

Executive Summary

The number of people on dialysis in NSW continues to increase each year. A significant proportion of these patients elect unit-based (satellite or in-centre) haemodialysis. This requires a steady increase in dialysis staff and an intermittent increase in commissioning of new dialysis units to meet the demand. The Dialysis Working Group (DWG) of the GMCT Renal Services Network was aware of concerns regarding both the dialysis staff workforce and current dialysis unit infrastructure capacity to meet the current and future demand for unit based dialysis. The DWG determined to perform a capacity audit to assess the validity of these concerns and to provide a current snapshot of dialysis services in NSW.

All twenty-three NSW renal services provided responses to a structured questionnaire in April-May 2009 describing the sixty-five haemodialysis units under their management. Ten of these units were excluded from the capacity analysis, due to their variation from the standard model for facility-based haemodialysis units. Data regarding dialysis unit infrastructure and staffing were analysed by area health service, by parent renal service within each area, and by the individual dialysis units of each renal service for the remaining fifty-five units.

The results confirm continued growth in the number of dialysis units within NSW, with 43% of current dialysis units having been commissioned within the last 5 years. The Dialysis Capacity Audit identified that NSW was operating at 90% capacity statewide. However, despite the substantial growth in dialysis facilities in recent years, twenty-three of the haemodialysis units are operating at or above 100% of their capacity. Fifteen of the units routinely function at greater than 100% capacity – eight of these are in the metropolitan and seven are in non metropolitan areas. In addition, fifteen of the twenty-three units operating at or above capacity are unable to further expand their current infrastructure to meet future demand.

Under the current configuration there is capacity to increase by 38% the number of patients treated state wide. This can be achieved by utilizing currently unfilled dialysis spots, by adding more dialysis chairs to currently plumbed dialysis ports and by adding additional ports within current dialysis units. This would allow for an additional 300 patients to be treated using current facilities, a further 224 patients by opening currently plumbed but unfurnished ports, and a further 208 patients by inserting more ports in existing units. However, the majority of this potential expansion (64%) is in the non-metropolitan area with the remaining 36% within the metropolitan units. This means that most of the potential additional capacity is not readily accessible because of travel distance for patients – eg a patient travelling from Manly to Gosford, or from Wagga Wagga to Bega. It should be noted that metropolitan dialysis units can increase activity by only 6% under current configuration which is slightly above the expected annual increase in dialysis numbers per year. Of particular concern are the three renal units operating significantly above capacity – Wollongong, Newcastle and Wagga Wagga - that are in urgent need of infrastructure expansion. St Vincent's Hospital is also functioning well above its funded capacity.

The audit identified surprisingly little objective evidence of staffing deficiency. Only 12% of units had vacancies for greater than six weeks. The major issue for most units was securing area level approval for staffing increases in the face of increasing workload, with little mention of difficulties with recruitment and retention of staff. Statewide there was marked variation in the utilization of enrolled nurses to provide dialysis services with variation, also, in the patient:staff ratios for in-centre and for satellite dialysis units across the state.

Our audit also showed only 13% of the NSW units have dedicated places for holiday patients. Staffing issues rather than ability of space to dialyse patients limit provision of holiday dialysis. On the other hand, the audit has identified considerable potential for sharing services in times of disaster. Across NSW, 73% of dialysis units (N=41/56) could increase their capacity either by using all currently available dialysis places or by furnishing already plumbed ports. This could provide up to 265 places in metropolitan locations and 259 places in non-metropolitan locations, depending on the constraints of the location of the disaster.

Finally, whilst excluded from our audit report, the seven self-care units operating in the GWAHS region deserve comment. These units have developed due to local demand for dialysis and typically consist of a dialysis machine (or machines) provided from a NSW Home Haemodialysis Program sited in a local hospital with local nursing support where required. Such units fall outside existing funding streams, but do provide a solution to provision of haemodialysis in small rural or regional areas where building of satellite dialysis services is not practical. Such a solution may be applicable in other Health Areas to provide dialysis closer to home for patients. If this is considered useful, a standardised approach to funding such programs should be considered.

In absence of a routine data collection, it is proposed to repeat this dialysis capacity audit on a regular basis to provide an ongoing picture of dialysis demands and infrastructure and staffing needs across NSW.

1. INTRODUCTION

The steady yearly increase in demand for satellite haemodialysis seen across NSW requires ongoing expansion of satellite dialysis services. This expansion requires steady increases in dialysis staff to meet demand and also intermittent commissioning of extensions to existing dialysis facilities or the commissioning of new satellite units when the facilities reach maximum capacity – commonly defined as four patients dialysed per chair per week (equivalent to twelve treatments per dialysis chair per week). The Dialysis Working Group (See Appendix A) of the GMCT Renal Services Network has been concerned with reports of dialysis workforce shortages and of some satellite units working at or above full capacity, with the risk that future patient demand may not be met in these areas without further infrastructure development. The group sought to understand the issue by undertaking an audit of all haemodialysis units in the NSW Health system.

There are three ways a haemodialysis unit can expand its services to meet increasing demand: firstly, by increasing staffing so that all the existing dialysis chairs provide twelve treatments per chair per week; secondly, by increasing the number of working dialysis chairs if there are additional dialysis ports that were previously not required; and thirdly, by installing and equipping additional ports if further space is available within the facility. When these options are exhausted a dialysis unit cannot expand to meet demand and must resort to turning patients away or to compromising quality of care until alternative solutions can be arranged.

The main questions to be answered from the audit of dialysis capacity were:

- What is the current hospital and satellite dialysis capacity in NSW, and how close is this to full capacity at both a local and state level?
- Is there physical room for growth in the current facilities if funding were provided for additional chairs/patients/staff?
- What dialysis services do renal units provide in 'unofficial' positions? (ie beyond their current service capacity or funding agreement?)

The other questions to be answered from the audit were:

- What potential is available for renal units to use other dialysis centres for their patients in case of disaster?
- What arrangements are available for holiday bookings?
- What are local units' staffing levels and use of enrolled nurses – and do they have any problems staffing their dialysis units?

2. METHOD

The NSW Dialysis Capacity Audit was undertaken in April-May 2009, covering all dialysis units across the eight Area Health Services in NSW, and the Children's Hospital Westmead. The scope of the audit was usual haemodialysis treatments provided in staffed facilities in the NSW Health system and the physical and workforce environment in which these services are provided. Additional information will be collected from private units for use in estimating potential for assistance in dialysis disaster planning.

A draft audit tool was developed by the authors and was piloted on 9% of NSW dialysis units. This led to slight changes being made to the audit tool. All data were collected by the GMCT Renal Services Network Manager, either by phone or face-to-face interview. The audit tool is provided in Appendix B. In most cases, the senior nurse manager was able to provide the information for all the haemodialysis units under the care of the parent renal service. Prior to the audit, permission was sought from heads of department or rural executive managers to ensure transparency and support for the audit. All were pleased to participate in the audit.

The audit data were entered into an Excel spreadsheet, and capacity was estimated using the following assumptions. Haemodialysis patients usually require three five-hour treatments per week. It is common for haemodialysis units to operate six days per week, running two shifts of dialysis per day. Greater than two shifts per day is not recommended in this report, as it is very hard on ambulatory patients to receive their routine treatment at 8:00pm to 1:00am and then to go home at that time of day. For this reason, calculations of system capability and capacity were based on a standard of each operational dialysis chair (ie furnished and staffed port) being capable of providing dialysis for four patients per week, at a maximum of twelve treatments per chair per week:

$$\text{Treatments per Chair per week} = 2 \text{ shifts/day} \times 6 \text{ days/week} = 3 \text{ treatments/patient} \times 4 \text{ patients/week} = 12$$

3. RESULTS

Demographics

The NSW Health system provides haemodialysis for approximately 1938 patients each week, in 65 haemodialysis units across eight Area Health Services and the Children's Hospital Westmead. There are approximately 5,784 haemodialysis treatments provided each week, across the NSW Health system.

For the purposes of this report, the sites have been sub-grouped into metropolitan and non-metropolitan locations, as this reflects population density and ease of access to NSW tertiary referral hospitals. Metropolitan areas have been defined as Sydney Basin, Newcastle, Wollongong, and the Central Coast. The remaining facilities have been described as non-metropolitan. Of the 65 units, 46% are in metropolitan locations and 54% are in non-metropolitan locations. The distribution of haemodialysis units in NSW is presented in Table 1.

Table 1: Distribution of Dialysis Units across NSW

Area Health Service	Metropolitan Locations			Non-Metropolitan Locations		
	Number of Units	Patients treated per week	% of Metro patients	Number of Units	Patients treated per week	% of Non-Metro patients
Children's Hospital Westmead	1	8	1%			
Greater Southern				5	75	14%
Greater Western				12 [#]	104	19%
Hunter New England	2	135	10%	9	118	22%
North Coast				7	210	38%
Northern Sydney & Central Coast	6*	196	14%			
South Eastern Sydney & Illawarra	7	397	29%	1	39	7%
Sydney South West	9	439	32%	1	1	0.2%
Sydney West	5*	216	16%			
TOTAL	30	1391	72% of NSW	35	547	28% of NSW

* At the time of this audit both NSCCAHS and SWAHS each had a new dialysis unit ready to be opened, at Mona Vale and Auburn, respectively. These units had no patients at that time and will not be included in the analysis of capacity.

Seven of these twelve units in Greater Western AHS are very small 'self-care' units and do not conform to the usual satellite model.

Exclusions

Of the sixty-five haemodialysis units listed in the audit, several were excluded from the analysis, for the following reasons (See Table 2.):

- a. Seven dialysis units are established as 'self-care' units, providing treatment to 14 patients in Greater Western Area Health Service. These are not recognised as formal dialysis units. Equipment is provided for these non-metropolitan units via the NSW home dialysis scheme and each of the 14 patients have their own allocated haemodialysis machine. Supervisory staff members are provided from the hospitals or the multi-purpose services. These seven units are not included in this analysis of capacity, nor of variation in staffing.
- b. At the time of this audit, there were two units located at Mona Vale and at Auburn, not treating any patients as they had not yet opened.
- c. The Children's Hospital Westmead was excluded from the capacity review, as it functions with a different capacity model to that used in the adult units.

Table 2: Exclusions used in the Report from the Dialysis Capacity Audit.

	No. of dialysis Units	Metropolitan Locations	Non-Metropolitan Locations
TOTAL Audit	65	30	35
a. Exclude 7 self-care units	58	30	28
b. Exclude 2 units which have not yet opened	56	28	28
c. Exclude Children's Hospital Westmead from the review of capacity	55	27	28

Distribution of Facilities

Patient acuity plays a large role in planning and management of patient care. Where possible, haemodialysis is provided in satellite centres away from the hospital environment. Patients with more acute needs or those with complex co-morbidities tend to be managed in in-centre units located within the hospital, unless there is insufficient room in the in-centre unit. Hospital-based haemodialysis units must maintain spaces for chronic haemodialysis patients admitted to hospital with other medical and surgical problems and also patients with acute renal failure as a complication of their acute admission. Some hospitals regularly provide haemodialysis to their patients in 'mixed' units irrespective of patient acuity. The distribution of types of haemodialysis units in NSW is presented in Table 3.

Table 3: Distribution of Category of Service across NSW (excluding 2 unopened & 7 self-care units)

Type of Haemodialysis Unit	Metropolitan Locations			Non-Metropolitan Locations		
	Number of Units	Patients treated each week	% of Metro patients	Number of Units	Patients treated each week	% of Non-Metro patients
In-Centre	12	548	39%	6	182	34%
Mixed	1	38	3%	2	54	10%
Satellite	15	805	58%	20	297	56%
TOTAL	28	1391		28	533	

There has been considerable investment in planning and providing dialysis services to meet the increasing demand. Of the 58 facilities in NSW, 43% have been commissioned in the last 5 years. This includes the two units at Mona Vale and Auburn, which have not yet commenced providing services. The distribution of haemodialysis facilities in NSW is presented in Table 4. The oldest dialysis facility has been operating for 31 years.

Table 4: Age of 58 Haemodialysis Facilities across NSW (excluding 7 self-care units)

	Metropolitan Locations		Non-Metropolitan Locations	
	5 years or less	Older than 6 years	5 years or less	Older than 6 years
Children's Hospital Westmead		1		
Greater Southern			4	1
Greater Western			3	2
Hunter New England		2	4	5
North Coast			2	5
Northern Sydney & Central Coast	2	4		
South Eastern Sydney & Illawarra	2	5		1
Sydney South West	4	5	1	
Sydney West	3	2		
TOTAL	11 (37%)	19 (63%)	14 (50%)	14 (50%)

70% of the units provide dialysis six or more days per week, and four of these run shifts seven days per week. 31% of the units run only one shift per day (75% of these are non-metropolitan), and 50% provide dialysis across 2 shifts per day, the remainder manage their demand using a mixture of shift arrangements. One unit routinely runs three shifts per day to manage their demand.

Current Operating Capacity

There are 541 dialysis chairs working in 56 haemodialysis units. These provide approximately 5784 treatments to patients across the NSW Health system each week. If we were to use a capability standard of twelve dialysis treatments per operational chair per week this means, on average, dialysis units in NSW are operating at 90% capacity^a, however many units are operating at 100% capacity or more. Comparative capacity of types of dialysis units is presented in Table 5. Figure 1, on page 12, illustrates the variation in capacity across NSW.

Table 5: Average Capacity of NSW Dialysis Services, by Age (N=55)

AGE of Unit	Metropolitan Locations			Non-Metropolitan Locations		
	In-Centre	Mixed	Satellite	In-Centre	Mixed	Satellite
5 years or less	104%		94%	82%		52%
More than 6 years*	103%	95%	102%	95%	65%	67%

* Excludes Children's Hospital Westmead, as this service uses different capability standards

Of the fifty-five adult haemodialysis units in NSW, twenty-three (42%) are working at 100% capacity or more. A listing of all NSW haemodialysis units and their current operating capacity is provided in Appendix C. These data have major implications for planning dialysis services, in an environment where growth in demand for dialysis is increasing at a rate of 4%-6% per annum¹. Appendix D contains a graph illustrating the capacity in each Area Health Service, and maps of location of these units are provided at Appendix E and Appendix F.

More than half of the metropolitan units (56%) are working at 100% capacity or greater, and would need to increase their approved numbers of dialysis chairs to meet increasing demand. Nevertheless, twelve of the twenty-seven metropolitan units could manage to treat more patients per week, under their current setup. In non-metropolitan locations, many units run one shift per day, 3-6 times per week. These units have the

^a Excludes Children's Hospital Westmead, which uses a different capability standard.

capability to double their capacity without any additional capital input, however they would need increased funding for staffing and running costs if the demand for haemodialysis increased in these locations.

There are nine units in NSW which are routinely functioning at greater than 100% capacity, and eight of them are in metropolitan locations. Most of these are operating within their official budget allocations, however they are all suffering under excessive demands and have to adapt their delivery of care to manage these demands.

Six of the units admitted to having to treat some of their patients outside their dialysis unit's operating budget, in order to manage the demand. This amounts to approximately thirty-three patients each week, across NSW.

Potential to expand services

The Dialysis Capacity Audit has identified potential for 38% increase across NSW, however maximum utilisation of all dialysis places would not be practicable in the more remote locations in NSW. The theoretical potential for growth in NSW dialysis units is outlined below in Table 6. The Children's Hospital Westmead is also able to increase its capacity if demand increases, however it is not included in this review of capacity.

Table 6: Capacity to increase dialysis services to additional patients in NSW, using current facilities

Additional PATIENTS	All NSW		Metropolitan Units		Non- Metropolitan Units	
	Additional Patients	Potential Growth	Additional Patients	Potential Growth	Additional Patients	Potential Growth
I) Use all unused dialysis spots	300	16%	77	6%	223	42%
II) Use all available ports	224	12%	188	14%	36	7%
III) Install new ports	208	11%	100	7%	108	20%
Total increase in capacity =	732	38%	365	26%	367	69%

I. Increase utilisation of current configuration

There is considerable variation in utilisation of dialysis chairs across the state. This audit has identified that there are thirty-two units which have unused places available for additional patients in their current setup, if funding were available. These unused places could provide routine treatment for an extra 300 patients (ie 16% increase) in NSW, however it is noted that the majority of these available places (N=223) are located in non-metropolitan locations. Metropolitan dialysis units can increase activity by only 6% under their current configuration.

II. Commission unused ports in current configuration

In addition, twenty-one of the dialysis units could increase their patient activity using already plumbed but unused ports. This would have the potential for increasing services by an additional 12% (224 patients), without needing additional capital funding, and includes two units that are currently functioning at more than 100% capacity. This amounts to thirty-nine units which have plumbed ports already available, but are currently not using these for dialysis either because of insufficient demand or restricted budget.

There are sufficient plumbed ports in the current system to treat an additional 224 patients, as well as the 300 unused dialysis places per week. Location of these places is of value for disaster planning.

III. Create new ports in current dialysis units

The capacity audit identified that eleven of the units (20%) have room to install and furnish additional dialysis ports, sufficient to treat an additional 208 patients, if there was funding allocated for the purpose. This could further increase statewide capacity by 11% of current levels. It was noted that six of these units would require a larger water treatment system to enable them to treat additional patients at the same time.

Eight of these eleven units already have unused places in their weekly dialysis service, and so the urgency in these locations is not as great as for those operating at 100% or greater.

IV. Unable to expand services within the current facility

There are 23 adult dialysis units across NSW (42%) that are currently operating at 100% full, or greater. Fifteen of these (27% of all 55 units) are unable to expand their services within their current facilities, either by using unused places or by plumbing additional ports. Eight of these are in metropolitan locations and seven are in non-metropolitan locations. The comparison of capacity is presented, by Area Health Service in Table 7.

Table 7: Review of Capacity by Area Health Service (excludes 7 self-care units in GWAHS)

Area Health Service**	No. of Units	Metropolitan Locations			Non-Metropolitan Locations		
		Functional Capacity	≥100% Full	Unable to increase	Functional Capacity	≥100% Full	Unable to increase
Sydney West*	4	103%	4	2			
Sydney South West	10	94%	2	1	25%	0	
South Eastern Sydney Illawarra	8	102%	4	3	75%	0	
Northern Sydney Central Coast*	5	93%	3				
Hunter New England	11	153%	2	2	43%	1	1
North Coast	7				90%	4	4
Greater Western	5				83%	2	1
Greater Southern	5				59%	1	1
TOTAL:	55		15	8		8	7

* At the time of this audit both NSCCAHS and SWAHS each had a new dialysis unit ready to be opened, at Mona Vale and Auburn, respectively. These units had no patients at that time and will not be included in the analysis of capacity.

**Children's Hospital Westmead is also excluded from this Table, as the capacity standard of 12 treatments/chair/week is not applicable to this service.

Disaster Planning

The audit has identified that thirty-three of the haemodialysis units in NSW (including Children's Hospital Westmead) would be able to provide dialysis for up to 304 additional patients under their current setup, however 223 of these places would be located in non-metropolitan locations. An additional 240 places could be made available at short notice by establishing dialysis chairs in all plumbed ports (if an additional fifty-six machines could be found at short notice). Of these increased places 204 would be located in metropolitan locations.

The majority of units could increase capacity using their current water treatment systems, however six units said their reverse osmosis system could not cope with additional ports.

Holiday and Out-of-Area Dialysis

Despite the unused dialysis places existing across the NSW system, only seven of the fifty-six units (13%) have dedicated places set aside for 'holiday' patients, or for those requiring dialysis away from their usual location. There are approximately forty-four dialysis treatments available, per week, across the NSW Health system for adult patients requiring out-of-area treatment. The Children's Hospital Westmead always ensures that there are places available for children should the need arise.

Staffing Issues

Information was collected on 'direct care' staffing levels and vacancies. Seven of the 56 units (12.5%) had advertised vacancies that had been waiting to be filled for longer than 6 weeks, however only 2 of these units were finding staffing to be a continuing problem. Securing Area approval for staffing in the face of increasing workload is a greater problem for managers than issues of recruitment and retention.

Use of endorsed enrolled nurses (EENs) for provision of care to dialysis patients varies considerably across NSW. Approximately 66% of NSW haemodialysis units employ EENs, that is 50% of in-centre dialysis units and 71% of satellite units.

Marked variation in utilisation of EEN staff was noted in those units which do employ EEN staff, ranging from 4% to 48% in in-centre units and 11% to 58% in satellite units. There are missing data for this part of the audit, as one of the parent units was unable to provide their staffing data. Comparative review of employment of EENs in NSW dialysis units is presented in Table 8. Illustration of the variation in EEN staffing ratios is presented in Figure 2, on page 12.

Table 8: Review of staffing considerations in NSW Dialysis Services (Review of 55 Units)

Type of Unit:	Metropolitan Locations (N=27)			Non-Metropolitan Locations (N=28)		
	In-Centre	Mixed*	Satellite	In-Centre	Mixed*	Satellite
Total no. of units/type	12	1	15	6	2	20
% of Dialysis Units which employ EENs	50%	100%	87%	50%	100%	60%
Average EEN staffing level	13%	17%	28%	23%	20%	30%
Patient: Staff FTE ratios (Range)	2.7 – 6.0	3.1	3.3– 7.75	2.3 – 4.5	3.4 – 3.6	1.7 – 8.0

* 1 mixed unit in metropolitan location and 2 mixed units in non-metropolitan locations – all employ EENs

Analysis of the staffing issues has also identified considerable variation in overall staff to patient ratios across NSW, using a standardised ratio of patients treated per week per full-time equivalent (FTE) dialysis nursing staff. Staffing ratios vary for in-centre and for satellite units, alike. The ranges for these units are presented in Table 8. Illustration of the variation in patient:staff ratios, and the average ratios are presented in Figure 2.

4. DISCUSSION

This audit has provided an overall 'snapshot' of what is happening across NSW in April-May 2009, and identifies several issues which should be considered in the planning and distribution of haemodialysis services.

Capacity

In theory, NSW haemodialysis services are operating at 90% capacity which seems ideal, however the availability of services according to patient location frequently does not match the local demand and many units (27%) are unable to expand to meet current and predicted growth in demand. Many of the haemodialysis units are reducing patients' hours of dialysis or else are operating under considerable stress and placing patients at risk of sub-optimal care. Some respondents gave examples of difficulties they have in routinely providing their services.

Metropolitan dialysis units can increase activity by only 6% under their current configuration. This is slightly greater than the NSW expected annual rate of increase.

Staffing is the greatest cost in the provision of dialysis services, and dialysis units arrange their shifts to function at optimal staffing efficiency. To provide dialysis for the additional patients, many of the units would need to apply for additional funding to cover the increased staffing shifts and consumables.

Of the twenty-three units which are currently functioning at 100% capacity or more (42%), fifteen can neither increase their operational capacity, nor expand service delivery without considerable additional capital input and funding for additional or larger facilities. Several of the other units noted that although there was some room where they could expand, this expansion would impact on other important components of their services such as peritoneal dialysis training and home haemodialysis training. Provision would need to be made to relocate and re-furnish these services. These issues would need to be addressed in any planning and funding applications.

NSW Health supports location of haemodialysis facilities according to patient demand, and AHSs try to achieve this in effort to maximise patient accessibility and reduce transport burden for patients. The capacity audit has identified that some sectors are suffering from excess demand, more than others. Also, there is opportunity for more efficient rationalisation in some AHSs, or creative management of funding and allocation of dialysis places. On the other hand, there appear to be some geographical locations for which planning and provision of services have been unable to keep pace with the demand. The current model used in GWAHS of using home haemodialysis machines in small regional hospitals for one or two patients has the benefit of being rapidly responsive to local needs without significant capital input and could be considered elsewhere, however the DWG would recommend that a specific funding stream is defined for this activity if it were to be expanded across AHS.

The Gibberd report provides growth estimates for the state as a whole and also for specific service regions. There is some evidence that growth in a number of regions is exceeding that predicted by Gibberd. Further audits will allow continued assessment of predicted and actual prevalent haemodialysis numbers across New South Wales.

It is noted that uptake of home-based dialysis treatment is also variable across different AHSs in NSW, however several sites suffering critical over-capacity problems have been noted to demonstrate high rates of uptake of home-based dialysis treatment. The uptake of home-based therapies is presented in more detail in the NSW Health report "Supporting Home-based Dialysis" (September, 2008)².

Several of the fourteen units functioning at exactly 100% capacity (25% of NSW units) have waiting lists and are unable to accept new patients until current patients leave their service due to death or transplant. In some cases patients move or travel to distant dialysis units because their local unit cannot take additional patients. Information on waiting lists was not collected in this audit.

Private haemodialysis units provide treatment for over 130 patients, predominantly in NSCCAHS. They have not been included in the audit. However, should there be changes in utilisation, either increases or decreases, this would have flow-on effects on public haemodialysis in this Area.

Compromises are being made daily in the NSW Health system to provision of haemodialysis care. There are 16% of the state's haemodialysis units which are managing current demand by using strategies such as

- a) running a third shift, requiring shortened dialysis times and patients in the night shift having to finish their dialysis treatment after midnight ;
- b) running a 'middle' shift, by reducing the amount of treatment provided to some of their patients to enable some chairs to treat more than 4 patients per week (11% of the state's haemodialysis units); and
- c) using home-training equipment to provide routine haemodialysis to patients, thereby reducing availability of home training to patients seeking to manage their own training at home.

Disaster Planning

The audit has identified considerable potential for sharing services in times of disaster. Across NSW, 73% of dialysis units (N=41/56) could increase their capacity either by using all currently available dialysis places or by furnishing already plumbed ports. This could provide up to 265 places in metropolitan locations and 259 places in non-metropolitan locations, depending on the constraints of the location of the disaster.

Such a response in times of disaster would require considerable logistics response to move staff and patients to these places, and to ensure that unused ports could be commissioned very quickly. This would be managed under the dialysis escalation plans that have been under review in 2009 to ensure effective management of disasters. A detailed report from the Dialysis Capacity Audit will be sent to those responsible for coordinating a workable dialysis disaster response for NSW.

'Holiday' and Out-of-Area Dialysis

There are limited places set aside for 'holiday' dialysis in the NSW Health dialysis system. Several units may have unused dialysis chairs, however their funding arrangements do not allow them to roster additional staff to care for the 'holiday' patient(s). The dialysis units run with tight operating budgets and do not have additional funding to roster staff for occasional patients who are not part of their regular workload. Responses revealed that although most units do not have allocated places available for 'holiday' dialysis, 70% of them are willing to take additional patients if their own patients are away. This arrangement makes it difficult for patients wishing to make bookings in advance to travel to a different location (for whatever reason).

Despite these constraints, managers demonstrated a genuine concern for patients seeking occasional treatment away from their normal location and demonstrated a willingness to accommodate wherever possible. One of the units goes to extra lengths during their local annual music festival, to put on an extra dialysis shift to accommodate those who come to their town for the festival.

Staffing Issues

It appears from this audit and from the results of the renal Nursing Education Survey undertaken in 2008³ that recruitment and retention is not a major issue for haemodialysis units. Problems that managers have with staffing their haemodialysis units relate to:

- i) Managing temporary loss of staff, especially through maternity leave; and
- ii) Negotiations with their AHS Human Resources offices for permission to recruit new staff.

It is also noted that the challenges of managing staff applications for maternity leave can have positive effects in the long term, because these staff often find working conditions in haemodialysis units are favourable for managing family commitments.

On the other hand, the information collected on staffing levels has identified marked variation in staff to patient ratios which might benefit from further analysis. It was surprising to note that staffing levels in satellite units are not markedly different from in-centre units. This can be explained in part by the increasing age and co-morbidities of patients being managed in satellite units, therefore increasing demands on staff. However this does not explain the considerable variation in staffing levels between units which manage similar patient populations.

It was also noted that there is marked variation in utilisation of EENs in dialysis care. The 66% of units which do employ EENs consistently noted their satisfaction with the nursing care provided by these staff. There is no obvious explanation why 24% of units do not employ EENs. The difference could not be explained by metropolitan location of the unit, nor by comparison of satellite compared to in-centre units.

In addition, a marked variation in utilisation of EEN staff was noted in those units which do employ EEN staff, ranging 11% to 58% in satellite units, and 4% to 48% in in-centre units. Whilst no strong trend was identified, Figure 2 demonstrates several cases where lower patient:staff ratios accompany higher rates of EEN employment.

5. CONCLUSION

The NSW dialysis capacity audit provides a point prevalence "snap shot" of dialysis infrastructure and of staffing capacity across NSW. It identifies a critical need for allocation of funds to several areas in NSW that are working at or above their current capacity with no ability to expand services within their current infrastructure. It would seem reasonable that any future capital funds ought to be expended in these areas as a matter of priority.

The audit reassuringly shows that concerns regarding the ability of the workforce to expand to meet need did not appear to be a current problem. There are marked variations across the state in utilization of enrolled

and registered nurses within renal units and also variations in patient staff ratios. Should staff shortages become a problem it would seem reasonable to attempt to identify how increasing the role of enrolled nurses and standardizing patient:staff ratios at an optimum ratio could meet service provision.

The dialysis capacity audit does not reflect clinical activity within each renal service. The rate of patients commencing dialysis, moving between different dialysis modalities and exiting dialysis by transplantation and death are not recorded. Such data would further enhance a picture of the clinical activities of renal services across NSW and further inform clinical and resource planning. This could be met by collection of the recommended dialysis minimum data set.

In absence of this data collection, the Dialysis Working Group would propose that this dialysis capacity audit is repeated on a regular basis to provide an ongoing picture of dialysis demands and infrastructure and staffing needs across NSW.

References

1. "Revised Projections of Demand for Renal Dialysis Services in NSW to 2021" Professor Robert Gibberd, Health Services Research Group, May 2009
2. NSW Health Statewide Services Development Branch Planning Services Series "Supporting Home Based Dialysis" September 2008
3. "Report from Renal Nursing Education Survey 2008", GMCT Nursing Workforce, Education & Training Sub-Group

APPENDICES

- A. Membership of Dialysis Working Group
- B. Copy of Audit Tool
- C. List of all NSW Haemodialysis Units and parent Renal Services
- D. Graph of Current Capacity, by Area Health Service
- E. Map of Location and Capacity of Haemodialysis Units – Sydney Basin
- F. Map of Location and Capacity of NSW Haemodialysis Units – excluding Sydney Basin

Figure 1: Capacity Audit: Haemodialysis Units in NSW, May 2009

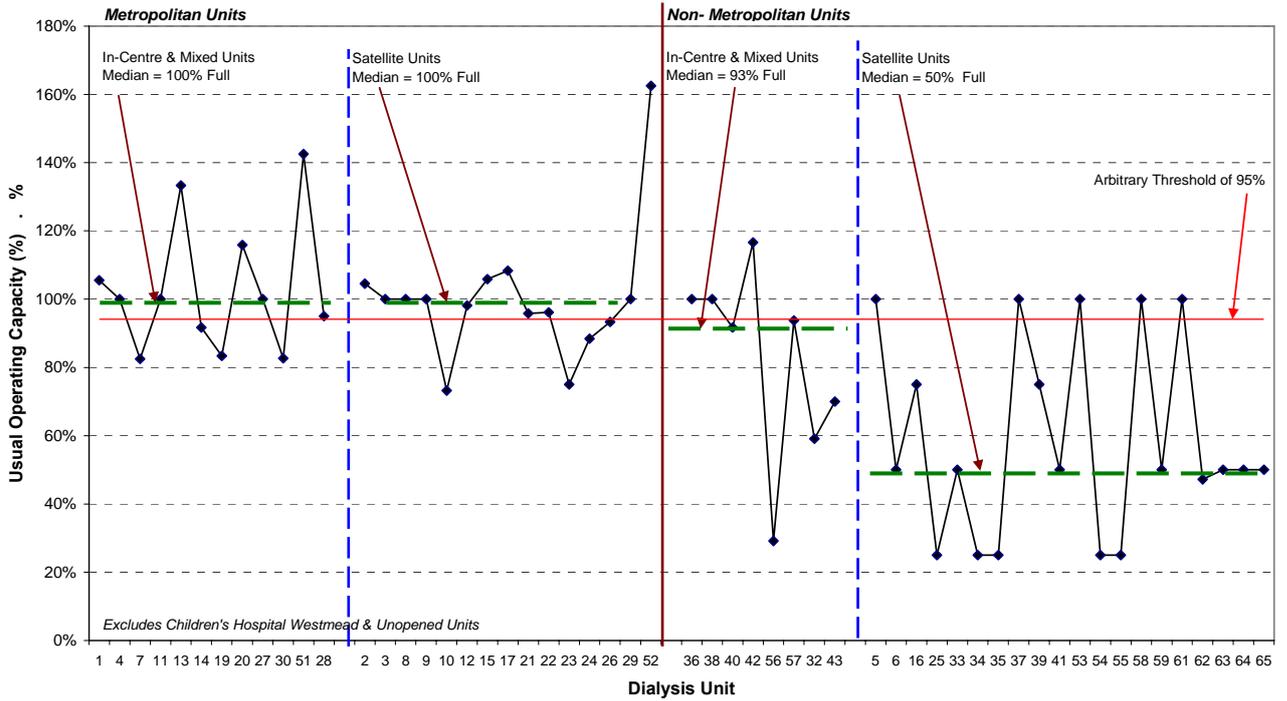
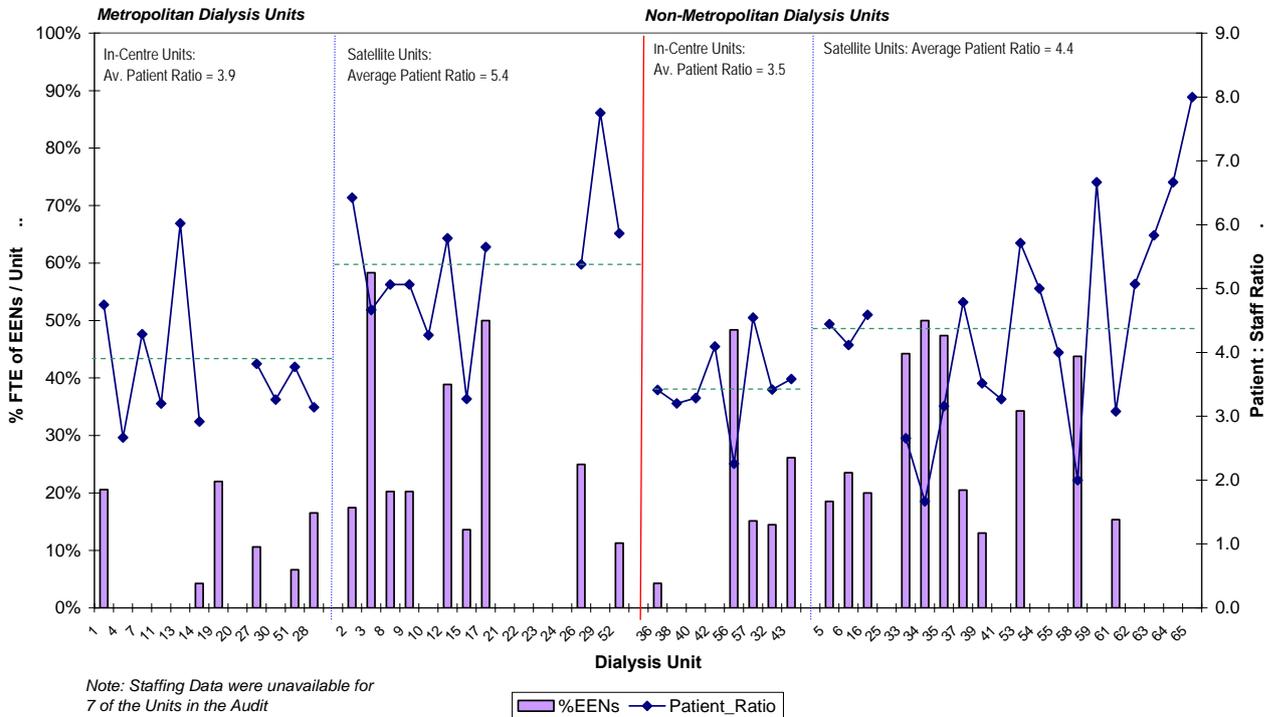


Figure 2: Staffing in NSW Haemodialysis Services



Membership of Dialysis Working Group

GMCT Renal Services Network

Dr Paul Snelling (Co-Chair)	Area Director of Dialysis Eastern Sector, Royal Prince Alfred Hospital	SSWAHS
Ms Cheryl Hyde (Co-Chair)	Nurse Manager, Sydney Dialysis Centre	NSCCAHS
Ms Kelly Adams	Nurse Manager Community Dialysis Services, Wansey Dialysis Centre	HNEAHS
Dr Josephine Chow	Area Clinical Manager, Cardiovascular Stream (Renal)	SSWAHS
Dr Bruce Cooper	Renal Physician, Royal North Shore Hospital	NSCCAHS
Ms Catharine Death	Nurse Manager – Renal Service Westmead Hospital	SWAHS
Mr Wayne Fuller	Senior Electronics Technician, Hunter Area Dialysis Technical Services	HNEAHS
Dr Alastair Gillies	Renal Physician, John Hunter Hospital	HNEAHS
Ms Kim Grimley	Nurse Manager Dame Eadith Walker	SSWAHS
Dr Maureen Lonergan	Director, Renal Unit Wollongong Hospital	SESAHS
Ms Gail O'Brien	NUM – Renal Unit and Outreach Service Dubbo Base Hospital	GWAHS
Ms Denise O'Shaughnessy	Social Worker, Renal Resource Centre	NSCCAHS
Ms Aditi Patwardhan	Dietitian, Royal Prince Alfred Hospital	SSWAHS
Prof. Michael Suranyi	Area Director of Renal Western sector, Liverpool Hospital	SSWAHS
Dr Girish Talauliker	Director Renal Unit, Canberra Hospital	ACT
Mr Geoff Youdale	GMCT Consumer Participant	
Ms Fidy Westgarth	Network Manager, GMCT Renal Services Network	GMCT

Document Control:

Version No:	Release Date:	Comments:
Draft Vs 1.0	21/7/09	Audit Data collected in April-May 2009, by Fidy Westgarth. Data analysed and first draft of Report prepared by Fidy Westgarth.
Draft Vs 1.1	7/8/09	Reviewed by Paul Snelling and Catharine Death. Revisions to text. For input from Dialysis Working Group.
Draft Vs 2.0	25/8/09	Updated following DWG meeting 13/8/09. Circulated 24/8/09, for verification by Heads of Renal Units and clinical leaders by 10/9/09.
Draft Vs 2.1	14/9/09	Data verified as accurate at time of Audit. Some units have changed since then, both patient numbers and treatment capability. In Vs 2.1 Paul Snelling & Fidy Westgarth have incorporated suggestions from Heads of Renal Units and clinician leaders.

NSW Renal Services Network Audit of Dialysis Units' Current & Future Capacity

For In-Centre and Satellite Haemodialysis Units in NSW:

This Survey is seeking information about the current usual weekly dialysis activity in dialysis units, and the potential to provide more treatment (if funding were available). The information will be valuable for Disaster Planning, and for long term predictions.

Name of Dialysis Centre: _____

Satellite
In-Centre
Mixed

Information provided by (name): _____

Renal Unit & Contact Phone No: _____

	Description of data required:	Quantity
	How many years has this centre (ie dialysis space) been in operation?	yrs
A	How many dialysis chairs (ports) are routinely in use in this unit	
B	How many patients are treated in this unit each week? (USUAL number) (all 3 times/week?)	X 3
C	How many days per week is dialysis provided in this unit?	
C	How many shifts per day? (Cycle 1 may be different from Cycle 2 - and Sundays?)	
G	How many additional patients/wk could you dialyse in this centre - if the funding were available? (assume 2 shifts per day)	
H	In your current setup, do you have capacity for dialysing 'holiday' patients? How many treatments per week?	
F	Do you have any ports that you are not using, that would be available for further expansion? How many (if funding were available ¹)?	
F ₂	Do you have room for more dialysis ports to be created, if funding was available?	
F ₃	Do you have sufficient treated-water capacity to supply extra ports? How many ports?	
S	How many FTE direct care nursing positions do you have in this Centre?	RN = (E)EN =
R	How many of these positions have been vacant for longer than 6 weeks?	RN = (E)EN =

May need to get this information from the Department Head:

D	Number of chairs <u>that you regularly use</u> that are currently NOT fully funded by your AHS	officially
E	Number of dialysis treatments that you provide regularly per week that are NOT fully funded	

COMMENTS:

Thank you for providing your assistance to the Dialysis Working Group, GMCT Renal Services Network

¹ If there was demand in your area for more

List of NSW Dialysis Units and Parent Renal Services - and their capacity

(estimated April-May 2009)

AHS	Parent	Code# ²	Haemodialysis Unit	Activity ³	Capability ⁴	Capacity ⁵
SWAHS	Sydney West Renal Services	1	Westmead In-Centre Dialysis Unit	190	180	106%
		2	Blacktown Regional Dialysis Unit	276	264	105%
		3	Penrith Community Dialysis Unit	168	168	100%
		4	Penrith In-Centre Dialysis Unit	24	24	100%
		18	Auburn Community Dialysis Unit	0	0	0%
SSWAHS	Liverpool Hospital	19	Liverpool In-Centre	90	108	83%
		20	Liverpool Isolation	153	132	116%
		21	Liverpool Satellite	138	144	96%
		22	Bankstown Dialysis Unit	150	156	96%
		23	Campbelltown Dialysis Unit	90	120	75%
		24	Fairfield Dialysis Unit	138	156	88%
	25	Bowral Dialysis Unit	3	12	25%	
	Statewide Renal Services	26	State-wide Satellite (Bldg12)	336	360	93%
		27	RPA In-Centre	108	108	100%
28		Concord Dialysis Unit	114	120	95%	
SESIAHS	Prince of Wales Hospital	10	Eora Dialysis Centre	123	168	73%
		11	PoW In-Centre Dialysis Unit	144	144	100%
	St George Hospital	12	Sutherland Satellite Dialysis Centre	106	108	98%
		14	St George Hospital, 4 West	330	360	92%
	St Vincent's	13	St Vincent's Hospital	192	144	133%
	Wollongong Hospital	15	Wollongong Dialysis Centre	216	204	106%
		16	Shoalhaven	117	156	75%
17	Shellharbour	78	72	108%		
NSCCAHS	Gosford Hospital	7	Gosford In-Centre	99	120	83%
		8	Gosford Lions Renal Unit	120	120	100%
		9	Lakehaven Renal Unit	120	120	100%
	Royal North Shore Hospital	29	Lanceley Cottage	120	120	100%
		30	RNSH, Clinic 11	129	156	83%
		31	Mona Vale Satellite Unit	0	0	0%
NCAHS	NCAHS	36	Tweed Renal Unit	144	144	100%
		37	Ballina Renal Unit	84	84	100%
		38	Lismore Renal Unit	108	108	100%
		39	Grafton Renal Unit	81	108	75%
		40	Coffs Harbour Renal Unit	99	108	92%
		41	Kempsey Renal Unit	30	60	50%
		42	Port Macquarie Renal Unit	84	72	117%
HNEAHS	John Hunter Hospital	51	Centre Dialysis Unit, JHH	171	120	143%
		52	Wansey Satellite Unit	234	144	163%
		53	Maitland Dialysis Unit	120	120	100%
		54	Muswellbrook Dialysis Unit	9	36	25%
		55	Singleton Dialysis Unit	12	48	25%
	Manning Rural Referral Hospital	56	Taree Dialysis Unit	21	72	29%
		65	Nita Reed Community D/s Centre	48	96	50%
	Tamworth/Armidale	32	Tamworth Dialysis Unit	78	132	59%
		33	Armidale Dialysis Unit	36	72	50%
		34	Inverell Dialysis Unit	12	48	25%
35	Moree Dialysis Unit	18	72	25%		
GWAHS	Dubbo	43	Dubbo Base Dialysis Unit	84	120	70%
		44	*Wellington	12	12	100%
		45	*Narromine	3	3	100%

² Code# = Code number used in Graphs

³ Activity = Number of patients x 3 treatments per week = Treatments that are usually provided each week.

⁴ Capability = Number of chairs x 12 = Treatments that could be provided/week using the current setup

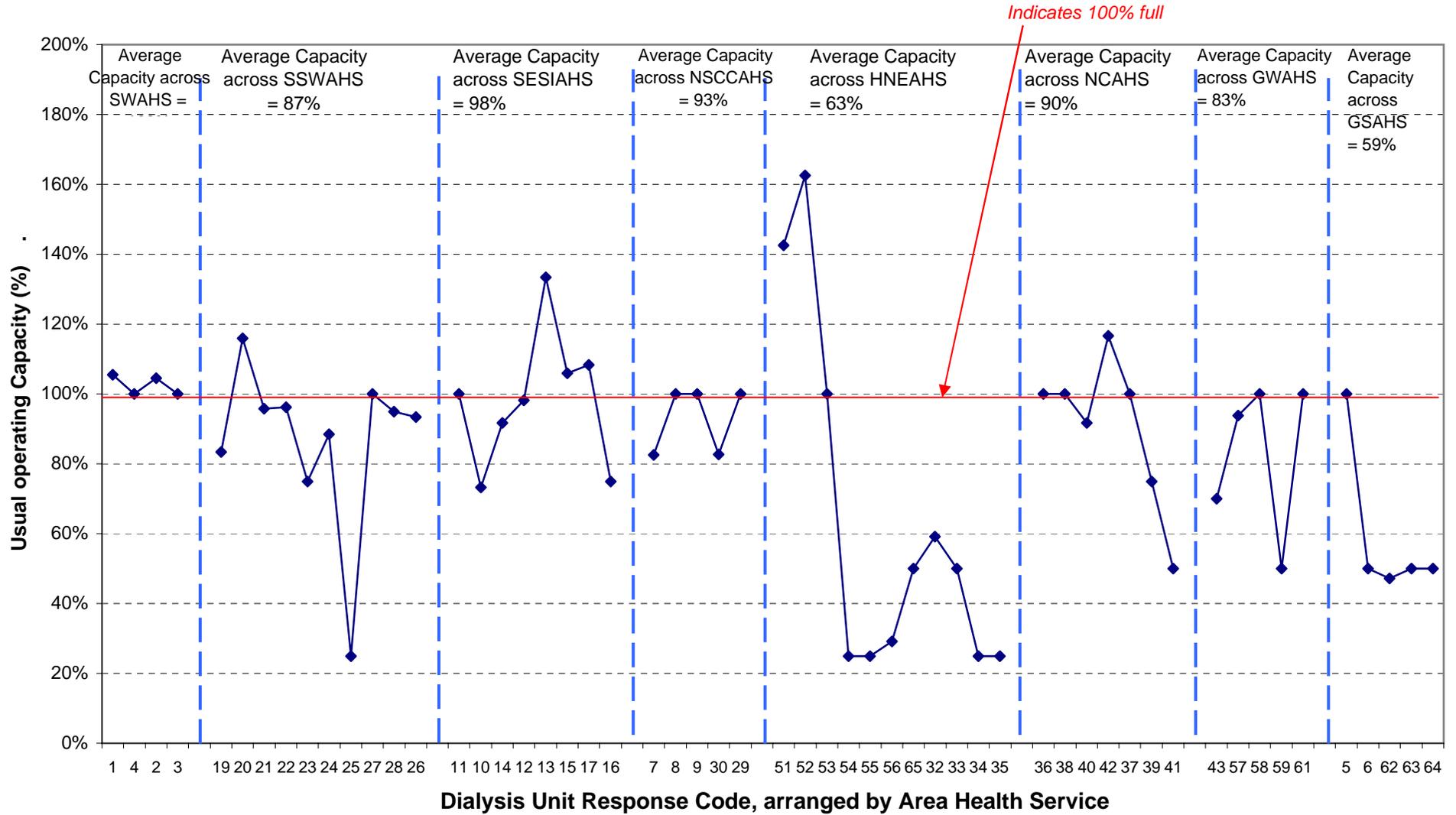
⁵ Capacity = Activity/Capability = Usual working capacity each week (%)

APPENDIX C

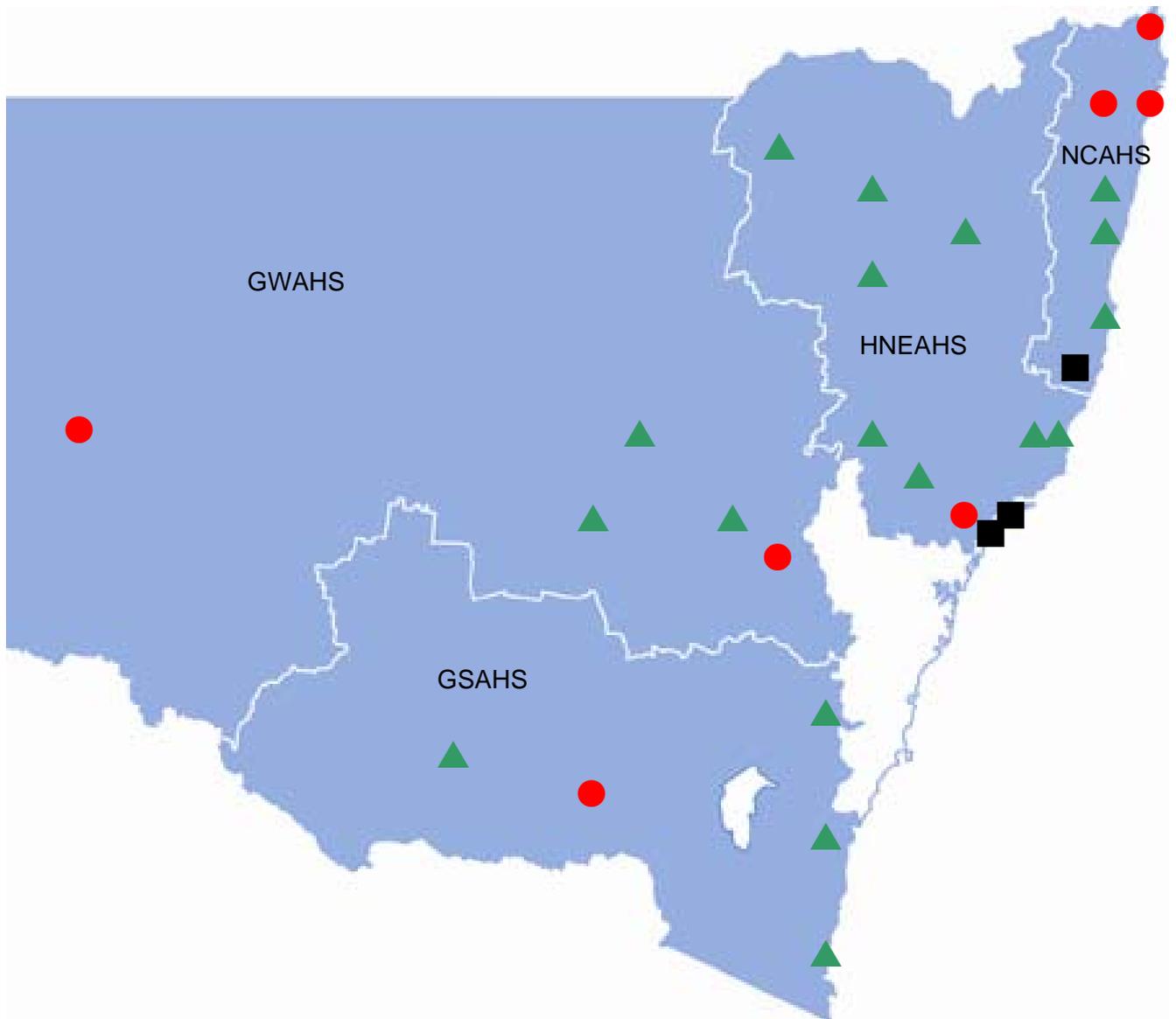
AHS	Parent	Code# ²	Haemodialysis Unit	Activity ³	Capability ⁴	Capacity ⁵
AHS		46	*Coonamble	3	3	100%
		47	*Gulargambone	3	3	100%
		48	*Warren	6	6	100%
		49	*Mudgee	3	3	100%
		50	*Brewarrina	12	12	100%
	Orange Base Hospital	57	Orange Dialysis Unit	90	96	94%
		58	Bathurst Dialysis Unit	48	48	100%
		59	Forbes Dialysis Unit	24	48	50%
	Queen Elizabeth	61	Broken Hill Dialysis Unit	24	24	100%
	GSAHS	GSAHS-RPAH	5	Wagga Wagga Dialysis Unit	72	72
6			Griffith Dialysis Unit	42	84	50%
62			Bega Dialysis Unit	17	36	47%
63			Moruya Dialysis Clinic	42	84	50%
64			Goulburn Dialysis Clinic	48	96	50%
CHW	Childrens Hospital Westmead	60	Childrens Hospital Renal Unit	28	8 chairs	

* These are all Self-Care Dialysis Units, and operate on a different funding and capacity model from the in-centre and satellite dialysis units

APPENDIX D: Capacity of NSW Dialysis Facilities (N=55), April 2009 - by Area Health Service



Location & Capacity of Haemodialysis Units across NSW (excluding Sydney Basin)



Codes:

▲	Dialysis Unit not at full capacity
●	Dialysis Unit is at 100% Capacity
■	Dialysis Unit operates at >100% capacity