

DIFFERENCES IN THE MANAGEMENT AND USE OF HEALTH SERVICES IN AUSTRALIA USING PUBLICLY AVAILABLE DATA: COMPARISONS BETWEEN NEW SOUTH WALES AND VICTORIA

Jo. M. Martins¹, Godfrey Isouard*²

1. Centre for Health Policy and Management, NSW, Australia
2. Faculty of Medicine and Health, University of New England, NSW, Australia

Correspondence: gisouard@optusnet.com.au

ABSTRACT

INTRODUCTION:

Differences in health service utilisation between States are noted in publicly reported data. The national averages for health service usage and health related actions in Australia may mask differences in the management and provision of health services among the states and territories. Although the utilisation of health services tends to rise with age, the extent of this and other factors has not been determined at the state level. This study will analyse these differences for the two largest states in Australia, New South Wales (NSW) and Victoria.

OBJECTIVES:

The purpose of the study is to examine specific features of health service provision and its management in New South Wales and Victoria. Using publicly available data the study analysed differences in the organisation, management, and expenditures of health services.

DESIGN:

The study uses data from the Australian Bureau of Statistics (ABS) and the Australian Institute of Health and Welfare (AIHW), focusing on the 2021 census.

FINDINGS:

The study highlights differences in health service utilisation and management between New South Wales (NSW) and Victoria. Victoria had higher hospital service use and more health service employees. Victoria also had higher health service expenditure per capita. The findings underscore the need for tailored strategies in policy development, resource allocation, and health service planning to address the unique needs of each state.

IMPLICATIONS:

The study highlights differences in health service management and utilisation between NSW and Victoria. These findings are relevant for policy development, resource allocation, and planning of health services. The study provides a basis for further research, particularly of a qualitative nature, to explore the identified differences in more detail.

KEYWORDS

Health service managers, health service use, health service employees, health service expenditure.

INTRODUCTION

Australia reports health data through the Australian Bureau of Statistics (ABS) and other agencies. These organisations collect, verify, and publish data on various health indicators, ensuring accuracy and reliability for public and policy use. This data can explain trends in public health, expenditures, the effectiveness of health policies, and areas needing improvement in healthcare services.

The literature widely reports the importance and usage of health data across the globe [1] [2]. In particular it's influence on the allocation of scarce resources and evidence-based decision making [3] [4] [5]. This type of data sets the foundation for the planning and management of health services and is pivotal to the effective delivery of health services [6].

Availability of health service utilisation data has been reported as important to health service managers for identifying disparities, resource allocation, policy development, quality improvement, and research and innovation [7]. Senior health managers in Alberta, Canada found timely and accurate health service utilisation data particularly critical when assessing outcomes, implementing changes, reviewing solutions and decision making [8].

One important issue is that the use of health services such as hospitals and General Practitioners tends to rise with age, especially at older ages, and may have a major influence on the use of health services [9] [10].

Some of the differences may be due to varying proportions of older people in individual states and territories. Accordingly, it might be expected that the use of health services and related expenditures, might be higher in South Australia with 20.0% of the population over the age of 64, and especially in Tasmania with 20.9%, than in other states and territories. While the Australian Capital and Northern territories with respectively 15.0% and 8.9% in this age bracket would be expected to have lower use. In contrast, the proportion of older people over the age of 64 years in NSW and Victoria are more closely related, respectively 17.6% and 16.8% in 2021 (Appendix A).

Therefore, other things being equal, it might be expected that the relative use of services, associated expenditures and the related number of health service managers to be similar in these two states. As these two states have more than half of the Australian population (respectively 31.8% and 25.6% at the time of 2021 Census) (Appendix A), they have a major but possible different influence on the Australian average.

However, a comprehensive review of the international literature confirmed that information on health service utilisation was never examined in the context of the health manager's role, and particular to the organisation and management of health services, and related expenditures. This identified gap in the research became a focal point for the current research investigation by the authors, and in particular targeting the two largest states, NSW and Victoria.

Although the data on health service utilisation for each state and territory in Australia provides important insights, it does not reveal information on the organisation of health services, their management and related expenditures. The responsibility for the latter tasks is with the health managers, who are concerned with the improvement of the health status of people in Australia.

It is in this context, the differences between NSW and Victoria for a subset of health services using publicly available data was examined. The examination was limited in scope by the data available for analysis and as a result of a special request for 2021 census data about health managers from the ABS, other items of data on health service characteristics from the ABS and the Australian Institute of Health and Welfare (AIHW). Whilst the analysis was limited by the characteristics of the data it provides valuable and new information and a basis for research by others of a more substantive nature.

This study provides an important contribution to the evaluation of health services management using publicly available information. The findings are relevant to policy development aimed at improving the health status of the population. As well there were implications to health managers, the planning of health services, the accompanying expenditure, and to the provision of senior management and other employees. Although the analysis is limited by the nature of the data, it does provide a basis for research by others of a more qualitative nature.

DATA SPECIFICATIONS AND RELIABILITY

Based on questions posed in the 2021 Population Census, the ABS provided data on the number and characteristics of health service managers following ABS' Australian occupation and industry classifications. Detailed specifications are described in Appendix B. The ABS also conducted post-enumeration surveys to ensure accuracy and reliability. Data covered managers in hospitals and primary care health services in both the public and private sectors. However, private sector pharmacists were excluded due to the difficulty in separating their pharmaceutical activities and expenditures from those related to non-healthcare services (e.g. toiletries, cosmetics, and other products).

Following the ABS occupation and industry standards, managers were divided into four groups: undefined managers, chief executive officers and general managers, specialist managers, and service managers. The data matched ABS' coding for people's characteristics.

ABS' concerns with confidentiality led to small differences in some instances that the authors amended without material impact. Whenever relevant, the authors followed ABS' definitions of sex and gender. Sex is defined as the biological characteristics of males and females. Gender refers to psychological and social characteristics that culturally determined from belief systems of what masculine and feminine behaviour is or ought to be [11]

Other data used regarding health services and related personnel are from ABS and AIHW sources, as indicated, and followed their definitions.

RESULTS

This section shows the findings in the health service management and use of health services in NSW and Victoria. These features include an analysis of the differences found in the organisation of health services, their management and related expenditures.

HEALTH SERVICE USE

NSW had a lower use of hospital services (415/1,000) than Victoria (455/1,000). Both had lower average use than other states and territories (500/1,000). While NSW had a slightly higher use of Medicare services (18 per person) than Victoria (17 per person). Both states were slightly higher than the average for other states and territories (16 per person). It should be stated that the averages for other states and territories mask considerable differences among them, such as in the cases of the Northern Territory and the Australian Capital Territory. However, as stated, the authors' focus in this paper is on the comparison between NSW and Victoria, that showed somewhat higher use of hospitals per head of population in Victoria than in NSW, while Victorian use of Medicare services per head of population was slightly lower (Table 1).

TABLE 1. HOSPITAL AND MEDICARE SERVICES, NEW SOUTH WALES, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2020/21

Service	NSW	Victoria	Other	Australia
Hospital separations per 1,000 people	415	455	500	462
Medicare services per person	18	17	16	17
People per km ²	10	29	2	3

Note: Population as at December 2020. (NSW) New South Wales. (Other) Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory, Northern Territory.

Sources: References [12] [13] [14] [15]. Computations made by the authors.

Differences in the Management and Use of Health Services in Australia Using Publicly Available Data: Comparisons between New South Wales and Victoria **3**

HEALTH SERVICE EMPLOYEES

Generally, most health service employees in Australia are females. At the time of 2021 census of population, females constituted 74.9% of health services employees in NSW and 76.6% in Victoria. The average proportion in other states and territories was 76.5%, and the Australian average 76.1%. The number of health service employees per thousand people was lower in NSW (37.2/1,000) than in Victoria (41.4/1,000) that was closer to the average for other states and territories (41.7/1,000) and the Australian average (40.2/1,000). The difference was particularly larger in the case of hospital employees: 19.2/1,000 in NSW in comparison with that of 22.7/1,000 in Victoria. The latter was close to the average for other states and territories of 22.8/1000. The averages for employees of medical and other health services were closer to the average for Australia of 18.6/1,000, but still lower in the case of NSW (18.0/1,000) than that of Victoria (18.7/1,000) (Table 2).

TABLE 2. HEALTH SERVICE EMPLOYEES, NEW SOUTH WALES, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2021 CENSUS

Service	NSW	Victoria	Other	Australia
Number of health service employees 000s				
Hospitals	155.0	147.8	247.0	549.8
Medical & other health	145.2	121.5	205.2	471.9
All health services	300.2	269.3	452.2	1,021.7
Percentage female employees				
Hospitals	76.0	78.7	77.2	77.3
Medical & other health	73.7	74.3	75.6	74.7
All health services	74.9	76.6	76.5	76.1
Employees per 1,000 people				
Hospitals	19.2	22.7	22.8	21.6
Medical & other health	18.0	18.7	18.9	18.6
All health services	37.2	41.4	41.7	40.2

Note: Population as per the 2021 Census. NSW. (Other) Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory, Northern Territory.

Sources: References [14] [16]. Computations made by the authors.

HEALTH SERVICE MANAGERS AND POPULATION

Most health managers like most health employees in Australia are females. However, while they constituted 76.1% of health service employees in 2021, their proportion of health managers was 63.6%. The proportion of female managers was only 62.6% in NSW and 63.8% in Victoria, compared with 74.9% and 76.6% respectively in the case of health service employees. The number of health managers per thousand population was lower in NSW (165.8/100,000) than in Victoria (175.2/100,000) but closer to the average in other states and territories (164.2/100,000). Thus, as in the case of the relative number of employees, Victoria also had a larger ratio of managers per population than NSW and the average for other states and territories (Table 3).

TABLE 3. HEALTH SERVICE MANAGERS, NSW, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2021 CENSUS

Service	NSW	Victoria	Other	Australia
Number of health service managers 000s				
Hospitals	6.5	5.6	9.2	21.2
Medical & other health	6.9	5.8	8.6	21.4
All health services	13.4	11.4	17.8	42.6
Percentage female managers				
Hospitals	65.4	66.9	65.0	65.6
Medical & other health	59.9	60.8	63.3	61.7
All health services	62.6	63.8	64.3	63.6
Number health service managers per 100,000 people				
Hospitals	80.4	85.5	86.6	83.3
Medical & other health	85.3	89.4	82.0	83.9
All health services	165.7	175.0	168.6	167.3

Note: Population as per the 2021 Census. (NSW) New South Wales. (Other) Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory, Northern Territory.

Sources: References14] [17]. Computations made by the authors.

HEALTH SERVICE MANAGERS AND EMPLOYEES

As is the case in the relationship between employees and population, the average number of health service employees per manager was lower in NSW (22.4 employees/manager) than in Victoria (23.6 employees/manager). However, these ratios were lower than those for the average of other states and territories (25.4 employees/manager). The differences were particularly so in the case of hospital services with less variation in medical and other health services. However, in hospitals the number of employees per manager was lower in NSW (23.9 employees per manager) than in Victoria (26.5 employees per manager) and the average for other states and territories (27.0 employees per manager) (Table 4).

TABLE 4. HEALTH SERVICE EMPLOYEES PER MANAGER, NSW, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2021 CENSUS

Service	NSW	Victoria	Other	Australia
Number of health service employees per manager				
Hospitals	23.9	26.5	27.0	25.9
Medical & other health	21.1	20.9	23.7	22.1
All health services	22.4	23.6	25.4	24.1

Note: (NSW) New South Wales. (Other) Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory, Northern Territory.

Sources: References [16] [17]. Computations made by the authors.

HEALTH SERVICE MANAGERS BY EXECUTIVE LEVEL

As indicated earlier, at the time of the 2021 Census, the proportion of female health service managers was lower than that of female employees, and that of chief executive officers/general managers (CEOs/GMs) was even below that on

average. In the case of hospital services, the proportion of female CEOs/GMs was lower in NSW (60.8%) than in Victoria (64.5%), and that for other states and territories (62.4%) and Australia (62.7%) (Table 5).

TABLE 5. HEALTH SERVICE MANAGERS BY EXECUTIVE LEVEL PROPORTION OF FEMALE MANAGERS, NSW, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2021 CENSUS

Service	NSW	Victoria	Other	Australia
Hospitals				
CEO/GM % female	60.8	64.5	62.4	62.7
Other managers % female	65.8	67.3	65.2	65.9
All hospital managers 000s	6.5	5.6	9.2	21.2
Medical & other health				
CEO/GM % female	46.5	48.8	56.1	51.0
Other managers % female	62.3	62.8	65.0	63.5
All med. & other managers 000s	6.9	5.8	8.6	21.4
All health services				
CEO/GM % female	51.1	55.9	58.5	55.6
Other managers % female	64.1	65.0	65.1	64.8
All health service managers 000s	13.4	11.4	17.8	42.6

Note: (NSW) New South Wales. (Other) Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory, Northern Territory. Sources: Reference [17]. Computations made by the authors.

The proportion of female CEOs/GMs was even lower in the case of medical and other health services, in NSW was 46.5%, 48.8% in Victoria, 56.1% in other states and territories for an average of 51.0% in Australia (Table 5).

TABLE 6. HEALTH SERVICE MANAGERS BY EXECUTIVE LEVEL PER THOUSAND PEOPLE, NSW, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2021 CENSUS

Service	NSW	Victoria	Other	Australia
Managers per 100,000 people				
Hospitals				
CEO/GM	6.5	10.6	7.7	8.0
Other managers	73.9	75.0	79.0	75.4
All hospital managers	80.4	85.5	86.6	83.3
Medical & other health				
CEO/GM	12.5	12.7	12.8	12.5
Other managers	72.8	76.7	69.0	71.4
All medical & other managers	85.3	89.4	82.0	83.9
All health services				
CEO/GM	19.1	23.3	20.5	20.5
Other managers	146.7	115.7	148.1	146.8
All health service managers	165.7	175.0	168.6	167.3

Note: (NSW) New South Wales. (Other) Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory, Northern Territory. Sources: References [14] [17]. (Computations made by the authors).

Although there were differences in the number of CEOs/GMs per head of population among the states and territories at the time of the 2021 Census, the largest differences were in the case of hospital CEOs/GMs. Accordingly, while there were 6.5 CEOs/GMs per hundred thousand people in NSW, there were 10.6/100,000 in Victoria, and an average of 7.7/100,000 in other states and territories, and 8.0/100,000 on average for Australia. On average, there were 20.5 CEOs/GMs for all health services per hundred thousand people in Australia, and 146.8/100,000 for other health service managers (Table 6).

TABLE 7. CHIEF EXECUTIVE OFFICERS, OTHER MANAGERS AND EMPLOYEES, NEW SOUTH WALES, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2021 CENSUS

Service	NSW	Victoria	Other	Australia
	Average number of employees & other managers per CEO/GM			
Hospitals				
Employees	294	170	305	272
Other managers	11	5	10	9
Medical & other health				
Employees	144	147	152	148
Other managers	6	6	5	6
Health services				
Employees	195	152	7	196
Other managers	8	5	210	7

Note: (NSW) New South Wales. (Other) Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory, Northern Territory. Computations made by the authors.

Sources: References [16] [17].

The estimation of the number of employees and other managers per CEO/GM from the 2021 Census indicates that differences between the states and territories were relatively small in the case of medical and other health services around the average for Australia of 148 employees per CEO/GM, with a ratio of 144 in NSW and 147 in Victoria. However, there were considerable differences in the case of hospital services with an average of 170 employees per CEO/GM in Victoria compared with 294 employees per CEO/GM in NSW and 305 in other states and territories. The large number of CEOs/GMs in Victoria also affected the ratio of other managers per CEO/GM of 5 compared with that of NSW of 11 and other states and territories of 10 (Table 7). The differences between Victoria and NSW as well as with other states and territories were notable and in line with previous observations of the higher ratio of hospital employees per thousand people in Victoria than NSW (Table 2) and also the ratio of health service managers per population (Table 3).

HEALTH SERVICE EXPENDITURE

Health service expenditure in Australia was estimated to have been \$220,893 million in 2020-21, or 10.7% of Gross National Product [9]. This was the equivalent of \$8,617 per head of population. However, this average masks large differences between the states and territories. Accordingly, Victoria spent on average \$8,616 per head of population while NSW spent a lower average of \$8,339 per head of population. Nevertheless, Victoria's average was lower than the average for other states and territories (excluding NSW) of \$8,823. Thus, the mentioned higher use of hospital services in Victoria and the higher number of people employed than in NSW was associated with a higher average health expenditure per head of population in Victoria than NSW, but not in other states and territories (Table 8).

TABLE 8. HEALTH SERVICE EXPENDITURE, AUSTRALIA, 2020-21

State/Territory	Total health expenditure \$ millions	Total health expenditure per capita \$
NSW	67,415	8,339
Victoria	56,850	8,616
Other states & territories	96,928	8,823
Australia	220,893	8,617

Source: References [14] [18]. Computations made by the authors.

Differences in the Management and Use of Health Services in Australia Using Publicly Available Data: Comparisons between New South Wales and Victoria

The analysis of health expenditure per main type of service for 2020-21 showed the larger relative importance of hospital services in Victoria compared with NSW. Accordingly, while in NSW hospital expenditure comprised 38.4% of total health expenditure, Victorian expenditure amounted to 43.8% of the total. This was particularly higher in the case of public hospitals that constituted 35.7% of the total in Victoria and 30.7% in NSW. This compared with an average of 40.2% for all hospitals in other states and territories and 40.6% for the whole of Australia. However, NSW expenditure in health services outside hospitals made up 51.4% of the total expenditure compared with 48.3% in Victoria. The NSW average was closer to the average for all other states and territories (52.3%), and about the same as the Australian average of 51.0%. In this context, it is relevant to point out that these percentages relate and influence the mentioned higher average health expenditure per head of population in Victoria than NSW (Table 9).

TABLE 9. HEALTH SERVICE EXPENDITURE, NSW, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, MAIN SERVICES, 2020-21

Expenditure item	NSW	Victoria	Other states & territories	Australia
	Percentage of total expenditure			
Public hospitals	30.7	35.7	30.6	31.9
Private hospitals	7.7	8.1	9.7	8.7
<i>Total hospitals</i>	38.4	43.8	40.2	40.6
Primary health care	33.5	31.6	34.0	33.2
Medical referrals	12.3	10.3	10.2	10.9
Other health	5.7	6.4	8.0	6.9
<i>Total other</i>	51.4	48.3	52.3	51.0
<i>Research</i>	3.6	3.3	2.7	3.1
<i>Total operational</i>	93.4	95.4	95.2	94.7
<i>Capital</i>	6.6	4.6	4.8	5.3
	\$			
Total average health expenditure per head of population	8,339	8,616	8,823	8,617

Source: Reference [14] [18]. Computations made by the authors.

SURVIVAL

An important issue is the life expectancy of Australians that at 83.3 years was among the highest among developed countries in 2021 [10]. In this context, the life expectancy at birth in Victoria (83.6 years) was slightly above that for NSW (83.3 years) in the period 2020-2022, both of which had a somewhat higher life expectancy than the average for other states and territories (83.0 years). These are small differences, but the average for other states and territories (than Victoria and NSW) mask substantial differences between them, such as the Northern Territory (78.4 years) and the Australian Capital Territory (84.1 years) (Table 10). Some might consider that life expectancy at 65 years of age might be more relevant to the importance of the provision of health services to survival. At 65 years of age, the difference in life expectancy between Victoria and NSW was relatively small at about one tenth of one year (Victoria 21.7 years and NSW 21.6 years) (Table 10).

TABLE 10. LIFE EXPECTANCY AT BIRTH, NSW, VICTORIA, OTHER STATES AND TERRITORIES, AUSTRALIA, 2020-2022

State/territory	Average life expectancy at birth (years)		
	Males	Females	People
NSW	81.3	85.3	83.3
Victoria	81.6	85.5	83.6
Other states and territories	80.9	85.1	83.0
Australia	81.2	85.3	83.3
	Average life expectancy at 65 years of age (years)		
NSW	20.2	22.8	21.6
Victoria	20.3	22.9	21.7
Other states and territories	20.2	22.8	21.6
Australia	20.2	22.8	21.6

Note: The average life expectancy at birth for people is the weighted average of male and female life expectancies at birth. The average for (Other states and territories) is also the weighted average for Queensland, South Australia, Western Australia, Tasmania, Australian Capital Territory and Northern Territory. This average masks large differences between the Northern Territory with the lowest average life expectancy (78.4 years) and the Australian Capital Territory with highest life expectancy in Australia (84.1 years).

Sources: References [14] [20]. Computations made by the authors.

DISCUSSION

The purpose of the analytical work carried out is to examine some features of health service provision and its management in NSW and Victoria, with more than half of the Australian population, at the time of the 2021 population census. The analysis shows substantial contrasts in the emphasis placed on different types of major health services in the two largest states in Australia.

At that time, NSW had the largest population of all Australian states and territories with about 8.1 million people compared with Victoria's second highest of 6.5 million. The population densities were the highest in Australia among states and territories, with the exception of the Australian Capital Territory. Therefore, in this respect, NSW and Victoria were more alike than other states and territories.

In the context of health services provision, a major difference between the two states was the higher use of hospital services per head of population, human resources involved and related expenditures in 2021. The number of hospital employees in Victoria was 22.7/1,000 people compared with 19.2/1,000 in NSW. In turn, the related number of hospital managers in Victoria was also substantially higher at 85.5/1,000 people than the ratio of 80.4/1,000 in NSW.

To a lesser extent, differences persisted between the two states in the number of employees in medical and other health services. The numbers in Victoria were slightly higher at 18.7/1,000 people than in NSW at 18.1/1,000. While the number of managers in these services continued to be higher in Victoria at 89.4/100,000 people than in NSW at 85.3/100,000.

The higher ratio of health service managers in the population in Victoria prevailed in the case of CEOs/GMs of hospital services. Thus, Victoria had a ratio 10.6 hospital CEOs/GMs per 100,000 people while NSW had a much lower average of 6.5 CEOs/GMs/100,000. This was reflected in the lower number of 170 employees per CEO/GM in Victoria compared with 294 employees per CEO/GM in NSW.

The ratios were much closer in the case of medical and other health services at 12.7 employees per 100,000 people in Victoria and almost the same ratio of 12.5/100,000 in New South Wales. The ratios were also close in the cases of Victoria's 147 employees per CEO/GM and 144 in NSW.

The differences in service use, especially of hospital services, between the two states and the higher ratios of employees and managers in Victoria were associated with differences in the average health service expenditures per head of population in 2020/21, that at \$8,616 was higher in Victoria than at \$8,339 in NSW. The substantially higher average expenditure on hospital services in Victoria was only partly compensated by the somewhat higher average expenditure on medical and other health services in NSW.

The notable difference in service use, people employed, and expenditure of hospitals and medical and other health services between Victoria and NSW was associated with a difference in average life expectancy at birth of 3 tenths of one year between them (average 2020-2022): Victoria 83.6 years and NSW 83.3 years. However, at 65 years of age life expectancy in Victoria was 21.7 years and close at 21.6 years in NSW.

LIMITATIONS

The analysis is limited by the data available from the 2021 census and other official sources. There is a lack of data on private hospitals and their bed capacity.

CONCLUSION AND AGENDA FOR FURTHER RESEARCH

The analysis in this paper shows considerable differences in the organisation of health services in NSW and Victoria, the provision of services, their management and related expenditures. This is especially remarkable in the case of hospital services and their management. This analysis raises important issues that the limited data used by the authors does not provide answers for. Accordingly, the limitations of this work should encourage further research of a more qualitative nature to give additional insights into the nature of the important differences identified and documented in this paper. In conclusion, the study provides an important and significant contribution to the evaluation of health services management and for planning towards improving the health status of the population. The findings have been shown to be relevant to health managers, policy development, the planning of health services and to the accompanying expenditure, and to the provision of senior management and other employees. Although the analysis is limited by the nature of the data, it does provide a basis for research by others of a more qualitative nature.

The study contributes to the evaluation of health services management and planning in Australia. It underscores the need for further research to address the limitations and provide deeper insights into health service management.

ABBREVIATIONS

ABS	Australian Bureau of Statistics
ACRS	Aged Care Residential Services
ANZCO	Australian and New Zealand Standard Classification of Occupations
CEO/GM	Chief Executive Officer/General manager
DH	Commonwealth Department of Health
M(nfd)	Managers no further defined
NSW	New South Wales
\$	Australian dollars

References

1. Baumann A, Wyss K. Exploring evidence use and capacity for health services management and planning in Swiss health administrations: A mixed-method interview study. *Plos One*. 2024, 19(5):e0302864. doi: 10.1371/journal.pone.0302864.
2. Croke K, Barasa E, Kruk ME. Health system evaluation: new options, opportunities and limits, *Editorial Bull World Health Organ*. 2024, 102(7):538-540. doi: 10.2471/BLT.23.289712.
3. Baghbanian A, Hughes I, Kebriaei A, Khavarpour FA. Adaptive decision-making: how Australian healthcare managers decide *Australian Health Review*. 2012, 36(1). 49-56. doi: 10.1071/AH10971
4. Ayele G, Abera A, Ayele A, Gudina D, Firdisa D. Utilization of routine health data and its determinants among healthcare workers in public health facilities of harari region, eastern Ethiopia. *BMC Health Services Research*. 2024, 24: 1-7. DOI:10.1186/s12913-024-10834-2
5. Yusuph F, Ntwenya JE, Kinyaga A, and Gibore NS. Routine health data use for decision making and its associated factors among primary healthcare managers in dodoma region. *BMC Health Services Research*. 2024, 24 (1168).
6. Alves M, Seringa J, Silvestre T, Magalhães T. Use of Artificial Intelligence tools in supporting decision-making in hospital management. *BMC Health Services Research*. 2024, 24:1282. <https://doi.org/10.1186/s12913-024-11602-y>
7. AIHW, Understanding health and health data, 2 July 2024. <https://www.aihw.gov.au/reports/australias-health/what-is-health>
8. Casebeer A, Johnson D. Potholes in the information highway: the use of health service utilization data by Alberta health care managers. *Healthcare Management forum*, 2000. 13(2), 58-64.
9. Australian Institute of Health and Welfare (AIHW). 2023. Older Australians. Canberra.
10. Reid N, T Gamage, S J Duckett & L C Gray. 2023. Hospital utilisation in Australia, 1993-2020, with focus on use by people over 75 years of age: a review of AIHW data. *Medical Journal of Australia*, July 2023, doi:05694/mja2.52026.
11. Australian Bureau of Statistics (ABS). 2021. Standard for Sex, Gender, Variations of Sex Characteristics and Sexual Orientation Variables. Canberra.
12. Australian Institute of Health and Welfare (AIHW). 2024. Admitted patient care 2020-21. Who uses these services? Canberra.
13. Department of health and Aged Care (DH). 2024. Medical annual statistics – state and territory (2008/9-2022/23). Canberra.
14. Australian Bureau of Statistics (ABS). 2022. National, state and territory population. Canberra.
15. Geoscience Australia. 2024. Land areas of states and territories. Canberra.
16. Australian Bureau of Statistics (ABS). 2021. 2021 Census – counting persons, place of usual residence. INDP Industry of employment. Level OCCP Occupation. Hospitals, medical care and other health services. Table Builder. abs.gov.au/ccby, retrieved 20 June 2024.
17. Australian Bureau of Statistics (ABS). 2024. 2021 Census of population and housing. Customised data report. (Tabulations prepared in accordance with specifications made by the authors). Canberra: ABS: 2023.
18. Australian Institute of Health and Welfare. 2022. Health expenditure Australia 2020-21. Canberra. www.aihw.gov.au/reports/health-welfare-expenditure/health-expenditure-australia-2020-21/data Accessed 6 July 2024.
19. Organisation of Economic Co-operation and Development (OECD). 2023. Health at a glance 2023. OECD Indicators. Paris.
20. Australian Bureau of Statistics (ABS). 2024. Life expectancy 2020-2022. Canberra.
21. Australian Bureau of Statistics. (2021). Managers. ANZSCO – Australian and New Zealand standard classification of occupations. Canberra.

APPENDIX A

POPULATION CHARACTERISTICS OF STATES AND TERRITORIES, AUSTRALIA, 2021

	NSW	Vic	Qld	SA	WA	Tas	ACT	NT	Other	Australia
Population										
Census 2021 000s	8,072.2	6,503.5	5,156.1	1,781.5	2,660.0	557.6	454.5	232.6	0.5	25,422.8
Population % total	31.8	25.6	20.3	7.0	10.5	2.2	1.8	0.9	...	100.0
Population per Km2	10.1	28.8	3.0	1.8	1.1	8.3	191.9	0.2	19.0	3.3
Female %	50.6	50.8	50.7	50.7	50.3	50.9	50.9	49.5	47.4	50.7
Male %	49.4	49.2	49.3	49.3	49.7	49.1	49.1	50.5	52.6	49.3
Median age (years)	39	38	38	41	38	42	35	33	43	38
Population										
65 years & over %	17.6	16.8	17.0	20.0	16.1	20.9	15.0	8.9	19.0	17.2
Median										
weekly income \$	813	803	787	734	848	701	1,203	936	1,497	805

Sources: References [14] [15].

APPENDIX B

MANAGERS CLASSIFICATION

The classification of managers in this paper is in accordance with ABS's adopted ANZCO: Australian and New Zealand Standard Classification of Occupations. According to it, managers are engaged in the planning, organisation, direction, control, coordination and review of organisations and/or departments. In other words, managers set the overall direction and objectives of organisations and/or their departments to make certain that set objectives are met. They are concerned with the allocation of assets and resources. They direct, control and/or coordinate the activities of organisations and/or their departments, either personally or through subordinates. They are concerned with monitoring and evaluating the overall or departmental performance of the organisation and changing policies and processes to make certain that set objectives are met. They are also engaged in the representation and/or negotiation of the interests of their organisations and/or departments.

Chief executive officers and general managers are engaged and responsible for the planning, organisation, direction, control, coordination and review of the overall operations of organisations, their major activities and representation of and negotiation on behalf of their organisations. Their tasks include the setting of the overall direction and goals of their organisations. They are concerned with the overall setting of the operations of their organisations. In addition, they are responsible for the performance of their organisation in line with set objectives. Further, they represent their organisations in public relations and negotiations with other organisations and regulatory authorities.

Specialist managers have more direct duties in the planning, organisation, control and coordination of given functions within the overall organisational setting, such in the production and distribution of services, the management of human and financial resources and other ancillary functions. Thus, their tasks include development and implementation of strategies concerned with monitoring and ensuring that policies and plans are followed and evaluation of their outcome, in terms of work progress, performance, and adjustment of processes and resources to achieve set goals. They control budget planning and report on performance and control of expenditure in their area of responsibility. They are involved in personnel planning and training and their performance. They may be involved in the representation of their organisation at given levels and also negotiations with other departments and other outside organisations, such as suppliers of goods and services.

Hospitality and service managers are concerned with the organisation and operation of accommodation, cleaning, transport and provisions such as food. They are concerned with the selection, training and supervision of related staff.

Source: Reference [21].