ANZDATA & ANZSN
SPECIAL REPORT

Haemodialysis Capacity Survey

Summarising the findings from the haemodialysis capacity survey conducted in association with the December 2022 ANZDATA data collection

CONTENTS

SUGGESTED CITATION

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PLAIN LANGUAGE SUMMARY

- Haemodialysis is the treatment option for most people with kidney failure. Regular dialysis is required to sustain life.
- Patients usually require haemodialysis treatments three times a week. Most patients on haemodialysis receive this treatment at a dialysis centre.
- A survey of dialysis units was undertaken by the Australia and New Zealand Dialysis Registry (ANZDATA) and the Australian and New Zealand Society of Nephrology (ANZSN), to assess the capacity to provide haemodialysis treatments at dialysis centres in Australia and New Zealand. The results from this survey are presented in this report.
- We found large variation in capacity to provide haemodialysis across different regions and within major capital cities in Australia. This indicates inequities in dialysis infrastructure, with some dialysis units experiencing strained capacity.
- Many dialysis units face challenges such as staff and funding shortages.
- Over half of dialysis units have waiting lists for new patients who need to start haemodialysis.

EXECUTIVE SUMMARY

This report is a collaboration between the Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry and the Australian and New Zealand Society of Nephrology (ANZSN). This Special Report on haemodialysis capacity complements existing Registry publications by focusing on the infrastructure supporting haemodialysis treatments in Australia. The survey follows a similar survey completed by Kidney Health New Zealand[1].

This report addresses concerns about dialysis infrastructure identified by clinicians across several jurisdictions. It reports on a survey of dialysis facilities throughout Australia, together with information from the Registry about the numbers of people receiving treatment at each location. The survey aimed to quantify haemodialysis capacity across jurisdictions, identify regional disparities, facilitate policy discussions and open avenues for ongoing data collection.

A lack of haemodialysis capacity has multiple impacts for patients. These include:

- A lack of choice of the type of dialysis available to them, reducing patient autonomy in modality selection.
- Difficulty with transition from home-based dialysis to in-centre dialysis treatment when home dialysis either becomes clinically less effective, the patient is no longer able to perform home-based treatment or transition is required due to social reasons.
- Longer travel times for dialysis as patients travel to units with capacity while local units have no available capacity
- The inability to travel away from their usual dialysis unit for work, family or cultural responsibilities or holiday

Overall, Australia reported an average of 3.33 patients per dialysis chair. However, there is substantial variation between regions and within cities. For individuals and health service providers, the key metric is capacity within each local area. Capital cities such as Darwin and Perth exhibited the highest ratios overall, indicating strained capacity, while Hobart and Canberra showed lower ratios. The survey also revealed that many units face challenges such as non-operational dialysis chairs due to staffing or funding shortages, and over half of units have waiting lists for new patients. The analysis highlights pressures that are particularly marked in public facilities. Detailed examination of the capacity in acute hospital-based facilities will require further investigation given the nature of the demand in these facilities.

The data, supplemented with detailed maps, underscores the need for strategic planning to enhance haemodialysis capacity. Previously published material indicates an ongoing increase in demand for haemodialysis, and the substantial distances many people are required to travel to access dialysis.

INTRODUCTION

This is a collaborative Special Report by the Australia and New Zealand Dialysis and Transplant (ANZDATA) Registry and the Australian and New Zealand Society of Nephrology (ANZSN). This special report provides summary information of a survey on haemodialysis capacity which ANZDATA, with support from ANZSN, conducted in conjunction with the annual Registry end-of-year patient survey in 2022. This report focuses on Australia; New Zealand capacity issues have been covered elsewhere[1]. This is an initial report; considerable further work is anticipated examining the relationships between various unit characteristics and other factors and planning future data collection.

BACKGROUND

The ANZDATA Registry reports on the number and location of people receiving different types of dialysis treatment as part of standard reporting. Previous Special Reports (available at https://www.anzdata.org.au/anzdata/publications/reports/) have included a range of clinical practices among dialysis units. However, available haemodialysis infrastructure has not been previously included, either in these reports or elsewhere.

The ANZSN had identified via communication with its members and through discussions at its policy focused Dialysis, Nephrology and Transplantation (DNT) meeting that haemodialysis capacity was a key concern for members. Through discussions between ANZDATA and ANZSN, this report is the result of increased support provided by ANZSN for work in assessing dialysis capacity across Australia and New Zealand (conducted by the ANZDATA/ANZSN Epidemiology Fellow).

Most individuals in Australia and New Zealand undergo long-term dialysis at dedicated dialysis facilities or dialysis units rather than in private residences. These include hospital-based facilities, satellite dialysis units or in some areas “community houses”. The level of medical support varies across these facilities, but all require some infrastructure and clinical oversight. Recently, concerns have been raised by clinicians and the ANZSN that the infrastructure in some areas is insufficient to support the necessary dialysis demand. To try and address this lack of capacity, units have reported a variety of approaches including reducing the standard duration and frequency of dialysis. Additionally, patients may be directed to undertake home therapies rather than being offered access to their preferred therapy. While alarming, these concerns are anecdotal, and no data has been routinely collected to confirm or refute them. This survey aims to correct this situation.

PURPOSE

To address this data gap and provide information for policy and practice regarding haemodialysis capacity, individual dialysis units were surveyed in conjunction with the annual end-of-year ANZDATA patient survey in 2022. This report aims to:

1) Provide data to quantify the ratio of people requiring dialysis to the number of chairs available
2) Stratify these ratios based on different jurisdictions
3) Present the data to the key advocacy groups (ANZSN and Kidney Health Australia) to allow advocacy for improved haemodialysis capacity to allow patients to have access to appropriate haemodialysis facilities.
4) Use these data to refine the ongoing ANZDATA data collection.
5) Sections 1-4 report the data around haemodialysis chairs and the number of patients. Subsequent sections cover further details about the responding units.

METHODS

We disseminated the survey via SurveyMonkey with the end-of-year ANZDATA survey in December 2022. This was initially sent by email to the nurse unit manager or nurse-in-charge for all dialysis units in Australia and New Zealand, requesting that it be completed by someone with relevant knowledge about their unit. The survey covered physical dialysis capacity, staffing, resources and clinical practice. Nurse unit managers and medical heads of unit were contacted by email and phone in 2023 to encourage completion of the survey.

"Acute" units are dialysis facilities that provide treatment to hospital inpatients (i.e. overnight admissions for reasons other than haemodialysis). "Satellite" vs "Hospital" refers to whether facilities are staffed and intended for stable ambulant patient's vs the capability to care for those who are medically unstable or who have greater care needs that require a higher level of staffing. There will generally be specialist nephrology support continuously available on-site for Hospital units, together with the ability to provide inpatient care onsite. Many (but not all) Hospital units are also "acute" facilities. "Satellite" facilities can be based in the community but may also be based in hospitals (especially in regional areas). Both Satellite and Hospital facilities have nursing staff who deliver dialysis treatments. "Community houses" have been constructed in some areas and are designed to provide infrastructure for people otherwise able to perform home haemodialysis, but whose home is not suitable. No on-site nursing or medical support is provided in these. "Holiday" dialysis refers to patients who are treated away from their usual location for personal or social reasons.

The analyses presented here are purely descriptive. The "ratio" reported is the ratio of long-term dialysis patients reported in the end of year 2022 ANZDATA survey[2] to the number of haemodialysis chairs reported by dialysis facilities. Importantly, this number excludes people receiving "acute" dialysis in a facility, whether they are receiving temporary dialysis for acute kidney injury or are long-term haemodialysis patients hospitalised for other reasons and receiving dialysis outside their usual dialysis facility.

This ratio is anticipated to vary substantially between large cities and metropolitan regions, and within cities. In addition to the tabular data presented here, interactive maps and detailed data are available on request.

These data must be interpreted in the correct clinical context. Haemodialysis treatments usually last 3.5-5.0 hours. The time for preparation and disinfection of machines is in addition to this. Therefore, a typical dialysis unit will have a morning and afternoon "shift" of patients in each dialysis "chair". People usually receive treatment 3 times per week; hence the standard operating model is 6 days per week, and each haemodialysis chair typically supports 4 patients. The "ratio" of patients to chairs then is 4.0. In a community or satellite unit, clinicians consider a ratio of greater than 4.0 reduces the dialysis unit's ability to deliver high quality patient care in a sustained fashion. It removes any flexibility to cope with unexpected delays, visiting patients or other factors.

In practice, there are several other important elements to the consideration of what is an "appropriate" dialysis capacity. The number of patients reported to ANZDATA includes long-term haemodialysis patients only. Dialysis facilities which support hospital inpatients (referred to as "acute dialysis") need more capacity to provide services to both long-term haemodialysis patients and acute hospital inpatients which may include patients needing dialysis on a short-term basis or long term haemodialysis patients admitted to hospital with an acute illness. ANZDATA does not currently collect data on short term dialysis treatments or patient numbers, and hence the overall patient-to-dialysis chair ratio appears lower in many cases but does not necessarily capture the workload of these centres. This component of short term "acute dialysis" workload varies enormously between sites, depending on the local situation.

The reason for capacity limitations in a given location can also vary, beyond the number of physical chairs and dialysis machines. In regional and remote areas, it is often the difficulty of finding and retaining adequately trained dialysis staff that is the limiting factor for dialysis capacity rather than the actual number of physical chairs. Finally, some units provide nocturnal dialysis (sessions run overnight), either to increase capacity or to provide an ability for longer dialysis sessions. For these reasons, results are presented stratified by jurisdiction and capital city vs other regions. Similarly, overall state- or city-wide data may be of limited value. Hence, various maps have been prepared to assist with local interpretation.

RESULTS

1. Haemodialysis Capacity Overall and by Country

Overall, there were 3.33 patients per chair in Australia (Table 1), with New Zealand having a ratio closer to 4 patients per chair. However, there is large variation within each country in this ratio.

Table 1
Ratio of patients per dialysis chair by country

Country	Total number of patients*	Total number of chairs	Ratio	Range
Australia	11702	3514	3.33	0.25-6.75
New Zealand	1998	508	3.93	0.75-6.21
Overall	**13700**	**4022**	**3.41**	**0.25-6.75**

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

2. Haemodialysis Capacity in Australian Capital Cities by Jurisdiction

Dialysis facilities in Darwin and Perth had the highest ratios exceeding 4 patients per chair, while Sydney, Melbourne, Adelaide and Brisbane had ratios around 3.5 to 4.0 patients per chair, and Hobart and Canberra had the lowest (Table 2). However, within these jurisdictions, a wide range of ratios was seen. Ratios are further summarised by acute vs non-acute units, hospital vs satellite and public vs private hospitals (Table 3).

Table 2
Ratio of patients per dialysis chair in capital cities by state

Jurisdiction	Total number of patients*	Total number of chairs	Ratio	Range
Darwin	254	59	4.31	3.78-5.26
Sydney	1900	526	3.61	1.50-6.00
Melbourne	2066	567	3.64	1.42-6.75
Brisbane	977	262	3.73	0.41-5.25
Adelaide	658	168	3.92	1.00-5.16
Perth	958	219	4.37	3.55-5.71
Hobart	77	38	2.03	-
Canberra	174	70	2.49	0.40-3.33

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

Table 3
Ratio of patients per dialysis chair by facility type

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	4062	1119	3.63	0.40-6.75
Non-acute	3002	790	3.80	0.41-5.60
Hospital	2869	738	3.88	0.40-6.75
Satellite	4204	1171	3.59	0.41-5.60
Public	5278	1385	3.81	0.40-6.75
Private	1786	524	3.41	0.41-4.50

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3. Haemodialysis Capacity in Capital Cities in each Jurisdiction

Ratios (of patients to chairs) are summarised below by acute vs non-acute units, hospital vs satellite and public vs private hospitals in capital cities in each jurisdiction (Tables 4 - 11).

3.1 Darwin

Table 4
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	100	19	5.26	-
Non-acute	154	40	3.85	3.78-4.12
Hospital	100	19	5.26	-
Satellite	154	40	3.85	3.78-4.12
Public	254	59	4.31	3.78-5.26
Private	-	-	-	-

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3.2 Sydney

Table 5
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	840	218	3.85	1.75-6.00
Non-acute	1060	308	3.44	1.50-5.23
Hospital	851	217	3.92	1.75-6.00
Satellite	1049	309	3.39	1.50-4.27
Public	1640	441	3.72	1.50-6.00
Private	260	85	3.06	1.87-4.25

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3.3 Melbourne

Table 6
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	858	246	3.49	1.42-6.75
Non-acute	1208	321	3.76	1.67-5.60
Hospital	761	214	3.56	1.42-6.75
Satellite	1305	353	3.69	1.67-5.60
Public	1750	484	3.62	1.42-6.75
Private	316	83	3.81	3.50-4.37

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3.4 Brisbane

Table 7
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	654	159	4.11	3.50-5.25
Non-acute	323	103	3.14	0.41-5.14
Hospital	561	133	4.22	3.50-5.25
Satellite	425	129	3.29	0.41-5.10
Public	613	141	4.35	1.62-5.25
Private	364	121	3.01	0.41-4.00

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3.5 Adelaide

Table 8
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	111	33	3.36	1.00-4.33
Non-acute	547	135	4.05	2.00-5.16
Hospital	157	40	3.93	1.00-5.16
Satellite	501	128	3.91	2.00-4.59
Public	454	109	4.17	1.00-5.16
Private	204	59	3.46	2.00-3.64

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3.6 Perth

Table 9
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	358	67	5.34	4.95-5.71
Non-acute	600	152	3.95	3.55-4.50
Hospital	358	67	5.34	4.95-5.71
Satellite	600	152	3.95	3.55-4.50
Public	455	91	5.00	4.00-5.71
Private	503	128	3.93	3.55-4.50

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3.7 Hobart

Table 10
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	77	38	2.03	-
Non-acute	-	-	-	-
Hospital	77	38	2.03	-
Satellite	-	-	-	-
Public	77	38	2.03	-
Private	-	-	-	-

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

3.8 Canberra

Table 11
Ratio of patients per dialysis chair by unit types

Type	Total number of patients*	Total number of chairs	Ratio	Range
Acute	4	10	0.40	-
Non-acute	170	60	2.83	2.50-3.33
Hospital	4	10	0.40	-
Satellite	170	60	2.83	2.50-3.33
Public	35	22	1.59	0.40-2.58
Private	139	48	2.90	2.50-3.33

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

4. Haemodialysis Capacity Outside of Capital Cities

Ratios (patients/chair) are summarised for units outside of capital cities by each jurisdiction (Table 12).

Table 12
Ratio of patients per dialysis chair outside of capital cities

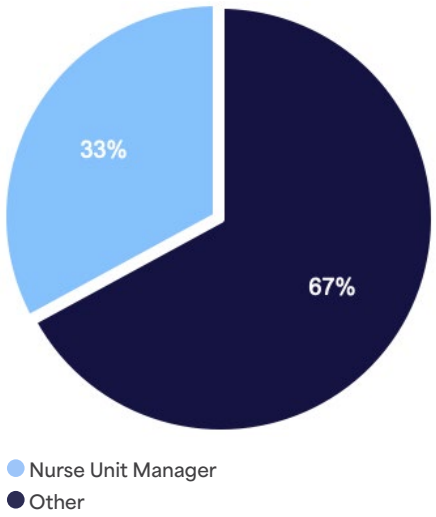
Jurisdiction	Total number of patients*	Total number of chairs	Ratio	Range
NT	482	103	4.68	2.67-6.46
NSW	1369	541	2.53	0.25-4.90
VIC	639	237	2.70	0.25-4.75
QLD	1478	527	2.80	0.50-5.00
SA	178	53	3.36	1.00-5.00
WA	397	100	3.97	2.17-5.40
TAS	103	42	2.45	2.40-2.48
Overall	**4646**	**1603**	**2.90**	**0.25-6.46**

*Number of prevalent haemodialysis recipients at point of yearly census, excluding home haemodialysis recipients

5. Individuals who Completed the Survey

Most of the surveys were completed by dialysis nurse unit managers. "Other staff" included. clinical director, acting nurse unit manager, renal nurse, nephrologist (Figure 1).

Figure 1
Role of individuals who completed the survey (%)



6. Dialysis Practices

a. Daytime services operated on Monday, Wednesday and Friday versus Tuesday, Thursday and Saturday

Excluding nocturnal shifts, most of the units operated on Monday, Wednesday and Friday with 2 shifts per chair per day, with about a quarter operating less than 2 shifts per chair per day (Figure 2). About half of the units operated on Tuesday, Thursday and Saturday with 2 shifts/ chair/day, with over one third operating less than 2 shifts/chair/day (Figure 3).

Figure 2
Percentage of units offering daytime services operated on Monday, Wednesday and Friday

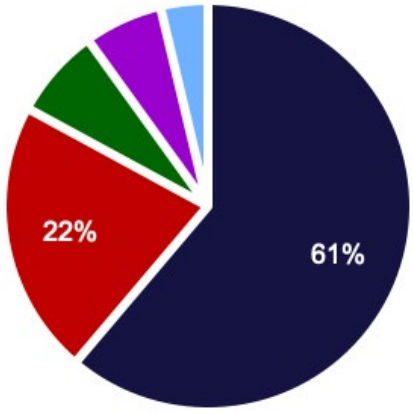
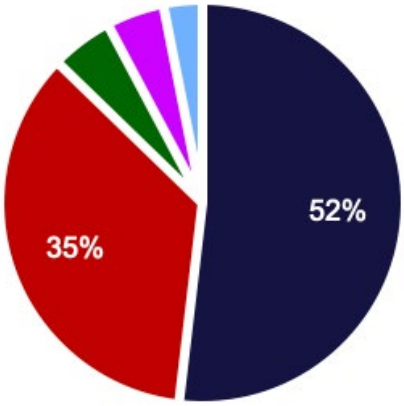
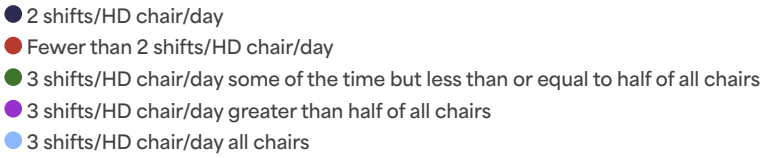


Figure 3
Percentage of units offering daytime services operated on Tuesday, Thursday and Saturday





b. Nocturnal Haemodialysis Sessions

Only 13 (4%) of dialysis units offered nocturnal haemodialysis sessions (Figure 4), mostly from Monday to Friday (Table 13).

Figure 4
Percentage of units offering nocturnal haemodialysis sessions

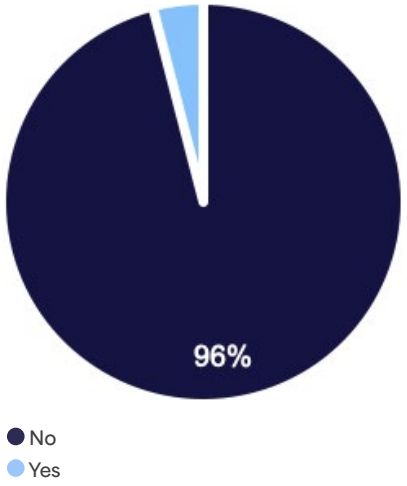


Table 13
Days nocturnal haemodialysis sessions are provided, n (%)

Days	N (%)
Monday	12 (92.3)
Tuesday	9 (69.2)
Wednesday	12 (92.3)
Thursday	9 (69.2)
Friday	12 (92.3)
Saturday	6 (46.1)
Sunday	4 (30.8)

c. Non-Operational Haemodialysis Chairs

Just over a quarter of units had non-operational haemodialysis chairs (Figure 5), with nearly 75% being due to lack of funding or staff (Figure 6). Other included reasons such as low long term dialysis patient numbers or patient who are temporarily receiving dialysis at a different dialysis unit at the time of the survey (e.g. admitted to hospital).

Figure 5
Percentage of units with non-operational haemodialysis chairs

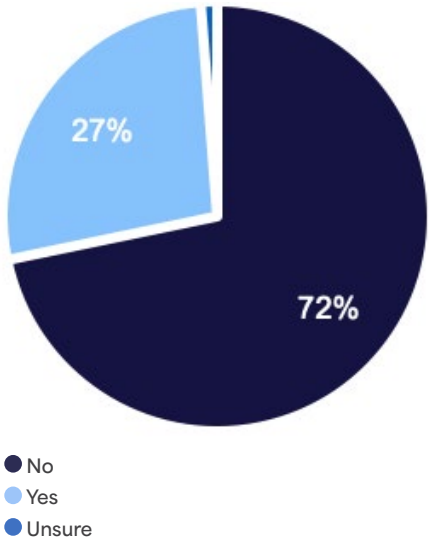
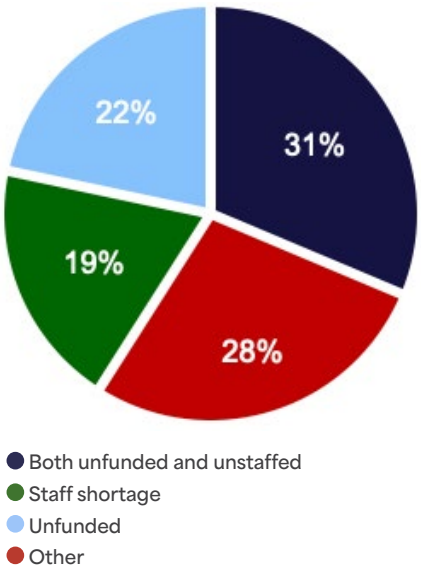


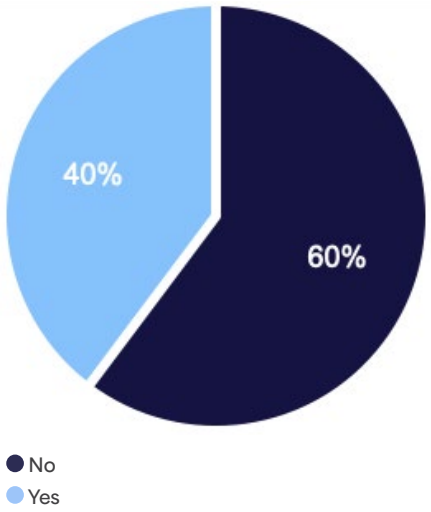
Figure 6
Reasons for having non-operational haemodialysis chairs (%)



d. Provision of Acute Haemodialysis to Hospital Inpatients in Addition to Ambulant Outpatients

Approximately 40% of the units provided acute haemodialysis to hospital inpatients in addition to ambulant outpatients (Figure 7).

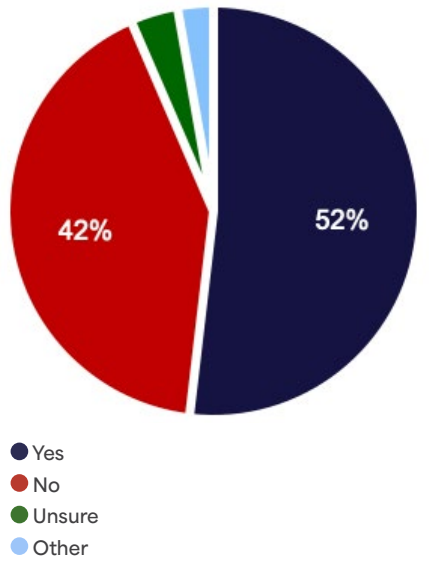
Figure 7
Percentage of units providing acute haemodialysis to hospital inpatients in addition to ambulant outpatients



f. Waiting List for Patients to Commence Haemodialysis

Just over half of the units reported that there is a waiting list for patients to commence haemodialysis (Figure 8). "Other" included responses that suggest recent fluctuations in the number of long term dialysis patients, e.g. where patients have received a kidney transplant or died.

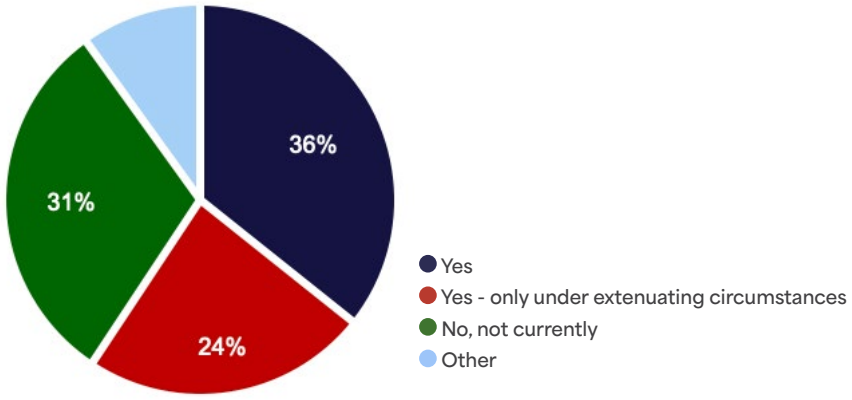
Figure 8
Percentage of units with a waiting list for patients to commence haemodialysis



g. Units Routinely Accepting Requests for Holidaying or Away-from-Home Dialysis Patients

"Holiday" dialysis is a generic term that includes patients who need to temporarily relocate their dialysis treatment to a unit that is different to their usual dialysis unit for personal or social reasons. Just over a third of units reported that they routinely accept requests for holidaying dialysis patients with a further 23% reporting that they would do this only under extenuating circumstances (Figure 9).

Figure 9
Percentage of units accepting requests for holidaying dialysis patients



7. Unit Characteristics

The number of facilities of various types is summarised overall in (Table 14) and in each jurisdiction in (Table 15).

Table 14
Number of hospitals versus satellite units

Type	Acute	Non-acute
Hospital	118	5
Satellite	13	191

Table 15
Number of units in each jurisdiction by facility type

Jurisdiction	Acute	Non-acute	Hospital	Satellite
Darwin	1	2	1	2
Rest of NT	1	5	1	5
Sydney	15	18	15	18
Rest of NSW	28	32	25	35
Melbourne	19	24	17	26
Rest of VIC	11	27	12	26
Brisbane	9	8	8	9
Rest of QLD	20	28	19	29
Adelaide	3	9	3	9
Rest of SA	1	10	0	11
Perth	4	7	3	9
Rest of WA	4	8	0	11
Hobart	1	0	1	0
Rest of TAS	1	1	1	1
Canberra	1	4	1	4
Rest of ACT	0	0	0	0

8. Maps

Each unit's location (street address) and ratio (of long term patients / chairs) have been plotted for Australia and an interactive map developed. The colour represents the rate of change of incident dialysis patients for each area per year, as an indicator of increasing demand (darker colour indicates greater growth in incident dialysis patients). Snapshots of the interactive maps for cities are provided below, illustrating the variation in haemodialysis capacity within these cities.

Figure 9
Map of Sydney area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

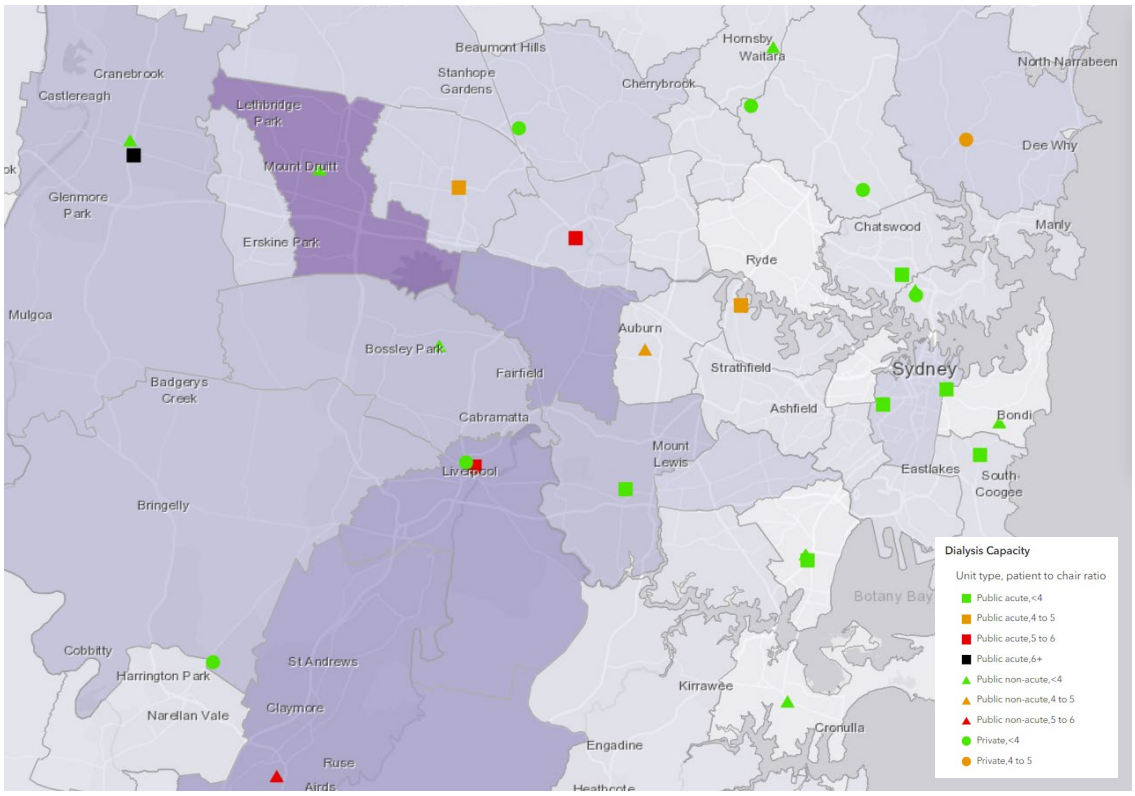


Figure 10
Map of Melbourne area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

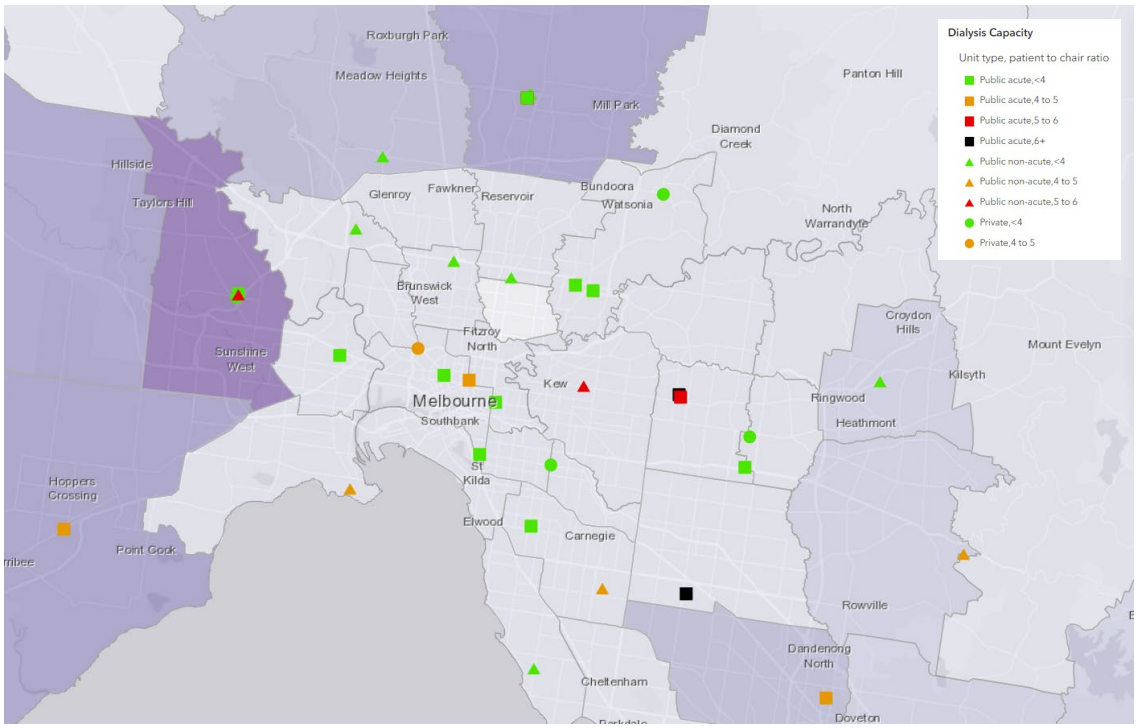


Figure 11
Map of Brisbane area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

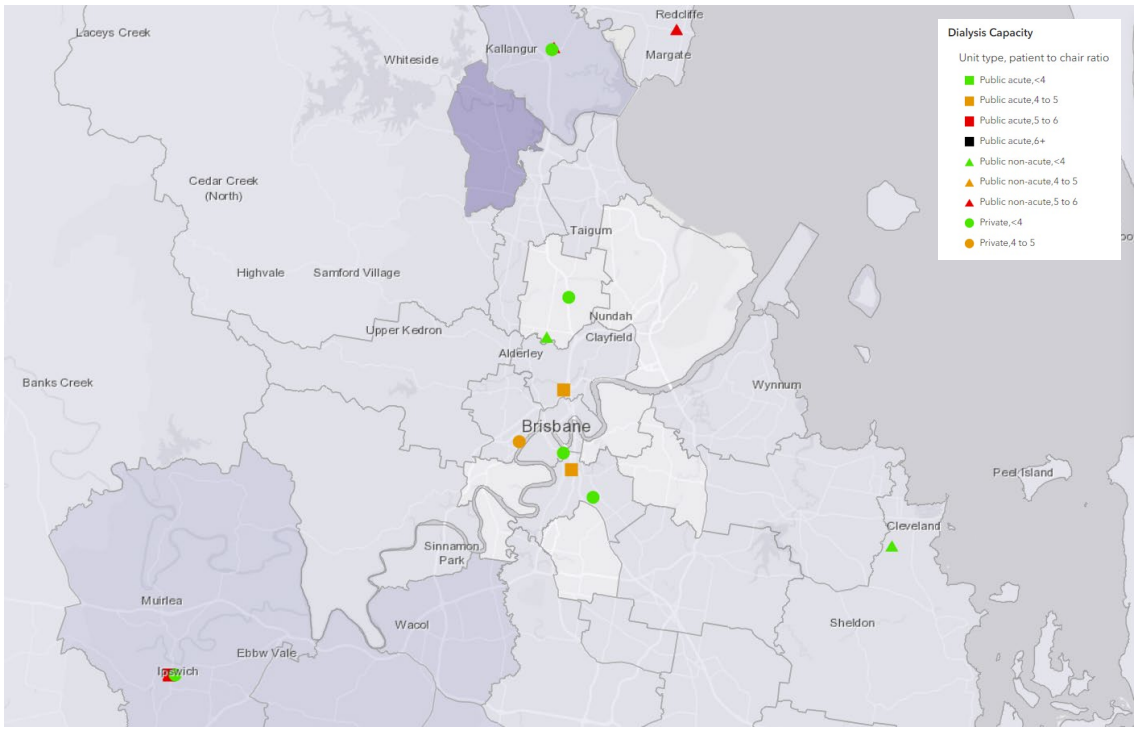


Figure 12
Map of Adelaide area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

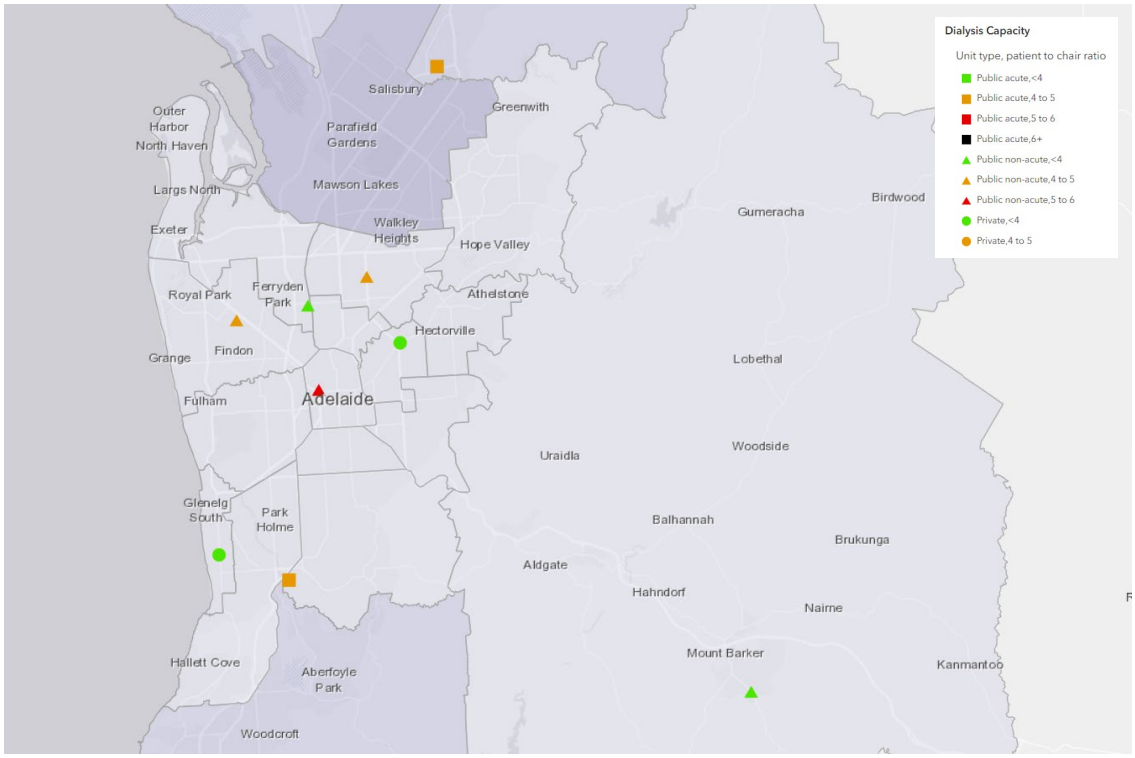


Figure 13
Map of Canberra area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

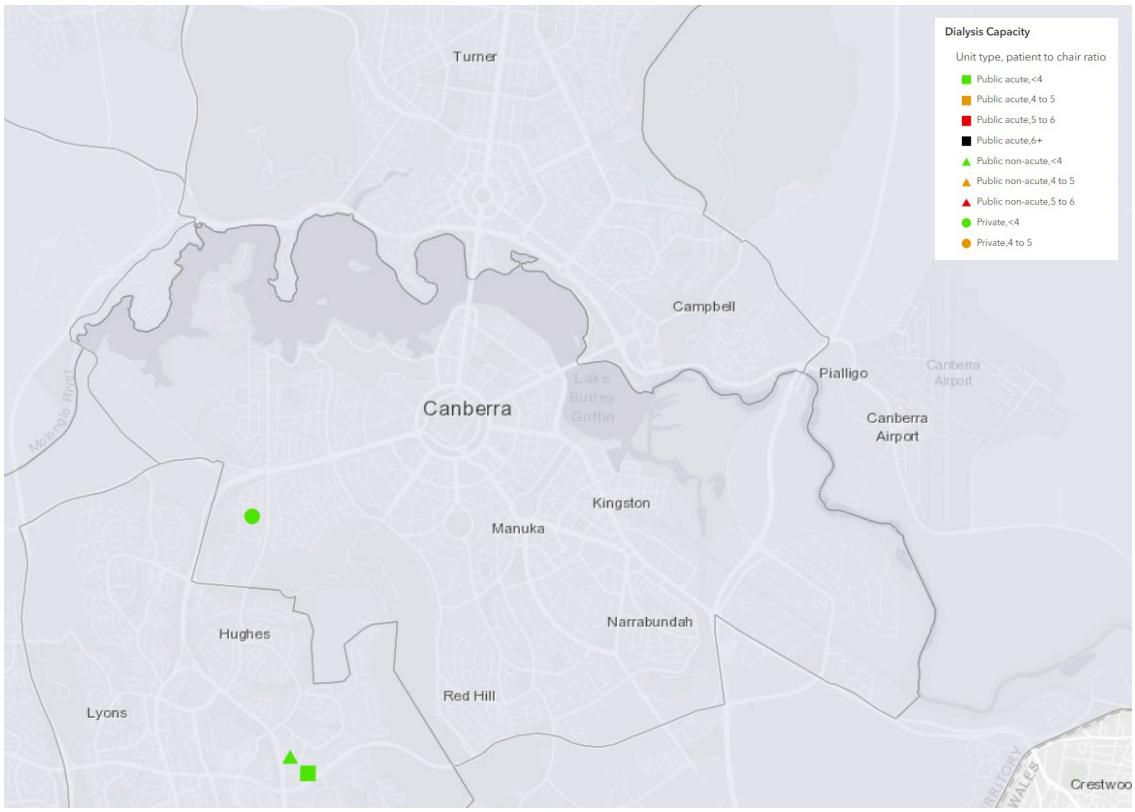


Figure 14
Map of Perth area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

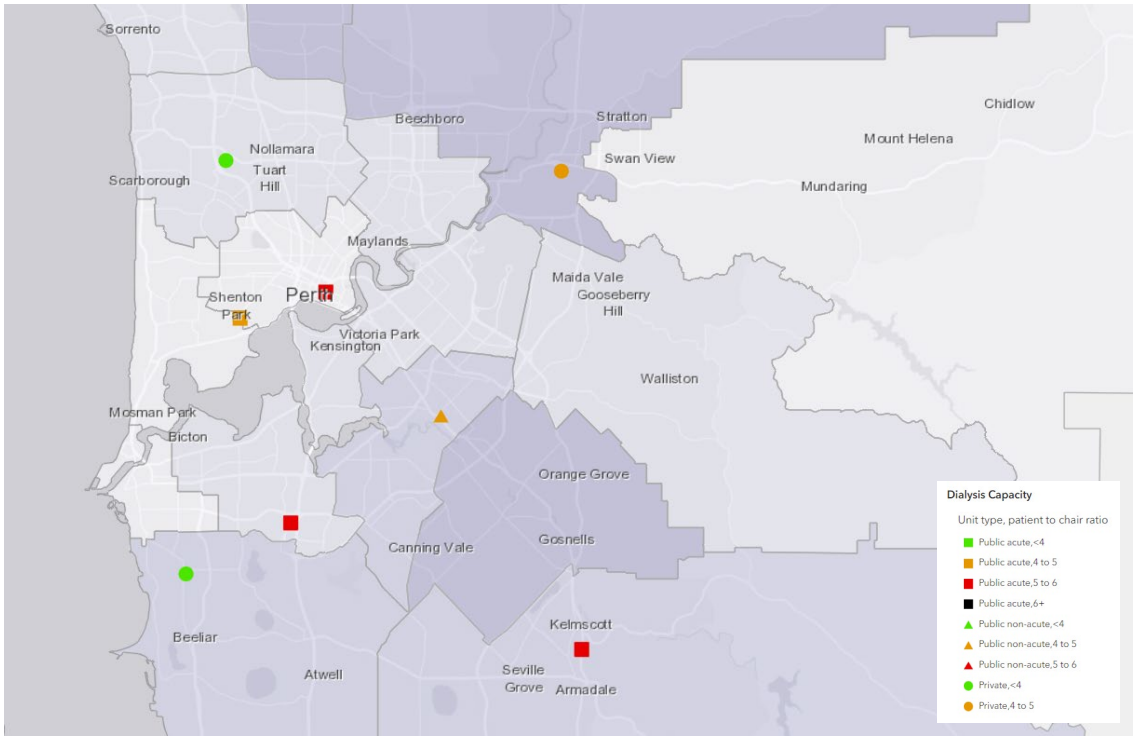


Figure 15
Map of Darwin area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

Figure 16
Map of Hobart area with dialysis facilities plotted together with the ratio of maintenance haemodialysis patients / chairs and the rate of growth by SA3 area

COMMENTS ON DIALYSIS CAPACITY FROM DIALYSIS UNITS

Several dialysis units provided comments on dialysis capacity as part of the survey. A selection of these comments is provided here. These comments reflected a variation in issues related to capacity binationally. The themes arising are related to general issues regarding dialysis capacity with both staffing and infrastructure, as well as issues related to ability to provide holiday dialysis:

General dialysis capacity concerns

"Daily juggling patients within the area health service to accommodate any no show patients/vacancy."

"Increasing number of haemodialysis patients and less capacity beds (twice weekly patients to accommodate patients who required haemodialysis treatment)"

"Significant wait list and out of area patients"

"Staffing is difficult"

"This survey doesn't address the large burden of after-hours dialysis on staff. Also there are too many patients - not enough chairs/shifts."

"We are at full capacity, and we are dialysing patients in ICU for acute presentation."

"Dialysis capacity is our unit's number one issue. We are on capacity alert over 90% of the time (i.e. where we are unable to accept further patients without it critically affecting the care of existing patients). Our dialysis capacity issues also adversely impact the function of our kidney transplant service."

"[Dialysis unit] has temporarily closed their Tues, Thurs, Sat evening shift due to staffing shortages... There is one patient wanting to relocate to [location of dialysis unit], but we have had to delay acceptance until staffing situation improves."

"Unable to staff currently for 6 days per week required."

"While we have physical infrastructure capacity to increase patient numbers from [XXX to XXX] patients, there is no funding to do this."

"Due to high demand of patients requiring dialysis treatment, we accept extra patients in between the 2 shifts, depending on staffing as well."

"It is common for patients from interstate to "turn up" unannounced and we need to accommodate them regardless. Our unit has always been over capacity and we rely heavily on 'Did Not Attends' to manage, even though this does not address the problem."

"We are a regional satellite unit with an increasingly unwell patient cohort that refuse transfer to tertiary units as that involves relocation 5 hours away."

COMMENTS ON DIALYSIS CAPACITY FROM DIALYSIS UNITS

Holiday and away-from-home dialysis

"Full and hate not been able to offer any holiday dialysis"

"Used to accept holiday dialysis patients when there was availability"

"We have full occupancy of Haemodialysis chairs and unable to provide holiday dialysis services."

"Holiday dialysis availability quite limited due to current capacity and running overfunded chairs"

"We are a busy holiday [dialysis unit], most weeks we are able to accommodate holiday patients"

"Have had holiday patients in the past but no currently. Over capacity"

"We cannot accept any holiday patients. Currently running at full funded capacity."

DISCUSSION

This report provides a cross-sectional examination of current haemodialysis capacity across Australia. The current situation reflects an excess of "demand" over "supply" at its core. There is a range of patient-to-chair ratios overall, however there are frequently ratios of greater than 4.0 which risk a satellite service's ability to deliver high quality patient care in a sustained fashion and may compromise patient safety. For acute and hospital units there is often substantial additional workload related to the acute dialysis load of hospital inpatients. This workload is not included in this survey, nor is data available at a national level about the number of haemodialysis treatments administered during hospital admission.

There is also great variability in dialysis capacity between different regions and within capital cities, with higher patient-to-chair ratios in some areas compared to others, indicating inequities in service provision based on location. The growth in haemodialysis numbers, and trends in treatment, have continued steadily for some time. This increase in the number of people undertaking haemodialysis has increased despite increases in the number of kidney transplants, and efforts to increase the uptake of home dialysis (both peritoneal dialysis and home haemodialysis). This situation is not sudden or unexpected but has arisen over many years. Projections of the demand and associated recommendations have been made at national, jurisdictional and regional levels[1,3-9]. How this information is incorporated into health service planning and delivery is not known, but the current situation suggests many units have severe capacity issues even though the jurisdiction wide ratio appears adequate. It is important to acknowledge that people needing dialysis need access to services close to home given the frequency and chronicity of treatment; capacity in a dialysis unit 1-2 hours' drive away is not helpful for most patients who access this treatment 3 times weekly.

The lack of capacity to provide optimal treatment forces clinical units then to allocate available resources among an increasing number of patients. Some approaches kidney units in Australia are currently taking include:

- Removing patient autonomy around choice of modality by mandating home treatment (unless absolutely contraindicated),
- Forcing patients to attend treatment at distant locations or unsociable/inconvenient hours,
- Reducing treatment frequency to twice weekly and
- Clinicians assessing fluid and electrolyte state of people who have attended dialysis to try and mitigate the risk of deferring treatment.

All these factors reduce the quality of the health services provided, and many will increase the risk of adverse events for patients. The clinical consequences of this imbalance between supply and demand are not within the scope of this report, but do need to be examined. Some indications of impact are seen in the very limited ability of facilities to offer dialysis to visiting patients. The lack of ability to offer this form of dialysis (referred to as "away from schedule" in the New Zealand report) is a major limitation on ability of dialysis patients to engage in normal life and societal events (such as weddings, funerals and other occasions). Another element of this (previously examined) is the distance patients must travel for treatment and the frequency in which patients are not treated in their closest unit[10]. Greater travel time has been associated with both greater mortality risk and lower quality of life[11]. Relocation from remote to urban areas has also been clearly associated with increased hospitalisations and health services utilisation among Aboriginal people living in remote communities in the Northern Territory.

This report is the first to describe the available capacity for facility-based haemodialysis across Australia. There are several complexities in the interpretation of these data. We have attempted to facilitate this interpretation by stratification of results in various ways. Critical issues to appreciate are that "acute" units have a varying and often substantial haemodialysis workload due to hospital inpatients and other transient patients which is not reflected in the end of year "census" that ANZDATA performs. In many regional areas, the limiting factor to capacity is staffing rather than the physical infrastructure. Hence, the simple "ratio" of long-term patients to available chairs does not accurately represent capacity utilisation. "Overall" ratios for the country or a state/territory are of limited relevance; examination of data at a local level is critical. In many areas there is substantial limitation in haemodialysis capacity. Within the usual schedule of thrice weekly dialysis, dialysis capacity must be accessible to patients in their local area. In some cases, this limitation means patients are not able to live in their hometown or community.

Publicly available data on dialysis capacity / availability is generally not available. Looking forward, we anticipate that information of this type will be collected periodically. Data on the number of "acute" treatments (whether delivered to people with acute kidney injury or long-term dialysis patients who are hospital inpatients) will be valuable, although not currently collected and challenging to collect at scale. Feedback on the scope of the information and how it has been utilised, is very welcome.

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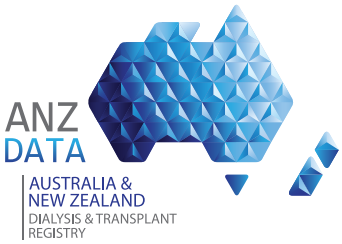

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