PERFORMANCE OF NEW ZEALAND’S PUBLICLY FINANCED HEALTH CARE SYSTEM: A FOCUS ON PERFORMANCE UNDER THE NEW ZEALAND PUBLIC HEALTH AND DISABILITY ACT (2000)

Nicholas Mays and Jacqueline Cumming

On Behalf of the Health Reforms 2001 Research Team

August 2007
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Introduction to the Health Reforms 2001 Research

In 2001, the New Zealand government introduced reforms to the structure of New Zealand’s health and disability sector. Under the New Zealand Public Health and Disability Act 2000, the government introduced a number of overarching strategies to guide the health and disability sector and it established 21 District Health Boards as local organisations responsible for population health and for the purchasing and provision of health and disability support services at a local level.

In 2002, funding was provided to chart the progress of, and to evaluate, these reforms as they were implemented. The research took place between 2002 and 2005. This paper is one of a series reporting on findings from the research. The papers in the series focus on:

- Health Reforms 2001 Research: Overview Report
- Governance in District Health Boards
- District Health Board Strategic Decision Making
- Financing, Purchasing and Contracting Health Services
- Devolution in New Zealand’s Publicly Financed Health Care System
- Māori Health and the 2001 Health Reforms
- Pacific Health and the 2001 Health Reforms
- Overview Report of the Research in Five Case Study Districts
- Print Media Reporting of the DHBs
- Public Sector Management and the New Zealand Public Health and Disability Act

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Executive Summary

In 2001, the New Zealand government introduced reforms to the structure of New Zealand’s health and disability sector. Under the New Zealand Public Health and Disability Act 2000, the government introduced a number of overarching strategies to guide the health and disability sector and it established 21 District Health Boards as local organisations responsible for population health and for the purchasing and provision of health and disability support services at a local level. This report, one of a series of reports assessing the way in which the new model works in practice, focuses on assessing the performance of New Zealand’s public health and disability system as a whole.

The research notes that different sorts of health systems give rise to different trade-offs between different desirable health system objectives. Analysis of trends in routinely available indicators of performance shows that the post-2001 public health system is no more efficient, and may be less efficient, than its predecessor, but is likely to be somewhat more equitable, and is more popular with system stakeholders and the general public than the previous arrangements. The extent to which this profile of performance is due to the intrinsic characteristics and incentives of the DHB system rather than secular trends in health technologies, trends in funding levels and other parallel policy initiatives, is impossible to ascertain at this stage. In part, the lack of a striking contrast in performance between the pre- and post-2001 periods may lie in the strong elements of continuity between the two systems.

While the post-2001 health system is arguably better suited to the culture of the health professions and the expectations of the public, it is a less straightforward system than its predecessor since its architecture embodies an attempt to balance a range of objectives in tension. This is shown most obviously in the dual felt and legal accountability of DHBs to their local populations and to the Minister of Health, and the simultaneous commitment to both a decentralised health system responsive to local variations in needs and consistent, equitable access to health services regardless of where people live in the country.
Another aspect of the complexity of the new model which may affect performance lies in the fact that the DHBs are responsible for purchasing and providing a large proportion of publicly financed health services. As a result, there is more risk of conflicts of interest which have to be guarded against and managed.

The fact that the new model works more obviously with the grain of the health sector and its values, carries with it other risks. The over-riding risk in a system with relatively few internal critics, and a focus on collaboration rather than contestability and competition is of a cosy consensus not given to self-criticism and insulated from external challenge. This may reduce the level of pressure for improvement in the system. Thus far, there are hints, but no more, that this may be occurring.

There will always be difficulties in determining the relative importance of changes in performance of health systems according to different criteria such as equity, efficiency and responsiveness. However, currently it is not possible to assess long term trends adequately in terms of any one of these measures. The summary of trends in indicators of outputs, quality, efficiency and productivity shows the difficulties of interpreting incomplete and discontinuous data over time. There is an urgent need for better measures of performance and comparable data over time to assess trends reliably. In particular, like many countries, New Zealand would benefit from having better longitudinal measures of hospital and other health services’ productivity that take some account of the ‘value-added’ of the services provided in terms of patients’ health and quality of life.
1 Introduction

In 2001, the New Zealand government introduced reforms to the structure of New Zealand’s health and disability sector. Under the New Zealand Public Health and Disability Act 2000, the government introduced a number of overarching strategies to guide the health and disability sector and it established 21 District Health Boards as local organisations responsible for population health and for the purchasing and provision of health and disability support services at a local level. This report, one of a series of reports assessing the way in which the new model works in practice, focuses on assessing the performance of New Zealand’s public health and disability system as a whole.

The performance of health systems is typically assessed in terms of broad criteria such as effectiveness, efficiency, economy (cost containment), equity, responsiveness, acceptability and sustainability. A moment’s reflection reveals that systems are unlikely to excel on all criteria simultaneously. Indeed, in many cases there are clear trade-offs between dimensions of performance and their related objectives. Similarly, major reforms of health systems tend to emphasise particular aspects of health system performance and while their proponents rarely, if ever, admit that their reforms might involve trade-offs, this is usually so (Brownell, Roos and Burchill, 2001). As a result, most accounts of the impact of health system reform are in the form of multi-criteria report cards rather than global assessments.

Indeed, much of the data collected in the research on New Zealand’s public health system reforms of 2001 introduced following the New Zealand Public Health and Disability Act (NZPHDA) 2000, bears witness to such trade-offs between the different objectives inherent in different ways of organising and managing the system. For example, the organisation and governance arrangements put in place in 2001 highlight the trade-off and tension between an emphasis on equity of access to services and national consistency on the one hand, and local decision making and local responsiveness to population needs on the other.
In this report, we consider the performance of the health and disability sector as a whole. The report begins with an overview of the 2001 reforms (Section 2) and of the methods used in the health reforms research and for this aspect of the research (Section 3). It then moves on to discuss the performance of the new model compared with the ‘quasi’-market model of the 1990s, focusing on a wide range of areas of the health and disability system (Section 4). In Section 5, we set out some explanations of the trends in performance discussed in Section 4 and we make some concluding comments in Section 6.
2 The 2001 Health and Disability Support Sector Reforms

In 2001, the New Zealand government reformed New Zealand’s health and disability support services sector. Under the auspices of the *New Zealand Public Health and Disability Act 2000*, the government shifted away from a ‘quasi-market’ model to a more collaborative set of arrangements for purchasing and providing health and disability support services, and established 21 majority locally elected district health boards (DHBs) as local agencies responsible for organising health care, and latterly, disability support (long term care) in their districts. DHBs undertake planning of services for their districts, they provide services through DHB ‘provider arms’ (public hospitals and population health services) and they fund services delivered by non-DHB providers. The government also developed a number of Strategies, in particular the two overarching strategies – the New Zealand Health Strategy and the New Zealand Disability Strategy – to provide overall guidance to the health sector, as well as the Primary Health Care Strategy aimed at enhancing the role of primary health care in New Zealand’s health system. In resource terms, the most significant of the strategies has been the Primary Health Care Strategy (Minister of Health, 2001) which has resulted in a major increase in the financial scope of the public system aimed at improving people’s low cost access to primary health care services.

These developments followed more than a decade of reforms in the health and disability sectors. During the 1980s, area health boards (AHBs) were established from hospital boards and the Department of Health’s regional offices of public health. AHBs eventually came to be governed by a mix of elected and appointed board members, and were tasked with planning services across their populations, as well as with running hospital services.
During the early 1990s, the system was radically reformed and a ‘quasi-market’ model was established. The Department of Health became a policy-focused Ministry of Health. Four regionally-based purchasing authorities (Regional Health Authorities or RHAs) became responsible for planning and purchasing all services. They purchased health and disability services from service providers, through formal contracts and in an environment which encouraged competition between providers, both government-owned and private for- and not-for-profit. The provider arms of the 14 AHBs were transformed into 23 government-owned hospital providers (Crown Health Enterprises or CHEs). These were charged with business-like behaviour and expected to earn a profit to be returned to the Crown. The boards of the government-owned RHAs and CHEs were appointed by Ministers. In 1997/8, this model was reorganised, with the four regionally-based purchasers amalgamated into a single national, purchaser of services (the Health Funding Authority or HFA), CHEs becoming Hospital and Health Services or HHSs (with less emphasis on profit-making), and a refocusing on collaboration between providers as opposed to competition.
3 Methods

The Health Reforms 2001 Research was focused particularly on evaluating the process of reform; i.e. on how the new (NZPHDA) model centred on the new DHBs was being implemented; and how well it was operating from the perspective of a wide range of those involved. There are a number of reasons for this emphasis on process rather than outcomes: firstly, because the Government’s main objectives for the new model appeared to relate to how the public system functioned rather than on what it achieved (e.g. the reintroduction of locally elected boards was justified primarily on democratic grounds rather than because elected members would necessarily take better decisions); secondly, because so much of the routinely available performance management data in the system, which the research team had no alternative but to rely on, was process-oriented; and, thirdly, because it is very difficult unequivocally to attribute changes in treatment outcomes or health outcomes at the population level to changes in the organisation and governance of the health system such as those brought about by the NZPHDA. Linking institutional features of health systems to their performance is a tricky undertaking and rarely attempted (Greene, 2004)

There are two reasons why it is difficult to attribute changes in outcomes to system reforms: many factors other than the health system affect population health; and other changes have occurred subsequently in parallel with the reforms brought about directly through the NZHDA. For example, the level of funding available to the public health system continued to rise in real terms during this period and a three-year funding ‘track’ was established to make it easier for DHBs and others to plan their staffing, investment in facilities, etc. These developments were not mandated in the NZPHDA, yet may well have enabled DHBs to improve services more easily than their predecessors, though with the exception of 2000/01, the annual percentage increases in real expenditure were slightly lower than in the period 1996/97-1998/99. In addition, there were major, parallel developments during the research period, not intrinsic to the DHB model, in particular, the implementation of the Primary Health Care Strategy (subject of a separate evaluation). Although it is still too early to tell definitively what impact the Strategy has had on population access to services and health, it is likely that the very large investment in primary care ($2.2 billion over the
seven-year roll-out period, 2001-08), will have had a positive effect. Despite the fact that part of the responsibility for implementing the Strategy fell to the DHBs, the gains made (e.g. admissions to hospital averted by better access to primary care) are not necessarily attributable to the design features of the NZPHDA system.

A final reason for a mainly process-oriented research relates to the likely timescale within which measurable benefits (and harms) would become apparent. Arguably, if the new model were to produce measurable benefits, these would most likely not become apparent in the four years covered by the research (2001-05).

Despite these limitations, the current report attempts to assess trends in health and treatment outcomes, and other quantitative measures of performance such as efficiency, equity and responsiveness, using a wide range of routinely available indicators before and at intervals after the introduction of the NZPHDA model in order to cast some light on the possible impacts of the changes.
4 Performance of the New Model Compared with the Quasi-Market of the 1990s

In their different ways, the other facets of the health reforms 2001 research have shown that the post-2001 model, though very different in terms of governance from its predecessor, has continued to provide satisfactory health services available to the public of New Zealand without encountering major problems of system cohesion and stability (Mays, Cumming and Tenbensel, 2007). In other reports from the research, participants described a gradual maturing of systems and relationships, marked by a greater sense of trust between purchasers, providers and regulators. The period since 2001 has demonstrated that it is possible to provide a reasonably comprehensive range of modern health services through the agency of 21 statutory authorities, the majority of whose members are locally elected and subjectively accountable to their local populations not to central government. Far from 21 majority locally elected DHBs inducing incoherence or even policy anarchy, it has proved possible to pursue a New Zealand Health Strategy and to use it as an organising framework within which each DHB draws up its strategic and annual plans, and purchases health services for its population in light of local needs.

However, beyond issues of reform process, the outstanding questions are whether the performance of the more collaborative, locally accountable public health system has changed since 2001 and whether it is possible to identify any association between the post-2001 model and trends in health system performance. Given that system performance is multi-dimensional; that good data are not available on all the aspects of performance of interest; and that health system performance is shaped by a wide range of external (e.g. social, economic and environmental factors) and internal factors (e.g. spending and staffing) many of which are unrelated or only partly related causally to a specific set of system ‘reforms’, this is far from straightforward.
The high level answer supported in more detail below is that there are no simple, unidirectional trends in performance associated with the advent of the 2001 model, but that there are some signs of performance improvement in certain areas and either a deterioration of performance, or halting of improvement in performance, since 2000/01 in other aspects of the system.

The assessment of performance start with trends in population health indicators before moving on to consider the resources available to the health system and how they have been used to produce services. This leads into a discussion of trends in efficiency and productivity, primarily in the public hospital sector since this is where the best data on activity and treatments delivered exists. This is followed by a section on how equitable the health system has become over time measured by patterns of access to services in relation to the needs of different sub-groups in the population. The assessment of system performance ends with a discussion of available indicators of public acceptability and support for the health system, and its responsiveness, measured primarily in terms of how long people wait for treatment.

As far as possible under each aspect of performance an attempt is made to compare the pre-2001 situation with the early years of the 2001 DHB system.

**Population Health**

Ideally, a health-related measure of the impact of the health system should take into account the quantity and quality of life generated by the health system, as opposed to other influences on population health, since the relationship between the health system and population health is complex. The preferred indicator would be the quality-adjusted life years (QALYs) gained as a result of health system actions whether curative, preventive or rehabilitative. Unfortunately, no such time series exists for New Zealand (or any other OECD country). Instead, a range of cruder measures of population health are used as proxies.
It is important to note that New Zealanders’ health has continued to improve in the DHB period, albeit that many of the factors within and outside the health system driving these improvements were likely to have been put in place well before 2001. Nonetheless, general health indicators not directly or exclusively related to the health system such as life expectancy have continued to improve since 2001 although not as quickly as in the previous two decades. For example, New Zealand’s life expectancy is currently below the average of the OECD countries – life expectancy in New Zealand remains below that in Japan, Australia and some European countries (Director-General of Health, 2006, p40, Table 3.1). Infant mortality has continued to fall, albeit very modestly. In fact, there has been relatively little improvement in infant mortality since the mid-1990s compared with big reductions in earlier decades. However, current rates are similar to Australia’s (Director-General of Health, 2006, p41).

In terms of so called ‘avoidable’ mortality (0-74 years) – that is, deaths potentially avoidable by timely appropriate health care, and health promotion and disease prevention activities – rates fell very considerably during the 1980s and 1990s but have changed little since. ‘Unavoidable’ mortality has remained the same since the late 1990s. Measures such as ‘avoidable’ deaths are more sensitive indicators of the effectiveness of the health system than crude indicators of health status such as life expectancy or infant mortality (Director-General of Health, 2006, pp 84-85).

During the 1990s and until 1999/2000, ‘ambulatory-sensitive’ hospital admission rates had increased. These are admissions that are regarded as potentially preventable through primary health care interventions and may reflect either inadequate access to primary care or poor quality primary care. Thus they are another potentially important indicator of health system performance. Since 1999/2000, ambulatory-sensitive admission rate increases initially slowed and then appear to have stabilised since 2002/03. Rates have also stabilised among Māori and Pacific populations, albeit slightly later and at a higher level than in the rest of the population (Director-General of Health, 2006, p130, Figures 4.25 and 4.26) (see Figure 13, below). It is not clear why these trends have occurred since the rate of increase in ‘ambulatory-sensitive’ admissions began to slow before the investment in improved access to primary health care following the implementation of the Primary Health Care Strategy could possibly
have had its effect. Whatever the precise causes, these trends are a positive sign of health system improvement.

Current smoking, a key indicator of future health, appears to have been falling substantially among school age children and in terms of tobacco consumption per adult smoker since the late 1990s. The latter is the continuation of a long-term trend since the mid-1970s, but has been sustained since 2001 (Director-General of Health, 2006, p185).

As well as overall health status, health system performance also needs to be assessed in terms of disparities between different groups in the population (e.g. between Māori and non-Māori and by socio-economic status or deprivation). Although disparities have persisted such that Māori and Pacific peoples, and people of low socio-economic status still have poorer health than non-Māori non-Pacific people, there is evidence of a narrowing of the gap in life expectancy between the main ethnic groups between 1995-97 and 2000-02 (the latest period for which these data are available by ethnic group) (Director-General of Health, 2006, p47, Figure 3.3). This period largely precedes the advent of the DHB model so it is unlikely that the reduction in health disparities can be attributed to the advent of the NHZPHDA model. In addition, most of the variables affecting health disparities lie outside the boundaries of the health system.

**Financial Performance**

There has been a strong emphasis through the performance management process between DHBs and the Ministry of Health on improving DHBs’ financial performance since 2001. Boards performing well financially are rewarded with early payment and a lower level of monitoring and oversight from the Ministry. Oversight and incentives seem to have paid off. The combined DHB deficit fell from $287 million in 2001/02 to $170m in 2002/03, $49m in 2003/04 and has remained between $30m and $40m since then (Stephen McKernan, presentation, *The Ministry, going ‘harder and faster’*, February 2007).
However, the reduction in deficits has to be set against continuing increases in Vote Health. In the five years before 2006/07, Vote Health increased by more than 50% in nominal terms, based on annual increases of 6-8% (see Figure 1, below). Since 2000, nominal ACC spending has increased even more, by 90%. This has come about as ACC has chosen to substitute surgical and rehabilitative services for income replacement in order to return claimants to work earlier (Treasury, personal communication, February 2007).

Figure 1: Trend in Vote Health

Note: Excluding capital and Ministry of Health running costs.

Source: Hon Dr Michael Cullen (2006) *Budget 2006: the estimates of appropriations for the Government of New Zealand, year ending 30 June 2007*, volume 1, Figure 5, p629.

The increase in Vote Health has enabled real increases in wages among publicly employed staff such as hospital nurses and doctors, and some increase in whole-time equivalent (WTE) staff (see discussion below of productivity trends).
Output, Quality and Efficiency

Ideally, DHB output and efficiency analysis over time would cover a wide range of DHB services. Unfortunately, routine activity and output data are only available over time for public hospitals and within hospitals only for medical and surgical inpatient and day case services. This equates to 35-45% of public hospital output (i.e. about 20-25% of DHB outputs and expenditure). Ideally, too, hospital activity and other outputs would be assessed in terms of the health-related quality of life and gains in survival generated. Without this, trends in hospital output are open to a range of interpretations – some increases in output may be desirable and planned, some may be a sign of weaknesses elsewhere in the system, some reductions are intended and others may be an indication of falling productivity. For example, as population health improves, there is no reason to expect that the rate of increase in hospital output experienced previously should be sustained. Currently, there is very limited routine assessment of the quality or outcomes of care resulting from hospital care (i.e. wound infection rates and global measures of patient satisfaction are reported routinely, but are difficult to interpret (see below)). Nonetheless, hospitals are a high profile part of the system, partly because of the increase in highly effective and cost-effective elective interventions available, and the area where it is hardest to contain costs, so their performance is important to monitor and attempt to understand despite the limitations of available data.
Trends in Output, Quality and Efficiency Before the 2001 Reforms

Limited research is available on the period prior to the introduction of the 2001 reforms on trends in output, quality and efficiency. McCloskey and Diers (2005) present one account of the impact of what they call system ‘reengineering’ in a ‘chaotic environment’ on patient outcomes during the 1990s. Using administrative datasets between 1989 and 2000, they show a large increase in a range of adverse patient outcomes associated with pressures on nursing care. For example, they find a 95% increase in sepsis among medical patients and 172% among surgical patients, and an increase in upper gastro-intestinal bleeds of 51% among medical patients and 35% among surgical patients. At the same time, they report a marked increase in discharges, and reductions in length of stay, generally, and falling hospital mortality among medical patients.

The authors found a statistically significant relationship between decreases in the size of the hospital nursing workforce and the number of nursing hours per discharge, and an increase in nursing skill mix, and several of the adverse outcome rates. They explain their findings in terms of the impact of the 1990s market-led reforms on the nursing workforce. They argue that the increase in skill mix was not large enough to offset the decrease in staff and nursing hours available, and the increased burden posed by falling lengths of stay. As a result, the frequency of adverse outcomes increased.

McCloskey and Diers (2005) offer a range of possible explanations for the seeming paradox of increases in adverse clinical events associated with nursing care and reductions in hospital mortality, including nurses concentrating on lifesaving interventions at the expense of averting other adverse outcomes, shorter lengths of stay leading to a shift of deaths outside hospitals and new technologies improving outcomes. They have no evidence for their first explanation. In terms of the second explanation, unfortunately, the authors do not specify which measure of mortality they used, though it appears that it was in-hospital mortality. If improvements in

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1 At the time of publication of this report, research covering the period prior to the introduction of the 2001 health reforms had also been undertaken by a team of researchers led by Professor Peter Davis at the University of Auckland. That research has yet to be published (Davis et al, in press 2007); once it has been published, we aim to update this report.
technology explain the reductions in mortality, it is not clear why there would not be similar improvements affecting other adverse outcomes such as ulcer care, infections and pulmonary failure. Perhaps surprisingly, the authors do not consider whether changes in medical staffing might help explain the seeming paradox.

McCloskey and Diers (2005) do not comment on the fact that their own data show that most of the nursing care-related adverse outcomes were already rising before 1993 when the public hospital system was ‘reengineered’, though they do not have nurse staffing data for the period 1989-1993 so it is impossible to say whether these pre-reform trends were also associated with changes in the nursing workforce or other factors.

The analyses of McCloskey and Diers (2005) show how difficult it is to undertake and interpret longitudinal studies of the impact of periods of reform on health systems. However, the period covered by these analyses almost entirely precedes the current DHB system, raising the question of what has happened since it was established.
Trends in Output, Quality and Efficiency Before and After the 2001 Reforms

Analysis undertaken by the Treasury for the period 1995/96-2003/04 sheds some light on the early years of the DHB model in relation to the immediately preceding quasi-market period (Treasury, 2005). It shows that numbers of hospital discharges and cost-weighted discharges (i.e. taking into account changes in the mix of patients treated over time) rose over the whole period 1995/96-2003/04, but that the main period of growth was in 1997/98-2000/01, before the DHB system was instituted (see above and Figure 2, below).

Figure 2: Hospital expenditure and output, 1995/96-2003/04

The Treasury analysis also shows that the cost per cost-weighted discharge rose steadily after 2000/01 suggesting increasing prices and/or reductions in productivity (see Figure 3). Most of the spending growth in the period went into staff costs and most of the spending growth on doctors and nurses went into higher costs per full time equivalent (FTE) (over the period 2000/01-2003/04, nominal costs per FTE doctor increased by 14% and per nurse by 9%), although there was some increase in FTE staff as well. DHBNZ, the umbrella body for DHBs, reports a 43.5% nominal increase in all medical salaries (junior and senior) in the public hospital sector in the five years to 2006/07 (i.e. since the new system was instituted). DHBNZ reported a 16% increase in FTE medical staff (Treasury, personal communication, March 2007). Perhaps as a result of these twin trends, cost-weighted discharges per doctor and nurse declined by 2.7% for doctors and 1.8% for nurses over the period 2000/01-2003/04 (Treasury, 2005).

**Figure 3: Total provider and governance expenditure per cost-weighted discharge, 1995/96-2003/04**

The Treasury analysis looked at other proxy measures of hospital efficiency such as length of stay and day case rates. Although lengths of stay had fallen consistently between 1988/89 and 1998/99, there had been little change since then and little or no reduction in the early DHB period. The increase in the day case rate also appeared to have slowed by 2001/02 despite the fact that it remained government policy to increase the amount and proportion of day case surgery. The proportion of patients treated as day cases increased by 14% each year, 1988/99-1995/96, but only by 3% per year to 2004/05. In 2005/06, the day case rate even fell slightly though there were large differences between DHBs in their day case rates (see Figure 4).

Figure 4: Day case surgery rates, 1988/89-2004/05

The most recent data available for surgical and medical DRGs only suggest that lengths of stay resumed their downward trajectory after 2002, albeit very gradually compared with the period up to the late 1990s (see Figure 5). The average was just over three days in March 2006 quarter – the lowest ever average. Reductions in lengths of stay are likely becoming more difficult to achieve as more work is undertaken as day cases and in outpatients and the remaining inpatient case mix becomes more complex.

**Figure 5: Average inpatient length of stay, 1988/89-2004/05**

There are a range of possible explanations for the decreasing discharges per clinical staff member and only marginally reduced length of stay in the period covered by the Treasury analysis: reduced staff productivity; an increase in activity and productivity in areas not included in the routine output data available (e.g. outpatient activity); artefacts due to data issues (e.g. the calculation of cost weighted discharges); and an improvement in the quality and outcomes of care. The Treasury report concluded that all these explanations were plausible and that it was not possible with the data available to assess their relative contribution to the trends observed. There is also the possibility that overall case complexity is increasing in the hospital sector.

Despite the fact that the Treasury analysis excluded large parts of DHB expenditure, unless there were clear reasons to expect inpatient and day case productivity to fall and be compensated by other, unmeasured parts of the system (e.g. a planned increase in treatment in hospital outpatient clinics), the analysis provides insight into trends in a major part of the system. Although more treatment is undertaken on an outpatient basis, the question is whether this increase has been sufficient to offset the observed reduction in productivity elsewhere in the hospitals. To look at this it would be necessary to disaggregate the trend and productivity data, at the very least into surgical and medical specialties since more of the increase in outpatient treatment is likely to have occurred in medical specialties, distinguishing between urgent and non-urgent treatments, and to collect outpatient treatment data. It would also be necessary to find a way of allocating clinical staff time to inpatient, day case and outpatient activity. At present, this is not possible at a national level. There is no way of knowing if staff members are spending a higher proportion of their time providing outpatient assessment, treatment and follow-up than in the past. In the Treasury (2005) analysis, all clinical staff time was allocated to the measured part of hospital output.

The three Auckland DHBs undertook their own analyses of trends in hospital productivity each year since 2004 for local managerial benchmarking, released in February 2007 to the National Party under the Official Information Act. Unlike Treasury (2005), these analyses include outpatient activity as well as inpatient and day case treatments in eight specialties in each Auckland hospital, and show a similar pattern of static or declining productivity as measured by the ratio of doctor and nurse full-time equivalent staff to measured outputs and costs per treatment episode for
similar types of cases. The analyses show a 13.5% rise in medical WTEs since 2004 accompanied by a 3.9% increase in measured outputs in terms of case-weighted discharges. The reports also show variations in efficiency between the Auckland hospitals for the same services. The reports attribute the trends in productivity to increased staffing levels designed to raise the quality of care in some areas, an increase in agreed non-clinical contact time for senior medical staff for continuing professional development (also related to improving quality of care) and pay rises for nursing staff (Johnston, 2007).

Simple analysis of discharges without reference to inputs (money and/or staff) indicates that there are different trends at work in medicine and surgery. Surgical discharges have been virtually flat since the late 1990s and medical discharges since 2000/01. Of course, increases in hospital use are not always desirable or in line with policy goals. Generally, the objective of the system over the last decade has been to increase access to elective (non-urgent, planned) surgery and contain urgent medical and surgical admissions since these are unplanned and can be interpreted, at least in part, as an indicator of weaknesses in the system of care outside hospital. Yet raw elective surgical rates have remained unchanged since 1999/2000 with some year-on-year fluctuations (e.g. in orthopaedics, there has been little or no change in the number of operations publicly funded since 1998/99) and urgent medical discharges have continued to rise, albeit very modestly and at a much slower rate than in the 1990s (see Figures 6 and 7). Arguably, neither of these trends is a sign of better performance.
Figure 6: Urgent and non-urgent hospital discharges, 1988/89-2004/05

Note: the drop in medical discharges is mainly due to late reporting of publicly financed care by non-government providers.

Figure 7: Discharges from high volume specialties, 1988/89-2004/05

Note: the drop in medical discharges is mainly due to late reporting of publicly financed care by non-government providers.


The picture looks different when elective surgery discharges are adjusted for case complexity. Case-weighted elective surgical discharges increased between 2001/02 and 2004/05 (Director-General of Health, 2006, p67), although it is not clear whether this is due to changes in the composition of the patient population or a change in the way that patients are prioritised in the surgical booking system. In theory, patients waiting for elective surgery should be treated in order of relative need and it may be that the clinical assessment criteria are being used more consistently. For example, there has been an increase in Māori and Pacific Island utilisation of elective surgery and this may have increased the case complexity of electives. Another possible explanation is that patients are being referred and treated later in the development of their condition, and thus present as more complex cases. This is not necessarily a sign of system improvement.
In general, taking account of changes in quality could produce a different picture of trends in hospital productivity before and after the 2001 reforms. On quality of hospital services, although it did not include all admission diagnoses, the Treasury analysis showed that 30-day post-admission mortality rates for treatment of patients for acute myocardial infarction and following coronary artery bypass grafting had fallen after 2000 after a small increase in 2001. Of course, without detailed information on the case mix of patients treated in each year, it is hazardous to draw conclusions on trends in outcomes for specific interventions and diagnoses.

Taking all discharges and routinely available statistics on deaths in hospital as opposed to 30-day mortality (though arguably the latter is a better measure of hospital quality as lengths of stay shorten), the trend data show a marked rise in the hospital mortality rate between 2000/01 and 2001/02 followed by a steady fall in the next three years such that by 2004/05, the in-hospital death rate was slightly lower than in 2000/01 (see Figure 8).
Figure 8: Hospital mortality rate per 100,000 discharges (all DHBs), 2000/01-2004/05

Hospital mortality rate (per 100,000 discharges)

Note: Rate based on dividing in-hospital deaths by total discharges, multiplied by 100,000. Rate excludes palliative and long-stay cases. Deaths in a non-hospital setting post-discharge are excluded.


Since average length of stay continues to fall, albeit at a slower rate than in the 1980s and first half of the 1990s, this fall in hospital mortality could be the result of more patients dying at home rather than indicating an improvement in quality of care. The upward blip in 2001/02 could have been a real or artefactual effect of the reorganisation of the health system in 2000-02. Thus it is impossible to say if quality is improving to offset the apparent reduction in public hospital productivity measured by the Treasury and the Auckland DHBs.

When lengths of stay are falling, readmission rates can increase as a sign that patients are being discharged prematurely. There is no evidence that this has been happening since 2000/01. The readmission rate for all DHBs remained unchanged from 2000/01 to 2004/05 (Director-General of Health, 2006, p167, Figure 4.36).
Patient satisfaction is another potential proxy measure of the quality of care. Yet, data from DHB hospital patient satisfaction surveys are hard to interpret since global patient satisfaction scores are typically very high in most systems, New Zealand included. Response rates are also very low in New Zealand, casting further doubt on the validity of the data (Ministry of Health, 2005). The contemporary focus has shifted to eliciting patients’ experiences of specific aspects of their care since the validity of patient satisfaction measures is questionable. Routine trend data indicate little change in global measures of satisfaction since DHBs were established in 2001. There are no comparable data for the period before DHBs.

Another measure of quality of hospital care is hospital-acquired infection. Data on hospital acquired infection rates between 1997 and 2005 show little change fluctuating around 3 infections per 1000 patients with a slight upward trend in the last few years. Again, trends are tricky to interpret since small absolute increases in numbers of infections can produce large proportionate increases in rates and rates are also influenced by the effectiveness of surveillance systems as much as by poor clinical standards of care.

Taking the limited data on the quality of hospital care into account, it is not possible to conclude whether the quality of hospital services has been rising, falling or staying the same, and thus it is not possible to conclude that the apparent fall in hospital productivity has been offset by gains in quality and better patient outcomes. There is no agreed way of measuring quality of care for use in trend analyses of health system productivity. This suggests that there is an urgent need in New Zealand and internationally to develop and institute data systems capable of generating quality-adjusted health service output measures on a routine basis.

Moving away from an exclusive focus on the hospital sector to consider the efficiency of the whole health system (public and private), Tobias (2005) compares the performance of OECD countries’ health systems by plotting the deviation in total health expenditure from that predicted by GDP with the deviation in life expectancy from that predicted by GDP. From this relatively crude, global perspective using 2002 data, New Zealand was characterised as spending less than would be expected but achieving a higher life expectancy than would be expected, placing it in the most cost-
effective top left quadrant of countries in Figure 9 below. In part this is because New Zealand has relatively low spending per capita when adjusted for the cost of living compared with most other OECD countries. The major weakness of this sort of global analysis of health system performance is the fact that almost certainly a large proportion of the health variable (life expectancy) is attributable to variables outside the health system such as levels of education. Nonetheless, it is an important reminder that in comparative terms the New Zealand health system performs pretty well.

**Figure 9: Deviation from GDP-based predictions of life expectancy at birth of total health expenditure, OECD countries (excluding Luxembourg), 2002**

Equity

An important part of the contribution of the health system to reducing inequalities in health is to ensure equitable access to preventive and treatment services between socioeconomic, ethnic, geographic and client groups. There is evidence from similar health systems such as the UK NHS that minority groups and more deprived communities tend to have lower rates of referral for elective procedures than their poorer health status would suggest, and better off and majority patients’ higher rates of referral (Dixon et al, 2007). This is attributed to more affluent patients likely being better informed, having better relationships with their GPs and being more assertive. Similar patterns are observed in NZ. Routine data show some progress between 1997/98 and 2004/05 in increasing Māori and Pacific peoples’ access to elective procedures such as coronary artery bypass grafting and angioplasty relative to the total population (see Figures 10 and 11).
Figure 10: Standardised discharge ratios for Māori access to surgery, 1997/98-2004/05

There was no obvious sign of an acceleration or deceleration in these trends with the advent of DHBs. Inequalities still exist in that non-Māori, non-Pacific peoples are more likely to receive angioplasties than Māori and Pacific peoples, despite the latter groups’ higher preponderance of risk factors for cardiac disease. However, Māori elective surgery rates adjusted for case weights are now substantially higher than the rest of the population, more in line with relative need, but Pacific peoples’ rates are still lower, suggesting that there is some way to go before their rates match their needs.
Turning to preventive and chronic disease management programmes, there is current evidence of inequity in diagnosis and access, but not necessarily in subsequent care once patients are in the system. For example, since 2002, disparities in enrolment among diagnosed diabetics in the free ‘get checked’ programme between ethnic groups have widened primarily due to a doubling of the take-up rate among Pacific peoples from just under 40% to 90%. The Māori rate rose from 30% to 40% between 2002 and 2005. Once enrolled in the ‘get checked’ programme, there appear to be fewer differences between ethnic groups in their quality of care. For example, the percentage of enrollees on statins has risen from around 10% to between 50% and 60% between 2001 and 2005 in all groups. On the other hand, in the same period, the percentage of enrollees receiving retinal screening appears to have diverged between Māori, Pacific and the remainder of the population (Director-General of Health, 2006, pp 95-98). Māori are also less likely to be diagnosed in the first place relative to their level of need than non-Māori.

Reducing inequalities in cancer incidence and outcomes is a major challenge for the health system. Māori cancer mortality rates are double those for non-Māori, non-Pacific people. Māori and Pacific women are less likely to access breast and cervical cancer screening services, have higher incidence rates in the case of Māori women and have poorer five-year cancer survival rates compared with non-Māori, non-Pacific women. Coverage of the National Cervical Screening Programme has not changed significantly since 2000. Coverage of Breastscreen Aotearoa rose from 45% to 62% from 2001 to 2005 accompanied by some narrowing of the gap between Māori, Pacific and women in the rest of the population (see Figure 12).
The higher rates of age-standardised ambulatory-sensitive hospital use by Māori and Pacific peoples compared with the rest of the population, described above, suggests that these two population sub-groups continue to benefit less from preventive and primary care services. Interestingly, the Asian population has had lower rates of ambulatory-sensitive hospitalisations allowing for age than the European/other section of the population and far lower rates than Māori and Pacific peoples throughout the period 1996/97-2003/04 (Director-General of Health, 2006, p130, Figure 4.26), despite having far lower rates of utilisation of primary medical services (Gribben and Cumming, 2007, p40).

However, there are signs that the Primary Health Care Strategy, one of the central aims of which is to reduce health inequalities by improving access to primary health care services, is beginning to have an impact, at least in terms of reducing patients’ fees for GP visits and for prescription drugs. There are also signs that the significant under-utilisation and lower expenditure on primary care for high need groups is beginning to reduce (Director-General of Health, 2006, p121-2, Figure 4.18).

A final aspect of equity relates to fair access to services for patients with different types of need. One of the government’s priorities has been to improve access to mental health services which was regarded as a neglected. There was little evidence of improved access to services despite an increase in funding (Mental Health Commission, 2005). In part, this may be because of difficulties in recruiting additional staff despite the availability of more money.
Public Acceptability

It is clear from interviews with a wide range of staff and board members involved in the DHB system that there was little taste for further major changes to the organisation and governance of the system. This is perhaps unsurprising since most of those interviewed stood to lose from further upheaval. More interesting from the point of view of assessing the performance of the system are the views of members of the public about the functioning of the system. The Commonwealth Fund of New York, a US health policy and management foundation, carried out comparative public opinion surveys in five countries (US, UK, Australia, New Zealand and Canada) in 1998, 2001 and 2004. The three surveys show a trend towards more positive assessments of the health system as a whole in New Zealand while assessments in other countries have tended to fluctuate. For example, in 1998, 32% of respondents in New Zealand agreed with the statement that the system needed to be ‘rebuilt completely’. This figure had fallen to 20% in 2001 and 19% in 2004. Likewise, 19% of respondents thought that the system needed only ‘minor changes’ versus 9% in 1998 (Schoen, Blendon, DesRoches, et al, 2002; Schoen, Downey and Osborn, 2003; Schoen, Osborn, Huynh, Doty, Davis, Zapert and Peugh, 2004; Schoen, Osborn, Huynh, Doty, Zapert, Peugh and Davis, 2005). The percentage of respondents who thought that the system had some good features, but needed fundamental changes to make it work better was the same in 1998 and 2004. Though these data can only be suggestive, they hint at the possibility either that the DHB model is preferred by more New Zealanders than its predecessor (perhaps because it resembles an earlier way of organising the system) or that the public has more confidence in the public health system when it is in the hands of left of centre coalitions than right of centre governments. In a 2006 survey of a random sample of 1,600 New Zealanders, 37% stated that they believed that the government had been very or quite successful in providing health care for the sick and 31% thought that the government had been neither successful nor unsuccessful (Massey University, 2007).
Responsiveness

Waiting times for emergency hospital treatment are indicators of system responsiveness, and, again, there appears to have been little change since 2001 when the current standards began to be audited (there was a change of policy in June 2000 as a result of which waiting statistics are difficult to compare before and after the institution of the DHB system). The level of performance and the management of waiting lists have increasingly attracted the attention of the mass media in the last year or two as they did in the 1990s.

The current arrangements for managing the demand for elective surgery have been in place since the mid-1990s and pre-date the NZPHDA system. The aim of the surgical booking system is to improve the match between the numbers of people booked for treatment after specialist assessment and the capacity available to treat them within six months of booking. The clinical priority of patients is assessed quantitatively and if they score above a threshold, they are referred for treatment within six months. The threshold or the surgical capacity available can be adjusted to keep waiting below the six month maximum. In principle, this means that patients who score below the threshold are returned to their GPs for periodic monitoring and the numbers waiting on the list should fall.

Elective waiting times show that the number of patients waiting more than six months for their first specialist assessment fell from over 30,000 in September 2002 to 4,700 in September 2006 (Minister of Health, 2006, Table 4, p86). The number of patients assessed as above the treatment threshold, but still waiting over six months for treatment has fluctuated since June 2002. On 30 September 2006, 3,340 people had waited more than the six months expected under the surgical booking system. This is a substantial reduction compared with the same time in the previous year, but it is unclear whether this represents a downward trend or another fluctuation in a dynamic system. The large reduction in people waiting for first specialist assessment since 2002 is most likely related to the number of people booked for treatment, but waiting longer than six months. The number of people in the latter group was reduced in 2005/06 as a result of an instruction from the Ministry of Health to DHBs to remove patients from the assessment and treatment waiting lists who could not feasibly be
treated within the six month period required under the terms of the surgical booking system. In the 12 months to 31 October 2006, 13,000 patients were sent back to their GP after having been booked for treatment, some of whom met the threshold criteria and some of whom did not.

Another high profile aspect of system responsiveness relates to waiting times for cancer treatment. Radiotherapy waiting times for ‘priority C’ (palliative and other treatment, non-urgent) patients have fallen considerably since mid-2004 such that less than 5% of these patients currently wait more than eight weeks for radiotherapy (Director-General of Health, 2006, p109, Figure 4.12).
5 Explaining Trends in Performance

It is difficult to reach an overall verdict on the trends in performance summarised above. The health system provides a very heterogeneous range of services for many different purposes and the indicators themselves are frequently open to a variety of interpretations. It is not possible to reduce health care outcomes and outputs to a single or a small number of measures. If forced to simplify and summarise, the observable trends suggest that the public health system shows some signs of greater equity of access to services, better financial performance in terms of deficit reduction, no obvious sign of efficiency improvements and possible reductions in some areas, some signs of an improvement in responsiveness in high profile areas such as electives and a higher level of public acceptability, against a background of substantial real terms expenditure increases. The first years of the DHB system exhibit strong elements of continuity with the previous period.

There are a number of possible explanations for these findings. First, it is apparent that few of the structural and governance changes instituted in 2001 were likely to have had immediate, major impacts on clinical staff and the pattern of their day-to-day work, and this was, indeed, found to be the case. As a result, any impacts on health services delivery will have taken time to accrue. Indeed, in many cases, there are still only two or three years of post-DHB performance data available upon which to make a judgement and in part of this period, the new system was still either being implemented or bedding down. In addition, reliable time series from even the mid-1990s to date do not exist in many areas of performance. In part this is because of successive restructurings of the system, in part because the range of indicators collected has changed over time in line with changes of policy and priority given to different areas.
Second, in relation to trends in efficiency and effectiveness, specifically, the 2001 reforms came after two decades of improvement in hospital efficiency and effectiveness as measured by routine indicators such as falling length of stay and increase in the share of day case treatment. These trends were similar to those observed in many high income countries and most likely related to the application of technological innovations allowing bed reductions to occur without compromising the quality of care as much as to the particular organisational and managerial contours of the health care system (Hensher, Edwards and Stokes, 1999; Carriere, Roos and Dover, 2000; Brownell, Roos and Burchill, 2001). Indeed, there is much less evidence of the effect of organisational and managerial characteristics on performance at the patient level. Of course, this raises the question of whether the rate of such improvements must inevitably slow in the following period.

Third, by historical standards, the health sector enjoyed relatively large year-on-year funding increases in the later 1990s and beyond, ahead of the growth in national income, which eased the transition to the new system and may have obscured all but the most obvious effects of changing the organisation and incentives in the system from 2000/01. Even so, there is a hint in the Treasury (2005) analysis that the incentives to increase measured hospital patient throughput and productivity may be less obvious and quality little or no better in the DHB hospital system than under the previous 1990s system based on a purchaser-provider split allied to payment of public hospitals according to their outputs (using national diagnosis-related group (DRG) prices). This may be because post-2001, DHB provider arms (hospitals) negotiate internal service level agreements with DHB purchaser arms. Output reimbursement is reserved for the treatment of out-of-district patients which represents a small part of the income of most public hospitals. It is a distinct possibility that external contracting is more effective in signalling quality and efficiency improvements to providers than internal service level agreements between parts of the same organisation. Alternatively, it may be that the previous quasi-market system simply encouraged providers to record their outputs more assiduously since they were paid for each patient treated up to certain thresholds and that this incentive was reduced after 2001. It is known that DRG-based payment systems lead providers to invest in better data collection and also to various forms of ‘gaming’ such as so called ‘up-coding’ of patients to more complex, and, therefore, more lucrative DRGs and recording
transfers of patients between specialists as separate patient episodes each attracting a payment. It would be interesting to see whether DHB provider arms that are more reliant on inter-District flow patients for income are more likely to have maintained levels of measured productivity compared with those whose income is relatively little affected by inter-District flows. One could hypothesise that the former DHB hospitals would continue to measure their outputs by DRG more carefully than the latter.

Fourth, the government unobtrusively retained a number of elements of continuity with the previous regime that reduced the contrast between the two eras (Ashton, Mays and Devlin, 2005). For example, the HFA’s ‘Service Coverage Document’ which had set out in some detail what the public could expect from the public health system and thus what purchasers should commission, found its place in the newly devolved DHB world. In theory, its survival was contrary to the idea of a system of devolved planning and purchasing of services with DHBs undertaking their own health needs assessments, determining local priorities and planning their purchasing accordingly, but it provided a helpful framework for the new DHBs.

The strongest sense at the health care delivery level was of continuity of established trends and large amounts of ‘business as usual’. Consistent with this, DHB staff and members generally reported that they had limited levers of change available and that their scope for change even in relation to implementing national strategies was highly circumscribed. Community input to local decision making in the period of the evaluation was also limited to the design of particular services rather than setting overall priorities. Likewise, DHB board members reported that they had made less progress than they had hoped for on very difficult issues such as reducing inequalities in population health in their areas, improving the degree of integration between primary and secondary care, community involvement in decision making and the social inclusion of disabled people. This is scarcely surprising given the large amount of work reported by DHB chairs to establish DHBs in the first place before they could focus on their main local health problems. From this perspective, the period 2001-03 is probably best seen as the establishment phase of the new system.
6 Conclusions

There will always be difficulties in determining the relative importance of changes in performance of health systems according to different criteria such as equity, efficiency, responsiveness and so on. However, currently it is not possible to assess long term trends adequately in terms of any one of these measures. The summary of trends in indicators of outputs, quality, efficiency and productivity in the public hospitals above exemplified the difficulties of interpreting incomplete and discontinuous data over time. There is an urgent need for better measures of performance and comparable data over time to assess trends reliably. In particular, like many countries, New Zealand would benefit from having better longitudinal measures of hospital and other health services’ productivity that take some account of the ‘value-added’ of the services provided in terms of patients’ health and quality of life.

The summary of performance further hints that different systems seem to give rise to different trade-offs between different desirable health system objectives. Put very broadly, it appears that the post-2001 system is no more efficient, and may be less efficient, than its predecessor, but is likely to be somewhat more equitable and more popular with system stakeholders and the general public than the previous arrangements. The extent to which this profile of performance is due to the intrinsic characteristics and incentives of the DHB system rather than secular trends in health technologies, trends in funding levels and other parallel policy initiatives, is impossible to ascertain at this stage. In part, the lack of a striking contrast in performance between the pre- and post-2001 periods may lie in the elements of continuity between the two systems (Ashton, Mays and Devlin, 2005).

However, there are some new features of the post-2001 system with potential implications for likely system performance. For example, while the post-2001 health system is arguably better suited to the culture of the health professions and the expectations of the public, it is a less straightforward system than its predecessor since its architecture embodies an attempt to balance a range of objectives in tension. The new model is essentially a hybrid since it does not conform strictly to corporate, bureaucratic or philanthropic traditions of governance. Thus the new system is more...
obviously built on compromises than its predecessor. This is shown most obviously in the dual felt and legal accountability of DHBs to their local populations and to the Minister of Health and the simultaneous commitment to both a decentralised health system responsive to local variations in needs and consistent, equitable access to health services regardless of where people live in the country.

Another aspect of the complexity of the new model which may affect performance lies in the fact that the DHBs are responsible for purchasing and providing a large proportion of publicly financed health services. As a result, there is more risk of conflicts of interest which have to be guarded against and managed. For instance, DHBs’ pricing and ‘make or buy’ decisions in respect of hospital services may be swayed by the fact that DHBs employ the staff at their hospitals and have to manage the consequences if clinical work is diverted elsewhere or deficits accrue regardless of the impact on efficiency. By contrast, under the previous system, not only were there far fewer purchasing entities, but none of the purchasers was responsible directly for any provision. In addition, both public purchasers and public provider organisations were unambiguously upwardly accountable ultimately to the Minister of Health.

The fact that the new model works more obviously with the grain of the health sector and its values, carries with it risks. The over-riding risk in a system with relatively few internal critics, a focus on collaboration rather than contestability and competition, and where the same leading party has been in government for three terms is of a cosy, consensus not given to self-criticism and insulated from external challenge. This may reduce the level of pressure for improvement in the system. Thus far, there are hints, but no more, that this may be occurring.
References


