

# Hotspots of potentially preventable hospital admissions

Pinpointing potential health inequalities by analysis of South Australian public hospital admitted patient care data

Second edition, November 2019

## Hotspots of potentially preventable admissions to South Australia's public hospitals, 2019

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# Hotspots of potentially preventable hospital admissions

## Preface

People are often admitted to hospital for reasons that could have been attended to with effective, timely preventative care in primary healthcare and other community health settings. The performance indicator set under Australia's National Healthcare Agreement defines 22 categories of health conditions for which hospitalisation is potentially preventable, a range of acute, chronic and vaccine-preventable conditions<sup>1</sup>.

In December 2017, the Health Performance Council published a bitesize teaser report of some high level analysis of South Australian public hospital admissions data to reveal some areas of the state, mainly in regional and remote country areas, which had particularly and persistently high levels of these potentially preventable hospital admissions<sup>2</sup>. As we reported at the time, SA Health had been leading a collaborative effort to produce a more detailed and robust study on the topic. Two years on, as we continue to await that detailed SA Health report, we have produced this second edition of our bitesize high level analysis with more recent data and improved analytical methods.

## Discussion

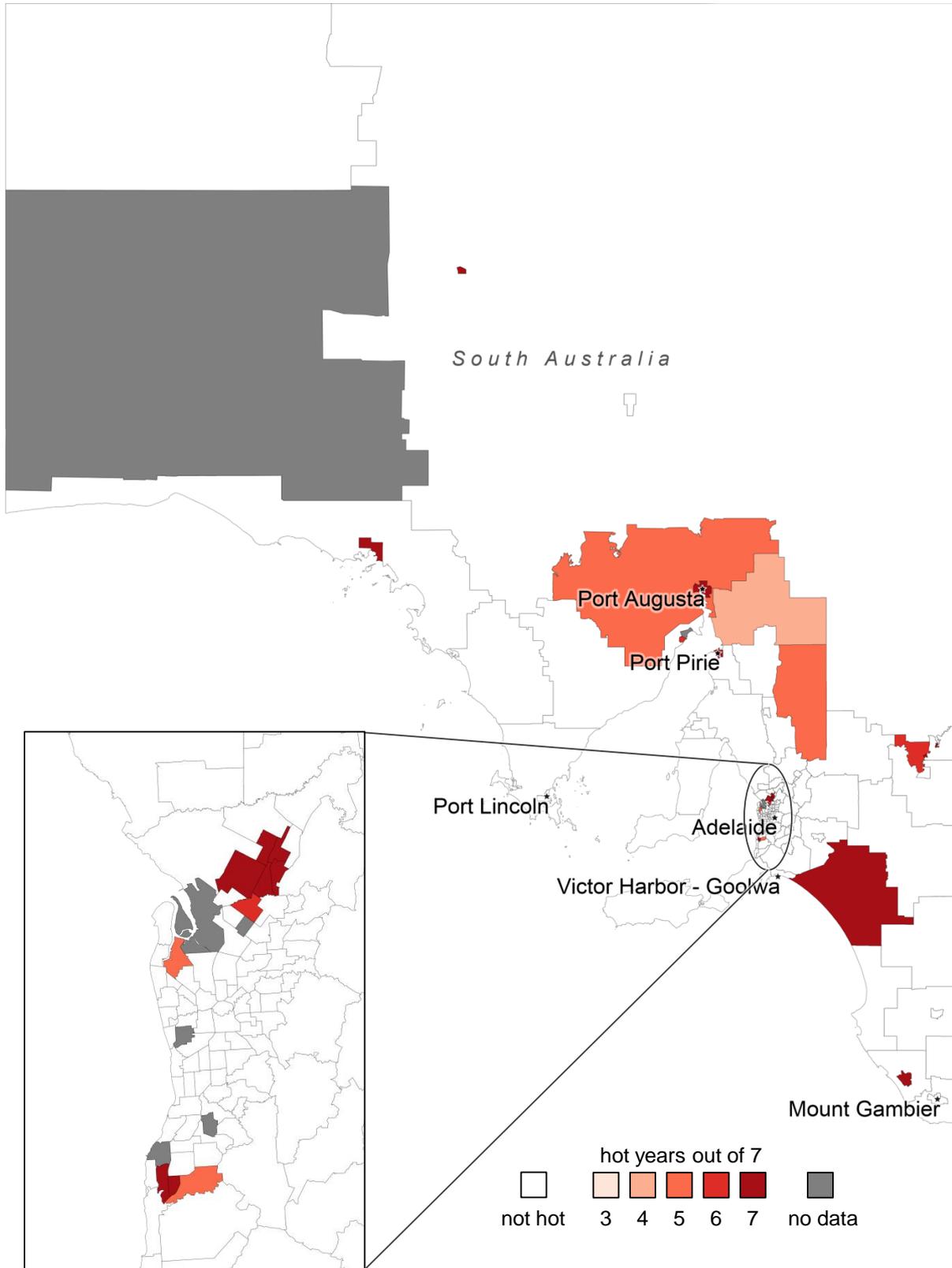
There were 36,500 inpatient admissions for potentially preventable hospitalisations recorded in South Australia's public hospitals in the 2018–19 financial year, some one in every 11 of all inpatient admissions. Effective, timely interventions in primary care settings or through public health interventions may have prevented many of these hospital admissions from having been necessary or reduced their incidence. Early interventions that could have removed the need for some of these admissions include take-up of vaccinations, early treatment of infections with GP-prescribed medications, and GP-led long-term management plans for chronic diseases.

But these potentially preventable hospital admissions are not evenly spread through the state. Comparing the number of these hospital admissions against the population in each community region<sup>3</sup> of the state reveals some areas to be particular 'hotspots' for these admissions, having rates of admission much higher than elsewhere in the state. Consistent with methods used for other analyses of data from Victoria<sup>4</sup>, Queensland<sup>4</sup> and Western Australia<sup>5</sup>, we have chosen to flag as 'hotspots' of potentially preventable hospital admission those areas with admission rates at least 50% higher than the state-wide average. We have adjusted for the effects of different population demographics (age and sex) by calculating direct-standardised rates. These relatively high rates of potentially preventable admission to hospital are potential indicators of areas being candidates for primary care or public health programs to secure that people receive earlier community based interventions and reduce hospital admission rates.

Looking across seven years of data starting from 2012–13 (the earliest year of data available for the geographic areas under analysis) reveals that some areas are not only identified as hotspots of potentially preventable hospital admissions but are persistently identified as such. We consider persistence of hotness — in some cases, areas being hotspots in all seven years of our dataset — to be important if results are to be used as a flag for potential place-based intervention, providing for a more robust conclusion than could be taken from any single year of data by reducing the opportunity for identifying an area as a hotspot merely by dint of random and expected fluctuations in the underlying hospital admissions data. The opportunity for effective intervention is also indicated by the predictive element to persistence: we found that in at least 90% of cases, areas identified as a hotspot in at least two consecutive years of the first six years of our dataset were again identified as a hotspot in the following year.

### Persistent hotspots of potentially preventable admissions to public hospitals

Number of years identified as a hotspot by level-2 ABS statistical areas for South Australia and (inset) Adelaide area. Areas not shown as 'hot' unless identified as a hotspot for three or more consecutive years out of seven.



Hot years out of 7	Adelaide area	Rest of South Australia
7 years	Christie Downs	Berri
	Davoren Park	Ceduna
	Elizabeth	Cooper Pedy
	Elizabeth East	The Coorong
	Hackham West - Huntfield Heights	Millicent
	Salisbury North	Port Augusta
	Smithfield - Elizabeth North	Port Pirie Renmark
6 years	Salisbury	Barmera Whyalla
	Hackham - Onkaparinga Hills	Goyder
5 years	Port Adelaide	Quorn - Lake Gilles
	-	Peterborough - Mount Remarkable
4 years	-	-
3 years	-	-

In our previous edition of this report, we had to exclude large parts of country South Australia from analysis because of low populations. The change to a different type of geography (standard 'level 2 statistical area' instead of postcode area) has meant that this has not been necessary in this repeat edition, allowing us to reveal a set of persistent hotspots in both the Adelaide area and in regional and remote South Australia. However, we consider it likely that many patients, especially those residing close to the state's borders, will attend hospitals in neighbouring states and territories; as extra-territorial hospital admissions are not recorded in our data, some border areas may therefore be more persistently a hotspot than our summary analysis suggests.

#### *Private hospital data*

This analysis is limited admissions to public hospitals in South Australia, as a result of a limitation in the data available to us for routine analysis. The more thorough analysis being developed by SA Health is expected to include data for all hospitals in South Australia. Results and conclusions that include private hospital admissions may differ in places from this report as a sizable fraction of hospital activity in South Australia does take place in private hospitals: more than 40% of hospital inpatient episodes in South Australia were in private hospitals in the year July 2017 – June 2018<sup>[6]</sup>. We do note that across all of Australia, the Australian Institute of Health and Welfare has reported of its analysis of both public and private hospital data that 'nearly 10% of hospital bed days were for potentially preventable hospitalisations'<sup>7</sup>, even given some differences in definitions and analytic methods, that is broadly commensurate with the approximately 1 in 11 admissions we report for South Australian public hospitals.

## Conclusion

Health outcomes for South Australians are not equal for all. Especially, in some parts of the state, the population are more frequently than elsewhere being admitted to hospital in circumstances that could often have been prevented through earlier community and primary healthcare interventions. Accounting for, and thus removing the effect of, differences in age and gender makeup of different parts of the state, we identify several areas for which this has been persistently the case over several years. Although not sufficient from our limited analysis for a definitive inference, this does serve as an indicative proxy for areas for which it might be warranted to investigate further the possibility of targeted public health promotion and preventional interventions. We look forward to reading the conclusions that will arise from more thorough and detailed analysis presently being led by SA Health.

## Find out more

As was the case with our 2017 edition of this report, this is intended to be just a very brief dip into public hospital activity data for high level findings on potentially preventable admissions. SA Health continues to lead on work to produce a more thorough and robust study of the data, including more detailed breakdowns by each of the 22 categories of potentially preventable hospital admissions. Health Performance Council and the two Primary Health Networks in South Australia are providing assistance with this work.

Changes made for this report compared to our 2017 edition have been made for alignment with the forthcoming SA Health report, including the use of statistical areas rather than postal areas, age and sex standardisation rather than crude admission rates, and some technical changes to the treatment of the raw data to avoid double-counting hospital admissions. Pending the release of the SA Health report, we would appreciate in the meantime any feedback from readers on this short teaser report: email [healthhealthperformancecouncil@sa.gov.au](mailto:healthhealthperformancecouncil@sa.gov.au) with your thoughts.

## Notes and references

### Further reading

This work was inspired by, and borrows heavily from the methods of, the Grattan Institute's *Perils of Place*<sup>[4]</sup> analysis of hospital data from Queensland and Victoria. Dr Stephen Duckett, a member of the Health Performance Council, is Health Program Director at Grattan. Find out more: <https://grattan.edu.au/report/perils-of-place-identifying-hotspots-of-health-inequality/>

Similar analysis to the Grattan work was also published for Western Australia in 2017<sup>[5]</sup>. Find out more: [https://ww2.health.wa.gov.au/Articles/J\\_M/Lessons-of-Location-report](https://ww2.health.wa.gov.au/Articles/J_M/Lessons-of-Location-report)

### Technical notes

- In this report, we have sought to ensure that only original *admissions* to hospital are counted for analysis rather than all recorded episodes of inpatient care. We have therefore applied filters to combine records where a patient was treated under two or more recorded episodes of care in a single hospital spell, and we have further sought to avoid double-counting by excluding from analysis those hospital inpatient episodes where the patient was recorded as having been transferred in from another hospital.
- Analysis for all years has used population estimates for June 2016. This may have produced small differences in results compared to the use of per-year population estimates.
- Statistical areas with populations under 1,000 were wholly excluded from analysis to mitigate small variations in numbers of hospital admissions from year to year affecting whether an area is identified as a hotspot. Excluded areas and their estimated resident populations were:

Parafield (118), Western (80), Lonsdale (30), Torrens Island (3), Dry Creek – North (0), Happy Valley Reservoir (0), Dry Creek – South (0), Adelaide Airport (0), Whyalla – North (0).

- Statistical area 'Mount Gambier' was split for official statistics purposes into East and West from the 2017–18 financial year, but has been re-merged in all years for our analysis.
- Statistical area 'Pooraka' was split for official statistics purposes into 'Pooraka – Cavan' and 'Mawson Lakes – Globe Derby Park' from the 2018–19 financial year, but has been re-merged in all years for our analysis.
- Underlying hospital data for statistical area 'Morphett Vale – West' appears as 'Morphett Vale – East' in some cases; these two areas have accordingly been merged for our analysis.

**The 22 categories of hospitalisation generally considered potentially preventable**

Source: *National healthcare agreement indicator set*<sup>1</sup>

Condition type	Condition categories
Acute	Cellulitis Convulsions and epilepsy Dental conditions Ear, nose and throat infections Eclampsia Gangrene Pelvic inflammatory disease Perforated/bleeding ulcer Pneumonia (not vaccine-preventable) Urinary tract infections, including pyelonephritis
Chronic	Angina Asthma Bronchiectasis Chronic obstructive pulmonary disease Congestive cardiac failure Diabetes complications Hypertension Iron deficiency anaemia Nutritional deficiencies Rheumatic heart diseases
Vaccine-preventable	Influenza and pneumonia Certain other vaccine-preventable conditions

## References

- <sup>1</sup> Australian Institute of Health and Welfare. *National healthcare agreement: PI 18 – selected potentially preventable hospitalisations, 2019*. Meteor metadata online registry identifier 698904.
- <sup>2</sup> Health Performance Council [South Australia]. *Hotspots of potentially preventable hospitalisations in South Australia's public hospitals — pinpointing potential health inequalities by analysis of public hospital activity data*. Government of South Australia, 2017.
- <sup>3</sup> Geographic areas used in this report are 'statistical area level 2' as defined by Australian Bureau of Statistics. Further information at [https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by Subject/1270.0.55.001~July 2016~Main Features~Statistical Area Level 2 \(SA2\)~10014](https://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by+Subject/1270.0.55.001~July+2016~Main+Features~Statistical+Area+Level+2+(SA2)~10014)
- <sup>4</sup> Duckett, S; Griffiths, K. *Perils of place — identifying hotspots of health inequality*. Grattan Institute, 2016. ISBN 978-2-925015-89-8.
- <sup>5</sup> Department of Health [Western Australia]. *Lessons of location: potentially preventable hospitalisation — hotspots in Western Australia 2017*. State of Western Australia, 2017.
- <sup>6</sup> Based on data from Australian Institute of Health and Welfare. Table 2.2 'Separations for public and private hospitals, states and territories, 2013–14 to 2017–18', *Admitted patient care 2017–18: Australian hospital statistics*, cat. no. HSE 225. May 2019.
- <sup>7</sup> Based on data from Australian Institute of Health and Welfare. Web report front page, *Potentially preventable hospitalisations in Australia by age groups and small geographic areas, 2017–18*, cat. no. HPF 36. November 2019.
- <sup>8</sup> Admitted patient care data based on data from: Department for Health and Wellbeing [South Australia]. Custom data extract, unpublished, Government of South Australia, 2019.
- <sup>9</sup> Population data based on Australian Bureau of Statistics data: Data cube 'Population Estimates by Age and Sex, Regions of Australia (ASGS 2016), 2018', *Regional Population by Age and Sex, Australia, 2018* (cat. no. 3235.0), 2019.
- <sup>10</sup> Statistical area boundaries based on Australian Bureau of Statistics data: 'Statistical Area Level 2 (SA2) ASGS Ed 2016 Digital Boundaries', *Australian Statistical Geography Standard (ASGS): Volume 1 - Main Structure and Greater Capital City Statistical Areas, July 2016* (cat. no. 1270.0.55.001), 2016.
- <sup>11</sup> Major South Australian city and town location data based on Australian Bureau of Statistics data: 'Significant Urban Area (SUA) ASGS Ed 2016 Digital Boundaries', *Australian Statistical Geography Standard (ASGS): Volume 4 - Significant Urban Areas, Urban Centres and Localities, Section of State, July 2016* (cat. no. 1270.0.55.004), 2016.