

**AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE**

Surgical Interventions

**The Second Australian
Atlas of Healthcare
Variation**

2017



The Australian Atlas of Healthcare Variation series



AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE

Interactive Atlas Platform

The Australian Atlas of Healthcare Variation

Mapping variation is an invaluable tool for understanding how our healthcare system is providing care. The Australian Atlas of Healthcare Variation series illuminates variation by mapping use of health care according to where people live. Each Atlas identifies specific achievable actions for exploration and quality improvement.

Healthcare Variation - what does it tell us?

Some variation is expected and associated with need-related factors such as underlying differences in the health of specific populations, or personal preferences. However, the weight of evidence in Australia and internationally suggests that much of the variation documented in the Atlas is likely to be unwarranted. Understanding this variation is critical to improving the quality, value and appropriateness of health care.

The Second Australian Atlas of Healthcare Variation data set specifications are available at [METeOR](#)

The First Australian Atlas of Healthcare Variation data set specifications are available at [METeOR](#)

Interactive Atlas

**The First
Australian Atlas
of Healthcare
Variation**

2015



Interactive Atlas

**The Second
Australian Atlas
of Healthcare
Variation**

2017



Interactive Atlas



Second Australian Atlas of Healthcare Variation

Examines variation nationally in 18 clinical items, grouped into 4 themes



Chronic disease and infection

- Chronic obstructive pulmonary disease (COPD)
- Heart failure
- Cellulitis
- Kidney and urinary tract infections
- Diabetes complications



Cardiovascular conditions

- Acute myocardial infarction
- Atrial fibrillation



Women's health and maternity

- Hysterectomy
- Endometrial ablation
- Cervical loop excision or cervical laser ablation
- Vaginal deliveries with third or fourth degree perineal tear
- Caesarean section, ages 20 to 34 years



Surgical interventions

- Knee replacement
- Lumbar spinal decompression
- Lumbar spinal fusion
- Laparoscopic cholecystectomy
- Appendicectomy
- Cataract surgery





Australian Commission on Safety and Quality in Health Care

- Australian Government agency
- Leads & coordinates national improvements in safety & quality of health care based on best available evidence
- Works in partnership with patients, consumers, clinicians, managers, policy makers & health care organisations
- Aims to ensure that the health system is sustainable, better informed, supported & organised to deliver safe & high quality care





Inside this toolkit

- Why does variation matter?
- How is variation measured in the Atlas?
- How is variation presented in the Atlas?
- Surgical Interventions: key findings
- Conclusion
- Further resources.





Why does variation matter?

- Large variations in healthcare use have been documented by researchers around the world for many years
- A proportion of this variation is termed '*unwarranted*'
- Unwarranted variation:
 - is unrelated to patient need or preference
 - may signal inappropriate care
 - may signal ineffective use of resources
- It raises questions about appropriateness of care, health system efficiency, equity and access
- Can highlight opportunities for further investigation and for the health system to improve.





How is variation measured in the Atlas?

- Healthcare use is mapped **by residence of patient** (not location of the healthcare provider)
- Location of residence mapped to Statistical Area Level 3 (SA3)
- Data are **age- and sex-standardised**
- Data sources used:
 - National Hospital Morbidity Database (NHMD)
 - National Perinatal Data Collection (NPDC)
- Data analysis and extraction performed by the Australian Institute of Health and Welfare (AIHW).





How is variation presented in the Atlas?

- Data are presented in maps and graphs
- For items where there were small numbers, three years of data have been presented
- Statistical Area Level 3 data is presented for:
 - state and territory analysis
 - remoteness and socioeconomic disadvantage
- State and territory level data is presented for:
 - Aboriginal and Torres Strait Islander Australian status
 - public and private patient funding status.



Surgical interventions key findings

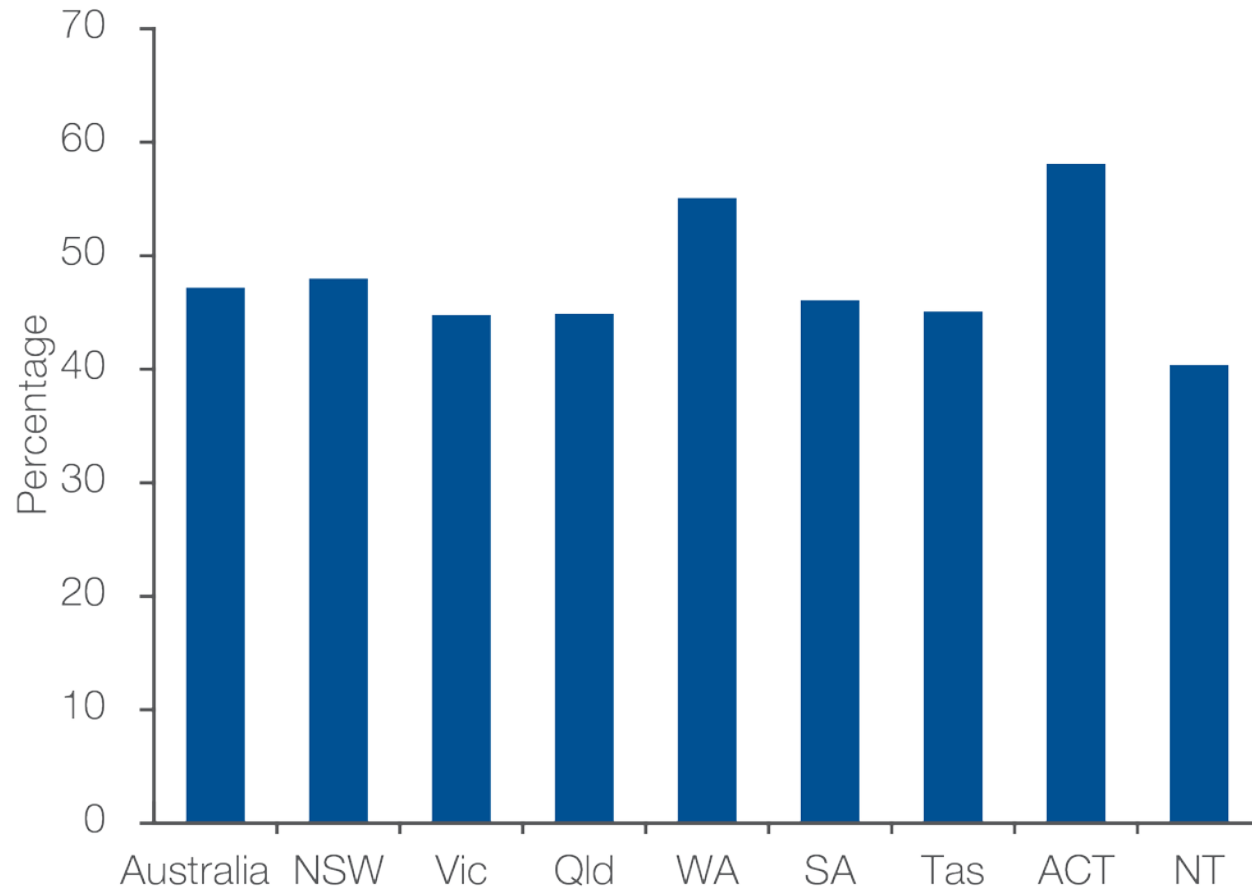
Data item	Range across SA3s per 100,000 people	Times difference	Times difference excluding top and bottom 10%	Number over one year
4.1 Knee replacement Hospitalisations, people aged 18 years and over (See table below for 4.2 and 4.3)	128 to 507	4.0	1.9	52,039
4.4 Laparoscopic cholecystectomy Hospitalisations, all ages	89 to 392	4.4	2.0	49,874
4.5 Appendicectomy Hospitalisations, all ages	103 to 360	3.5	1.6	40,752
4.6 Cataract surgery Hospitalisations, people aged 40 years and over	835 to 3,279	3.9	1.6	245,797

Data item	Range across SA3s per 100,000 people	Times difference	Times difference excluding top and bottom 10%	Number over three years
4.2 Lumbar spinal decompression Hospitalisations, people aged 18 years and over	30 to 156	5.2	2.0	44,169
4.3 Lumbar spinal fusion Hospitalisations, people aged 18 years and over	10 to 69	6.9	2.5	14,746





Percentage of people with private hospital insurance by state and territory

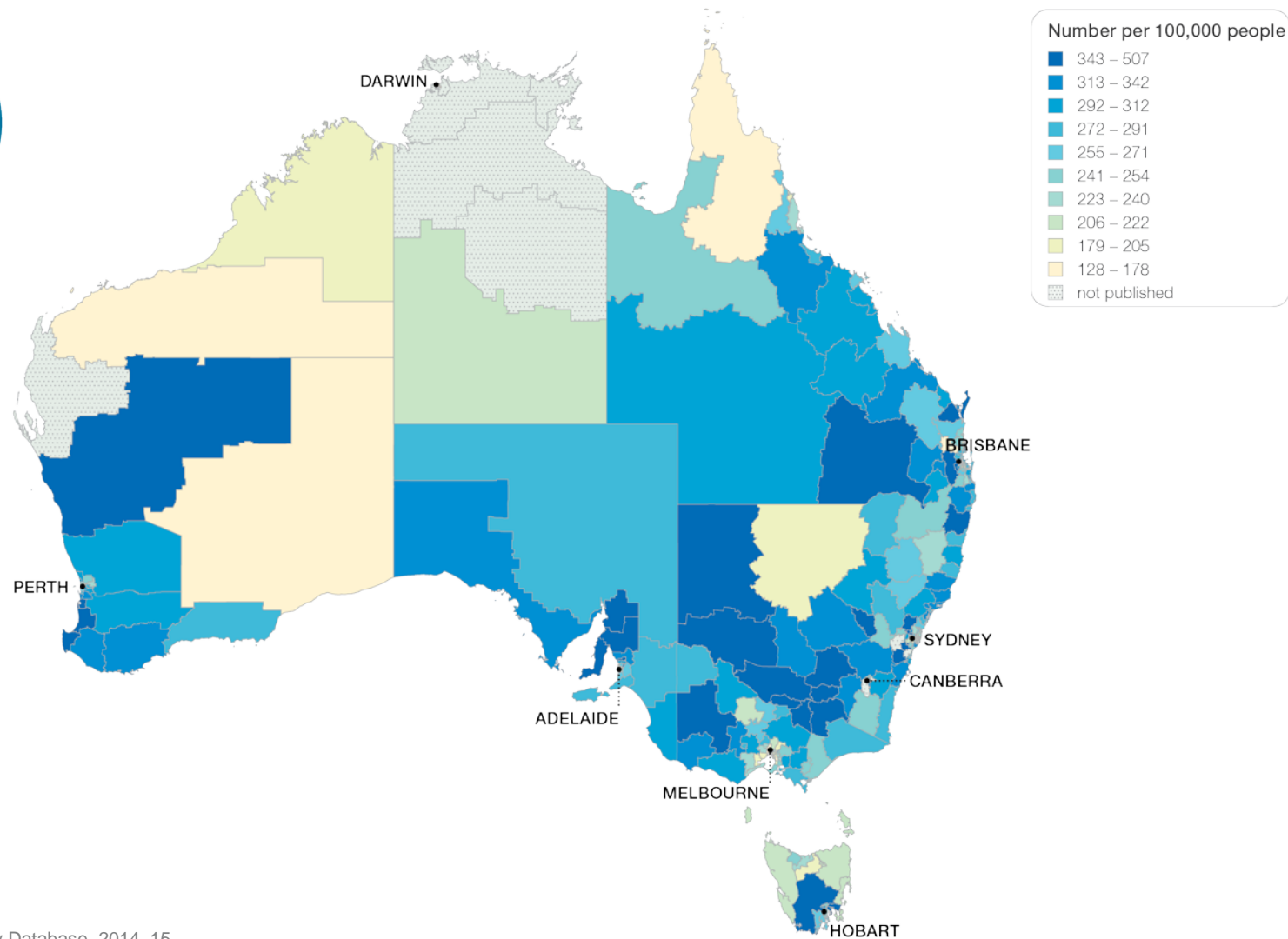


Source: Australian Prudential Regulation Authority. Statistics: privately insured people with hospital treatment cover – annual analysis sex, age and state. Sydney: APRA; 2016.



4.1 Knee replacement hospitalisations 18 years and over

4.0x
AS HIGH
in the highest rate area
compared to the
lowest rate area



National Hospital Morbidity Database, 2014–15

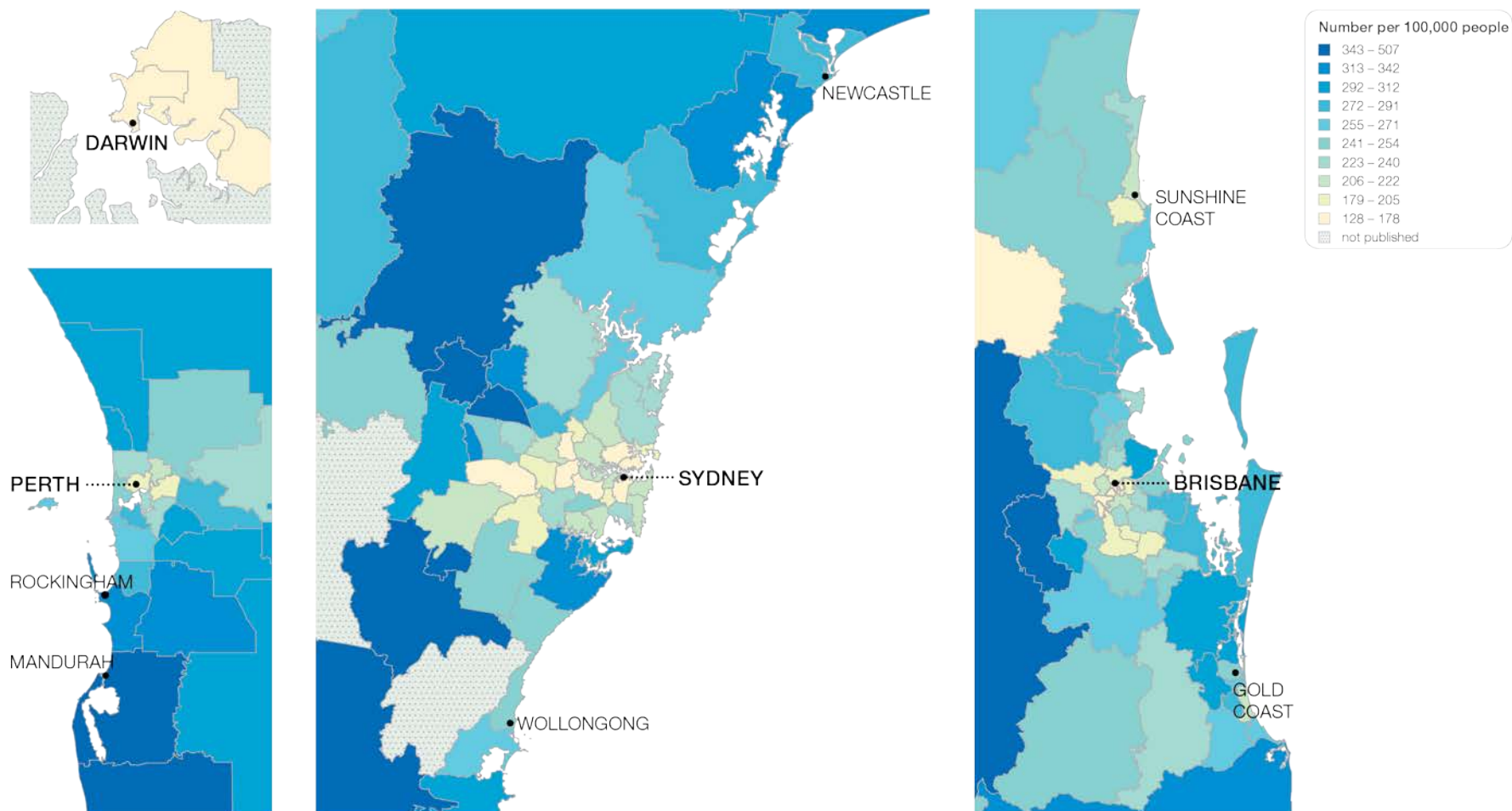


Surgical interventions

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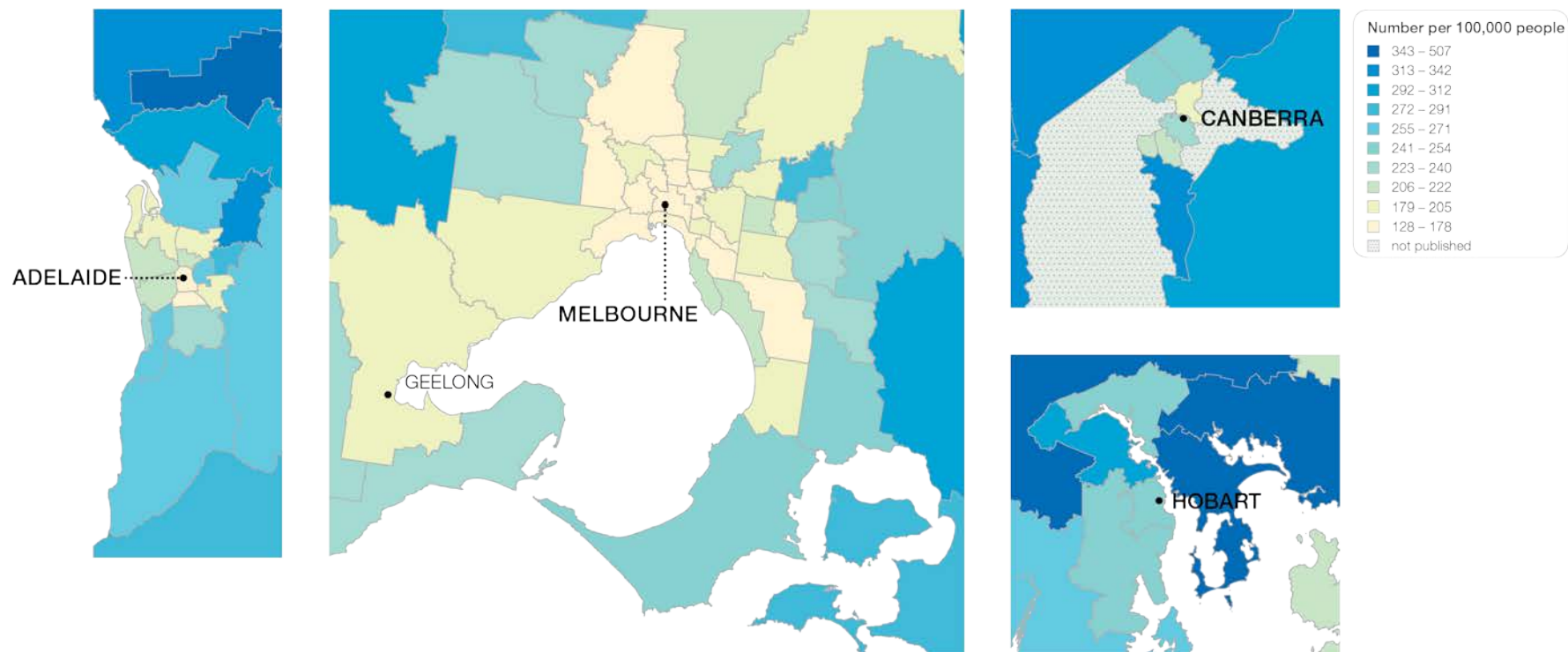
4.1 Knee replacement hospitalisations 18 years and over



National Hospital Morbidity Database, 2014–15



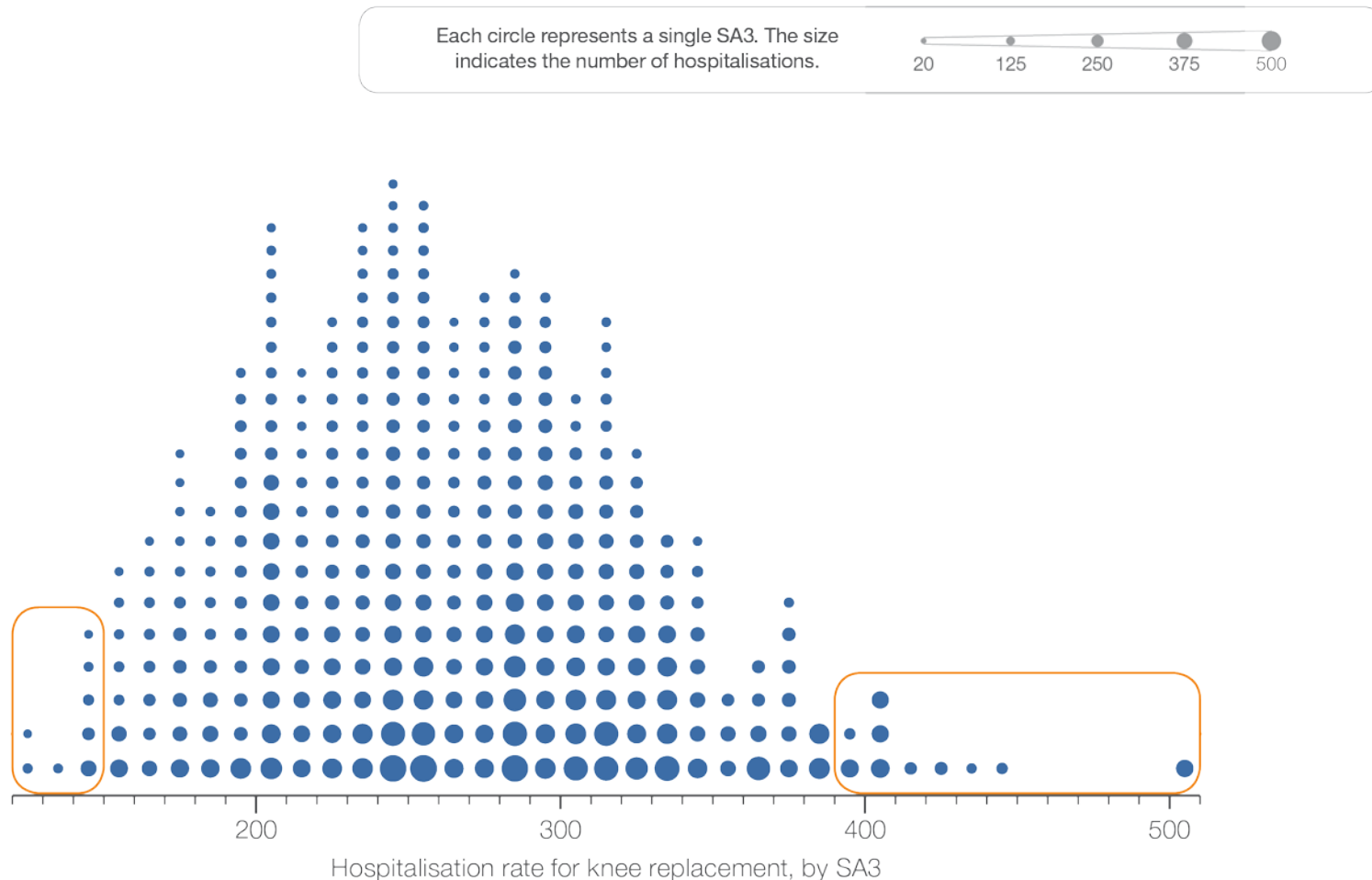
4.1 Knee replacement hospitalisations 18 years and over



National Hospital Morbidity Database, 2014–15



4.1 Knee replacement hospitalisations 18 years and over

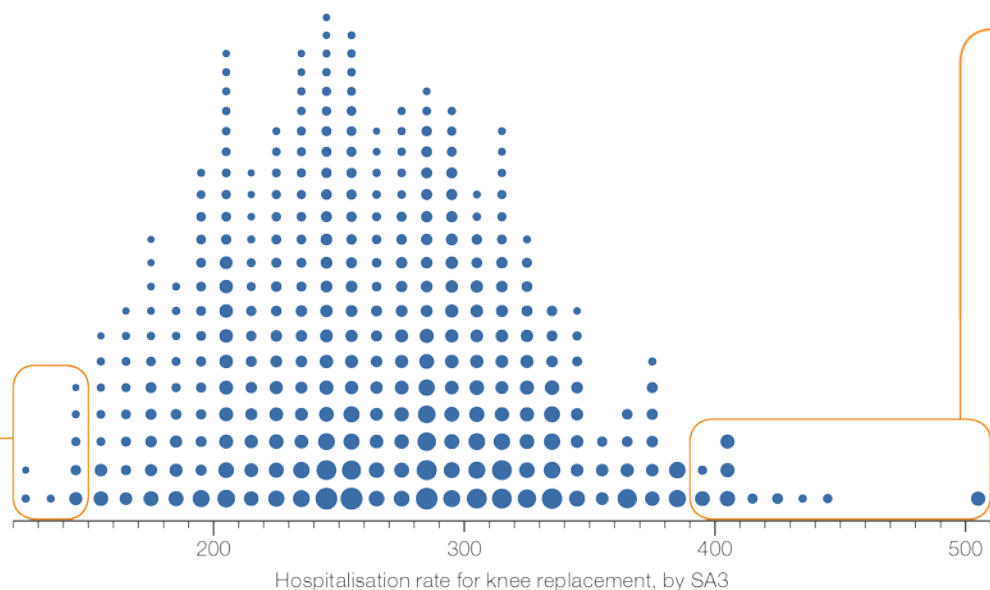


National Hospital Morbidity Database, 2014–15



4.1 Knee replacement hospitalisations 18 years and over

Each circle represents a single SA3. The size indicates the number of hospitalisations.



Highest rate areas

SA3	State	Rate	Hospitalisations
Mid West	WA	507	243
Hawkesbury	NSW	443	92
Lower Murray	NSW	438	62
Mid North	SA	420	133
Richmond - Windsor	NSW	419	117
Grampians	Vic	400	278
Ipswich Hinterland	Qld	400	240
Albury	NSW	400	238
Wodonga - Alpine	Vic	391	262
Broken Hill and Far West	NSW	390	89

Lowest rate areas

SA3	State	Rate	Hospitalisations
Maribyrnong	Vic	128	60
Darwin City	NT	128	22
Darebin - South	Vic	133	52
Brimbank	Vic	141	207
Brunswick - Coburg	Vic	142	84
Chatswood - Lane Cove	NSW	146	125
Palmerston	NT	146	24
Sherwood - Indooroopilly	Qld	147	52

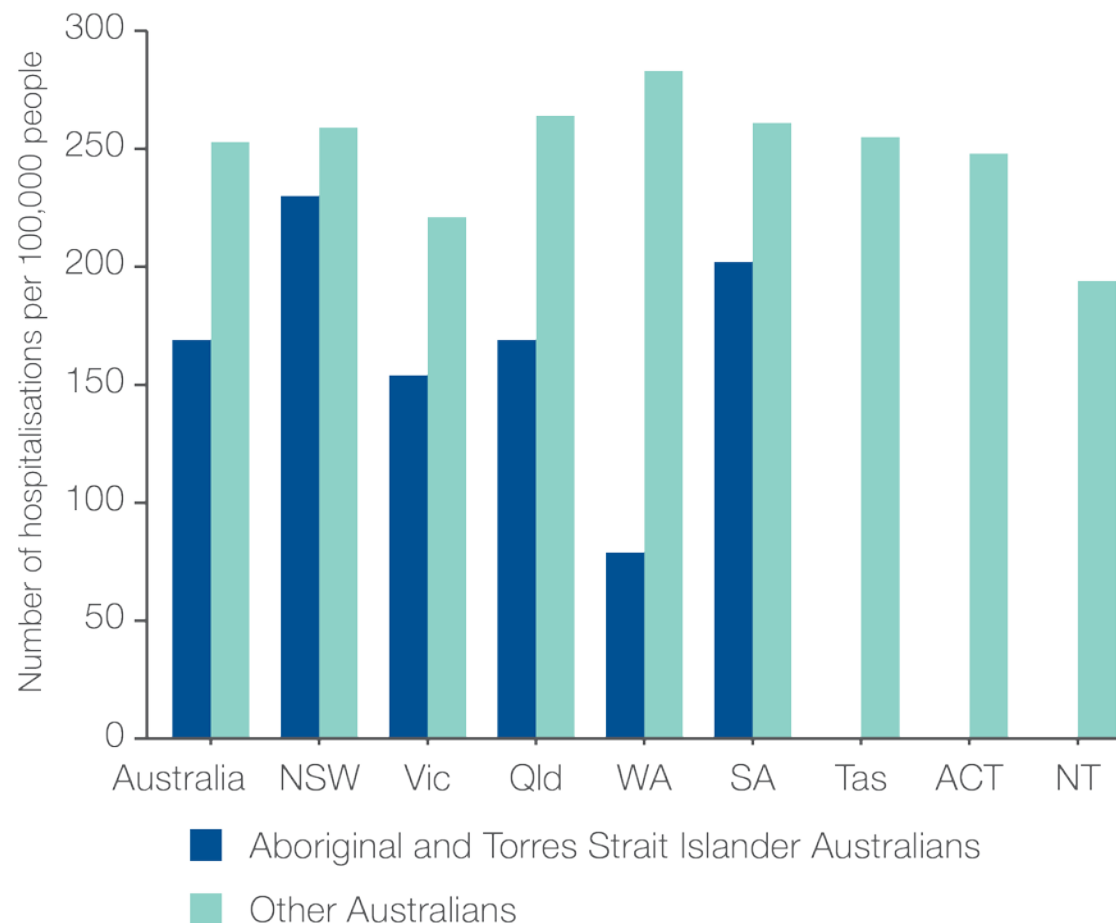
National Hospital Morbidity Database, 2014–15





4.1 Knee replacement hospitalisations 18 years and over

Aboriginal and Torres Strait Islander status



National Hospital Morbidity Database, 2014–15



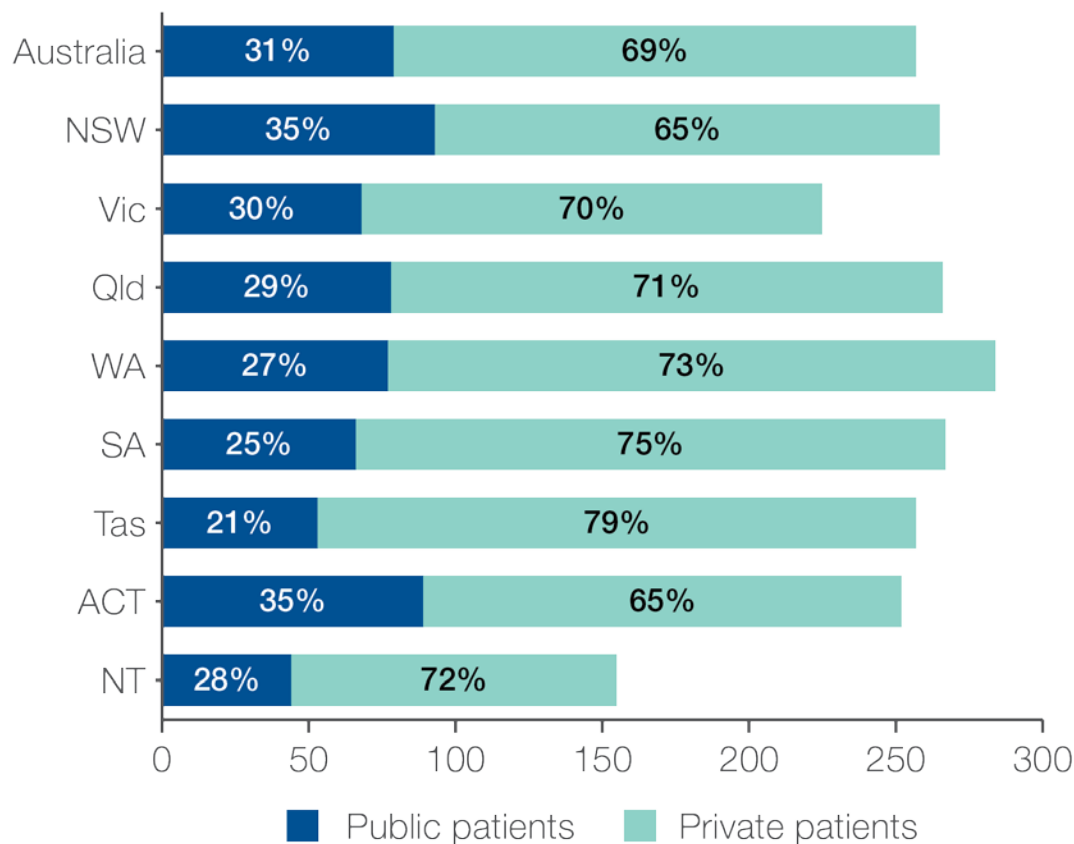
Surgical interventions

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4.1 Knee replacement hospitalisations 18 years and over

Patient funding status



Number of hospitalisations per 100,000 people

National Hospital Morbidity Database, 2014–15

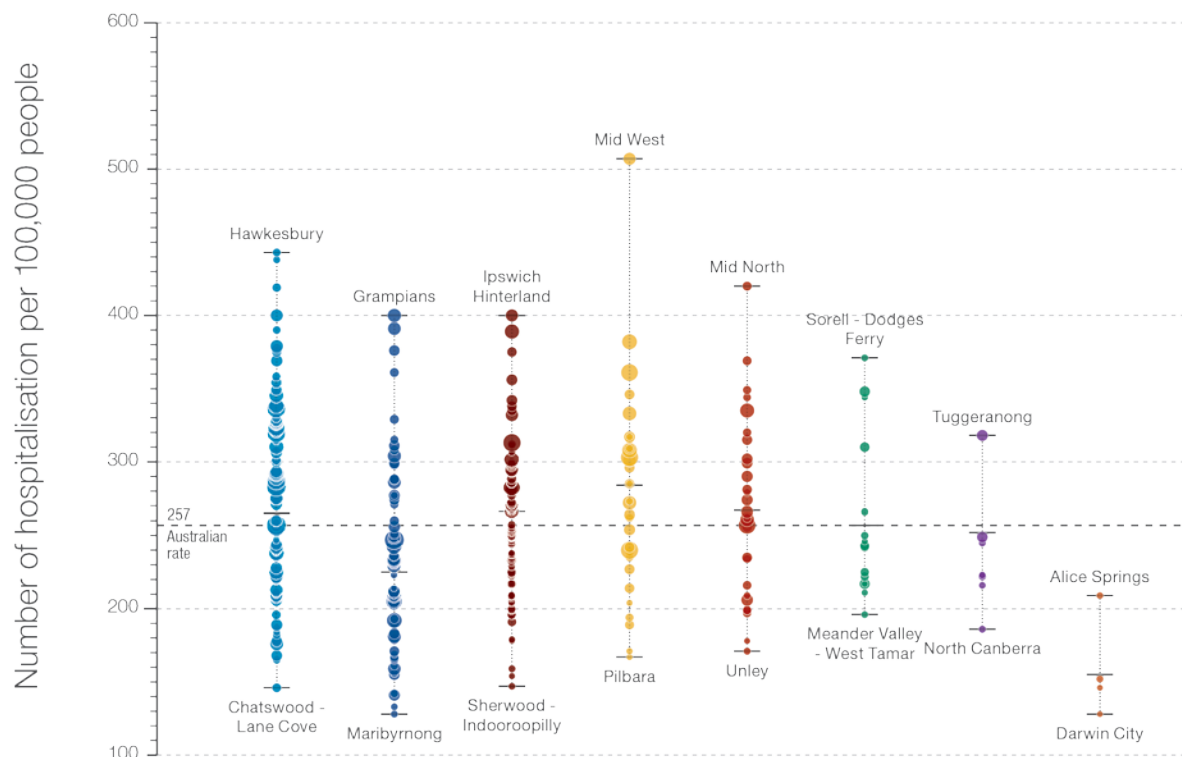


4.1 Knee replacement hospitalisations 18 years and over

State and territory

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Highest rate	443	400	400	507	420	371	318	209
State/territory	265	225	266	284	267	257	252	155
Lowest rate	146	128	147	167	171	196	186	128
No. hospitalisations	17,786	11,329	10,540	5,694	4,331	1,374	708	219

Each circle represents a single SA3. The size indicates the number of hospitalisations.



National Hospital Morbidity Database, 2014–15



4.1 Knee replacement hospitalisations 18 years and over

Remoteness and socioeconomic status

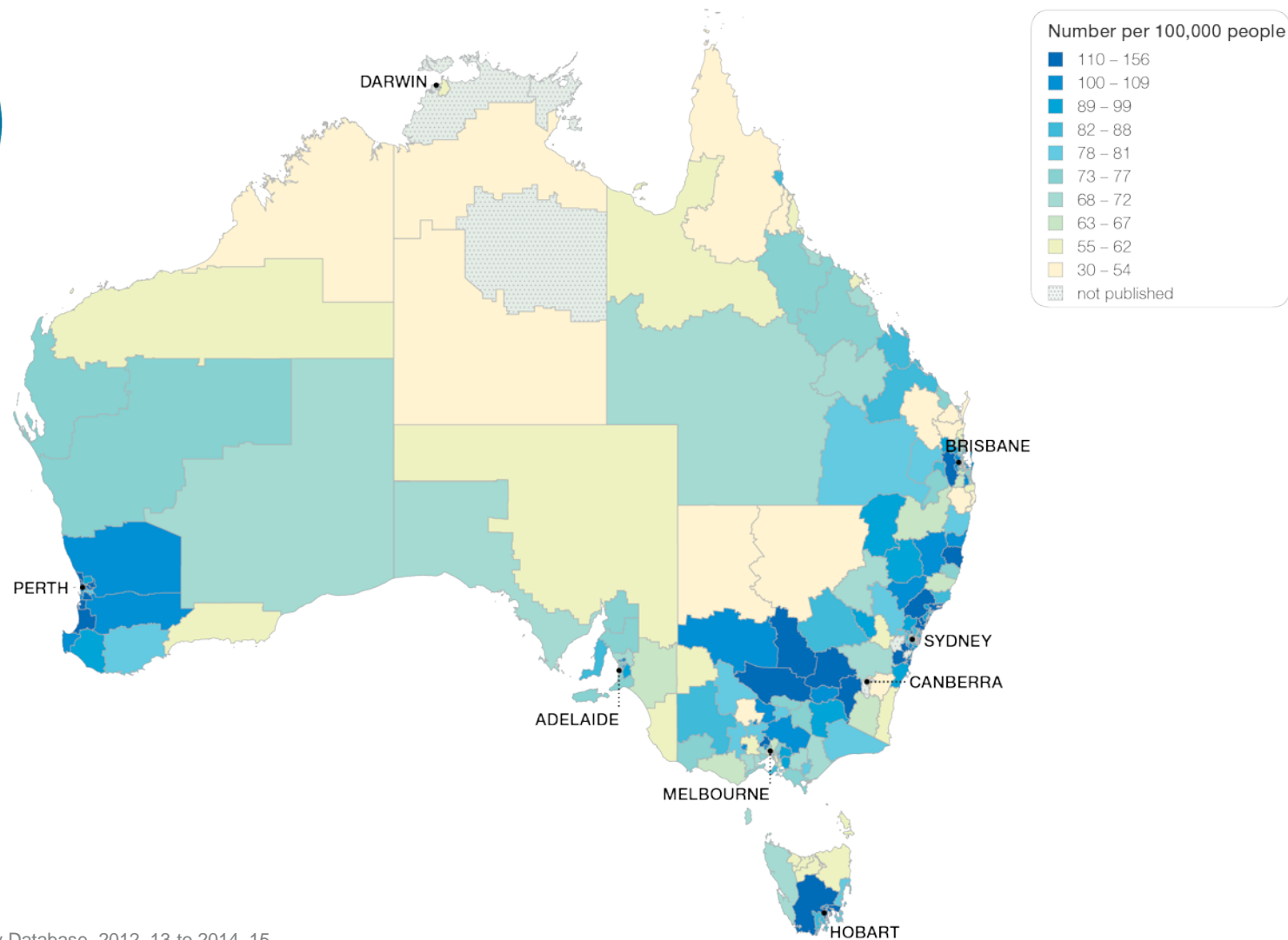


National Hospital Morbidity Database, 2014–15



4.2 Lumbar spinal decompression hospitalisations 18 years and over

5.2x
AS HIGH
in the highest rate area
compared to the
lowest rate area



National Hospital Morbidity Database, 2012–13 to 2014–15

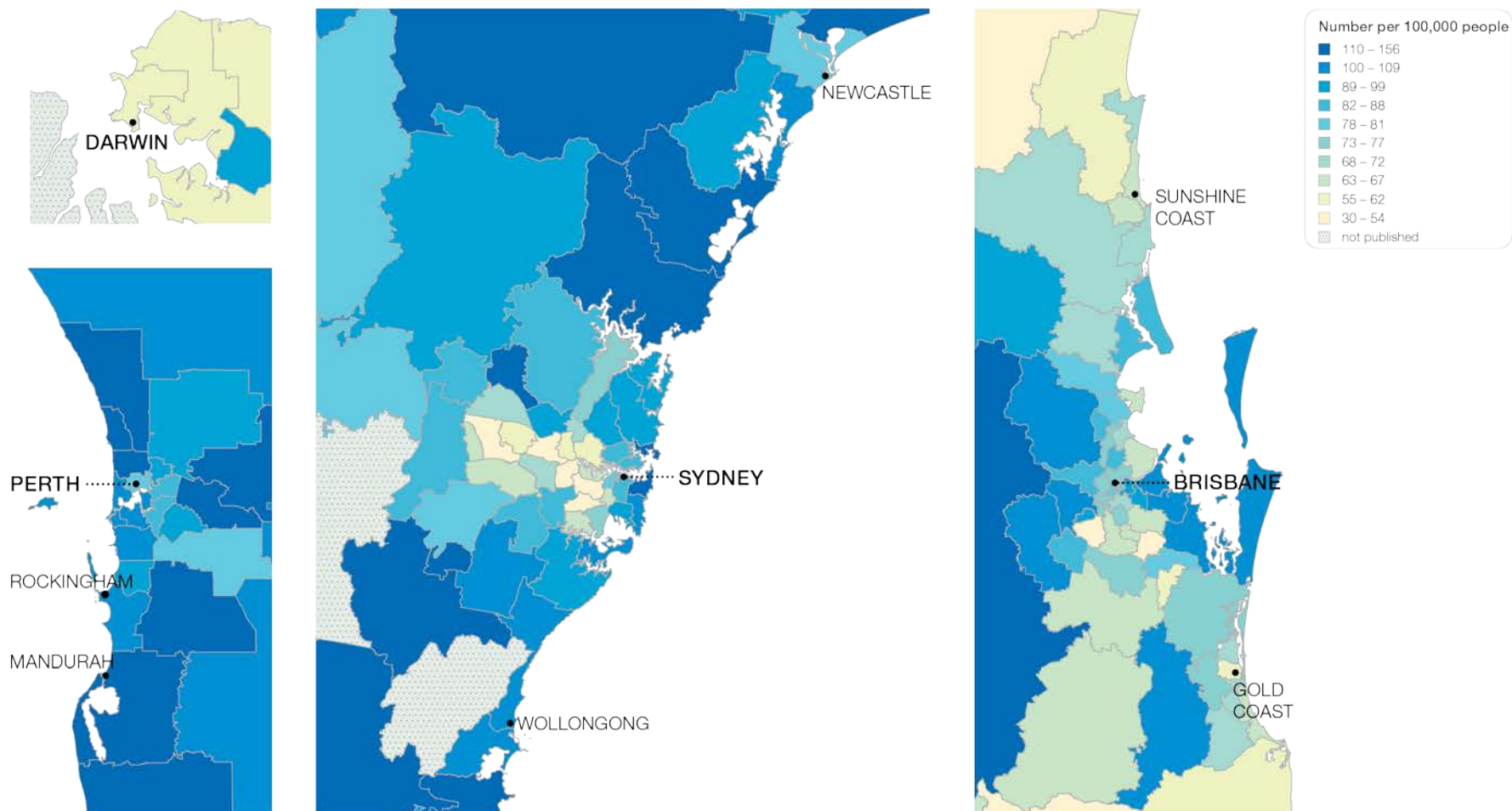


Surgical interventions

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4.2 Lumbar spinal decompression hospitalisations 18 years and over



National Hospital Morbidity Database, 2012–13 to 2014–15

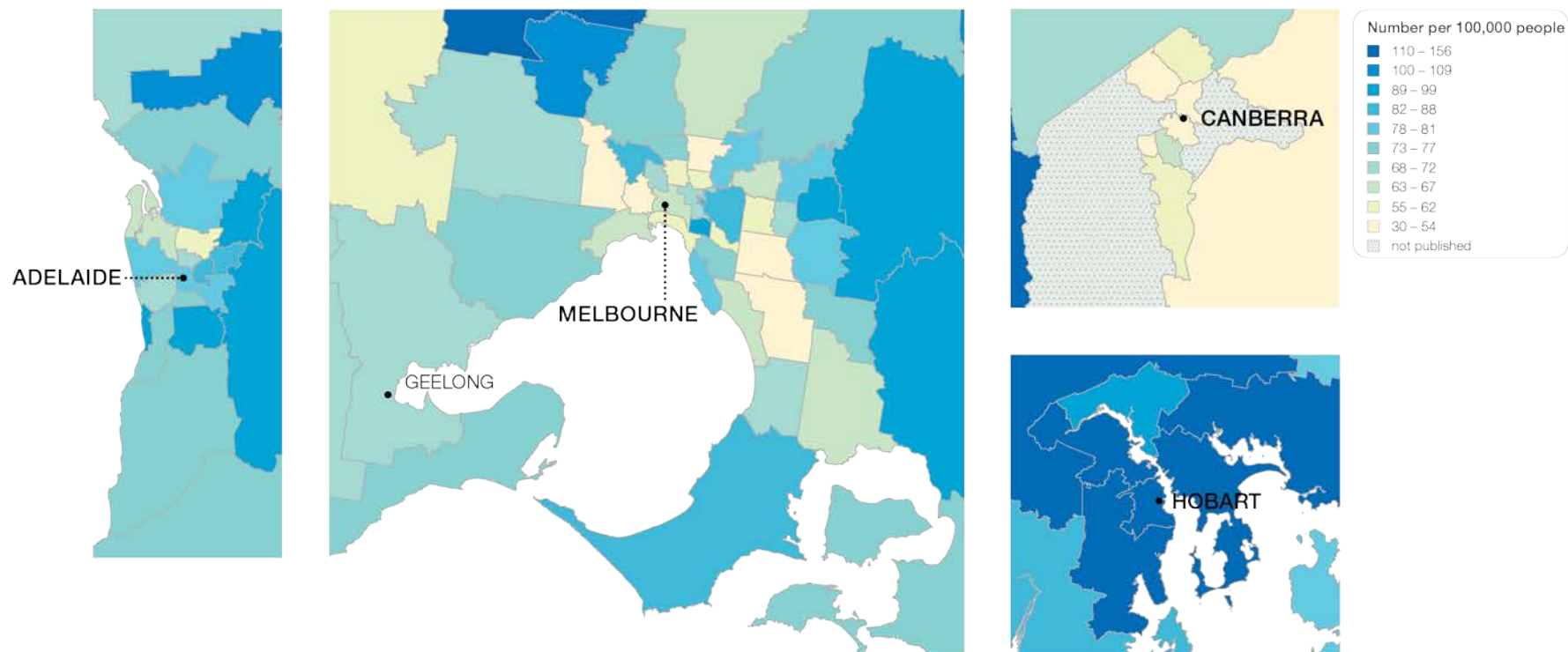


Surgical interventions

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4.2 Lumbar spinal decompression hospitalisations 18 years and over

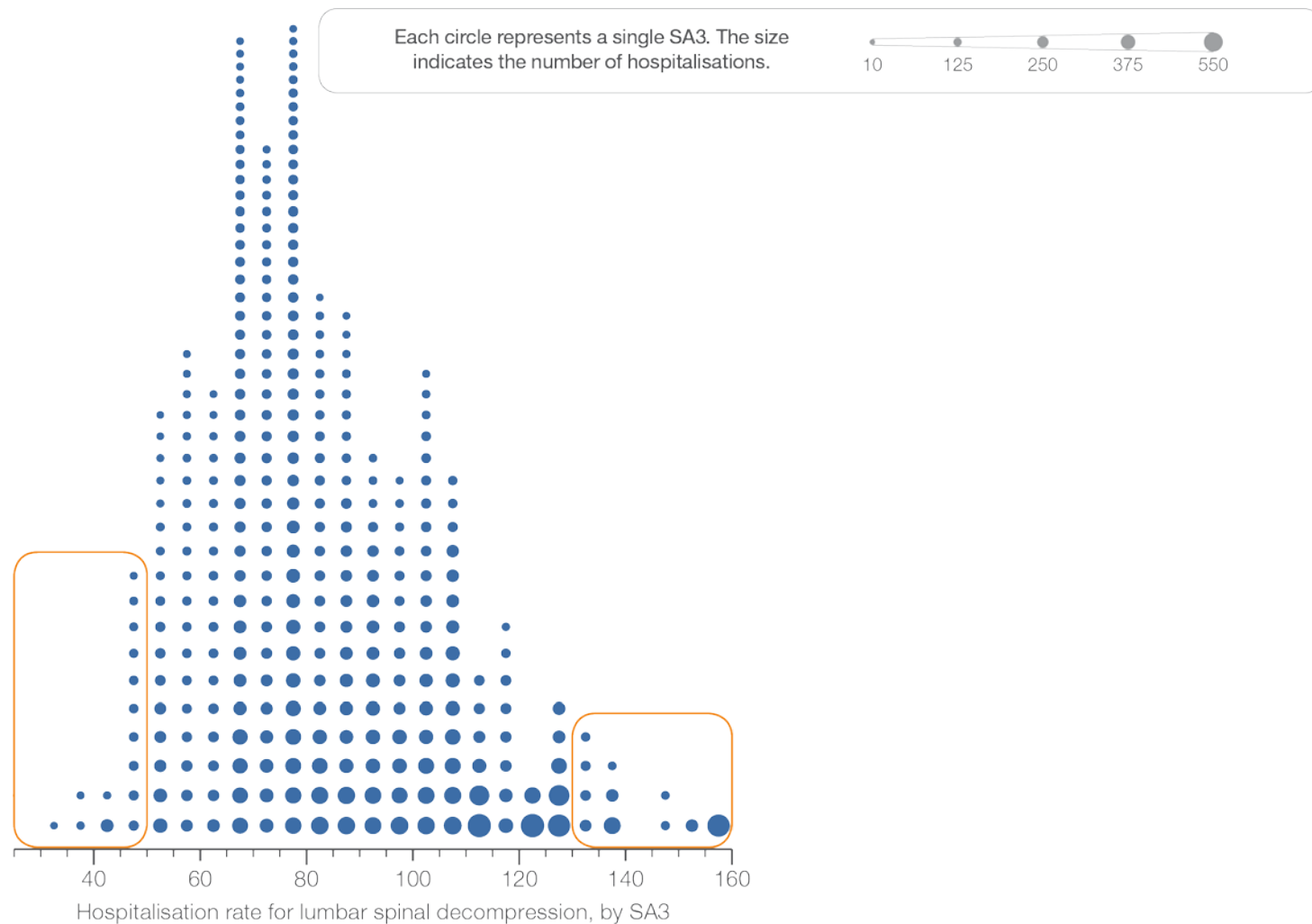


National Hospital Morbidity Database, 2012–13 to 2014–15





4.2 Lumbar spinal decompression hospitalisations 18 years and over

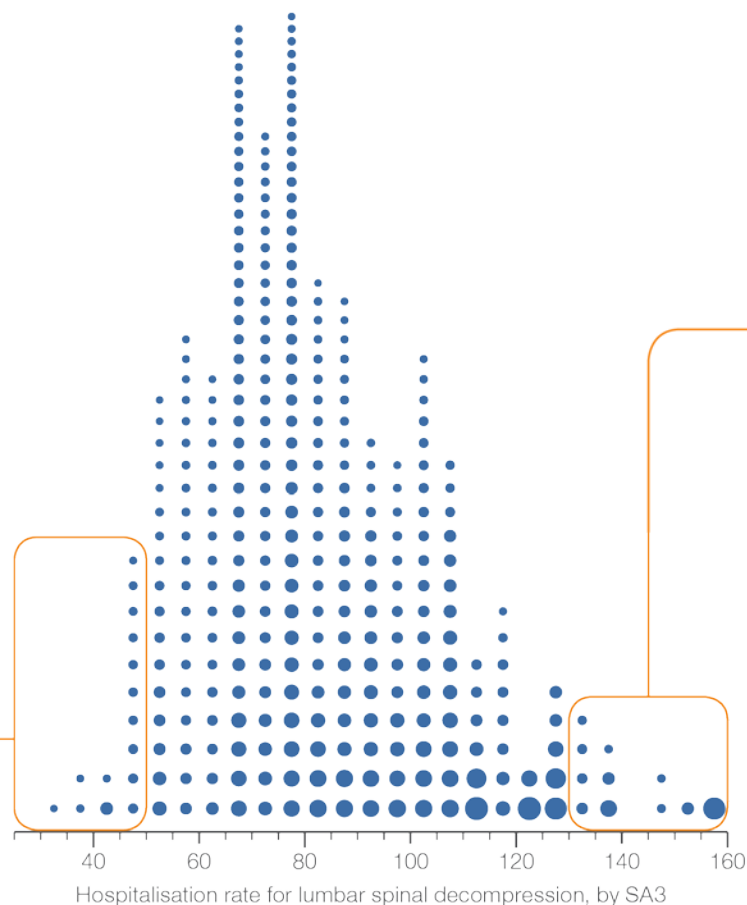


National Hospital Morbidity Database, 2012–13 to 2014–15



4.2 Lumbar spinal decompression hospitalisations 18 years and over

Each circle represents a single SA3. The size indicates the number of hospitalisations.



Highest rate areas

SA3	State	Rate	Hospitalisations
Eastern Suburbs - North	NSW	156	500
Camden	NSW	152	178
Serpentine - Jarrahdale	WA	149	68
Sorell - Dodges Ferry	Tas	147	53
Hobart - North East	Tas	138	179
Bunbury	WA	137	323
Tumut - Tumberumba	NSW	137	54
Hobart - South and West	Tas	133	102
Rouse Hill - McGraths Hill	NSW	133	77
Wollondilly	NSW	132	119
Griffith - Murrumbidgee (West)	NSW	130	153

Lowest rate areas

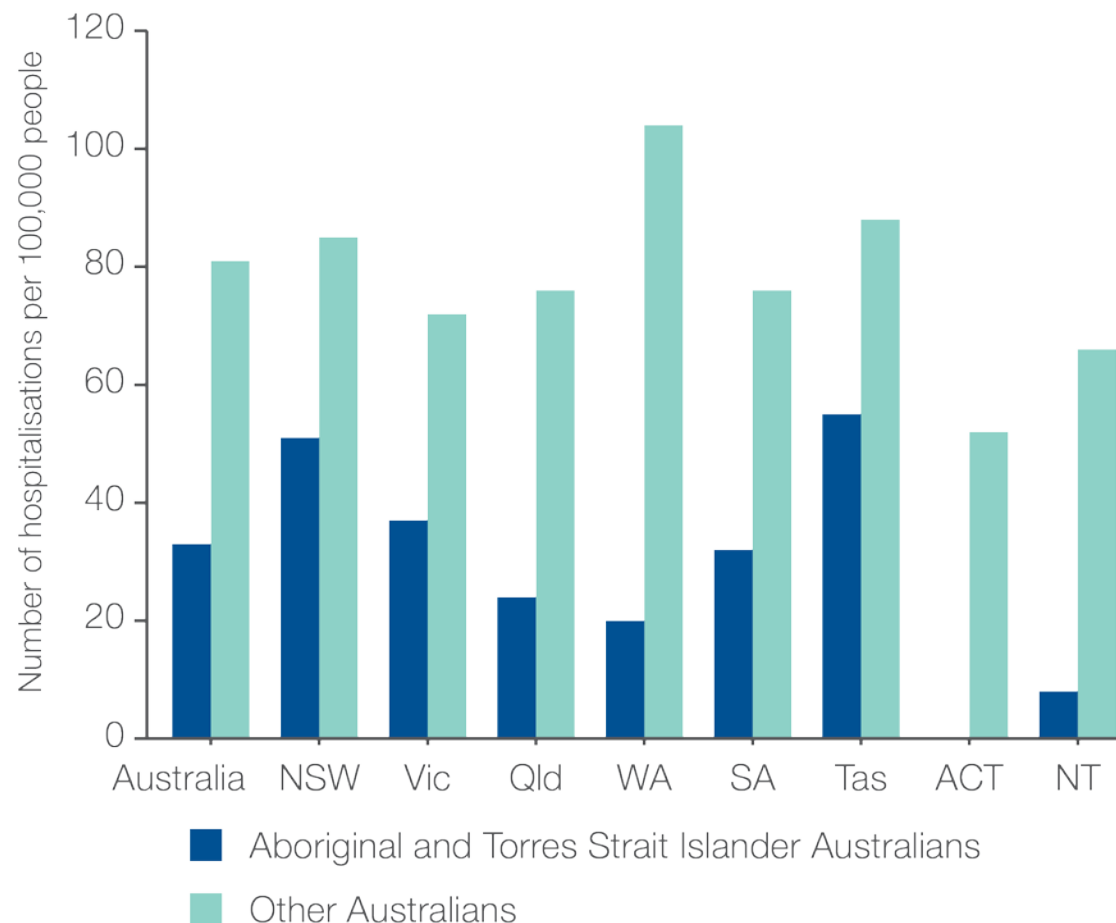
SA3	State	Rate	Hospitalisations
Far North	Qld	30	19
Kimberley	WA	36	30
North Canberra	ACT	38	44
Dandenong	Vic	44	192
Alice Springs	NT	44	37
Richmond Valley - Hinterland	NSW	45	83
Queanbeyan	NSW	45	61
Cairns - South	Qld	47	103
Belconnen	ACT	47	102
Maribyrnong	Vic	47	84
Auburn	NSW	47	81
Bourke - Cobar - Coonamble	NSW	47	30
Richmond Valley - Coastal	NSW	48	96
Forest Lake - Oxley	Qld	49	72
Gympie - Cooloolo	Qld	49	63

National Hospital Morbidity Database, 2012–13 to 2014–15



4.2 Lumbar spinal decompression hospitalisations 18 years and over

Aboriginal and Torres Strait Islander status

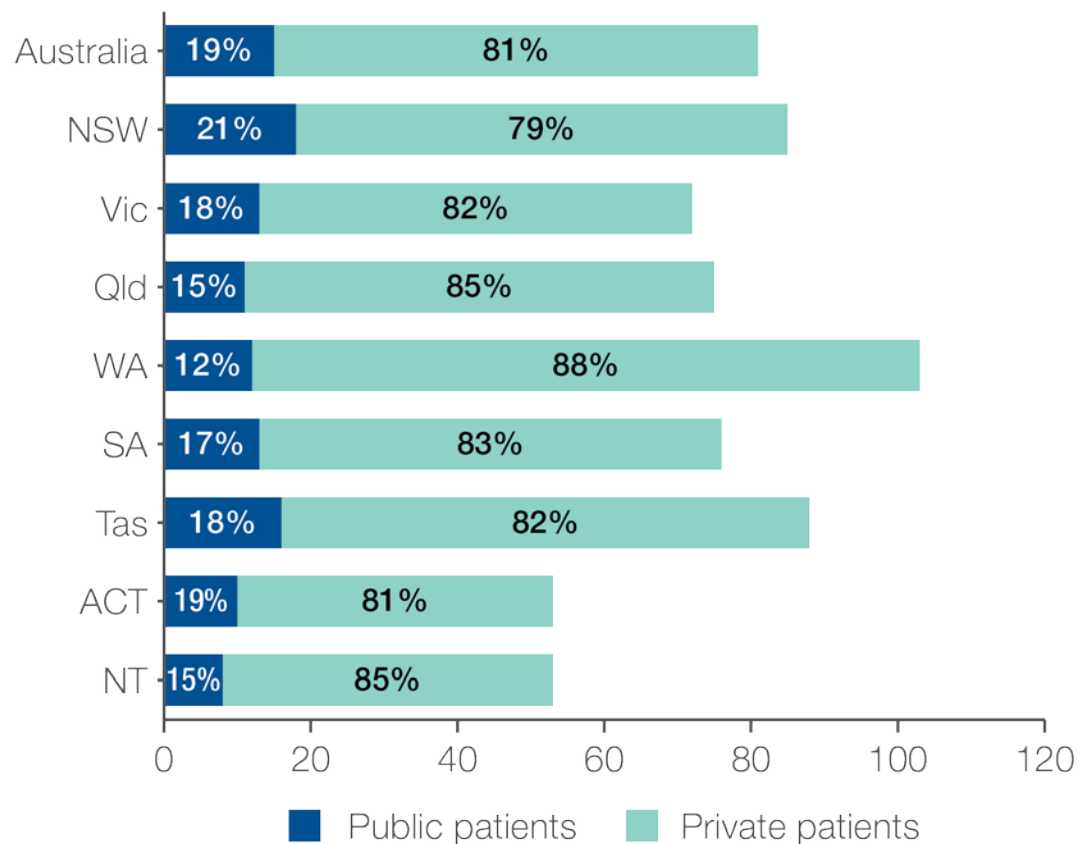


National Hospital Morbidity Database, 2012–13 to 2014–15



4.2 Lumbar spinal decompression hospitalisations 18 years and over

Patient funding status



Number of hospitalisations per 100,000 people

National Hospital Morbidity Database, 2012–13 to 2014–15

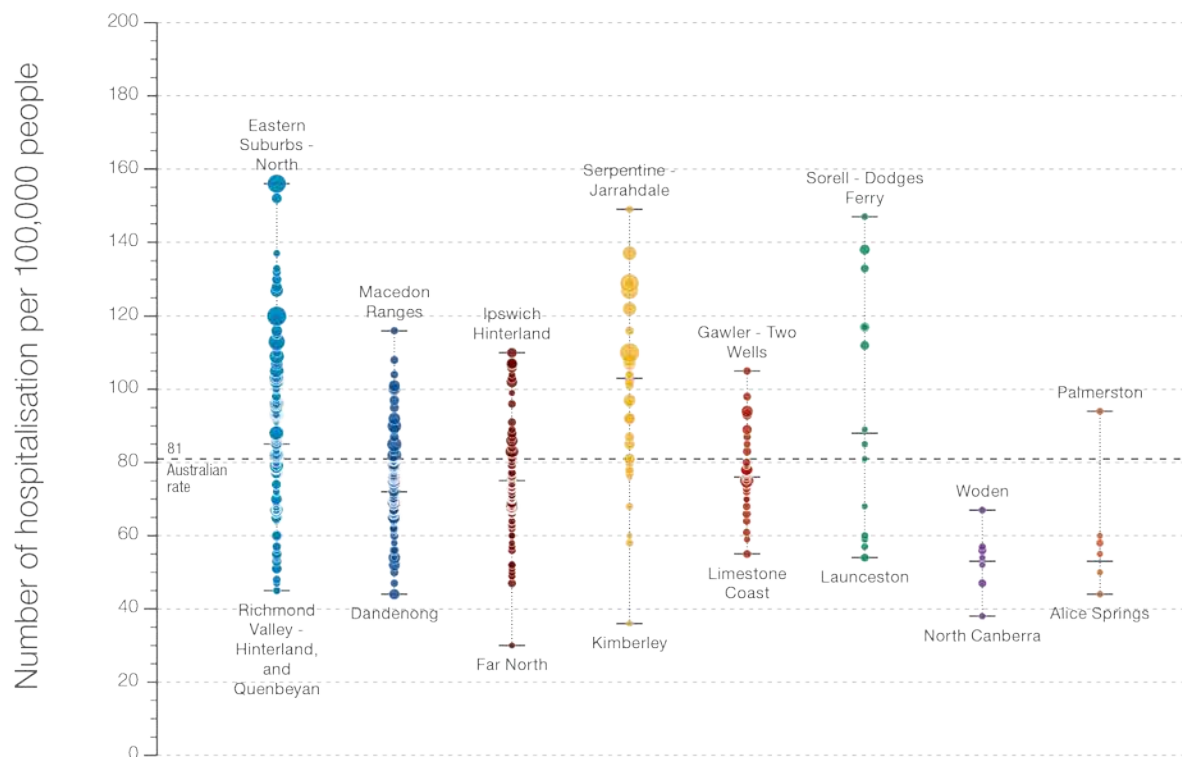


4.2 Lumbar spinal decompression hospitalisations 18 years and over

State and territory

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Highest rate	156	116	110	149	105	147	67	94
State/territory	85	72	75	103	76	88	53	53
Lowest rate	45	44	30	36	55	54	38	44
No. hospitalisations	15,216	9,892	8,039	5,906	3,230	1,098	442	270

Each circle represents a single SA3. The size indicates the number of hospitalisations.

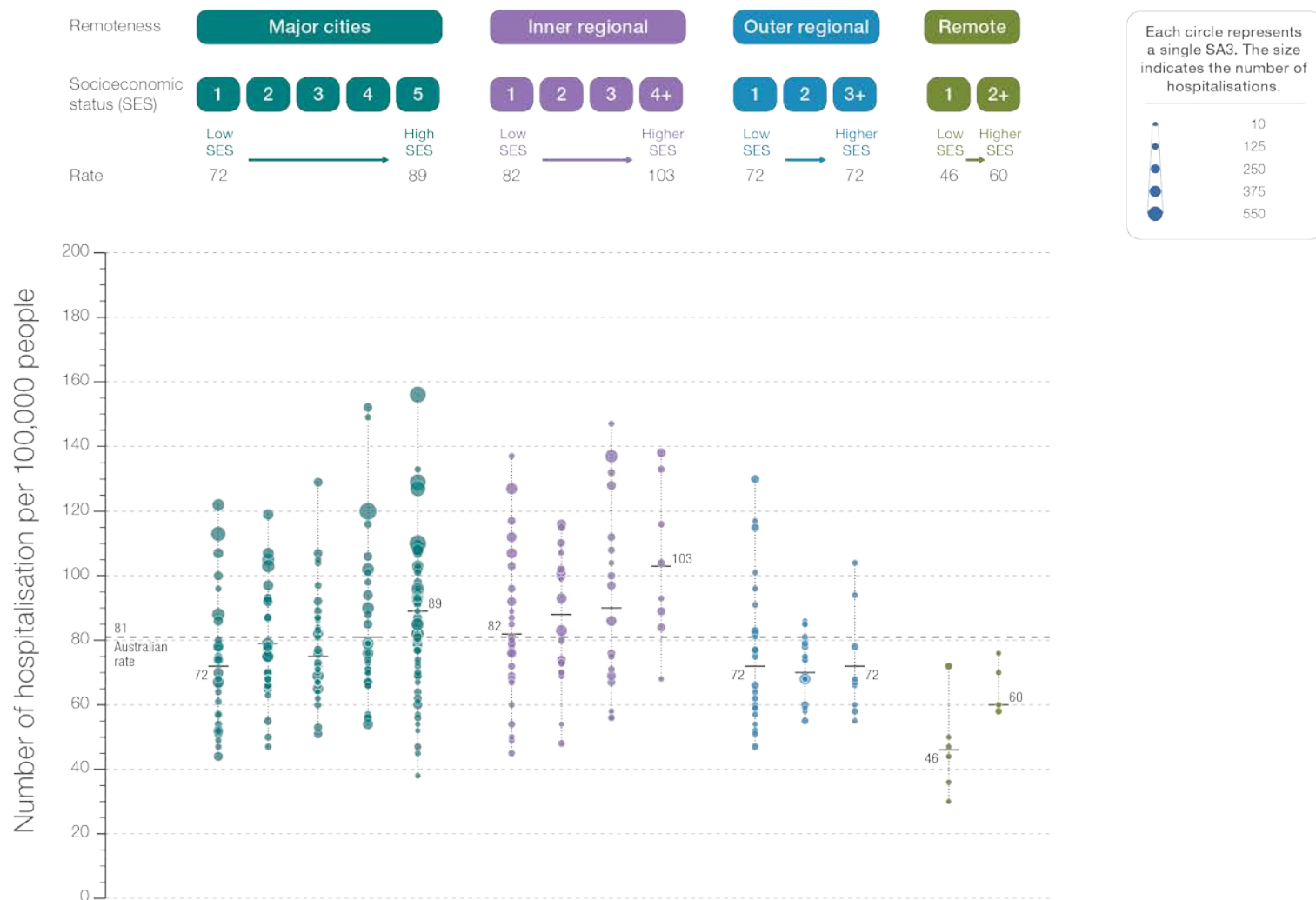


National Hospital Morbidity Database, 2012–13 to 2014–15



4.2 Lumbar spinal decompression hospitalisations 18 years and over

Remoteness and socioeconomic status

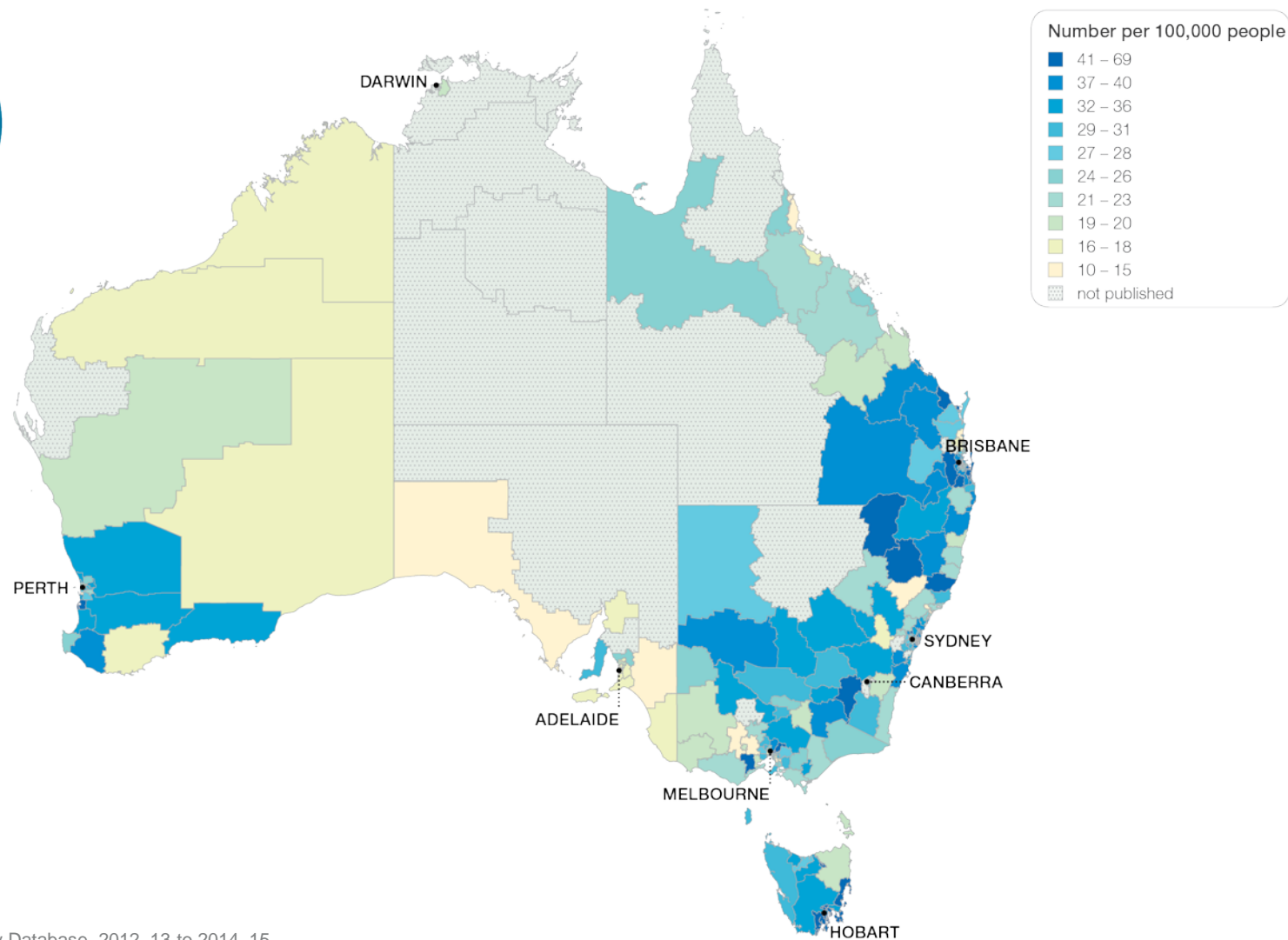


National Hospital Morbidity Database, 2012–13 to 2014–15



4.3 Lumbar spinal fusion hospitalisations 18 years and over

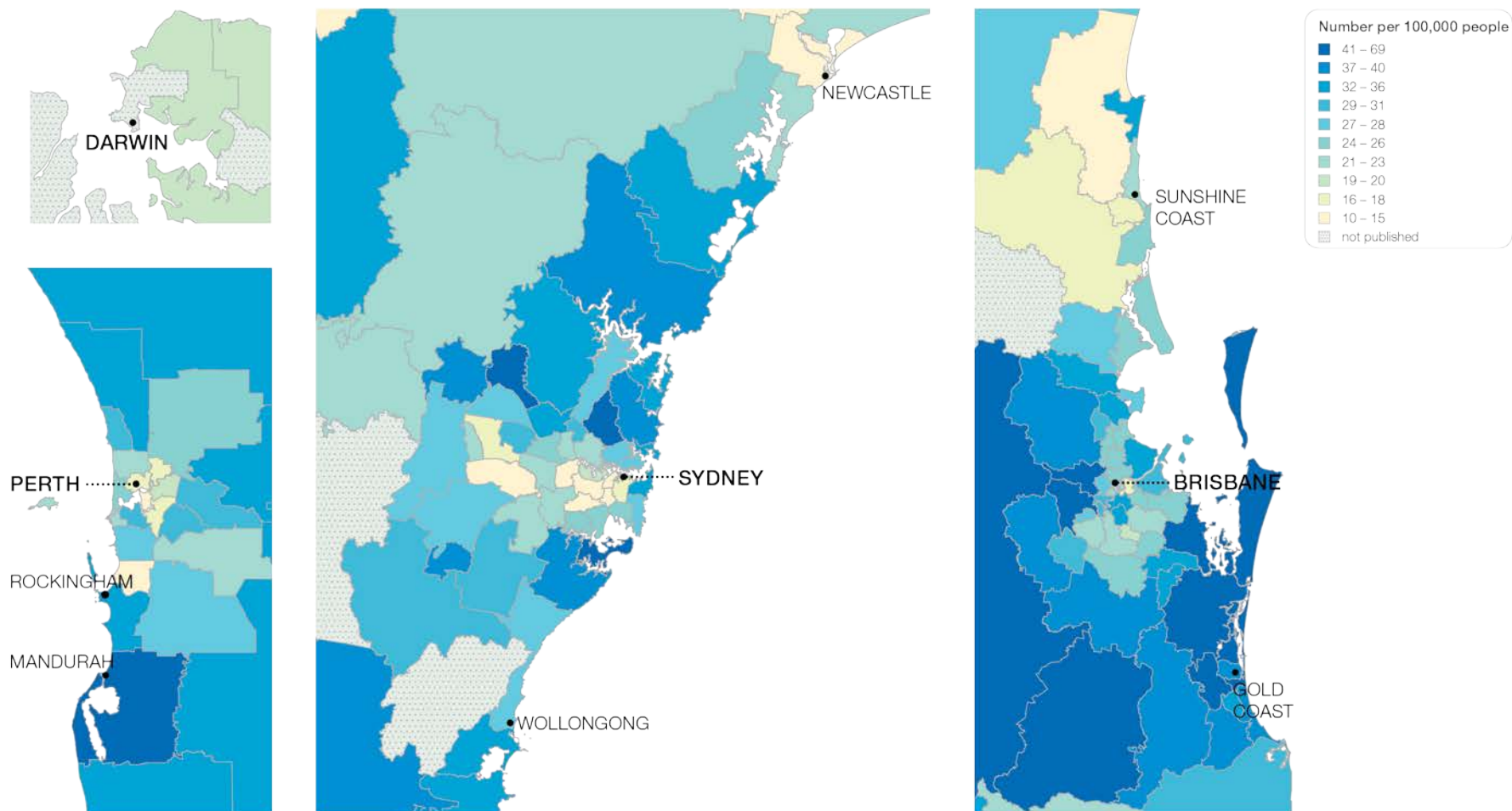
6.9x
AS HIGH
in the highest rate area
compared to the
lowest rate area



National Hospital Morbidity Database, 2012–13 to 2014–15



4.3 Lumbar spinal fusion hospitalisations 18 years and over



National Hospital Morbidity Database, 2012–13 to 2014–15

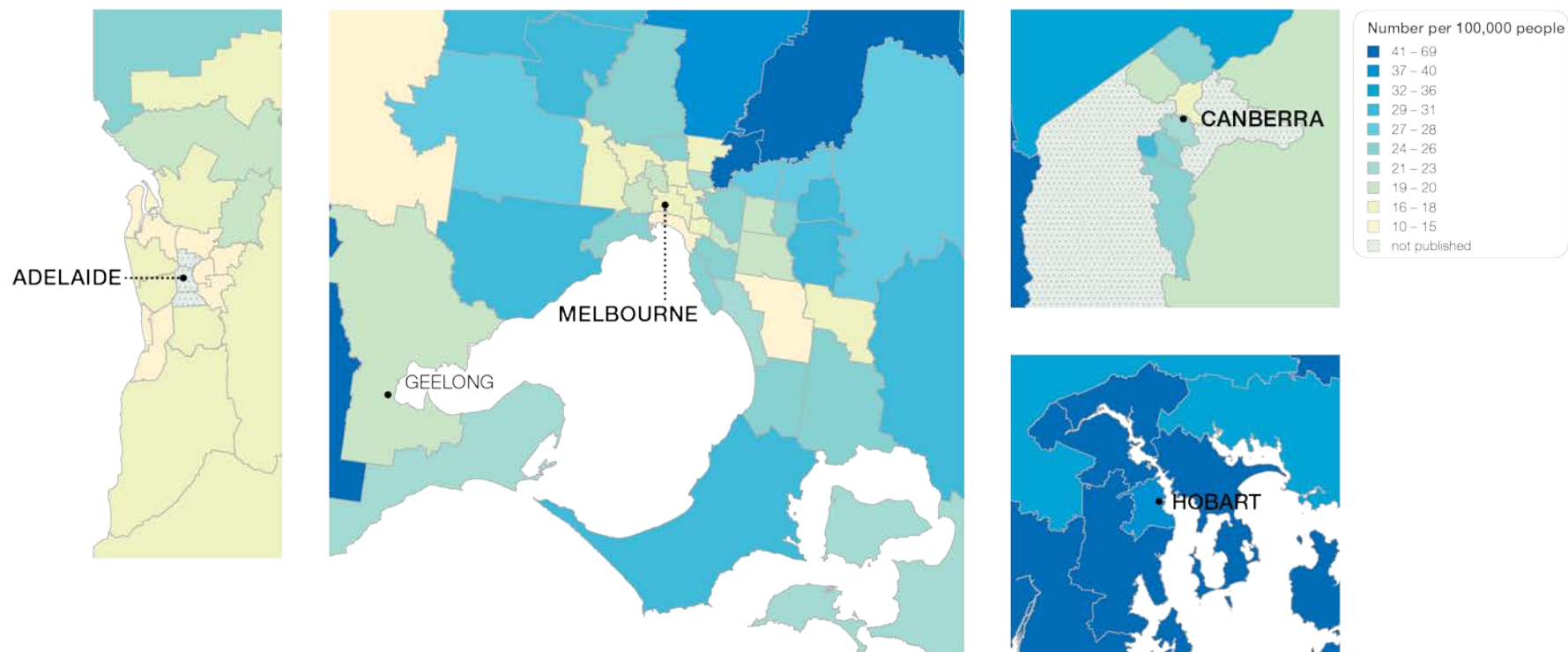


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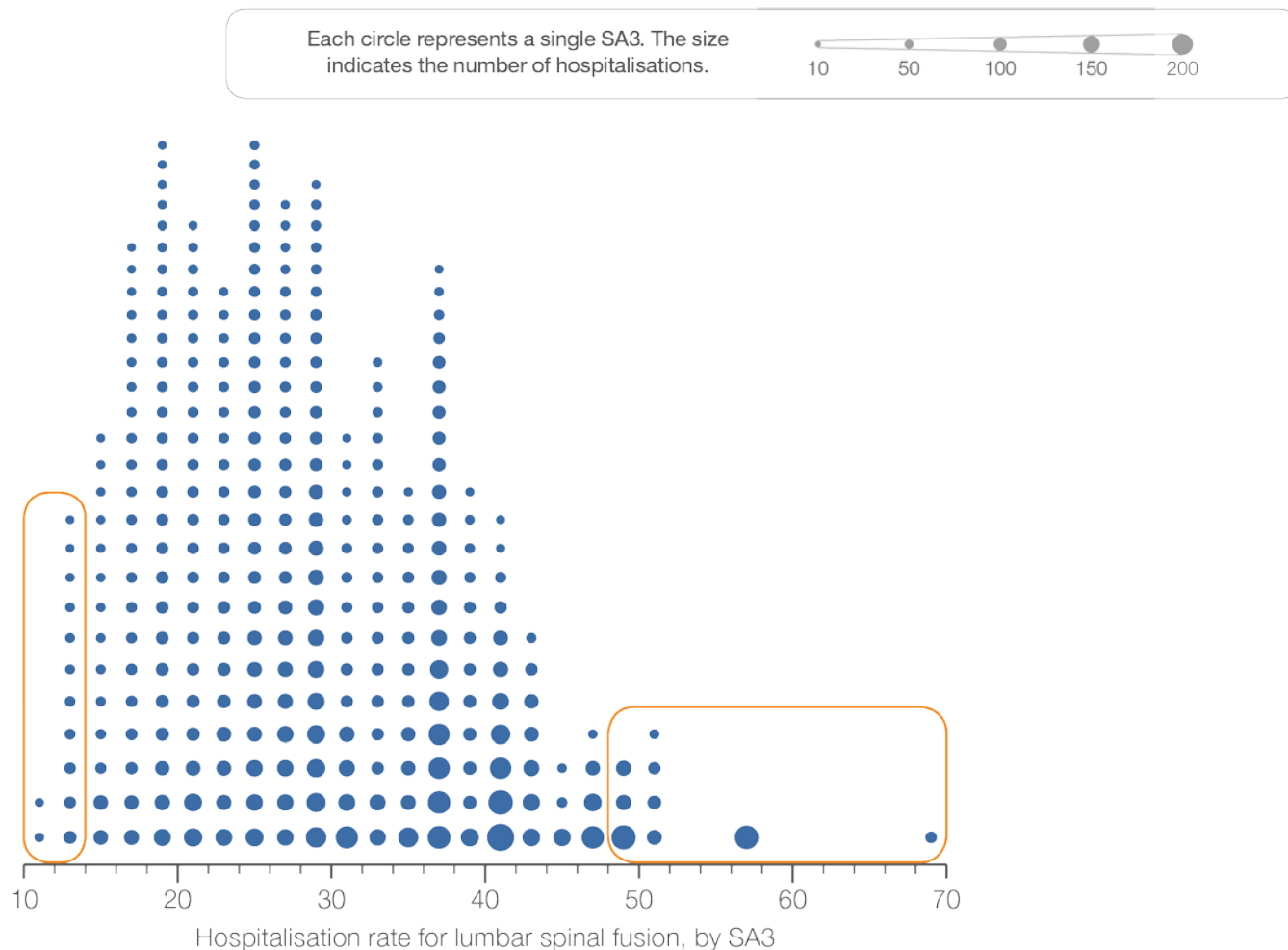
4.3 Lumbar spinal fusion hospitalisations 18 years and over



National Hospital Morbidity Database, 2012–13 to 2014–15



4.3 Lumbar spinal fusion hospitalisations 18 years and over

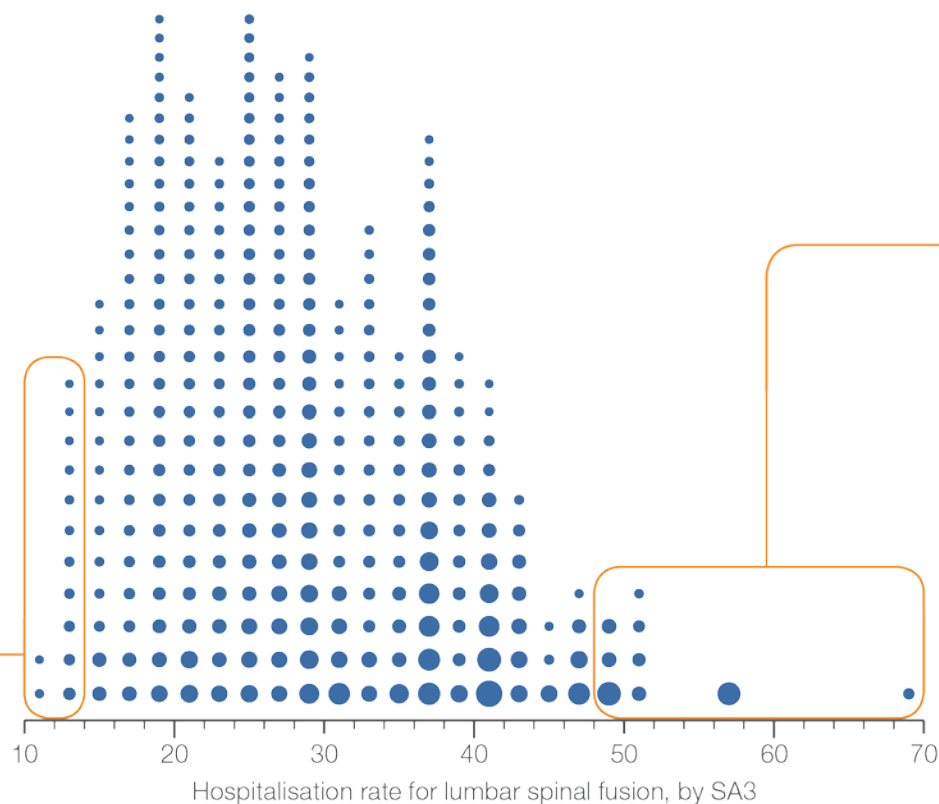


National Hospital Morbidity Database, 2012–13 to 2014–15



4.3 Lumbar spinal fusion hospitalisations 18 years and over

Each circle represents a single SA3. The size indicates the number of hospitalisations.



Highest rate areas

SA3	State	Rate	Hospitalisations
Huon - Bruny Island	Tas	69	37
Bundaberg	Qld	57	154
Hobart - North West	Tas	51	69
Barwon - West	Vic	51	20
Kenmore - Brookfield - Moggill	Qld	50	58
Hobart - South and West	Tas	50	44
Nillumbik - Kinglake	Vic	49	72
Banyule	Vic	48	161
Nerang	Qld	48	73

Lowest rate areas

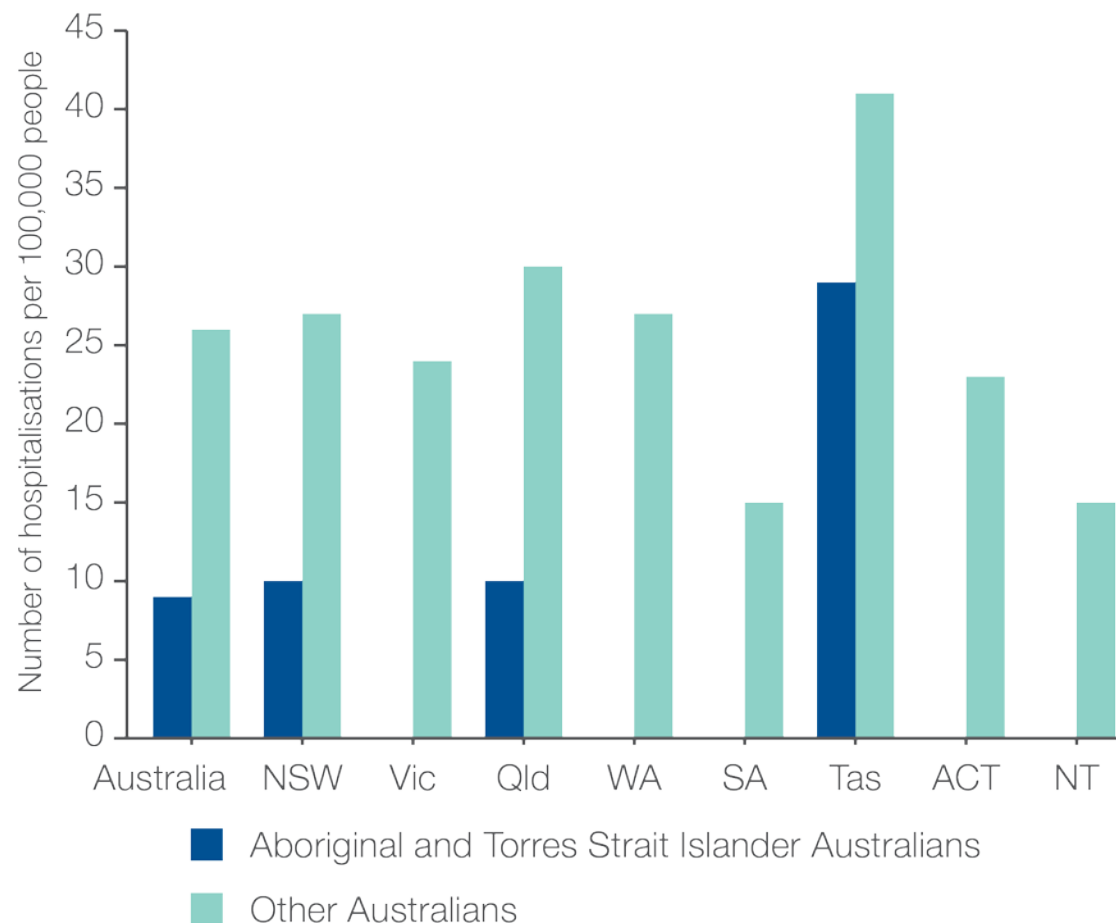
SA3	State	Rate	Hospitalisations
Campbelltown	SA	10	12
Port Adelaide - East	SA	11	17
Strathfield - Burwood - Ashfield	NSW	12	40
Canterbury	NSW	12	37
Auburn	NSW	12	20
Eyre Peninsula and South West	SA	12	20
Maitland	NSW	12	19
South Perth	WA	12	14
Maryborough - Pyrenees	Vic	12	10
Newcastle	NSW	13	50
Port Phillip	Vic	13	30
Cairns - South	Qld	13	27
Upper Hunter	NSW	13	10

National Hospital Morbidity Database, 2012–13 to 2014–15



4.3 Lumbar spinal fusion hospitalisations 18 years and over

Aboriginal and Torres Strait Islander status

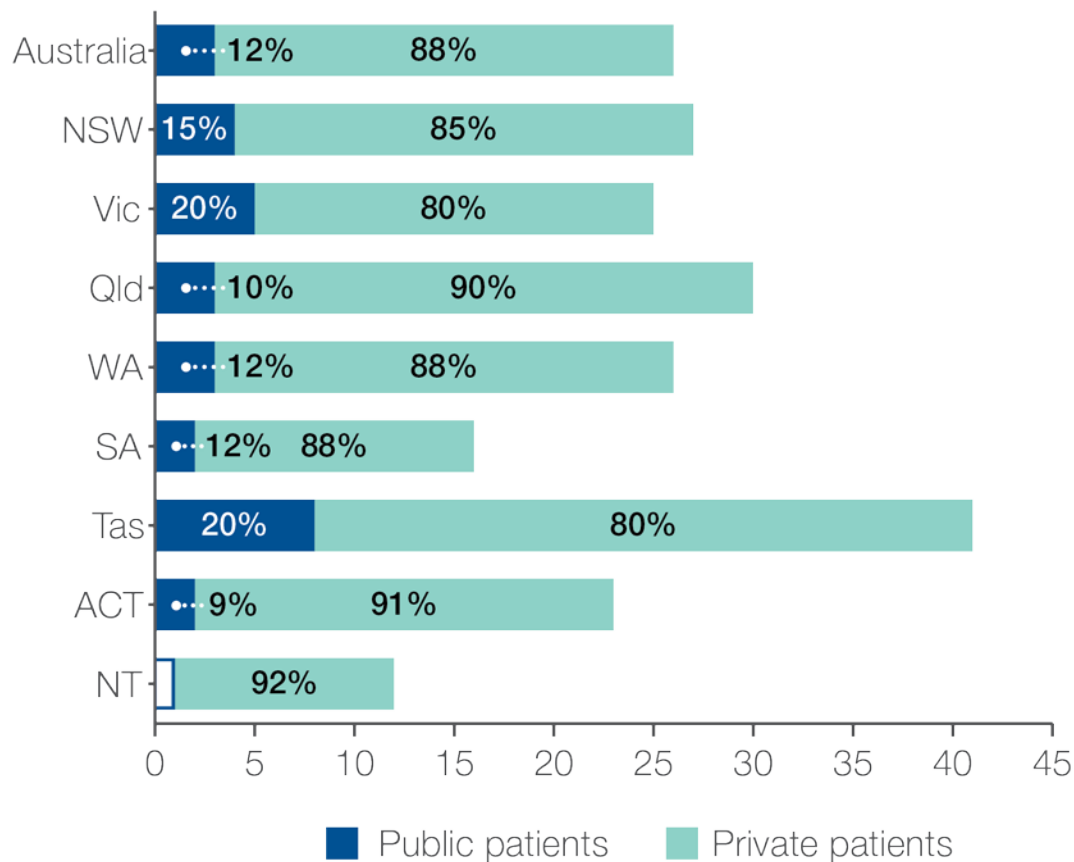


National Hospital Morbidity Database, 2012–13 to 2014–15



4.3 Lumbar spinal fusion hospitalisations 18 years and over

Patient funding status



Number of hospitalisations per 100,000 people

National Hospital Morbidity Database, 2012–13 to 2014–15

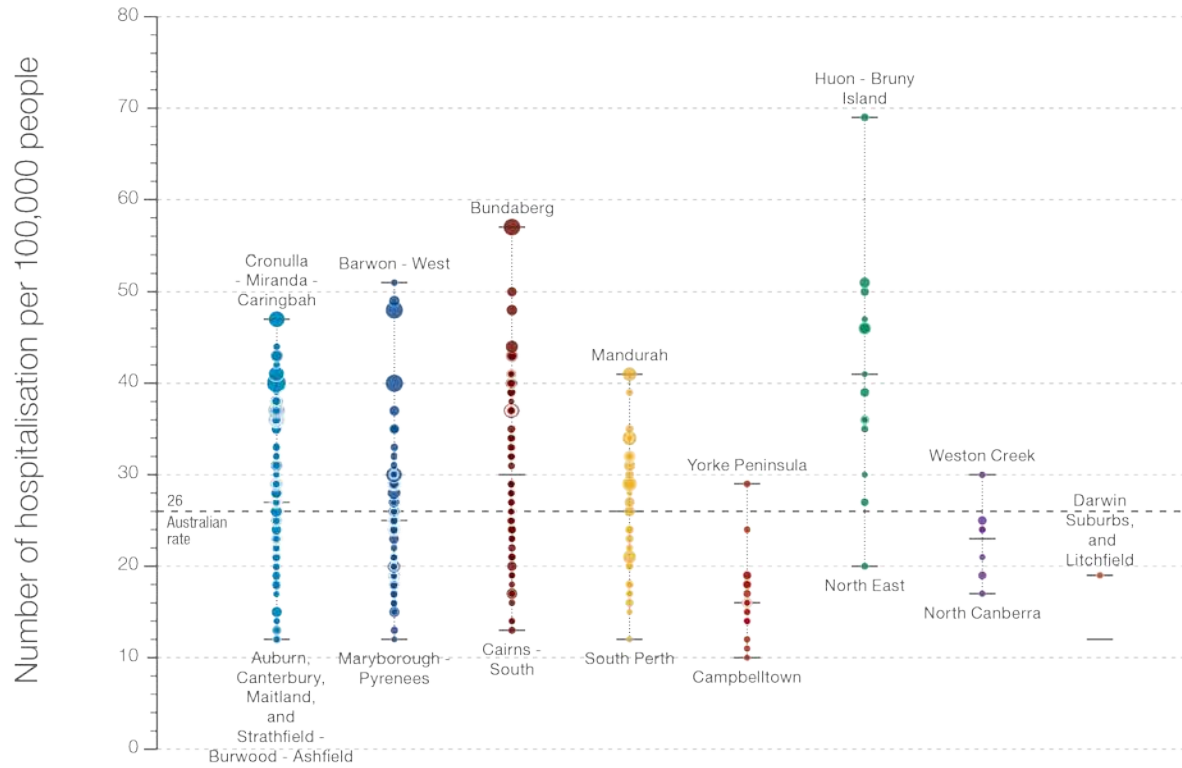


4.3 Lumbar spinal fusion hospitalisations 18 years and over

State and territory

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Highest rate	47	51	57	41	29	69	30	19
State/territory	27	25	30	26	16	41	23	12
Lowest rate	12	12	13	12	10	20	17	19
No. hospitalisations	4,986	3,442	3,282	1,522	675	573	193	58

Each circle represents a single SA3. The size indicates the number of hospitalisations.

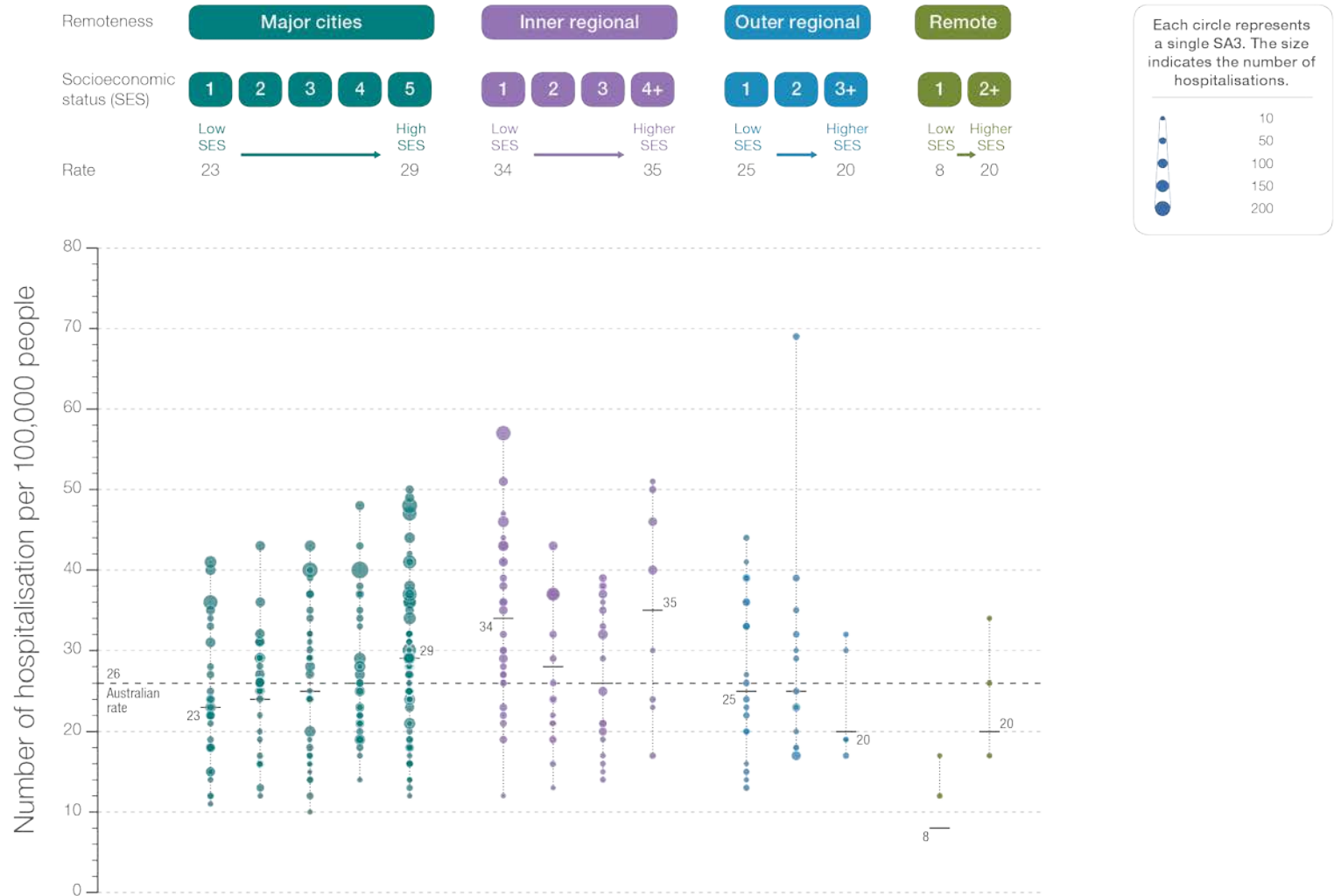


National Hospital Morbidity Database, 2012–13 to 2014–15



4.3 Lumbar spinal fusion hospitalisations 18 years and over

Remoteness and socioeconomic status

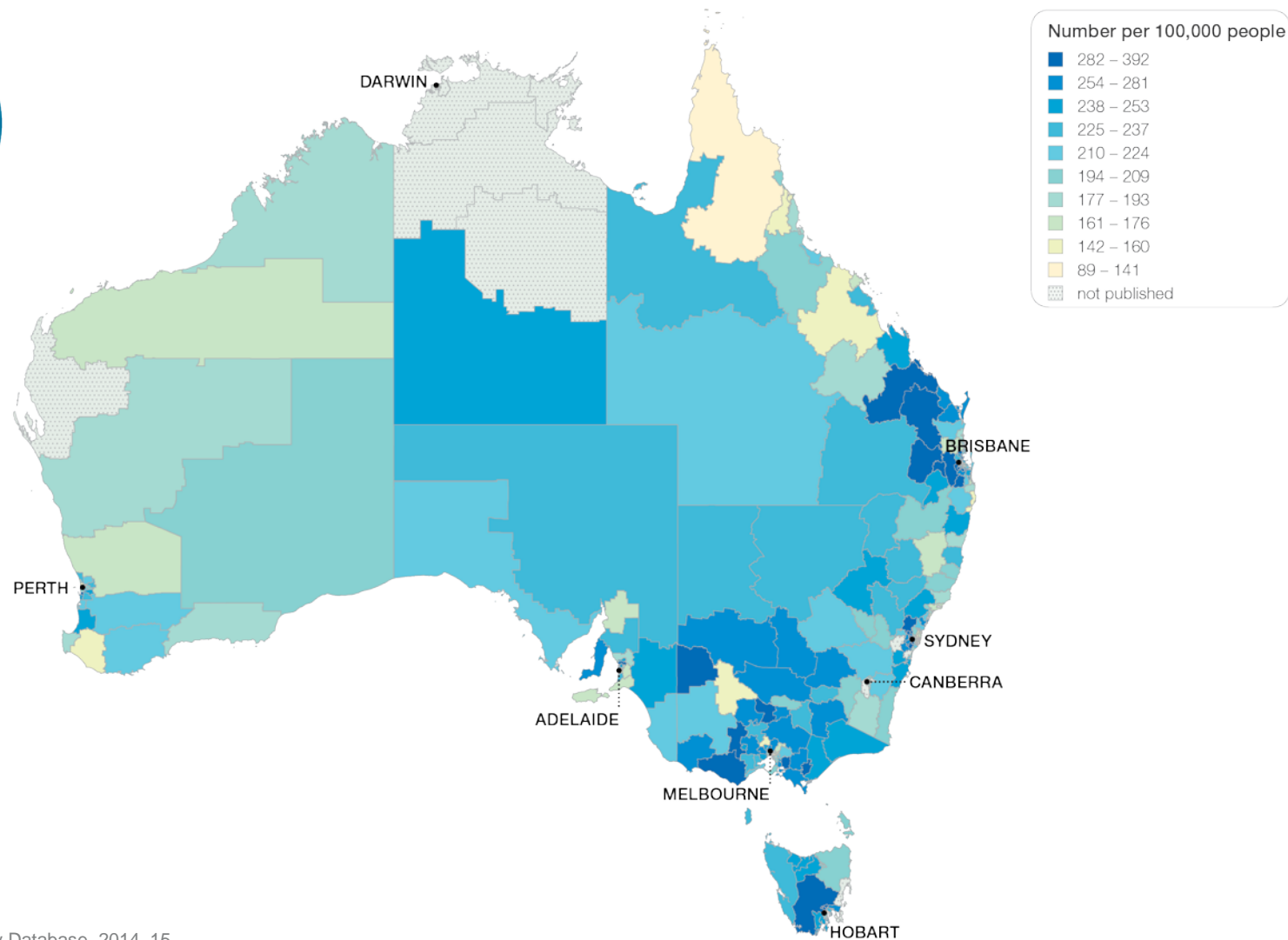


National Hospital Morbidity Database, 2012–13 to 2014–15



4.4 Laparoscopic cholecystectomy hospitalisations

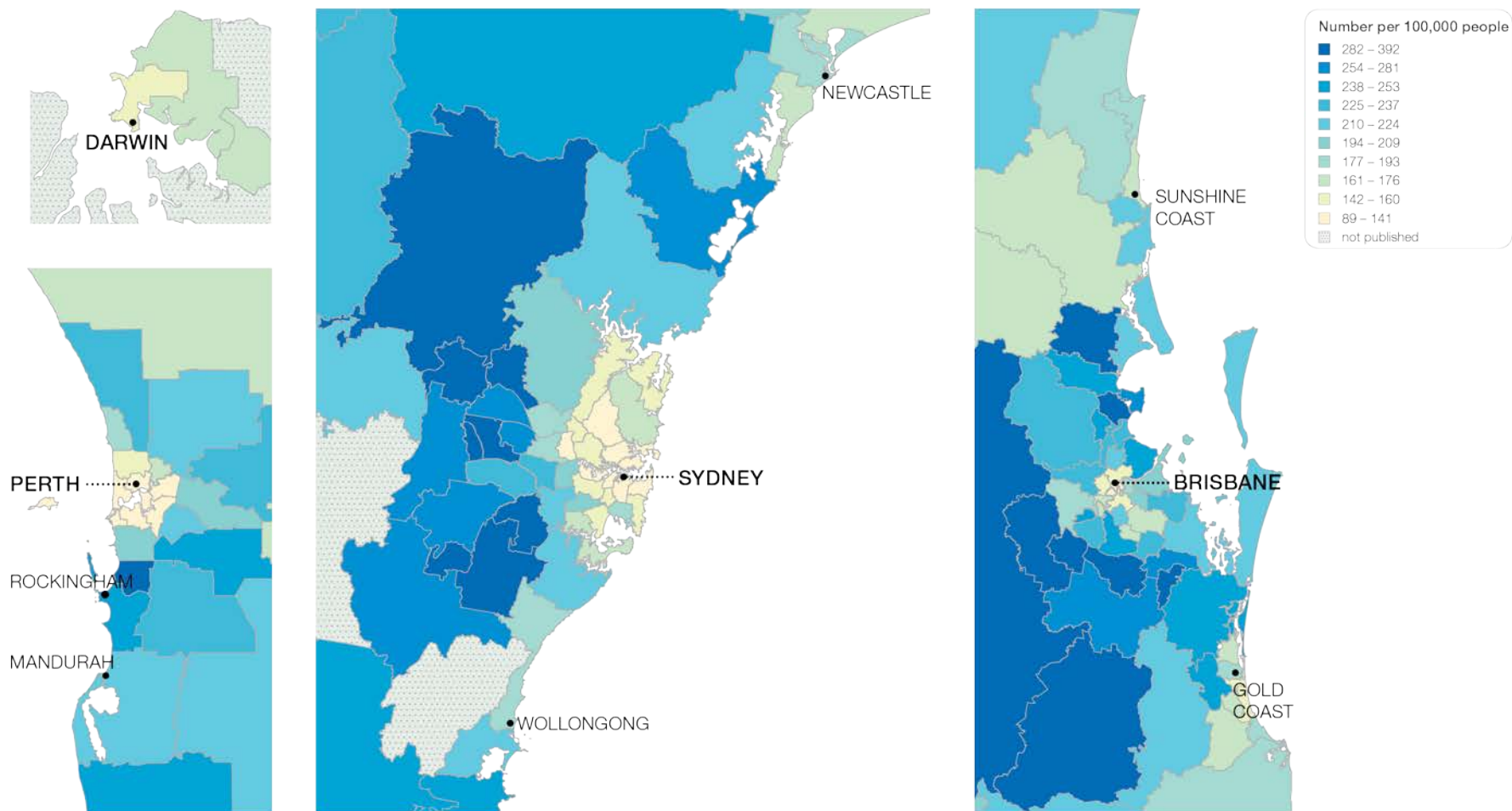
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in the highest rate area
compared to the
lowest rate area



National Hospital Morbidity Database, 2014–15



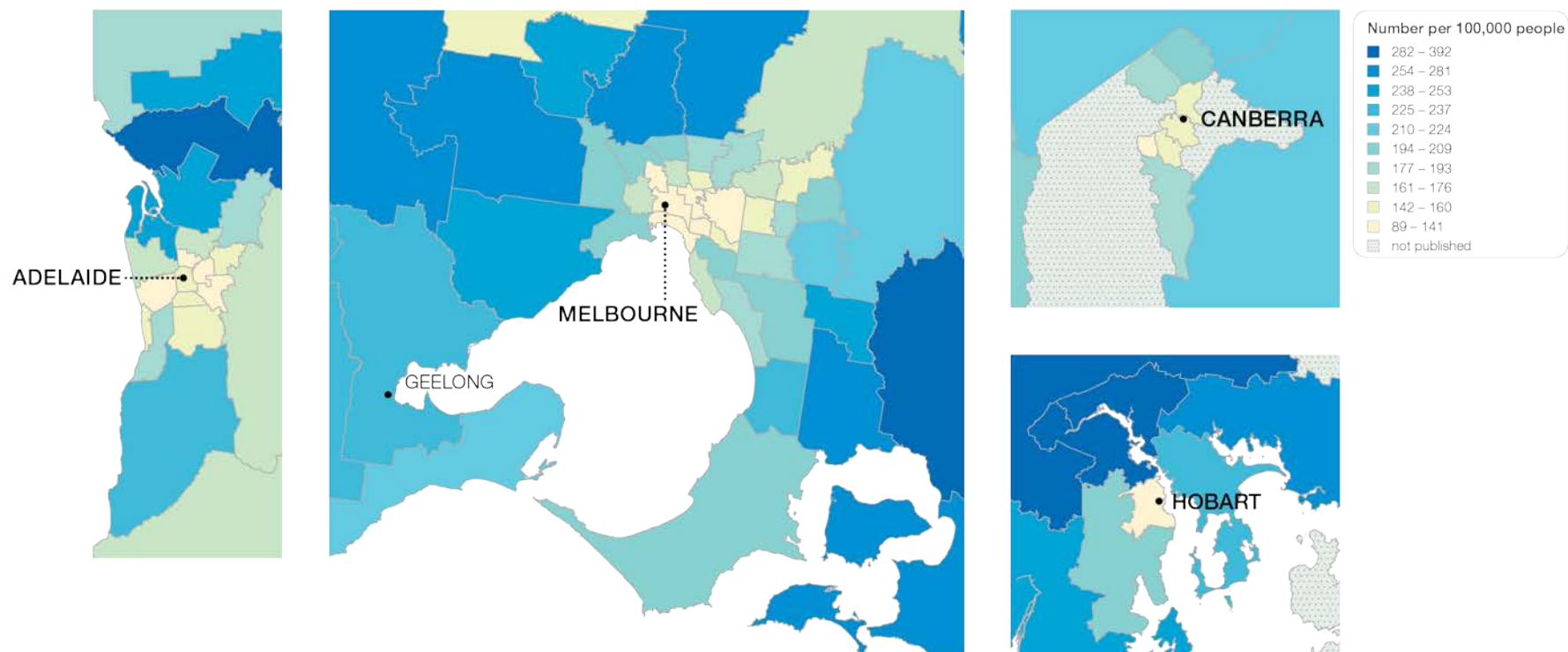
4.4 Laparoscopic cholecystectomy hospitalisations



National Hospital Morbidity Database, 2014–15



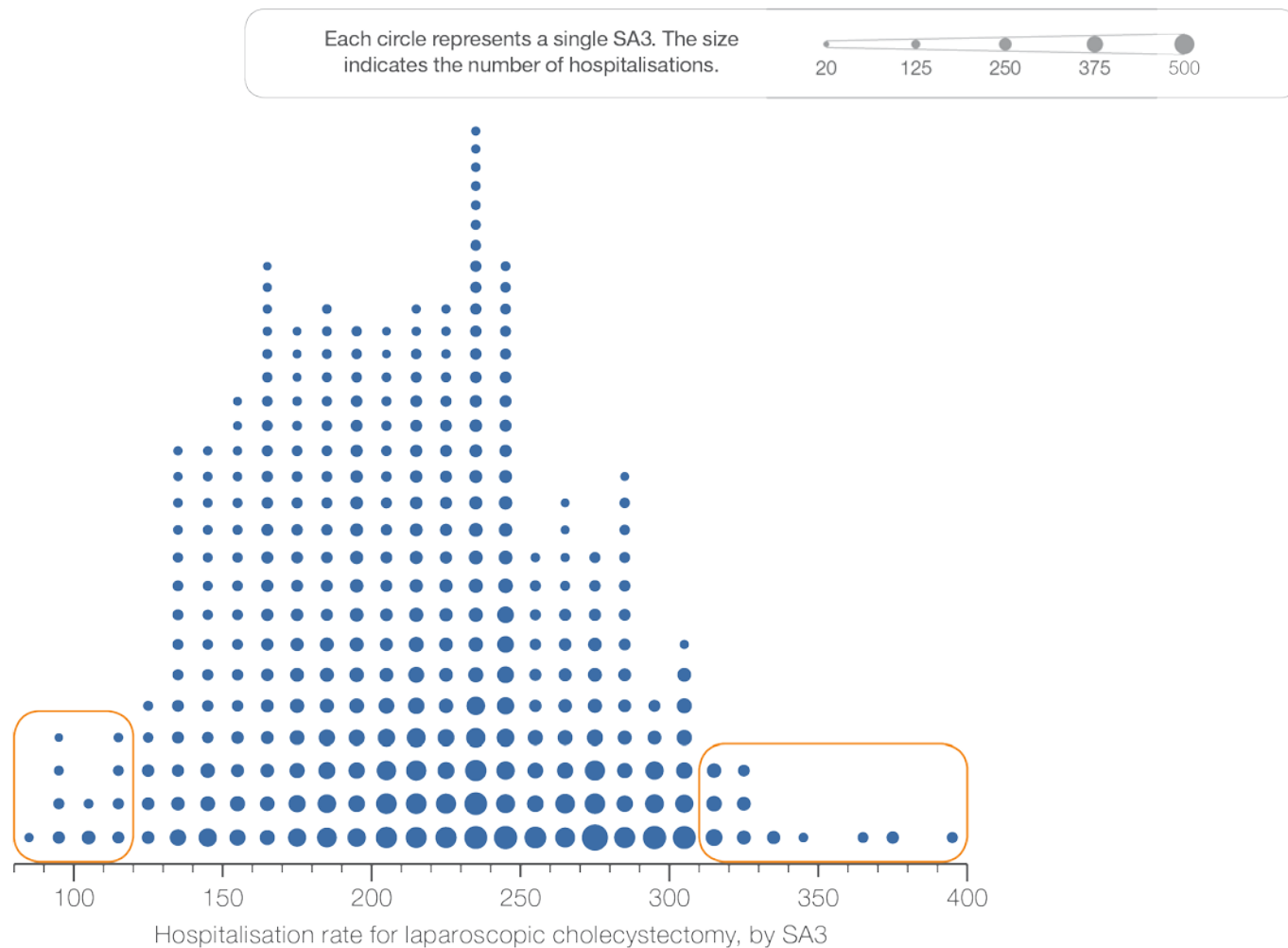
4.4 Laparoscopic cholecystectomy hospitalisations



National Hospital Morbidity Database, 2014–15



4.4 Laparoscopic cholecystectomy hospitalisations

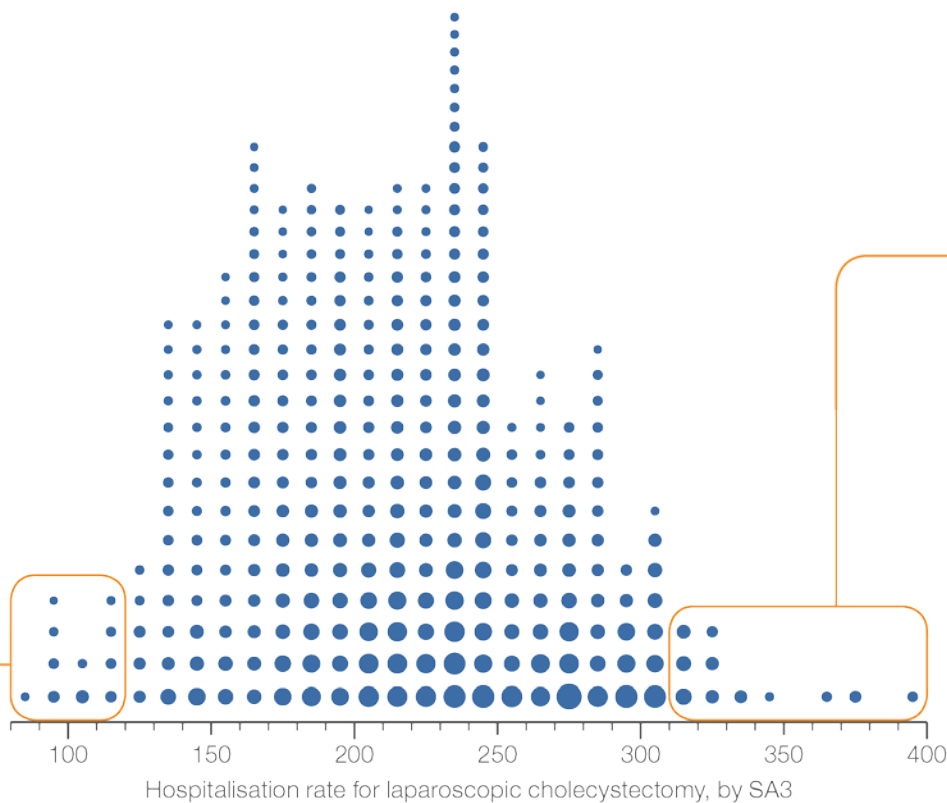


National Hospital Morbidity Database, 2014–15



4.4 Laparoscopic cholecystectomy hospitalisations

Each circle represents a single SA3. The size indicates the number of hospitalisations.



Highest rate areas

SA3	State	Rate	Hospitalisations
Hawkesbury	NSW	392	96
Richmond - Windsor	NSW	375	138
Maryborough - Pyrenees	Vic	366	92
Brighton	Tas	343	55
Burnett	Qld	334	165
St Marys	NSW	329	181
Camden	NSW	326	184
Campaspe	Vic	323	118
Cardinia	Vic	318	270
Ipswich Hinterland	Qld	318	198
Browns Plains	Qld	313	233

Lowest rate areas

SA3	State	Rate	Hospitalisations
South Perth	WA	89	43
Weston Creek	ACT	92	23
Eastern Suburbs - North	NSW	94	135
Perth City	WA	95	100
Leichhardt	NSW	96	63
Sydney Inner City	NSW	100	177
Cairns - North	Qld	108	61
Manly	NSW	110	53
North Sydney - Mosman	NSW	114	124
Cottesloe - Claremont	WA	116	87
Melbourne City	Vic	117	102

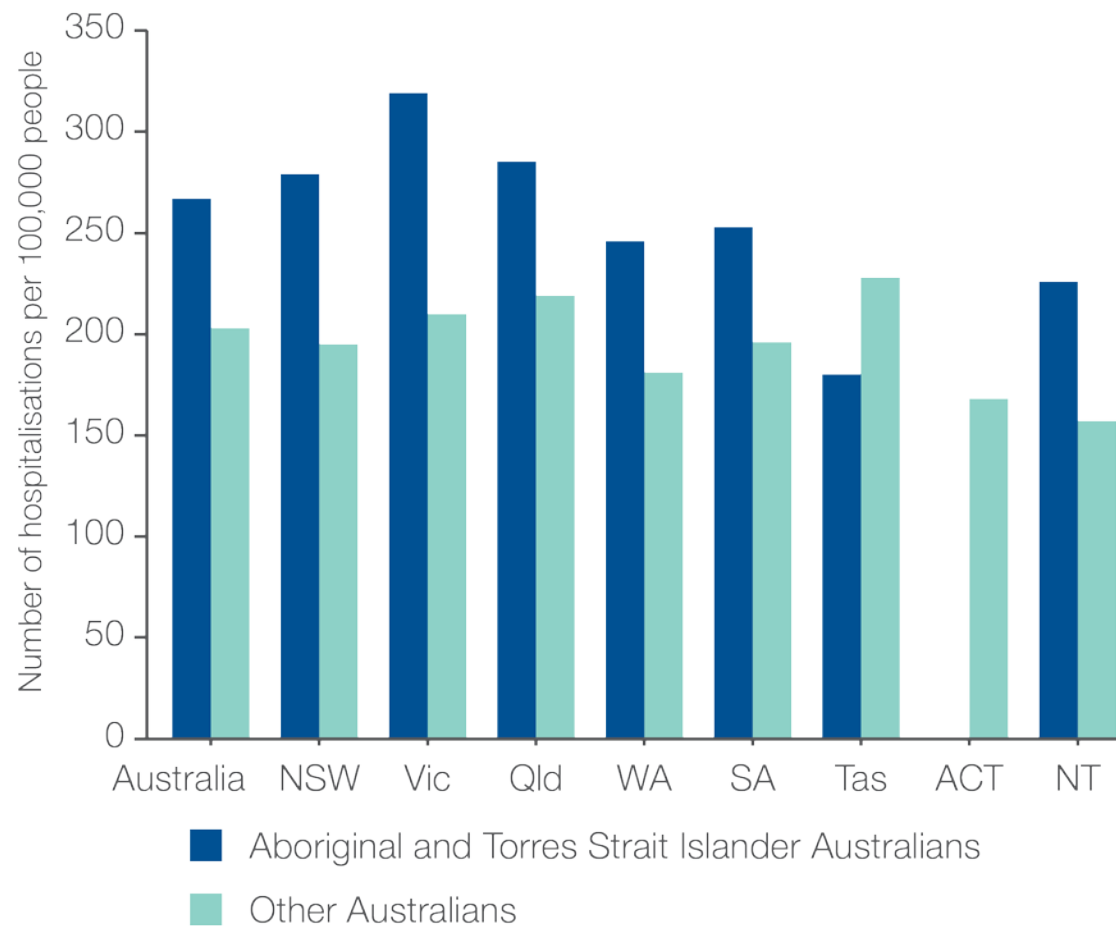
National Hospital Morbidity Database, 2014–15





4.4 Laparoscopic cholecystectomy hospitalisations

Aboriginal and Torres Strait Islander status

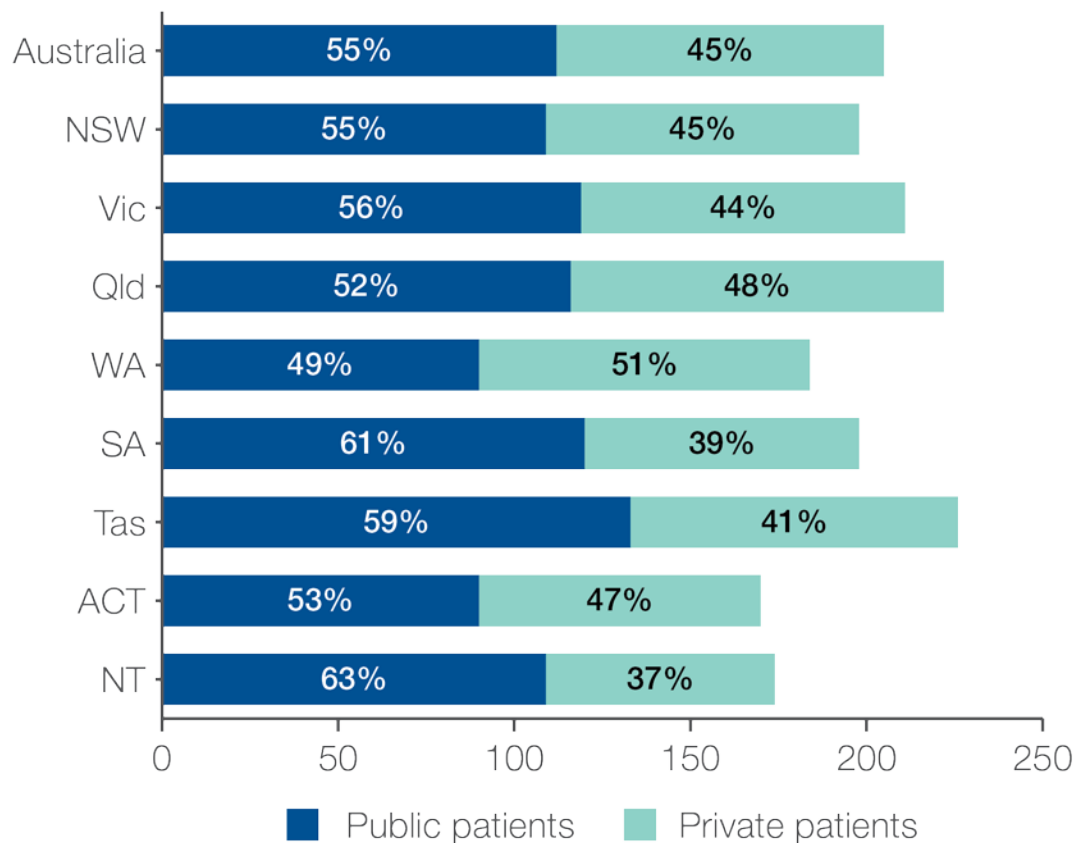


National Hospital Morbidity Database, 2014–15



4.4 Laparoscopic cholecystectomy hospitalisations

Patient funding status



Number of hospitalisations per 100,000 people

National Hospital Morbidity Database, 2014–15


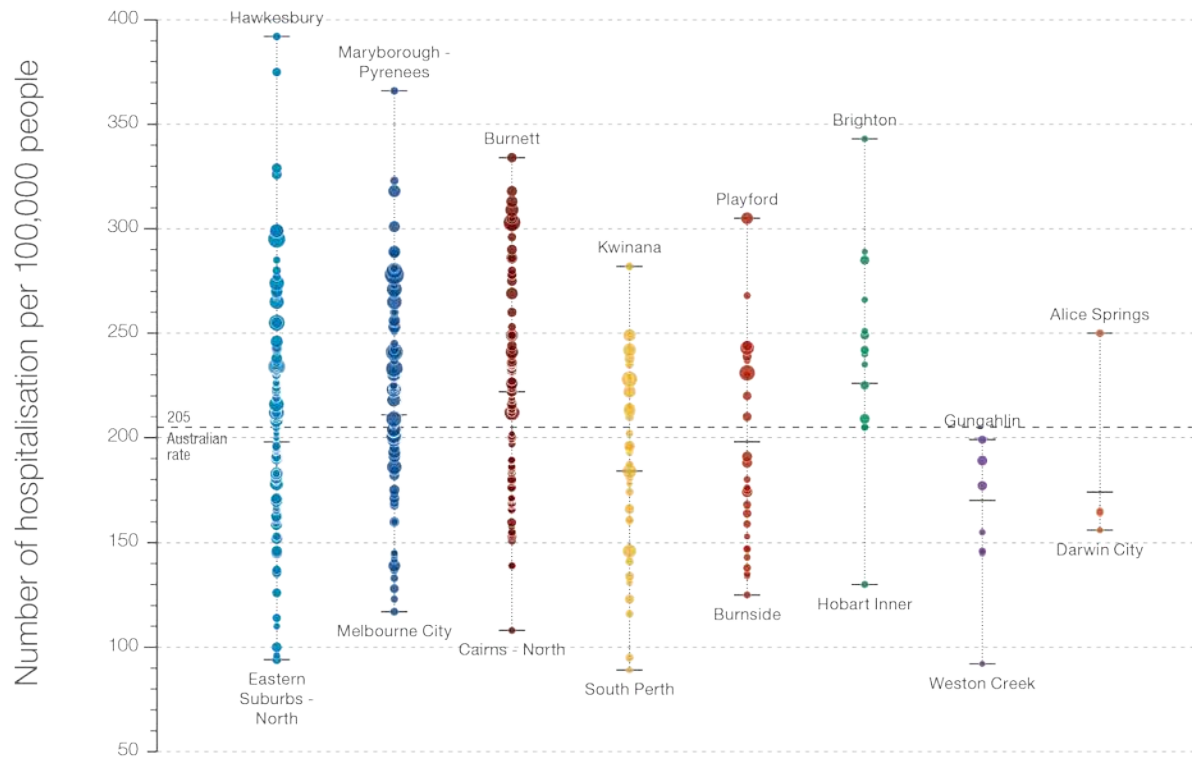


4.4 Laparoscopic cholecystectomy hospitalisations

State and territory

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Highest rate	392	366	334	282	305	343	199	250
State/territory	198	211	222	184	198	226	170	174
Lowest rate	94	117	108	89	125	130	92	156
No. hospitalisations	15,555	12,905	10,716	4,758	3,535	1,231	659	391

Each circle represents a single SA3. The size indicates the number of hospitalisations.

National Hospital Morbidity Database, 2014–15



4.4 Laparoscopic cholecystectomy hospitalisations

Remoteness and socioeconomic status

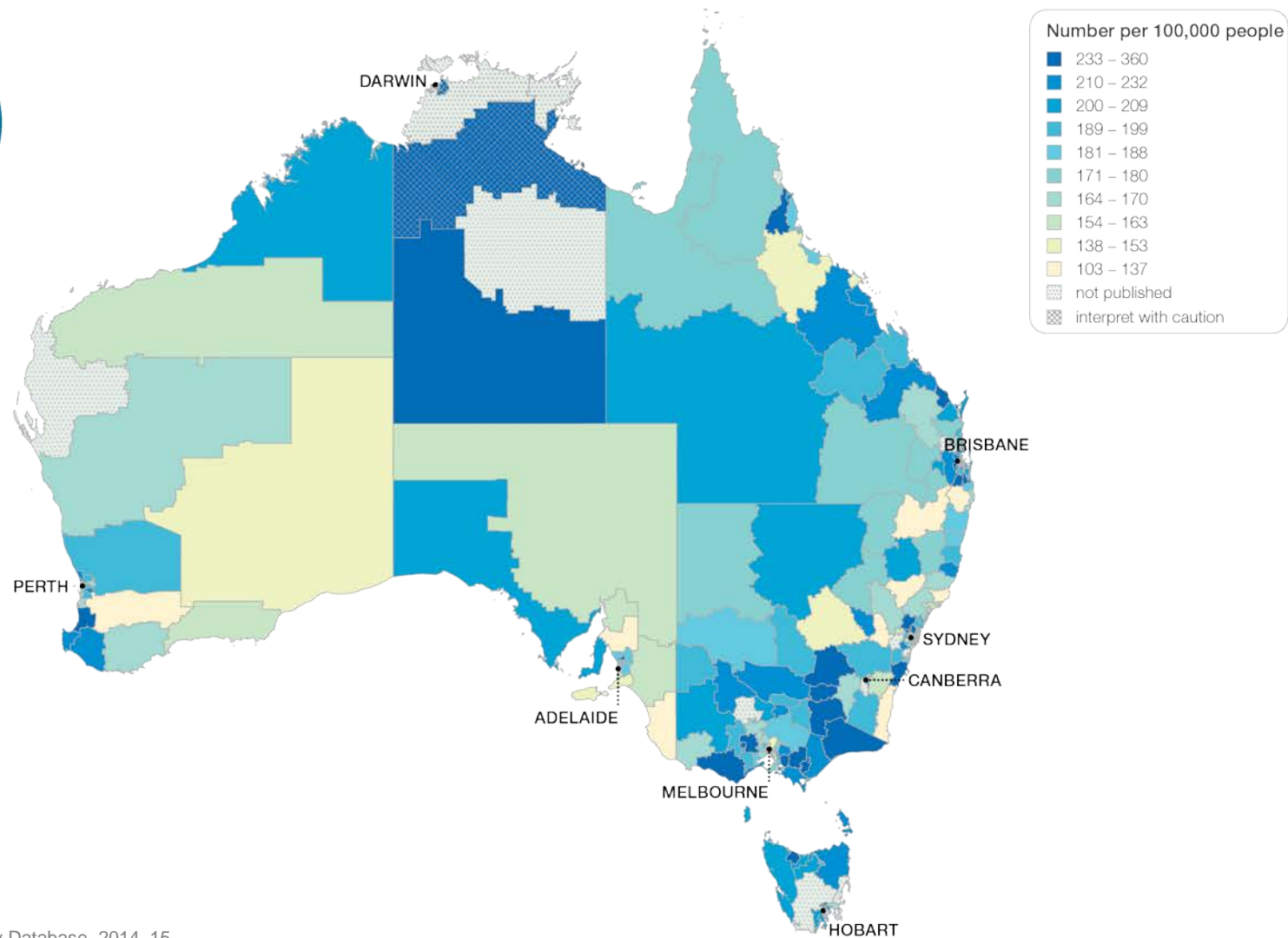


National Hospital Morbidity Database, 2014–15



4.5 Appendicectomy hospitalisations

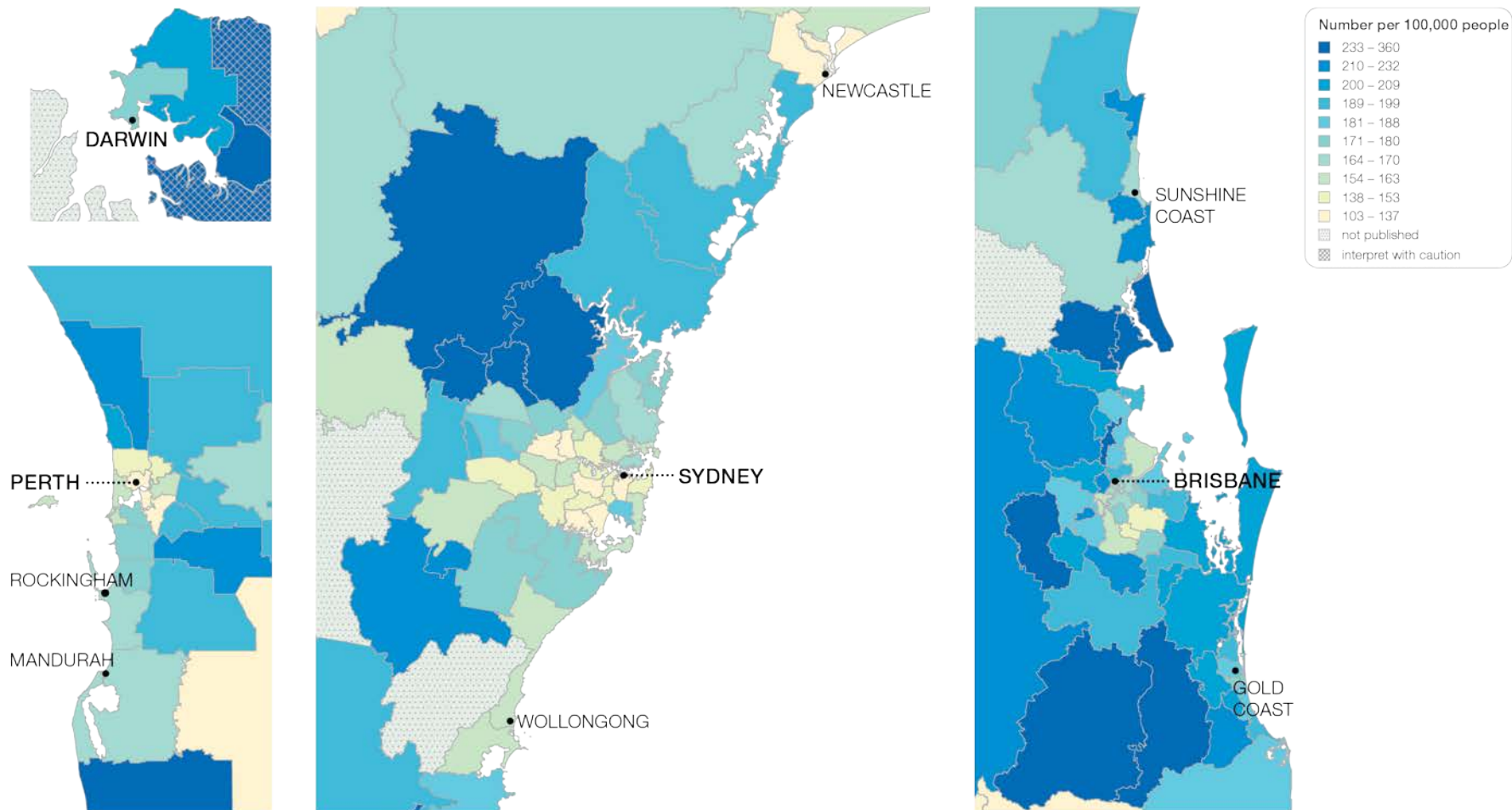
3.5x
AS HIGH
in the highest rate area
compared to the
lowest rate area



National Hospital Morbidity Database, 2014–15



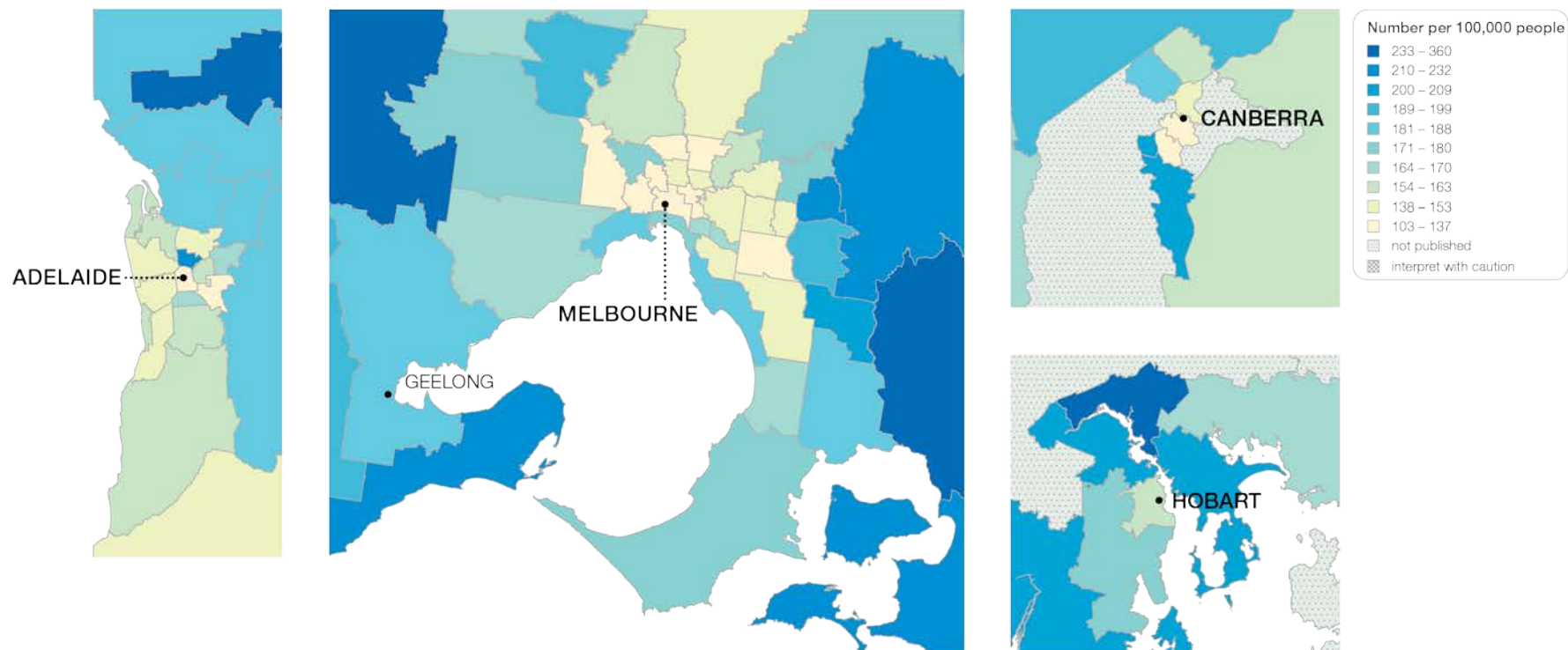
4.5 Appendicectomy hospitalisations



National Hospital Morbidity Database, 2014–15



4.5 Appendicectomy hospitalisations

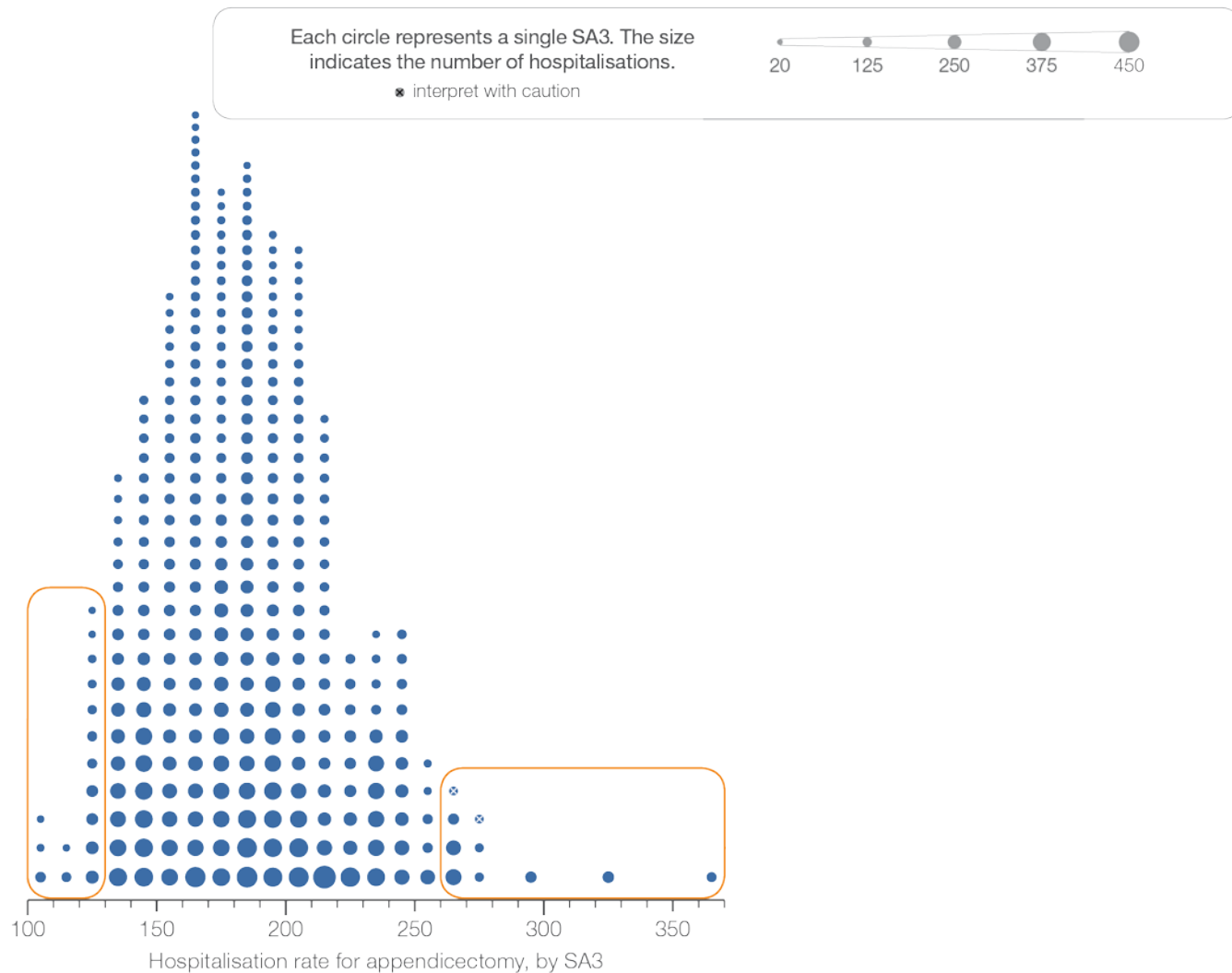


National Hospital Morbidity Database, 2014–15





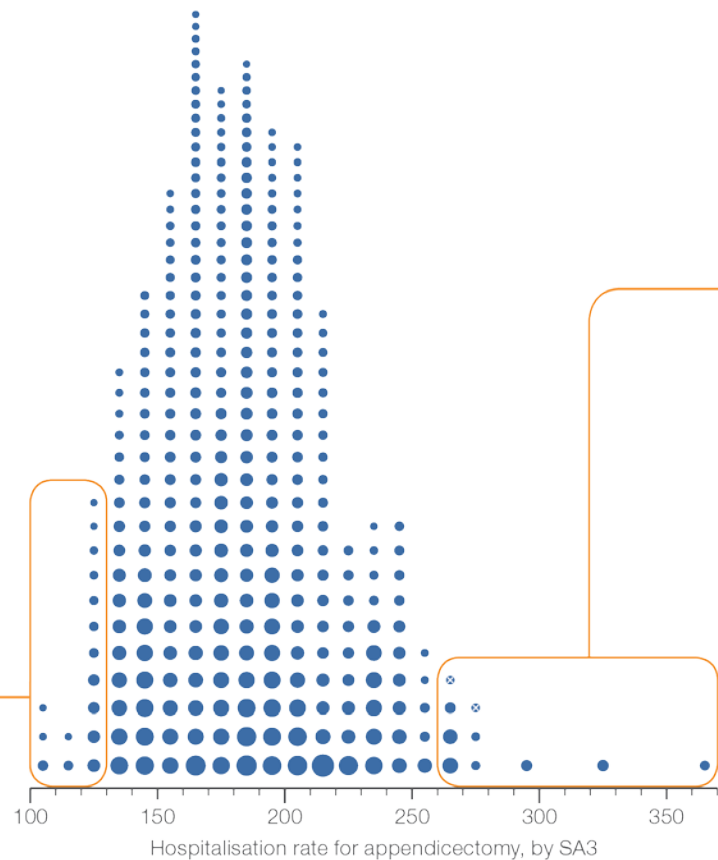
4.5 Appendicectomy hospitalisations



National Hospital Morbidity Database, 2014–15



4.5 Appendicectomy hospitalisations



Each circle represents a single SA3. The size indicates the number of hospitalisations.
 * interpret with caution



Highest rate areas

SA3	State	Rate	Hospitalisations
Hawkesbury	NSW	360	85
Richmond - Windsor	NSW	329	126
Baw Baw	Vic	293	119
Litchfield	NT	278*	59
Dural - Wisemans Ferry	NSW	275	68
Creswick - Daylesford - Ballan	Vic	271	62
Katherine	NT	265*	57
Wagga Wagga	NSW	264	236
Burnie - Ulverstone	Tas	263	116
Warrnambool - Otway Ranges	Vic	261	208

Lowest rate areas

SA3	State	Rate	Hospitalisations
Woden	ACT	103	36
South Canberra	ACT	107	26
Darebin - North	Vic	108	104
Adelaide City	SA	117	25
Moreland - North	Vic	118	85
South Coast	NSW	120	71
Perth City	WA	122	131
Canning	WA	124	132
Carlingford	NSW	124	80
Kogarah - Rockdale	NSW	125	162
Wheat Belt - South	WA	125	23
Hurstville	NSW	126	156
Richmond Valley - Hinterland	NSW	128	87
Lower North	SA	128	26
South Perth	WA	129	60
Burnside	SA	129	53

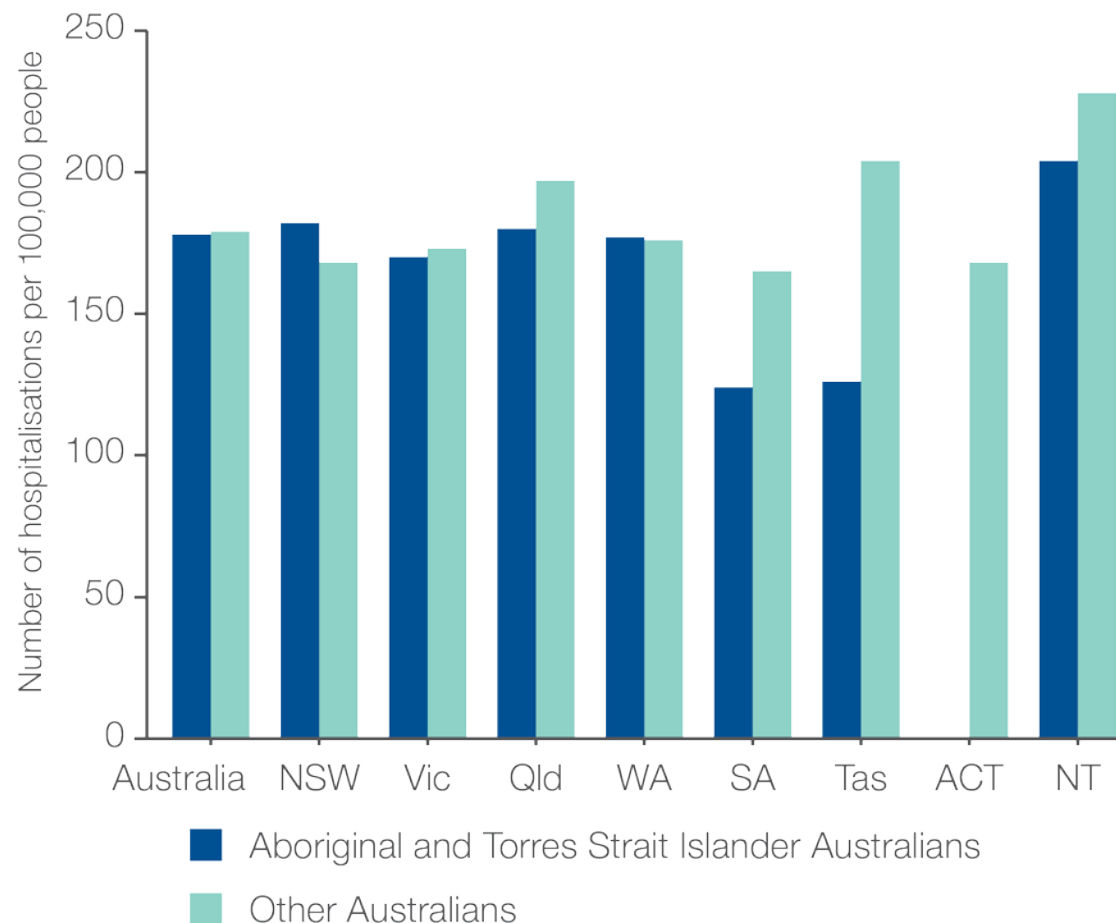
National Hospital Morbidity Database, 2014–15





4.5 Appendicectomy hospitalisations

Aboriginal and Torres Strait Islander status



National Hospital Morbidity Database, 2014–15



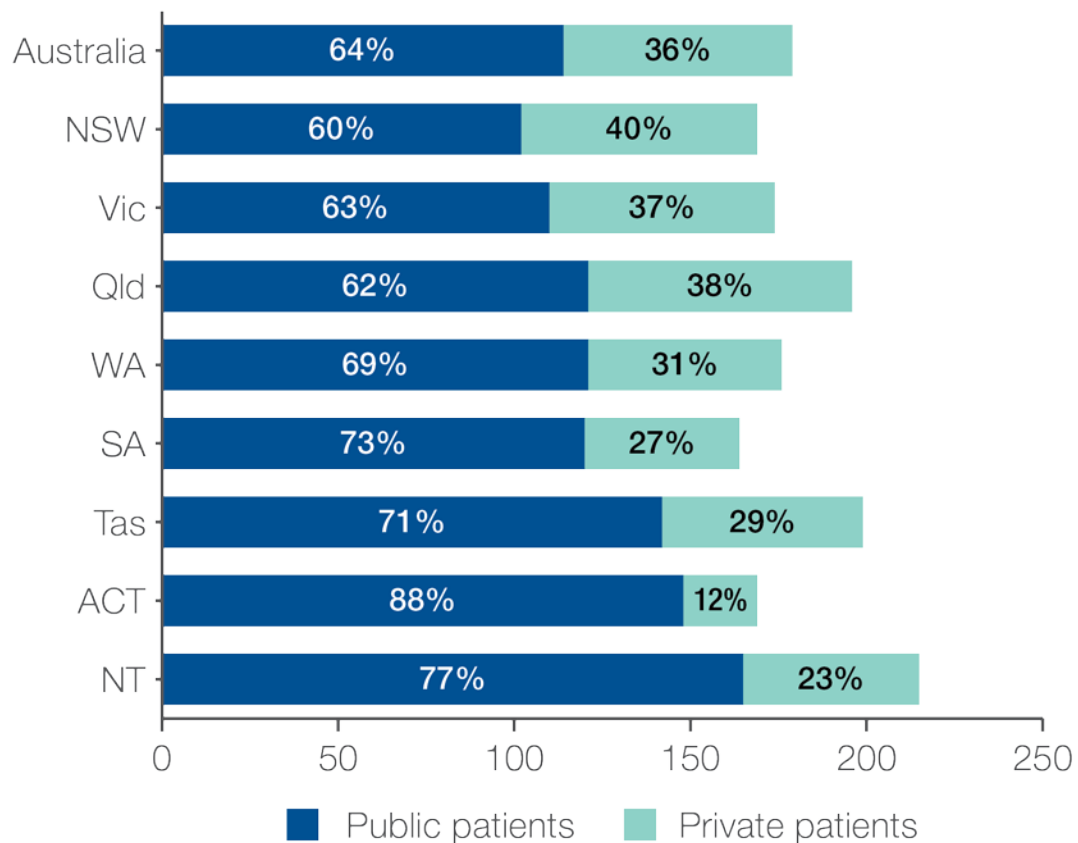
Surgical interventions

AUSTRALIAN COMMISSION
ON SAFETY AND QUALITY IN HEALTH CARE Atlas 2017



4.5 Appendicectomy hospitalisations

Patient funding status



Number of hospitalisations per 100,000 people

National Hospital Morbidity Database, 2014–15

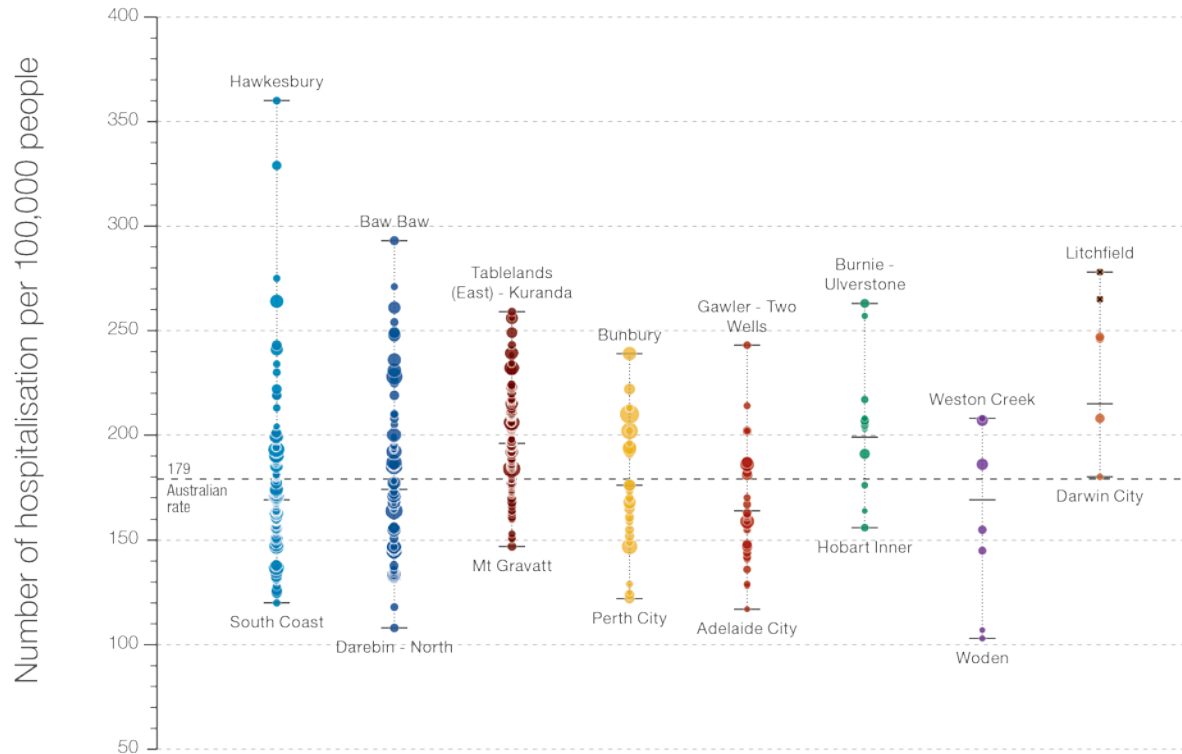


4.5 Appendicectomy hospitalisations

State and territory

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Highest rate	360	293	259	239	243	263	208	278*
State/territory	169	174	196	176	164	199	169	215
Lowest rate	120	108	147	122	117	156	103	180
No. hospitalisations	12,165	9,850	9,048	4,422	2,626	947	663	547

Each circle represents a single SA3. The size indicates the number of hospitalisations.

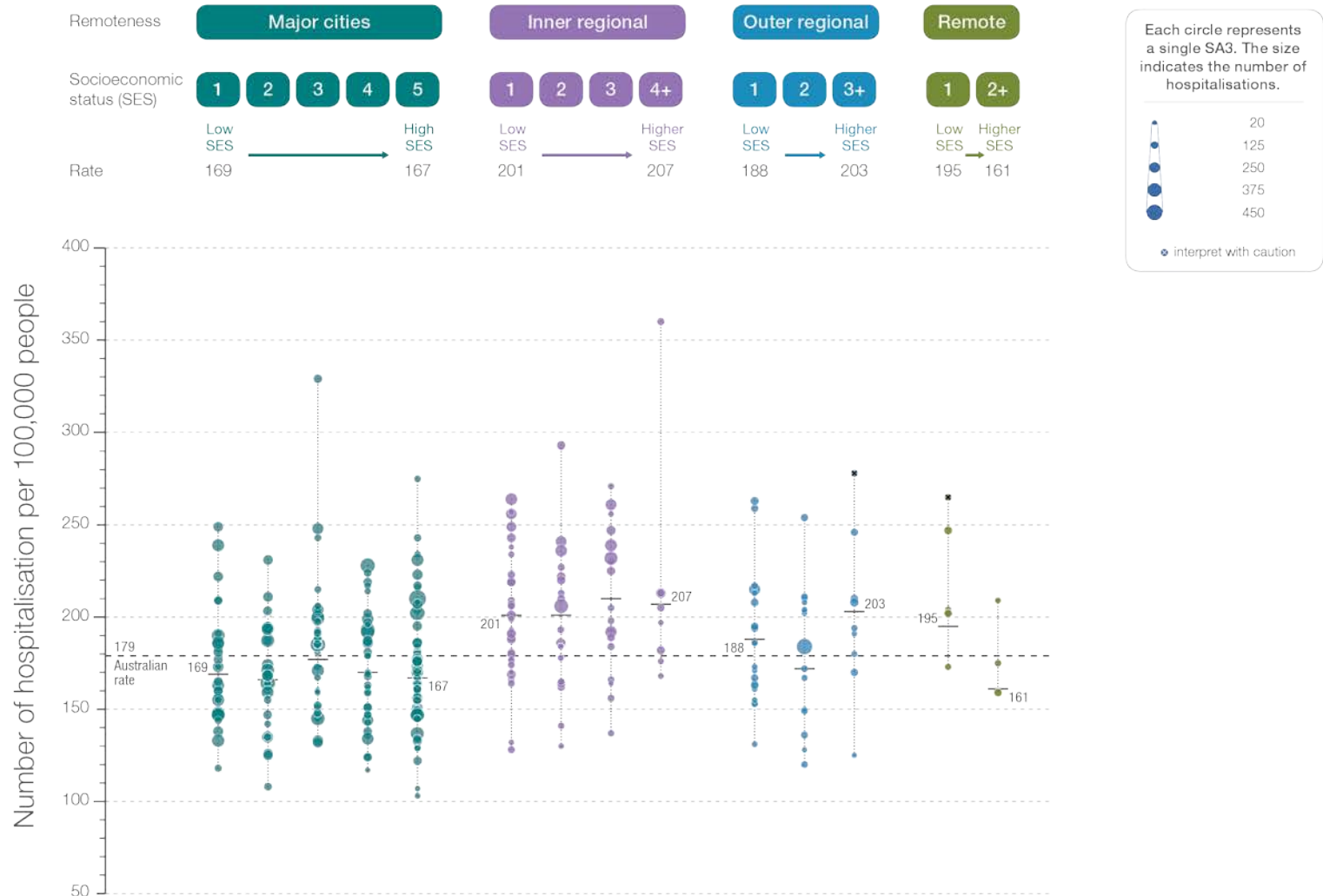


National Hospital Morbidity Database, 2014–15



4.5 Appendicectomy hospitalisations

Remoteness and socioeconomic status

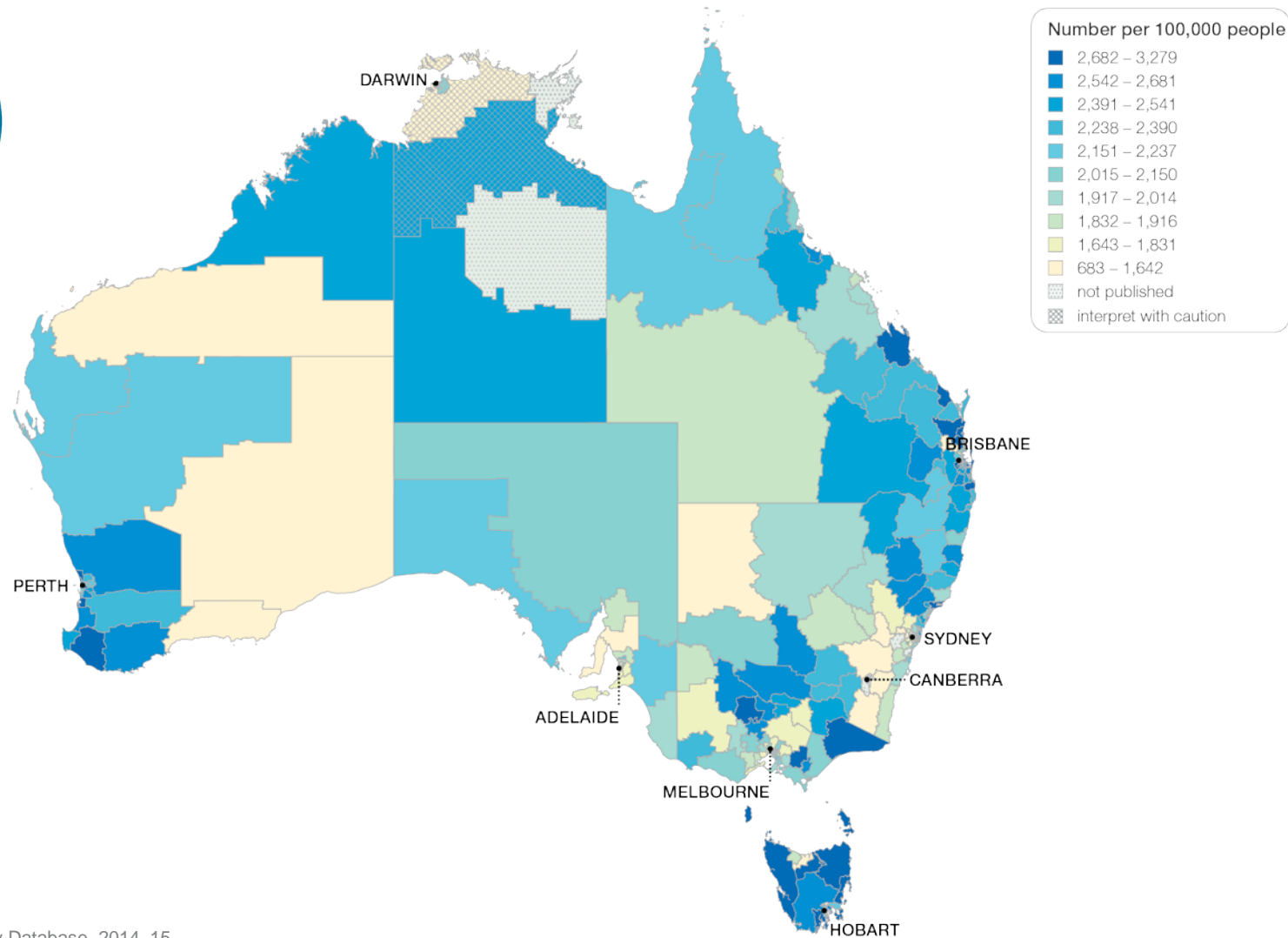


National Hospital Morbidity Database, 2014–15



4.6 Cataract surgery hospitalisations 40 years and over

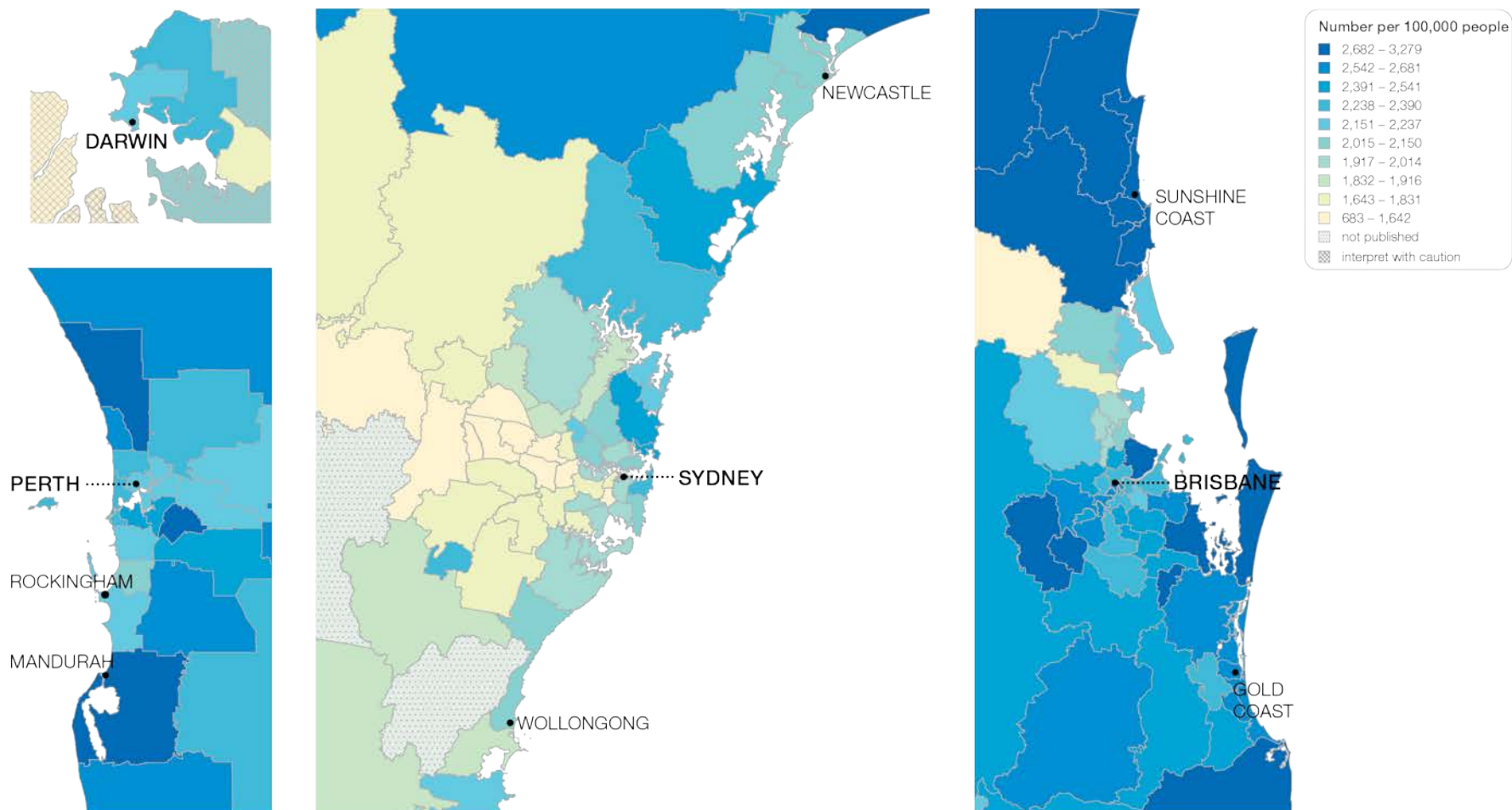
3.9x
AS HIGH
in the highest rate area
compared to the
lowest rate area



National Hospital Morbidity Database, 2014–15



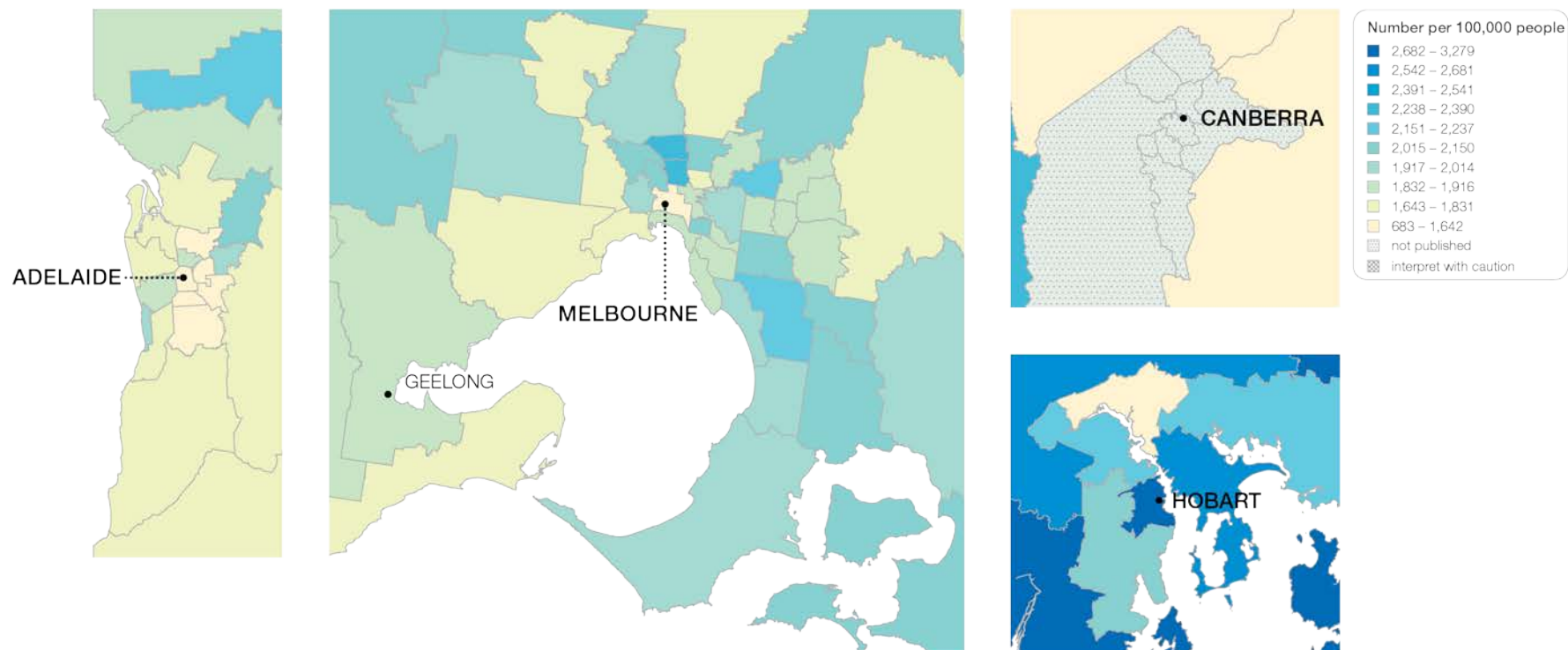
4.6 Cataract surgery hospitalisations 40 years and over



National Hospital Morbidity Database, 2014–15



4.6 Cataract surgery hospitalisations 40 years and over

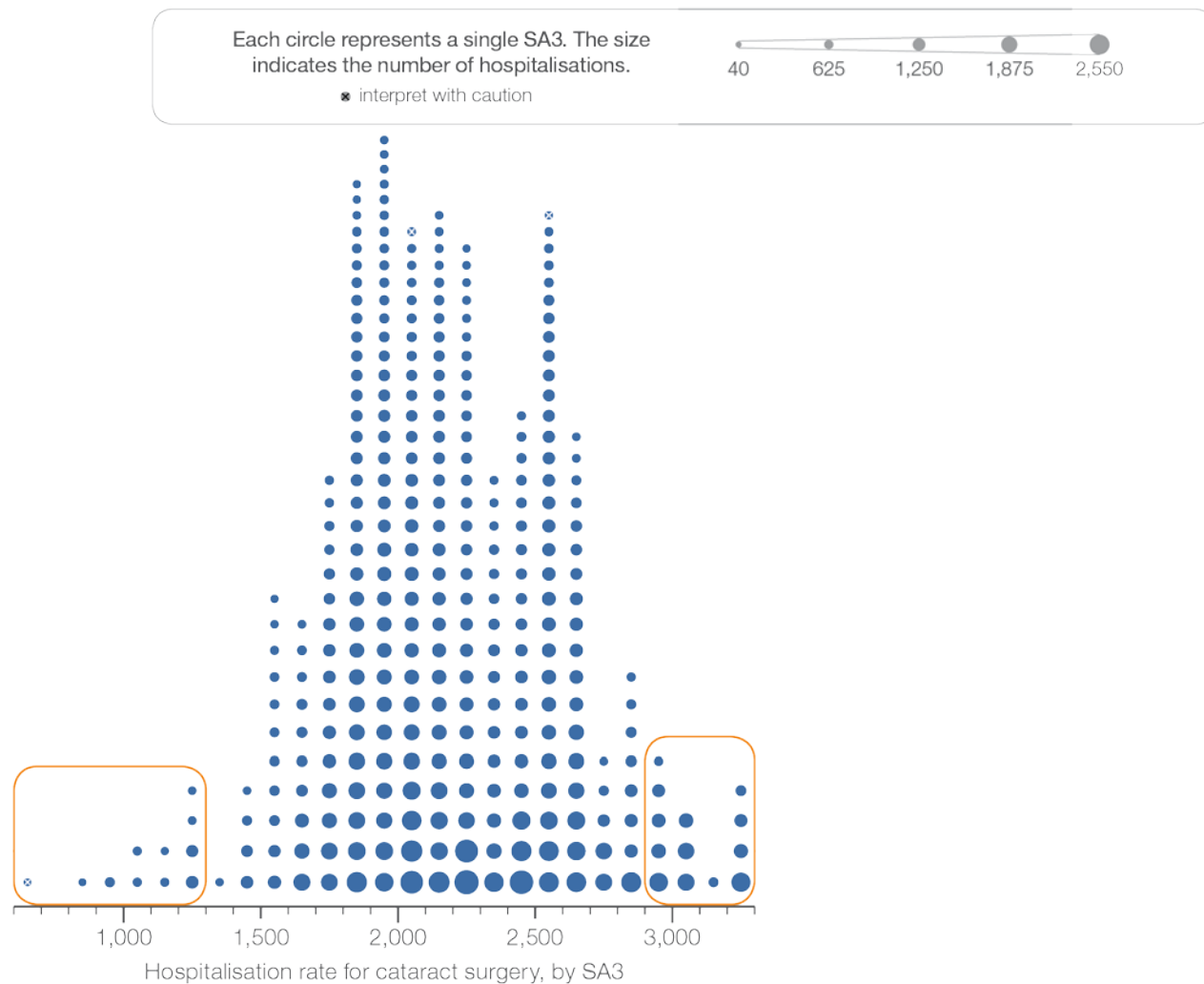


National Hospital Morbidity Database, 2014–15





4.6 Cataract surgery hospitalisations 40 years and over

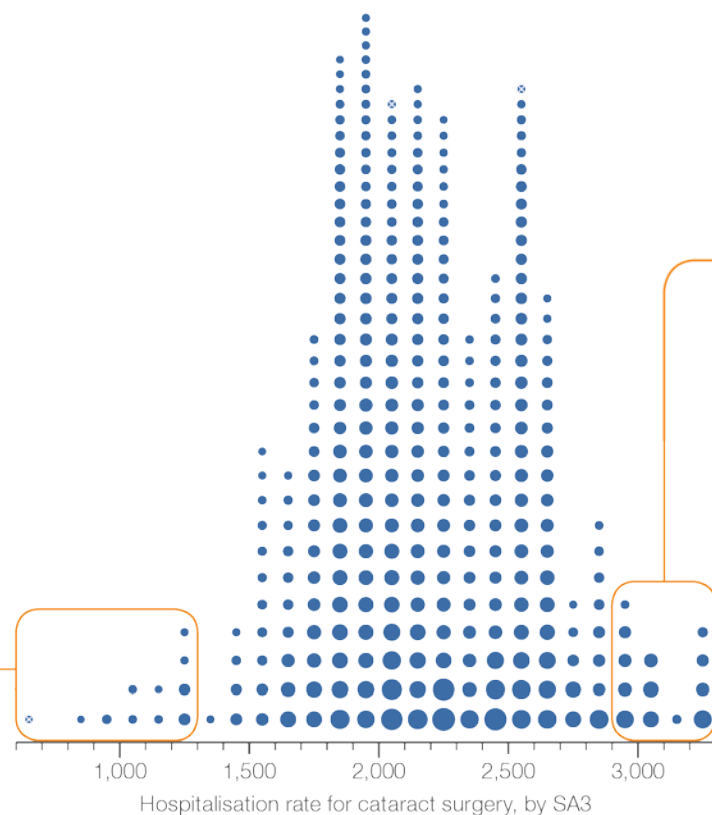


National Hospital Morbidity Database, 2014–15



4.6 Cataract surgery hospitalisations 40 years and over

Each circle represents a single SA3. The size indicates the number of hospitalisations.
 • interpret with caution



Highest rate areas

SA3	State	Rate	Hospitalisations
North East	Tas	3,279	827
Caloundra	Qld	3,266	1,753
Meander Valley - West Tamar	Tas	3,255	494
Gympie - Cooloola	Qld	3,239	1,002
Huon - Bruny Island	Tas	3,116	356
Launceston	Tas	3,094	1,435
Gippsland - East	Vic	3,015	1,067
Gosnells	WA	3,000	1,369
Nambour - Pomona	Qld	2,990	1,070
Noosa	Qld	2,938	821
Maroochy	Qld	2,933	964
Loddon - Elmore	Vic	2,925	244
Rockhampton	Qld	2,905	1,699

Lowest rate areas

SA3	State	Rate	Hospitalisations
Daly - Tiwi - West Arnhem	NT	683*	40
Brighton	Tas	835	51
Mount Druitt	NSW	978	385
Queanbeyan	NSW	1,064	241
Bathurst	NSW	1,083	254
Esperance	WA	1,154	97
St Marys	NSW	1,182	241
Lower North	SA	1,202	185
Merrylands - Guildford	NSW	1,208	774
Blacktown	NSW	1,245	696
Snowy Mountains	NSW	1,268	148

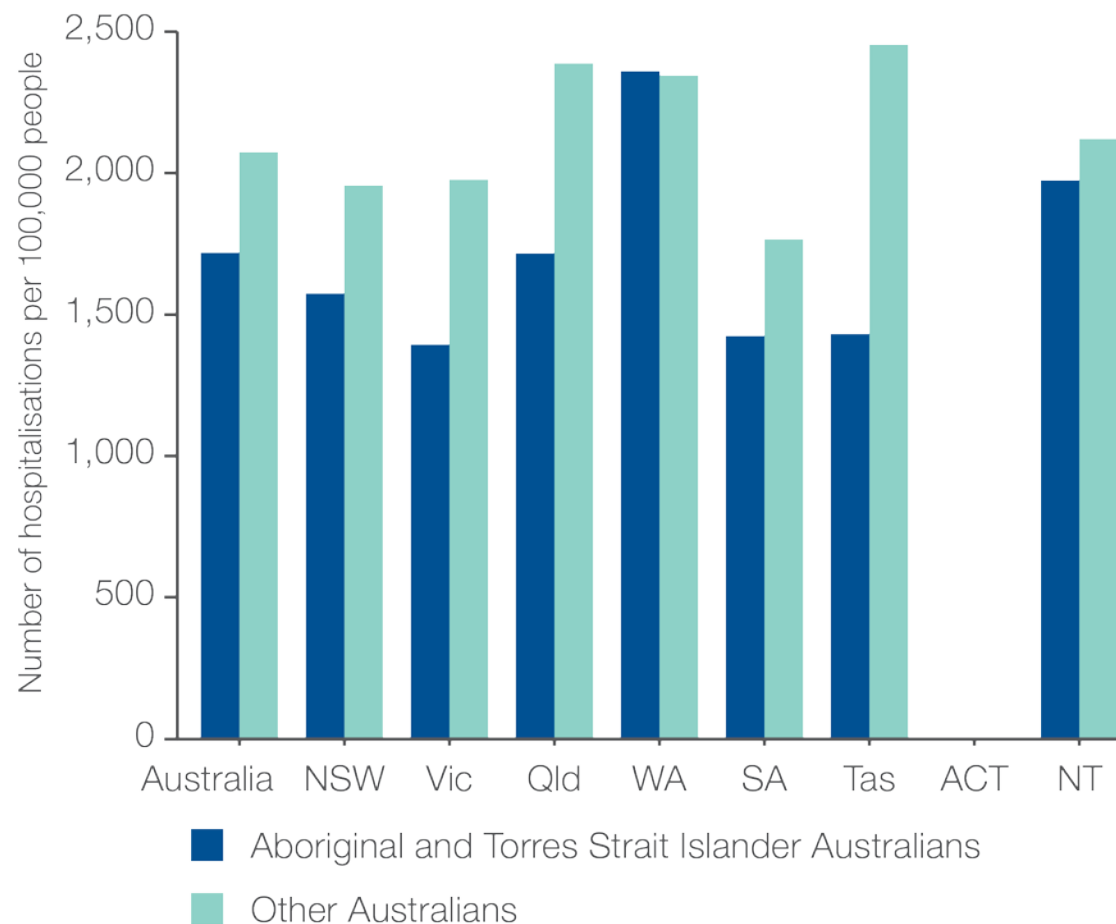
National Hospital Morbidity Database, 2014–15





4.6 Cataract surgery hospitalisations 40 years and over

Aboriginal and Torres Strait Islander status

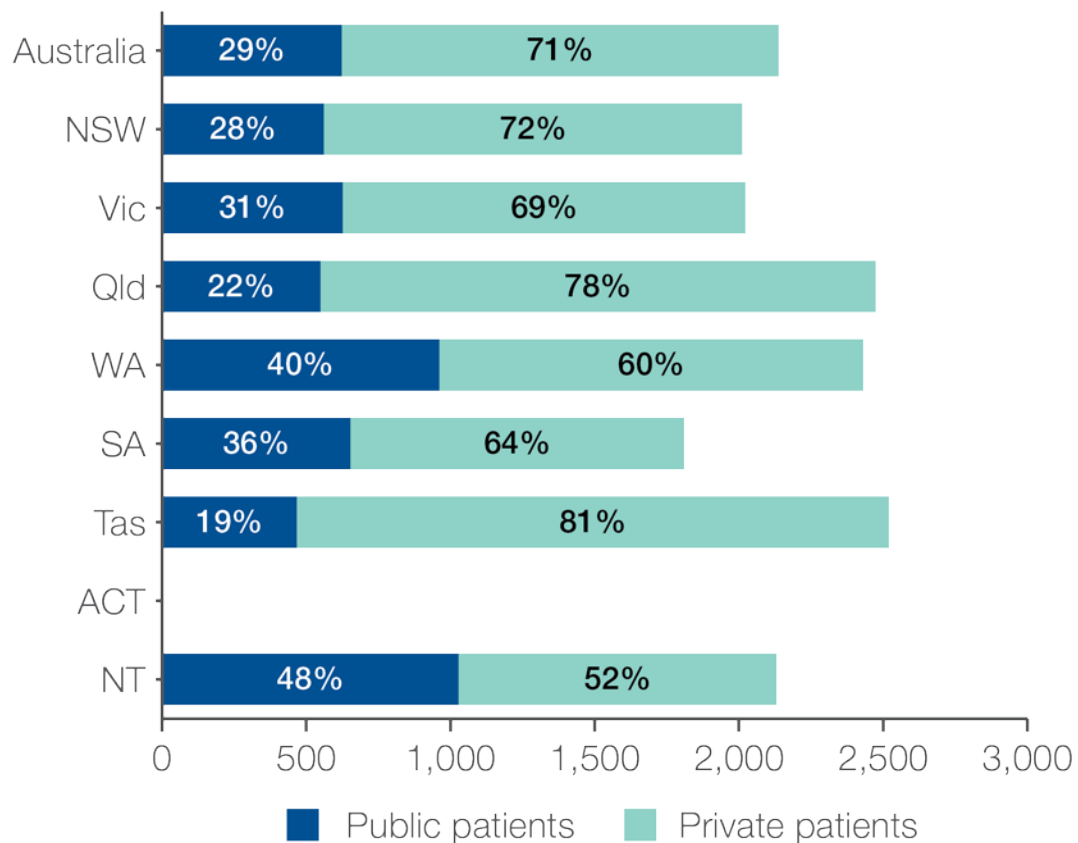


National Hospital Morbidity Database, 2014–15



4.6 Cataract surgery hospitalisations 40 years and over

Patient funding status



Number of hospitalisations per 100,000 people

National Hospital Morbidity Database, 2014–15



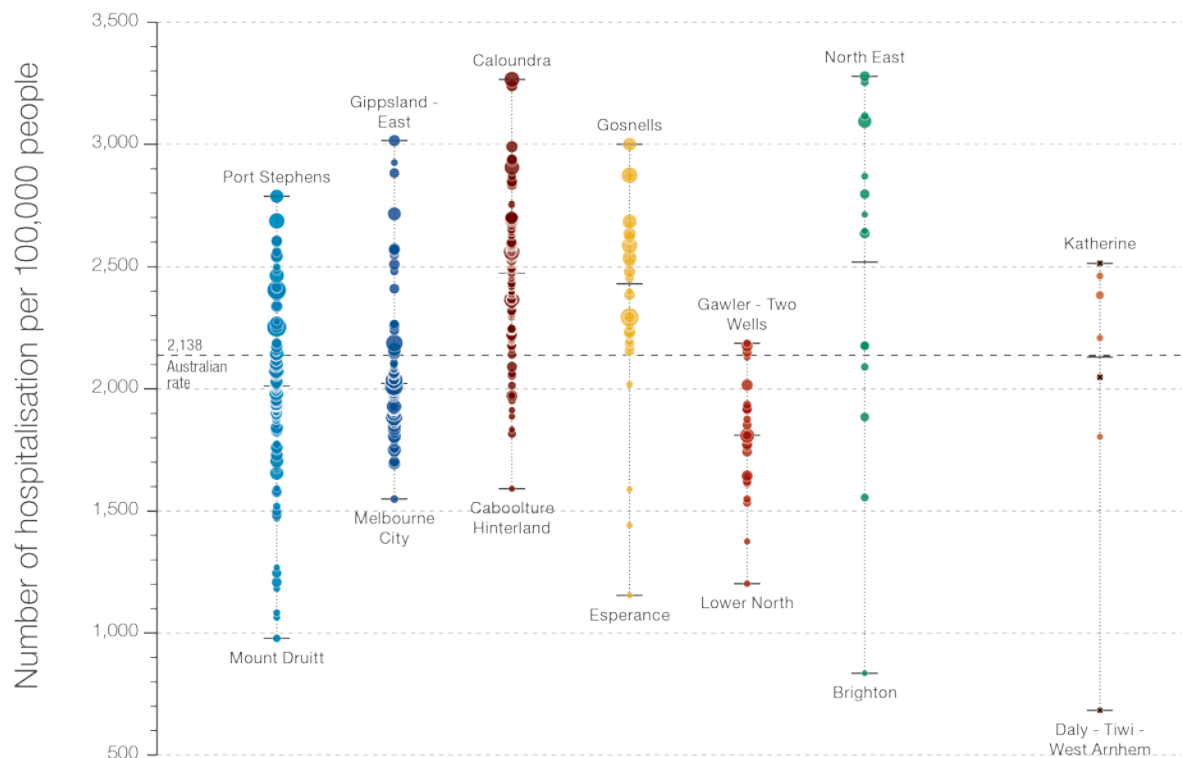
4.6 Cataract surgery hospitalisations 40 years and over

State and territory

	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
Highest rate	2,787	3,015	3,266	3,000	2,187	3,279	n.p.	2,515*
State/territory	2,012	2,023	2,474	2,431	1,810	2,520	n.p.	2,130
Lowest rate	978	1,549	1,591	1,154	1,202	835	n.p.	683*
No. hospitalisations	77,410	58,451	54,350	26,947	17,289	7,602	n.p.	1,381

Each circle represents a single SA3. The size indicates the number of hospitalisations.

interpret with caution



National Hospital Morbidity Database, 2014–15



4.6 Cataract surgery hospitalisations 40 years and over

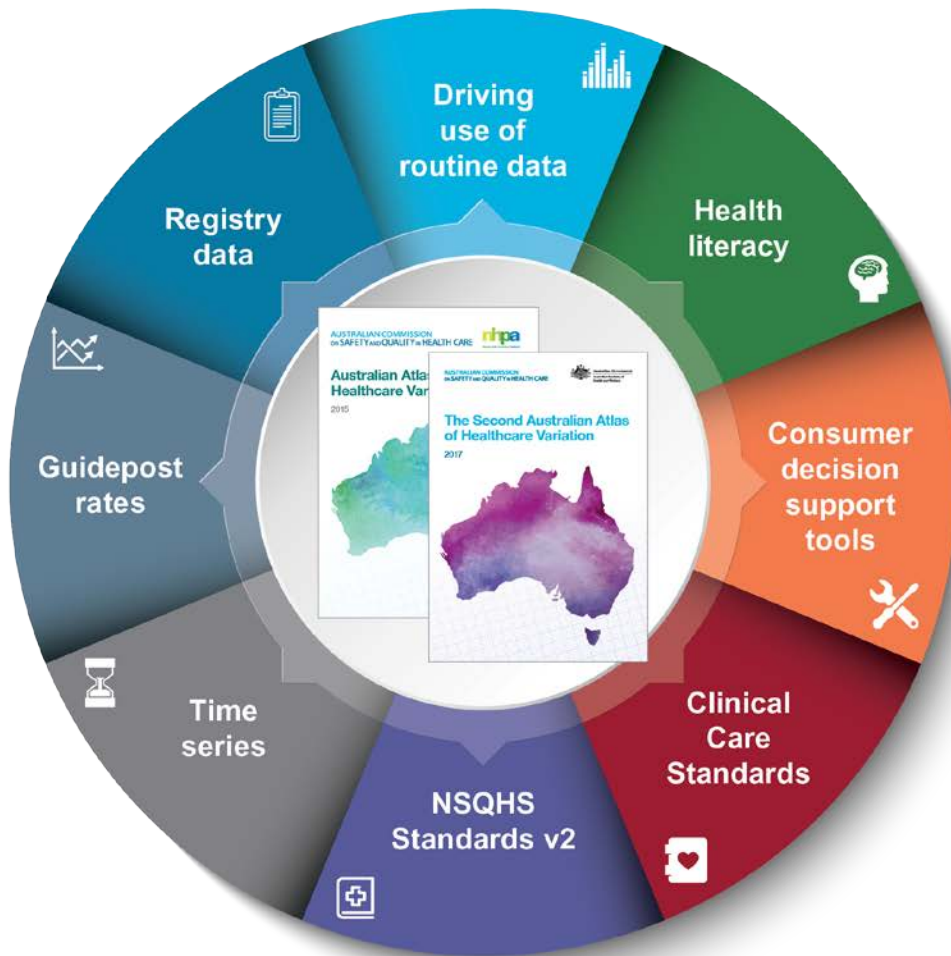
Remoteness and socioeconomic status



National Hospital Morbidity Database, 2014–15



Promoting appropriate care



Explore variation

Identify unwarranted variation

Address unwarranted variation





Further resources

- Explore the data further using the interactive Atlas at www.safetyandquality.gov.au/atlas/
- Please send any queries to atlas@safetyandquality.gov.au



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The Second Australian Atlas of Healthcare Variation

2017

