2 days), - Coastal (6.0 days) and - Inner West (5.9 days); Campbelltown - West (7.0 days); West Torrens - West (6.8 days); Onkaparinga - Woodcroft (5.4 days) and - North Coast (5.2 days); and Prospect (5.3 days).

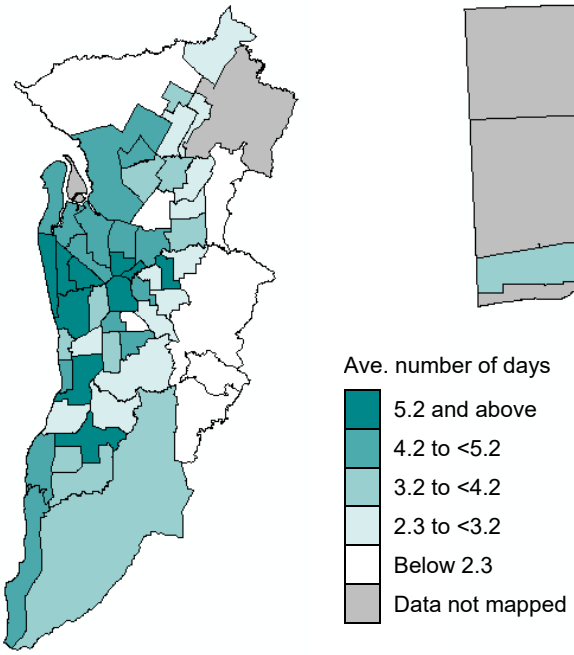
Admissions of people from Adelaide Hills - Ranges (1.2 days) and - Central (1.9 days), Salisbury - South-East (1.7 days), Playford - West (1.7 days) and Tea Tree Gully - Hills (2.0 days) were all less than half the average stay.

Many areas in Regional South Australia had very small numbers of admissions with sleep apnoea over this two-year period and have not mapped. Of those for which data were available, as in Adelaide there were some very long stays, the longest being for admissions from Mount Barker balance (27.3 days, the average for 300 admissions) and from Loxton Waikerie - West (10.4 days). Other lengthy average stays were recorded for people living in Alexandrina - Strathalbyn (8.2 days), Barmera (8.0 days), Karoonda East Murray (7.6 days), Mid Murray (7.5 days), Grant (6.1 days), Whyalla (5.6 days), Mount Gambier (5.4 days), Yorke Peninsula - North (5.4 days) and Port Augusta (5.4 days).

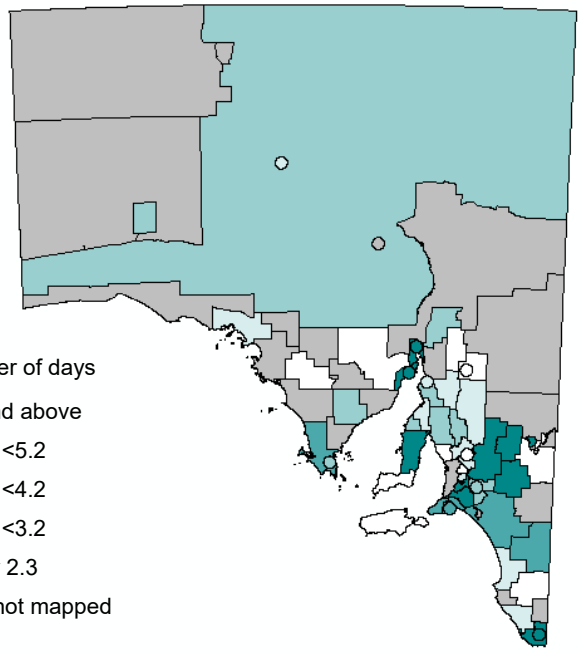
SLAs with under half the average length of stay for Regional South Australia were Peterborough (an average length of stay of 1 day for eight admissions), Yorke Peninsula - South (1.4 days), Adelaide

Hills - North (1.5 days), Kangaroo Island (1.5 days), Naracoorte and Lucindale (1.9 days), Mallala (2.0 days) and Loxton Waikerie - East (2.0 days).

Map 67: Average length of stay for public hospital admissions with sleep apnoea in any diagnosis, persons, number of days, Adelaide, 2011/12 and 2012/13



Map 68: Average length of stay for public hospital admissions with sleep apnoea in any diagnosis, persons, number of days, Regional South Australia, 2011/12 and 2012/13



Lung cancer

Admissions with lung cancer as a principal diagnosis

There were 1,556 admissions with lung cancer as a provincial diagnosis over the two years 2011/12 and 2012/13. Although these data have not been mapped in this atlas, they are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html. However, the pattern of rates at the SLA level in Adelaide and Regional South Australia is highly consistent with that shown below, for admissions with lung cancer in any diagnosis.

Admissions with lung cancer in any diagnosis

There were 3,659 admissions with lung cancer in any diagnosis in South Australia, with similar rates in Adelaide (105.5 admissions per 100,000 population) and Regional South Australia (112.7).

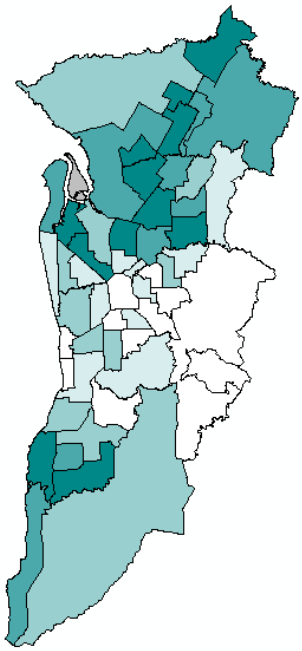
Rates of 50% or more above the average for Adelaide were recorded in a number of areas of socioeconomic disadvantage, in Playford - West Central (268.0 admissions per 100,000 population) and - Elizabeth (239.0); Salisbury - South-East (238.9), - Inner North (183.3) and - Central (175.9); Onkaparinga - North Coast (201.4) and - Hackham (163.3); Gawler (186.9); Port Adelaide Enfield - Inner (184.5); and Charles Sturt - North-East (169.4).

The lowest admission rates in Adelaide were in Burnside - North-East and - South-West (11.5 and 16.5 admissions per 100,000 population, respectively), Adelaide Hills - Central (23.8) and Holdfast Bay - North and - South (both with 55.1 admissions per 100,000 population).

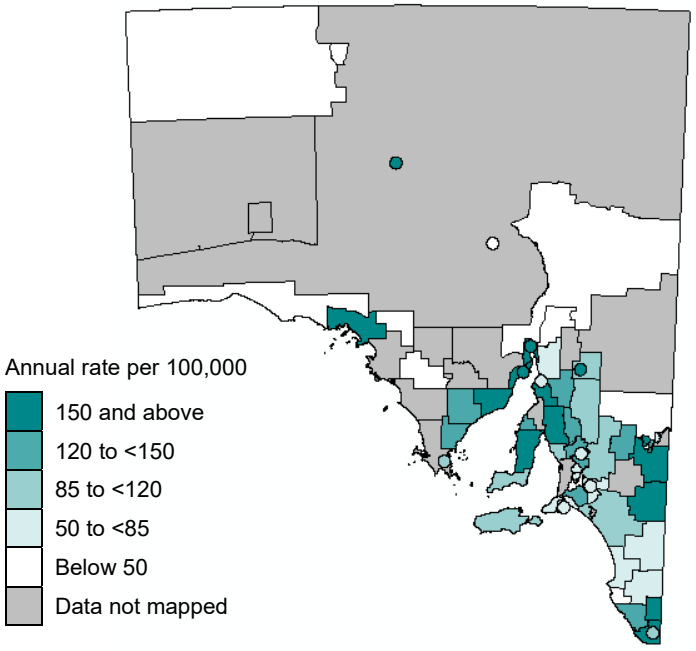
In Regional South Australia, SLAs with rates 25% or more above the average rate were Ceduna (398.6 admissions per 100,000 population), Franklin Harbour (301.2), Coober Pedy (255.6), Port Pirie City and Districts Balance (226.9), Wakefield (200.0), Southern Mallee (185.1), Yorke Peninsula North (178.6), Barmera (174.1), Whyalla (172.2), Wattle Range - East (167.6). Loxton Waikerie - East (154.7), Grant (153.9) and Port Augusta (153.8).

Several areas had a small number of admissions with lung cancer and were not mapped, while a small number of other areas had no admissions – they were Roxby Downs, Flinders Ranges, Wudinna and Robe.

Map 69: Public hospital admissions with lung cancer in any diagnosis, rate per 100,000, Adelaide, 2011/12 and 2012/13



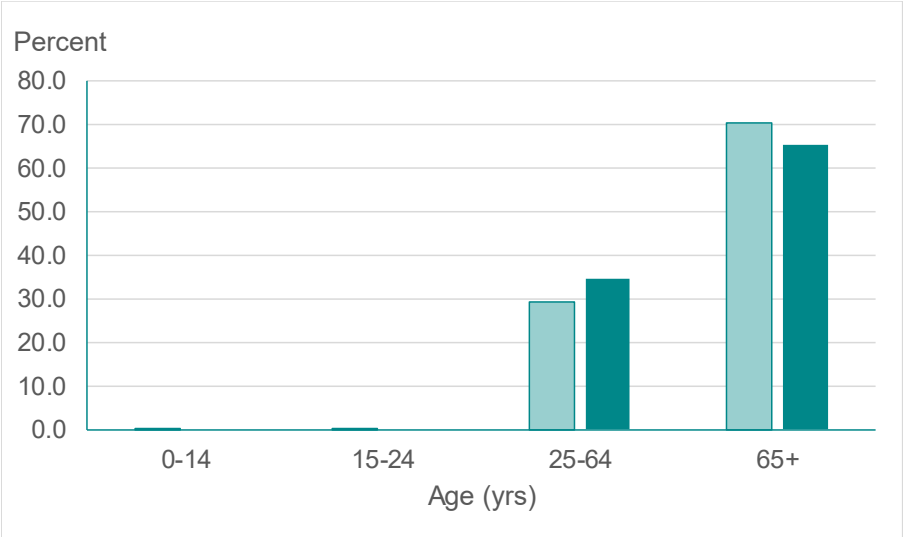
Map 70: Public hospital admissions with lung cancer in any diagnosis, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Admissions by age and sex

The majority (61.2%) of admissions with lung cancer in any diagnosis were for males; of those admitted, 70.2% were aged 65 years and over. For females, 65.3% were aged 65 years and over.

Figure 6: Public hospital admissions with a primary diagnosis of lung cancer, by age and sex, 2011/12 and 2012/13



Length of stay

The average length of stay for hospital admissions with lung cancer in any diagnosis was 8.0 days in South Australia, with average stays of 8.4 days for people living in Adelaide and 7.2 days in Regional South Australia.

As noted above, the average length of stay is not adjusted to reflect differences in the age of the population (and therefore the likelihood of variations in admission to hospital with a disease such as lung cancer). This, in part at least, explains the different pattern at the SLA level in this map when compared with the map of admission rates, above.

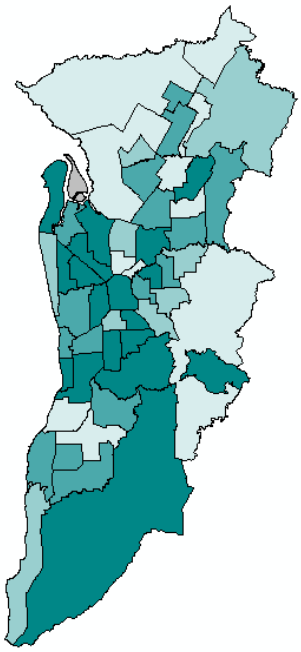
The longest stays in Adelaide were related to admissions of people from Port Adelaide Enfield - Park (13.8 days) and - Coast (11.0 days), Adelaide (13.6 days), Charles Sturt - North-East (12.5 days) and - Inner-West (11.8 days), Adelaide Hills - Central (11.8 days) and Mitcham - Hills (11.4 days).

The shortest average stays in Adelaide were of admissions from Gawler (5.6 days), Salisbury Balance (5.7 days) and Marion - South (5.7 days).

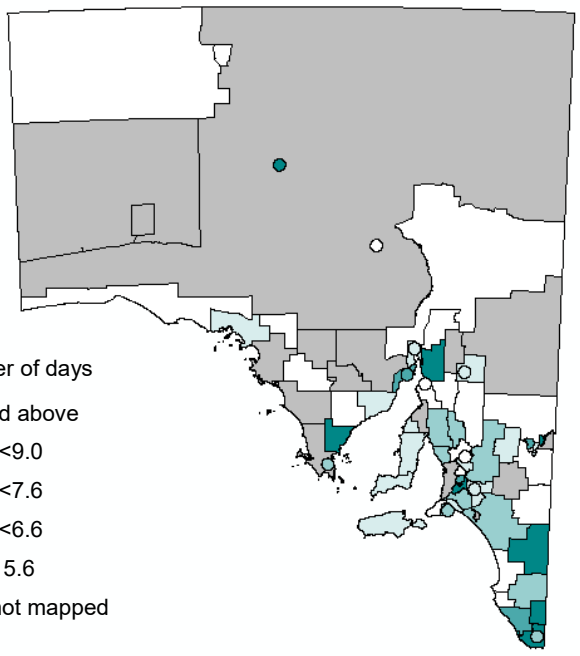
The longest average length of stay from any SLA in the State for hospital admissions with lung cancer was recorded for admissions of people from Coober Pedy, at 38.1 days, for 419 admissions over the two-year period 2011/12 and 2012/13. Other long stays were recorded for people from Mount Remarkable (18.0 days), Mount Barker Balance (14.4 days), Tatiara (11.3 days), Tumby Bay (10.6 days) and Wattle Range - East (10.5 days).

Leaving aside the areas with no admissions or with numbers of admissions too small to map, the lowest average lengths of stay were for admissions of people from Cleve (2.0 days), Kingston (2.8 days), Northern Areas (3.7 days) and Southern Mallee (3.9 days).

Map 71: Average length of stay for public hospital admissions with lung cancer in any diagnosis, persons, number of days, Adelaide, 2011/12 and 2012/13



Map 72: Average length of stay for public hospital admissions with lung cancer in any diagnosis, persons, number of days, Regional South Australia, 2011/12 and 2012/13



Influenza

Admissions with influenza as a principal diagnosis

There were 1,078 admissions with influenza as the principal diagnosis over the two years 2011/12 and 2012/13. Although these data have not been mapped in this atlas, they are available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html. However, the pattern of rates at the SLA level in Adelaide and Regional South Australia is highly consistent with that shown below, for admissions with influenza in any diagnosis.

Admissions with influenza in any diagnosis

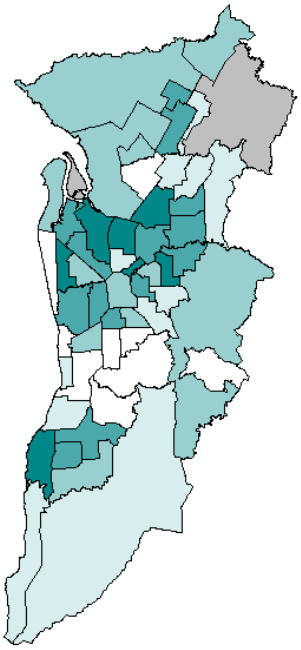
There were 1,775 admissions with influenza in any diagnosis in South Australia, with 54.2 admissions per 100,000 population in Adelaide and 49.5 admissions per 100,000 population in Regional South Australia.

Rates of 50% or more above the Adelaide average were recorded for admissions of people living in Charles Sturt Inner West (103.6 admissions per 100,000 population), Onkaparinga - North Coast (97.4), Port Adelaide Enfield - Park (89.4) and - Inner (85.9) and Salisbury - South-East (88.2).

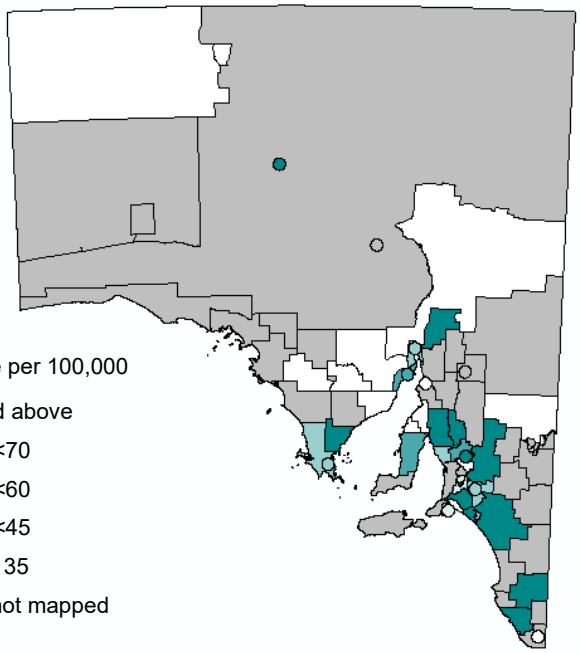
Rates of less than half the Adelaide average were recorded for admissions of people living in Mitcham - North-East (21.1 admissions per 100,000 population, with just 7 admissions) and - Hills (26.0, 13) and Adelaide Hills - Central (24.8, 6).

Almost half of the SLAs in Regional South Australia had either no admissions with lung cancer or too few cases for the data to be reliable. Of the areas mapped, the highest rates of admission were of people from Flinders Ranges (302.7 admissions per 100,000 population, with just 10 admissions), Tumby Bay (238.4, 13), Coober Pedy (146.3, 5), The Coorong (114.6, 13) and Mid Murray (108.4, 18). The lowest were in Copper Coast (20.3 admissions per 100,000 population, with just 6 admissions), Port Pirie (23.8, 7) and Mount Gambier (26.9, 14).

Map 73: Public hospital admissions with influenza in any diagnosis, rate per 100,000, Adelaide, 2011/12 and 2012/13



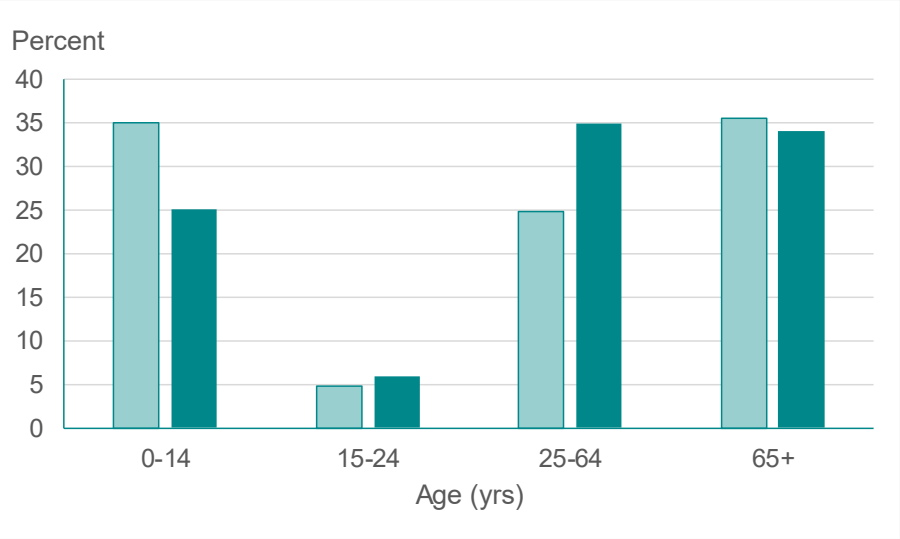
Map 74: Public hospital admissions with influenza in any diagnosis, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



Admissions by age and sex

Females accounted for 51.5% of admissions to hospital for influenza, with just over a third of female admissions being at ages 25 to 64 and 65 years and over, with 25.0% aged 0 to 14 years. For admissions of males the distribution was a little different, just over one third were aged 65 years and over and 0 to 14 years, with 24.8% aged 25 to 64 years.

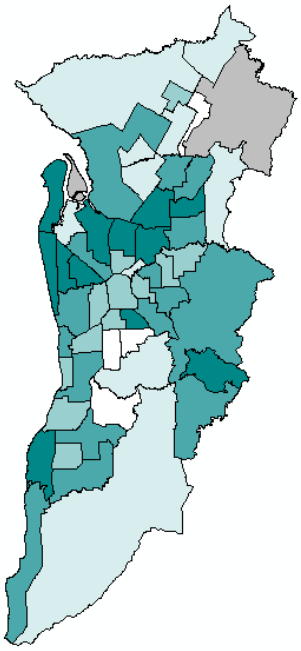
Figure 7: Public hospital admissions with a primary diagnosis of influenza, by age and sex, 2011/12 and 2012/13



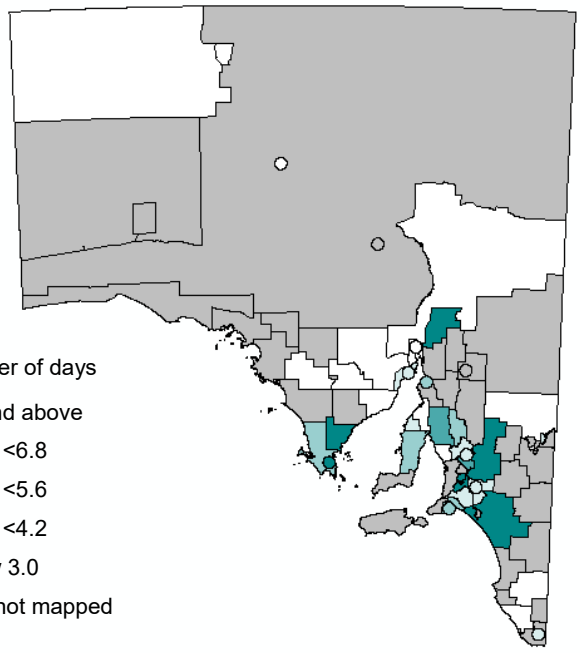
Length of stay

The average length of stay for hospital admissions with influenza in any diagnosis was 5.9 days in South Australia, with average stays of 6.0 days for people living in Adelaide and 5.7 days for those in Regional South Australia.

Map 75: Average length of stay for public hospital admissions with influenza in any diagnosis, persons, number of days, Adelaide, 2011/12 and 2012/13



Map 76: Average length of stay for public hospital admissions with influenza in any diagnosis, persons, number of days, Regional South Australia, 2011/12 and 2012/13



In Adelaide, SLAs with stays of 25% or more above average were Charles Sturt Inner East (15.4 days), Port Adelaide Enfield - Inner (11.1 days) and - East (8.6 days), Unley - East (10.3) and Adelaide Hills - Central (8.7 days).

The lowest stays, all under half the Adelaide average, were in Mitcham - North-East (1.7 days) and - West (2.4 days), Onkaparinga - Reservoir (2.0 days), and Playford - East Central (2.5 days).Admissions of people living in Mount Barker Balance had a length of stay of 54.7 days, 9.6 times the average stay for Regional South Australia. Other long stays were recorded for Adelaide Hill Balance (11.4 days), Port Lincoln (9.9 days), Tumby Bay (9.4 days) and Mid Murray (7.8 days).

The shortest average stays were of admissions of people from Mallala (2.1 days), Naracoorte and Lucindale (2.3 days), Coober Pedy (2.6 days), Port Augusta (2.7 days) and Wattle range West (2.9 days).

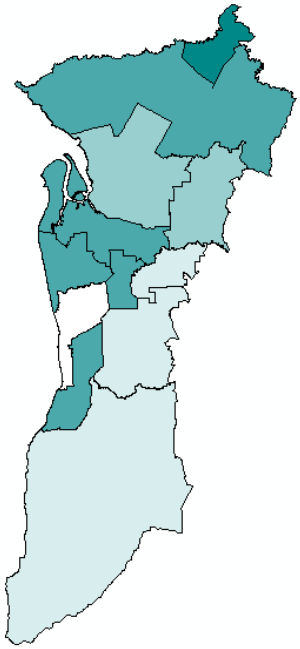
Admissions of the Aboriginal population

Although there were only 1,982 admissions of Aboriginal people for respiratory-conditions in any diagnosis (1,257 for respiratory conditions as a primary diagnosis), they have been mapped as the geographic area at which health data for the Aboriginal population is generally released, the Indigenous Area, is larger than the SLAs mapped for the total population.

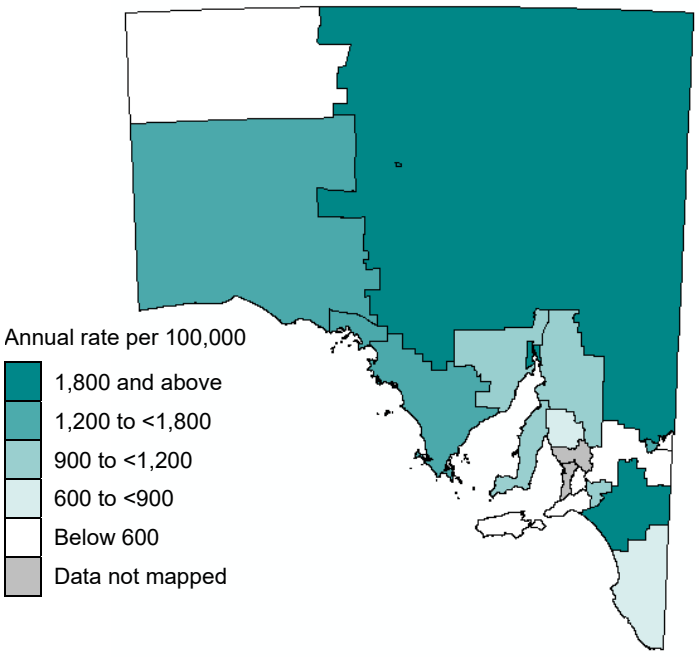
There were 1,297.5 admissions per 100,000 of Aboriginal people for respiratory conditions in any diagnosis in South Australia in the period 2011/12 and 2012/13, 16.0% below the rate for the total population (3,090.0 admissions per 100,000 population).

The highest rates above the average for South Australia were largely recorded in Indigenous Areas in Regional South Australia, in Coober Pedy - Umoona (3,329.2 admissions per 100,000 population, with 57 admissions), Murray Mallee 2,633.8, 53), Port Augusta (2,208.9, 272), Eyre (1,817.2, 56), Ceduna (1,765.1, 77) and Barmera (3,247.3).

Map 77: Public hospital admissions with respiratory conditions in any diagnosis, Indigenous population, rate per 100,000, Adelaide, 2011/12 and 2012/13



Map 78: Public hospital admissions with respiratory conditions in any diagnosis, Indigenous population, rate per 100,000, Regional South Australia, 2011/12 and 2012/13



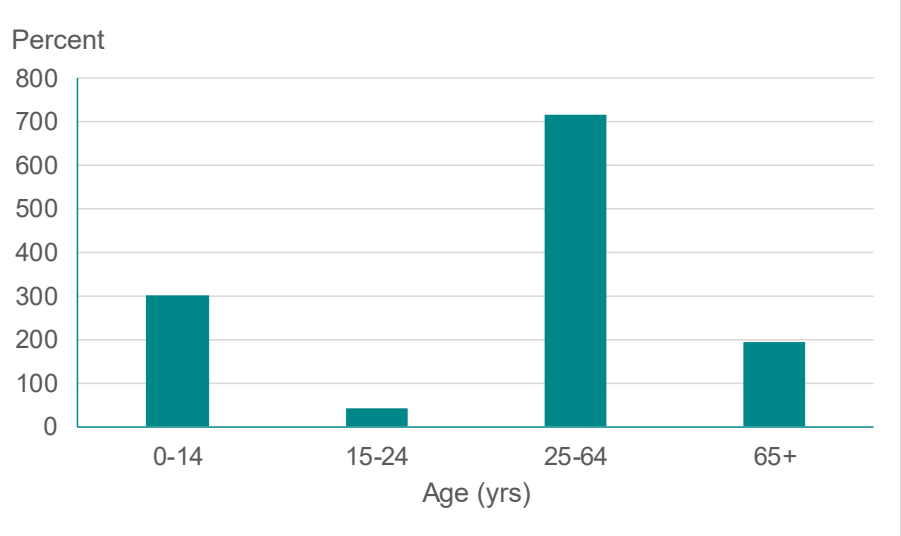
In Adelaide, the highest rates were in Gawler (1,967.1), Port Adelaide - Enfield (1,727.8), Charles Sturt (1,560.2), Marion (1,533.7) and Playford 1,362.2).

Very low rates of admissions were recorded in Fleurieu - Kangaroo Island 261.7, with 7 admissions), Anangu Pitjantjatjara (379.0, 34 admissions), Adelaide Hills - Mount Barker (404.2, 9 admissions) and Loxton - Waikerie - Mid Murray (438.3, 8 admissions).

Admissions by age and sex

The age data for Aboriginal admissions with a primary diagnosis of respiratory disease were not available by sex. Adults aged 25 to 64 years and children aged under 15 years accounted for the largest proportion of Aboriginal admissions.

Figure 8: Public hospital admissions of Aboriginal people with a primary diagnosis of respiratory disease, by age, 2011/12 and 2012/13



Premature mortality

Premature mortality due to respiratory system diseases

Context: ***Respiratory system diseases are those that affect the respiratory tract (upper airway, trachea, bronchus and lung). Some may persist over many years and, if severe, may require a wide range of treatments and medications from specialised health practitioners. Some diseases result from exposures to environmental pollutants such as tobacco smoke or asbestos, or toxic emissions from industry or transport. Others are the result of genetic conditions which affect people from birth, such as cystic fibrosis. Many of these diseases can cause those affected to die prematurely.***

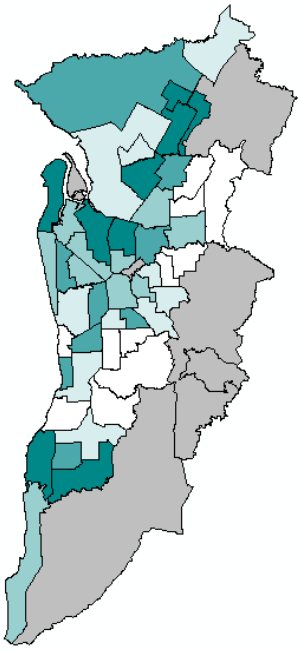
People who are most likely to die prematurely from respiratory system diseases include Aboriginal and Torres Strait Islander people (twice the rate of non-Indigenous people), those living outside major cities, and those living in areas of lower socioeconomic status. [18]

There were 16.9 deaths at ages 0 to 74 years from respiratory system diseases in South Australia over the period 2010 to 2014, with the same rate in Adelaide and Regional South Australia.

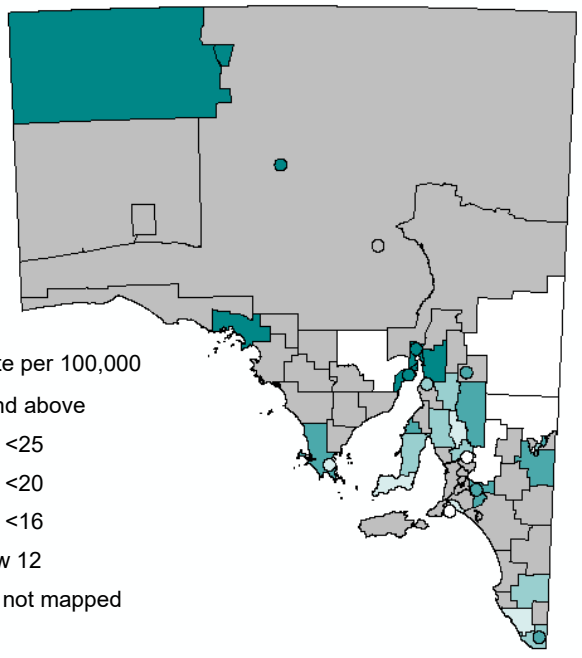
Although the number of deaths from these diseases is relatively small, several areas had rates of 50% or more above the rate in Adelaide. The highest of these were in Playford - West Central (45.9 deaths per 100,000 population), - Elizabeth (40.6 and 43 deaths, the largest number) and - East Central 25.6); Salisbury - Central (31.5); Onkaparinga - North Coast (31.4) and - Hackham (30.4); and Port Adelaide Enfield - Park (29.8), - Coast (28.2) and - Inner (27.5).

There were fewer than ten premature deaths from these diseases in the following areas, all of which had rates of less than half the Adelaide average. These SLAs were Mitcham - Hills (4.0 deaths per 100,000 population) and - West (6.1), Campbelltown - East (5.5) and - West (6.6) and Onkaparinga - Reservoir (6.9).

Map 79: Premature mortality due to respiratory system diseases, rate per 100,000, Adelaide, 2010-14



Map 80: Premature mortality due to respiratory system diseases, rate per 100,000, Adelaide, 2010-14



In Regional South Australia, more areas had no or fewer than five premature deaths and were not mapped. Of SLAs with five or more deaths, the highest rates were in Anangu Pitjantjatjara (133.4 deaths per 100,000 population, with 8 deaths over this five-year period), Coober Pedy (49.9, 6 deaths), Ceduna (48.0, 8 deaths), Whyalla (28.1, 29 deaths) and Port Augusta (26.7, 17 deaths).

No deaths were recorded from these causes in Tanunda and a number of the Unincorporated areas of the State. Rates of less than half the Regional South Australian average were recorded in Victor Harbor (10.8 deaths per 100,000 population, 12 deaths), Mid Murray (116, 6 deaths), Mount Barker - Central (121, 11 deaths), Alexandrina - Coastal (12.3, 13 deaths) and Angaston (12.4, 6 deaths).

Premature mortality due to chronic obstructive pulmonary disease (COPD)

Context: ***Chronic Obstructive Pulmonary Disease (COPD) limits airflow in the lungs and covers those long-term lung conditions which are characterised by shortness of breath, such as chronic bronchitis and emphysema*** [19]. ***Whilst each condition can occur on its own, many people have a mixture of the two problems. COPD usually occurs in people who have smoked or continue to smoke cigarettes. Exposure to irritants like dust and fumes can also increase the risk of developing COPD; and there is also a rare genetic cause of COPD*** [20].

There were 667 deaths at ages 0 to 74 years from COPD in South Australia over the five years from 2010 to 2014, with a higher rate in Regional South Australia (9.5 deaths per 100,000 population), than in Adelaide (8.4 deaths per 100,000 population). The distribution of rates is similar to that seen for all respiratory system diseases, above and have not been mapped. The maps are, however, available in the interactive atlas at atlasesaustralia.com.au/respiratory/respiratory.html.

Premature mortality due to lung cancer

Context: ***Lung cancer is the leading cause of cancer death in Australia and represents the fourth most commonly diagnosed cancer*** [21]. ***In 2010, there were 8,099 deaths from lung cancer*** [22]. ***In 2012, it was estimated that 11,280 cases of lung cancer would be diagnosed*** [22]. ***While the incidence rate for lung cancer in men has been decreasing, there has been a marked increase in the incidence rate in females. Similarly, while five-year relative survival from lung cancer has increased for both sexes, survival from this disease remains low. The different pattern of incidence rates in males and females reflect historical differences in smoking behaviour*** [21].

In Australia, tobacco smoking is the largest single cause of lung cancer, responsible for about 90% of lung cancers in males and 65% in females. The risk of lung cancer among smokers is strongly related to duration of smoking and the number of cigarettes smoked [21]. ***Exposure to second-hand smoke (also known as passive smoking) is also a cause of lung cancer. Other potential causes include radon gas, exposure to industrial and chemical carcinogens, air pollution, family history of lung cancer and previous lung diseases*** [21].

There were 1,674 deaths at ages 0 to 74 years from COPD in South Australia over the five years from 2010 to 2014, with similar rates in Adelaide and Regional South Australia (21.8 and 22.1 deaths per 1

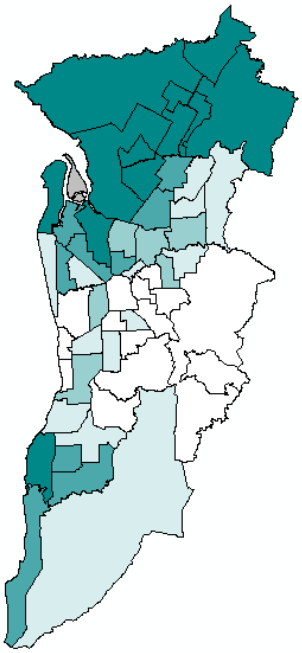
00,000 population, respectively).

Above-average rates apply across a wide area from the north-west of the city to the outer north, as well as in some outer southern SLAs. All of the Playford (with rates as high as 54.8 deaths per 100,000 population in Playford - Elizabeth) and Salisbury (38.3 deaths per 100,000 population in Salisbury Balance) SLAs are in this group, as are some in Port Adelaide (with 42.5 deaths per 100,000 population in Port Adelaide Enfield - Park).

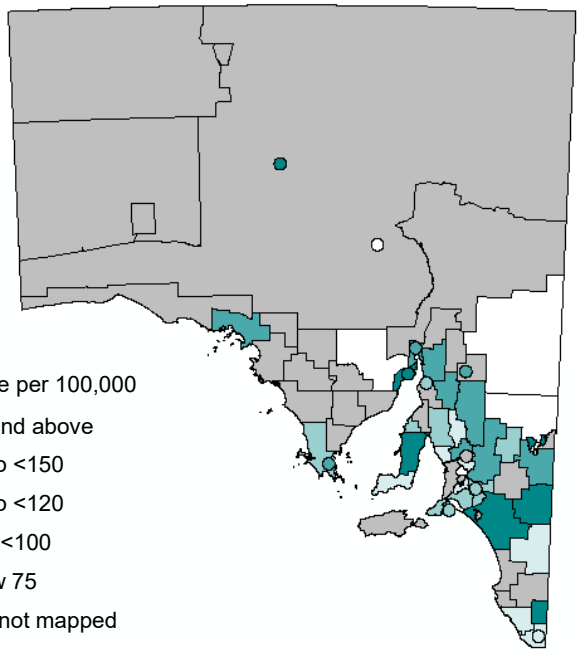
Rates of less than half the Adelaide average were recorded in Mitcham - Hills (7.4 deaths per 100,000 population), Burnside - North-East (8.2), Holdfast Bay - South (8.7), Adelaide Hills - Ranges (10.0) and Adelaide (10.4).

Almost one third of areas in Regional South Australia had fewer than five deaths and were not mapped. Of the remainder, the highest rates were in Southern Mallee (50.4 deaths per 100,000 population and 5 deaths), Coober Pedy (42.0 and 5 deaths), Wattle Range - East (37.0 and 6 deaths) and Whyalla (33.5 and 34 deaths).

Map 81: Premature mortality due to lung cancer, persons, rate per 100,000, Adelaide, 2010-14



Map 82: Premature mortality due to lung cancer, persons, rate per 100,000, Adelaide, 2010-14



Summary of respiratory disease indicators

The following tables present a visual summary by SLA in Adelaide and in Regional South Australia, for a selection of indicators presented in the maps above. There are two tables: the first summarising indicators for the Adelaide area and the second for Regional South Australia.

Indicators are presented which provide some contextual information on community characteristics at SLA level, along with information describing lifestyle risk factors, prevalence of respiratory disease, respiratory health-related services provided under the Medical Benefits Schedule and Pharmaceutical Benefits Scheme (see the text box on the following page for a list of the indicators).

For each indicator, the data were divided into thirds, based on the rank of their percentage or rate within the group of SLAs presented (i.e., Adelaide or Regional South Australia). For all except the ISRD (which has been reversed to aid interpretation), the highest third was assigned the darkest shade (for the IRSD the darkest shade represents low scores, or greater relative disadvantage). Where data were not available, cells are shaded grey.

The overall impression from viewing Table 1 (for the Adelaide area), is that the more disadvantaged areas have the greatest health need due to respiratory conditions. These are the areas which have the highest prevalence of respiratory diseases and of risk factors for these diseases, the highest rate of services delivered under the Medical Benefits Schedule and Pharmaceutical Benefits Scheme and the highest rates of hospitalisation and premature deaths due to respiratory diseases. The SLAs that appear in the highest third across the majority of the indicators include a majority of the SLAs in the LGAs of Onkaparinga, Playford and Salisbury, Port Adelaide Enfield; and, to a lesser extent, some SLAs in Charles Sturt.. Gawler also has high rates for these indicators.

In Regional South Australia (Table 2), there is not such an obvious geographical pattern where high rates on all indicators are observed. However, there are areas, such as Berri & Barmera, Coober Pedy, Peterborough, Port Augusta, Port Lincoln, Port Pirie and Whyalla, that demonstrate high health needs from these data. It is notable that there are numerous areas in Regional South Australia where data are unable to be published due to very small numbers.

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Key to indicators in Table 1 and Table 2

1. IRSD: SEIFA Index of Relative Socio-economic Disadvantage, 2011
2. AEDC: Children assessed as being developmentally vulnerable
3. Learning or earning
4. Unemployment
5. Households receiving rent assistance
6. Homes with no Internet connection
7. Fair/poor health
8. Current smokers
9. Obesity prevalence
10. Low birth weight
11. Smoking during pregnancy
12. Respiratory disease prevalence
13. Asthma prevalence
14. Chronic obstructive pulmonary disease prevalence
15. Services under the Medical Benefits Schedule (i) respiratory function tests (ii) completed asthma cycle of care
16. Items dispensed under the Pharmaceutical Benefits Scheme (i) allergy & asthma medications (ii) smoking cessation medications
17. Emergency department attendances (i) persons (ii) male (iii) female
18. Hospitalisations – primary diagnosis (i) respiratory system diseases (ii) chronic obstructive pulmonary disease (iii) asthma (iv) pneumonia
19. Premature mortality (i) respiratory system diseases (ii) chronic obstructive pulmonary disease (iii) lung cancer

Legend for Table 1 and Table 2

NOTE: The colours assigned have been reversed for IRSD (indicator 1) and Learning or earning (indicator 3).

Table 1: Comparison table of selected indicators in Statistical Local Areas, Adelaide

Statistical Local Area	1.IRSD	2.AEDC: Children assessed as developmentally vulnerable (%)	3.Learning or earning (%)	4.Unemploy-ment (%)	5.Households receiving rent assistance (%)	6.Homes with no Internet connection (%)	7.Fair/ poor health	8.Current smokers	9.Obesity	10.Low birth weight (%)	11.Smoking during pregnancy (%)	12.Respiratory disease prevalence	13.Asthma prevalence	14.COPD prevalence	15.Services under the Medical Benefits Scheme		16.Items dispensed under the Pharmaceutical Benefits Scheme		17.Emergency Department attendances			18.Hospitalisations - primary diagnosis				19.Premature mortality		
															Respiratory function tests	Completed asthma cycle of care	Allergy & asthma medications	Smoking cessation medications	Persons	Male	Female	Respiratory system diseases	Asthma	COPD	Pneum-onia	Respiratory system diseases	COPD	Lung Cancer
Adelaide (C)	1013	23.3	87.1	6.1	25.0	12.7	13.0	12.3	12.7	5.5	3.7	20.7	5.9	1.7	17.8	2.0	463.3	18.1	2462.7	3063.7	1931.0	807.4	110.8	296.7	257.0	17.7	11.8	10.4
Adelaide Hills (DC) - Central	1099	17.9	85.9	2.7	6.2	11.5	9.6	11.3	17.0	5.1	5.8	28.9	11.7	1.8	13.1	1.2	365.1	13.0	1067.1	1188.8	867.9	390.9	116.3	59.9	154.5	..	..	12.7
Adelaide Hills (DC) - North	1063	23.6	84.8	3.6	8.9	17.1	12.4	14.4	22.4	7.3	7.2	29.9	11.7	2.1	11.0	1.1	344.4	17.4	1081.2	1193.1	958.0	793.1	209.4	162.8	302.5	..	0.0	14.1
Adelaide Hills (DC) - Ranges	1098	16.4	85.8	2.7	6.5	12.0	9.9	11.1	17.1	4.9	5.6	28.6	11.6	1.9	12.5	1.1	301.8	11.7	876.4	896.6	453.4	309.6	38.4	47.6	138.2	..	..	10.0
Adelaide Hills (DC) Bal	1050	16.6	84.8	3.6	8.9	17.0	12.6	14.7	23.3	7.0	7.1	29.8	11.7	2.1	9.6	1.1	359.6	10.9	1067.2	1103.5	578.7	572.9	123.6	134.6	190.9	..	..	..
Burnside (C) - North-East	1082	21.1	90.0	2.5	11.1	16.3	10.6	10.0	15.3	7.5	3.5	29.0	8.5	2.0	16.6	1.0	323.3	10.5	947.1	1110.2	686.7	323.3	105.4	60.5	111.5	12.4	..	8.2
Burnside (C) - South-West	1081	19.6	90.5	2.5	10.5	16.6	9.9	10.4	13.8	7.0	4.6	29.1	9.4	2.1	16.2	0.8	273.1	9.4	1043.0	1243.9	830.2	319.1	39.0	71.2	130.3	12.4	..	14.7
Campbelltown (C) - East	1034	20.0	86.5	5.3	13.2	23.4	16.1	14.5	22.4	5.6	6.1	28.0	9.9	2.1	15.1	1.0	352.4	12.8	1689.5	2017.0	1142.7	653.5	129.0	137.4	233.9	5.5	..	17.0
Campbelltown (C) - West	980	21.8	85.5	5.6	14.8	25.5	16.5	14.4	21.3	6.5	6.1	27.0	9.7	2.2	14.7	0.9	362.5	12.2	1918.3	2062.9	1448.9	811.1	111.0	204.7	273.1	6.6	..	21.2
Charles Sturt (C) - Coastal	1033	13.9	83.5	4.2	11.5	24.7	15.3	15.8	23.1	6.4	9.1	29.3	10.2	2.3	17.4	0.8	372.6	16.8	1913.4	2086.8	1515.7	564.4	142.6	166.4	159.0	16.1	7.5	18.6
Charles Sturt (C) - Inner East	968	22.1	81.1	6.3	16.7	28.0	18.5	18.0	24.9	7.4	8.8	27.1	9.9	2.5	15.6	0.8	418.9	22.9	2618.4	2924.3	1981.7	776.7	146.4	215.9	260.6	19.1	5.8	17.7
Charles Sturt (C) - Inner West	963	20.3	82.0	6.0	14.2	28.6	17.7	17.2	23.9	6.4	9.9	27.5	9.6	2.3	15.9	1.2	434.9	19.9	2537.8	2806.8	1833.1	813.1	169.3	223.8	249.6	19.9	8.8	24.3
Charles Sturt (C) - North-East	931	29.8	81.1	7.5	19.7	29.0	20.0	18.5	25.3	6.6	10.8	26.3	9.6	2.4	14.4	1.1	542.5	20.7	2892.9	3269.0	2119.3	1057.8	122.1	327.7	408.7	16.7	5.4	28.2
Gawler (T)	966	24.2	79.3	6.6	24.7	23.9	16.0	19.6	24.8	5.4	19.0	35.0	13.2	2.6	11.3	2.3	580.3	27.9	2150.9	2217.4	1953.6	1347.8	225.4	454.0	449.6	15.4	11.2	30.4
Holdfast Bay (C) - North	1042	17.2	83.9	4.6	16.1	21.5	12.8	13.1	20.7	8.0	7.9	26.1	9.2	2.2	13.0	1.9	310.1	14.0	1537.9	1816.1	1004.3	447.5	90.1	121.6	172.7	7.8	..	12.5
Holdfast Bay (C) - South	1036	16.5	83.9	4.6	15.6	20.8	12.4	13.9	20.7	4.6	7.6	27.2	9.5	2.1	11.6	1.7	372.5	18.3	1872.5	2032.5	1547.2	638.9	93.6	197.4	271.5	20.7	9.1	8.7
Marion (C) - Central	977	21.5	80.1	8.5	16.9	25.1	15.8	17.8	23.5	7.3	8.8	29.5	10.7	2.6	12.0	1.5	442.6	21.4	2114.9	2266.8	1957.2	793.4	136.1	275.6	252.2	14.9	8.2	21.7
Marion (C) - North	975	19.5	80.1	8.0	16.8	28.2	16.2	16.1	24.0	5.3	7.9	27.4	10.8	2.4	13.0	1.4	437.0	18.1	2176.7	2351.1	2009.7	923.1	140.8	319.0	302.1	23.6	10.6	19.3
Marion (C) - South	1066	17.4	83.8	4.3	10.8	12.4	12.6	14.0	23.8	6.7	7.6	31.4	10.6	2.1	16.2	5.7	399.8	17.7	2106.2	2249.9	1765.3	636.8	156.2	108.2	239.0	8.2	6.1	19.1
Mitcham (C) - Hills	1087	15.8	88.1	3.6	9.1	13.4	10.1	11.4	18.5	5.1	4.2	35.2	10.1	1.9	11.9	2.4	356.8	13.3	1473.4	1750.7	1005.3	508.0	88.0	167.8	191.6	4.0	..	7.4
Mitcham (C) - North-East	1078	19.1	89.2	3.2	12.8	18.0	10.9	12.2	18.1	5.2	3.1	33.3	9.5	1.8	15.6	1.1	293.2	11.0	1254.2	1505.0	802.9	317.0	92.8	70.0	100.5	7.5	..	11.0
Mitcham (C) - West	1042	20.1	88.6	4.2	15.1	20.3	13.4	12.6	20.3	6.6	4.0	32.7	9.7	2.0	12.0	0.8	353.7	13.2	1548.0	1743.7	1370.9	491.6	97.8	124.0	159.5	6.1	..	18.3
Mount Barker (DC) - Central	1024	17.0	80.8	5.9	15.7	17.4	13.3	16.4	25.3	5.4	12.0	30.1	13.3	2.2	13.3	1.1	437.7	19.1	1151.4	1385.9	821.8	923.5	277.4	193.2	269.9	12.1	6.8	15.9
Mount Barker (DC) Bal	1052	21.3	81.3	4.8	11.7	15.4	12.3	15.6	24.3	3.5	15.7	30.1	12.6	2.0	8.7	0.5	339.0	15.1	538.2	486.3	276.4	368.6	52.4	105.1	174.4	..	..	19.1
Norw. P'ham St Ptrs (C) - East	1005	14.5	87.3	4.5	13.9	25.4	16.1	14.3	22.1	5.1	3.6	26.0	9.1	2.2	14.8	0.5	373.3	11.2	1824.4	2156.2	1379.0	746.4	124.9	206.8	281.0	14.9	9.7	12.5
Norw. P'ham St Ptrs (C) - West	1043	18.0	88.7	4.0	13.2	19.1	13.1	12.6	17.0	5.8	3.5	24.3	7.7	2.3	14.2	0.9	325.6	10.7	1511.4	1722.4	1240.4	524.3	99.7	93.9	190.4	19.2	9.4	14.4
Onkaparinga (C) - Hackham	921	31.2	72.0	14.7	22.5	23.3	19.1	24.0	28.6	7.3	20.6	34.1	11.2	2.9	16.4	3.4	713.7	41.3	5039.4	4606.9	3554.9	1404.6	204.3	509.1	480.2	30.4	16.1	28.5
Onkaparinga (C) - Hills	1054	17.1	86.3	3.9	9.7	16.5	12.8	14.8	22.9	3.4	8.2	35.1	11.9	2.2	13.8	5.7	378.5	16.0	1935.1	2006.9	1115.2	424.5	66.6	141.4	117.1	..	..	15.3
Onkaparinga (C) - Morphett	944	33.7	72.7	12.3	17.3	23.6	18.0	22.2	28.7	6.6	19.9	34.2	10.8	2.7	12.2	3.6	594.7	33.6	4164.3	4336.4	3986.3	1168.3	209.0	381.5	367.1	20.0	12.0	28.6
Onkaparinga (C) - North Coast	902	31.8	71.5	17.8	26.1	26.2	19.5	25.4	28.0	7.3	20.9	33.6	11.1	2.8	18.7	3.1	753.9	44.0	5571.9	5469.4	5692.2	1463.0	263.5	583.2	426.0	31.4	21.3	39.3
Onkaparinga (C) - Reservoir	1077	19.4	86.7	3.9	8.4	11.0	12.4	13.6	22.0	5.5	7.2	35.7	9.8	1.9	13.7	3.4	394.3	17.3	1949.3	2096.9	1773.2	659.1	164.7	126.4	255.8	6.9	..	13.9
Onkaparinga (C) - South Coast	979	24.8	73.0	10.8	24.9	19.2	16.1	20.5	27.7	6.8	14.8	33.9	10.9	2.5	15.1	4.9	538.5	27.9	3323.2	3365.4	3266.4	946.7	149.4	289.0	319.2	16.9	10.7	27.7
Onkaparinga (C) - Woodcroft	1037	23.3	82.0	5.6	13.9	15.7	14.6	17.1	25.6	7.3	10.3	34.4	10.9	2.1	12.6	3.8	482.9	26.8	2584.2	2781.1	2386.3	841.6	162.4	246.3	269.7	14.0	5.1	15.7
Playford (C) - East Central	981	32.3	75.3	9.4	31.8	20.7	18.7	21.3	29.2	5.7	20.3	33.9	10.9	2.5	16.8	1.8	749.3	42.8	2030.5	2067.2	1595.4	864.9	108.0	207.7	345.1	25.6	11.7	33.7
Playford (C) - Elizabeth	748	38.7	64.0	22.5	32.6	33.2	24.5	29.9	29.2	8.2	27.7	34.2	11.4	3.3	19.0	2.9	873.6	47.1	4312.7	4402.9	3366.7	2039.3	270.6	864.6	586.8	40.6	25.2	54.8
Playford (C) - Hills	1064	23.4	82.9	4.1	29.6	13.3	14.2	15.1	24.9	..	15.8	34.7	10.8	2.1	14.4	1.4	772.6	32.8	996.3	1302.0	297.6	532.6	131.1	..	252.8	..	..	30.1
Playford (C) - West	960	28.6	76.0	9.0	31.4	19.9	18.1	21.0	28.9	7.5	17.3	34.0	10.7	2.4	23.1	1.6	692.3	27.1	2360.8	2564.3	1429.7	1033.9	208.7	328.8	265.3	22.0	10.1	33.5
Playford (C) - West Central	809	29.8	63.4	20.9	35.2	27.6	23.9	29.0	32.2	8.7	25.8	32.8	11.1	3.2	16.8	1.2	803.4	37.1	3863.3	3977.4	3212.2	2032.9	238.0	1006.4	677.2	45.9	33.7	38.3
Port Adel. Enfield (C) - Coast	975	21.4	79.0	6.5	15.2	25.3	15.7	20.1	24.8	7.1	14.8	29.0	11.4	2.2	15.6	1.3	537.5	24.1	2332.9	2569.1	2111.3	971.5	146.9	341.1	321.7	28.2	14.2	31.3
Port Adel. Enfield (C) - East	974	24.1	79.1	6.3	19.9	23.2	15.9	16.3	23.4	7.0	7.6	29.2	9.6	2.5	15.2	0.4	462.2	19.7	2371.9	2552.5	1792.7	971.1	128.1	290.2	336.6	22.1	9.5	23.2
Port Adel. Enfield (C) - Inner	880	23.5	77.0	12.2	23.1	31.4	20.8	19.9	28.7	6.8	8.1	30.0	9.1	2.5	11.9	1.1	507.2	21.3	2813.6	3289.7	2358.7	1005.6	173.6	276.8	316.3	27.5	15.5	21.8
Port Adel. Enfield (C) - Park	847	29.8	78.9	11.7	19.4	33.0	24.1	21.5	29.2	7.5	7.3	25.0	8.8	2.5	11.8	1.3	599.9	24.5	1654.8	2850.4	2426.6	994.6	166.5	281.2	307.8	29.8	15.3	42.5
Port Adel. Enfield (C) - Port	898	27.5	78.9	11.7	19.4	33.0	22.8	20.8	27.1	9.4	15.3	25.1	9.0	2.3	11.8	1.2	649.2	29.6	2097.2	3695.1	3022.7	1213.0	173.3	498.3	290.9	16.4	12.5	28.5
Prospect (C)	1042	15.3	86.6	4.7	15.4	19.2	13.8	12.9	20.1	6.8	3.1	28.2	9.6	2.1	14.3	0.9	379.4	12.9	1798.4	1914.8	1684.4	634.8	144.3	158.0	212.5	18.2	8.1	24.6
Salisbury (C) - Central	879	36.2	72.5	11.9	24.0	24.8	19.6	22.4	29.2	8.0	16.3	31.3	9.9	2.3	16.2	4.1	666.7	30.8	3002.7	3349.7	2264.1	1376.9	185.6	491.7	503.3	31.5	17.4	37.7
Salisbury (C) - Inner North	887	31.6	72.8	11.6	23.9	24.2	21.9	21.9	31.4	8.3	18.2	31.4	9.9	2.5	16.4	3.8	881.1	34.1	2792.4	2874.7	2543.6	1249.1	133.5	569.7	470.7	15.2	9.5	30.8
Salisbury (C) - North-East	962	30.3	76.8	8.7	17.9	22.3	17.4	20.9	28.5	6.6	21.1	33.1	10.2	2.4	17.1	3.1	537.1	30.3	2204.0	2368.6	1431.2	974.1	166.2	327.8	266.9	20.8	13.0	28.8
Salisbury (C) - South-East	959	24.5	78.6	6.8	16.1	21.2	16.2	18.8	26.7	6.8	12.3	31.9	9.7	2.3	15.1	1.7	531.2	26.0	2675.4	2702.4	2150.5	1303.3	198.2	412.8	443.6	17.7	7.8	28.7
Salisbury (C) Bal	1023	25.5	76.0	8.0	20.6	20.4	18.7	18.2	28.0	7.1	11.5	30.2	9.2	2.4	9.3	1.9	373.5	15.0	2287.2	2495.9	1393.2	857.3	131.2	218.5	335.1	15.5	11.9	38.3
Tea Tree Gully (C) - Central	1035	16.9	82.2	4.0	11.3	15.6	13.8	16.9	25.0	6.5	10.9	33.3	10.7	2.3	14.5	0.8	458.8	21.9	1991.9	2201.3	1298.1	923.1	257.9	192.2	251.0	11.0	7.0	15.9
Tea Tree Gully (C) - Hills	1067	15.0	82.5	3.8	10.7	16.2	13.4	16.9	24.1	6.7	10.8	33.5	10.7	2.2	12.8	..	304.8	16.0	1531.3	1584.3	866.7	565.6	155.5	120.4	198.3	9.5	..	15.8
Tea Tree Gully (C) - North	1049	20.2	83.1	3.4	9.7	13.8	13.5	15.9	26.1	7.6	8.8	34.7	11.1	2.3	18.1	0.5	431.1	19.1	2066.7	2221.7	1501.6	895.2	185.0	230.0	289.9	11.9	7.0	17.3
Tea Tree Gully (C) - South	1018	18.4	81.6	5.0	13.4	21.9	14.5	16.6	23.2	5.3	9.9	31.5	10.2	2.2	14.8	0.5	403.6	17.9	1936.9	2192.1	1393.9	884.7	180.0	206.5	311.3	17.6	7.2	22.8
Unincorp. Western	n.a.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Unley (C) - East	1064	8.9	87.4	3.0	11.9	17.7	11.4	10.3	16.0	8.3	3.9	28.1	8.0	1.9	14.8	1.1	307.7	10.7	1491.5	1713.4	1294.5	528.9	117.2	121.9	191.0	20.4	..	19.2
Unley (C) - West	1066	19.8	87.6	3.6	13.4	16.3	11.3	10.7	16.3	6.7	4.0	27.2	10.5	1.9	13.7	1.6	331.9	13.7	1409.6	1716.6	1133.2	601.5	121.0	206.6	172.2	12.0	6.8	13.1
Walkerville (M)	1065	14.7	86.6	4.7	15.4	19.2	11.9	14.2	18.8	5.9	..	29.0	9.7	1.8	13.8	..	276.7	7.8	2665.4	3042.7	2307.8	447.9	113.6	112.3	135.7	..	..	17.7
West Torrens (C) - East	980	24.8	83.6	5.4	18.2	25.7	17.6	16.6	24.1	6.9	5.4	25.3	9.3	2.2	13.8	1.3	396.4	19.3	1679.3	1989.6	1236.5	622.7	122.1	164.3	205.9	20.0	12.3	20.5
West Torrens (C) - West	1013	19.5	85.3	4.5	15.5	24.1	14.9	16.0	22.8	6.8	6.1	26.9	8.8	2.1	14.8	1.6	355.2	15.1	2014.9	2218.5	1513.9	668.8	130.0	155.0	242.2	12.6	4.8	12.7

Table 2*:* Comparison table of selected indicators in Statistical Local Areas, Regional South Australia

Statistical Local Area	1.IRSD	2.AEDC: Children assessed as developmentally vulnerable (%)	3.Learning or earning (%)	4.Unemploy-ment (%)	5.Households receiving rent assistance (%)	6.Homes with no Internet connection (%)	7.Fair/ poor health	8.Current smokers	9.Obesity	10.Low birth weight (%)	11.Smoking during pregnancy (%)	12.Respiratory disease prevalence	13.Asthma prevalence	14.COPD prevalence	15.Services under the Medical Benefits Scheme		16.Items dispensed under the Pharmaceutical Benefits Scheme		17.Emergency Department attendances			18.Hospitalisations - primary diagnosis				19.Premature mortality		
															Respiratory function tests	Completed asthma cycle of care	Allergy & asthma medications	Smoking cessation medications	Persons	Male	Female	Respiratory system diseases	Asthma	COPD	Pneum-onia	Respiratory system diseases	COPD	Lung Cancer
Alexandrina (DC) - Coastal	974	20.5	73.7	6.4	26.8	26.4	16.0	19.4	25.9	7.1	17.4	28.0	12.2	2.5	9.3	2.3	483.1	23.8	684.2	769.4	634.1	658.4	161.3	225.4	179.2	12.3	7.6	14.7
Alexandrina (DC) - Strathalbyn	1004	23.8	77.8	4.4	15.2	21.5	14.5	17.8	26.8	5.9	11.2	30.1	12.5	2.2	7.0	1.1	421.8	23.0	761.6	970.5	628.0	926.0	292.3	225.9	258.7	..	..	22.9
Anangu Pitjantjatjara (AC)	593	76.3	51.3	35.6	..	70.8	..	..	..	..	..	..	..	..	..	..	65.8	5.5	..	..	..	686.4	..	557.2	275.7	133.4	..	..
Barossa (DC) - Angaston	994	18.1	80.8	3.8	12.3	24.5	14.6	17.9	25.8	6.1	15.2	34.9	13.2	2.3	7.1	5.6	440.1	20.7	257.8	281.7	253.2	1091.7	183.9	289.9	447.8	12.4	..	13.2
Barossa (DC) - Barossa	1036	15.0	81.7	4.1	12.3	19.4	14.1	17.3	25.5	3.6	12.0	35.4	12.5	2.3	8.8	2.1	505.1	20.0	868.3	1015.2	535.9	844.6	168.0	254.7	285.6	..	..	19.0
Barossa (DC) - Tanunda	1027	24.2	80.2	3.7	12.7	26.9	15.0	18.1	26.1	5.4	8.3	34.7	13.7	2.3	9.8	3.8	347.4	15.4	305.5	314.4	230.9	825.7	285.0	200.1	205.8	0.0	0.0	..
Barunga West (DC)	954	32.9	78.1	7.0	16.1	30.3	16.4	21.8	25.5	6.6	17.9	29.6	11.3	2.2	8.3	..	618.2	11.4	172.6	..	161.7	914.4	317.7	280.2	172.7	..	..	..
Berri & Barmera (DC) - Barmera	895	26.0	73.6	7.5	19.9	31.9	18.6	23.7	26.9	6.3	26.8	30.0	12.7	2.5	4.0	11.2	800.7	47.7	1478.1	1527.3	1885.3	1401.8	299.8	556.2	306.9	..	..	30.5
Berri & Barmera (DC) - Berri	909	19.6	73.6	7.5	19.9	31.9	20.0	23.5	28.1	7.1	23.7	30.1	12.7	2.7	4.7	2.6	651.7	46.8	2179.2	2183.5	2879.2	1074.5	263.7	343.8	289.6	18.8	..	16.1
Ceduna (DC)	932	24.7	67.6	8.1	12.7	30.8	..	..	..	8.2	12.6	..	..	..	2.9	0.0	368.9	27.6	434.6	577.7	280.1	1498.8	145.6	384.2	696.6	48.0	..	27.6
Clare and Gilbert Valleys (DC)	1002	22.9	83.3	4.7	12.3	24.8	14.1	17.9	26.3	3.0	12.2	29.6	12.0	2.3	10.2	3.6	554.1	30.4	340.9	353.6	280.2	1096.4	363.7	293.1	242.6	14.5	..	18.5
Cleve (DC)	1018	..	78.8	2.4	10.2	28.5	14.8	18.3	28.0	..	8.3	34.8	8.8	2.3	3.6	..	593.6	25.4	267.6	413.7	..	1354.8	352.5	592.1	178.5	..	..	..
Coober Pedy (DC)	870	51.2	68.6	7.1	11.4	30.9	..	..	..	..	25.0	..	..	..	3.8	..	378.2	48.7	914.8	1025.5	1028.6	2431.5	407.0	846.2	754.0	49.9	40.2	42.0
Copper Coast (DC)	927	19.5	77.5	10.9	21.9	33.1	19.4	23.4	28.9	5.4	23.2	30.6	13.8	2.8	7.3	0.0	599.7	39.1	264.3	374.9	140.6	947.9	188.6	295.8	291.7	21.4	10.8	23.8
Elliston (DC)	991	..	84.5	3.8	12.0	29.6	12.1	13.0	18.0	..	..	24.6	8.5	1.8	6.6	0.0	453.2	29.6	674.2	392.2	1317.6	1062.4	..	349.8	480.9	..	0.0	..
Flinders Ranges (DC)	955	..	67.9	9.9	15.8	33.7	15.6	25.9	25.2	..	16.3	30.7	13.8	2.5	4.9	0.0	481.7	23.7	160.6	..	..	1245.7	198.0	349.9	364.8	..	..	..
Franklin Harbour (DC)	975	..	78.8	2.4	10.2	28.5	14.8	17.9	27.2	..	..	34.2	8.6	2.3	4.2	0.0	352.6	27.8	292.3	352.9	..	1151.5	..	336.8	522.1	..	..	..
Goyder (DC)	942	24.3	83.5	8.3	16.0	31.2	17.1	22.0	26.9	10.3	28.9	30.7	11.3	2.5	4.6	2.9	597.1	31.6	343.1	496.9	230.3	1241.3	329.7	481.8	346.7	24.8	..	24.5
Grant (DC)	1018	20.1	79.4	4.2	11.9	25.9	15.5	19.0	28.4	4.6	13.0	32.6	11.7	2.2	6.2	..	370.1	21.8	561.8	691.2	330.0	547.4	172.2	86.6	216.5	16.5	..	15.1
Kangaroo Island (DC)	983	29.3	82.6	4.9	13.9	26.3	15.3	19.0	25.9	7.5	18.2	30.4	11.9	2.1	3.8	7.0	362.9	23.8	168.3	148.7	209.8	830.7	147.0	237.5	315.9	..	..	..
Karoonda East Murray (DC)	986	..	77.6	5.5	12.0	30.9	17.1	22.3	28.1	..	..	31.2	11.8	2.3	25.7	0.0	428.7	26.2	..	0.0	..	858.5	234.7	..	..	..	..	..
Kimba (DC)	1045	..	78.8	2.4	10.2	28.5	14.6	18.1	27.8	..	..	34.4	8.7	2.3	9.8	0.0	416.0	19.9	..	0.0	..	245.1	..	0.0	0.0	..	..	..
Kingston (DC)	975	24.3	85.2	2.5	11.0	27.6	14.2	20.4	24.4	..	16.2	32.4	11.0	2.0	5.9	..	390.8	8.7	156.0	247.3	..	695.8	117.0	292.2	136.8	..	..	..
Light (RegC)	1026	25.8	82.2	4.8	15.5	20.9	15.9	18.8	27.2	6.7	11.8	35.6	12.4	2.3	12.9	3.2	562.8	29.4	966.7	970.3	929.2	1022.0	174.7	331.5	330.5	17.5	12.9	26.9
Lower Eyre Peninsula (DC)	1015	23.4	81.1	4.8	13.4	29.1	12.8	15.2	19.7	5.1	13.5	26.8	9.6	2.0	3.4	1.5	431.0	21.6	367.5	492.6	155.3	542.7	144.2	154.7	181.0	21.4	17.2	23.2
Loxton Waikerie (DC) - East	954	22.9	78.5	4.4	18.4	28.1	16.2	20.2	27.7	8.0	17.7	30.1	11.7	2.3	5.2	..	433.0	29.9	323.0	400.7	252.4	967.0	336.1	149.5	349.0	23.5	..	28.6
Loxton Waikerie (DC) - West	936	22.8	76.4	5.1	16.6	32.3	18.1	21.0	27.7	8.2	19.1	29.7	11.5	2.5	6.9	..	518.9	27.0	321.3	490.7	175.2	1139.9	195.4	422.9	372.3	..	..	22.2
Mallala (DC)	980	20.4	80.4	4.8	12.8	19.4	16.9	19.9	27.9	5.2	18.3	34.4	11.9	2.2	16.3	2.3	583.1	26.2	1962.2	2243.6	1813.2	943.0	119.0	193.9	415.7	..	..	15.7
Maralinga Tjarutja (AC)	692	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Mid Murray (DC)	937	35.5	78.8	6.1	15.6	30.2	17.1	20.8	27.1	5.8	17.6	31.1	11.8	2.4	6.7	2.7	566.4	28.5	344.2	403.4	270.8	1077.1	258.2	274.8	346.0	11.6	10.4	26.3
Mount Gambier (C)	927	28.6	76.6	6.1	18.8	28.2	16.6	21.4	28.0	6.9	16.7	34.7	14.1	2.6	11.2	0.8	619.9	30.5	1706.5	1857.4	1856.5	1049.3	233.8	427.9	307.8	21.3	11.9	17.4
Mount Remarkable (DC)	983	26.5	82.2	7.9	9.7	35.0	18.6	21.8	26.8	..	20.3	29.3	11.8	2.4	2.1	0.0	400.0	24.7	399.9	443.5	268.2	1029.9	205.0	343.9	356.7	25.1	..	24.7
Murray Bridge (RC)	901	22.3	71.2	8.3	22.9	32.2	19.4	23.7	30.0	5.3	23.9	29.4	13.1	2.7	8.1	1.7	532.3	28.2	394.6	461.2	326.5	1050.6	183.7	360.9	343.9	22.0	15.9	22.1
Naracoorte and Lucindale (DC)	996	20.2	76.7	3.5	13.3	26.4	14.7	17.4	26.8	8.2	18.7	33.5	12.4	2.2	6.2	2.8	484.5	27.6	145.0	145.3	174.1	1047.0	264.8	409.8	257.1	18.0	..	..
Northern Areas (DC)	982	10.0	77.2	5.8	12.3	30.3	15.8	20.2	26.9	5.6	15.7	31.0	12.1	2.5	5.4	1.9	610.4	39.5	195.8	265.1	163.1	962.4	135.3	307.7	371.9	18.6	..	25.8
Orroroo/Carrieton (DC)	993	..	82.1	7.9	9.8	34.9	..	..	..	..	..	..	..	..	..	0.0	240.0	31.5	..	..	..	810.7	..	..	422.3	..	..	..
Peterborough (DC)	798	26.7	82.3	8.0	9.7	35.0	18.6	21.9	26.9	..	20.3	29.4	11.9	2.4	8.9	..	739.5	61.4	433.2	509.8	282.7	2143.1	216.7	1204.9	355.2	..	..	..
Port Augusta (C)	906	45.1	67.9	9.9	15.8	33.7	17.5	24.7	27.5	7.4	21.9	30.3	13.4	2.8	8.0	..	623.5	31.9	2400.6	2175.7	2941.5	1732.1	293.9	751.9	451.0	26.7	14.3	28.0
Port Lincoln (C)	950	20.8	72.0	8.1	18.2	27.2	16.2	21.4	27.0	5.4	17.1	33.8	13.6	2.5	3.6	4.2	538.8	47.0	1755.1	1772.8	1923.3	933.3	186.4	245.0	344.5	15.7	7.2	25.8
Port Pirie C Dists (M) - City	873	27.4	73.4	14.4	20.2	37.7	21.5	25.6	29.3	6.3	29.8	32.3	14.4	3.1	6.8	1.2	695.3	39.3	2422.3	2363.4	2713.9	1395.2	239.5	474.5	591.7	19.4	8.2	22.5
Port Pirie C Dists (M) Bal	974	38.6	76.9	6.3	12.9	30.7	16.7	20.5	27.4	..	12.7	31.1	12.3	2.7	5.7	..	575.3	34.2	151.9	276.7	..	1243.9	167.4	231.1	218.3	..	..	..
Renmark Paringa (DC) - Paringa	976	..	78.5	4.4	18.4	28.1	16.9	19.2	27.4	..	25.9	30.1	11.8	2.3	9.1	..	607.1	27.5	2190.5	1996.3	1705.6	641.4	199.3	..	210.7	..	..	..
Renmark Paringa (DC) - Renmark	902	22.8	74.6	7.6	19.6	33.7	19.8	22.5	28.1	5.4	24.0	28.8	12.4	2.6	5.4	0.6	554.3	37.0	1800.2	1900.7	1621.1	1074.5	243.4	452.7	217.8	22.7	16.5	30.4
Robe (DC)	1013	..	85.2	2.5	11.0	27.6	14.5	20.2	24.9	..	16.2	32.4	11.0	2.1	7.9	..	482.5	22.2	..	..	..	471.9	..	251.8	..	..	0.0	..
Roxby Downs (M)	1096	12.9	78.1	0.8	4.3	6.6	8.2	12.8	21.2	4.0	9.2	23.4	8.1	1.4	5.8	..	258.5	26.0	277.3	283.9	312.7	511.8	104.5	..	129.8	..	..	0.0
Southern Mallee (DC)	988	22.5	77.4	5.4	11.7	31.0	17.5	22.3	29.4	..	13.1	31.1	11.7	2.3	6.9	0.0	558.2	23.3	247.4	..	189.0	1298.6	460.5	449.8	230.2	..	..	50.4
Streaky Bay (DC)	989	28.0	67.7	8.0	12.7	30.8	0.0	0.0	0.0	..	10.9	0.0	0.0	0.0	2.4	0.0	273.2	32.3	183.4	..	..	560.0	173.3	..	229.0	..	..	..
Tatiara (DC)	996	14.1	85.2	2.5	11.0	27.6	16.6	20.8	27.8	5.4	18.0	33.1	11.2	2.3	12.3	1.0	440.5	26.7	206.5	238.9	210.4	740.3	223.4	203.8	229.2	..	..	16.3
The Coorong (DC)	949	25.9	77.4	5.4	11.7	31.0	17.2	22.0	28.5	5.3	24.6	31.1	11.6	2.4	7.0	1.5	611.7	32.0	304.6	299.9	415.7	1296.8	268.1	632.6	198.0	..	0.0	30.1
Tumby Bay (DC)	980	24.0	84.5	3.8	12.0	29.6	11.0	13.9	17.3	..	12.2	24.9	8.5	1.7	3.6	2.8	473.5	34.8	315.6	289.5	252.8	1140.3	185.1	134.1	501.5	..	..	..
Unincorp. Far North	923	50.3	68.7	7.1	11.4	30.7	..	..	..	..	14.7	..	..	..	4.6	0.0	341.9	21.3	475.6	600.8	230.0	1158.8	..	810.3	301.6	..	..	..
Unincorp. Flinders Ranges	961	..	68.6	7.2	11.6	30.9	..	..	..	..	..	..	..	..	10.9	0.0	450.7	23.3	1118.1	1224.5	1185.9	2101.3	262.2	751.3	1223.1	..	..	..
Unincorp. Lincoln	1016	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Unincorp. Pirie	n.a.	..	68.6	7.1	11.4	30.9	..	..	..	0.0	..	..	..	..	..	0.0	492.9	..	..	..	..	n.a.	n.a.	n.a.	n.a.	0.0	0.0	0.0
Unincorp. Riverland	954	0.0	..	..	..	31.3	..	..	..	0.0	0.0	..	..	..	..	0.0	516.8	..	..	..	..	..	..	0.0	..	0.0	0.0	0.0
Unincorp. West Coast	871	..	67.6	8.1	..	30.8	..	..	..	..	..	..	..	..	..	0.0	338.4	49.9	609.1	763.1	..	2829.8	..	1824.1	929.5	..	..	..
Unincorp. Whyalla	775	0.0	67.9	9.9	..	33.7	..	..	..	0.0	..	..	..	..	19.5	0.0	1333.5	73.1	..	0.0	..	..	..	0.0	0.0	0.0	0.0	0.0

See over for continuation of table

Table 2: Comparison table of selected indicators in Statistical Local Areas, Regional South Australia (continued)

Statistical Local Area	1.IRSD	2.AEDC: Children assessed as developmentally vulnerable (%)	3.Learning or earning (%)	4.Unemploy-ment (%)	5.Households receiving rent assistance (%)	6.Homes with no Internet connection (%)	7.Fair/ poor health	8.Current smokers	9.Obesity	10.Low birth weight (%)	11.Smoking during pregnancy (%)	12.Respiratory disease prevalence	13.Asthma prevalence	14.COPD prevalence	15.Services under the Medical Benefits Scheme		16.Items dispensed under the Pharmaceutical Benefits Scheme		17.Emergency Department attendances			18.Hospitalisations - primary diagnosis				19.Premature mortality		
															Respiratory function tests	Completed asthma cycle of care	Allergy & asthma medications	Smoking cessation medications	Persons	Male	Female	Respiratory system diseases	Asthma	COPD	Pneum-onia	Respiratory system diseases	COPD	Lung Cancer
Victor Harbor (C)	968	7.3	71.5	7.1	29.1	27.9	16.0	20.4	25.6	6.4	13.5	27.4	12.5	2.5	7.0	6.1	447.9	24.0	398.2	404.3	482.1	641.0	250.8	148.7	214.4	10.8	5.0	20.0
Wakefield (DC)	942	33.0	78.1	7.0	16.1	30.2	17.7	21.8	27.2	6.7	17.9	29.8	11.3	2.4	7.5	4.2	570.2	37.8	849.3	1041.5	761.7	953.3	241.9	243.1	229.2	16.1	..	23.7
Wattle Range (DC) - East	968	19.4	79.7	3.9	12.1	29.2	16.2	19.7	27.6	9.2	24.5	34.6	11.9	2.3	5.3	..	293.9	24.5	886.9	987.1	635.5	698.1	118.4	220.4	290.1	..	..	37.0
Wattle Range (DC) - West	937	31.8	77.3	5.8	13.2	31.8	17.6	21.7	28.2	7.1	20.1	35.3	13.1	2.5	5.8	..	622.2	36.8	478.9	502.0	432.4	1226.2	250.0	449.1	336.7	13.6	0.0	17.8
Whyalla (C)	905	29.6	70.0	9.9	12.1	30.1	18.9	23.9	29.9	8.2	26.5	33.1	13.5	3.2	10.6	0.7	630.4	36.8	1771.0	1814.0	2213.6	1362.1	191.4	615.6	350.8	28.1	18.5	33.5
Wudinna (DC)	1023	24.1	84.3	3.7	11.9	29.6	12.4	14.0	19.4	8.4	8.6	25.5	8.6	1.8	9.4	..	329.2	27.9	459.5	461.2	579.9	..	..	..	..	..	0.0	..
Yankalilla (DC)	972	19.6	71.5	7.1	29.0	27.9	17.4	18.7	25.6	..	22.6	27.3	12.5	2.6	9.4	1.5	542.7	26.5	2400.2	2709.5	1973.0	938.8	85.8	340.1	432.5	..	..	23.5
Yorke Peninsula (DC) - North	950	29.3	82.7	8.1	14.1	34.4	17.5	21.6	25.6	..	13.6	31.3	10.9	2.7	9.7	0.0	494.0	31.2	406.2	485.8	293.1	974.1	184.5	333.2	262.1	19.4	9.2	30.7
Yorke Peninsula (DC) - South	956	24.2	82.7	8.1	14.1	34.4	17.2	21.3	24.7	6.1	12.3	31.3	10.9	2.6	9.0	..	473.5	21.1	263.3	272.1	164.0	784.9	75.6	240.1	268.3	15.7	..	15.6

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Analysis by socioeconomic status and remoteness

Socioeconomic status

The following charts show variations in rates of healthcare activity, related prescribing and service use for, and premature mortality from respiratory disease for Adelaide (Figure 9 to Figure 13) and for Regional South Australia (Figure 14 to Figure 18), by socioeconomic status.

To calculate rates by socioeconomic status, SLAs in Adelaide were ranked, using the Index of Relative Socio-economic Disadvantage score from the 2011 Census. This listing was then divided into five groups, with each group comprised of approximately 20% of the population in Adelaide. The data for each indicator in this atlas were then allocated (at the SLA level) to the appropriate group and the rate for that indicator calculated for each of the five groups; the groups are referred to as quintiles of socioeconomic disadvantage, reflecting the index on which they are based. This exercise was repeated for SLAs in Regional South Australia.

In addition to showing the variation between the quintiles for each indicator in a chart, a rate ratio is given to describe the magnitude of variation between the most disadvantaged and least disadvantaged quintile for each indicator. A rate ratio of 1 shows that the rate in the least and most disadvantaged quintiles is the same. A rate ratio of more than 1 shows there is a higher rate in the most disadvantaged quintile, e.g., a rate ratio of 2 would indicate there is double the activity in the most disadvantaged compared to the lest disadvantaged quintile. Where the rate ratio is more or less than 1, this shows there may be some inequality in access to services across population groups, or in early death, when looked at by level of disadvantage. However, it is also important, and informative, to note that variations occur across all of the quintiles: in many cases there is a social gradient, a variation in the data that runs from top to bottom of the socioeconomic spectrum.

When comparing between charts, please note that the scales are not consistent.

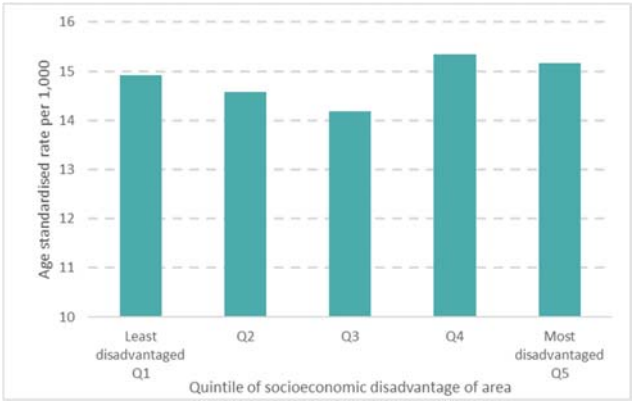
Key points from these analyses of variations by quintile of socioeconomic disadvantage follow.

- The most disadvantaged quintile had consistently higher rates of prescriptions dispensed under the Pharmaceutical Benefits Scheme than the least disadvantaged quintile in Adelaide, with all but one of the items also showing a social gradient in rates, with a higher rate of prescriptions dispensed with each increase in the level of disadvantage: the exception was bupropion smoking cessation medication.
- Similarly, Emergency Department attendances, admissions to hospital and premature mortality from respiratory diseases had much higher rates in the most disadvantaged areas when compared with the least disadvantaged areas, with strong social gradients.
- The patterns observed were largely the same in Regional South Australia, with the most disadvantaged quintile generally having the highest rates across the range of indicators (other than for the items under the Medical benefits Schedule). With the exception of premature mortality, for which the differential in rates between the most and least disadvantaged groups is very large and the social gradient is strong, the rates in the intervening quintiles were more irregular, with fewer showing a social gradient.

Quintiles of socioeconomic disadvantage in Adelaide

Figure 9: Primary care: Medical Benefits Schedule, Adelaide

Respiratory function tests
Rate ratio = 1.02



Asthma cycle of care
Rate ratio = 1.26

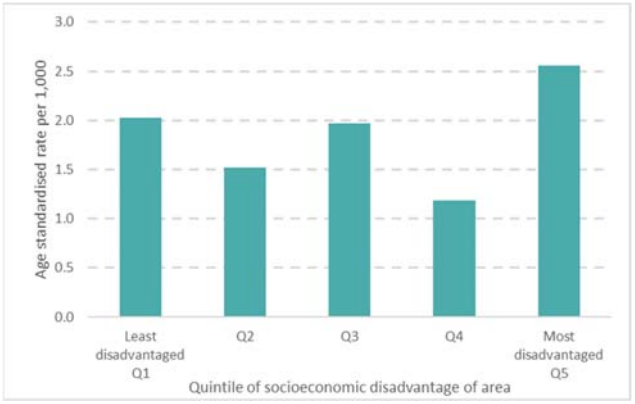
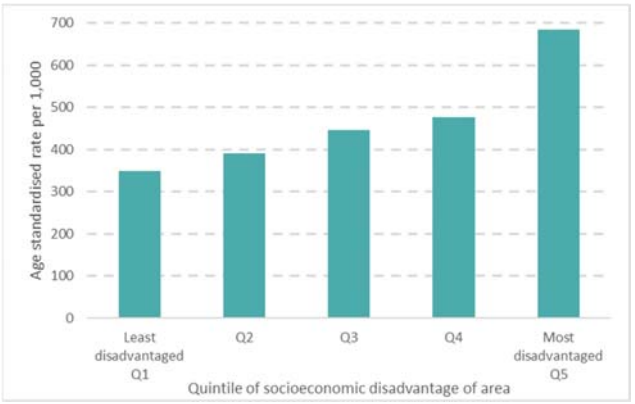
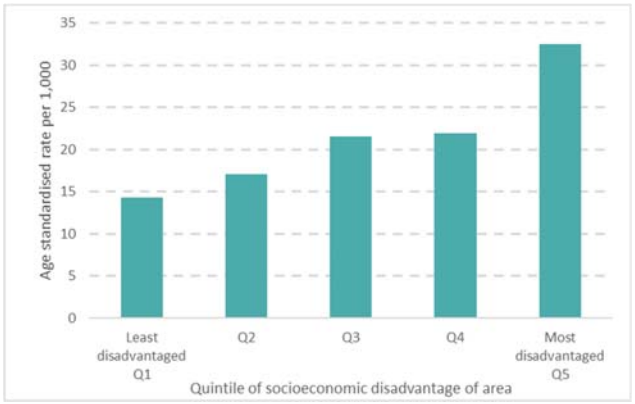


Figure 10: Primary care: Pharmaceutical Benefits Scheme, Adelaide

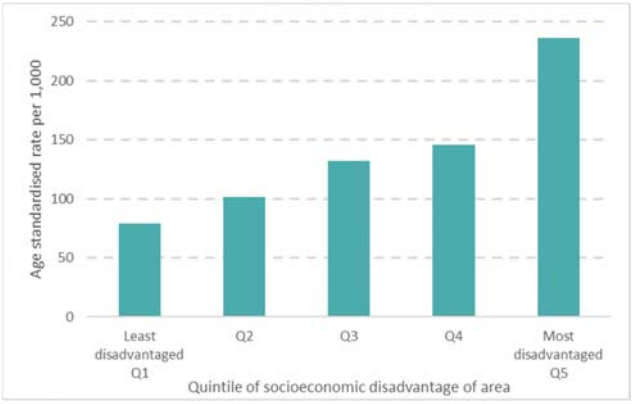
Allergy and asthma medications: items dispensed
Rate ratio = 1.96



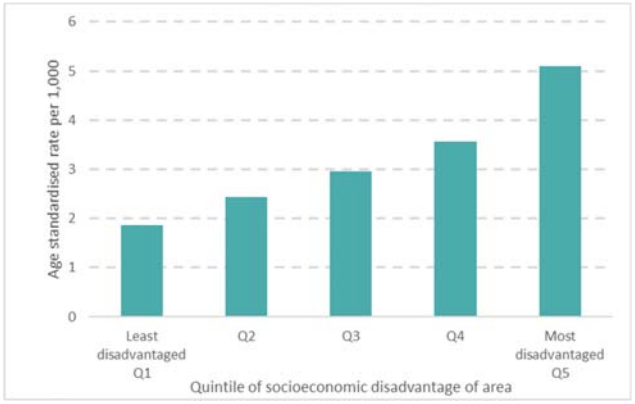
Smoking cessation medications: items dispensed
Rate ratio = 2.27



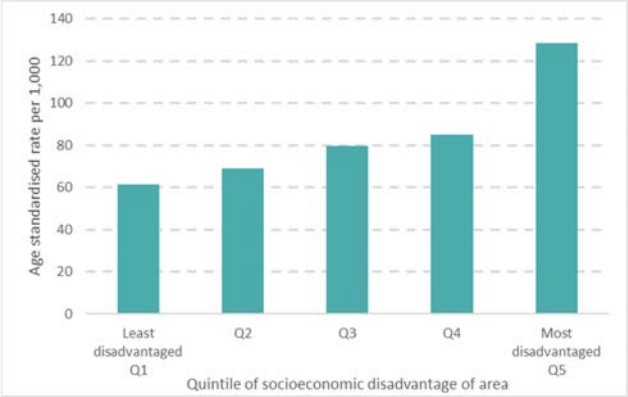
Short-acting beta agonists: items dispensed
Rate ratio = 2.99



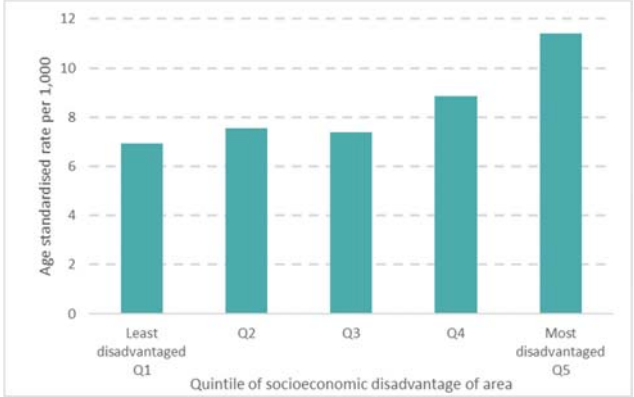
Short-acting muscarinic agonists: items dispensed
Rate ratio = 2.75



Long-acting muscarinic agonists alone: items dispensed
Rate ratio = 2.09

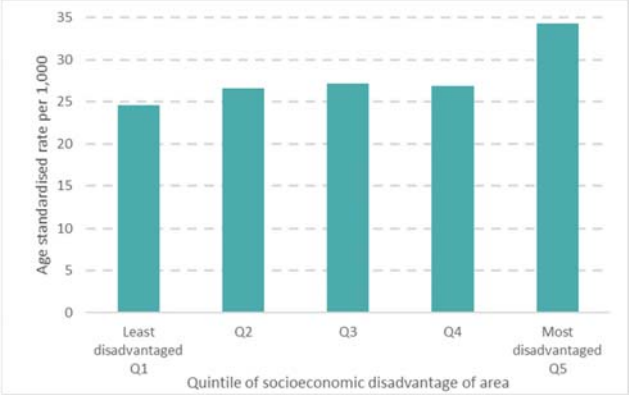


Long-acting beta agonists alone: items dispensed
Rate ratio = 1.64

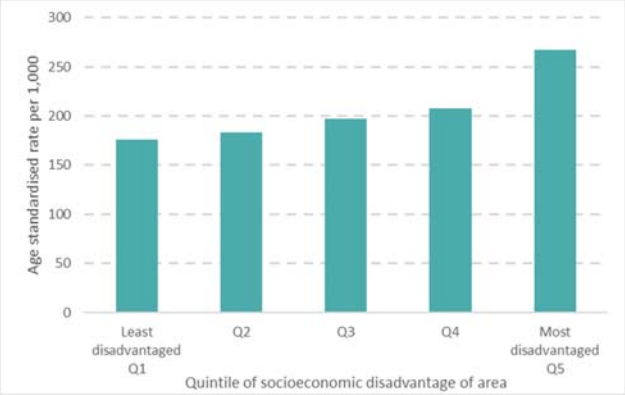


Inhaled corticosteroids alone: items dispensed

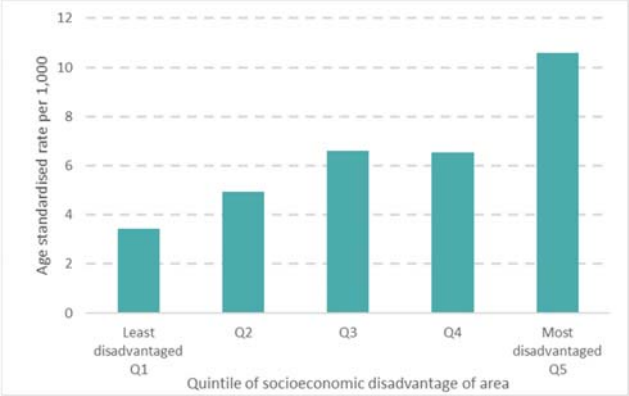
Rate ratio = 1.39



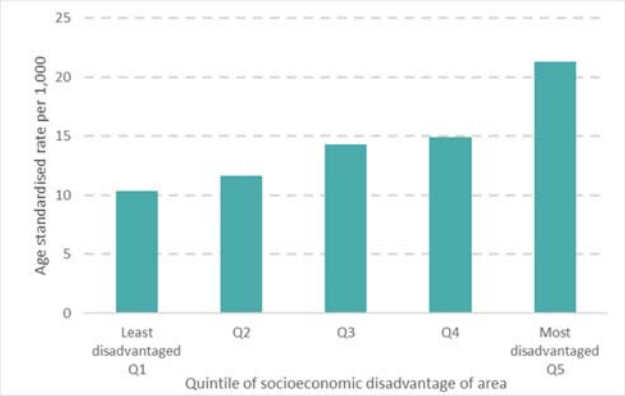
Inhaled corticosteroids / long-acting beta agonist combinations: items dispensed
Rate ratio = 1.52



Nicotine replacement therapy: items dispensed
Rate ratio = 3.09



Varenicline: items dispensed
Rate ratio = 2.05



Bupropion: items dispensed
Rate ratio = 1.28

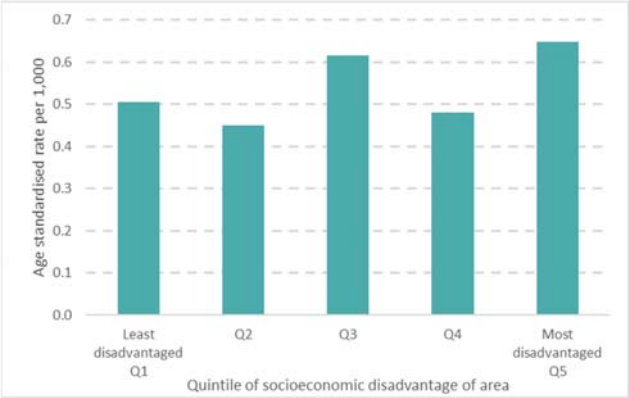
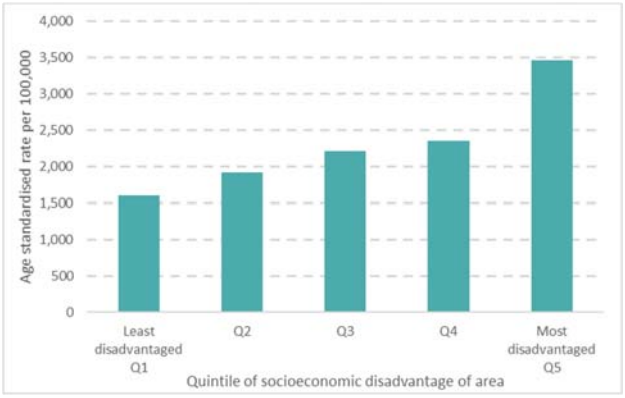
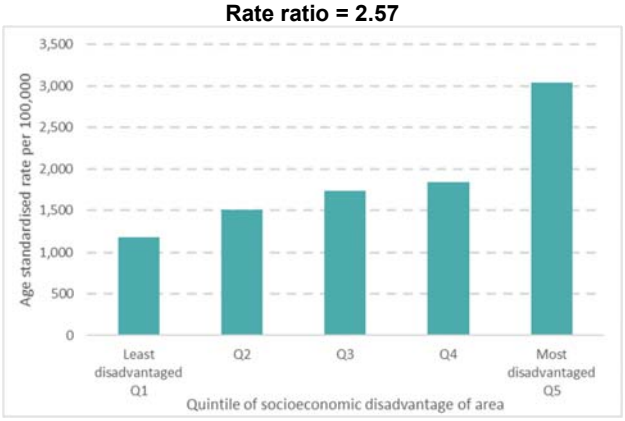


Figure 11: Emergency department attendances (respiratory disease)

Emergency Department attendances: persons
Rate ratio = 2.16



Emergency Department attendances: females
Rate ratio = 2.57



Emergency Department attendances: males
Rate ratio = 2.09

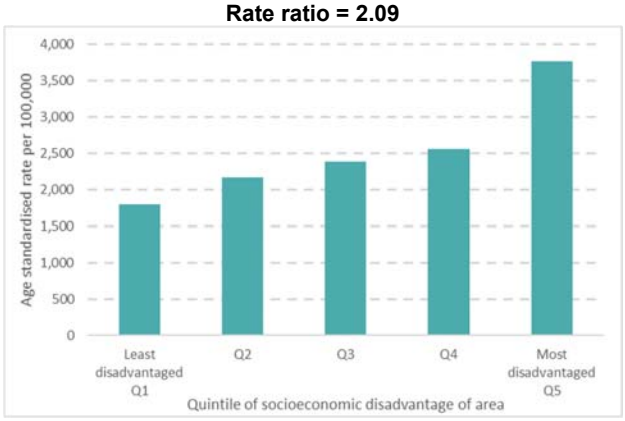
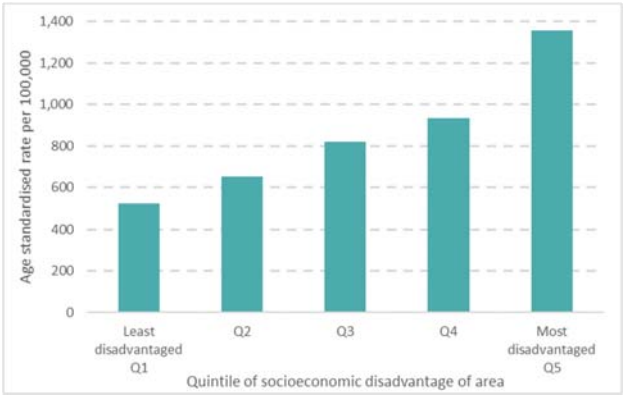


Figure 12: Hospitalisations with a diagnosis of respiratory disease, Adelaide

Public hospital admissions, primary diagnosis
Rate ratio = 2.60



Public hospital admissions, any diagnosis
Rate ratio = 2.79

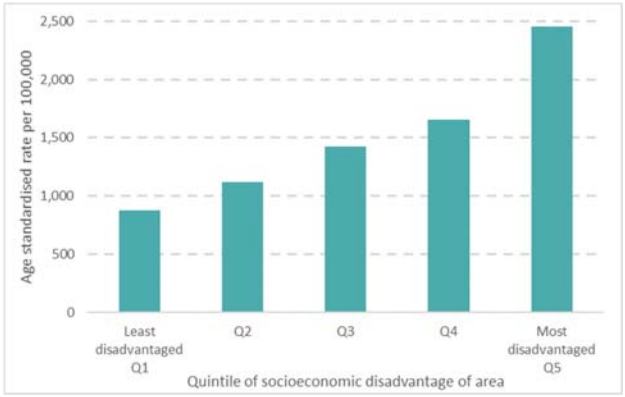
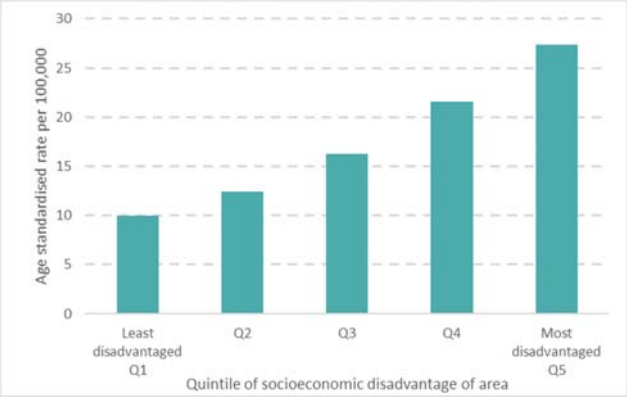


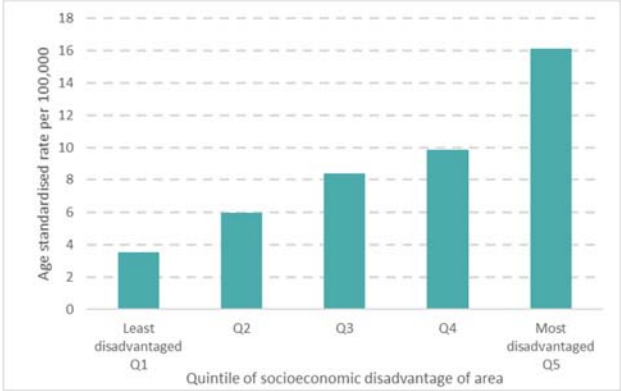
Figure 13: Premature mortality (<75 years), Adelaide

Premature mortality – respiratory system disease
Rate ratio = 2.75

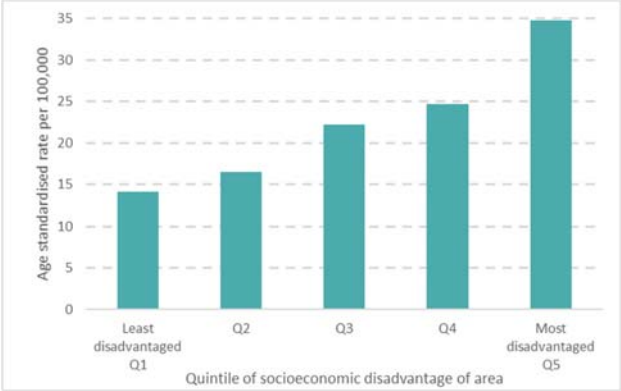


Premature mortality – COPD

Rate ratio = 4.59



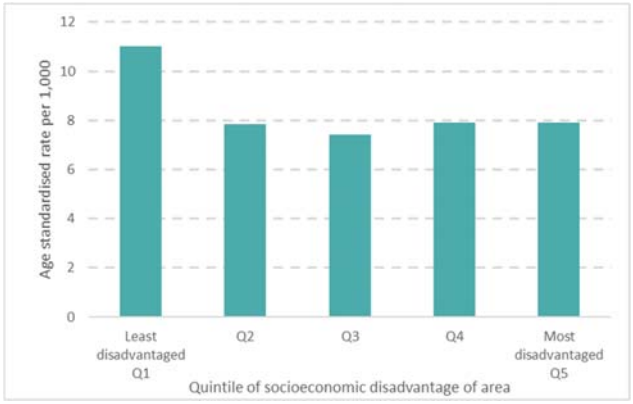
Premature mortality – lung cancer
Rate ratio = 2.47



Quintiles of socioeconomic disadvantage in Regional South Australia

Figure 14: Primary care: Medical Benefits Schedule, Regional South Australia

Respiratory function tests
Rate ratio = 0.72



Asthma cycle of care
Rate ratio = 0.56

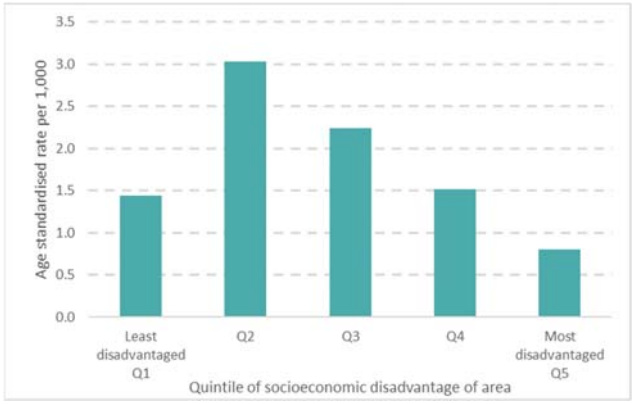
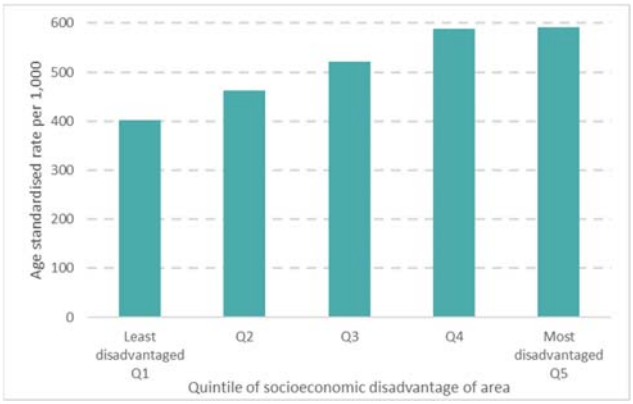
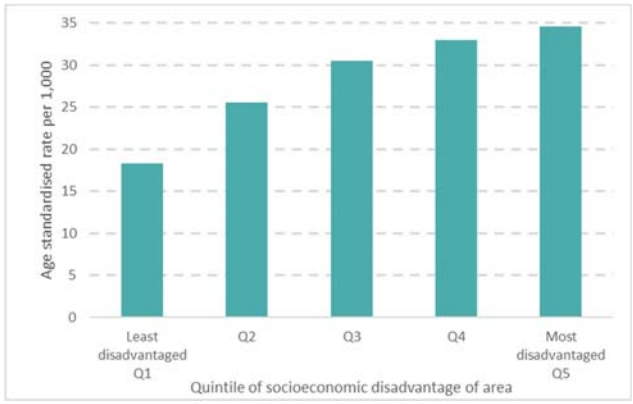


Figure 15: Primary care: Pharmaceutical Benefits Scheme, Regional South Australia

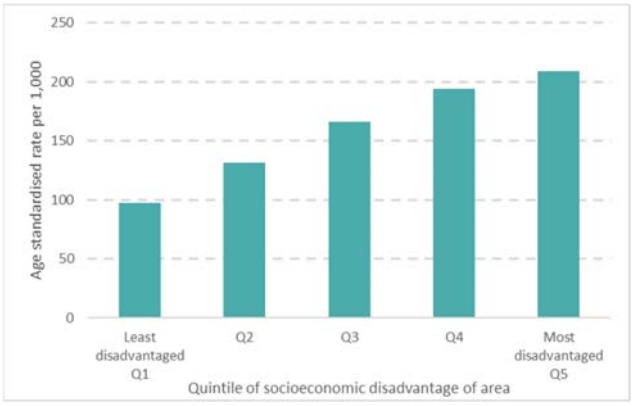
Allergy and asthma medications: items dispensed
Rate ratio = 1.47



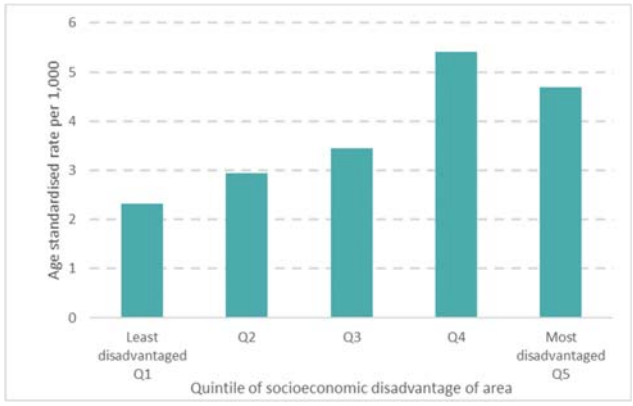
Smoking cessation medications: items dispensed
Rate ratio = 1.89



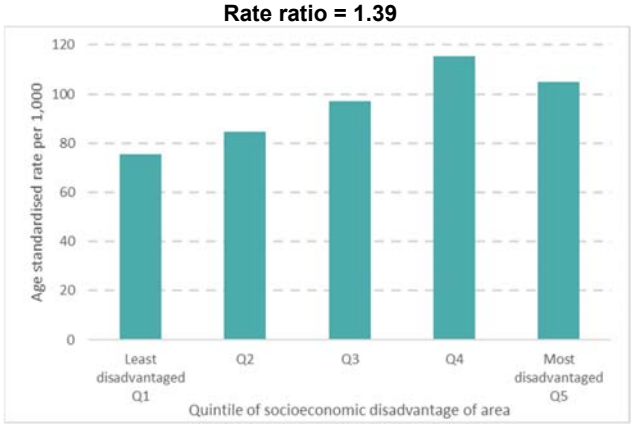
Short-acting beta agonists: items dispensed
Rate ratio = 2.15



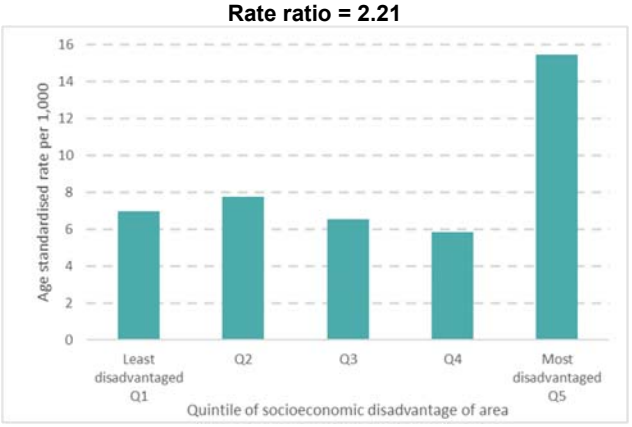
Short-acting muscarinic agonists: items dispensed
Rate ratio = 2.01



Long-acting muscarinic agonists alone: items dispensed
Rate ratio = 1.39

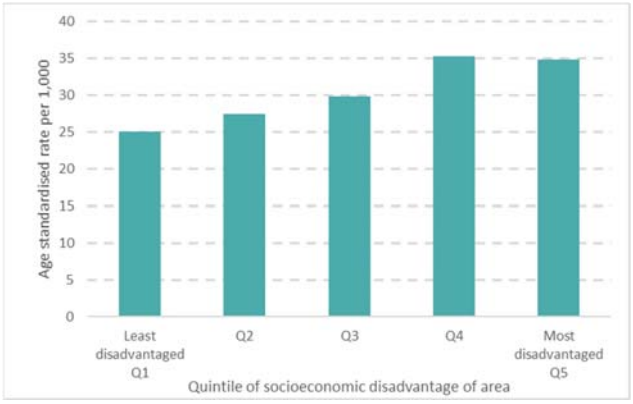


Long-acting beta agonists alone: items dispensed
Rate ratio = 2.21

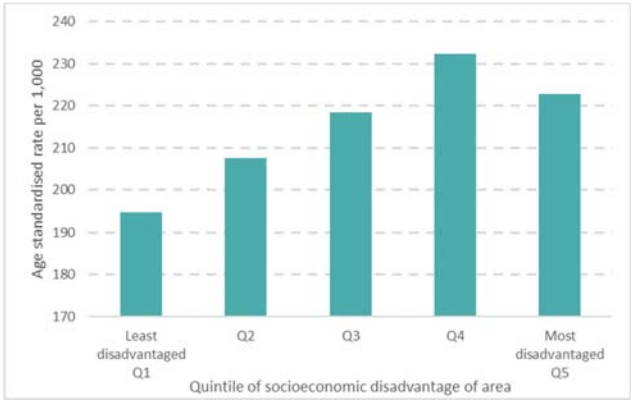


Inhaled corticosteroids alone: items dispensed

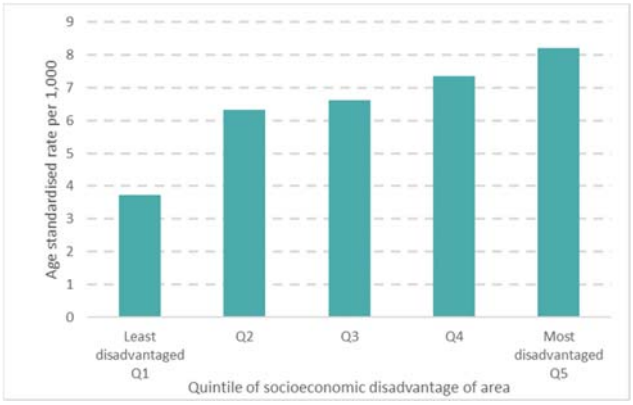
Rate ratio = 1.39



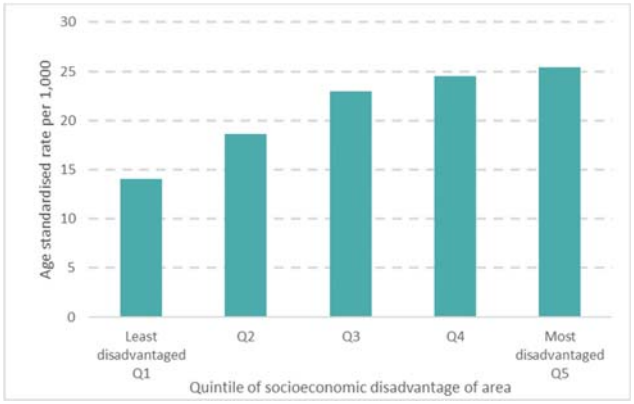
Inhaled corticosteroids / long-acting beta agonist combinations: items dispensed
Rate ratio = 1.14



Nicotine replacement therapy: items dispensed
Rate ratio = 2.20



Varenicline: items dispensed
Rate ratio = 1.80



Bupropion: items dispensed
Rate ratio = 2.14

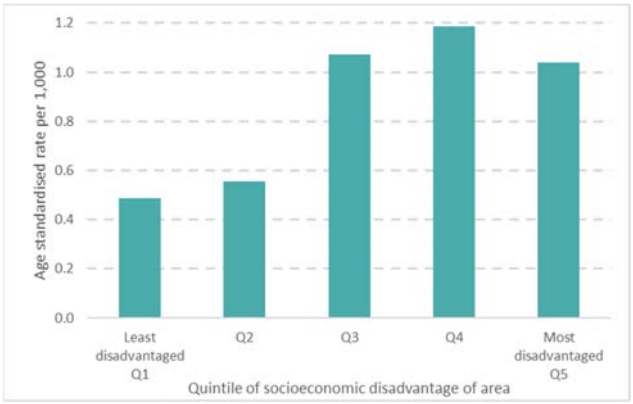
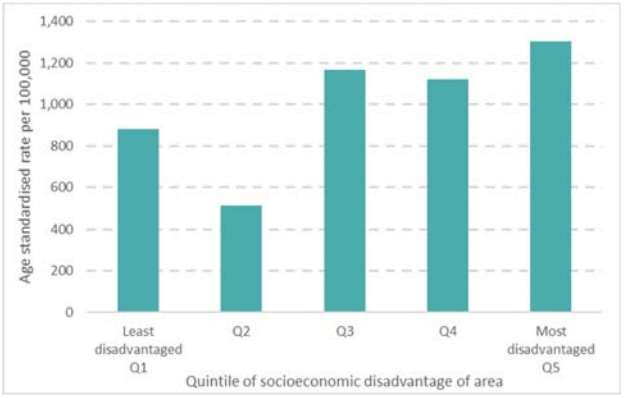
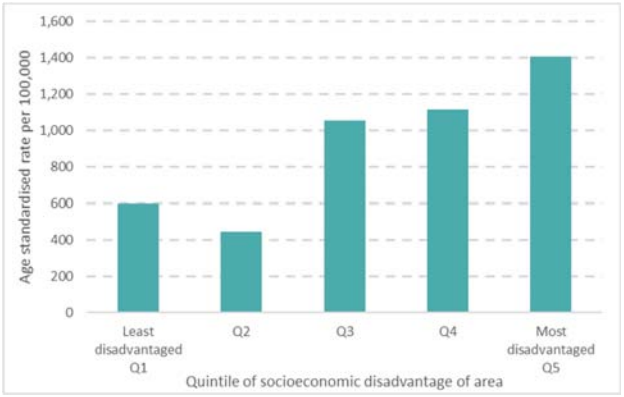


Figure 16: Emergency department attendances (respiratory disease), Regional South Australia

Emergency Department attendances: persons
Rate ratio = 1.48



Emergency Department attendances: females
Rate ratio = 2.35



Emergency Department attendances: males
Rate ratio = 1.36

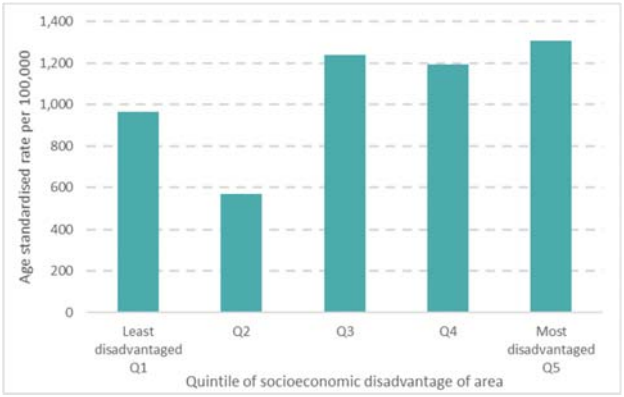
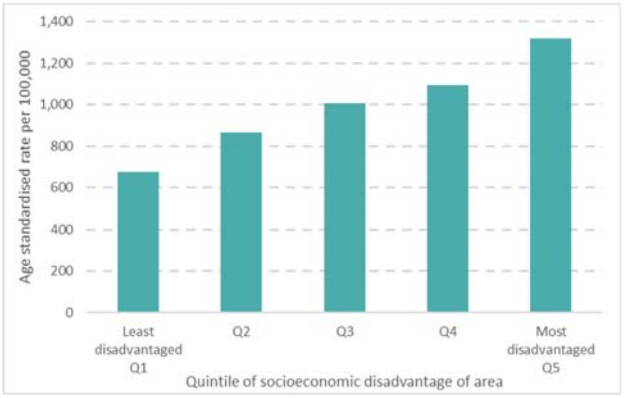


Figure 17: Hospitalisations with a diagnosis of respiratory disease, Regional South Australia

Public hospital admissions, primary diagnosis
Rate ratio = 1.96



Public hospital admissions, any diagnosis
Rate ratio = 1.82

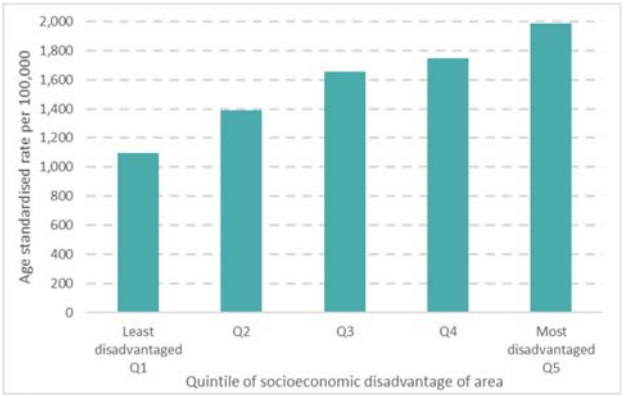
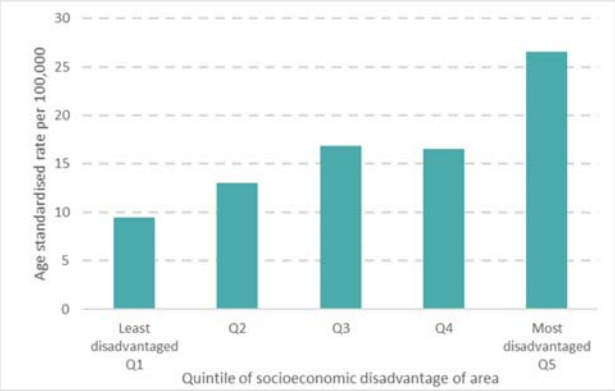
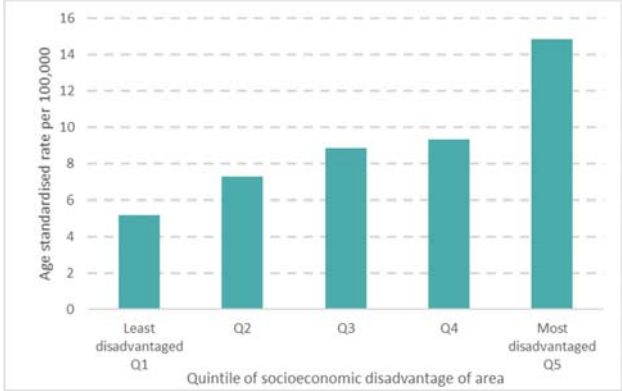


Figure 18: Premature mortality (<75 years), Regional South Australia

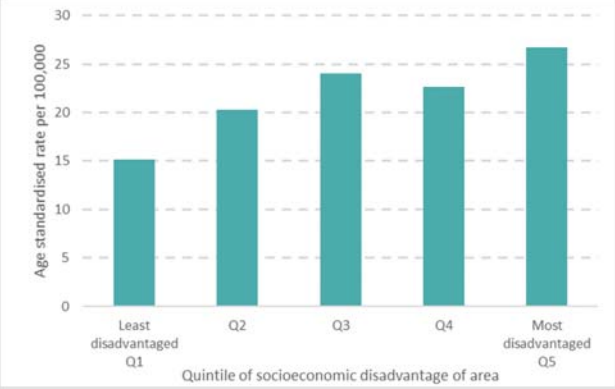
Premature mortality – respiratory system disease
Rate ratio = 2.80



Premature mortality – COPD
Rate ratio = 2.87



Premature mortality – lung cancer
Rate ratio = 1.77



Remoteness

The following charts (Figure 19 to Figure 233) show variations in rates of healthcare activity, related prescribing and service use for, and premature mortality from respiratory disease by category of remoteness, using the Australian Bureau of Statistics' (ABS) Australian Statistical Geography Standard-Remoteness Area structure, which defines locations in terms of remoteness [23] [24]. Geographic remoteness is essentially a measure of a physical location's level of access to goods and services [24]. 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 [23] [24].

When comparing between indicators, note that while scales on the horizontal axis aim to be consistent for data displayed for the same indicator, the scale has been changed where necessary to enable data to be displayed clearly.

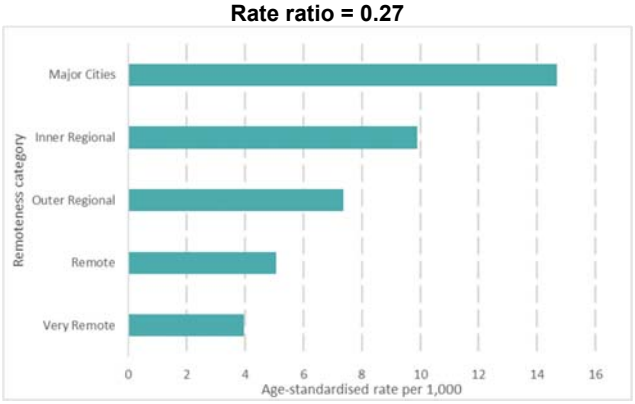
Key points from these analyses of variation by category of remoteness follow.

- Very Remote areas have the lowest rates of services provided under the Medical Benefits Schedule, with respiratory function tests almost a quarter of the rate in Very Remote areas compared to Major Cities, and asthma cycle of care in Very Remote areas less than a sixth of the rate seen in Major Cities. This is a result both of limited access to general medical practitioners (GPs) and that GP services in some services (e.g., some Aboriginal health services) are not recorded under the MBS.
- For indicators relating to the Pharmaceutical Benefits Scheme, prescriptions for allergy and asthma medications (in total and for each type shown) were lowest in Very Remote areas.
- There was variation between categories of remoteness for smoking cessation medications, with Outer Regional areas consistently having the highest number of prescriptions dispensed.
- The rate of ED attendances for respiratory and related reasons generally decreased with increasing remoteness, and was lowest in the Very Remote areas, at about a fifth of the rate seen in Major Cities for all persons, females and males.
- The highest rates of emergency hospital admissions for respiratory disease as a principal or in any diagnosis were from the Very Remote areas. However, for elective admissions the highest rates were observed from Outer Regional areas.
- The highest rates of premature death due to respiratory system diseases were observed to be in the Very Remote areas, with almost three times the rate compared to Major Cities. The Very Remote areas also had the highest rates of premature deaths due to chronic obstructive respiratory disease and lung cancer.

Remoteness areas in South Australia

Figure 19: Primary care: Medical Benefits Schedule

Respiratory function tests
Rate ratio = 0.27



Asthma cycle of care
Rate ratio = 0.14

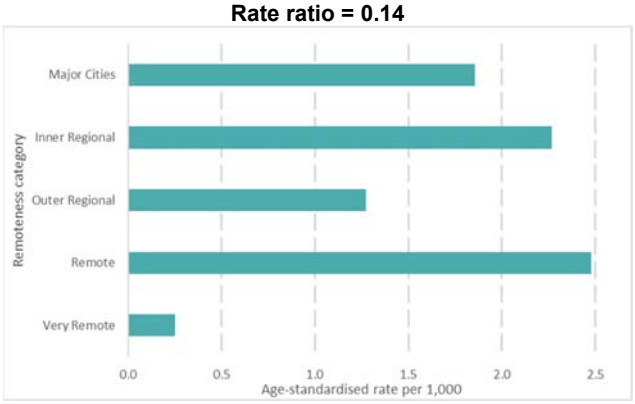
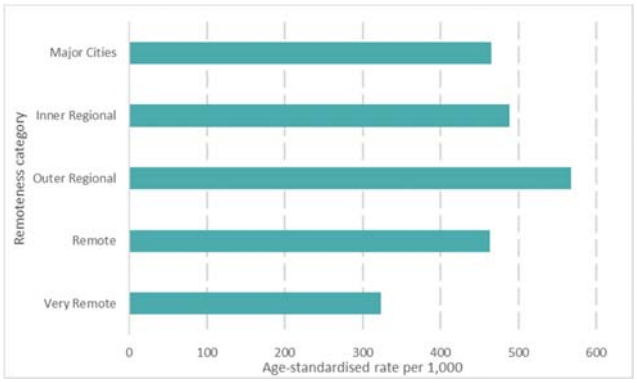
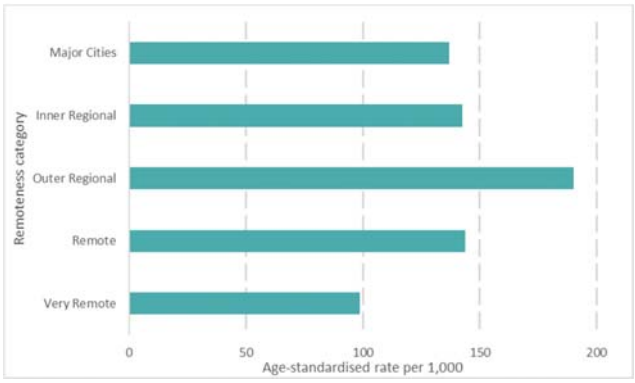


Figure 20: Primary care: Pharmaceutical Benefits Scheme

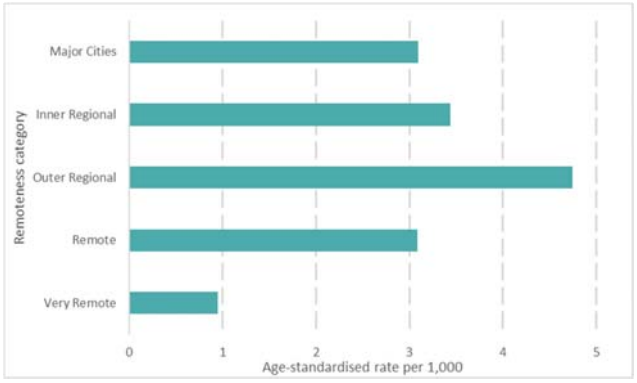
Allergy and asthma medications: items dispensed
Rate ratio = 0.70



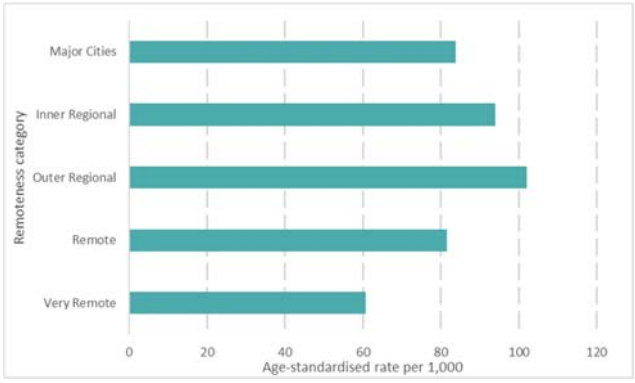
Short-acting beta agonists: items dispensed
Rate ratio = 0.72



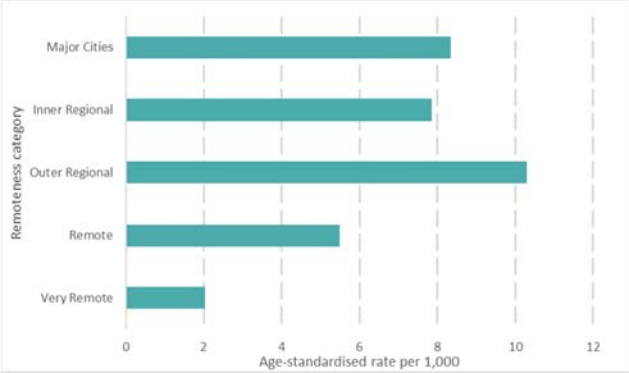
Short-acting muscarinic agonists: items dispensed
Rate ratio = 0.31



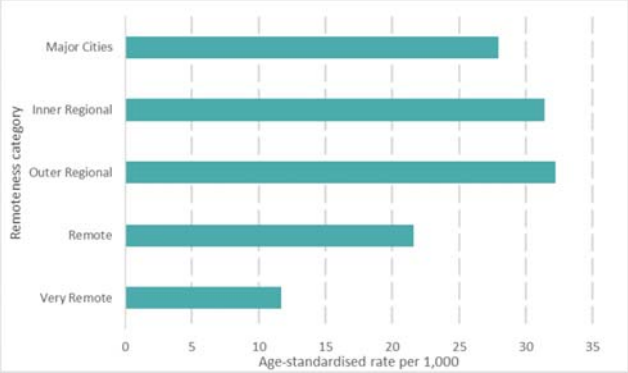
Long-acting muscarinic agonists alone: items dispensed
Rate ratio = 0.73



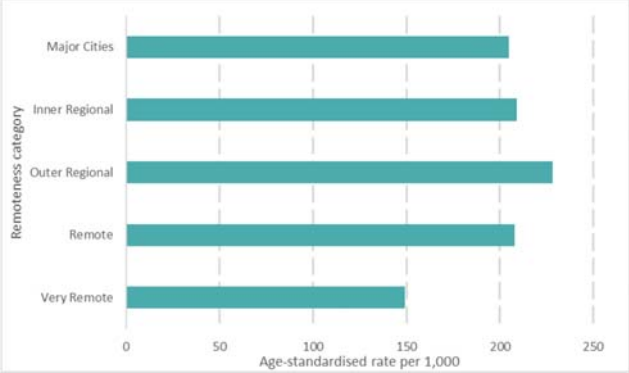
Long-acting beta agonists alone: items dispensed
Rate ratio = 0.24



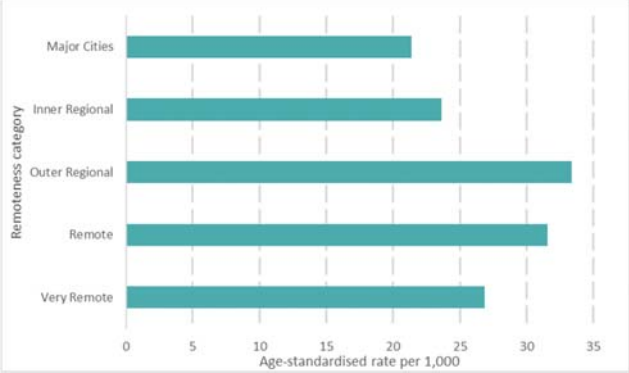
Inhaled corticosteroids alone: items dispensed
Rate ratio = 0.42



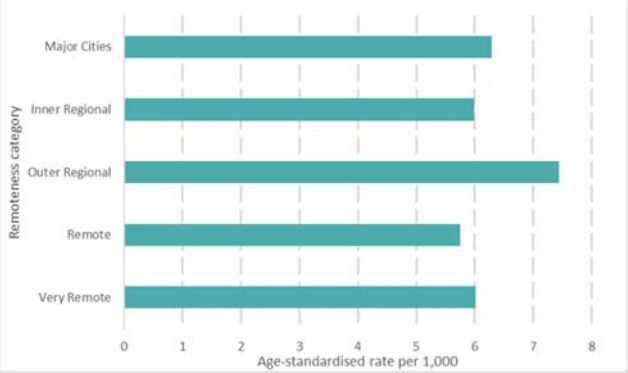
Inhaled corticosteroids / long-acting beta agonist combinations: items dispensed
Rate ratio = 0.73



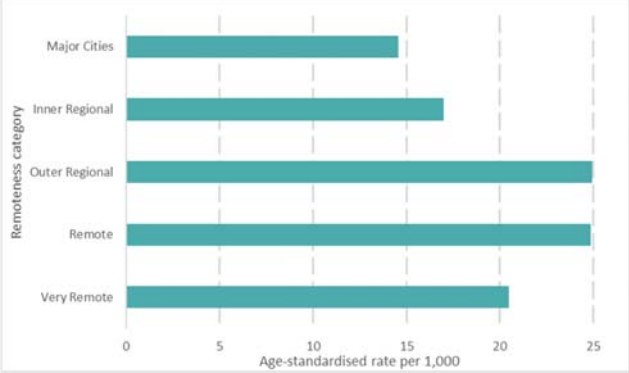
Smoking cessation medications: items dispensed
Rate ratio = 1.26



Nicotine replacement therapy: items dispensed
Rate ratio = 0.96



Varenicline: items dispensed
Rate ratio = 1.41



Bupropion: items dispensed
Rate ratio = 0.58

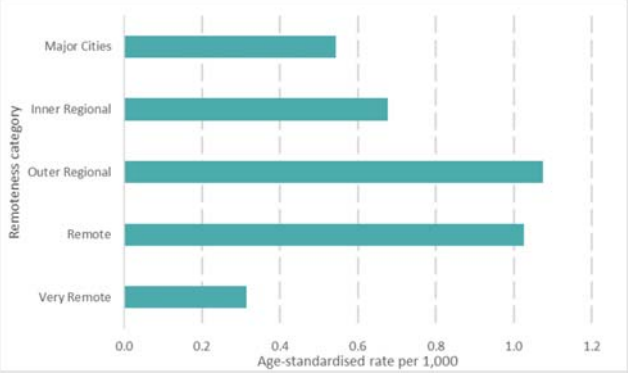
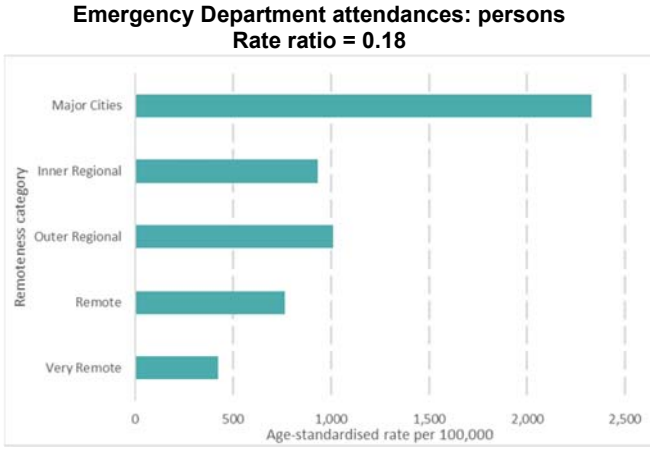
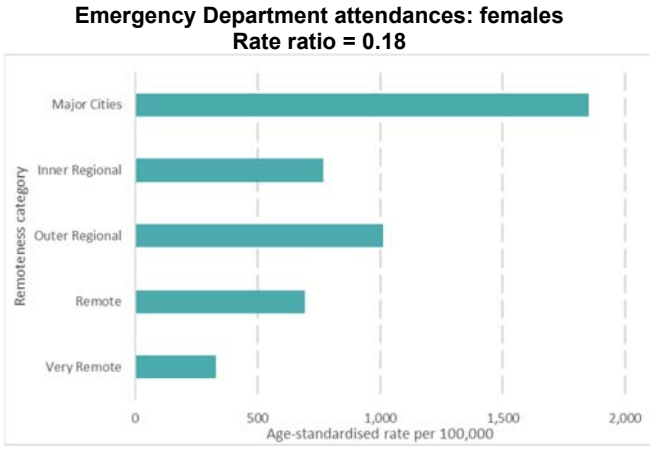


Figure 21: Emergency department attendances (respiratory disease)





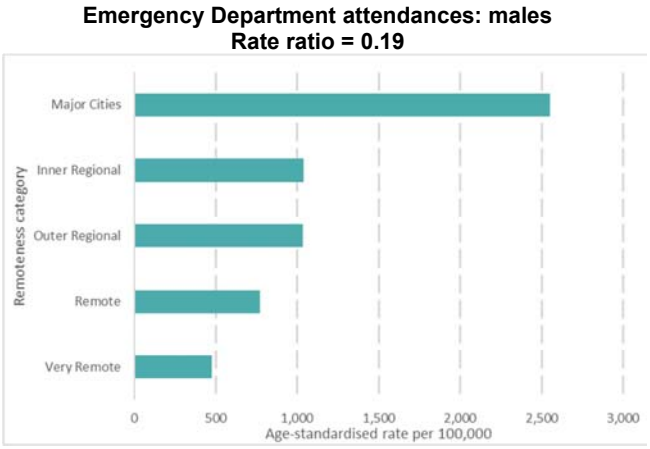
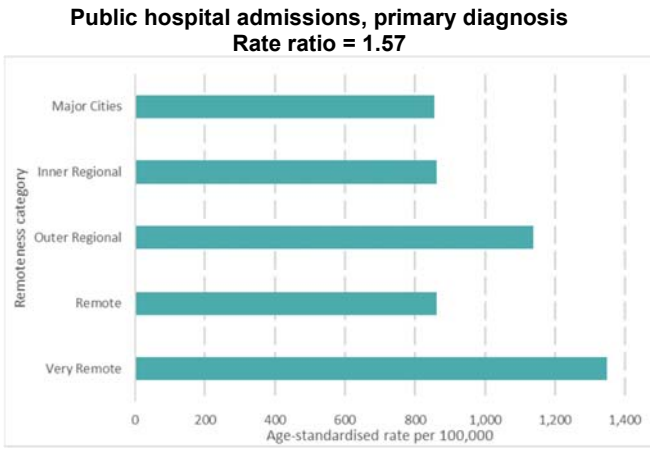


Figure 22: Hospitalisations with a diagnosis of respiratory disease



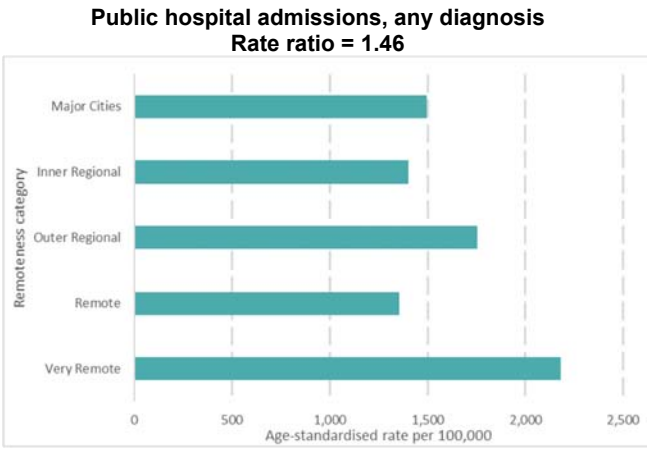
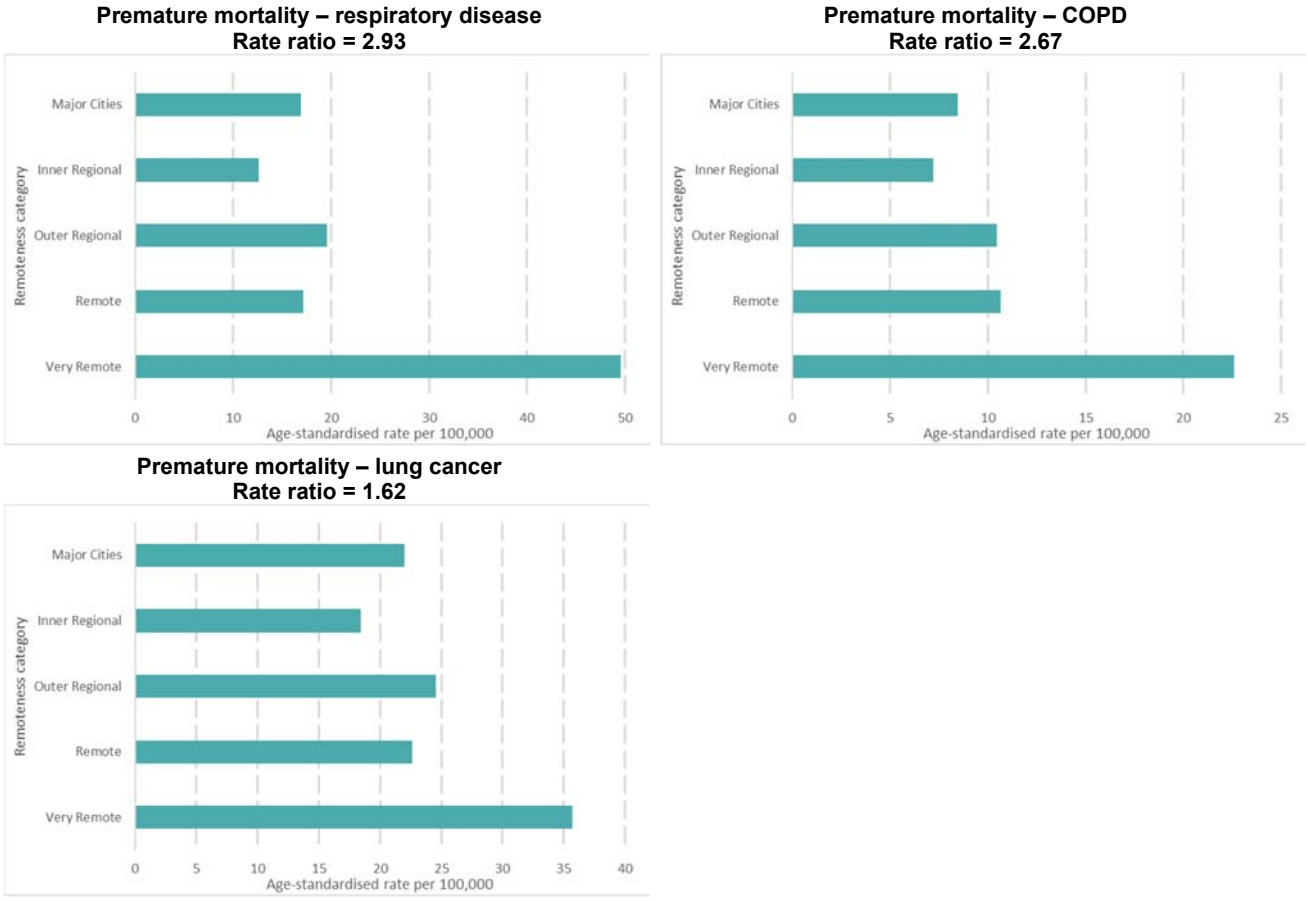


Figure 23: Premature mortality (<75 years)



Correlation analysis

Introduction

A correlation analysis has been undertaken to illustrate the extent of association at the SLA level in Adelaide (Table 3) and in Regional South Australia (Table 4) between the indicators in this atlas.

As a general rule, correlation coefficients of plus or minus 0.71 or above are of substantial statistical significance, because this higher value represents at least 50% shared variation (r^2 greater than or equal to 0.50): these are referred to in this atlas as being 'very strong' correlations> Correlations of 0.50 to 0.70 are of meaningful statistical significance, and are referred to as being 'strong' correlations. Readers should note that correlations between the IRSD and poor health outcomes (e.g., high rates of premature death) appear in the tables as negative numbers. This occurs because low numbers (under 1000) indicate high levels of relative socioeconomic disadvantage under the IRSD and high numbers (above 1000) indicate low levels of relative socioeconomic disadvantage.

Note that correlation coefficients are generally lower in Regional South Australia, in part as a result of the smaller populations at the geographic area level.

Findings

In interpreting the correlation matrices, any two variables, which appear to be related to each other, must be carefully considered as to whether there is a plausible explanation underlying the association. In addition, care must be taken to ensure that the two variables which are being compared are independent of each other. For instance, the correlation matrices examining associations at SLA level appear to show correlations between ED attendance for all persons (variable 19) with ED attendances for males and females (variables 20 and 21). These findings are therefore not surprising. It is also important to note that correlation between two variables does not imply causation, as relationships are likely to be more complex and may involve a number of other contributing factors.

For the Adelaide area (Table 3), there are very strong correlations at the SLA level with, for example, high rates of premature mortality from respiratory conditions and a number of indicators. These are unemployment, households receiving rent assistance, smoking, prescriptions dispensed for allergy and asthma medications, and a number of the principal diagnoses for hospital admissions. High rates of PBS scripts dispensed for allergy and asthma medications and smoking cessation medications are also very strongly correlated with the social determinants of health – examples are poor outcomes in education and early childhood development and high rates of unemployment. Emergency department attendances and hospital admissions show similar associations. There was a very strong inverse (negative) correlation between high rates of premature mortality from respiratory conditions and high rates of people aged 15 to 19 years engaged in learning or earning. There are also many strong correlations in evidence.

For Regional South Australia (Table 4), correlations between these indicators are generally much weaker. However, there are again very strong correlations between high rates of premature mortality from respiratory conditions and a number of indicators. These are high proportions of young children assessed as being developmentally vulnerable on one or more domains under the AEDC, unemployment and people in private dwellings with no Internet connection. Strong correlations were recorded with high proportions of low birthweight babies, respiratory function tests, allergy and dispensing of prescriptions for asthma medication. There was also a strong inverse (negative) correlation between high rates of premature mortality from respiratory conditions and high rates of people aged 15 to 19 years engaged in learning or earning.

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Table 3: Correlation matrix for SLAs in Adelaide

Correlations

	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12	v13	v14	v15	v16	v17	v18	v19	v20	v21	v22	v23	v24	v25	v26	v27	v28
v1	1																											
v2	-.789**	1																										
v3	.843**	-.792**	1																									
v4	-.917**	.802**	-.915**	1																								
v5	-.742**	.730**	-.756**	.773**	1																							
v6	-.822**	.496**	-.534**	.644**	.486**	1																						
v7	-.944**	.772**	-.808**	.851**	.730**	.831**	1																					
v8	-.895**	.811**	-.956**	.921**	.747**	.641**	.881**	1																				
v9	-.736**	.690**	-.859**	.720**	.602**	.535**	.816**	.888**	1																			
v10	-.510**	.424**	-.440**	.472**	.398**	.418**	.524**	.444**	.376**	1																		
v11	-.687**	.757**	-.901**	.791**	.710**	.367**	.660**	.891**	.789**	.314*	1																	
v12	-.030	.240	-.363**	.217	.161	-.260*	.018	.341**	.427**	-.033	.512**	1																
v13	-.007	.105	-.318*	.123	-.010	-.131	-.030	.282*	.370**	-.216	.461**	.593**	1															
v14	-.835**	.692**	-.881**	.868**	.687**	.648**	.805**	.898**	.765**	.430**	.798**	.305*	.281*	1														
v15	-.288*	.303*	-.267*	.302*	.414**	.096	.235	.301*	.138	.292*	.297*	.146	-.159	.286*	1													
v16	.170	.344**	-.344**	.311*	.181	-.122	.139	.308*	.319*	.016	.360**	.462**	.190	.198	.127	1												
v17	-.792**	.823**	-.840**	.821**	.833**	.446**	.778**	.853**	.757**	.456**	.847**	.358**	.205	.752**	.417**	.339*	1											
v18	-.751**	.831**	-.871**	.831**	.770**	.422**	.729**	.885**	.768**	.405**	.902**	.442**	.291*	.797**	.382**	.410**	.936**	1										
v19	-.710**	.644**	-.758**	.817**	.593**	.490**	.652**	.778**	.581**	.379**	.657**	.278*	.044	.738**	.411**	.452**	.657**	.737**	1									
v20	-.778**	.667**	-.735**	.837**	.615**	.598**	.742**	.784**	.586**	.456**	.615**	.145	-.082	.703**	.373**	.400**	.673**	.721**	.961**	1								
v21	-.714**	.616**	-.700**	.808**	.535**	.543**	.662**	.739**	.543**	.432**	.586**	.173	.005	.677**	.288*	.420**	.634**	.704**	.930**	.952**	1							
v22	-.889**	.753**	-.887**	.889**	.715**	.597**	.816**	.905**	.742**	.495**	.789**	.257	.193	.852**	.331*	.243	.819**	.815**	.782**	.793**	.745**	1						
v23	-.566**	.448**	-.640**	.593**	.426**	.333*	.525**	.681**	.621**	.405**	.599**	.360**	.335*	.624**	.289*	.150	.571**	.623**	.581**	.581**	.563**	.771**	1					
v24	-.878**	.734**	-.867**	.909**	.777**	.578**	.784**	.873**	.668**	.498**	.804**	.244	.164	.828**	.341**	.251	.874**	.819**	.759**	.772**	.735**	.956**	.631**	1				
v25	-.830**	.744**	-.867**	.830**	.711**	.526**	.771**	.853**	.731**	.430**	.763**	.258	.188	.812**	.254	.251	.807**	.787**	.733**	.714**	.671**	.955**	.662**	.910**	1			
v26	-.805**	.618**	-.768**	.807**	.731**	.581**	.702**	.768**	.542**	.392**	.649**	.041	.134	.743**	.316*	.093	.710**	.702**	.652**	.674**	.617**	.755**	.472**	.762**	.726**	1		
v27	-.793**	.584**	-.774**	.869**	.740**	.481**	.693**	.785**	.495**	.390*	.660**	.219	.054	.736**	.282	.176	.686**	.648**	.638**	.678**	.611**	.782**	.376*	.829**	.711**	.906**	1	
v28	-.814**	.782**	-.836**	.812**	.753**	.586**	.824**	.856**	.756**	.487**	.779**	.266*	.189	.767**	.276*	.226	.807**	.773**	.612**	.642**	.603**	.784**	.541**	.761**	.754**	.730**	.695**	1

v1	IRSD
v2	AEDC: Developmentally vulnerable on one or more domain
v3	Learning or earning at ages 15 to 19 years
v4	Unemployed
v5	Households receiving rent assistance
v6	Private dwellings with no Internet connection
v7	Fair or poor self-assessed health
v8	Estimated prevalence current smokers (18 years and over)
v9	Estimated prevalence people who were obese (18 years and over)
v10	Low birth weight
v11	Smoking during pregnancy
v12	Respiratory disease (estimated prevalence)
v13	Asthma (estimated prevalence)
v14	Chronic obstructive pulmonary disease (estimated prevalence)

v15	Repiratory function tests (MBS)
v16	Completed cycles of asthma care (MBS)
v17	Allergy & asthma medication prescriptions (PBS)
v18	Smoking cessation medication prescriptions (PBS)
v19	Emergency Department attendances (persons)
v20	Emergency Department attendances (males)
v21	Emergency Department attendances (females)
v22	Hospitalisations, primary diagnosis, respiratory system diseases (persons)
v23	Hospitalisations, primary diagnosis, COPD (persons)
v24	Hospitalisations, primary diagnosis, asthma (persons)
v25	Hospitalisations, primary diagnosis, pneumonia (persons)
v26	Premature mortality due to respiratory system conditions
v27	Premature mortality due to chronic obstructive pulmonary disease
v28	Premature mortality due to lung cancer

Legend		
	No, or weak, correlation:	< ± 0.30
	Moderate:	± 0.30 to ± 0.49
	Strong:	± 0.50 to ± 0.70
	Very strong:	> ± 0.70
	Not applicable:	1.00

Notes:

Inverse correlations shown as negative (-)
* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Table 4: Correlation matrix for SLAs in Regional South Australia

Correlations

	v1	v2	v3	v4	v5	v6	v7	v8	v9	v10	v11	v12	v13	v14	v15	v16	v17	v18	v19	v20	v21	v22	v23	v24	v25	v26	v27	v28
v1	1																											
v2	-.504**	1																										
v3	.666**	-.477**	1																									
v4	-.838**	.620**	-.700**	1																								
v5	-.342**	-.182	-.346**	.444**	1																							
v6	-.805**	.583**	-.523**	.863**	.204	1																						
v7	-.599**	.141	-.095	.456**	.389**	.453**	1																					
v8	-.563**	.183	-.168	.467**	.308*	.417**	.932**	1																				
v9	-.289*	.005	-.003	.120	.185	.102	.881**	.868**	1																			
v10	.059	.582**	.190	-.005	.200	.112	.245	.226	.106	1																		
v11	-.609**	.308*	-.262	.523**	.369**	.381**	.620**	.570**	.421**	.529**	1																	
v12	-.044	-.024	.263	-.130	-.050	-.046	.682**	.693**	.869**	.054	.169	1																
v13	-.383**	.017	-.138	.349**	.392**	.134	.822**	.841**	.832**	.026	.418**	.749**	1															
v14	-.499**	.124	-.165	.447**	.377**	.361**	.934**	.908**	.886**	.202	.517**	.745**	.863**	1														
v15	-.082	-.326*	.051	.006	.023	-.089	.202	.185	.262	-.467**	-.038	.260	.220	.183	1													
v16	.056	.014	.185	-.155	.318*	-.313*	.083	.093	.094	.303	.151	.128	.242	.067	-.196	1												
v17	-.229	-.371**	.022	-.062	.382**	-.068	.635**	.604**	.463**	-.311*	.466**	.299*	.499**	.597**	.349**	.148	1											
v18	-.362**	-.250	-.138	.022	.125	.006	'.280*	.203	.081	-.312	.443**	-.102	.124	.228	.089	.053	.646**	1										
v19	-.326*	.114	-.347**	.380**	.410**	.069	.379**	.294*	.241	.043	.514**	.133	.346*	.372**	.278*	.062	.432**	.313*	1									
v20	-.249	.178	-.393**	.411**	.448**	.053	.450**	.377**	.274	.147	.490**	.066	.455**	.447**	.005	.064	.216	.172	.988**	1								
v21	-.359*	.178	-.458**	.435**	.337*	.135	.384**	.365*	.219	.087	.498**	.083	.381**	.447**	.168	.057	.463**	.389**	.958**	.923**	1							
v22	-.412**	.337*	-.312*	.126	-.082	.144	.434**	.435**	.290*	.348*	.352*	.169	.332*	.415**	-.098	-.106	.254	.583**	.130	.173	.242	1						
v23	-.209	.357*	-.114	.046	-.032	.213	.190	.230	.243	.120	.119	.112	.121	.137	-.060	.099	.277*	.174	-.038	-.011	.023	.473**	1					
v24	-.413**	.555**	-.362**	.224	-.170	.230	.435**	.422**	.264	.514**	.448**	-.019	.205	.371**	-.163	-.137	-.070	.325*	.127	.177	.237	.866**	.359*	1				
v25	-.161	.292*	-.263*	.113	-.047	.098	.213	.162	.039	.489**	.316*	.065	.213	.221	-.130	-.161	-.195	.148	.197	.242	.236	.748**	.086	.566**	1			
v26	-.732**	.803**	-.653**	.843**	-.151	.819**	.409*	.477*	.264	.690**	.488**	-.247	-.079	.394*	-.528**	-.215	-.519**	-.351	.165	.260	.157	.126	.160	.510**	.293	1		
v27	-.305	.622**	-.358	.273	.062	.058	.448*	.409	.361	.435	.468*	.031	.314	.505*	-.313	.007	-.161	.155	.265	.374	.203	.636**	.345	.590**	.568**	.938**	1	
v28	-.118	.599**	-.004	.145	.043	.302	.444**	.469**	.427**	.732**	.460**	.172	.214	.381*	-.406*	.088	-.164	-.068	.061	.231	.065	.561**	.513**	.627**	.402*	.804**	.713**	1

v1	IRSD
v2	AEDC: Developmentally vulnerable on one or more domain
v3	Learning or earning at ages 15 to 19 years
v4	Unemployed
v5	Households receiving rent assistance
v6	Private dwellings with no Internet connection
v7	Fair or poor self-assessed health
v8	Estimated prevalence current smokers (18 years and over)
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v27	Premature mortality due to chronic obstructive pulmonary disease
v28	Premature mortality due to lung cancer

Legend		
	No, or weak, correlation:	< ± 0.30
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	Very strong:	> ± 0.70
	Not applicable:	1.00

Notes:

Inverse correlations shown as negative (-)
* Correlation is significant at the 0.05 level (2-tailed)
** Correlation is significant at the 0.01 level (2-tailed)

Appendices

Appendix 1: MBS, selected item numbers

MBS service	Item group	MBS item numbers
Respiratory function tests	D1.14	11503
Completion of annual asthma cycle of care	A44	2546 – 2559 and 2664 – 2677

For more detailed information, visit the Department of Health's MBS Online website at:
http://www.mbsonline.gov.au/internet/mbsonline/publishing.nsf/Content/Home

Appendix 2: PBS classifications

PBS group	Anatomical Therapeutic Chemical (ATC) Code	Description
SABA	1099W, 8288F, 8354Q, 3495Y, 1252X	Drugs for obstructive airway diseases: Short-acting beta agonists
SAMA	8671J	Drugs for obstructive airway diseases: Short-acting muscarinic agonists
LAMA alone	8626B	Drugs for obstructive airway diseases: Long-acting muscarinic agonists alone
LABA alone	8141L, 8136F, 8239P, 8240Q, 5134F, 5137J	Drugs for obstructive airway diseases: Long-acting beta agonists alone
ICS alone	8406K, 8407L, 8408M, 8409N, 2070Y, 2071B, 2072C, 8147T, 8149X, 8346G, 8148W, 8345F, 8516F, 8853Y, 8854B	Drugs for obstructive airway diseases: inhaled corticosteroids alone
ICA / LABA combinations	8625Y, 8796Y, 8750M, 8430Q, 8431R, 8517G, 8518H, 8432T, 8519J	Drugs for obstructive airway diseases: inhaled corticosteroids / long-acting beta agonist combinations
Smoking cessation: NRT	5465P, 9198D, 3414Q, 5572G, 5573H, 5571F, 4571N, 4572P, 4573Q, 4576W, 4577X, 4578Y	Drugs used in nicotine dependence: nicotine replacement therapy
Smoking cessation: varenicline	5469W, 9128K, 9129L	Drugs used in nicotine dependence: varenicline
Smoking cessation: bupropion	8465M, 8710K	Drugs used in nicotine dependence: bupropion

For more detailed information, visit the Department of Health's PBS Online website at:
http://www.pbs.gov.au/pbs/home

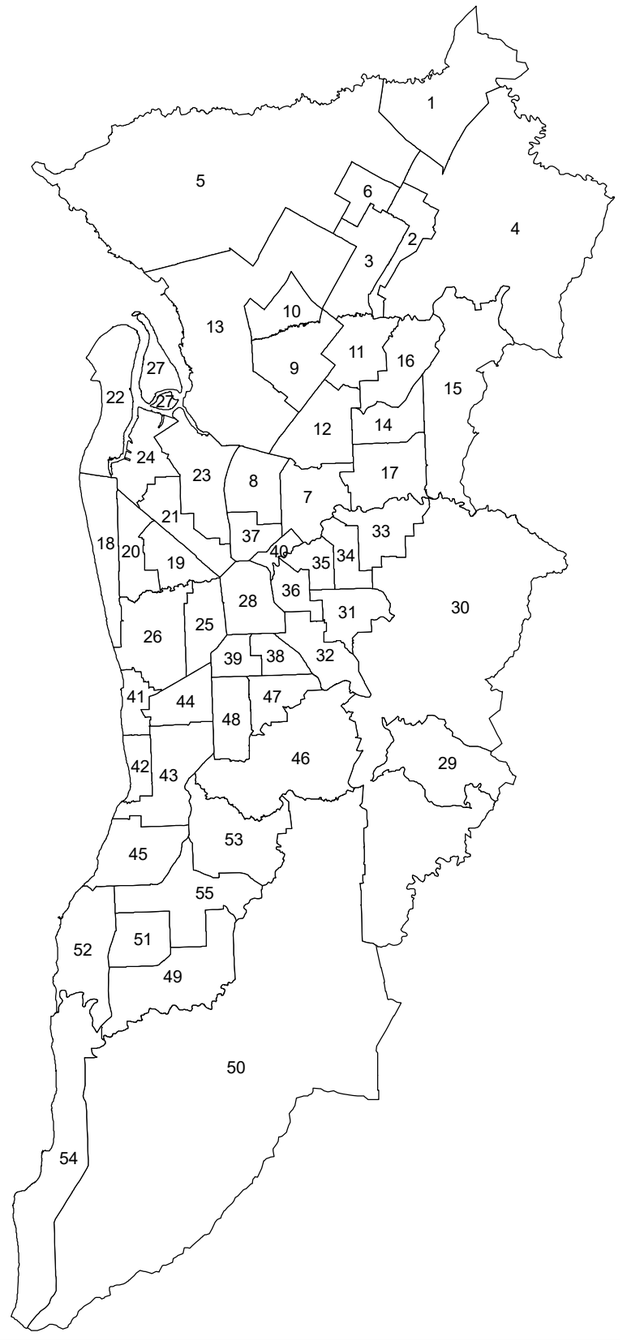
Appendix 3: Emergency department and hospital admission codes

Activity type	Codes (ICD-10-AM and AR-DRG classifications)	Description
Emergency department	J00 – J99	Diseases of the respiratory system
Hospital admissions	J20, J41 – J44	COPD
	J45, J46	Asthma
	G47.3	Sleep apnoea
	C34	Lung cancer
	J12 to J18	Emergency admissions: pneumonia
	J09, J10, J11	Emergency admissions: influenza

Key maps

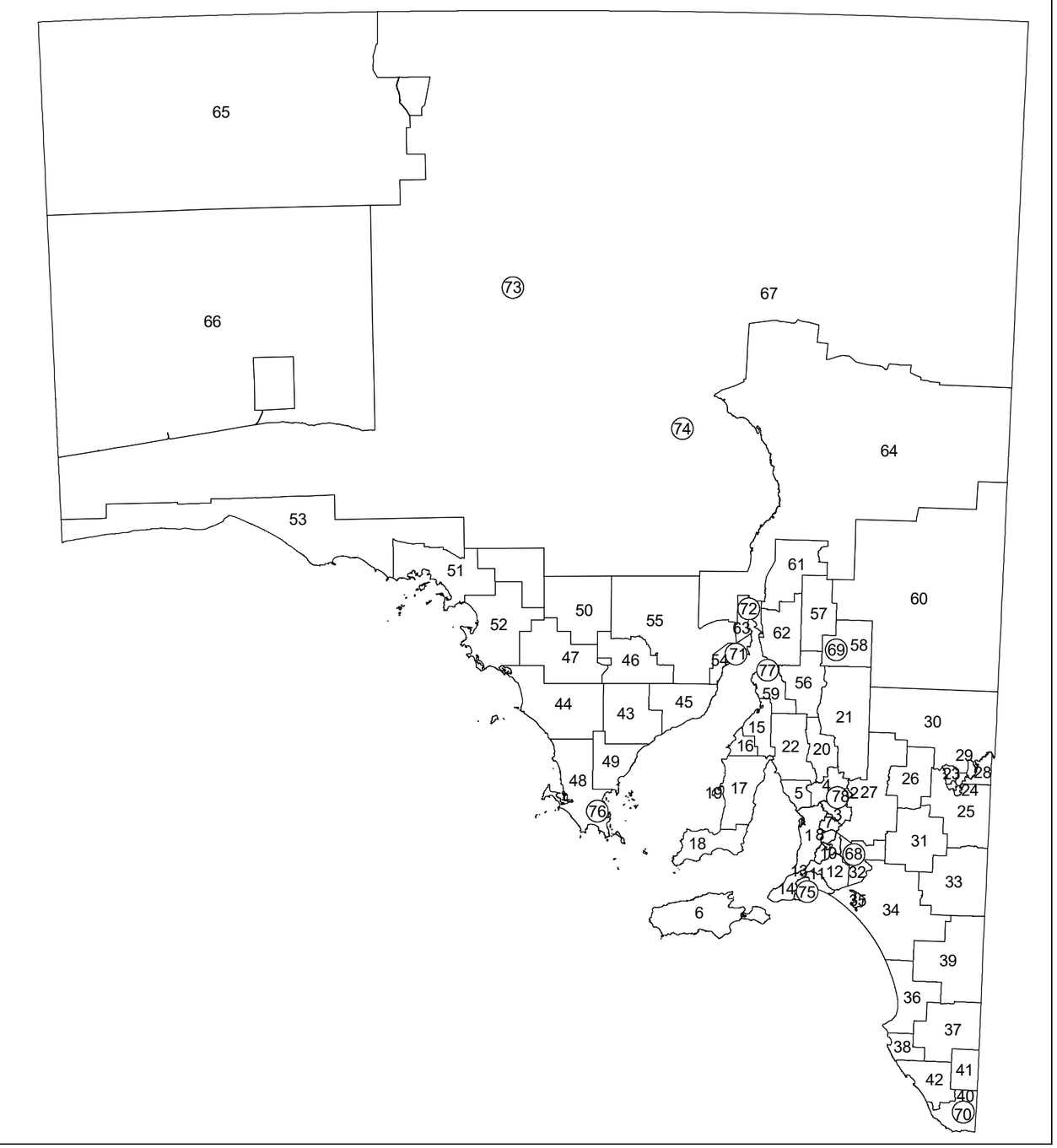
Statistical Local Areas	Map ref	Statistical Local Areas	Map ref
Gawler (T)	1	Adelaide Hills (DC) - Central	29
Playford (C) - East Central	2	Adelaide Hills (DC) - Ranges	30
Playford (C) - Elizabeth	3	Burnside (C) - North-East	31
Playford (C) - Hills	4	Burnside (C) - South-West	32
Playford (C) - West	5	Campbelltown (C) - East	33
Playford (C) - West Central	6	Campbelltown (C) - West	34
Port Adel. Enfield (C) - East	7	Norw. P'ham St Ptrs (C) - East	35
Port Adel. Enfield (C) - Inner	8	Norw. P'ham St Ptrs (C) - West	36
Salisbury (C) - Central	9	Prospect (C)	37
Salisbury (C) - Inner North	10	Unley (C) - East	38
Salisbury (C) - North-East	11	Unley (C) - West	39
Salisbury (C) - South-East	12	Walkerville (M)	40
Salisbury (C) Bal	13	Holdfast Bay (C) - North	41
Tea Tree Gully (C) - Central	14	Holdfast Bay (C) - South	42
Tea Tree Gully (C) - Hills	15	Marion (C) - Central	43
Tea Tree Gully (C) - North	16	Marion (C) - North	44
Tea Tree Gully (C) - South	17	Marion (C) - South	45
Charles Sturt (C) - Coastal	18	Mitcham (C) - Hills	46
Charles Sturt (C) - Inner East	19	Mitcham (C) - North-East	47
Charles Sturt (C) - Inner West	20	Mitcham (C) - West	48
Charles Sturt (C) - North-East	21	Onkaparinga (C) - Hackham	49
Port Adel. Enfield (C) - Coast	22	Onkaparinga (C) - Hills	50
Port Adel. Enfield (C) - Park	23	Onkaparinga (C) - Morphett	51
Port Adel. Enfield (C) - Port	24	Onkaparinga (C) - North Coast	52
West Torrens (C) - East	25	Onkaparinga (C) - Reservoir	53
West Torrens (C) - West	26	Onkaparinga (C) - South Coast	54
Unincorp. Western	27	Onkaparinga (C) - Woodcroft	55
Adelaide (C)	28		

Statistical Local Areas – Adelaide



Statistical Local Areas	Map ref	Statistical Local Areas	Map ref
Metropolitan Adelaide	1	Wattle Range (DC) - East	41
Barossa (DC) - Angaston	2	Wattle Range (DC) - West	42
Barossa (DC) - Barossa	3	Cleve (DC)	43
Light (RegC)	4	Elliston (DC)	44
Mallala (DC)	5	Franklin Harbour (DC)	45
Kangaroo Island (DC)	6	Kimba (DC)	46
Adelaide Hills (DC) - North	7	Le Hunte (DC)	47
Adelaide Hills (DC) Bal	8	Lower Eyre Peninsula (DC)	48
Mount Barker (DC) - Central	9	Tumby Bay (DC)	49
Mount Barker (DC) Bal	10	Unincorp. Lincoln	50
Alexandrina (DC) - Coastal	11	Ceduna (DC)	51
Alexandrina (DC) - Strathalbyn	12	Streaky Bay (DC)	52
Victor Harbor (C)	13	Unincorp. West Coast	53
Yankalilla (DC)	14	Whyalla (C)	54
Barunga West (DC)	15	Unincorp. Whyalla	55
Copper Coast (DC)	16	Northern Areas (DC)	56
Yorke Peninsula (DC) - North	17	Orroroo/Carrieton (DC)	57
Yorke Peninsula (DC) - South	18	Peterborough (DC)	58
Unincorp. Yorke	19	Port Pirie C Dists (M) Bal	59
Clare and Gilbert Valleys (DC)	20	Unincorp. Pirie	60
Goyder (DC)	21	Flinders Ranges (DC)	61
Wakefield (DC)	22	Mount Remarkable (DC)	62
Berri & Barmera (DC) - Barmera	23	Port Augusta (C)	63
Berri & Barmera (DC) - Berri	24	Unincorp. Flinders Ranges	64
Loxton Waikerie (DC) - East	25	Anangu Pitjantjatjara (AC)	65
Loxton Waikerie (DC) - West	26	Maralinga Tjarutja (AC)	66
Mid Murray (DC)	27	Unincorp. Far North	67
Renmark Paringa (DC) - Paringa	28	Murray Bridge (RC)	68
Renmark Paringa (DC) - Renmark	29	Peterborough (DC)	69
Unincorp. Riverland	30	Mount Gambier (C)	70
Karoonda East Murray (DC)	31	Whyalla (C)	71
Murray Bridge (RC)	32	Port Augusta (C)	72
Southern Mallee (DC)	33	Coober Pedy (DC)	73
The Coorong (DC)	34	Roxby Downs (M)	74
Unincorp. Murray Mallee	35	Victor Harbor (C)	75
Kingston (DC)	36	Port Lincoln (C)	76
Naracoorte and Lucindale (DC)	37	Port Pirie C Dists (M) City	77
Robe (DC)	38	Barossa (DC) - Tanunda	78
Tatiara (DC)	39		
Grant (DC)	40		

Statistical Local Areas – Regional South Australia



References

[1] Australian Institute of Health and Welfare, “https://www.aihw.gov.au/reports/asthma-other-chronic-respiratory-conditions/asthma-chronic-obstructive-pulmonary-disease-and/contents/table-of-contents,” 20 May 2010. [Online]. Available: https://www.aihw.gov.au/reports/asthma-other-chronic-respiratory-conditions/asthma-chronic-obstructive-pulmonary-disease-and/contents/table-of-contents. [Accessed 14 September 2017].

[2] Australian Bureau of Statistics, “Census of Population and Housing: Socio-Economic Indexes for Areas (SEIFA), Australia, 2011,” 2013. [Online]. Available: http://www.abs.gov.au. [Accessed May 2017].

[3] Public Health England / UCL Institute of Health Equity, “Reducing the number of young people not in employment, education or training,” 2014.

[4] G. Turrell, L. Stanley, M. de Looper and B. Oldenburg, “Health Inequalities in Australia: Morbidity, health behaviours, risk factors and health service use. Health Inequalities Monitoring Series No. 2. AIHW Cat. No. PHE 72,” Queensland University of Technology and the Australian Institute of Health and Welfare, Canberra, 2006.

[5] Department of Health, “Tobacco Control key facts and figures,” 29 June 2016. [Online]. Available: http://www.health.gov.au/internet/main/publishing.nsf/content/tobacco-kff. [Accessed 5 June 2017].

[6] Wirral Performance and Public Health Intelligence Team, “Health effects of unemployment,” 2012.

[7] R. C. Kessler, J. B. Turner and J. S. House, “Intervening processes in the the relationship between unemployment and health,” *Psychological Medicine,* vol. 17, pp. 949-961, 1987.

[8] J. Forker-Dunn, “Internet-based Patient Self-care: The Next Generation of Health Care Delivery,” *Journal of Medical Internet Research,* vol. 5, no. 2, p. e8, 2003.

[9] R. Price-Robertson, “What is community disadvantage? Understanding the issues, overcoming the problem,” May 2011. [Online]. Available: https://aifs.gov.au/cfca/publications/what-community-disadvantage-understanding-issues-ov. [Accessed 5 June 2017].

[10] D. Doiron, D. G. Fiebig, M. Johar and A. Suziedelyte, “Does self-assessed health measure health?,” *Applied Economics,* vol. 47, pp. 180-94, 2014.

[11] O. Manor, S. Matthews and C. Power, “Self-rated health and limiting longstanding illness: inter-relationships with morbidity in early adulthood,” *International Journal of Epidemiology,* vol. 30, no. 3, pp. 600-607, 2001.

[12] Australian Institue of Health and Welfare, “Chapter 1 - Understanding health and illness,” in *Australia's health 2014. Australia's health series no. 14. Cat. no. AUS 178*, Canberra, AIHW, 2014.

[13] Australian Institute of Health and Welfare, “Tobacco-related harms,” 2017. [Online]. Available: http://203.2.121.30/alcohol-and-other-drugs/smoking/harm/. [Accessed 21 August 2017].

[14] A. Chan, J. Scott, A.-M. Nguyen and L. Sage, “Pregnancy outcome in South Australia 2006,” Pregnancy Outcome unit, South Australian Department of Health, Adelaide, 2007.

[15] Australian Institute of Health and Welfare, “Chronic respiratory conditions including asthma and COPD,” 2017. [Online]. Available: http://203.2.121.30/chronic-respiratory-conditions/. [Accessed 21 August 2017].

[16] Department of Health, “Smoking Cessation Guidelines: for Australian general practice,” [Online]. Available: http://www.health.gov.au/internet/main/publishing.nsf/content/21A287831207BB16CA257BF0001E0159/$File/smoking_flip.pdf. [Accessed 25 August 2017].

[17] Royal Australian College of General Practitioners, “Clinical guidelines: Supporting smoking cessation, Varenicline,” [Online]. Available: https://www.racgp.org.au/your-practice/guidelines/smoking-cessation/pharmacotherapy-for-smoking-cessation/varenicline/. [Accessed 25 August 2017].

[18] Australian Institute of Health and Welfare, “Australia's health 2010,” AIHW, Canberra, 2010.

[19] Australian Institute of Health and Welfare, “COPD (chronic obstructive pulmonary disease),” 22 December 2016. [Online]. Available: https://www.aihw.gov.au/reports/asthma-other-chronic-respiratory-conditions/copd-chronic-obstructive-pulmonary-disease/contents/what-is-copd. [Accessed 10 October 2017].

[20] The Australian Lung Foundation, “COPD,” [Online]. Available: https://lungfoundation.com.au/patient-support/copd/. [Accessed 10 October 2017].

[21] Australian Institute of Health and Welfare, “Lung cancer - an overview,” AIHW, Canberra, 2011.

[22] Australian Institute of Health and Welfare & Australasian Association of Cancer Registries, “Cancer in Australia 2010: an overview. Cancer series no. 60,” AIHW, Canberra, 2010.

[23] Hugo Centre for Migration and Population Research, “ARIA,” Australian Population and Migration Research Centre, [Online]. Available: https://www.adelaide.edu.au/hugo-centre/spatial_data/aria/. [Accessed 10 October 2017].

[24] Australian Institute of Health and Welfare, “Remoteness classification (ASGS-RA) N - METeOR,” [Online]. Available: http://meteor.aihw.gov.au/content/index.phtml/itemId/531713/meteorItemView/long. [Accessed 31 March 2016].