History of Efficiency Measurement by the New Zealand Health Sector

Post 2000

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Contents

I. Executive Summary

1. This report examines the context in which attempts to measure efficiency/productivity by national health sector organisations, excluding the Accident Compensation Corporation, has occurred in the past 20 years. Fifteen examples are documented. The report is background to the Productivity Commission's inquiry ***Measuring and improving state sector productivity***.

Description of Health Sector

2. Since 2000, the overall design, strategy and policy approaches applied to the publicly funded health system has been stable - one of continuity. This followed a decade of structural upheaval and continual transitions.

3. The key overview organisations are the Ministry of Health (MoH) and District Health Boards (DHBs). DHBs, which are crown entities, are responsible for improving the health of their population, planning and acquiring most health services, and directly managing public hospitals in their geographical locations. They vary significantly in population size. Health services are acquired from a range of different types of providers either via contracts, subsidies, or directly (owned-public hospital). DHBs are primarily funded from Vote: Health via a population based funding formula. While there are locally elected board members, they are strictly accountable to the Minister of Health who can direct on a wide range of matters. The MoH also plans and funds a range of services which have not been devolved to DHBs. The Ministers of Health and Disability produce strategies for the sector, the Ministry of Health is also responsible for monitoring and being the primary policy advisor. In practice, the post-2000 regime, reinforced by Government expectations, established a "high-trust" model in respect of production decisions for the health sector. The system design incorporates a somewhat fluid mix of tight central control and devolved decision making.

4. DHBs are required to meet the accountability requirements of the New Zealand Health and Disability Act(2000), Crown Entities Act and Public Finance Act. They, as well as the Ministry of Health, produce a number of planning and reporting documents. b Nonfinancial performance measures cover whole-of-Government priorities, the Health Targets, System Level Measures, New Zealand Health and Disability priority areas, and other agreed measures of performance.

5. The immediate pre-2000 period health system design focused on separating purchasing and providing functions. The objective was to clarify responsibilities and, among other things, embed incentives for efficient production. It was short-lived but has left a lasting perception around how to pursue efficiency improvements in the sector. In the context of the Commission's inquiry it would revolve around how to obtain health practitioner leadership and/or input into meaningful measure design.

Demand for Efficiency Measures

6. An examination of sources of national demand, since 2000, for measuring efficiency/productivity of the New Zealand publicly funded health system identified 4 primary drivers:

- Fiscal flexibility - where funders seek efficiency gains as a way of reducing the impact of the sector on the government's budget constraints or to increase service coverage
- Performance management - where monitors seek a comprehensive set of measures covering health outcomes, service quality and breadth, and best use of funding (efficiency/productivity measurement is only one component)
- Macro-economic productivity improvement - which revolves around recognising the significant size of health sector (9.4% of GDP[1] overall-public and private in 2015)
- Benchmarking - where managers are interested in their services relative performance compared to other similar providers

7. A key task of the report was to document the history of previous attempts at measuring efficiency in the sector. Fourteen examples which incorporated or intended to incorporate some form of quantitative efficiency measurement were identified. The context around the Health Targets, which are output measures not directly efficiency/productivity measures, was also examined. Only 3 examples focused exclusively on measuring productivity. These were initiated to support economic objectives external to the health system. Efficiency measures were either a part of a broader performance framework or input for operational purposes. With the exception of the operational purposes, these examples highlight the difficulty that officials have had in identifying a meaningful set of efficiency/value for money indicators.

Examples of measurement by sector

8. Using a time-sequence topology to document the examples did not prove useful; no progression in measurement over time was identifiable. The most useful topology has been to group examples roughly together by what the measurement in the example is doing. The categories are pricing, conceptually measuring productivity, targets, benchmarking, monitoring reports, and other. Table 1 outlines the examples.

Table 1
Examples of Health Sector Measures

Example	Organisations (Time period)	Features
Pricing		
The National Pricing Framework	MoH & DHBs[2] (2002 & ongoing)	- models efficient prices for services provided to other DHBs populations for operational purposes - few in the sector have the skills to engage
Conceptually measuring productivity		
2005 Treasury Report *Productivity Analysis of DHBs*	The Treasury (2005,one-off)	- a conceptual report focusing on what could be measured; identified a range of limitations (particularly output measurement) - a negative response from the health workforce
Performance Assessment and Management Steering	MoH with steering group including	- sought to improve productivity estimates - output incorporated into ongoing DHB monitoring indicators framework

[1] The Treasury (2015) Table 3

[2] Steering Group also included the Treasury and initial work was started by the Health Funding Authority prior to 2000

Group's productivity work stream	DHB input and central agencies (2005-2007;2009)	- work on Health Targets (another work stream) became the priority
Statistics New Zealand's Health Productivity Series	Statistics NZ (2009, ongoing series)	- macro-economic purpose - while not comprehensive was an improved measure compared to prior measure
Targets		
The Health Targets	MoH led steering group including DHB input and central agencies (Development-2005-2007, then ongoing by MoH)	- enduring significant component of the health sector performance framework adopted by consecutive Ministers - small set of understandable health priority targets supported by stakeholders including Ministry leadership, health professionals, and the community - output results focused - leadership and analytical support provided - no explicit efficiency measure though achieving targets may also have increased technical efficiency
Administrative Full-Time Equivalent (FTE) Targets	Government via SSC with MoH implementing (2009-	- Government public sector wide initiative - purpose was increasing efficiency of the sector by focusing on reducing an input and redirecting to front line - effectively strengthens the high-trust model of providers
Health Benefit Limited (HBL)Cost Saving Targets	Minister of Health with new organisation (2010-2016)	- savings target to be achieved by more efficient purchasing of certain inputs - owned and governed directly from the centre - ambitious target created tensions - restructured into a joint DHBs owned vehicle
Benchmarking		
DHB Hospital Quality and Productivity Project	DHBs Chief Operating Officers via national DHB organisations (2009-2015)	- examines DHB variation on 15 indicator measures including efficiency (productivity) - for DHB internal use (impact unknown) - ended as part of a prioritisation review of TAS projects
DHB CEs membership in the Health Round Table	DHBs CEs (2002-onging)	- Initiative is a joint Australian-NZ voluntary organisation - based on a self-learning framework with tight confidentiality expectations -range of benchmarking performance indicators (one specific to efficiency)
Monitoring Reports		
DHB Performance Monitoring Indicators: Ownership-Efficiency/ Productivity	MoH (ongoing)	- one component of a wide ranging framework of DHB nonfinancial performance measures - current measures- inpatient average length of stay and reducing acute readmissions to hospital; at various times labour productivity was also reported - following a review to streamline reporting (to incorporate system level measures), these measures are no longer regularly reported to Ministers or DHB Boards
Health Quality and Safety Commission(HQSC)	HQSC (2010-ongoing)	- HQSC has monitoring framework for measuring health system performance against 3 aims, one which is better value for public health system resources (incorporating

		efficiency): currently reporting health care cost per capita, health care expenditure as a proportion of GDP
The Treasury's Annual DHB Performance Assessment Reports (2014-2016)	The Treasury (2014 and ongoing)	- to assist in advising the Minister of Finance as signatory to DHB annual plans - reports are an overview of DHB performance including productivity as a component - Productivity measures being used are: case weighted discharges per cost of production; case weighted discharges per personnel cost inputs; case weighted discharges per FTE; and the average length of inpatient hospital stay
Ministry of Health Annual Reporting and Director-General's Reports on the State of the Health System	MoH (yearly but content varies)	- at various times, either or both reports have produced efficiency/productivity measures - Efficiency/value for money has consistently been a component of the MoH's strategic frameworks - specific efficiency/productivity measures most likely to be used: average length of stay in hospitals; elective day case rate; ambulatory sensitive hospitalisation[3]; labour (doctors and nurses) productivity - international comparisons of the New Zealand sector are also reported as value for money indicators
Other		
Integrated Performance and Incentive Management Framework and System Level Measures	MoH with primary care and DHBs (2013- ongoing)	- initiative to develop a new performance and incentive framework, utilising a similar triple aim framework as HQSC, with a range of specific measures and providing a financial incentive on achieving measures - the framework evolved to the 5 System Level Measures which do not include an efficiency measure - System Level Measures set high level goals with local Alliances identifying quantifiable contributory measures
Capital Investment Decision Process	Ministerial Committee (2009-ongoing)	- a key methodological component of the process is identifying the least cost ways to produce future services as part of capital investment business case - there is not a single methodology/measure and it is a prospective assessment

Conclusion

9. Attempts to measure efficiency/productivity in the health sector has been tough going. There are data gaps, missing paradigms, and communication issues. The analytical capacity and capability across the sector appears to be in short supply. Measures that are part of operational processes appear more enduring but that could be expected. Meaningful succinct measures to populate performance frameworks have been elusive.

10. The Health Targets on the other hand have been a measurement success. It is not however the instrument in itself that has made it so. Rather it seems to be a combination of features including how they were developed, their acceptance as supporting achievement of important

[3] Hospitalisation able to be avoided through earlier intervention

health system objectives across stakeholders (from Ministers, to health practitioners, to the community), Ministry leadership through target champions and analytic support and the development of a knowledge base to support achievement.

11. Technical constraints are not the only explanation. The design of the health system, the Government's priorities for the sector, the perceptions of key stakeholders, and the generic expectations around public sector monitoring frameworks will have influenced the priority given towards resolving the technical constraints around efficiency measures. Over this period, the focus of public sector monitoring frameworks has been to improve definition and measurement of outcomes (and outputs as interim) not inputs. This is not only applicable to the health sector but also other public services. While being efficient is a widely endorsed objective, measurement of technical efficiency, in particular, has been a lower priority activity compared to other measurement activities.

12. Health sector specific considerations identified include:
    - Government priorities are that the Ministry/DHBs meet capped budgets (no deficits) thereby supporting their overall fiscal strategy and to ensure service delivery which responds to community expectations that there are more and better health services
        - The efficiency/productivity discussion is often linked to a means of improving fiscal sustainability of publicly funded health services
        - Health funding is set separately (while based on) from actual demand and costs
        - Production decisions which are the scope for technical efficiency are devolved to providers which are distanced from the centre
        - Monitoring efforts reflect priorities

    - Since 2000, the Minister of Health's expectations (reinforced by sector experience on making effective change) has been that health practitioners shall have a key role in developing initiatives; however, technical efficiency/least-cost/productivity is the language of economists/accountants/Productivity Commission not health practitioners which implies
        - Efficiency measures need to be meaningful to the workforce if they are to influence improvement

    - Productivity measurement with a focus on output/health practitioner implying too high pay or not enough effort has tended to be perceived "negatively or intuitively wrong" by the workforce

    - Concern over the "incentives" that any potential efficiency/productivity measure has on how DHBs focus on hospital outputs versus nonhospital outputs. The current expectation is that significant cost savings will be from increasing and improving services outside of the hospital.

13. On the basis of this review of previous attempts to measure efficiency, there is scope for the Productivity Commission to advise on meaningful measures of efficiency and productivity (including developing the productivity story) that would be useful to the health sector.

II. Introduction

Purpose

14. The Productivity Commission commissioned this history of measurement of technical efficiency/productivity in the health sector as background for their Inquiry ***Measuring and improving state sector productivity***. The primary purpose of the report is to examine the context in which measurement of efficiency/productivity has occurred rather than a discussion of what should be measured or the technicalities of surrounding specific measures. The latter issues are being covered by other work streams. The focus is on measurement activity not on whether the health system operates efficiently. A secondary component was to also briefly consider the development and use of other system performance measures.

15. Technical efficiency, efficiency, productivity, value for money have unique definitions – both in economics and common usage. Technical efficiency (least cost production) and productivity (output/cost) measures are financial/economic measures which in themselves do not make a judgement about the value of what is being produced. For the purposes of this paper the concepts will be conflated. In the majority of the specific examples and in the system-wide performance frameworks identified in this report efficiency and productivity are put together. However, it is possible to be operating at a technically efficient point but have declining productivity or have increasing productivity without operating efficiently.

Approach

16. The approach started by identifying the examples where national organisations – the Ministry of Health, the Treasury, Health Funding Authority, and Shared Support Agencies attempted to measure efficiency or productivity and then explore the contexts which create the demand for this measurement and what was measured. A range of documents were examined including generic documents (Budget Speeches, Ministry of Health Annual Reports, Health and Independence Reports, documents available in the National Service Framework, District Health Boards planning guidance), specific reports on productivity in the sector, and a few published reports discussing or evaluating the health sector and the 2000 health system reforms. Discussions were held with a wide range of individuals in the different agencies to inform this paper. All views expressed are those of the author.

17. This report is not a literature review or an evaluation of the measures identified.

Exclusions

18. The report revolves around Vote Health and within this context District Health Boards (DHBs). No consideration has been given to attempts by the Accident Compensation Corporation (ACC) to estimate or measure the efficiency of their contracted health sector providers. The nature of the contracts would be expected to have an impact on efficient provision in the non-publicly owned parts of the health sector, particularly, where prices are negotiated. As the focus was on measurement by national organisations, individual DHB measurement practices of their own businesses also have not been examined.

19. Also excluded are examples which have been produced independently of the public sector as they do not provide insight into sector measurement behaviour.

III. Overview of the Health and Disability System[4] -2000 to today

20. Since 2000 the overall design, strategy, and policy approaches applied to the publicly funded health system has been stable. Continuity is a key descriptor. Post transition, structural change over this period has been either incremental or at the periphery of the system. The focus has been on improving health and delivering more services.

Description of the System as it applies to Vote Health

21. In 2017 Vote Health's operating expenditure was $15.3 billion, 5.8% of GDP[5]. It is used to fund a broad range of health and disability support interventions for the population based on need but not on entitlement. The main exception is treatment and prevention of injuries which is funded by the Accident Compensation Corporation.

22. The New Zealand Public Health and Disability Act (2000) (NZHDA) establishes the framework (organisations, their functions, and accountabilities) for managing this funding.

23. It provides for DHBs who are responsible for improving the health of their population (defined by geographical location), planning and acquiring most health services, and managing public hospitals in their geographical locations. Services needed by their population can be (and are) acquired from outside of a DHB's region. The Ministry of Health also plans and funds a range of services which have not been devolved to DHBs. The decision on which services are devolved to local DHBs sits with the Minister of Health. The 20 District Health Boards vary significantly in size – some such as West Coast DHB have small populations and some such as Canterbury DHB large populations.

24. DHBs are Crown Entities and classified as agents of the Crown. They are governed by boards of appointed and elected members who are elected at the same time as local body elections. The boards are strictly accountable to the Minister.

25. The public funding supports provision by public sector entities (primarily hospitals which are part of the local DHB), primary care (generally private though most General Practitioners now participate in Primary health organisations (non-profits)), Private for profit providers (for example: aged care, some hospital care), nongovernment non-profit agencies (for example: disability, ambulance, and mental health services). The nature of the funding arrangement can be direct for DHB provided services, through priced contracts for a service, or as a partial or full subsidy (GP practices, aged residential care). The nature of organisations and funding arrangements can have an impact on inherent incentives for efficient practice in the sector and the type of information on costs that should be obtainable. For example, for DHB owned

[4] This excludes a discussion of the role of ACC which has a different legislative and funding structure.

[5] The Treasury. ***District Health Board Financial Performance to 2016 and 2017 Plans.*** Table 3. February 2017. Wellington. The Treasury.

hospitals there aren't comprehensive prices but there should be cost information; for non-DHB providers there will be a price but cost information tends to be of a commercially confidential nature.

26. DHBs are primarily funded via a population based funding formula (PBFF) which incorporates a demographic and cost parameter. Additional funding is also provided for certain new initiatives—which in most cases becomes part of future PBFF baselines. DHBs are expected to manage with their annual funding – though deficits do arise.

27. DHBs are required to meet the accountability requirements of the NZHDA, Crown Entities Act and Public Finance Act. A range of documents and their timing are prescribed by the Acts. There is, however, flexibility in determining the content of non-financial measures though the Ministry of Health provides significant guidance. The guidance improves consistency making it easier to monitor and advise Ministers.

28. The DHB planning package, monitoring framework, expectations, performance measures, and reporting requirements are all outlined in the Ministry of Health's National Service Framework. Performance measures cover whole-of-Government priorities (such as relevant Better Public Service targets), the Health Targets, System Level Measures, New Zealand Health and Disability Strategies priority areas, and other agreed measures of performance. The Minister of Health outlines priority expectations for DHBs in the annual Letter of Expectations. A key document is the Annual Plan which sets out the financial expectations and what is going to be achieved. The Annual Plans require the sign off of both the Minister of Health and the Minister of Finance. There are also other plans produced. DHBs are required to provide information as part of quarterly and annual reporting. Annual reports are tabled in Parliament.

29. The nonfinancial measures are reviewed regularly. An ongoing issue has been how to reduce the volume of measures being reported on as part of the performance management system while increasing their usefulness.

30. The NZHDA (2000) did not originally refer to efficiency as a DHB objective or purpose. However, in 2010, the Act was amended to introduce for DHBs:
    - a new objective: to seek the optimum arrangement for the most effective and efficient delivery of health services in order to meet local, regional and national needs
    - a new purpose: to collaborate with relevant organisations to plan and coordinate at local, regional, and national levels for the most effective and efficient delivery of health services.
    - Stronger powers of direction covering a wide range of activities including to yield cost savings or provide information that would support the effectiveness and efficiency of the sector.

31. The NZHDA (2000) also requires the Minister(s) of Health and Disability to produce strategies for the sectors and report against them. Besides the funding and monitoring roles, the Ministry of Health is the primary policy advisor to the Minister of Health, undertakes a number of regulatory functions (for example: approving medicines for use, certifying health care providers), and provides certain services on behalf of all DHBs (producing contracts and making associated payments). Under the Health Act (1956) the Director General of Health is also required to report annually on the state of public health.

IV. Pre 2000: Purchaser Provider Split

32. Between 1993 and 2000, a different health system structure - summarised as purchaser provider split- was tried. Tried reflects the design not progressing significantly beyond transition. Improved efficiency (both technical and allocative) of the sector was a key expectation.

33. The impetus for this system change was concern over the ongoing significant deficits that were being created by the predecessor area health boards. By clarifying and separating roles and strengthening the budget constraint, sources of deficits should become transparent and accountability clearer.

34. Briefly, initially four Regional Health Authorities (RHAs) were established and made responsible for planning and purchasing all publicly funded health and disability services. They were funded via the Ministry of Health on a population based funding formula. They purchased services through formal contracts and in an environment which encouraged competition between providers including public hospitals. The Public hospitals became 23 Crown Health Enterprises (CHEs) and were tasked with operating in a business- like manner and to earn a profit. CHEs were not to engage in service provision for which they were not paid for. They were to become more efficient. The RHAs and CHEs were responsible to different Ministers. RHAs were monitored by the Ministry of Health and CHEs by the Crown Company Monitoring Advisory Unit of Treasury. The boards were entirely appointed by the Minister rather than elected as previously.

35. As part of the establishment, deficits were addressed via significant injections of funding.

36. The RHAs were short-lived. The 1996 election resulted in a new National-New Zealand First Coalition government making two significant changes: removal of purchaser contestability by creating a single national Health Funding Authority and changing Crown Health Enterprises (for profit) to Hospital and Health Services (service not enterprise)). The purchaser-provider separation was retained.

37. The structural design was expected to lead to system service improvements by allowing the "purchaser" to focus on the needs of the population and therefore potentially new service design rather than on the viability of existing services (particularly hospitals). Clarifying what outputs were being purchased and at what quality and price mattered. Contracts continued. There was work initiated on setting efficient prices for the services. Processes and mechanisms to engage users and the community were being investigated under an assumption that the purchaser was acting on their behalf. Transparency in the health system was expected to improve. Hospital viability was still an issue for the Government.

38. It was a design with high information needs for decision-makers.

39. It was also a period of significant sector upheaval. As a group, health practitioners saw themselves as being marginalised from key decisions and blamed for problems in the sector. The language of economic efficiency, incentives, contracting was a new lexicon and somewhat removed from their frameworks, practices, and priorities. The tension flowed to increasing

Community concern about whether services would be there when they needed them and whether it was going to cost to access services.

40. While the design was not all about efficiency or profit making nor privatisation, that is what stuck.

Implications
The language of efficiency has a negative association from this era for key health sector stakeholders (the community as well as health professionals)

Health practitioner buy-in, if not leadership, is critical to significant changes, not only for clinical practice but also system structure

The community places a higher value on stability in the health sector (assurance that they can access services when needed) than efficiency

V. The DHB model post 2000: production decisions distanced from the centre

41. Reiterating the decision making framework under the DHB model: Government decides the overall budget constraint and the priorities for the system. Providers (hospitals, primary care, aged residential care, disability support) decide how best to produce the services. Boards provide organisational strategic direction taking into account the Government's expectations, ensure services at the right quality (and price/cost) are being provided for their population, that the Government's assets (i.e. hospitals) are well managed, and are accountable to the Minister. District Health Boards develop annual plans (based on Ministry of Health Guidance) that commit to managing within their budget, address identified priorities, and identify any significant local decisions. The Minister of Health and Minister of Finance sign off the plans providing an opportunity for central input. Central monitoring follows suit.

42. The post-2000 regime and Government expectations established a "high-trust" model for the health sector – it assumes that health entities and practitioners will do their best. Ministers of Health Letters of Expectations to DHB Boards have regularly reinforced two points: you are responsible for managing within your budget and clinical leadership is to be developed, supported, and be provided opportunities to participate in decision making.

43. Introducing distance from the production decisions also has a practical driver. The capped funding approach is combined with flexibility in production to separate the budget constraint from the determination of wages and salaries, a significant input cost. Employers settle pay, conditions and make the payments. Wage settlements are to be met from the budget provided. Ministers of Health do not directly engage in the negotiations. DHBs (and other providers) are provided with significant freedom in determining how they produce their services. But importantly, DHBs are not allowed to trade-off service coverage – that is reduce services to fund pay increases or meet other costs.

44. The incentive for boards to seek efficiency in the delivery of services is that it increases their scope to respond to local priorities and provide more services to their population.

45. However, it would be naïve to assume pay settlements don't impact on budget allocations. Furthermore, in practice, the centre has directed production decisions at various times (from requiring aged care providers to pay more to carers to requiring DHBs to utilise particular providers of certain services).

46. The light-handed approach of the centre to business-as-usual production does not apply to major capital investments. Ministers and Ministries strongly participate in the requirements and assessments of business cases around new major capital investment decisions.

47. In addition, a key strategic objective for the District Health Boards is that they support the overall health system to become less hospital-centric: that is recognise that other bases of provision may have better outcomes at lower cost. Initiatives that strengthen monitoring of hospitals will need to consider how they affect achievement of this objective.

Implication
While the health sector is overwhelmingly publicly funded, production is devolved to crown entities and non-government agencies who decide the mix of inputs and methods of delivery—distance is deliberately sought

The system encourages "high-trust" of health practitioners

VI. Demand for measuring efficiency/productivity

The Government (Parliament, Cabinet, Minister(s))

48. Annual Budget Speeches (and some other related documents), Ministry of Health Annual Reports, and Minister's Letters of expectations were reviewed to assess how a Government and a Minister influenced the demand for measuring efficiency in the sector.

49. Foremost, adequate and then sustainable funding of Health has been a constant priority of all Governments. There is no question of whether there will be more, just on the quantum. In addition, each Government has made delivering a better health system than their predecessor a key goal. In practical terms this has meant delivering more services (or interventions that are health improving).

50. Efficiency of health services has been a lesser objective. Improving efficiency is part of being able to deliver more with a lower impact on the overall Government fiscal constraint; that is ensuring that the system keeps performing well without taking an ever larger share of the budget. The preferred language is one of sustainability. Ministers continually direct the sector to live within their means and support the close monitoring of deficits. Increasing efficiency or productivity is of interest if it is a "free" way of doing more but it is not to create risks around service availability and sector stability. This is reinforced by the parliamentary process where

opposition parliamentarians (regardless of the Government) quickly hold Ministers of Health to account for identifiable service failures and gaps in their communities.

51. Vote Health's draw on the annual Budget at the same time establishes an ongoing tension between Ministers of Health and other Ministers on whether there are better ways that health funding could be managed.

52. In addition, Ministers (and the Government) do not find it very rewarding to just be providing funding for maintenance, they want to be getting something for the money. The measures associated with the Health Targets (paragraph 83) have responded well to this need.

53. The government's productivity focus is a macro-level innovation led economic growth story. It is not a recent focus. Previous Ministers of Finance have asked, given the health sectors size in the economy, how does it fit into the productivity story? This was a consideration for Statistics New Zealand in working on improving the measurement of health sector (and social sector) productivity. The Health sector productivity paradigm, however, remains under-developed leaving the question open.

District Health Board Boards

54. DHB Boards have a governance function with responsibilities to monitor and set strategy. The governance boards, however, have been invisible in the discussions and documentation reviewed for this report. Conceptually they should have a significant role and want measures. The approach taken to focus on the relevant attempts by central/national agencies, however, means that no meaningful observations can be made at this stage on whether the governance Boards have influenced or have tried to measure efficiency in their local hospitals.

The Monitors (The Treasury, the Ministry of Health, the Auditor General)

55. The Treasury, the Ministry of Health, and the Auditor General each undertake monitoring of the health system. These monitors seek to provide assurance that public entities are using public funds as expected (right outputs) and not wastefully (efficiently). This requires them to collect and collate information. They continually ask for better measures to be developed and reported on. Furthermore, their collective view is that while words paint a picture, a good quantitative measure is clearer for assessing performance. The majority of the Ministry of Health and The Treasury led projects identified arise to address monitoring requirements. While the Office of the Auditor General does not initiate or work on projects with agencies, they have strongly sought better performance measures across the accountability documents of health sector agencies.

The Stewards –the designers (Ministers, Ministry of Health)

56. The Stewardship function is stepping back and taking a longer term view on how the system should operate. Health stewardship has an interest in the efficiency with which services are delivered. Understanding cost drivers can be key to system change and design. Stewardship initiatives including changing regulation to allow more workforce flexibility or changing funding systems to incentivise primary care providers to change their practice which can have step changes in the cost of delivering services. A Stewardship initiative will have led to the

establishment of Health Benefits Limited. Major capital investment processes can be seen as a stewardship function as they provide an opportunity to change constraints such as the location of services which have the potential to reduce overall costs.

57. Measures that might support the stewardship function may not be practically useful for the purposes of identifying performance improvement at the front line of health provision. An example is the value for money measure Health as a %of GDP compared to international peer countries. While it says something about the system, it is not meaningful to frontline decisions.

DHB/Ministry funders

58. DHB/Ministry funders seek to acquire quality services at lowest price/cost – that is, from efficient provision as it allows funding to be available for other uses. As such, they should be interested in what drives the costs of provision, particularly where they can-not rely on tendering (and other market mechanisms) to reveal the least-cost option. Hospital services create additional complexities for funders because DHBs cannot effectively shift the risk of cost over-runs to the provider. As owners, a cost over-run comes back as a deficit. How individual DHBs demand or measure efficiency of their providers or themselves has not been explored but may provide some insight into good efficiency measures.

The DHB Provider Sector Managers

59. Sector managers are the budget holders and also should have an understanding of the costs in producing their outputs. Senior sector managers have a key role in delivering on DHB performance expectations. They also collectively negotiate the wages and salaries for their most significant cost – the workforce.

60. Two of the examples identified have been initiated from this group:
    - they commissioned a multi-year quality and productivity benchmarking exercise across DHBs

    - all New Zealand DHB CEs are members of the Health Round Table which provides a wide range of robust comparative hospital benchmarking information. While the level of information to individual DHB management may vary, they have access to much more detailed information on input costs and outputs of different providers than any other group in the system.

Health Practitioners

61. Health practitioners are not passive inputs into the production-mix decisions. The workforce has strong views and most of the expertise on the best way to provide services. They are critical to implementing service improvements. In addition, supporting clinical leadership (primarily nurses and doctors) in decision making and performance improvement has been a key objective across the sector at all levels. The majority of health practitioners accept that they have obligations to ensure the system operates well and that public funding is limited (though not necessarily at the existing level for their service).

62. The language of technical efficiency and economic productivity does not motivate this group. They need to see the health benefit. There have been a number of examples – often using a

quality improvement framework- where health professionals respond well to an efficiency proposition that also articulates a health value – higher quality or better patient outcome.

Community (including users)

63. The Community's interest is around security of service – any efficiency improving initiatives that threaten security of service will have significant opposition.

VII. Examples of Measuring Technical Efficiency/Productivity by the Health System

64. A task of this report is to document the history of previous attempts at measuring efficiency in the health sector. Fifteen examples which incorporate some form of quantitative measurement were identified. The examples are primarily indicators of potential efficiency improvement. Using a time-sequence topology to identify examples did not prove useful; no progression in measuring efficiency over time was identifiable. While one significant difference between the Labour-led governments and National-led governments is identifiable, using Governments or Ministers of Health in thinking about the examples was also not particularly helpful. The most useful topology has been to group by what the measurement in the example is doing: i.e., pricing, benchmarking of own-performance, monitoring, etc.

65. The examples are:
- Pricing:
  (1) The National Pricing Framework
- Conceptually measuring productivity:
  (2) 2005 Treasury Report *Productivity Analysis of DHBs*
  (3) Performance Assessment and Management Steering Group's productivity work stream
  (4) Statistics New Zealand's Health Productivity Series
- Targets:
  (5) The Health Targets
  (6) Administrative Full-Time Equivalent (FTE) Targets
  (7) Health Benefit Limited Cost Saving Targets
- Benchmarking:
  (8) DHB Hospital Quality and Productivity Project
  (9) DHB CEs membership in the Health Round Table
- Monitoring Reports:
  (10) DHB Performance Monitoring Indicators: Ownership-Efficiency/Productivity
  (11) Health Quality and Safety Commission
  (12) The Treasury's Annual DHB Performance Assessment Reports (2014-2016)
  (13) Ministry of Health Annual Reporting and Director-General's Report on the State of the Health System reports
- Other:
  (14) Integrated Performance and Incentive Management Framework and System Level Measures
  (15) Capital Investment Decision Process

National Pricing Framework: Data Envelopment Analysis Project

66. Under the auspices of the National Pricing Framework Project a set of 'efficient prices' for hospital services are calculated using a Data Envelopment Analysis (DEA) model. This work was initiated by the Health Funding Authority to price hospital services. Prices would be set not based on costs of the individual provider but on the costs of a "group" of efficient providers for the service.

67. With the establishment of DHBs there continued to be a need to set prices for inter-district flows (IDFs). Officials (Ministry, DHBs and Treasury) agreed that this work would continue as a basis for determining these prices and to establish reference prices for DHBs for managing their own hospitals. The framework continues to be the basis for IDF payments for hospital services with prices being updated on the basis of new cost information regularly (annually until a couple of years ago). Expectations are that prices will be updated in the near future. The prices determined through this process have been generally acceptable to all DHBs. The extent to which the information is used or has been used for DHB own purposes (benchmarking, allocating budgets) is unknown.

68. Data Envelopment Analysis is a mathematical technique that can be used to identify least cost providers for particular services. It relies on econometric and linear programming modelling. Cost data at an event level (an individual receiving specific health interventions) is provided by DHBs. The determination of the prices requires expert quantification skills and is a highly technical process which few in the sector engage with. But as it appears fit for purpose, it has continued.

69. To work, the model requires a significant portion of DHBs to collect and provide detailed cost information at an event level. Not all DHBs have the required costing systems, they are found primarily in the larger/tertiary DHBs. Maintaining these systems requires having sufficient analytical support for front line managers to accurately allocate costs to events. For some DHBs the analysis/decision-support expertise is in short supply. Quality control can be an issue. It is expected that if the DHB can use this information for internal purposes quality would be better.

70. This is a rich data set on hospital costs but it is not comprehensive. It is an average cost model. While the technique can incorporate constraints, there are limits.

Implication
Estimating the DEA-based efficient prices for hospital services is operationally driven but few in the sector have the skills to engage with the model.

Treasury's 2005 *Productivity Analysis of DHBs*

71. In 2005, Treasury produced a significant report on productivity in the Health sector. Treasury's stated objective for undertaking the analysis was to show that productivity in Health could be measured. It covered a wide range of the methodology issues in measuring productivity in the sector. While not confirmed, it is likely that the significant pay settlements in the sector around that time sparked the analysis.

72. The report analysed expenditure, inputs and outputs using available data. Data limitations meant that they focused on DHB hospitals and only a portion of their activity –in patient medical and surgical. They acknowledged a wide range of limitations.

73. The primary measures were:
    - cost weighted discharges/FTEs (doctors and nurses)
    - average length of stay by DHB case mix adjusted.

74. The report showed recent declines in the productivity of the clinical staff. The focus on doctor/nurse productivity resulted in a lot of sector attention, and not unexpectedly, not positively.

75. While acknowledging the uncertainties over the quality of the data, the then Minister of Finance in correspondence to the Minister of Health tied the analysis to fiscal considerations: "improving hospital productivity is an important way of freeing up money for services outside hospital and for other priorities".[6]

76. The Treasury's work leading up to the report was a key precursor to the focus of the productivity work stream that the Ministry of Health initiated at this time.

The Performance Assessment and Management Steering Group's Productivity Work Stream

77. The Performance Assessment and Management Steering Group (PAM) was formed in early 2005. It was chaired by the Director-General of Health and included representatives from the Ministry, DHBs, District Health Boards New Zealand (DHBs national organisation), Treasury, Department of Prime Minister and Cabinet, and State Services Commission. Its focus was to recommend enhancements to the performance assessment and management of the sector. PAM established an outcomes management working party and a productivity working party. In 2006 PAM also took responsibility for overseeing the Health Expenditure Review which was one of the number of Vote reviews announced by the Government.

78. A set of headline performance indicators to populate the Ministry's system performance framework's objectives of the health system (which were equity &access; quality; efficiency& value for money; effectiveness; and inter-sectoral focus) were identified. Productivity indicators fit into the efficiency & value for money objective. The productivity working group was to recommend an approach to measurement. The initial focus was to capture key drivers of DHB provider arm financial sustainability – personnel costs and labour productivity. While the intent was to produce better measures than the Treasury's estimates, the result was to effectively use the same data sets (with slight adjustments).

79. In 2007, PAM came to an end. Officials recommended to the Minister and then Cabinet to introduce The Health Targets (see paragraph 83). The refinement and implementation of the targets became the priority and consumed a significant amount of the Ministry of Health's analytical capacity.

[6] Letter from Minister of Finance to Minister of Health accompanying report released under OIA.

80. At the time, the productivity work was not completed and Cabinet agreed that productivity measures were to be resolved by the Minister of Health (rather than Cabinet). It became a business-as-usual project. The expectation was that a richer productivity picture would be developed. The main data improvement arose from the completion of the National Non-admitted Patient data set (medical/surgical outpatients and emergency department). In 2009 a technical report was produced on detail advice on measuring:
    - medical and nursing personnel costs per medical and surgical output
    - medical and surgical outputs per medical and nursing FTE

81. Outputs incorporating case weighted discharges for– outpatients, emergency department and inpatients and graphed for 2001/02 to 2007/08. The updated measures were incorporated into annual DHB reporting requirements (paragraph 103).

Statistics New Zealand Health Sector Productivity Estimates

82. In 2009, Statistics New Zealand did a feasibility study on explicitly measuring productivity in health. The objective was to improve the national productivity economy-wide data series. While there were measurement problems associated with the various output measures from the national minimum data set, Statistics New Zealand concluded productivity measures consistent with other industries were possible and would be an improvement over their existing practice. Statistics New Zealand regularly calculates output on the basis of case-weighted in patient discharges, number of day-patient discharges and the average length of stay in hospitals. The productivity measure reflects output growth relative to input growth. The information comes from Ministry of Health National Minimum data sets. The health sector has not used Statistics New Zealand measures in their frameworks.

Implications

The lack of comprehensiveness in measuring outputs remains a concern for the sector in using productivity statistics—measuring on the basis of data availability has not been enduring

Productivity estimates with their "implied blame" on workforce is not helpful in identifying practical efficiency enhancing changes

A productivity paradigm for the health sector needs development -- not just the measure but what does it say/imply about the nature of health services (inputs are internationally mobile/outputs are not; technology is embodied in workforce; the output is changing over time)

The Health Targets

83. The Health Targets have been a key component of the health sector performance framework since 2007. The DHBs and the Ministry are jointly accountable for achieving the targets. As identified above, they were an outcome of the Performance Assessment and Management Steering Group work programme.

84. Appendix 2 outlines the targets over time. They have been relatively stable though there were enhancements in what was actually being measured over time. While not efficiency measures

in themselves, a number of them, particularly electives, incorporate a strong efficiency improvement focus.

85. The benefits and risks of targets is widely covered in the international health performance literature. The most significant concern is that a strong target can have unexpected consequences (the target is achieved at the expense of something else important). The health targets were carefully selected to operate as a group – covering a range of services, hospital and nonhospital, and relevant to the wider sector. They were developed with clinical expertise. They are measurable. They have a strong and tight ongoing reporting process. Each target has a national champion and ongoing support. The champions meet with the Minister quarterly to discuss progress. Progress is discussed by the Boards. Interventions with an evidence base that would support achievement of the target are identified.

86. The idea of targets came into the system via officials. The initial analytical – conceptual arguments were put forward by The Treasury who were influenced by developments in the United Kingdom. UK expertise was used. They were endorsed by the Performance Assessment and Management Steering Group (paragraph x) as a way to strengthen performance management and recommended to Minister of Health and Cabinet.

87. The then Minister and Cabinet agreed to their introduction. They were adopted with some changes by the new Government Ministers in 2009. The main changes being reducing the number and turning them into a community-based accountability mechanism by making them public (which required some changes in how they were measured so as that they could be more easily understood). They are published quarterly in local Newspapers. In 2016 they were updated – the diabetes and cardiovascular checks target, which was consistently being met, was replaced by the Raising Healthy Kids target.

88. Ministers find targets useful. They are action-results oriented. Targets are being used more widely in the Public Sector. In 2012, public sector wide targets with multi-organisational accountability covering 10 goals were introduced.

89. The intensity of focus on targets throughout the health system (from CEs, boards, Ministers) does not apply to the other nonfinancial performance indicators that make up DHB quarterly and annual reporting.

Improving Efficiency of Public Sector Administrators and Moving Resources to the Frontline

90. An examination of a range of documents (budget speeches, Minister's letters of expectations for DHBs) since 2009 identifies "efficiency" as being most closely linked to reducing the cost of public sector administration through administrative FTE reduction targets to free up resources for front line services. This was a public sector wide drive. This "efficiency" objective is not technical efficiency (perversely, the targets will have increased the relative value of people undertaking administrative functions in a production function). However, if it eliminated low value spend there may have been system efficiency gains.

91. It is of interest to this paper because it is an example of the centre strongly monitoring a resource /input and it reinforces the "high trust" of providers within the health sector.

92. In health, the target had two components -- FTE numbers in the Ministry of Health and nonclinical FTEs in DHBs were to reduce and Clinical FTEs (numbers of Doctors and Nurses) were to increase. The FTE numbers were closely monitored by the Minister of Health, particularly the Clinical FTEs.

93. This initiative also put pressure on the funding and planning functions, coordination agencies, data collection, and analytical capacity. It was accompanied by changes to the performance system (less reports, fewer indicators). Developing technical efficiency measures is an administrative function. The actual impact of the reducing bureaucracy drive on capability in the sector is unknown, but it would be expected to at least reduce capacity. Over time, the system could be expected to adapt by increasing the sharing of analytical skills as a way of overcoming the constraints. Analytical-data management capacity and capability is an ongoing issue for DHBs and the Ministry.

Health Benefits Limited- using cost savings targets to drive efficiency gains in the purchasing of non-clinical services

94. Health Benefits Limited was established as a result of recommendations from the 2009 Ministerial Review with a target to save DHBs $700 million over five years by reducing the costs of back office functions through joint (national) purchasing/contracting for various supplies and services. There was to be no negative impact on health services outputs. The result is an efficiency gain for health services– the outputs can be produced at lower input cost. HBL was tasked with measuring the savings but this did require DHBs to provide information.

95. This initiative was imposed on the DHBs. Ownership sat with the Minister of Finance and the Minister of Health. The savings targets proved difficult to achieve. The speed with which HBL was established and expected to achieve savings meant that there were tensions with DHBs. The structure required Chief Executives and Boards to get involved in purchase decisions on items which they would not otherwise have been considering. In addition, individual DHBs were not always winners from an initiative (collectively there would be a reduction in costs but not across the board).

96. In 2016, HBL's governance structure was changed to being owned collectively by the DHBs and now operates as Health Partnerships Ltd.

Implications
The Health Targets appear to be a successful mechanism for achieving change[7]
-- they were chosen and implemented in a manner which facilitates a level of engagement throughout the system – Ministers, Ministry, DHBs, Health Professionals, and the community
-- they respond to health issues of concern
-- there are only a few
-- evidence and professional expertise support achievement
-- Ministry supports (champions, analysts) are in place

The FTE reduction and cost saving targets ran into more difficulties implying that context and supporting infrastructure around a target could be key.

[7] They have not been evaluated.

DHBs Shared Support Agency: Hospital Quality and Productivity Project

97. In 2009, Chief Operating Officers commissioned from the DHBs shared support agency a project on hospital quality and productivity indicators across DHBs. This was initially part of District Health Boards New Zealand's Value for Money work programme which included the Releasing Time to Care programme, the Productive Operating Theatre Programme, and the Leadership Improvement Programme. The purpose was to assist Chief Operating Officers, clinical staff, and service managers in improving the productivity of their hospitals. It did not link to any contractual obligations.

98. Regular reports were available to DHBs until 2015. The indicators were selected to be relevant to operational decision makers, including clinical staff. Significant effort went into making the indicators work for the organisations. The development of service weights rather the cost-weights to improve relevance and acceptability to clinicians was key to this. The report had 15 indicator measures (Table 2) covering economy, efficiency (and productivity), effectiveness and quality. The process focused on identifying variances across DHBs. DHBs could select the peers they wished to compare themselves with. A final document was produced for DHBs in 2015 summarising the results over the six years. The programme ended as part of a prioritisation review of TAS projects.

Table 2
The Measures

• Direct-personnel utilisation • Clinical supplies utilisation • Infrastructure utilisation • Direct-personnel productivity • Direct-medical-personnel productivity • Weighted Inpatient Average Length of Stay • Day of Surgery Admission • Same-day elective surgery	• Did not attend • % ED Patients seen within time thresholds for triage categories 1 to 4 • Unplanned acute readmissions • Follow-up ratio • Emergency department returns • Pressure ulcer rates • Urinary tract infection rates

Health Round Table

99. New Zealand's DHB Chief Executives and by extension NZ's hospitals belong to the Health Round Table. The Health Round Table is an Australian-New Zealand non-profit organisation, independent of funders and regulators, established to provide opportunities for executives of health provider organisations to learn how to achieve best practice in their organisations. The organisation collects, analyses and produces information comparing member organisations and identifies ways to improve operational practice; and promote collaboration amongst health organisation executives. The focus is to support operational improvement in a supportive manner and remove "defensiveness".

100. A requirement of members is that any information they access is used only to assist in understanding their organisation's performance and that all information obtained through this association is kept confidential, particularly information that related to other organisations.

101. The roundtable undertakes a wide range of benchmarking activity across its members as well as highlighting innovative practices. Their reports use an efficiency indicator based on length of stay which can be broken down to high levels of detail (made relevant to specific subservices). Their indicators are considered to have a high degree of validity because of the large volume of information that is used to calculate them.

102. A discussion with the NZ Round Table contact indicated that the majority of DHBs participate in benchmarking and receive information comparing their operations with a peer group (15 peers). They have observed a significant strengthening of interest over the last 2 ½ years in the data, including on efficiency.

Implications
Developing, maintaining, compiling, and using benchmarking data sets requires access to analytical/information management skills which are in short supply across the DHBs -- the indicator does not explain why there is a variance.

DHBs have access to robust (indicators are determined using sector-expertise and considered relevant for improvement) sector-based benchmarking information that facilitates a learning approach to improving their hospital business

The DHB Performance Monitoring Indicators: Ownership- Efficiency/Productivity measures

103. The DHB monitoring framework aims to provide a rounded view of an individual DHB's performance using a range of indicators. For many years this has included a category: providing quality services efficiently or ownership. The Ministry defines efficiency as reducing the costs of inputs relative to the value of outputs.

104. Two particular measures have been used[8]: inpatient average length of stay and reducing acute readmissions to hospital.

105. The rationale for the two measures are that lower numbers signal improvements in how the system operates; they do not however allow comment on how costs are being managed. How reporting on these measures have influenced DHB decisions and processes is also not clear.

106. From 2016/17, following a review of performance reports to streamline and make room for System Level Measures, the efficiency-ownership measures are no longer made available regularly to Ministers and Boards. They remain part of the comprehensive package of performance reports that are provided to the Ministry and considered by officials.

[8] I have been unable to confirm a start date for the specific measures but an "ownership-efficiency" performance measure would have been part of the monitoring framework for DHBs since inception.

Elective services and efficiency

107. An examination of district annual plan guidance, monitoring expectations, Ministry of Health Annual Reports over a long period put elective services and technical efficiency improvement together—it is the primary service that consistently links to efficiency improvement in accountability related documents. This has not, however, translated to a quantifiable efficiency measure for reporting purposes.

108. The elective services target is quite simple – a specified increase in volumes of elective services discharges. It has been argued that the achievement of the elective services target is an efficiency measure, especially when considered in the context of achieving emergency department and cancer targets. Achieving improvements of all three are expected to imply that the DHB hospital has improved the efficiency of their operations. To the extent that target achievement has been achieved with additional funding, this argument may not hold. A closer look at how the electives targets have been achieved may be able to inform recommendations on practices which embed seeking lower cost ways of delivering services.

Health Quality and Safety Commission (HQSC) – Triple Aim

109. The Health Quality and Safety Commission was established on the 2009 Ministerial Review Group recommendation with widespread support from clinical leaders in New Zealand. All of the work of the Commission is undertaken closely with the sector.

110. The HQSC's purpose is to work with health practitioners, providers, and consumers to improve health and disability support services. Improvement covers three aims:
- improved quality, safety and experience of care
- improved health and equity for all populations
- better value for public health system resources

111. The HQSC has an interest in working on initiatives which achieve all 3 aims at once.

112. One example (taken from their website) is The Optimising the Patient Journey Programme. It focused on placing the patient at the centre of the journey through inpatient services and was aimed at making more effective use of limited and expensive resources. 20 DHBs participated by working on at least one initiative that improved the quality of care for the patient while eliminating waste from the system. A review found that the programme improved staff and patient satisfaction, and was estimated to reduce bed days by 575 and save around $3 million over 5 years.

113. The Commission has a health quality evaluation programme which incorporates measuring health system performance against the aims. As such they have had experience in developing measures. The framework is intended to incorporate efficiency/resource utilisation measures. Similar to other attempts to measure efficiency/better value for money – progress has been relatively slow and current measures include the often used: health care cost per capita, health care expenditure as a proportion of GDP. Some work has been undertaken to look at another better value measure: Hospital days during last six months of life.

The Treasury's Annual DHB Performance Assessment Documentation (November 2014, June 2016 and February 2017)

114. Since 2014 The Treasury has produced a performance assessment of DHBs. Initially, the assessment was for internal purposes only but given the high level of interest in their analysis, it is now published. Treasury has a second-opinion role as an advisor to Ministers on health expenditure and health-owned assets. They support the Minister of Finance in his role as a signatory with the Minister of Health to DHB annual plans. These reports are intended to assist in that process and are expected to continue to be produced. A range of health system related matters in addition to financial management are analysed.

115. In the most recent assessment they cover financial management and efficiency, provider-arm vs non-provider arm expenditure; provider-arm personnel expenditure growth and staffing profile, capital management, repairs and maintenance, and productivity. There were no efficiency-specific measures and the productivity measures were produced for continuity. In previous years, the report also provided some health outcome data.

116. The productivity measures used by The Treasury for this purpose are:
    - Case weighted discharges (excluding mental health and disability services)per cost of production
    - Case weighted discharges per personnel cost inputs
    - Case weighted discharges per FTE
    - The average length of inpatient hospital stay

117. As with their 2005 report (paragraph 75), these subsequent reports acknowledge the incompleteness of the productivity measures.

Ministry of Health Annual Reporting and the Director General's Report on the State of the Health System- the *Health and Independence Reports*

118. As part of its annual report and the Director General's Reports on the State of the Health System, the Ministry of Health reports on a range of health system matters. The Health and Independence Reports incorporate a wide range of data on health status and health system performance over time. Annual reports are focused on current issues and reflect the previous year's priorities for the Ministry of Health.

119. Over the period reviewed, The Ministry's strategic and outcome frameworks for reporting consistently incorporate an efficiency/ value for money component. At the overall system level there has been a reliance on international comparator measures. The specific New Zealand sector efficiency/productivity measures have varied over time. The most often (though not at the same time) specific efficiency/productivity measures reported are
    - Average length of stay in hospitals
    - Elective Day Case Rate
    - Ambulatory sensitive hospitalisations[9]
    - Labour (Doctors and Nurses) productivity in public hospitals

[9] Ambulatory-sensitive hospitalisations measures the number of people who appear in hospital with conditions that could have been prevented or treated in out-of-hospital settings such as primary health care

International Comparisons as indicators of system performance

120. International comparisons (a form of benchmarking) of health expenditure to GDP or per capita expenditure is regularly used as an indicator of overall value for money of the New Zealand health system. The argument being that New Zealand's health outcomes and available health services are comparable to peer countries but is costing less (or is comparable) to other countries New Zealand benchmarks against. The OECD and the Commonwealth Fund (a U.S. health improvement foundation) regularly provide a range of statistics on health system performance across countries.

121. These international indicators, however, do not answer the question whether New Zealand services are delivered at least cost, they just assist a judgement call that overall the system is working cost-effectively.

Implication
These four examples, highlight the difficulty the sector has had in populating its efficiency-value for money indicator set -- implying that there has been insufficient conceptual work on potential indicators and, therefore, that it is a gap that could be better addressed

The Integrated Performance and Incentive Management Framework and System Level Measures

122. System Level Measures were introduced into the DHB performance management framework in 2016/17.

123. Starting in 2013 the primary care work stream in the Ministry of Health initiated a project to develop a new performance and incentive management framework, primarily for primary care but with expectations that it could be extended to other parts of the health sector. This initiative was to link incentives (including financial) to appropriate performance measures. This work was undertaken with a wide range of sector input and use of expert committees. Local Alliances across primary care providers and the DHB were developed. The performance framework was based on the triple aim (paragraph 109) objectives used by the Health Quality and Safety Commission.

124. Significant work went into identifying measurable performance measures that could be used in making progress by primary care in improving health outcomes for their populations. The agreed criteria included being intelligible; contributing to quality and safety; improved population health; value for money (does improvement in performance against this indicator have potential to drive efficiency and achievement of improved value for money); focus on sector priority/area of concern; ability to influence change; technical and operationally feasible.

125. The framework relied upon the concept of system level measures, which were to be set nationally and could encapsulate high level goals for the health system. Locally providers would then identify their contributory measure to the high level measure which would reflect the needs and priorities of their community.

126. Sole-focused better value for public health system resources were not identified at this point. The indicators in the framework did not ignore value for money criteria (a safety indicator can have the potential to drive efficiency) but few indicators populated the better value for public health system resources component of the framework compared to the other two components: quality, safety and experience of care and health and equity for all populations.

127. Progress on the project was influenced by the 2014 election and change in Ministers. The new Minister's priority was to produce an updated New Zealand Health Strategy. This then influenced how the project was taken forward. It evolved into the limited set of Systems Level Measures which were incorporated in the DHBs existing performance management system. The broad-based indicator framework was not progressed. There are no specific system level efficiency or cost measures. The System Level Measures are: ambulatory sensitive hospitalisation rates for 0-4, acute hospital bed days per capita; patient experience of care; amenable mortality rates; and proportion of babies who live in smoke-free household at six weeks post-natal. A quality improvement approach by DHBs and the local Alliances is to underpin progress on the System Level Measures. Local Alliances will determine how they would contribute to the achievement of the system level measure.

Implication
Meaningful measures of efficiency continues to elude the sector

Strengthening the capital investment decision process

128. The 2009 Ministerial Review Group recommended the strengthening of the capital investment decision making process - including giving it a more independent focus from ongoing operational decisions. A Ministerial Committee was established to focus on advising on all major capital projects in the health system – generally around hospital new builds. This example has been included because a key methodological component is identifying least cost ways to produce required future services. Major new investments provide the opportunity to seek the efficient production process (best input mixes, building design, key equipment, the appropriate location (in hospital/in community)) for a range of services.

129. This process does not however provide systematic/consistent information to measure ongoing efficiency of health services. Over time there should be a convergence of methodology in business cases – same benefits, same costs calculated consistently. They are, however, prospective assessments.

Implication
Operational needs can support the measurement of technical efficiency in the sector

VIII. What does past attempts to measure efficiency imply for future attempts to improve efficiency measurement in the health sector?

130. In a nutshell, attempts to measure efficiency in the health sector have been tough going. There are data gaps, missing paradigms, and communication issues. The analytical capacity and capability across the sector is in short supply.

131. Three of the examples incorporate efficiency measures in a relatively enduring and ongoing manner:
    - the national pricing framework
    - The Round Table Benchmarking
    - Capital Investment Process

132. The pricing framework and capital investment approach revolve around responding to operational requirements of DHBs – hence the motivation for this work is clear.

133. The other example, participation in the independent Health Round Table, is low cost for DHB senior managers and their organisations with any action/follow-up remaining within their control. It contributes to a learning culture rather than accountability and performance management. While their benchmarking includes an efficiency indicator, this is only one of many indicators on a range of performance dimensions.

134. An enduring approach to measuring and monitoring for results has been the Health Targets. The success[10] is not just because a target mechanism is a stronger measure than an indicator. Supporting features are that the targets as a group reflect health priorities for multiple sector stakeholders. This has facilitated ongoing engagement. The implementation was a key priority for the Director-General of Health and leadership was provided. There has been ongoing infrastructure support (champions, analysts), and the development of a knowledge base to support achievement. The Health Targets are not only monitored but there is a programme supporting their achievement.

135. A number of the Health Quality and Safety Commission initiatives have a similar underlying infrastructure - monitoring indicators are part of a programme supporting achievement of quality improvements. Measurement is not undertaken in isolation from supporting activity.

136. Both of the preceding examples, however, do not focus on measuring efficiency of the services, though in achieving their objectives are expected to have increased the efficiency of services.

137. A number of the examples highlight the difficulties that officials have had in identifying a meaningful set of efficiency/value for money indicators. All of the system monitoring frameworks identify efficiency/value for money as a key aim for the sector or DHB, but meaningful specific indicators have not been identified. There appears to be a gap about how to think about efficiency- least cost production- for performance monitoring in the health sector.

[10] Success is being defined as being in ongoing use as a measurement tool; in this case the targets appear to be being achieved but the programme has not been evaluated.

138. Overall productivity estimation has been initiated from outside the sector to address external-to-sector needs: supporting economic growth and improving associated national productivity statistics. The exception is the DHBs Hospital Quality and Productivity framework which included workforce productivity measures as part of its comparator statistics. At the micro-level, the measure says something about each DHBs production function compared to others in the sector. Output/input measures would be expected to be a common management metric in most sectors across the economy.

IX. Conclusion

139. On the basis of this review of previous attempts to measure efficiency, there is plenty of scope for the Productivity Commission to advise on measures of efficiency and productivity that would be useful to the health sector. Language will, however, matter if recommendations are meant for the wider sector.

140. The health sector's performance frameworks, at all levels, acknowledge that efficiency/value for money are key components of a high performing health system. The organisations, however, have not invested significantly in developing their own measures. Meaningful succinct measures (and measurement) have been elusive. Data availability and its quality is an issue but other considerations are likely to have played a role given the relative priority on improving the data.

141. The aggregate productivity paradigm also needs development. The productivity measures are too easy to interpret as doctors and nurses are being paid too much or are not doing enough. This is only useful if workforce controversy in wage negotiations is the aim. It is not just about a debate over the technicalities of what is included in the measurement, but what is it actually saying about the sector. From a system performance assessment perspective what does it mean to measure productivity in a traditional way when most of the workforce is internationally mobile but the outputs are not? Is technology improvement/innovation internalised within the workforce via new knowledge or is it external (IT systems, new equipment)? Are the outputs over time actually comparable (is a discharge in 1997 the same as in 2017)?

142. System design expectations have had an effect on what type of indicators are being measured. Both the funding system (capped with strong monitoring but devolving and providing flexibility on the production function) and the public sector performance management system (outcomes/outputs – not inputs) don't encourage focusing on the production functions of providers.

143. The sector is also likely to have strong views on the 'incentives' that any potential efficiency measure has on how DHBs focus on hospital outputs versus non hospital outputs. The current expectation is that significant cost savings (change in the slope of the sector's cost curve) will be made by focusing on increasing and improving services outside of the hospital. Under this scenario, an individual hospital's services may become more costly (average costs increase) but the systems costs reduce. It is asking the question of where least cost is measured – at the provider or at the system.

144. While efficient production is an objective in its own right, the demand for information and measures on whether services are being produced efficiently has closely linked to deteriorating financial performance in the health sector. At this point, funders, particularly the Minister of Finance ask: is more money really required to maintain the level of services? Or can services be maintained by improving efficiency? There are serious information gaps in being able to answer the question and the best information sits with the provider seeking funding. Unless the sector efficiency measure assists in responding to this question will it be seen as sufficiently useful to the Minister of Finance?

145. Finally, technical efficiency/least cost production/productivity is the language of economists/accountants/The Productivity Commission; without a health outcome or health service quality anchor, health practitioners will fail to engage. How important this last point is revolves around how the measure is expected to be used – for whom is it meant to be meaningful?

References

Ashton, T. (2015). Measuring health system performance: A new approach to accountability and quality improvement in New Zealand. *Health Reform Monitor* retrieved 14 September 2017 from www.healthpolicyjrnl.com/article/S0168-8510(15)00119-0/fulltext

Ashton, T. (2007). Financing, Purchasing and Contracting Health Services. Health Reforms 2001 Research Project Report No 4. Health Services Research Centre: Victoria University of Wellington. Retrieved 13 September 2017 from www.victoria.ac.nz/health/centres/health-services-research-centre/our-publications/reports

Coleman, J. (2016). Ministers Letter to DHB CEs. Retrieved 25 August 2017 from www.nsfl.health.govt.nz/dhb-plannningpackage/system-level-measures-framework

Cumming, J. (2007). Devolution in New Zealand's Publicly Financed Health Care System. Health Reforms 2001 Research Project Report No 5. Health Services Research Centre: Victoria University of Wellington. Retrieved 13 September 2017 from www.victoria.ac.nz/health/centres/health-services-research-centre/our-publications/reports

Desai, J. (2010). Explaining variation in hospital productivity in New Zealand. Presentation. Retrieved 18 August 2017 from www.adhb.govt.nz/news/Events/Tertiary%20Services%20Conference/2010/Presentations/3_Explaining%20variation%20in%20hospital%20productivity%20in%20New%20Zealand.pdf

Desai, J, Bowden, N & Cumming J. (n.d.). Whither hospital productivity in NZ? Presentation. Health Services Research Centre: Victoria University of Wellington. Retrieved 18 September 2017 from www.cdn.auckland.ac.nz/.../documents/Productivity%20and%20efficiency%20in%2

Gauld, R. (2013). Governance of the New Zealand health system. Presentation retrieved 16 August 2017 from www.igps.victoria.ac.nz/events/03%20May%202013Gov%20of%20NZ%20Health%20System

Mays, N. & Cumming, J. (2007). Performance of New Zealand's Publicly Financed Health Care System: A Focus on Performance under the New Zealand Public Health and Disability Act (2000). Health Reforms 2001 Research Project Report No 10. Health Services Research Centre: Victoria University of Wellington. Retrieved 13 September 2017 from www.victoria.ac.nz/health/centres/health-services-research-centre/our-publications/reports

Mays, N., Cumming, J. & Tenbensel, T. (2007). Overview Report. Health Reforms 2001 Research Project Report No 1. Health Services Research Centre: Victoria University of Wellington. Retrieved 13 September 2017 from www.victoria.ac.nz/health/centres/health-services-research-centre/our-publications/reports

Meridien Consulting. (2003). Methodology for the NZ Health Sector National Reference Pricing Framework: A Review. Prepared for the Joint Sector Working Group. Provided 15 September 2017 by the Ministry of Health. Unpublished document.

Ministerial Review Group. (2009). Meeting the Challenge: Enhancing Sustainability and the Patient and Consumer Experience within the Current Legislative Framework for Health and Disability Services in New Zealand (Report and Annexes) retrieved 14 August 2017 from www.beehive.govt.nz/release/ministerial-review-group-report-released

Ministry of Health (2015). From Cost to Sustainable Value An Independent Review of Health Funding in New Zealand. *Commissioned by the Director General of Health.* Retrieved 30 August 2017 from

www.health.govt.nz/about-ministry/what-we-do/new-zealand-health-strategy-update/funding-review

Ministry of Health (2014). Integrated Performance and Incentive Framework Expert Advisory Group Final Report. Final Report Appendices. Letter from Dr Graham Scott. Retrieved 3 September 2017 from hiirc.org.nz/page/45527/

Ministry of Health. (2012). *The New Zealand Health and Disability System: Organisations and Responsibilities: Briefing to the Minister of Health*. Wellington: Ministry of Health retrieved 16 August 2017 from www.health.govt.nz

Ministry of Health. (2006). 2006/07 Ministry of Health Output Plan. Retrieved 11 September 2007 from www.health.govt.nz/system/files/.../moh-output-plan-20062007-may07-v5.pdf

Ministry of Health. DEA Project Team (2003). Joint National Provider Arm Benchmarking and Pricing Programme: DEA Modelling Final Report. Provided 15 September 2017. Unpublished internal document.

Ministry of Health. (2003). New Zealand Health and Disability Sector Overview. Wellington. Ministry of Health. Retrieved 11 September 2009 from www.moh.govt.nz/notebook/nbbooks.../NewZealandHealthAnOverviewJuly03.pdf

Ministry of Health (n.d.) Annual Reports (multiple years). Retrieved between 15 August and 30 September 2017 from www.health.govt.nz/about-ministry/corporate-publications/annual-reports

Ministry of Health (n.d) Background Paper: Application of DEA and Sustainability; A General Introduction to Data Envelopment Analysis (DEA). Provided 15 September 2017. Unpublished internal document.

Ministry of Health (n.d). Health and Independence Reports (multiple years). Retrieved between 15 August and 30 September from www.health.govt.nz/about-ministry/corporate-publications/health-and-independence-reports.

Ministry of Health (n.d). National Service Framework Library. Webpage. Available at www.nsfl.health.govt.nz Provided extensive information on Ministry of Health monitoring of DHBs in current and past years.

Ministry of Health (n.d.). Technical documentation on the 2009 update of the Ministry of Helath Performance Assessment and Management Steering Group (PAM) productivity metric. Unpublished document. Retrieved on 11 September 2017 from www.moh.govt.nz/notebook/nbbooks.../D34D974C68795741CC25772000717FF

New Zealand Productivity Commission. (2017). *Measuring and improving state sector productivity: Issues paper*. Available from www.productivity.govt.nz/inquiry-content/state-sector-productivity

Parliamentary Library Research Paper. (2009). New Zealand Health System Reforms. Research Paper 09/03. Retrieved on 13 September 2017 from www.parliament.nz/resource/en-NZ/00PLSocRP09031/9772cc5da74650da549200e3627fef0ef46c5fa

Provost L.(2015) Inquiry into Health Benefits Limited. Office of the Auditor General. Retrieved on 14 September 2017 from www.oag.govt.nz/2015/inquiry-hbl/docs

Scott G. (2008). After the Reforms: Some Questions About the State of the State in New Zealand. *Policy Quarterly: 4(2):3* retrieved on 1 September 2017 from www.treasury.govt.nz/downloads/pdfs/tfr-ar-2oct09

Statistics New Zealand. (2010). Measuring government sector productivity in New Zealand: feasibility study. Wellington: Statistics New Zealand. Retrieved 20 September 2017 from www.stats.govt.nz › Browse for statistics › Economic indicators › Productivity

Steering Committee for the Review of Commonwealth/State Service Provision. (1997). *Data Envelopment Analysis: A technique for measuring the efficiency of government service delivery,* AGPS, Canberra retrieved 13 September 2017 from www.pc.gov.au/research

Tenbensel,T. (2007). District Health Board Strategic Decision-Making. Health Reforms 2001 Research Project Report No 3. Health Services Research Centre: Victoria University of Wellington. Retrieved on 13 September 2017 from www.victoria.ac.nz/health/centres/health-services-research-centre/our-publications/reports

Tenbensel,T., Mays, N. & Cumming,J. (2007). Public Sector Management and the New Zealand Public Health and Disability Act. Health Reforms 2001 Research Project Report No 11. Health Services Research Centre: Victoria University of Wellington. Retrieved 13 September 2017 from www.victoria.ac.nz/health/centres/health-services-research-centre/our-publications/reports

Technical Advisory Services Ltd. (2015). Hospital Quality & Productivity Report to December 2015. Provided on 3 September 2017. Confidential unpublished internal document

The Treasury. (2017). District Health Board Financial Performance to 30 June 2016 and 2017 Plans. Retrieved 13 September 2017 from www.treasury.govt.nz/publications/informationreleases/health/dhb-performance

The Treasury. (2016). Analysis of District Health Board Performance to 30 June 2015. Retrieved 8 September 2017 from www.treasury.govt.nz/publications/informationreleases/health/dhb-performance

The Treasury. (2014). Analysis of District Health Board Performance: 2009-2013. Retrieved 8 September 2017 from www.treasury.govt.nz/publications/informationreleases/health/dhb-performance

The Treasury (2014). Briefing to Incoming Minister Health. Retrieved 14 September 2017 from www.treasury.govt.nz/publications/briefings/2014

The Treasury. (2005). Treasury Report: Value for money in health – the DHB sector. Retrieved 13 September 2017 from www.treasury.govt.nz/publications/informationreleases/health/sector/tr05-344.pdf

Annex 1

The Health Targets

2007	**2009/10**	**2016/17**
Elective Surgery	Elective Surgery	Elective Surgery
Cancer waiting times	Cancer waiting times	Cancer Waiting Times
Reducing ambulatory sensitive hospitalisations		
Immunisation coverage	Immunisation coverage	Immunisation coverage
Oral health		
Diabetes services-checks	Diabetes and Cardiovascular services-checks	
Mental health services		
Nutrition, physical activity and obesity		
Tobacco use harm	Quit Smoking	Quit Smoking
% of health budget spent on the Ministry of Health		
	Emergency departments	Emergency departments
		Raising Healthy Kids