

Workforce Snapshot Report

Neurosurgeons in Australia and Aotearoa New Zealand

April 2024



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1 Workforce Snapshot Report

1.1 Overview

The Neurosurgical Society of Australasia (**NSA**) has developed this workforce snapshot report to highlight key trends, challenges, and opportunities within the neurosurgical workforce in Australia and Aotearoa New Zealand. The report provides valuable insights into workforce demographics and distribution. However, this report does not forecast future demand for neurosurgical care and is not intended to be a comprehensive workforce analysis.

1.2 Data Sources

This report was produced using data as of April 2024 and the data within is that which was available to the NSA at that time.

The Australian population figures were based on the most recent estimated resident population published by the Australian Bureau of Statistics at the time of the report (26,966,789), which was the December 2023 estimate. The Aotearoa New Zealand population figures were based on the most recent estimated resident population published by the New Zealand Government (5,338,900), which was the March 2024 estimate.

The active neurosurgeon data for Australia was sourced from the Medical Board of Australia's National Register, via the Australian Health Practitioner Regulation Agency (**AHPRA**), for April 2024. This extract included individuals with active specialist registration as neurosurgeons. A limitation of this data is that those practicing with limited registration are not assigned a specialty in the data fields and are therefore excluded. A principal place of practice is as reported to AHPRA, but it is acknowledged that individuals may work at multiple locations and can only nominate one location as their principal place of practice.

The active neurosurgeon data for Aotearoa New Zealand was sourced from the Medical Council of New Zealand's published data in the register of doctors. The data included all individuals with an active vocational scope of practice documented as neurosurgery, for April 2024.

The data was supplemented by existing NSA data, particularly regarding age, which was not available from the sources above. Ages could not be determined for all neurosurgeons.

1.3 Data Accuracy

The data obtained by the NSA from the sources above has been provided on the basis that it may not be error-free. As such, for the avoidance of doubt, NSA does not guarantee the accuracy of data presented in this report.

The data should be interpreted cautiously, as it is known that in some instances, neurosurgeons continue to hold medical registration in both Australia and Aotearoa New Zealand and as such are included in the data but may no longer practicing.

2 Australian Workforce Snapshot

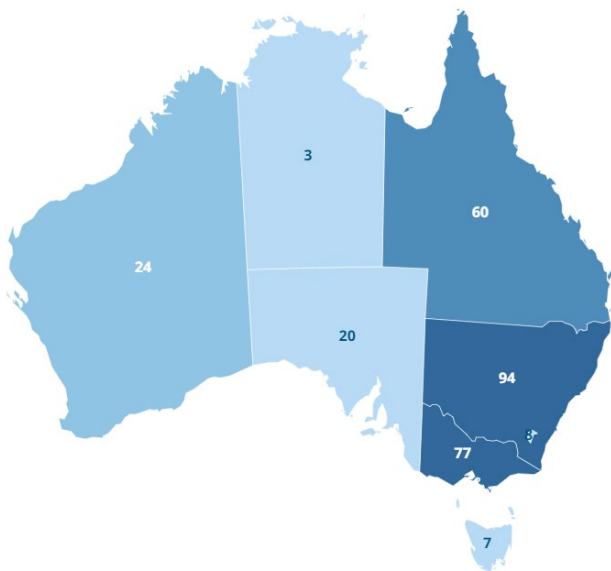
2.1 Active Neurosurgeons to Population Ratio

The ratio of neurosurgeons to the population in Australia is approximately **1.09 neurosurgeons per 100,000 people**. That is, there were 293 neurosurgeons servicing a population of 26,966,789 people.

Most states and territories have a similar ratio of around 1.1 neurosurgeons per 100,000 population, except for the Australian Capital Territory and Western Australia, which are outliers. The Australian Capital Territory has the highest ratio of neurosurgeons per 100,000 population at 1.7. Western Australia has the lowest ratio of neurosurgeons per 100,000 population at 0.82. The ratio for the Northern Territory of Australia should be interpreted cautiously, as of the three persons who have listed it as their principal place, only one is known to permanently reside in the Northern Territory.

For global comparison, Australia's neurosurgeon-to-population ratio is higher than that of many countries, including the United Kingdom (0.56 neurosurgeons per 100,000 people). Australia's ratio is more comparable to other high-income nations, such as the Canada and the United States (1.52 neurosurgeons per 100,000 people).¹

Despite Australia's favorable overall ratio of neurosurgeons to population, internal disparities between states and territories indicate the need for targeted policies to ensure equitable distribution of neurosurgical services.



LOCATION	NUMBER	PER 100,000 POPULATION
ACT	8	1.7
NSW	94	1.11
NT	3	1.18
QLD	60	1.09
SA	20	1.07
TAS	7	1.22
VIC	77	1.11
WA	24	0.82
	293	

2.2 Active Neurosurgeon Distribution by ASGS-RA

The Australian Statistical Geography Standard - Remoteness Area (**ASGS-RA**) is a framework used to classify areas in Australia based on their relative access to services. This classification system divides Australia into five levels of remoteness: Major Cities, Inner Regional, Outer Regional, Remote, and Very Remote. These

¹ Gupta, S., Gal, Z. T., Athni, T. S., Calderon, C., Callison, W. É., Dada, O. E., Lie, W., et al. (2024). Mapping the global neurosurgery workforce. Part 1: Consultant neurosurgeon density. *Journal of Neurosurgery*, 141(1), 1–9. <https://doi.org/10.3171/2023.9.JNS231615>

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classifications are determined using the Accessibility/Remoteness Index of Australia Plus (ARIA+), which measures the distance people must travel to access various services.

The vast majority of neurosurgeons (95.6%) are located in major cities. There are very few neurosurgeons in inner regional (2.4%) and outer regional (2%) areas, and none in remote or very remote areas.

LOCATION	MAJOR CITIES	INNER REGIONAL	OUTER REGIONAL	REMOTE	VERY REMOTE	TOTAL
ACT	8	0	0	0	0	8
NSW	94	0	0	0	0	94
NT	0	0	3	0	0	3
QLD	57	0	3	0	0	60
SA	20	0	0	0	0	20
TAS	0	7	0	0	0	7
VIC	77	0	0	0	0	77
WA	24	0	0	0	0	24
TOTAL	280	7	6	0	0	293

2.3 Active Neurosurgeons by Gender

In Australia, males make up 83.96% (246) of the active neurosurgeons, with females making up only 16.04% (47) of the total workforce.

Within individual jurisdictions, South Australia (35%), Tasmania (28.57%), and the Australian Capital Territory (25.00%) lead in terms of female neurosurgeon representation as a percentage of the workforce in that jurisdiction, while Northern Territory (0%) and Western Australia (8.33%) have the lowest female representation.

For global comparison, the percentage of female neurosurgeons globally is relatively low compared to their male counterparts. According to recent studies, approximately 12% of neurosurgeons worldwide are female. This proportion varies significantly by region and country and is an estimate only.²

LOCATION	TOTAL OVERALL		BY JURISDICTION	
	FEMALE	MALE	% FEMALES	% MALES
ACT	2	6	25.00%	75.00%
NSW	16	78	17.02%	82.98%
NT	0	3	0.00%	100.00%
QLD	9	51	15.00%	85.00%
SA	7	13	35.00%	65.00%
TAS	2	5	28.57%	71.43%
VIC	9	68	11.69%	88.31%
WA	2	22	8.33%	91.67%
TOTAL	47	246		
TOTAL PERCENTAGE	16.04%	83.96%		

² Lulla, T., Behmer Hansen, R. T., Smith, C. A., Silva, N. A., Patel, N. V., & Nanda, A. (2021). Women neurosurgeons around the world: A systematic review. *Neurosurgical Focus*, 50(3), E12. <https://doi.org/10.3171/2020.12.FOCUS20943>

2.4 Active Neurosurgeons by Age

The average age of neurosurgeons across the various states and territories in Australia ranges from 52 to 56 years. The overall average age of neurosurgeons in Australia is 52 years.

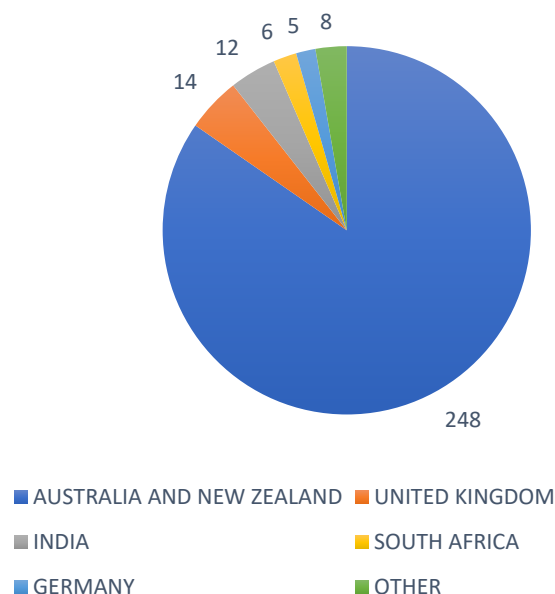
JURISDICTION	AVERAGE AGE
ACT	54
NSW	52
NT	56
QLD	53
SA	53
TAS	53
VIC	53
WA	54
TOTAL	52

2.5 Location of Initial Neurosurgical Qualification

The data on the where current Australian neurosurgeons completed their **initial** neurosurgical specialist qualification reveals that a significant majority (84.64%) were trained in Australia and Aotearoa New Zealand. There is also diverse international representation accounting for 15.36% of the total, with notable numbers from the United Kingdom (14), India (12), and South Africa (6).

The data is limited to where neurosurgeons completed their **initial** specialist qualifications. Many neurosurgeons who have gone through the specialist international medical graduate assessment in Australia also held additional international qualifications, particularly from the United Kingdom, which is not shown here. These secondary qualifications were often considered in the assessment process. Therefore, this data does not reflect which international qualifications have been found comparable to the Australasian training program and should be interpreted with this limitation in mind.

COUNTRY	NUMBER
AUSTRALIA & NEW ZEALAND	248
UNITED KINGDOM	14
INDIA	12
SOUTH AFRICA	6
GERMANY	5
BELGIUM	1
JORDAN	1
ITALY	1
IRAN	1
ARGENTINA	1
PALESTINE	1
BOSNIA	1
SWEDEN	1
TOTAL	293



3 Aotearoa New Zealand Workforce Snapshot

3.1 Active Neurosurgeons to Population Ratio

The ratio of neurosurgeons to the population in Aotearoa New Zealand is approximately **0.49 neurosurgeons per 100,000 people**. That is, there were 26 neurosurgeons servicing a population of 5,338,900 people.

Health New Zealand (Te Whatu Ora) has four regional divisions being the Northern Division, Te Manawa Taki Division, Central Division and Te Waipounamu Division. The most populous areas in each division are Auckland in the Northern Division, Hamilton in the Te Manawa Taki Division, Wellington in the Central Division and Christchurch, Dunedin and Otago in the Te Waipounamu Division.

The distribution of neurosurgeons across the Health New Zealand divisions shows variability. Te Waipounamu Division has the highest neurosurgeon-to-population ratio (0.63 neurosurgeons per 100,000 population), whereas Te Manawa Taki Division has the lowest ratio (0.38 neurosurgeons per 100,000).

For global comparison, the New Zealand's neurosurgeon-to-population ratio is similar to the United Kingdom (0.56 neurosurgeons per 100,000 people). However, it is lower than many other high-income nations, such as Australia (1.09 neurosurgeons per 100,000 people), Canada and the United States (1.52 neurosurgeons per 100,000 people).³



LOCATION	NUMBER	PER 100,000 POPULATION
Northern Division	8	0.43
Te Manawa Taki Division	4	0.38
Central Division	5	0.50
Te Waipounamu Division	9	0.63
	26	

³ Gupta, S., Gal, Z. T., Athni, T. S., Calderon, C., Callison, W. É., Dada, O. E., Lie, W., et al. (2024). Mapping the global neurosurgery workforce. Part 1: Consultant neurosurgeon density. *Journal of Neurosurgery*, 141(1), 1–9. <https://doi.org/10.3171/2023.9.JNS231615>

3.2 Active Neurosurgeon Distribution by GCH

The Geographic Classification for Health (GCH) classifies all areas of Aotearoa New Zealand as rural (1 to 3, with 3 being the most rural) or urban (1 to 2, with 1 being the most urban). The classifications reflect the degrees of urban influence and rurality, based on population size and drive times to the nearest major, large, medium, or small urban areas.

All neurosurgeons (100.0%) are in classifications of Urban 1. The classification Urban 1 refers to areas with the highest level of urban influence. These are typically the largest urban centers with the highest population densities and the greatest access to a wide range of services, including health services.

LOCATION	URBAN 1	URBAN 2	RURAL 1	RURAL 2	RURAL 3	TOTAL
Northern Division	8	0	0	0	0	8
Te Manawa Taki Division	4	0	0	0	0	4
Central Division	5	0	0	0	0	5
Te Waipounamu Division	9	0	0	0	0	9
Total	26	0	0	0	0	26

3.3 Active Neurosurgeons by Gender

In Aotearoa New Zealand, males make up 88.46% (23) of active neurosurgeons, with females making up only 11.54% (3) of the total workforce.

The Northern Division and Te Waipounamu Division have a similar gender distribution with around 11-12% females. The Te Manawa Taki Division shows a relatively higher percentage of female neurosurgeons at 25%, while the Central Division stands out with no female neurosurgeons.

For global comparison, the percentage of female neurosurgeons globally is relatively low compared to their male counterparts. According to recent studies, approximately 12% of neurosurgeons worldwide are female. This proportion varies significantly by region and country and is an estimate only.⁴

DIVISION	TOTAL OVERALL		BY DIVISION	
	FEMALE	MALE	% FEMALES	% MALES
Northern Division	1	7	12.50%	87.50%
Te Manawa Taki Division	1	3	25.00%	75.00%
Central Division	0	5	0.00%	100.00%
Te Waipounamu Division	1	8	11.11%	88.89%
Total	3	23		
Total Percentage	11.54%	88.46%		

⁴ Lulla, T., Behmer Hansen, R. T., Smith, C. A., Silva, N. A., Patel, N. V., & Nanda, A. (2021). Women neurosurgeons around the world: A systematic review. *Neurosurgical Focus*, 50(3), E12. <https://doi.org/10.3171/2020.12.FOCUS20943>

3.4 Active Neurosurgeons by Age

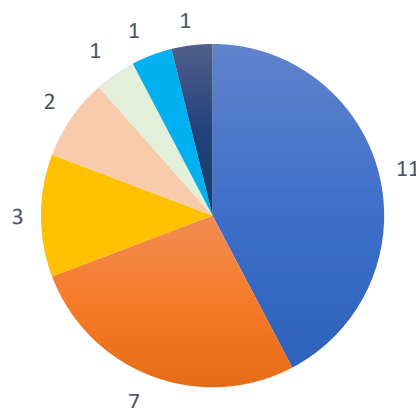
The average age of neurosurgeons across the Aotearoa New Zealand Health Divisions ranges from 48 to 56 years. The overall average age of neurosurgeons in Aotearoa New Zealand where known is 52 years. There were five neurosurgeons for whom age was not known.

DIVISION	AVERAGE AGE
Northern Division	48
Te Manawa Taki Division	51
Central Division	54
Te Waipounamu Division	56
Overall	52

3.5 Location of Initial Neurosurgical Qualification

The data on where current Aotearoa New Zealand neurosurgeons completed their initial neurosurgical specialist qualification reveals that 42.3% did so in Australia and Aotearoa New Zealand, which indicates a strong reliance on international graduates (57.7%). Notably, 26.9% of the neurosurgeons received their initial qualification in the United Kingdom, and 11.5% in South Africa.

A limitation of the data is that the data only reflects where neurosurgeons completed their **initial** specialist qualifications. Many neurosurgeons who have undergone the specialist international medical graduate assessment process in Aotearoa New Zealand to practice in the region may also hold additional international specialist qualifications in neurosurgery, which are not shown. These secondary qualifications were often considered during the specialist assessment process. Consequently, this data does not indicate which international neurosurgical qualifications have been found substantially comparable to the Australasian training program and should be interpreted with this limitation in mind.



COUNTRY	NUMBER
AUSTRALIA & NEW ZEALAND	11
UNITED KINGDOM	7
SOUTH AFRICA	3
FINLAND	2
BELGIUM	1
GERMANY	1
ITALY	1
TOTAL	26

- AUSTRALIA & NEW ZEALAND
- UNITED KINGDOM
- SOUTH AFRICA
- FINLAND
- BELGIUM
- GERMANY
- ITALY