

## 2.3 Computed tomography of the lumbar spine

### Context

This data item examines computed tomography of the lumbar spine. The data are for services funded by the MBS. They exclude publicly funded hospital services. Each repeat lumbar spine CT imaging service for one person is counted as one service.

Computed tomography, more commonly known as a CT or CAT scan, is a diagnostic test that uses radiation to produce images of structures within the body.

The lumbar spine is the lowest portion of the spine and comprises vertebral bones, blood vessels, nerves, ligaments and cartilage. Back pain is common in the lumbar spine area. In Australia, low back pain is the number one cause of years lived with disability.<sup>1</sup> It is also the third most common problem seen by Australian general practitioners.<sup>2</sup>

Internationally, the use of CT scanning to diagnose low back pain is increasing.<sup>3</sup> CT of the lumbar spine should be performed only to confirm or exclude the presence of an underlying injury or disease of the spine that would change the subsequent medical treatment or investigation of the patient.<sup>4</sup> Inappropriate use of imaging can expose patients to unnecessary harm from radiation. Radiation doses from CT scans are about 100 times greater than from plain X-rays.<sup>4</sup>

The Royal Australian and New Zealand College of Radiologists has recommended that lumbar spine imaging for adults with non-specific acute lower back pain should only be undertaken when the patient has indicators of a serious cause for low back pain including risk factors for fracture and previous or current cancer.<sup>5</sup>

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## Magnitude of variation

In 2013–14, there were 314,033 MBS-funded services for CT imaging of the lumbar spine, representing 1,282 services per 100,000 people (the Australian rate).

The number of MBS-funded services for CT imaging of the lumbar spine across 320\* local areas (SA3s) ranged from 209 to 2,464 per 100,000 people.

The number of services was **11.8 times higher** in the area with the highest rate compared to the area with the lowest rate. The average number of services varied across states and territories, from 720 per 100,000 people in the Northern Territory, to 1,407 in New South Wales.

After excluding the highest and lowest results, the CT imaging of the lumbar spine rate across the 292 remaining local areas was **2.7 times higher** in one local area compared to another.

Rates of CT of the lumbar spine were highest in major cities and decreased with increasing remoteness. Rates of claims were highest in areas of low socioeconomic status and decreased with increasing socioeconomic status.

## Interpretation

Potential reasons for the variation include differences in:

- clinical decision making and clinicians' adherence to clinical guidelines
- the incidence and prevalence of back injury and back pain
- the prevalence of risk factors such as obesity<sup>6</sup>
- levels of private health insurance and access to private hospitals, noting that services provided to public patients in public hospitals are excluded from the data. The proportion of scans carried out in private hospitals may vary according to state and territory, as well as by remoteness and socioeconomic status. In particular, people living in metropolitan areas, and those of higher socioeconomic status, have greater access to private hospital services
- clinician referral patterns
- availability and access to CT scanners
- patient preferences and understanding of the risks and benefits of CT imaging
- indications for CT of the lumbar spine on the MBS schedule.

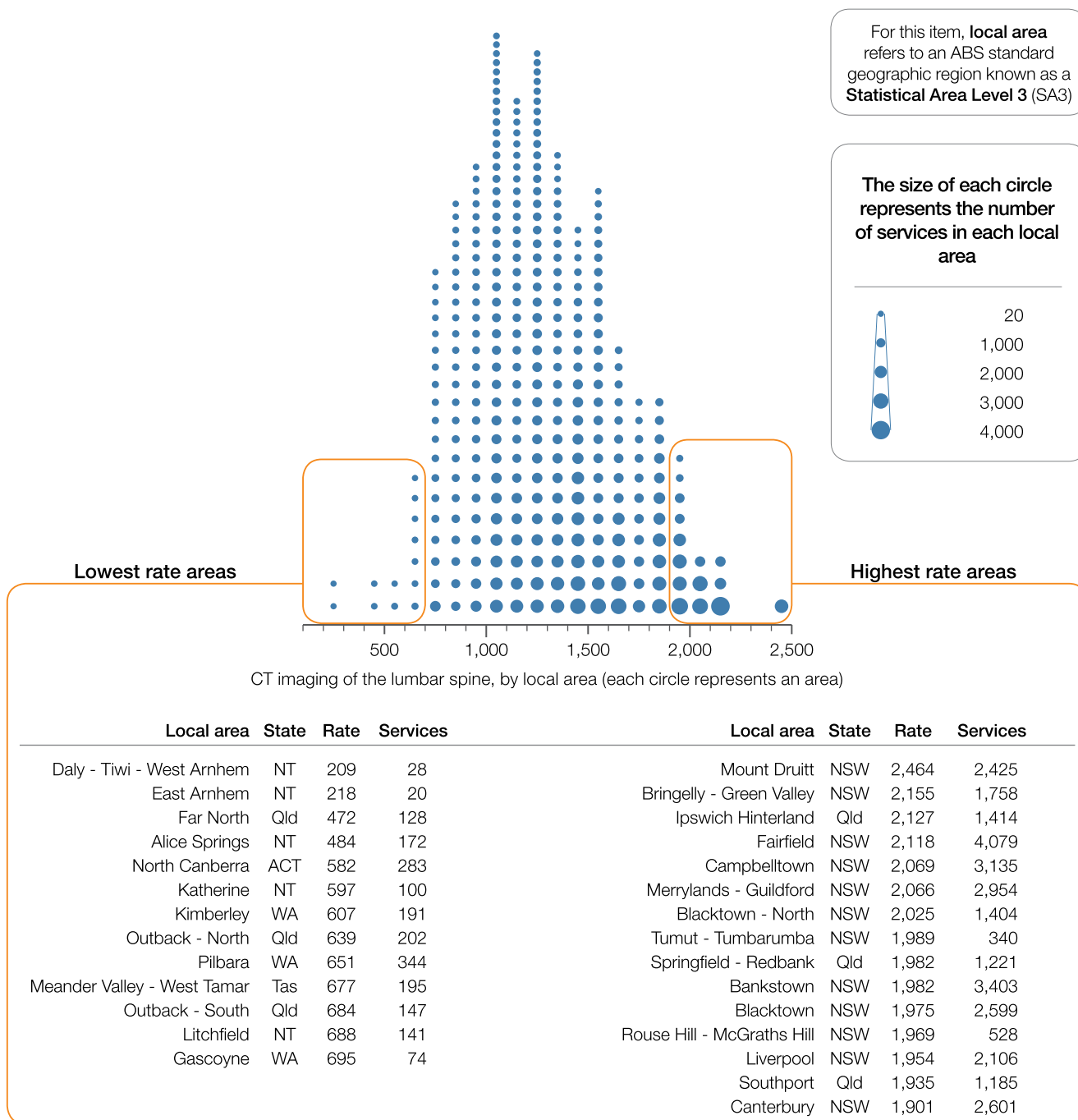
To explore this variation, further analysis could focus on:

- gathering data on rates of CT of the lumbar spine for public patients to develop a comprehensive picture of variation
- linking data to explore outcomes of imaging, such as patient reported outcome measures or the proportion of patients who progress to surgery.

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\*There are 333 SA3s. For this item, data were suppressed for 13 SA3s. This is because of confidentiality requirements given the small numbers of services in these areas.

**Figure 25: Number of MBS-funded services for CT imaging of the lumbar spine per 100,000 people, age standardised, by local area, 2013–14**



**Notes:**

Rates are standardised based on the age structure of the Australian population in 2001.  
State/territory and national rates are based on the total number of services and people in the geographic area.  
The term local area refers to an ABS standard geographic region known as a Statistical Area Level 3 (SA3).

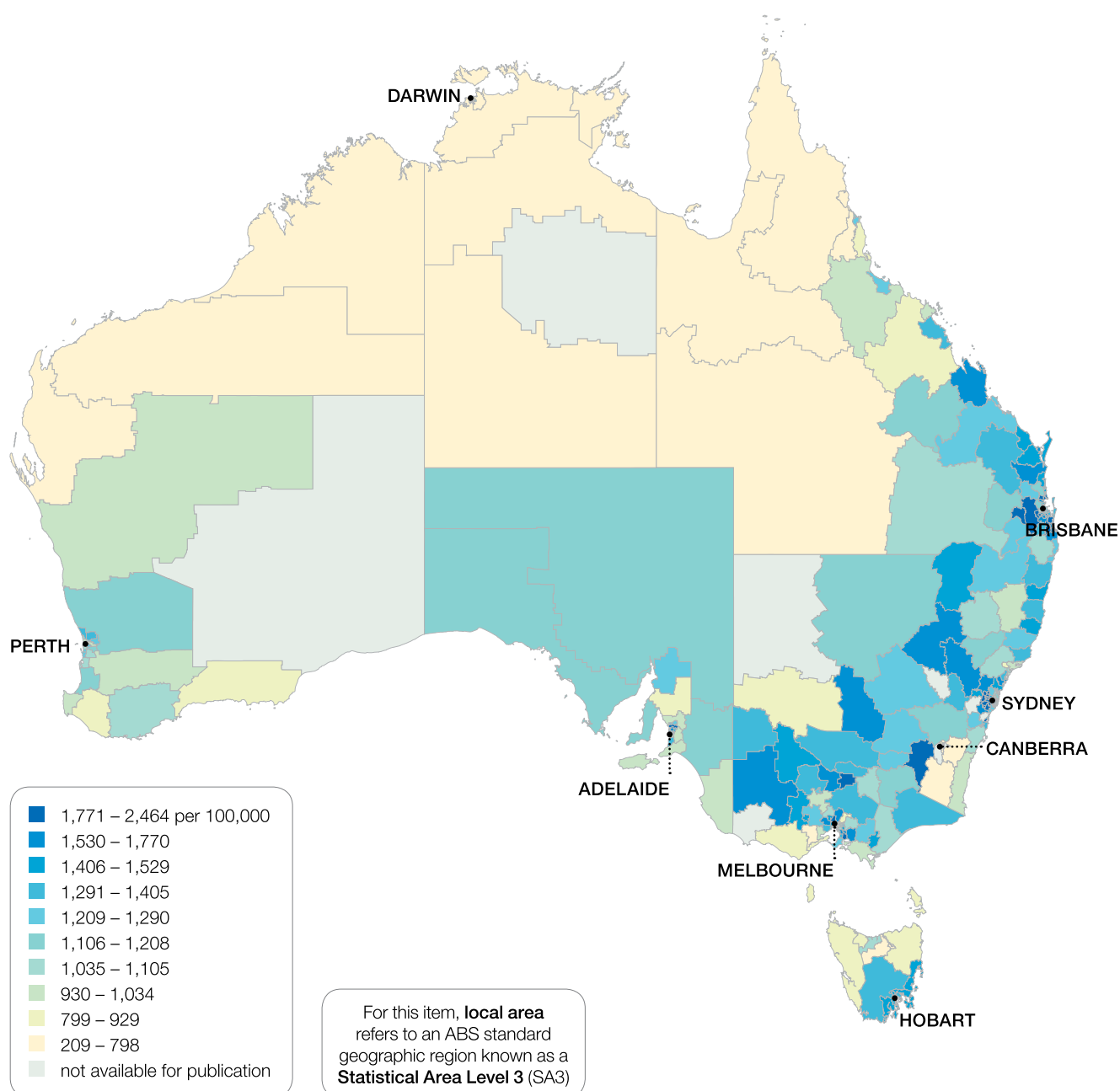
MBS statistics exclude services provided free of charge to public patients in hospitals, to Department of Veterans' Affairs beneficiaries, some patients under compensation arrangements and through other publicly funded programs. SA3 analysis excludes approximately 190 services from GPO postcodes 2001, 2124, 3001, 4001, 5001, 6843 but these data are included in state/territory and national level analysis.

For more technical information please refer to the Technical Supplement.

**Sources:** National Health Performance Authority analysis of Department of Human services Medicare Benefits statistics 2013–14 (data supplied 12/08/2014) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

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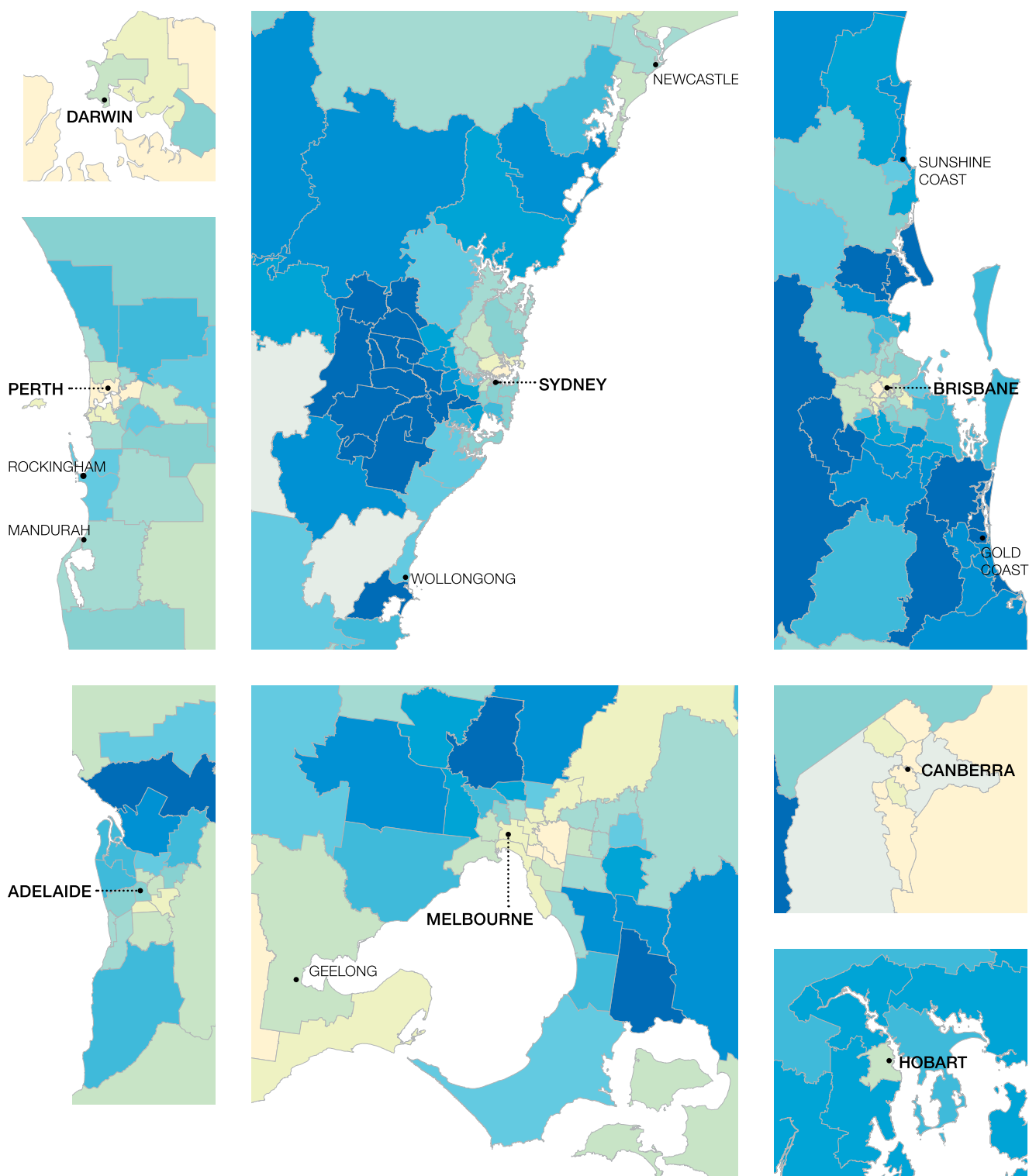
**Figure 26:** Number of MBS-funded services for CT imaging of the lumbar spine per 100,000 people, age standardised, by local area, 2013–14



**Sources:** National Health Performance Authority analysis of Department of Human services Medicare Benefits statistics 2013–14 (data supplied 12/08/2014) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.



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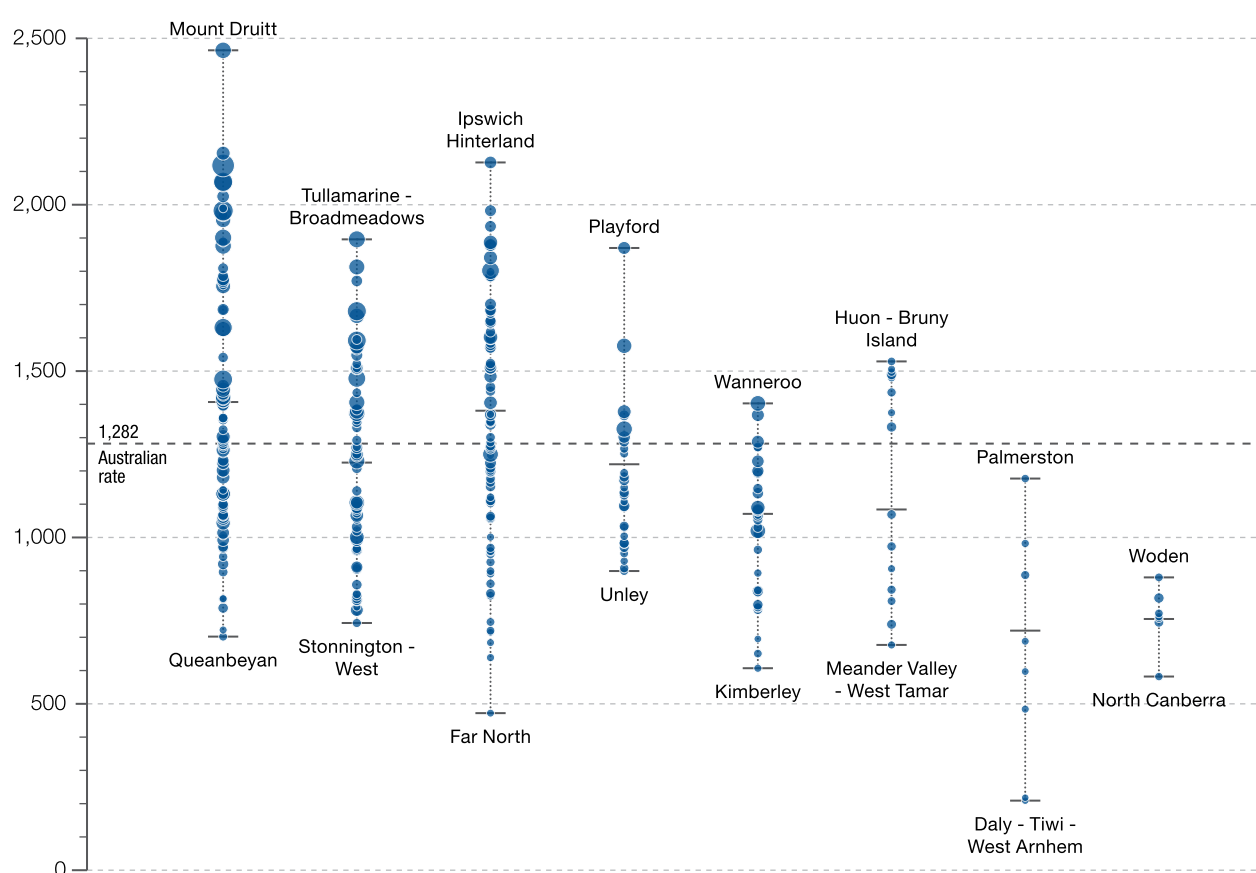


**Sources:** National Health Performance Authority analysis of Department of Human services Medicare Benefits statistics 2013–14 (data supplied 12/08/2014) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

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**Figure 27: Number of MBS-funded services for CT imaging of the lumbar spine per 100,000 people, age standardised, by local area, state and territory, 2013–14**

	NSW	Vic	Qld	SA	WA	Tas	NT	ACT
Highest rate	2,464	1,896	2,127	1,870	1,403	1,529	1,177	880
State/territory	1,407	1,225	1,381	1,220	1,071	1,084	720	755
Lowest rate	702	743	472	899	607	677	209	582
No. services	112,105	74,753	66,419	22,782	27,336	6,320	1,482	2,825



For this item, **local area** refers to an ABS standard geographic region known as a **Statistical Area Level 3 (SA3)**

The size of each circle represents the number of services in each local area

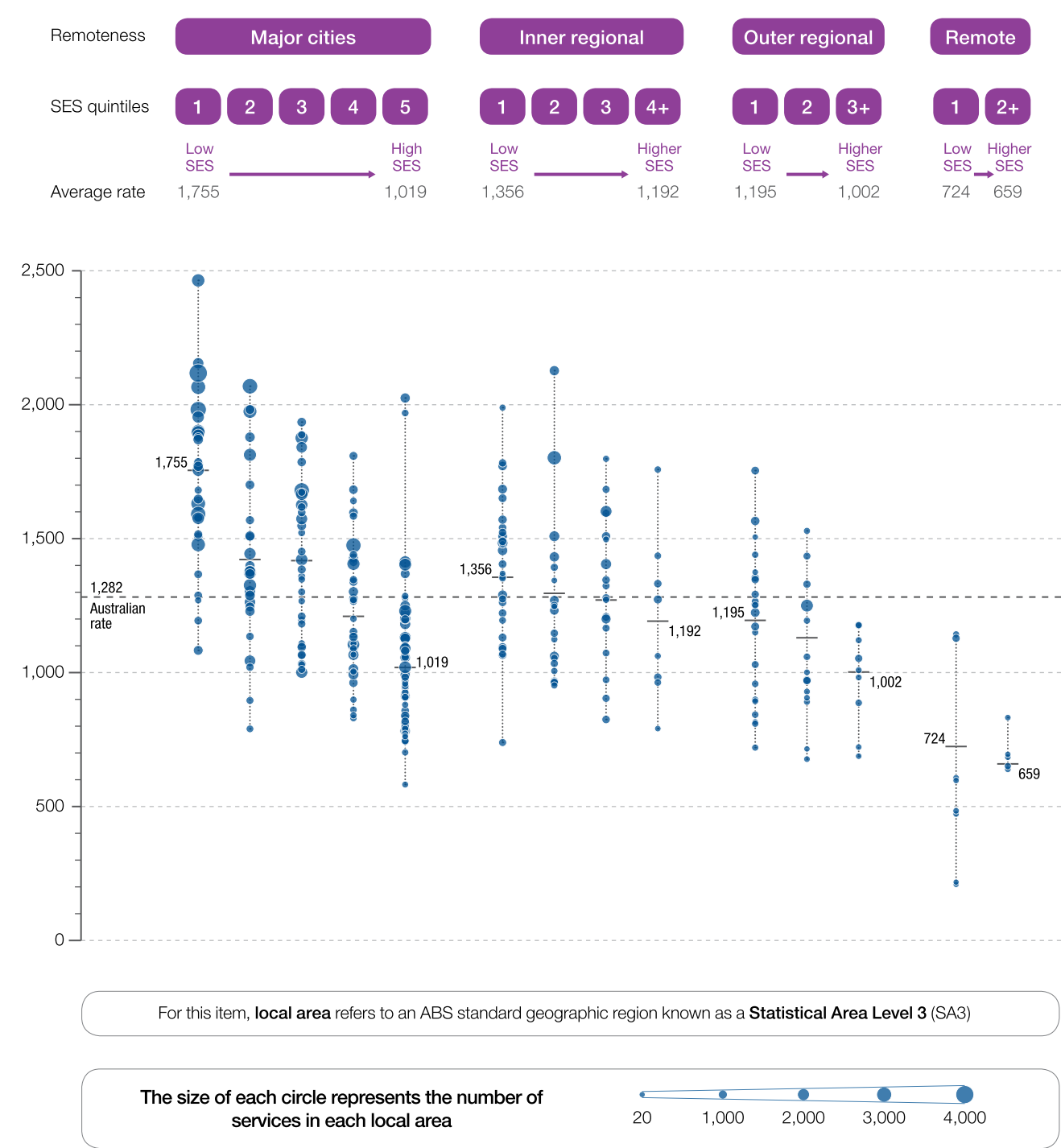


## Notes:

Rates are standardised based on the age structure of the Australian population in 2001. State/territory and national rates are based on the total number of services and people in the geographic area.

**Sources:** National Health Performance Authority analysis of Department of Human services Medicare Benefits statistics 2013–14 (data supplied 12/08/2014) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

**Figure 28: Number of MBS-funded services for CT imaging of the lumbar spine per 100,000 people, age standardised, by local area, remoteness and socioeconomic status (SES), 2013–14**



**Notes:**  
Rates are standardised based on the age structure of the Australian population in 2001.  
The national rate is based on the total number of services and people in Australia.  
Average rates are based on the total number of services and people in the local areas within each group.

**Sources:** National Health Performance Authority analysis of Department of Human services Medicare Benefits statistics 2013–14 (data supplied 12/08/2014) and Australian Bureau of Statistics Estimated Resident Population 30 June 2013.

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## Resources

- National Health and Medical Research Council. *Lumbar Imaging in Acute Non-Specific Low Back Pain*. 2008. Available at [www.nhmrc.gov.au/\\_files\\_nhmrc/file/nics/news\\_events/080221\\_lumbar\\_imaging.pdf](http://www.nhmrc.gov.au/_files_nhmrc/file/nics/news_events/080221_lumbar_imaging.pdf).
- Royal Australian and New Zealand College of Radiologists. *Education Modules for Appropriate Imaging Referrals*. Available at: [www.ranzcr.edu.au/quality-a-safety/program/key-projects/education-modules-for-appropriate-imaging-referrals](http://www.ranzcr.edu.au/quality-a-safety/program/key-projects/education-modules-for-appropriate-imaging-referrals)).
- Royal Australian and New Zealand College of Radiologists. *Inside Radiology*. Available at: <http://insideradiology.com.au/>.
- Choosing Wisely, Royal Australian and New Zealand College of Radiologists. *Tests, treatments and procedures clinicians and consumers should question*. 2015. Available at: [www.choosingwisely.org.au/recommendations/ranzcr](http://www.choosingwisely.org.au/recommendations/ranzcr).
- Choosing Wisely, American College of Emergency Physicians. *Lumbar spine imaging in the ED*. 2014. Available at: [www.choosingwisely.org/clinician-lists/acep-lumbar-spine-imaging-in-the-ed/](http://www.choosingwisely.org/clinician-lists/acep-lumbar-spine-imaging-in-the-ed/).

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- 1 Vos T, Barber RM, Bell B, Bertozzi-Villa A, Biryukov S, Bolliger I, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the global burden of disease study 2013. *The Lancet*. 2015;386(9995):743.
  - 2 Australian Institute of Health and Welfare. *Australia's Health 2010*. Canberra: AIHW, 2010.
  - 3 Dagenais S, Galloway EK, Roffey DM. A systematic review of diagnostic imaging use for low back pain in the United States. *The spine journal*. 2014;14(6):1036–48.
  - 4 Goergen S, Maher C, Leech M, Kuang R. *Acute low back pain. Education modules for appropriate imaging referrals*. Sydney: Royal Australian and New Zealand College of Radiologists, 2015.
  - 5 Choosing Wisely, Royal Australian and New Zealand College of Radiologists. *Tests, treatments and procedures clinicians and consumers should question*. 2015. (Accessed 7 October 2015 at: [www.choosingwisely.org.au/recommendations/ranzcr](http://www.choosingwisely.org.au/recommendations/ranzcr)).
  - 6 Shiri R, Karppinen J, Leino-Arjas P, Solovieva S, Viikari-Juntura E. The association between obesity and low back pain: a meta-analysis. *American Journal of Epidemiology*. 2010;171(2):135–154.