

Reference: 20170064

28 April 2017

Antony Andrews
fyi-request-5474-69fb092f@requests.fyi.org.nz

Dear Antony Andrews

Thank you for your Official Information Act request, received on 1 March 2017. You requested:

*"Please refer to the official request made to Ministry of health.
<https://fyi.org.nz/request/5272-efficiency-analysis-of-district-health-boards?nocache=incoming-17277#incoming-17277>*

The reply from MOH suggest that there is no method as such used to analyze efficiency of District Health Boards. As I understand, they are required to provide services to their population with in their budgets.

*I note that there was a Treasury paper in 2005,
<http://www.treasury.govt.nz/publications/informationreleases/health/sector/tr05-344.pdf>*

*I would like to know if Treasury has undertaken any more studies to do efficiency analysis of District Health Boards by using any parametric or non-parametric methods specially to look into efficiency of DHBs.
I am particular interested in knowing how if Treasury undertake analysis to account for the resources/inputs (labour and capital) that each DHB uses."*

Information to be Released

Please find enclosed the following document:

| Item | Date | Document Description | Decision |
|------|---------------|--|-----------------|
| 1. | November 2014 | Analysis of District Health Board Performance: 2009-2013 | Release in full |

Information Publicly Available

The Treasury prepared a report on DHB efficiency last year. This is covered by your request and is publicly available on the Treasury website:

| Item | Date | Document Description | Website Address |
|------|-----------|---|---|
| 1. | June 2016 | Analysis of District Health Board Performance to 30 June 2015 | http://www.treasury.govt.nz/publications/informationreleases/health/dhb-performance |

Accordingly, I have refused your request for the documents listed in the above table under section 18(d) of the Official Information Act – the information requested is or will soon be publicly available.

Information to be Withheld

A report providing updated analysis of District Health Board Performance to 30 June 2016 is also covered by your request. I have decided to withhold this in full under section 9(2)(f)(iv) of the Official Information Act - to maintain the current constitutional conventions protecting the confidentiality of advice tendered by Ministers and officials.

In making my decision, I have considered the public interest considerations in section 9(1) of the Official Information Act.

Please note that this letter (with your personal details removed) and enclosed documents may be published on the Treasury website.

This fully covers the information you requested. You have the right to ask the Ombudsman to investigate and review my decision.

Yours sincerely



Ben McBride
Manager, Health

Analysis of District Health Board Performance: 2009-2013

November 2014

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THE TREASURY
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New Zealand Government

Treasury:3043672v3

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Executive summary

This report provides an overview of the financial and non-financial performance of district health boards (DHBs) over the period 2009-13. As this is our first attempt to report systematically on health sector performance at DHB level, we concentrate on a limited number of key performance indicators. We also focus here exclusively on historical performance. We will provide forward-looking advice about DHB annual plans separately. The two work-streams already inform each other at a practical level and we hope to be able to integrate our reporting over time.

Key performance indicators

The key performance indicators that we have used are as follows:

- ▶ *Overall financial management.* Based on net consolidated surplus / deficit over the three years to 2013.
- ▶ *Hospital productivity.* Based on case weighted discharges and costs of production. This provides a measure of surgical outputs for inputs. It does not tell us about the quality of outcomes or reflect non-surgical activity.
- ▶ *ED waiting times.* Based on performance against the health target (95% of patients waiting less than 6 hours). This is considered to be a good indicator of the overall flow through a hospital, reflecting bottlenecks occurring elsewhere in the system. The target is also strongly related to quality of secondary care, since long stays and overcrowding in emergency departments have been linked to negative clinical outcomes.
- ▶ *Mortality following acute myocardial infarction (AMI).* This measures in-hospital mortality following a heart attack. It is used as a proxy for the quality of acute care.
- ▶ *Ambulatory sensitive hospitalisations (ASH).* This measures avoidable hospitalisations. It is used as a proxy for the quality and accessibility of primary care.
- ▶ *New acute mental health admissions.* This refers to the proportion of acute mental health admissions who are people being seen for the first time. This is used as a measure of the overall quality and coverage of primary mental health services.

Comparing the performance of DHBs is difficult. Each faces a unique set of challenges. They vary significantly in terms of their size, the characteristics of the populations they serve, the scale and quality of their capital stock and the types of services they deliver directly. Nevertheless, to focus our analysis, we have rated the performance of each DHB against our selected indicators using a simple traffic-light system. Table 1 provides a summary.

For most indicators, the rating reflects performance relative to other DHBs, rather than an assessment against an objective benchmark: it is therefore (almost) inevitable that some DHBs will be rated green, some amber, and some red. There are two exceptions, where all DHBs could in principle be given the same rating. The rating for financial performance is based on net consolidated surplus / deficit over three years and the rating for ED waiting times is based on performance against the health target.

Table 1 – DHB performance summary

| | Financial management | | Acute care system | | Primary & community care | |
|-------------------|----------------------|--------------|-------------------|---------------|--------------------------|------------------------------|
| | Net deficit | Productivity | ED target | AMI mortality | ASH rate | New acute mental health adm. |
| Auckland | Green | Amber | Green | Amber | Red | Green |
| Bay of Plenty | Green | Green | Amber | Amber | Amber | Amber |
| Canterbury | n/a | Amber | Green | Amber | Red | Amber |
| Capital and Coast | Red | Red | Red | Red | Red | Green |
| Counties Manukau | Green | Amber | Green | Amber | Red | Green |
| Hawke's Bay | Green | Green | Amber | Red | Green | Amber |
| Hutt | Amber | Amber | Green | Green | Red | Amber |
| Lakes | Red | Green | Amber | Amber | Amber | Red |
| MidCentral | Green | Red | Red | Amber | Green | Red |
| Nelson | Amber | Amber | Green | Green | Green | Amber |
| Northland | Green | Amber | Amber | Amber | Amber | Amber |
| South Canterbury | Green | Amber | Green | Green | Green | Red |
| Southern | Red | Amber | Amber | Green | Green | Red |
| Tairāwhiti | Red | Red | Green | Red | Amber | Green |
| Taranaki | Green | Amber | Amber | Green | Green | Red |
| Waikato | Green | Green | Amber | Red | Red | Amber |
| Wairarapa | Red | Green | Green | Green | Amber | n/a |
| Waitemata | Green | Amber | Green | Green | Red | Green |
| West Coast | Red | n/a | Green | Amber | Green | Red |
| Whanganui | Amber | Amber | Green | Amber | Amber | Amber |

Financial performance and efficiency

Despite a reduction in the growth rate of new funding, there has been a significant improvement in the aggregate financial performance of DHBs, as measured in terms of net deficits. The combined total of DHB deficits (ex Canterbury) reduced from \$142 million in 2009 to \$15 million in 2011 and has thereafter remained fairly stable. However, a number of DHBs have run material deficits (>1% of total revenue) in all or most years: Capital and Coast, Lakes, Southern, Tairāwhiti, Wairarapa and the West Coast have all been red rated on that basis. A number of DHBs face financial pressures and an uptick in the aggregate deficit position for the current year seems likely. We will report on this separately as part of the current (FY15) annual planning round.

Case weighted discharge numbers show an 11% increase in the combined volume of surgical output over the five year period covered by this report. This increase in output appears to have coincided with a convergence in productivity levels across DHBs, but average productivity has declined. In other words, inputs increased faster than surgical outputs overall, but there is now less variation between DHBs. A number of DHBs consistently reported productivity levels that were well below average. This group includes Capital and Coast, MidCentral and Tairāwhiti, which have all been red rated. Nelson Marlborough and Waitemata raised their productivity at the end of the period and are therefore amongst the DHBs rated amber.

Secondary care performance

DHB performance against the target for ED waiting times shows a marked improvement in overall system performance since the target was introduced in 2010. There have also been substantial improvements by individual DHBs. Auckland, Waitemata and Whanganui all improved their performance by more than 15 percentage points over four years and achieved the 95% target. Capital and Coast, Hutt, and Southern also reported substantial improvements, although of these only Hutt had managed to reach the target by 2013.

Using AMI mortality rates as a proxy for acute care quality, we find that the New Zealand health system compares favourably to those of other OECD countries. The ratings we have assigned to individual DHBs, which are based on their performance relative to each other, should be read in that context. Capital and Coast and Hawke's Bay both saw a notable increase in their rate in 2013 compared to their average performance over the preceding three years. It is unclear whether this marks a deterioration in care quality or a natural fluctuation in the rate over time.

Primary care performance

ASH rates have been used as a measure of primary care outcomes, and a proxy for access and quality. We found significant ethnic disparities as well as marked differences between DHBs. These results are likely caused partly by factors outside the control of DHBs, such as low incomes and poor housing, although this does not make them less concerning. They also suggest that certain population groups may not engage with, or be effectively supported by, the health system. This applies particularly to Māori and Pasifika. Data revealed a fairly clear division between the seven (red rated) DHBs with the highest ASH rates and the remaining (amber and green rated) DHBs for which rates are more evenly distributed.

The proportion of acute mental health admissions who are people being seen for the first time varied quite widely across DHBs. For individual DHBs, the rate seems to be reasonably consistent over time. This suggests that there may be structural differences between DHBs in terms of access to and/or quality of primary care services. Ratings have been assigned on the basis of relative performance, with the top and bottom quartiles rated green and red respectively. Note, however, that rates of new acute admissions may also be influenced by outsourcing arrangements. Given the importance of mental health to a range of long-term outcomes, greater emphasis should be given to develop robust indicators of health system performance in this area.

Introduction

This report provides an overview of the financial and non-financial performance of district health boards (DHBs). It covers a number of whole-of-system and DHB-level indicators over the period from 2009 to 2013. Trends in major cost drivers are discussed, along with selected measures of efficiency and effectiveness.

As part of the Treasury's "ministry of finance" work programme, we have strengthened our monitoring of health sector performance. To date, our detailed monitoring has focused primarily on DHBs, which are responsible for managing around three quarters of Vote Health (\$11.4 billion). The DHB-level analysis in this report is based on financial information received as part of the annual planning cycle, along with some additional performance information received under a memorandum of understanding with the Ministry of Health. The Ministry continues to be responsible for the direct monitoring of DHBs. We have consulted them on the contents of this report.

This is the first time we have attempted to report systematically on health sector performance at DHB-level. We therefore focus on a limited number of key metrics that we think provide some insight into how the system is functioning, and which it should be reasonably straightforward to continue to monitor on an on-going basis; and we only look at historical performance over the five years to 2013. We hope to incorporate additional metrics into future reports, including some assessment of financial performance against forecasts as a measure of the robustness of DHB financial management.

The report is structured as follows:

- ▶ Section 1 discusses some whole-of-system measures of spending and performance
- ▶ Section 2 looks at the characteristics of DHBs
- ▶ Section 3 looks at the financial performance of DHBs, their main cost drivers, and their level of efficiency
- ▶ Section 4 looks at key indicators of service quality in primary and secondary care.

Section 1: Context

This section provides some high-level contextual information about spending and staffing levels in the New Zealand health system compared to the systems of other developed economies, and about overall health outcomes.

Spending levels

Core Crown Health spending represents more than a fifth of government spending and about 6.3% of GDP. Figure 1 shows changes in health spending over the last decade. Spending has continued to rise in nominal terms throughout this period, although the rate of increase has slowed. Health spending has declined slightly as a proportion of national income since 2013.

Figure 1 – Core Crown Health Spending in New Zealand

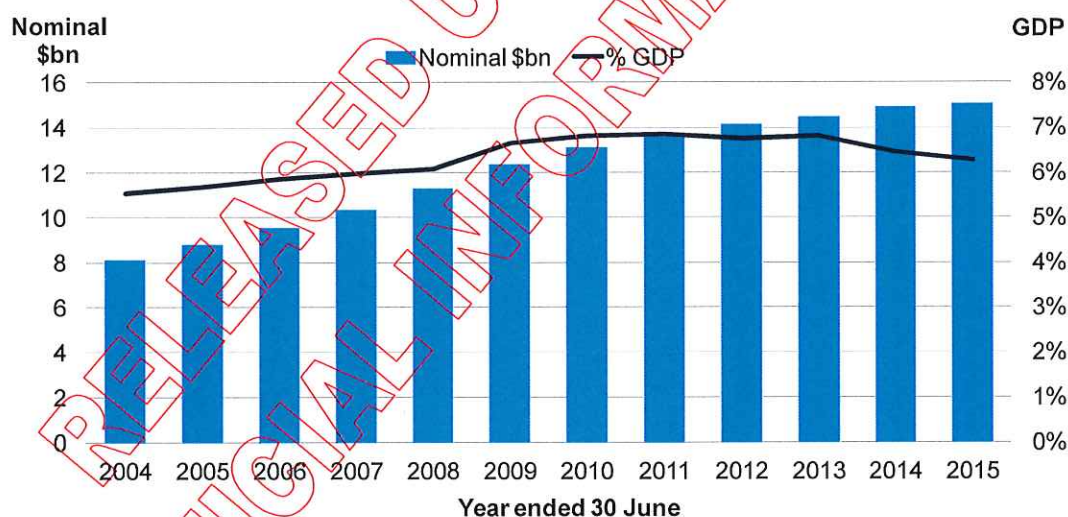
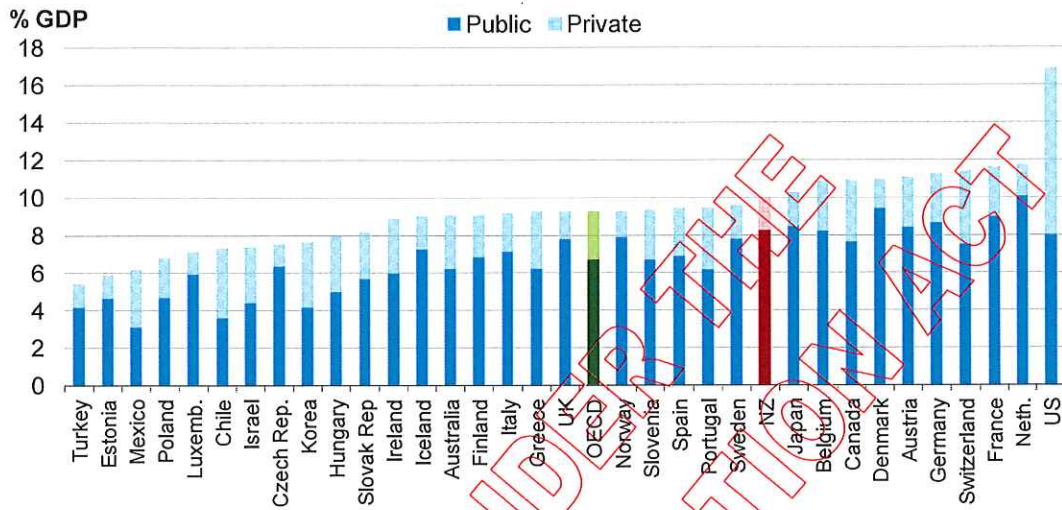


Figure 2 compares New Zealand health spending (public and private) as a percentage of GDP with that of other OECD countries. (Note that this data follows OECD classifications for defining and aggregating health and health-related expenditure and so differs from the Core Crown Health data referred to above.) Total expenditure is somewhat higher than the OECD average as a percentage of national income. The proportion of health spending that is publicly funded is also relatively high.

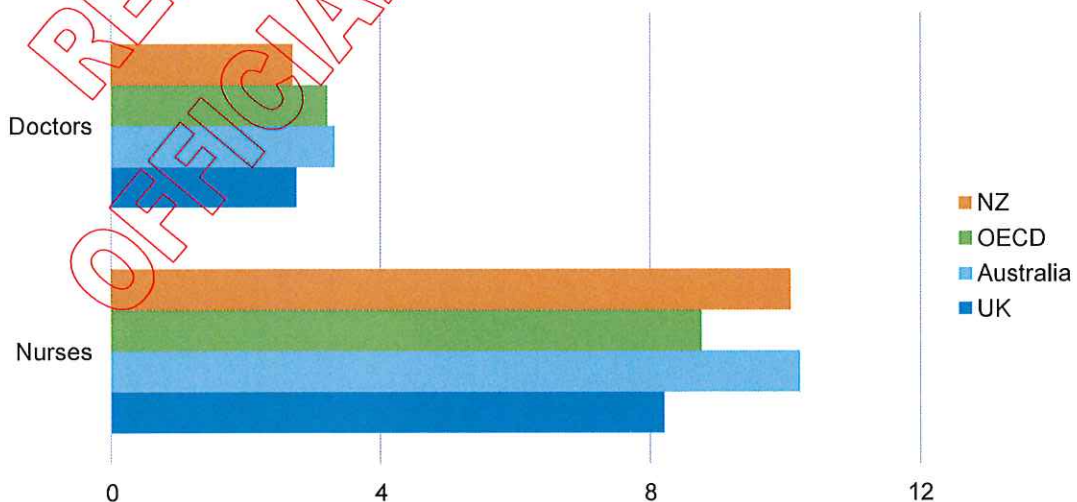
Figure 2 – Health spending as a percentage of GDP in OECD countries (2012 or nearest year)



Staffing levels

Available data suggests that per capita staffing levels are similar to the OECD average for both doctors and nurses. Figure 3 compares the number of doctors and nurses per 1,000 population in New Zealand to the equivalent rates in selected countries and to the average rate across all OECD countries. These figures should capture all practising doctors and nurses in the workforce, including those working in primary and community settings.

Figure 3 – Number of staff per 1,000 population (2012 or nearest year)

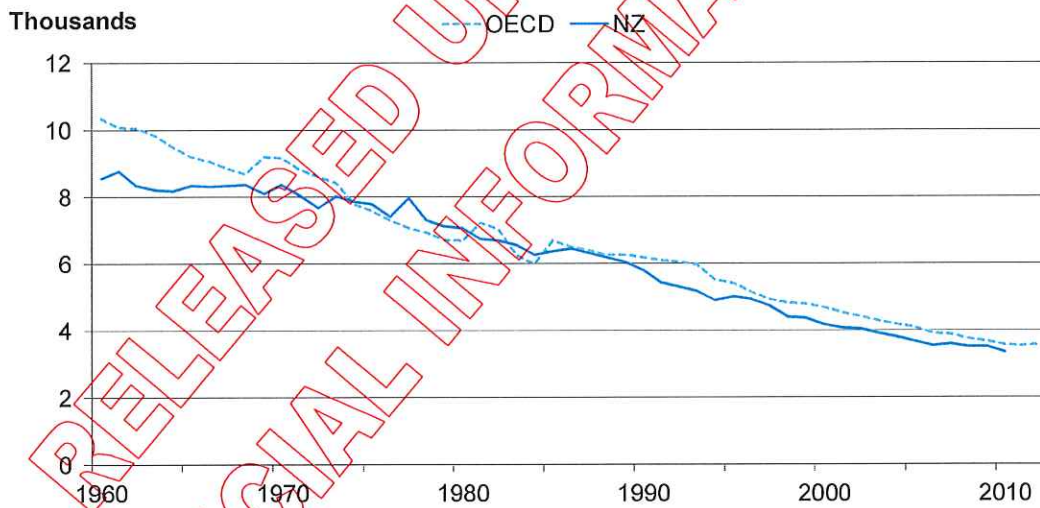


Outcomes

In terms of broad measure of health outcomes, our performance is comparable with that of other developed economies. Potential years of life lost (PYLL) measures deaths that should have been preventable given effective and timely healthcare. Deaths occurring at younger ages are given a higher weighting. This is a statistical measure that reflects judgements about which conditions are amenable to treatment. It is not perfect, but it provides a useful yardstick for understanding health system performance over time and across countries.

Rates have improved steadily across the OECD over the last sixty years. New Zealand's overall performance is about average by OECD standards, although domestic data shows significant variations by ethnicity (with higher rates for Māori and Pasifika).

Figure 4 – Potential years of life lost per 100,000 population under 70



Section 2: DHB population, capital intensity and funding

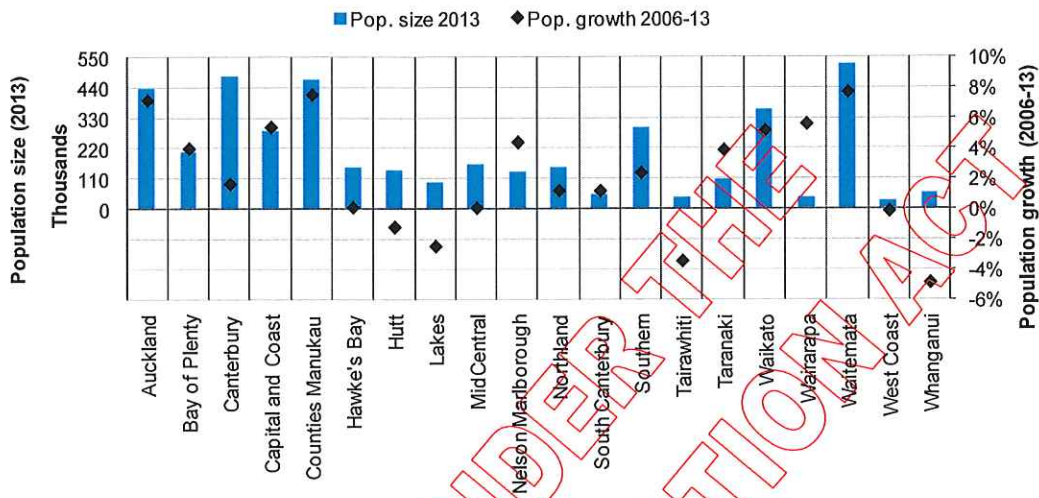
Challenges in comparing performance of DHBs arise from the differences in the populations they serve and associated differences in size of their asset bases and per capita funding.

Some DHBs are responsible for delivering services to relatively wealthy but aging populations, while others have highly deprived populations which typically include significant number of Māori and/or Pasifika (table 2). DHBs also vary significantly in the size and growth rates of their populations (figure 5), as well as in population density.

Table 2 – DHB population characteristics (Census 2013)

| DHB | Over 75s | Māori | Pasifika | Most deprived quintile |
|--------------------|----------|-------|----------|------------------------|
| Auckland | 5% | 8% | 11% | 18% |
| Bay of Plenty | 8% | 24% | 2% | 25% |
| Canterbury | 7% | 8% | 2% | 9% |
| Capital and Coast | 5% | 11% | 7% | 12% |
| Counties Manukau | 4% | 15% | 21% | 36% |
| Hawke's Bay | 7% | 24% | 3% | 27% |
| Hutt | 6% | 16% | 8% | 20% |
| Lakes | 6% | 35% | 2% | 34% |
| MidCentral | 7% | 18% | 3% | 25% |
| Nelson Marlborough | 8% | 9% | 1% | 9% |
| Northland | 7% | 32% | 2% | 37% |
| South Canterbury | 9% | 7% | 1% | 9% |
| Southern | 7% | 9% | 2% | 12% |
| Tairāwhiti | 6% | 49% | 2% | 47% |
| Taranaki | 7% | 17% | 1% | 15% |
| Waikato | 6% | 22% | 3% | 25% |
| Wairarapa | 8% | 16% | 2% | 20% |
| Waitemata | 5% | 9% | 7% | 8% |
| West Coast | 7% | 11% | 1% | 10% |
| Whanganui | 8% | 25% | 2% | 36% |

Figure 5 – DHB population size and growth

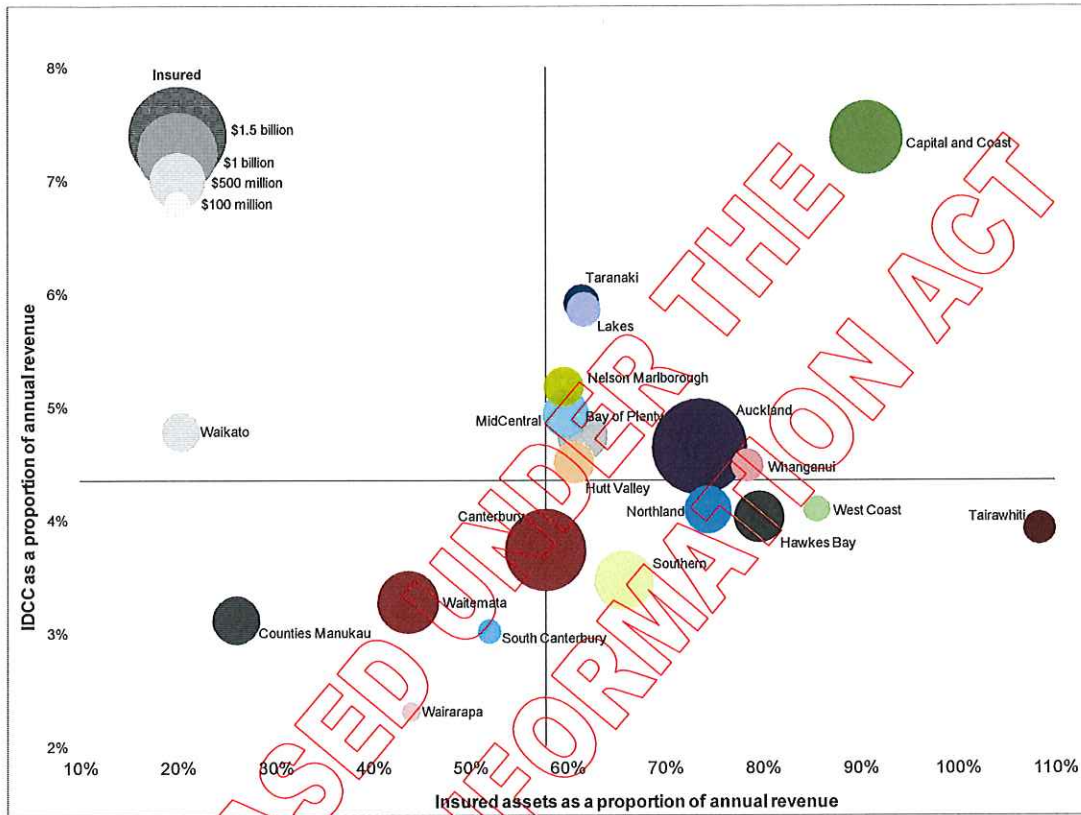


Population characteristics influence the particular challenges that DHBs face. Younger, faster growing populations will require more maternity and paediatric services, while aging populations will require a greater emphasis on managing chronic conditions. Māori have higher rates of most health conditions, while obesity and diabetes pose major health challenges for Pasifika. People living in more deprived areas have higher levels of all health risks and most health conditions. Other factors may also be important. DHBs with low-density rural populations may face different challenges and higher cost structures to those in urban areas. The provision of tertiary hospital services also increases the cost structure of the larger DHBs.

Capital intensity reflects the services that DHBs deliver to their populations as well as their relative proximity to other DHBs and is highly variable across DHBs both in absolute and relative terms (figure 6). Larger relative asset bases of small and remote DHBs, such as West Coast and Tairāwhiti, suggest that they have to invest more in capital in order to maintain services in locations where travel to larger neighbours is difficult. Conversely, Waitemata, Counties Manukau, South Canterbury and Wairarapa appear to be able to leverage their proximity to large capital bases of their neighbouring DHBs (Auckland, Canterbury and Capital and Coast respectively) to maintain a lower than average capital intensity.

Annual cost of capital, represented by the sum of interest, depreciation and capital charge (IDCC), is influenced not only by the relative scale and age of physical assets but also by cash and investment reserves, Crown injections of equity to support deficits, and variation in gearing levels (proportion of lower cost debt). This further contributes to the variation in costs faced by DHBs

Figure 6 – DHB capital intensity (2013)



Funding is allocated to DHBs using a population based funding formula (PBFF). Funding is determined by population size and characteristics (age, sex, ethnicity, and deprivation), based primarily on historical utilisation rates. Various adjusters attempt to compensate for specific factors like population density and tertiary cost structures, as well as for possibility that certain population groups are currently underserved (so that their needs are not fully reflected in utilisation rates). In principle, provision of additional funding through the PBFF should allow similar health outcomes to be achieved across the DHBs. However, there are limits to the how far any top-down funding formula can accurately match resources to need.

Section 3: Financial Performance and Efficiency

This part of the report discusses the financial sustainability of DHBs under three headings:

- ▶ *Financial performance.* We look at the net surplus / deficit for individual DHBs in previous years as a simple measure of financial performance.
- ▶ *Expenditure.* We provide a breakdown of DHB expenditure by category to give a picture of the main cost drivers for DHBs. Personnel costs are both the largest item of expenditure and the fastest growing, so we also provide more detailed analysis of FTE numbers and costs.
- ▶ *Productivity.* We discuss different measures of hospital productivity using case weighted discharges and look at the productivity performance of individual DHBs.

Financial performance

Table 3 – DHB financial performance

| DHB | 2009 | 2010 | Years used for rating | | |
|--|-------|-------|-----------------------|-------|-------|
| | | | 2011 | 2012 | 2013 |
| Auckland | - | - | - | - | - |
| Bay of Plenty | - | -0.2% | - | - | - |
| Canterbury | -1.8% | -0.7% | - | - | 16.0% |
| Capital and Coast ¹ | -8.6% | -5.6% | -3.7% | -2.2% | -1.1% |
| Counties Manukau | -0.3% | - | 0.4% | 0.4% | 0.2% |
| Hawke's Bay | -1.4% | -1.3% | 1.2% | 0.4% | 0.4% |
| Hutt | -2.3% | -1.1% | -0.7% | - | -0.6% |
| Lakes | 2.0% | 1.0% | -1.1% | -1.0% | -0.6% |
| MidCentral | -2.1% | -1.8% | 1.8% | 1.2% | 1.1% |
| Nelson Marlborough | -1.3% | -1.4% | 0.1% | -1.3% | -0.7% |
| Northland | 0.1% | 0.2% | 0.1% | 0.1% | 0.1% |
| South Canterbury | 1.7% | 0.2% | 0.6% | 0.2% | 0.4% |
| Southern | -2.8% | -1.8% | - | -1.6% | -1.4% |
| Tairāwhiti | -2.1% | -0.4% | -2.1% | - | -1.0% |
| Taranaki | -0.2% | -1.0% | 0.5% | 0.1% | - |
| Waikato | -0.2% | 1.8% | 1.0% | 0.8% | 0.2% |
| Wairarapa | -3.4% | -3.8% | -2.8% | -5.2% | -2.5% |
| Waitemata | -0.4% | -0.6% | 0.3% | 0.4% | 0.5% |
| West Coast | -6.4% | -6.0% | -5.2% | -3.7% | -2.7% |
| Whanganui | -5.0% | -2.0% | -1.3% | -0.1% | -0.8% |
| Total deficit, % of revenue (ex. Cant.) ² | -1.4% | -0.8% | -0.1% | -0.2% | -0.2% |
| Total deficit, \$ million (ex. Cant.) ² | -142 | -93 | -15 | -23 | -18 |

1. Figures for Capital & Coast exclude the \$8 million deficit switch in 2013.

2. Canterbury is excluded so that rebuild costs do not distort the aggregate picture.

Table 3 summaries DHBs' net financial position over a five-year period, expressed in form of surplus / deficit as percentage of total revenue. We have rated DHB performance as red, amber or green based on their net position across the last **three** years. Red rated DHBs reported deficits that exceed 1% of total revenue in at least two of those three years. Amber rated DHBs reported deficits of more than 0.5% in at least one year. Other DHBs have been rated green.

The combined DHB deficit declined significantly between 2009 and 2011, both in absolute dollar terms (from \$142 million in 2009 to \$15 million in 2011) and as a percentage of total revenue (from 1.4% to around 0.1%). Since 2011, the combined deficit has remained fairly stable in absolute and relative terms.

Expenditure by DHBs

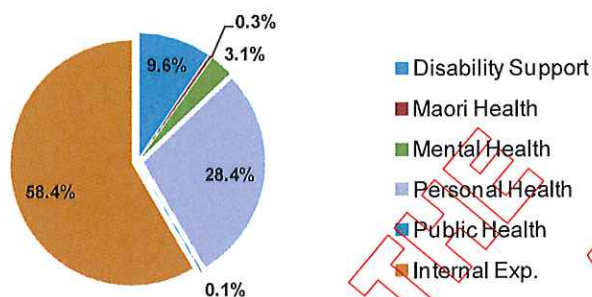
Total expenditure by DHBs in 2013 was about \$13.9 billion. This included the cost of services provided directly by the DHBs (internal expenditure) as well as services delivered by a variety of non-DHB providers. Total expenditure exceeded appropriated DHB funding (\$11.4 billion) for a number of reasons, the most significant being that DHBs incur extra costs when delivering services that are subcontracted to them by the Ministry of Health, such as additional electives.

Total expenditure

Figure 7 provides a breakdown of total DHB expenditure. *Internal expenditure* relates to the DHB provider arm and accounts for just over 58% of total DHB spending (all DHBs). This mainly covers hospital-based services. At an aggregate level, internal expenditure remained fairly stable as a proportion of total DHB expenditure over the period. There is some variation across DHBs in the proportion of total spending that is internal expenditure, with a range from 47% to 67%. This variation will partly reflect differences in the types of services that DHBs provide. The components of internal expenditure are discussed in more detail below.

Remaining expenditure (about 42% of the total) relates to services provided by non-DHB providers. *Personal health* relates to funding for primary care services, laboratory services and community pharmaceuticals. *Disability support* mainly relates to home-based and residential care for older people. *Mental health* covers treatment and support for people with mental illness or mental health problems. *Public health* covers services for whole population groups (mainly services of a protective or promotional nature).

Figure 7 – Breakdown of total expenditure (2013)



Internal expenditure

Figure 8 provides a breakdown of DHB internal expenditure by broad cost category. The three cost categories that relate most directly to the delivery of hospital-based services are: (i) clinical supplies; (ii) personnel and (iii) the cost of capital, namely interest, depreciation and capital charge (IDCC). Together, these categories capture between 75% and 90% of internal expenditure, depending on the DHB.

Figure 8 – Breakdown of internal expenditure (2013)

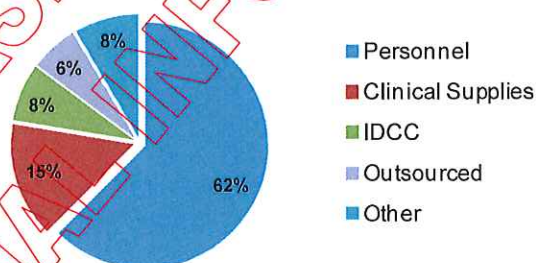


Figure 9 shows real growth in these internal expenditure cost categories over a five year period. Growth is given in 2009 dollars and as a percentage of the 2009 baseline. Internal expenditure as a whole grew by 8.4% over the period. There have been substantial real increases in expenditure on personnel and clinical supplies, and moderate increases in IDCC spending. At an aggregate (all DHB) level, personnel costs increased at the fastest rate and also accounted for the largest share (83%) of new internal expenditure. Changes in personnel expenditure varied considerably across DHBs (figure 10).

Figure 9 – Real changes in internal expenditure categories (2009-2013)

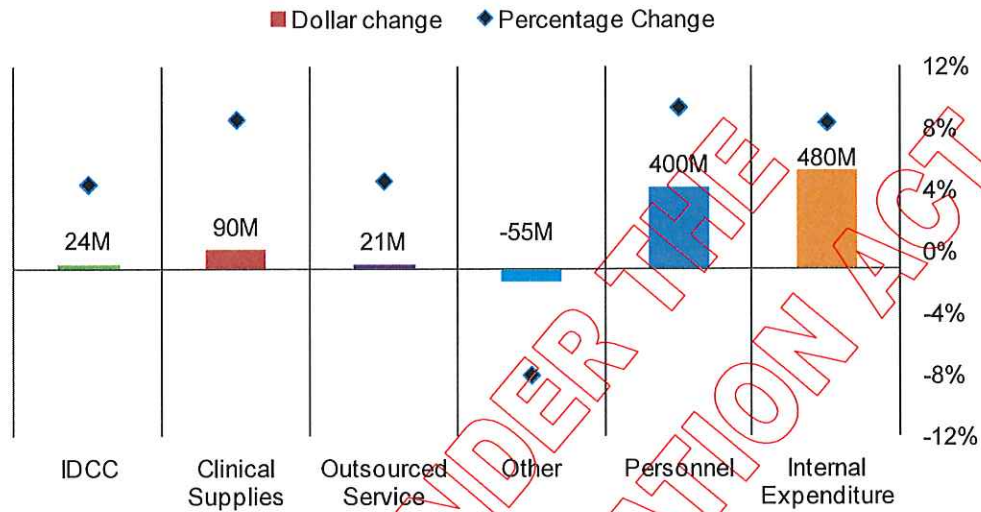


Figure 10 – Real changes in personnel costs at the DHB level (2009-13)

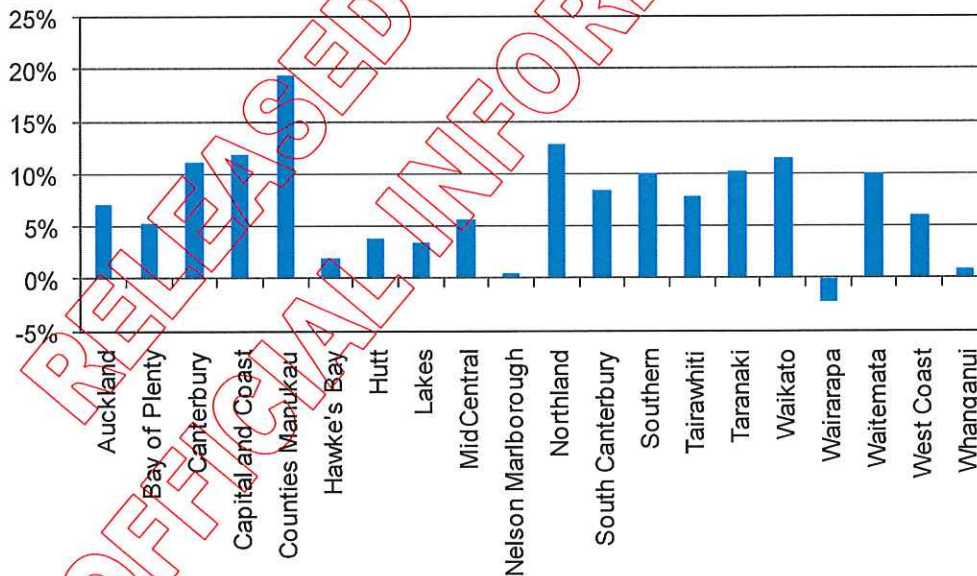


Figure 11 shows changes in per capita FTE numbers for individual DHBs over the same five-year period. All DHBs increased the number of medical FTEs (doctors) relative to the size of their population. The picture for other FTE categories (nursing, allied health, other) was mixed, with per capita reductions in some categories for some DHBs. Overall, there seems to have been a change in the mix of labour, with a greater proportion of doctors in the DHB workforce. The reasons for this are not clear. We are aware that DHBs may not be reporting FTE numbers on a consistent basis, so these numbers should be treated with caution.

Figure 11 – Percentage change in FTE numbers per 1,000 population (2009-13)

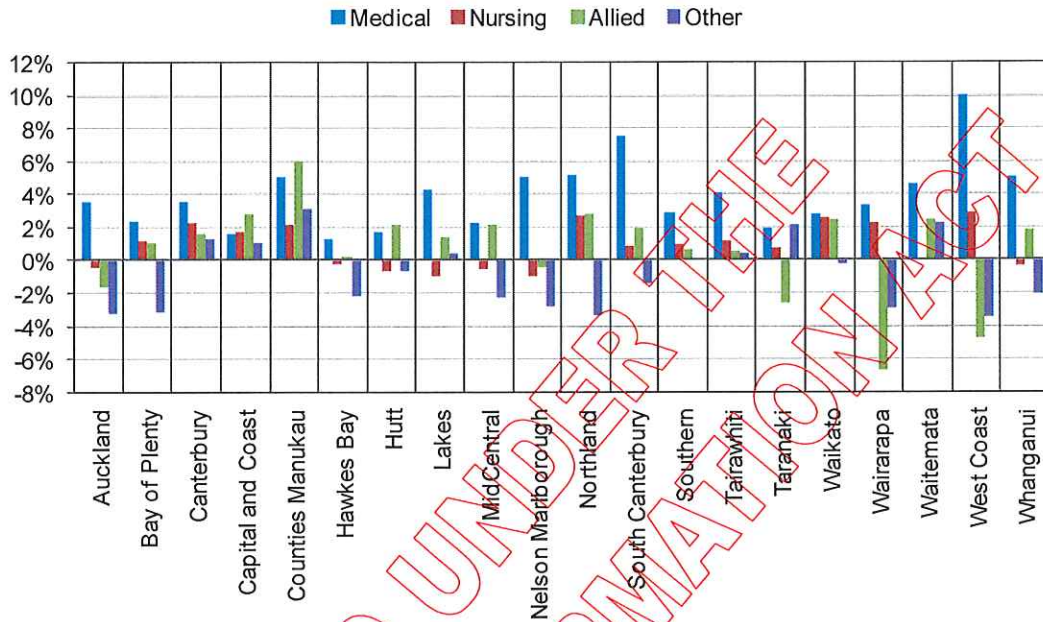
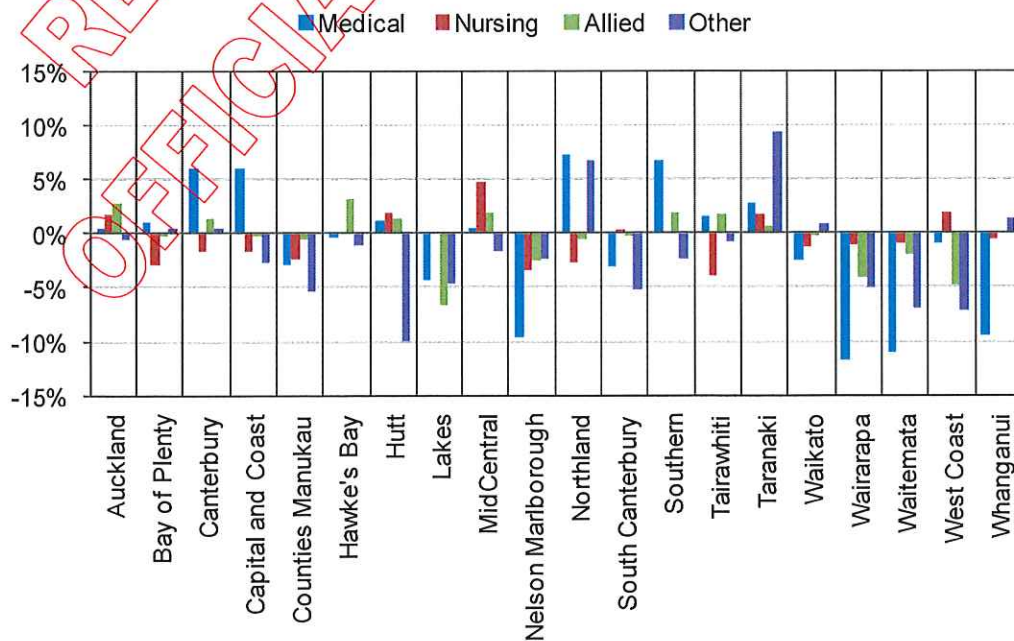


Figure 12 shows real changes in personnel costs per FTE for individual DHBs over the period. Real wage growth has been limited. On the whole, the growth in personnel expenditure seems to have been driven by an increase in the number of FTEs. Higher staffing levels may increase the risk posed by future wage pressures for the sustainability of the sector.

Figure 12 – Percentage change in real average cost per FTE (2009-13)



Hospital productivity

To get a better understanding of the returns to additional expenditure by DHB provider arms, we have analysed these costs relative to case weighted discharge (CWD) numbers. These numbers measure the volume of surgical service activity delivered by each DHB. They account for differences in the complexity of treatment required by various patients: more complex procedures are weighted more heavily.

From 2009 to 2013, the overall volume of CWDs increased fairly steadily, with an increase of about 11% over the period (figure 13).

Figure 13 – Total volume of Case Weighted Discharges



CWD numbers provide a basic unit of output that gives context for patterns of DHB expenditure and allows for some assessment of hospital productivity. They do not tell us about quality of outcomes, nor do they reflect non-surgical hospital activity, and they should therefore be treated with caution. It is possible to construct different measures of hospital productivity at DHB level using CWD numbers.

- ▶ **CWDs per cost of production.** This measure looks at CWDs per total expenditure on medical and nursing personnel, clinical supplies and IDCC. It attempts to capture the direct costs of producing surgical outputs and includes the cost of capital and supplies as well as staff inputs.
- ▶ **CWDs per personnel cost inputs.** This measure looks at CWDs per expenditure on medical and nursing personnel. It should capture the difference in the productivity of FTEs across DHBs. This is particularly useful when comparing two DHBs with different staff and staffing cost profiles.
- ▶ **CWDs per FTE inputs.** This measure looks at CWDs per medical and nursing FTE and provides a simple measure of productivity based on staff headcount.

We have used the first of these measures (CWDs per cost of production) to assess DHB performance. West Coast DHB was excluded from this analysis as its service

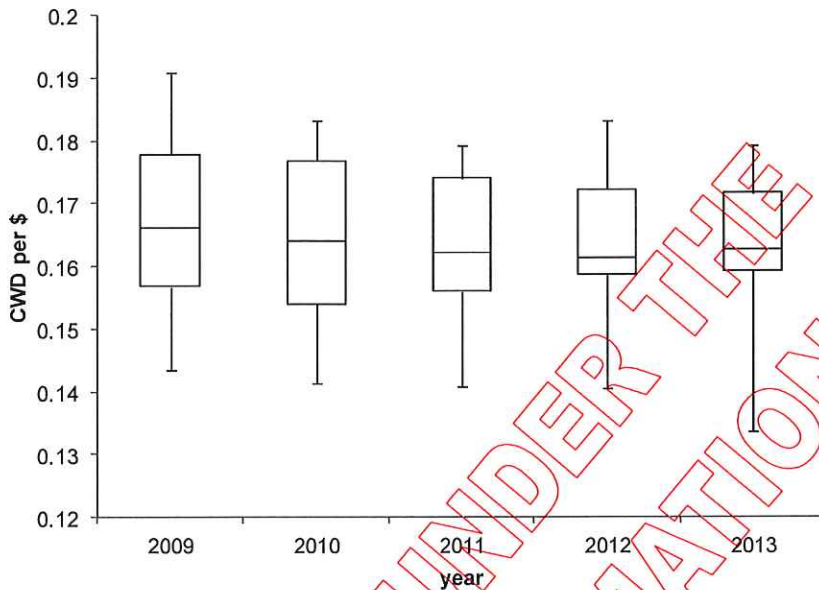
delivery model is substantially different from other DHBs. We have rated DHB performance as red, amber or green based on performance relative to other DHBs in the **most recent year** for which we have data (table 4). Green rated DHBs were either in, or within 5% of, the top 5 performers. Red rated DHBs were in the bottom 5 performers and more than 5% worse than the remaining DHBs, which were rated amber.

Table 4 – CWD per cost of production DHB performance rating

| | | |
|------------------|--------------------|-------------------|
| Bay of Plenty | Auckland | Capital and Coast |
| Counties Manukau | Canterbury | MidCentral |
| Hawke's Bay | Hutt | Tairāwhiti |
| Lakes | Nelson Marlborough | |
| Waikato | Northland | |
| Wairarapa | South Canterbury | |
| | Southern | |
| | Taranaki | |
| | Waitemata | |
| | Whanganui | |

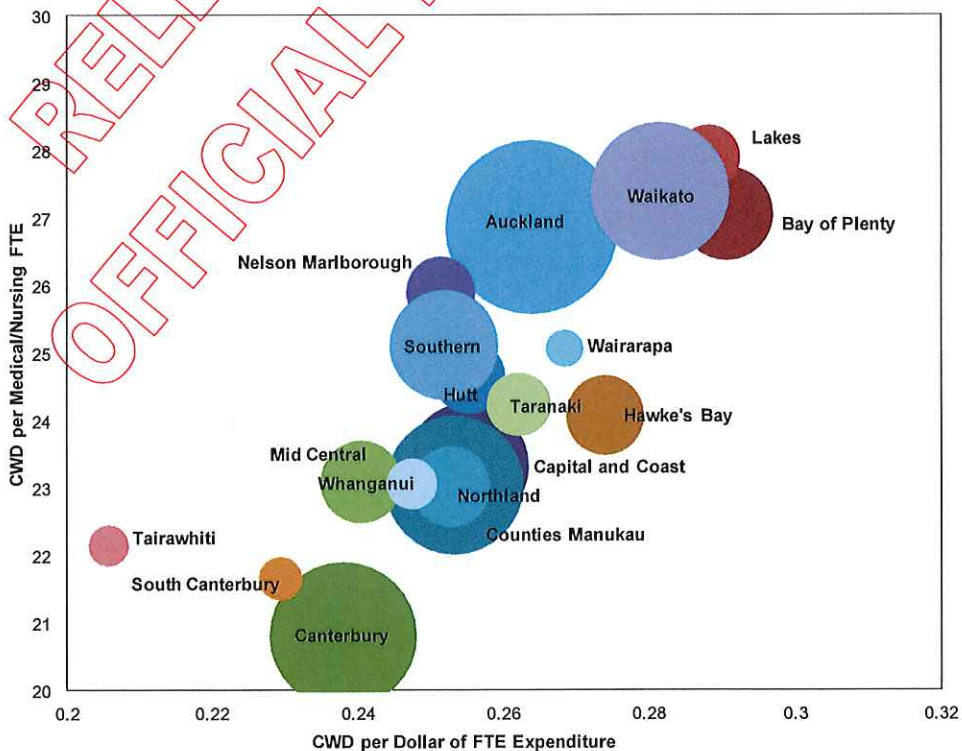
Figure 14 summarises DHB performance against the same measure of productivity over a five year period. Median DHB performance is represented by the middle line within the box. The box itself represents the distribution of the ten middle performing DHBs, while the bars represent the distribution of the five top and the five bottom performing DHBs. Figure 14 suggests that, for the majority of DHBs, productivity levels are slowly converging and that median productivity has declined somewhat. There is a relatively long tail of low productivity. A number of DHBs were consistently among the bottom five performers over the past 5 years (Capital and Coast, MidCentral, Nelson Marlborough, Tairāwhiti and Waitemata).

Figure 14 – CWD productivity per cost of production (ex. West Coast)



We have also looked at DHB productivity using FTE inputs and personnel cost inputs, and compared the results (figure 15). Most DHBs perform similarly to their peers across these two productivity measures. There are a small number of DHBs that appear to have high cost, low output staff compared to their peers (bottom left corner) and a few DHBs with low cost, high output staff (top right corner).

Figure 15 – CWD productivity measures: per FTE and per FTE expenditure (2013)



There are a number of non-trivial issues that should be borne in mind when considering this analysis of productivity.

- ▶ FTE numbers may not be counted on a consistent basis – either between DHBs or across different years.
- ▶ Some FTEs will be delivering services that are not captured by the CWD data, such as mental health, primary care or outpatient services. It is currently not possible to identify this split in the data.
- ▶ CWDs may not be the best longitudinal measure of productivity in the health sector. They capture the resources used in delivering services, rather than improvements in health. A procedure previously performed as an inpatient case that is now delivered on a day-case basis will attract a lower case-weight than before. This would show up in our analysis as a reduction in output, whereas in fact the same level of health improvement has been achieved at lower overall cost.

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Section 4: Health Outcomes

This part of the report looks at the performance of DHBs in terms of the health outcomes they deliver. Currently, only a limited selection of consistent, DHB-level outcome data is readily available. We therefore focus on four outcome measures:

- ▶ emergency department waiting times (an existing health target)
- ▶ mortality rates following acute myocardial infarction (heart attacks)
- ▶ ambulatory sensitive hospitalisation (ASH) rates
- ▶ acute mental health admissions seen for the first time.

The first two indicators focus on the quality of secondary healthcare. The two remaining indicators are an attempt to measure the effectiveness of primary care services.

Emergency department waiting times

Introduced in 2010 as a national health target, the emergency department waiting time target measures the percentage of people who wait less than 6 hours to be treated and discharged. While not strictly a health outcome in itself, we consider the target to be a good proxy, since long stays and overcrowding in emergency departments have been linked to negative clinical outcomes. The target is also considered to be a good indicator of overall flow through a hospital, since a bottleneck at other points will be reflected in longer waiting times in the emergency department.

The introduction of the target coincided with a marked improvement in overall system performance and substantial improvements for a number of individual DHBs. Over a 4 year period, Auckland, Waitemata and Whanganui improved their performance by more than 15 percentage points and achieved the 95% performance target. Hutt, Southern and Capital and Coast also reported substantial improvements in performance, although of these only Hutt had met the target by 2013.

Table 5 summarises the performance of each DHB against the target since 2010. We have rated DHB performance as green, amber or red depending on their performance. A green rating indicates that the target of 95% was achieved (11 DHBs). An amber rating indicates performance in the 90-95% range (six DHBs). A red rating indicates performance below 90% (three DHBs).

Table 5 – ED wait target performance

| DHB | 2010 | 2011 | 2012 | 2013 |
|--------------------|-------|-------|-------|-------|
| Auckland | 80.1% | 94.6% | 94.8% | 95.4% |
| Bay of Plenty | 83.8% | 90.3% | 89.4% | 90.2% |
| Canterbury | 91.5% | 95.6% | 95.7% | 95.4% |
| Capital and Coast | 80.0% | 73.8% | 87.4% | 87.5% |
| Counties Manukau | 96.7% | 96.8% | 97.0% | 95.9% |
| Hawke's Bay | 92.6% | 93.9% | 95.8% | 93.3% |
| Hutt | 87.0% | 87.0% | 91.2% | 96.5% |
| Lakes | 90.9% | 92.0% | 88.9% | 91.8% |
| MidCentral | 83.7% | 86.5% | 90.2% | 86.3% |
| Nelson Marlborough | 97.7% | 97.2% | 97.7% | 96.7% |
| Northland | 86.2% | 89.5% | 94.9% | 91.9% |
| South Canterbury | 96.6% | 96.9% | 98.1% | 96.4% |
| Southern | 79.2% | 82.7% | 89.9% | 91.4% |
| Tairāwhiti | 92.3% | 96.1% | 97.7% | 94.6% |
| Taranaki | 93.1% | 89.5% | 90.4% | 95.5% |
| Waikato | 82.7% | 88.8% | 91.9% | 88.4% |
| Wairarapa | 97.2% | 97.6% | 96.6% | 97.4% |
| Waitemata | 74.1% | 93.6% | 97.3% | 96.2% |
| West Coast | 99.6% | 99.8% | 99.6% | 99.6% |
| Whanganui | 79.1% | 91.0% | 98.2% | 96.9% |

Acute myocardial infarction (AMI) mortality rate

Acute myocardial infarction (AMI) mortality rates show the frequency with which people die following a major heart attack. AMI rates are considered to be a good measure of the overall quality of acute care. At an aggregate level, New Zealand's rates are below (better than) the OECD average.

Figure 16 shows the AMI mortality rate for each DHB in 2013, along with the average rate for the preceding three year period (2010-12). As with the productivity data, we have rated the performance of individual DHBs as red, amber or green based on their performance relative to other DHBs in the **most recent year** (table 6). Green rated DHBs were either in, or within 5% of, the top 5 performers. Red rated DHBs were in the bottom 5 performers and more than 5% worse than the remaining DHBs, which were rated amber.

Figure 16 – In-hospital AMI mortality rates: 2013 and 2010-2012 average

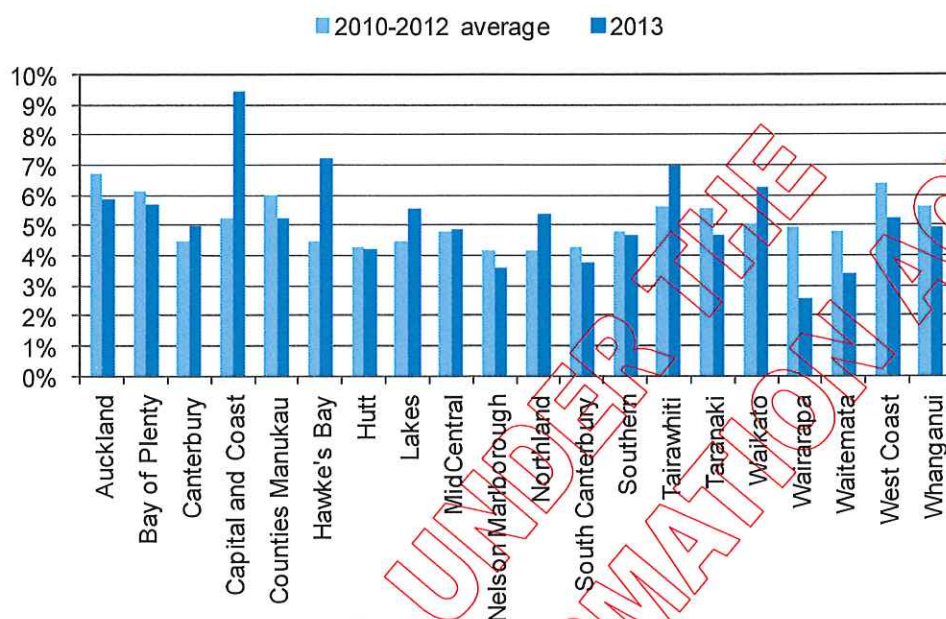


Table 6 – DHB specific AMI performance rating

| | | |
|--------------------|------------------|-------------------|
| Hutt | Auckland | Capital and Coast |
| Nelson Marlborough | Bay of Plenty | Hawke's Bay |
| South Canterbury | Canterbury | Tairāwhiti |
| Southern | Counties Manukau | Waikato |
| Taranaki | Lakes | |
| Wairarapa | MidCentral | |
| Waitemata | Northland | |
| | West Coast | |
| | Whanganui | |

Assessing DHB performance using data for a single year has drawbacks. As can be seen from figure 16, the average rate for 2010-2012 period shows limited variation across DHBs, with rates between 4% and 7%. The results for 2013 show that the majority of DHBs achieved a similar level of performance when compared to their 3 year trend, but there are marked increases and decreases for some individual DHBs. In particular, Capital and Coast and Hawke's Bay reported AMI rates that were 4.2% and 2.8% points higher than their 3 year trend. Some of the differences between the short-term rate and the longer-term trend could be due to changes in models of care, but they are more likely to represent natural variation in the rate. Observing the performance of DHBs over longer periods should give us a better idea of whether changes are sustained over time.

Ambulatory sensitive hospitalisation (ASH) rates

Ambulatory sensitive hospitalisations are mostly acute hospital admissions that could have been avoided through prophylactic or therapeutic interventions deliverable in a primary care setting. Thus, although other aspects of healthcare, including hospital supply and configuration may also have an effect on ASH rates, they are typically used as a proxy for primary care access and quality. High rates may indicate difficulty accessing primary care, poor care coordination or continuity, or structural constraints such as limited supply of primary care workers.

Figure 17 and table 7 summarise our analysis of ASH data for 2013. Total rates (all ethnicities) show a fairly clear division between the seven DHBs with the highest rates (above 8,000 cases per 100,000 population) and the remaining DHBs (all of which had fewer than 6,000 cases per 100,000 population). The seven DHBs with the highest rate have been rated red. Differences between the remaining DHBs are much less marked. These have been rated either amber or green depending on whether they fall above or below an (arbitrary) dividing line of 5,000 cases per 100,000 population.

Figure 17 – DHB specific ASH rates (2013)

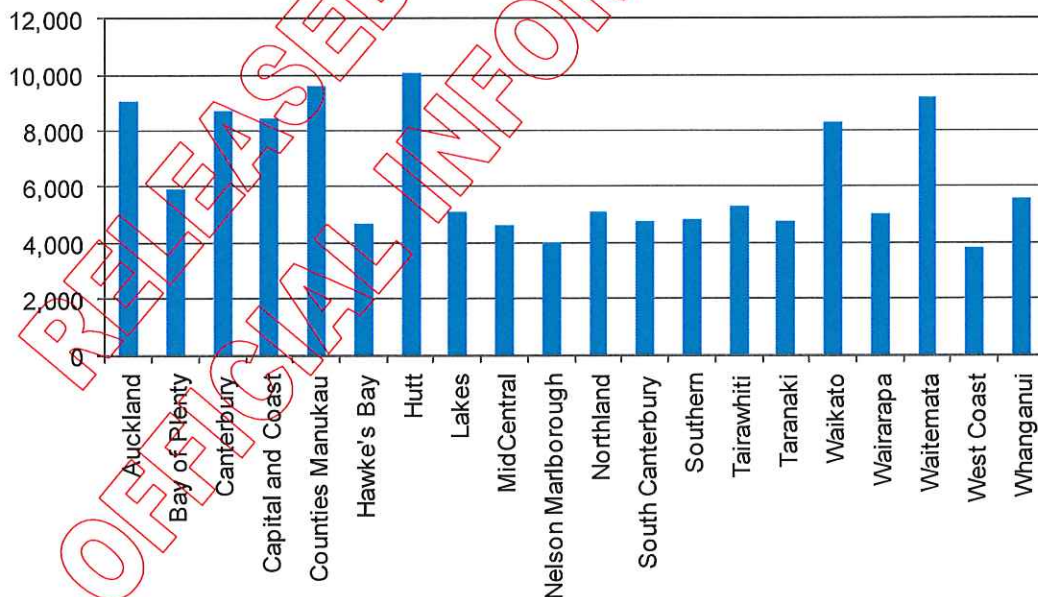
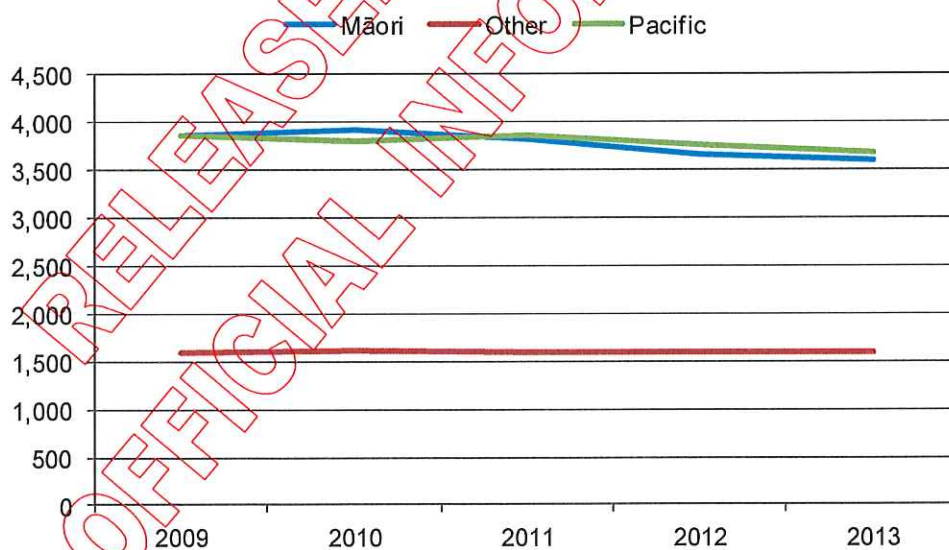


Table 7 – DHB specific ASH performance rating

| | | |
|--------------------|---------------|-------------------|
| Hawke's Bay | Bay of Plenty | Auckland |
| MidCentral | Lakes | Canterbury |
| Nelson Marlborough | Northland | Capital and Coast |
| South Canterbury | Tairāwhiti | Counties Manukau |
| Southern | Wairarapa | Hutt |
| Taranaki | Whanganui | Waikato |
| West Coast | | Waitemata |

At the aggregate (all DHBs) level, there are marked and persistent disparities in ASH rates across ethnic groups. Figure 18 shows that age standardised ASH rates for Māori and Pasifika are more than twice as high as those for other ethnic groups. Standardised rates for Māori fell by 6.7% over the five-year period 2009-13, compared to a reduction of only 4.6% for Pasifika and around 1% for other ethnicities. Pasifika populations are only large enough to contribute to ASH statistics in 7 DHBs.¹

Figure 18 – Age standardised ASH rates for Māori, Pasifika and Other per 100,000



The data also shows notable differences in the conditions that trigger ASH events across ethnic groups. Table 8 summarises the top 4 conditions and the average rates for these conditions over the period 2009-13 for each ethnic group. Serious skin infections are the most common reason for ASH events among Māori and Pasifika, with particularly high rates among Pasifika. In contrast, skin infections are only the third

¹ Auckland, Canterbury, Capital and Coast, Counties Manukau, Hutt, Waikato and Waitemata. It should be noted that even though these 7 DHBs also have the highest ASH rates, ethnic composition is only one of many factors that may affect their ASH rates. Other factors, such as deprivation and models of care, may also contribute to higher ASH rates and further research is necessary to understand the main determinants of ASH rates across DHBs.

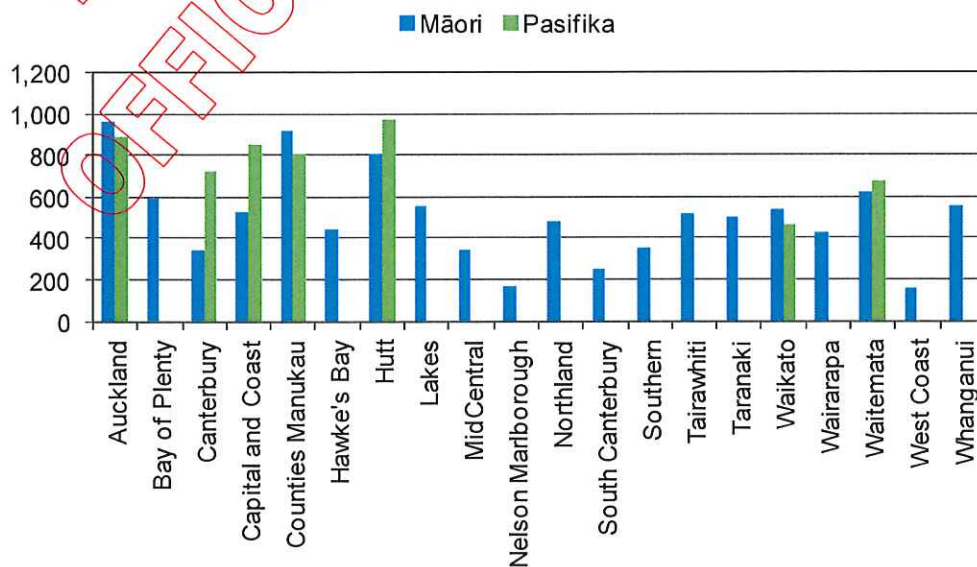
most common reason for such events among other ethnic groups. ASH rates for other ethnic groups are on average 2.7 times lower than rates among Māori and 3.7 times lower than rates among Pasifika.

Table 8 – Top 4 ASH related conditions by ethnicity

| Ethnicity | Condition | ASH rate |
|-----------|--------------------------------------|----------|
| Māori | Skin infection | 529 |
| | Dental | 443 |
| | Respiratory infections and pneumonia | 351 |
| | Asthma | 344 |
| Pacific | Skin infection | 725 |
| | Respiratory infections and pneumonia | 446 |
| | Dental | 338 |
| | Asthma | 316 |
| Other | Gastroenteritis and Dehydration | 225 |
| | Dental | 214 |
| | Skin infection | 198 |
| | Respiratory infections and pneumonia | 144 |

Given the high ASH rates for Māori and Pasifika, and the prevalence of skin infections as a cause of those hospitalisations, we looked specifically at the frequency of those events across individual DHBs. Figure 19 shows the variation in standardised ASH rates due to serious skin infections for Māori and Pasifika in 2013.

Figure 19 – Māori and Pasifika ASH rates due to skin infections per 100,000 (2013)



The observed ethnic and regional differences are likely to be related to differences in deprivation, with higher proportions of Māori and Pasifika groups living in more deprived areas. People on low incomes may face greater cost barriers to accessing primary care or paying for prescriptions. Cold, damp or over-crowded housing could at least partially explain the higher incidence of asthma and respiratory infections related hospitalisations among Māori and Pasifika.

Acute mental health admissions seen for the first time

Mental health is an important element of overall health. Poor mental health can have a strong and long-lasting effect on a range of individual outcomes, such as employment, income and social participation. Mental health is not particularly well captured in health system performance measures. It is currently excluded from CVD data due to difficulties capturing the cost of delivering mental health services.

We have used the proportion of acute mental health admissions that are people being seen for the first time (new acute mental health admissions) as a measure of the overall quality and coverage of primary mental healthcare services. New acute admissions are assumed to represent instances where mental health issues have not been addressed by the community-based mental health services before they escalate to a high level of acuity.

Figure 20 shows the rate of new mental health admissions for each DHB in 2013 and the average rate for the three-year period 2010-12. We have rated the performance of individual DHBs as red, amber or green based on their performance relative to other DHBs in the **most recent year** (table 9). Green rated DHBs were either in, or within 5% of, the top 5 performers. Red rated DHBs were in the bottom 5 performers and more than 5% worse than the remaining DHBs, which were rated amber. We have already discussed the drawbacks of assessing performance based on a single year. In addition, we note that rates for some DHBs may be affected by outsourcing (the clearest example is Wairarapa, which outsources all mental health services to Hutt and therefore shows a nil rate).

Figure 20 – New mental health admissions: 2013 and 2010-2012 average

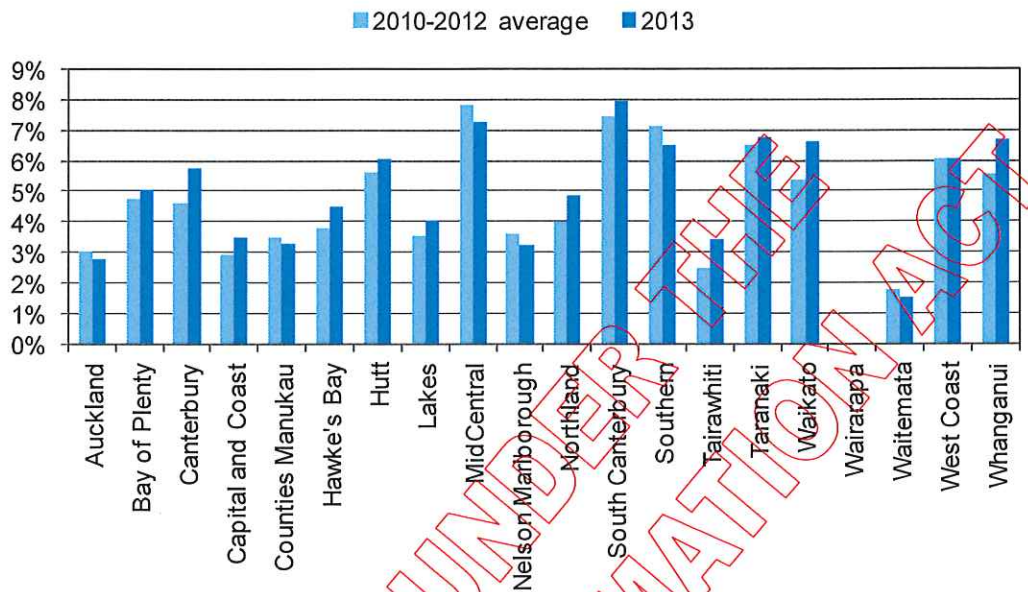


Table 9 – DHB specific performance rating for new mental health admissions

| | | |
|-------------------|--------------------|------------------|
| Auckland | Bay of Plenty | MidCentral |
| Capital and Coast | Canterbury | South Canterbury |
| Counties Manukau | Hawke's Bay | Southern |
| Tairarwhiti | Hutt | Taranaki |
| Waitemata | Lakes | West Coast |
| | Nelson Marlborough | |
| | Northland | |
| | Waikato | |
| | Whanganui | |

New admission rates appear to be fairly stable over time, with rates for individual DHBs in 2013 being broadly in line with their average rate over the preceding three years. Districts with lower density, rural populations seem typically to have higher rates than other districts, but this pattern does not hold in all cases (Tairarwhiti is the most obvious exception).