



Health Needs Assessment

for the Central Region's District Health Boards

Chronic Conditions – Renal Failure and Kidney Disease

October 2008



Central Region's Technical Advisory Services Limited (TAS)

Health Needs Assessment - Chronic Conditions - Renal Failure and Kidney Disease chapter only

for the Central Region's District Health Boards

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This chapter is one of several contributing to the Central Region's Health Needs Assessment (HNA). The chapters included in this HNA are:

- Introduction
- Key Findings for Regional Action
- Demographic Profile of the Central Region
- Health Status of the Central Region
- Access to Services and the Utilisation of Services
- Risk and Protective Factors
- Chronic Conditions including Circulatory System Diseases, Diabetes, **Renal Failure and Kidney Disease**, and Respiratory Conditions
- Cancer
- Mental Health
- Child, Youth and Maternal Health
- Health of Older People
- Disability
- Injuries and Accidents
- Violence
- Data Quality

This chapter may be read in isolation but in order to gain a context of the Central Region, readers should in particular refer to the chapters 'Demographic Profile of the Central Region' and 'Health Status of the Central Region'.

For a summary of the findings for the region, their implications and some key areas for strategies readers should refer to the 'Key Findings for Regional Action' chapter.

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Chronic conditions - Renal failure and kidney disease

Chronic kidney disease (CKD) imposes a substantial burden on both communities and individuals. It mainly affects the older population but can develop in people of any age. CKD usually develops without symptoms and thus is often only detected at the very late stage. Acute renal failure is reversible whereas CKD is a progressive loss of kidney function through five stages - stage five is end-stage renal failure (ESRF) and most patients at this stage require intensive and expensive renal replacement therapy (RRT) such as dialysis or a transplant.

The most common risk factors for CKD are diabetes and hypertension. Although only a small proportion of patients develop end-stage renal failure this accounts for most of the burden of CKD through the use of hospital services, health expenditure and impacts on quality of life. As the number of patients with CKD increases, due to the improved survival of people with cardiovascular disease and the epidemic of type 2 diabetes, we can also expect the number of patients requiring RRT to increase.

Reporting and analysis of kidney disease and renal failure is difficult. The small number of hospital admissions recorded for kidney disease contradicts what sources suggest with regards to the impact of kidney disease, as patients with kidney problems often have co-morbidities (as described in Table 1). Raw

hospitalisation volumes from the National Minimum Data Set (NMDS) do not accurately reflect the incidence of kidney-related morbidity, as cases are often coded with a primary diagnosis representative of another co-morbid condition. For example, diabetic nephropathy, a condition responsible for at least \$36 million each year in direct healthcare costs and accounting for up to 45% of new patients that reach end-stage chronic kidney disease¹; is coded with a primary diagnosis that falls within the diabetes category of the ICD10 classification.

Table 1: Co-Morbid Conditions of Dialysis Patients

Co-Morbid Condition	%
Hypertension requiring treatment	84%
Type 2 diabetes	39%
Coronary artery disease	36%
Peripheral vascular disease	20%
Chronic lung disease	14%
Cerebrovascular disease	12%

Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry). Published May 2006.

Note: Many patients had more than one of these conditions.

Another issue with using hospitalisation data is the change to treating dialysis patients as outpatients rather than inpatients which occurred at different times

¹ Endre Z, Beaven D, Buttimore A. Preventable kidney failure, the cost of diabetes neglect? The New Zealand Medical Journal, Dec 2006, Vol 119, No. 1246.

for different DHBs. Due to these data limitations the following analysis focuses on data for RRT patients obtained from ANZDATA (Australia and New Zealand Dialysis and Transplant Registry). This data is available by DHB of service (Capital & Coast and MidCentral). Thus this analysis excludes all patients with kidney disease who do not receive RRT. Renal services in the Central Region are provided by Capital & Coast, MidCentral and from July 2007 Hawke's Bay DHB.

In November 2007, the Central Region's Technical Advisory Service (TAS) released a document examining renal services in the Central Region². While this HNA analysis goes into more depth regarding the epidemiology and treatment of RRT patients, readers seeking more information on renal services in the Central Region, including strategic direction and recommendations, should refer to the "Renal Services in the Central Region" document.

² Central Region's Technical Advisory Services (TAS). Renal Services in the Central Region. Strategic direction and opportunities for regional action. November 2007. Central Region's Technical Advisory Services (TAS), Wellington.

Key themes

Renal failure and kidney disease are conditions associated with significant costs for the New Zealand health sector. Projections undertaken by Public Health Intelligence indicate that the incidence and prevalence of renal replacement therapy (RRT) is expected to increase by between 4 to 6% between 2005 and 2015. Data for patients with end-stage renal failure receiving RRT forms the focus of this chapter as analysis of hospitalisation data for patients affected by kidney disease is difficult due to coding issues and co-morbidities.

Dialysis prevalence

The number of patients receiving dialysis in the Central Region has increased from 155 in 1993 (approximately 200 per million) to 386 in 2006 (approximately 464 per million). The percentage increase has been greater for Palmerston North than Wellington Hospital. In 2006 the rate for Māori was 934 per million compared to 386 per million for Other. The age groups with the highest crude rates are 65-74 years (1717 per million in 2006) and 75-84 years (1195 per million in 2006). This is in line with the overseas trend to treat a higher and increasing proportion of older people with dialysis treatment. The number of patients receiving home based dialysis is trending downward, but numbers still exceed those receiving hospital based dialysis.

Dialysis incidence

In 2006 there were 90 new dialysis patients in the Central Region (approximately 108 per million) down from a peak of 113 in 2003

(approximately 138 per million). For the years 2002 to 2006 the crude rate for Māori patients commencing dialysis has been on average twice that for those of Other ethnicity. New dialysis patients start off with hospital based dialysis, the majority receiving hospital haemodialysis (59% Wellington Hospital and 75% Palmerston North Hospital for the years 2002-2006).

Death of dialysis patients

The total number of deaths for patients receiving dialysis in the Central Region in 2006 was 86 (mortality rate of 22%). For all but one year between 1999 and 2005, the mortality rate for Māori has been higher than for Other. In 2006, the mortality rates were comparable. Between 2002 and 2006, the mortality rate for those aged 75-84 years has been trending down while that for the 25-44 and 45-64 age groups has been trending up.

Transplants

The number of new transplants between 2002 and 2006 decreased for all three New Zealand hospitals with Wellington showing the biggest decrease (41%). However, in 2007 the number of transplants performed in New Zealand reached an all time high of 123, while the 29 performed by Wellington was the highest since 2000. Nationally and for Wellington, the driver for the decrease from 2002 to 2006 was fewer transplants from a deceased donor. However, these increased in 2007. Since 2000, transplants from living donors have been trending upwards, 87% for New Zealand and 86% for Wellington Hospital.

Kidney disease prevalence and incidence

At present there are no reliable prevalence estimates for the number of people in New Zealand with kidney disease. According to University of Otago studies, up to one in seven New Zealanders may have renal disease (based on Australian epidemiological studies)³. Only a small proportion of these will go on to develop end-stage renal failure (ESRF).

Data is available for those patients with ESRF who receive RRT. This is collected and maintained by the Australian and New Zealand Dialysis and Transplant Registry (ANZDATA). This data will underestimate the incidence and prevalence of ESRF in the whole community as not all people will accept or be suitable candidates for RRT, and numbers treated will also be influenced by both availability and accessibility of RRT services.

³ "Kidney Research Vital to New Zealand's Health." http://www.otago.ac.nz/news/news/2007/08-03-07_press_release.html

Renal replacement therapy overview

National

Nationally as at 31 December 2006, there were 3224 patients (779 per million) receiving RRT, of which 1253 (303 per million) had a functioning kidney transplant and 1971 (476 per million) were receiving dialysis treatment. During the same year, 484 patients (117 per million) commenced RRT. Trends for national kidney transplants are presented later in this chapter.

Projections undertaken by the Public Health Intelligence group of the Ministry of Health indicate that the incidence and prevalence of RRT is expected to increase by 4 to 6% per year between 2005 and 2015. This equates to a growth of 57% by 2015 for those aged 15-69 years. Up to half of the projected growth is likely to be due to the impact of type 2 diabetes, with only one third of growth as a result of demographic factors².

Central Region

In the Central Region as of July 2007, renal services are provided by Capital & Coast, MidCentral and Hawke's Bay DHBs. Wellington Hospital largely provides renal services for Capital & Coast, Hutt Valley, Wairarapa and Nelson-Marlborough residents plus transplants for the region, while Palmerston North Hospital services MidCentral and Whanganui residents. Since July 2007, Hawke's Bay has re-established its own renal services but prior

to this its residents received their renal services from an outreach service provided by Capital & Coast.

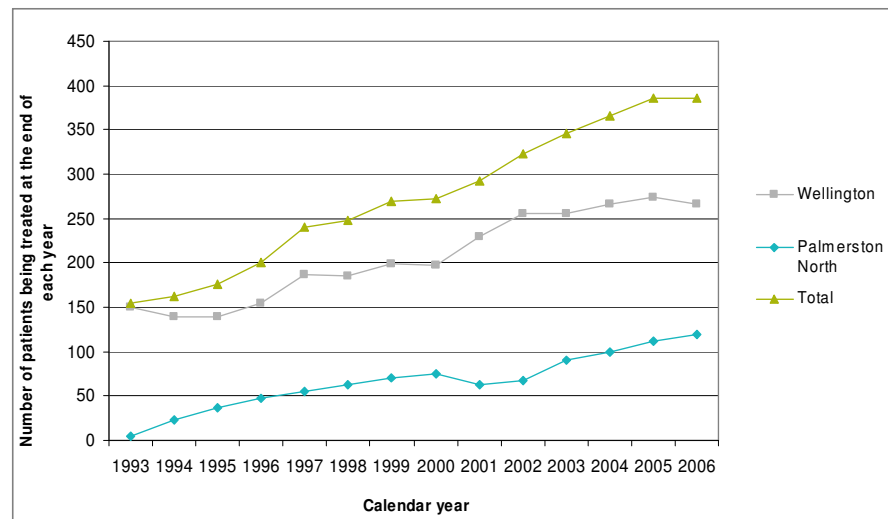
As of July 2007 the renal service provided by Capital & Coast had 514 patients with ESRF. Of this number 243 had received transplants and 271 were receiving dialysis. The MidCentral service, as at June 2007, had 283 patients with ESRF; 53 transplants, 100 enrolled in a pre-dialysis programme and 130 receiving dialysis. As of October 2007, the Hawke's Bay service had 133 patients, 60 having received transplants and 73 receiving dialysis².

The following analysis presents trends in dialysis services between the years 1993-2006 for Wellington and Palmerston North Hospitals.

Dialysis prevalence

The number of patients receiving dialysis in the Central Region has increased from 155 in 1993 (approximately 200 per million⁴) to 386 in 2006 (approximately 464 per million) (Figure 1). Over the latest five years of available data (2002-2006), numbers have increased by 20%. The increase over this period has been greater for Palmerston North Hospital (76%) than Wellington Hospital (4%).

Figure 1: Number of Dialysis Patients Being Treated at the End of Each Year by Wellington and Palmerston North Hospitals, 1993-2006



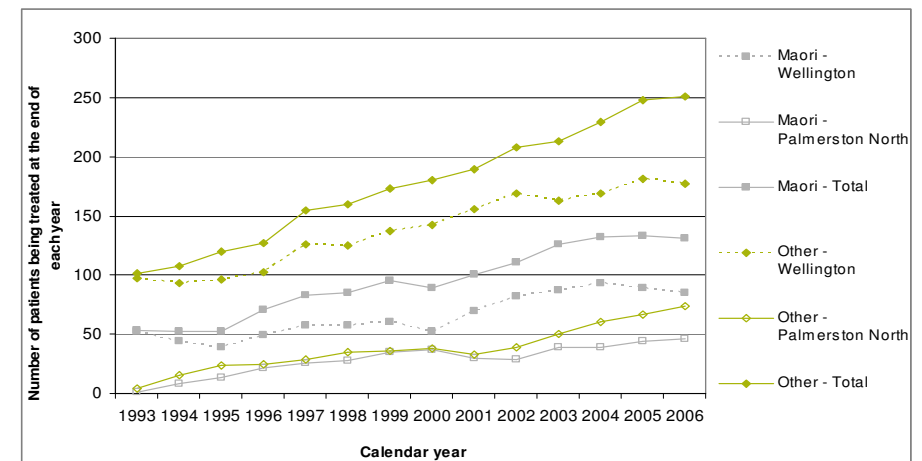
Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

⁴ Crude calculation derived by dividing the number of patients by the population for the Central Region in the same year. Does not take into account any Central Region residents who may have received treatment outside the region or any Nelson-Marlborough residents receiving treatment within the region.

Dialysis by ethnicity

For dialysis patients treated in the Central Region, numbers for those of Other⁵ ethnicity increased more between 2002 and 2006 than those of Māori ethnicity (21% and 18% respectively) (Figure 2). However for all years the crude rate⁴ for Māori has been over twice (and occasionally three times) that for Other. In 2006, the rate for Māori was 934 per million compared to 386 per million for Other. Palmerston North has shown a larger percentage increase in patient numbers than Wellington Hospital, for both ethnic groups. Numbers for Pacific People treated in the Central Region are low, peaking with seven in 2003 and hence are not reported on elsewhere in this chapter.

Figure 2: Dialysis Patient Volumes by Ethnicity, Wellington and Palmerston North Hospitals, 1993-2006



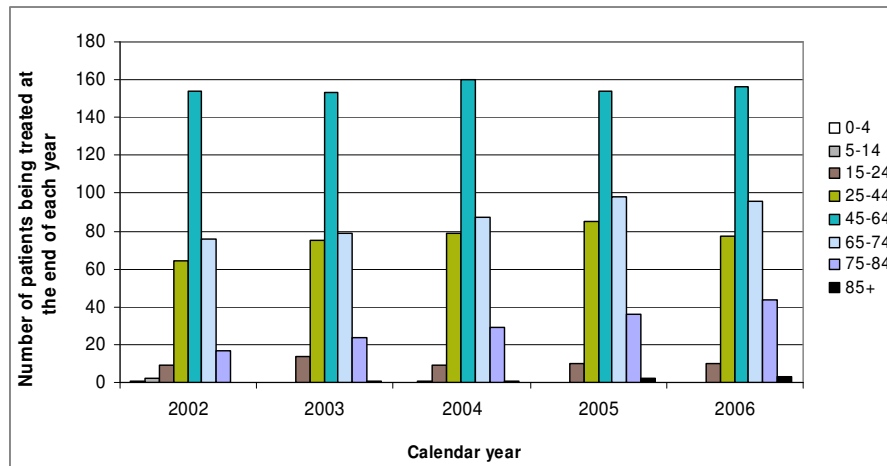
Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

⁵ Throughout this chapter, Other ethnicity includes all ethnicities that are not defined as Maori or Pacific Peoples.

Dialysis by age group

For dialysis patients treated within the Central Region, the greatest numbers are aged 45-64 years (Figure 3). However the number of patients in this age group has remained steady over the last five years and it has the third highest crude rate⁴ (789 per million in 2006). The age groups with the highest crude rates are 65-74 years (1717 per million in 2006) and 75-84 years (1195 per million in 2006). This latter age group has increased from 17 patients in 2002 to 44 in 2006. This is in line with the overseas trend to treat a higher and increasing proportion of older people with dialysis treatment. Palmerston North Hospital treats a higher proportion of patients aged over 65 years than Wellington Hospital (43% and 35% respectively in 2006).

Figure 3: Dialysis Patient Volumes by Age Group, Wellington and Palmerston North Hospitals Combined, 2002-2006

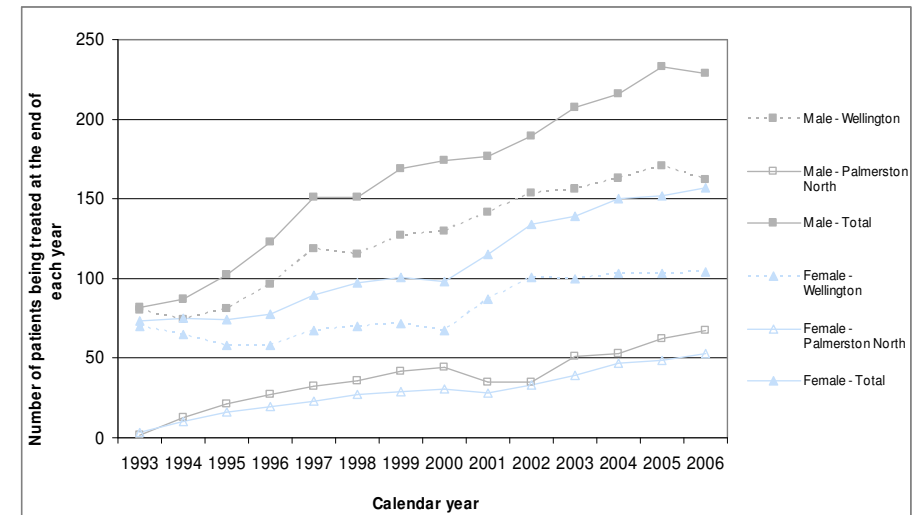


Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

Dialysis by gender

Data for dialysis patients treated in the Central Region by gender show that more patients are male than female (59% male in 2006) (Figure 4). Over the last five years, males have also shown a greater percentage increase (21% versus 17% for females). This probably reflects underlying differences in risk factor prevalence for CKD.

Figure 4: Dialysis Patient Volumes by Gender, Wellington and Palmerston North Hospitals, 1993-2006



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

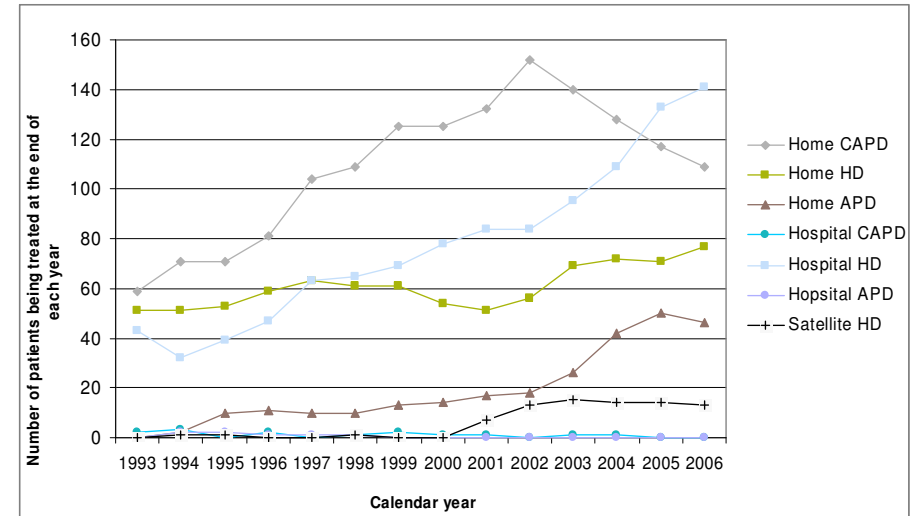
Dialysis type (modality)

The number of dialysis patients in the Central Region treated with home based continuous ambulatory peritoneal dialysis (CAPD) has been decreasing since 2002; a 28% decrease over the last five years (Figure 5). By contrast the number of patients in the region treated with hospital haemodialysis (HD) has increased by 68% between 2002 and 2006. However the number of patients receiving home based dialysis is still greater than that receiving hospital based dialysis (60% versus 37% respectively in 2006) (Figure 6).

However there are differences by hospital. The number of Wellington Hospital patients receiving hospital HD in 2006 matched those receiving home CAPD. At Palmerston North Hospital, the number of patients receiving hospital HD was almost three times the number receiving home CAPD for the same year.

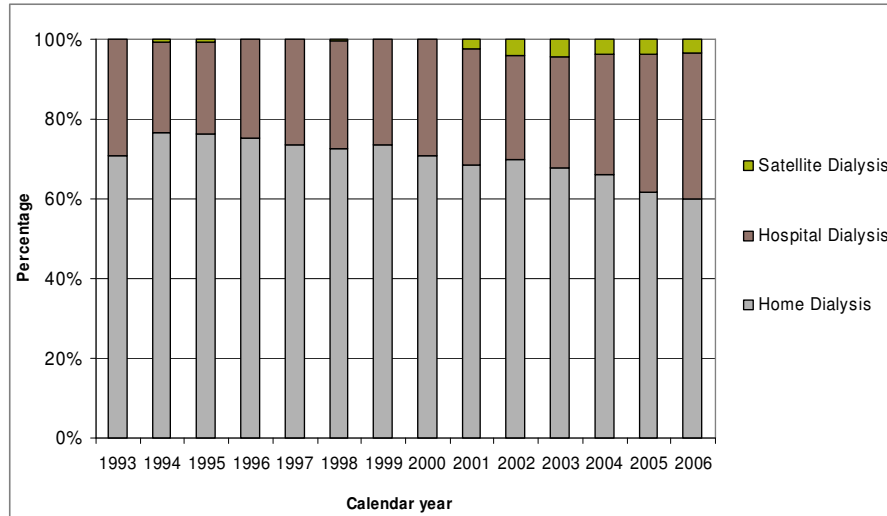
Patients receiving satellite HD (Wellington Hospital) have remained steady, averaging 13 a year for the past six years.

Figure 5: Dialysis Patient Volumes by Dialysis Type, Wellington and Palmerston Hospitals Combined, 1993-2006



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

Figure 6: Percentage Contribution by Dialysis Type to all Dialysis at Wellington and Palmerston North Hospitals Combined, 1993-2006

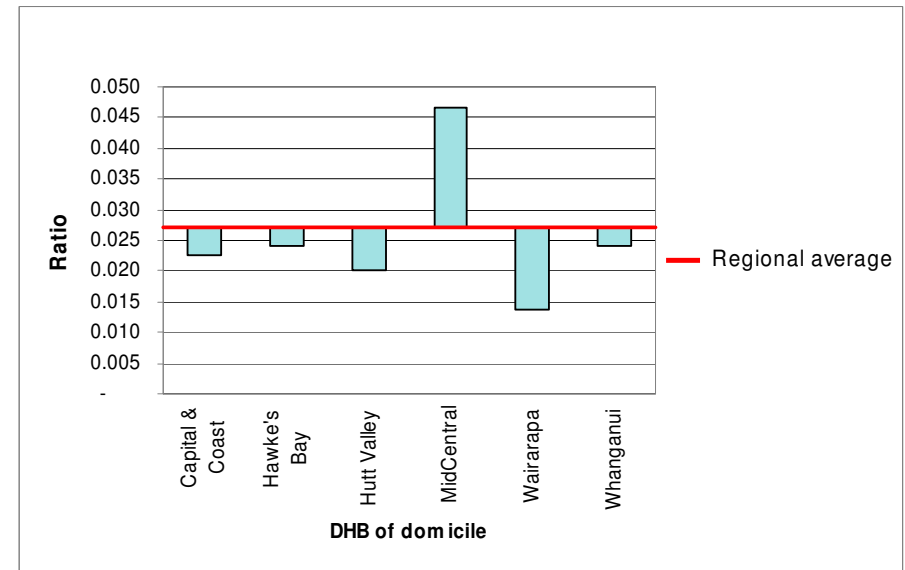


Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

Dialysis by DHB of residence

Limited data is available for dialysis services by DHB of residence. Some is available from the Personal Health Non Case-Weight data source (PNHCW) used to calculate inter-district flows. Using this data for the 2006/07 financial year, it appears that residents in MidCentral received more dialysis services for their population base than those in the other Central Region DHBs (Figure 7).

Figure 7: Ratio of Attendances for Dialysis Services to Adjusted Population* by Central Region DHBs, 2006/07



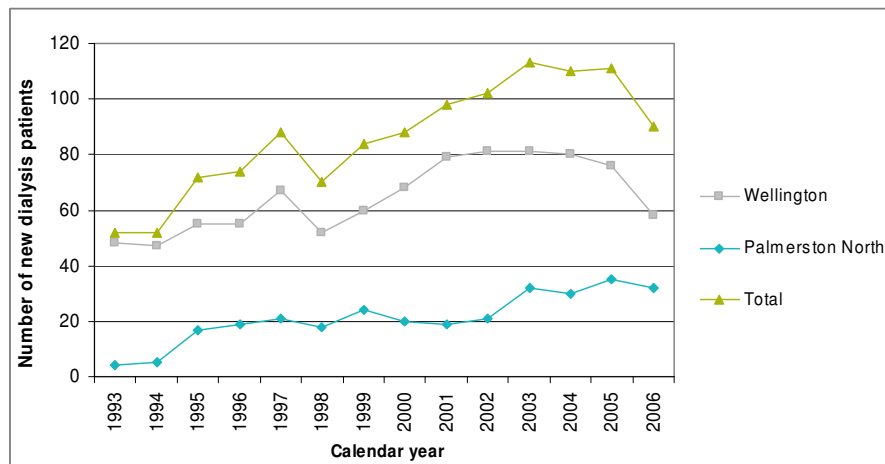
Source: PHNCW dataset 2006/07.

Note: Adjusted population is derived by multiplying the 2006 Census population by the percentage share of the population based funding formula for each DHB.

Dialysis incidence

In 2006 there were 90 new dialysis patients in the Central Region (approximately 108 per million) (Figure 8). The number of new dialysis patients for the region peaked in 2003 at 113 (approximately 138 per million). The number of new dialysis patients for Palmerston North Hospital has been showing a stronger upward trend than that for Wellington Hospital which remained steady between 2001 and 2004 before decreasing over the following two years.

Figure 8: Number of New Dialysis Patients for Wellington and Palmerston North Hospitals, 1993-2006

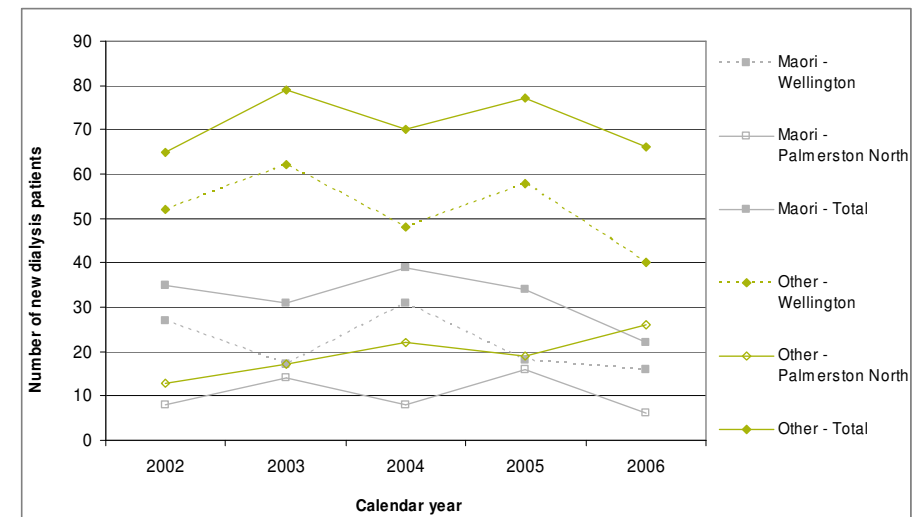


Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

Dialysis by ethnicity

For the years 2002 to 2006 the crude rate for Māori patients commencing dialysis has been on average twice that for those of Other ethnicity. The number of new patients, in the Central Region and the two individual hospitals, are variable by year. Over this five year period, an average of 71 patients of Other ethnicity and 32 of Māori ethnicity started dialysis treatment in the Central Region (Figure 9).

Figure 9: Number of New Dialysis Patients by Ethnicity for Wellington and Palmerston North Hospitals, 2002-2006



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

Dialysis by age group

By age group the greatest number of new dialysis patients for both hospitals were aged 45-64 years. While five year trends demonstrated a decrease for Wellington Hospital (29%), numbers for Palmerston North were more variable. In 2006 over half (53%) of the new dialysis patients for Palmerston North Hospital were aged 65 plus years compared to 31% for Wellington Hospital.

Dialysis by gender

A higher percentage of new dialysis patients in the Central Region are male (57%). This is likely a reflection of underlying differences in risk factor prevalence for CKD.

Dialysis type (modality)

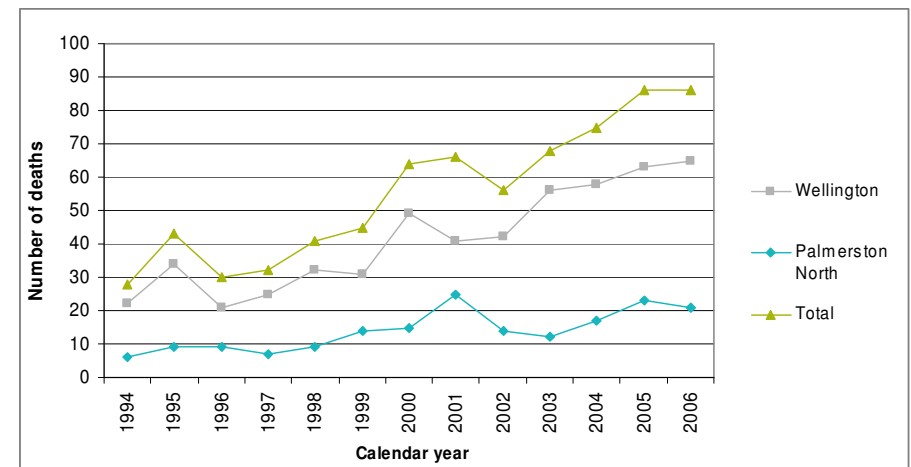
New dialysis patients start off with hospital based dialysis, the majority receiving hospital haemodialysis. Between 2002 and 2006, 59% of patients commencing treatment at Wellington Hospital began with this treatment, the percentage for Palmerston North Hospital was higher (75%) and showed more annual variability.

Death of Central Region patients on dialysis

In this analysis mortality rates have been calculated by dividing the number of deaths per year by the number of patients receiving dialysis at the end of each year. It is recognised that this is an approximation.

The total number of deaths for patients receiving dialysis in the Central Region in 2006 was 86, the same as in 2005 (Figure 10). Between 2002 and 2006, the number of deaths for Wellington Hospital dialysis patients increased from 42 to 65, a 55% increase. Over the same five year period, the number of deaths for Palmerston North dialysis patients has been more variable, ranging from 12 to 23. The peak for this hospital was in 2001 (25 deaths).

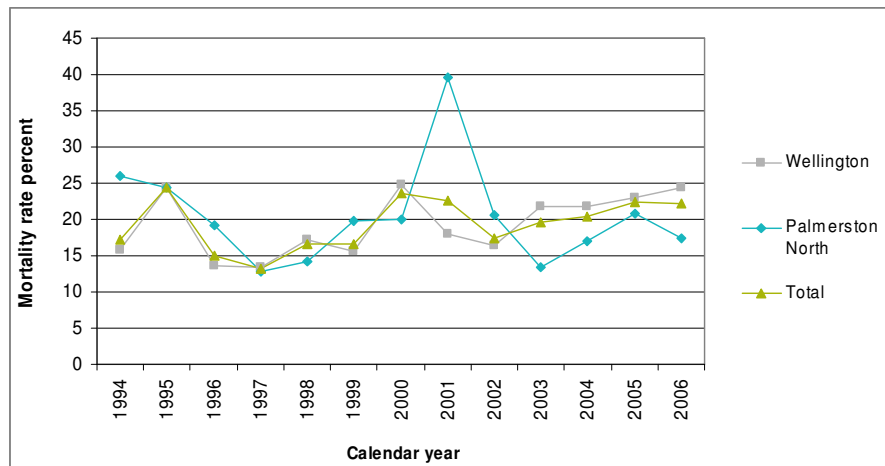
Figure 10: Number of Deaths for Patients on Dialysis, Wellington and Palmerston North Hospitals, 1994-2006



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

For the last four years of data, the mortality rate for Wellington Hospital dialysis patients has been higher than that for Palmerston North Hospital (Figure 11). The former is trending upwards (range 17% to 24%) while the latter is more variable (range 13% to 21%).

Figure 11: Mortality Rate Percent for Patients on Dialysis, Wellington and Palmerston North Hospitals, 1994-2006



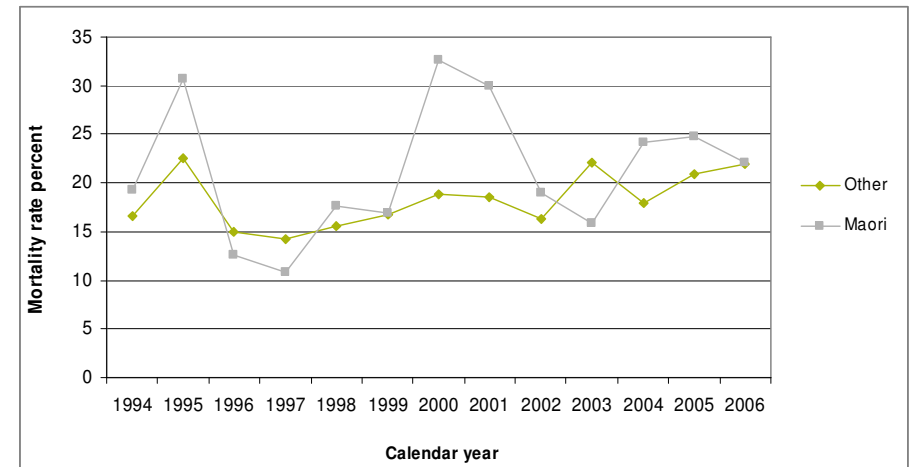
Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

The remainder of this analysis is based on combined numbers for Wellington and Palmerston North Hospitals to allow for more robust interpretation.

Deaths by ethnicity

For all but one year, between 1999 and 2005, the mortality rate for Māori has been higher than for Other (Figure 12). In 2006, the mortality rates were comparable.

Figure 12: Mortality Rate Percent for Patients on Dialysis by Ethnicity, Wellington and Palmerston North Hospitals Combined, 1994-2006



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

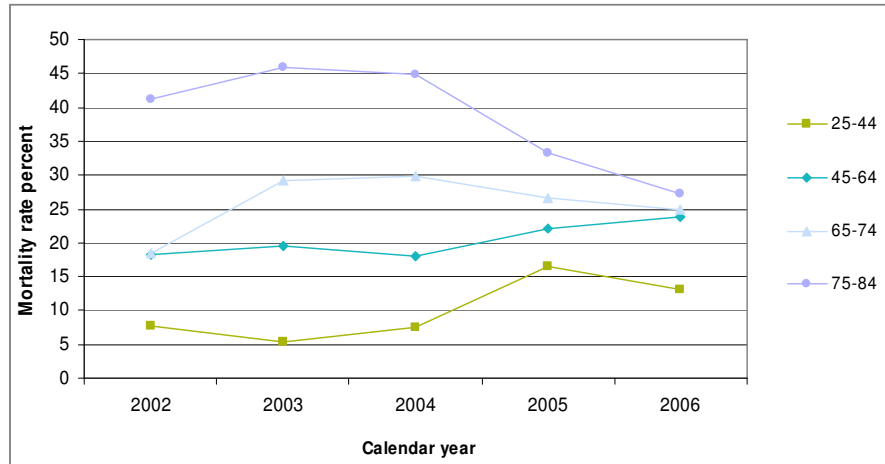
Deaths by gender

Between 2002 and 2006, slightly more dialysis patients who died were male (57%), reflecting the higher number of male patients receiving dialysis.

Deaths by age group

Between 2002 and 2006, the mortality rate for those aged 75-84 years has been trending down while that for the 25-44 and 45-64 age groups has been trending up (Figure 13). For those aged 65-74 years, the mortality rate is more variable. Rates for other age groups are not presented due to small numbers.

Figure 13: Mortality Rate Percent for Patients on Dialysis by Age Group, Wellington and Palmerston North Hospitals Combined, 2002-2006



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

Transplants

From 2002 onwards three hospitals in New Zealand are equipped to perform renal transplants, one of which is Wellington Hospital. Waikato performed its last transplant in 2001.

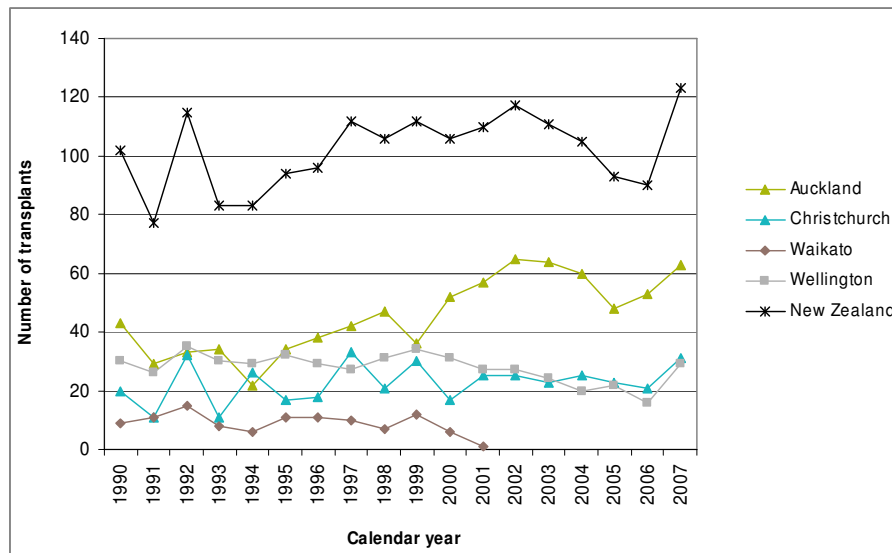
Nationally and for Wellington Hospital, the number of transplants performed each year between 2002 and 2006 trended downwards, with Wellington showing the biggest decrease (41%) (Figure 14). Had the transplant rate for 2002-2006 remained the same as that between 1998-2002, 57 more patients would have significantly improved quality and quantity of life².

However, in 2007 the number of transplants performed in New Zealand reached an all time high of 123, while the 29 performed by Wellington Hospital was the highest since 2000. For the five year period from 2003 to 2007, Wellington Hospital averaged 22 transplants a year.

Nationally and for Wellington Hospital, the driver for the decrease between 2002 and 2006 was fewer transplants from a deceased donor (Figure 15). However, these increased in 2007. The number of cadaver transplants is restricted by the availability of donors and with people living longer this is limited.

Since 2000, transplants from living donors have been trending upwards, 87% for New Zealand and 86% for Wellington Hospital. In 2008, Wellington Hospital is to increase the number of transplants it performs from around one a month to about two a month.

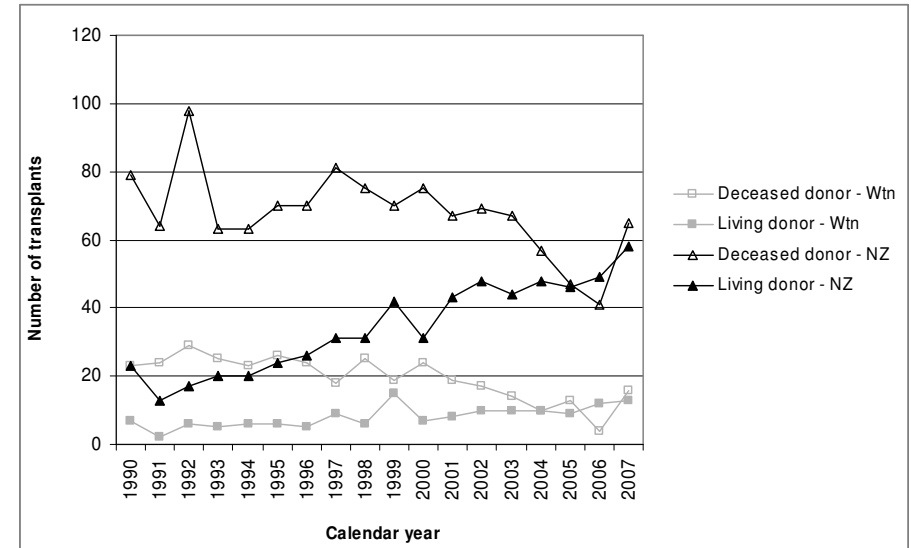
Figure 14: Number of Kidney Transplants by Hospital and for New Zealand, 1990-2007



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

The “Renal Services in the Central Region” report² states that “renal transplantation is the most cost effective and the preferred treatment for 20-30 percent of people needing renal replacement therapy” and “the availability of donor kidneys and surgical transplant capacity currently constrains renal transplantation rates”.

Figure 15: Number of Kidney Transplants for Wellington and New Zealand by Donor Type, 1990-2007



Source: ANZDATA (Australian and New Zealand Dialysis and Transplant Registry).

Renal failure and kidney disease related hospitalisations

The National Minimum Data Set contains data related to renal failure and kidney disease hospitalisations - ICD10 codes N00-N19 and N25-N29 (glomerular diseases, renal tubulo-interstitial diseases, renal failure, and other disorders of kidney and ureter). However this data is subject to coding issues and inconsistencies. For example, dialysis treatment has changed from an inpatient to an outpatient service at different times for the different DHBs, making comparisons difficult. Therefore this data is not presented in this chapter.

Renal services in the Central Region report

The above report has been referred to several times in this chapter. The report also covers the following areas which are not reiterated here; patient experiences, patient centred care and process improvement, information improvements, transplantation surgery, workforce, joint procurement, service models, and priorities for regional action including improvement initiatives, clinical network, funding and support and next steps.