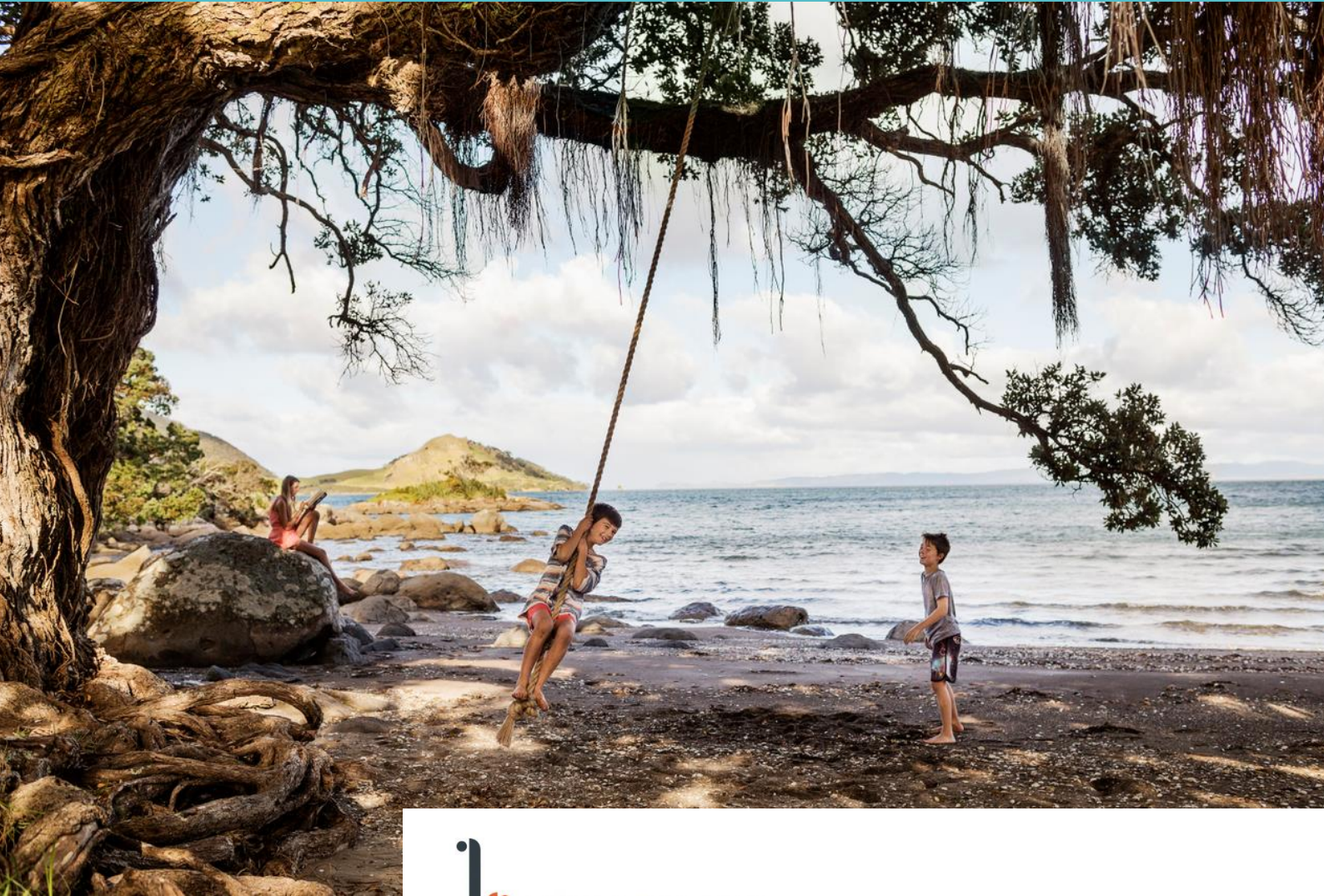




Sector State of Play: Health and Disability Infrastructure

Discussion Document

Foreword

Our wellbeing depends on our infrastructure

Our way of life depends on infrastructure. Whether it's moving freight to keep the supermarket shelves stocked, warming our homes, driving to work or calling our friends, there are few parts of our lives that don't rely on the services provided by infrastructure.

Infrastructure decisions have intergenerational impacts, so it is essential that we take a strategic view of the planning, development and operation of infrastructure in Aotearoa. New Zealand Infrastructure Commission was formed to give infrastructure this strategic voice, and the significance of this task is reflected in our Māori name, Te Waihangā, which means *cornerstone*.

Our first task is to develop a 30-year strategy for infrastructure - this paper is a part of this work. It takes a closer look at the current state of play in New Zealand's health and disability sector. By understanding where we are now we can set a course for where we want to go and the steps we'll need to take to get there over the next 30 years.

New Zealand faces a range of challenges and opportunities over the next 30 years which will have significant implications for infrastructure. Our changing climate, rapidly growing cities, aging population and evolving global technologies will change what we need from infrastructure in order to maximise the wellbeing of New Zealanders. Each of us has our own experiences of infrastructure, so we look forward to receiving your feedback to ensure this State of Play report accurately reflects the current state.



Ross Copland

Chief Executive

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1. Executive Summary

1.1. Introduction

The New Zealand Infrastructure Commission, Te Waihangā, is responsible for developing a 30-year strategy for infrastructure. With your input, we will build our understanding of future trends and likely challenges and make recommendations on how infrastructure can support New Zealand's future wellbeing.

This chapter provides a summary of New Zealand's current health and disability sector (the Sector) and the infrastructure that supports it. For the purposes of this report, health infrastructure refers to the physical assets owned and maintained by the broader health system where the "health system" comprises the many organisations involved in healthcare - public, private and non-government - including District Health Boards (DHBs), primary health organisations, as well as professional and regulatory bodies, among others.¹ However, health infrastructure is dependent on other infrastructure sectors (such as telecommunications and education) to function effectively, provide high quality services and achieve the best outcomes. This State of Play report takes a system wide perspective with non-health related infrastructure and service delivery discussed in order to highlight the inter-dependencies within the system and the need for a system wide perspective on infrastructure management and investment. Views from numerous reports and sector leaders have been collated to present a summary of how well placed the sector is to meet New Zealand's longer-term opportunities and challenges.

Note: This document was prepared prior to the Government's health announcements on 21 April 2021. As such, this document reflects the status quo organisation arrangements and is a snapshot in time. The announced changes to the health system's organisational structure are also not expected to have an immediate effect on physical infrastructure.

1.2. About the System

Health and disability infrastructure is a type of social infrastructure designed to support and improve a person's quality of life through the provision of healthcare, supported living, and end-of-life care.² The Minister of Health has overall responsibility for the health and disability System, and is supported by the Ministry of Health (MoH). MoH ultimately oversees and funds the 20 DHBs in New Zealand in addition to monitoring DHB and non-DHB Crown entity performance on behalf of the Minister.³ The DHBs plan, manage, and purchase health services for their populations:

- DHBs provide secondary and tertiary services. The former are services provided by medical specialists, typically in a hospital setting. The latter are specialist inpatient services for patients who stay in a hospital or health centre (e.g. cancer management, cardiac surgery).⁴
- Primary health care covers a broad range of health services, including diagnosis and treatment, health education, counselling, disease prevention, and screening.⁵ Primary services are provided through DHB contracts with primary health organisations and their contracted primary health providers.⁶ In some instances, DHBs provide primary health care directly (e.g. West Coast DHB).⁷

¹ Ministry of Health, *Overview Of The Health System*.

² Infrastructure Commission definition.

³ Ministry of Health. *Overview of The Health System*.

⁴ West Coast District Health Board, "Primary, secondary, and tertiary healthcare."

⁵ Ministry of Health. "Primary health care."

⁶ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 44.

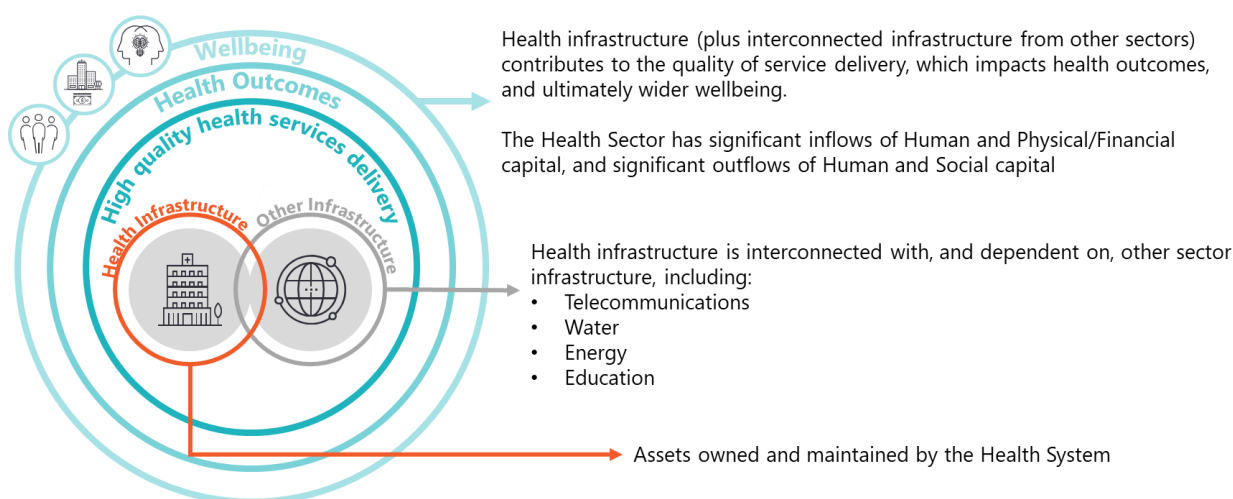
⁷ West Coast District Health Board, "Primary, secondary, and tertiary healthcare."

- Aged care services include home-based community care, intermediate care (rehabilitation and short-term residential stays), and long-term residential care.⁸ The majority of residential care facilities are privately operated (1% DHB owned), with DHBs contracting aged care services from eligible facilities. Aged residential care hospital level services are subsidised by DHBs.

Health and disability system assets contribute to wellbeing by enabling a better standard of service delivery, which in turn contributes to more equitable health outcomes. Within the New Zealand context, it is important to note the sector's obligations under Te Tiriti o Waitangi | The Treaty of Waitangi to act on principles of good faith and partnership, active protection, equity, and options. It is therefore imperative for the sector to incorporate the Māori worldview on health and wellbeing to promote equitable outcomes. He Korowai Oranga (the Māori Health Strategy)⁹ and the Māori Health Action Plan¹⁰ currently guide Government and sector direction for advancing Māori health and wellbeing.

The physical infrastructure underpinning the health system includes community-based facilities, aged residential care facilities, DHB facilities (including hospitals), and privately funded health care facilities.¹¹ However, health and disability infrastructure is not limited to physical assets such as buildings and technology. It also encompasses the network of soft infrastructure services required to support effective and equitable service delivery. This includes the skilled workforce, research and regulation, governmental structures, training and educational resources, data connectivity, the natural environment, social connections, and cultural norms. The sector therefore has dependencies on other sectors, such as transport, water, energy, telecommunications, and education to support both the general health and wellbeing of the population and aid the delivery of services through resilient infrastructure and a thriving workforce. For example, a report by the United Kingdom's Commission for Architecture and the Built Environment (now merged into the Design Council) highlights the value of the physical environment in improving health outcomes. In particular, the report encourages built environment planning to include greater provision of active modes of transport and public transport connections to promote good health and improve access to health services, thus exemplifying the relationship between the health and transport sectors.¹²

Figure 1: Relationship between health (and other) infrastructure, service delivery, outcomes, and wider wellbeing



⁸ Ernst & Young, Aged Residential Care Funding Model Review.

⁹ Ministry of Health, "He Korowai Oranga."

¹⁰ Ministry of Health, *Whakamaua Māori Health Action Plan 2020-2025*, 21

¹¹ Health and Disability System Review, *Health and Disability System Review Final Report*, 97-8, 147.

¹² Commission for Architecture and the Built Environment. "Future Health", 6-8

Where possible, this report aims to provide an overview of the health and disability system on a holistic basis. However, comments on infrastructure largely relate to assets own by crown entities as there is limited understanding of wider system and private facilities – particularly with respect to asset age and condition, future investment plans, and return on investment.

1.3. Current State, Issues, and Challenges

Māori Health Inequities

Māori health inequities remain persistent within the sector, with Māori continuing to experience disproportionately poor health outcomes. The recent Waitangi Tribunal's Health Services and Outcomes Inquiry (the Inquiry) (Wai 2575)¹³ found the Crown in breach of Te Tiriti o Waitangi commitments to guarantee tino rangatiratanga or "absolute sovereignty and self-determination".

The Inquiry recommended establishing a national Māori controlled agency/organisation/collective to oversee Māori health related spending and policy. Similarly, the Health and Disability System Review (the Review) recommended the creation of a Māori Health Authority to control funding and commissioning of services for Māori.¹⁴ There is a clear need to develop commissioning models that work for Māori and provide greater access to wider kaupapa Māori services for Māori communities. Discussions as to what this will entail are still ongoing, but the implications for the system's infrastructure requirements – both physical and soft – are likely to be significant.

Rapidly Growing and Ageing Population

New Zealand's rapidly growing and aging population (27% over 65 by 2050)¹⁵ is also expected to place significant pressure on the sector. In combination with the increasing prevalence of chronic disease and higher consumer expectations, this demographic shift will increase demand for services (both public and private), further straining infrastructure already stressed from historic underinvestment and poor planning. Current health and disability facilities have also been found to be not fit-for-purpose due to insufficient facility maintenance and renewal due to decades of under-investment, increasing demand, and the inability to keep up with modern models of care that respond to new and emerging trends. 'Models of care' refer to the way health services are organised and delivered including between hospitals and community and primary care. Existing models of care are often outdated and inadequate to support anticipated future care needs from our ageing population, increasing ethnic diversity, growing patient complexity, and more exacting consumer expectations.

Planning and Governance

More transparent planning, governance, and prioritisation of investment at a national level will be required to ensure facilities and equipment are safe and fit-for-purpose. In particular, long-term investment planning, development of a nationally significant investment pipeline, standardisation of the capital investment and delivery process, and greater financial and governance expertise on DHB Boards were noted as key recommendations from the Review. A national long-term investment plan and investment pipeline will be required to ensure business cases are not developed for projects that are not of national priority.¹⁶

The sector's governance and regulatory structure is complex, with devolved governance contributing to a lack of coordination and leadership. The Review provided extensive regulatory and governance

¹³ Health and Disability System Review, *Health and Disability System Review Final report*; Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*.

¹⁴ Health and Disability System Review, *Health and Disability System Review: Final Report*, 7.

¹⁵ Health and Disability System Review, *Health and Disability System Review: Final Report*, 117.

¹⁶ Health and Disability System Review, *Health and Disability System Review: Final Report*, 17.

recommendations,¹⁷ including the creation of Health NZ to be accountable for service delivery, a new Māori Health authority, and consolidation of the DHBs. Robust infrastructure will be required to support these changes including investment to improve data interoperability and strengthen technology/digital infrastructure. Good infrastructure is required to support governance structures and decision-making; just as good governance is required to build quality infrastructure.

Funding Model Issues

Current funding models have also been commonly criticised in the literature. Widespread issues have been identified with the calculation of the capitation and population-based formulas used to apportion Vote Health public funding. These funding models have led to financial barriers to access for those most in need – funding changes have been incremental and ad hoc when access barriers need to be systematically addressed.¹⁸

The health system is also characterised by underspending among DHBs against budget for capital expenditure.¹⁹ DHBs are focused on delivering short-term results within a challenging operating environment and financial constraints, to the detriment of longer-term planning and capital investment. This is because expenditure on maintaining assets and use of depreciation is discretionary in the publicly funded health system (including for community and primary care). In essence, where funding has not kept pace with service costs, less has been spent on assets. Where once Crown funding was sought for larger infrastructure projects, it is now being sought for critical maintenance and remediation and ICT. These smaller investments were once funded from within DHB operating expense.²⁰

Improvements to how the sector is funded will require a better capital appropriation pathway so that capital is allocated for specific purposes, more efficient utilisation of current funding levels, better assessment and prioritisation of funding to ensure there is sufficient investment to support an appropriate balance of capital and operational investment, and sufficient investment to address inequities. The 2019 Government decision to directly fund DHBs for their capital charge costs for new facilities (previously DHBs were required to pay back six percent of the cost of any Government capital investment in the form of a capital charge each year) represents a move to reduce the immediate cost pressures for DHBs and provide more stability for long term asset planning.

Infrastructure Capabilities

The health system is characterised by poor asset management capabilities which is likely to be undermining health outcomes. In 2016/2017, the Office of the Auditor General found that DHBs' asset management was not as mature as expected from organisations of their size and with their level of reliance on their assets. A summary report of their 2016/2017 audits found that: about two-thirds of DHBs were unlikely to have substantively updated their asset management plans since 2009; DHBs tended not to specify the levels of service they expected from their assets, resulting in weak asset performance reporting; and there was limited reporting to governors and senior managers on the performance and condition of assets.²¹ More recent MoH Health Infrastructure Unit information suggests that only 11 of the DHBs have current Asset Management Plans. Few have master plans and clinical service plans that plan for future investment (locally and regionally) to address changing demographics, use of workforce and technology solutions and adoption of new models of care.

Furthermore, given the immaturity of health sector investment capabilities and asset management planning, asset management plans often do not inform the business case process. This often lengthens the business case process, but also has far reaching impacts beyond the decision-making process and

¹⁷ Health and Disability System Review, Health and Disability System Review Final Report.

¹⁸ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 116.

¹⁹ Ministry of Health, *DHB Sector Financial Performance Report Year ended 30 June 2020*, 9.

²⁰ Ministry of Health, *subject matter expert interview, 2021*

²¹ Controller, Auditor General. *Health sector: Results of the 2016/17 Audits*, 7.

allocation of capital funding.²² Whole-of-life costs for infrastructure are often not well considered in business cases, and estimations of required maintenance and operations spend over the lifetime of the asset are often under-represented. As a result, the New Zealand Health and Disability System has seen historic deferral of maintenance and reallocation of maintenance expenditure to fund operational (service delivery) requirements as DHB funding is not ringfenced solely for maintenance spend.²³ The negative impact of this reallocation is evidenced by the pervasiveness of leaky buildings, compliance issues, defects within design life parameters, and product and material failures identified in the National Asset Management Programme Current State Assessment.²⁴ Unfortunately, it is not possible to effectively assess and understand the trade-offs of a lack of ringfencing of maintenance spend within New Zealand given the widespread lack of good strategic asset management or robust asset management plans across the health and disability system.

Workforce Attraction and Retention

The sector is also facing workforce retention and attraction challenges, which will only be exacerbated as demand increases for services and fit-for-purpose, good condition infrastructure. Sub-issues include remuneration disputes, access to training, an ageing workforce, supply limits due to COVID-19, and high workforce stress levels.

COVID-19 exacerbated existing issues and challenges faced by the sector. Several notable impacts included added financial strain, service and capital project delays, rapid adoption of new technology, and the exposure of Māori and Pacific health inequities. The pandemic highlighted the importance of robust health infrastructure, the need for long-term planning in order to meet unforeseen health challenges, and the dependencies that other sectors have on the health and disability system in the event of an emergency.

1.4. Sector Performance

Existing industry measures in New Zealand are largely process (rather than outcomes) focussed. Existing Health Targets and System Level Measures at the time of drafting also have limited overlap with the OECD Framework for Health System Performance Measurement, which has a greater emphasis on outcomes. However, MoH recently developed a new set of performance measures with a greater focus on outcomes, which should provide easier comparison with OECD peers; this System Level Measures Framework was published on the Ministry of Health's website on January 2021.²⁵ At the time of drafting, DHB performance against these measures had not been reported. Former System Level Measures and OECD comparisons were therefore used to provide an indication of New Zealand's performance.^{26, 27}

New Zealand performs above the OECD average across the Suicide Rate and Health Status Living Standards Framework (LSF) indicators. It should be noted however, New Zealanders are not staying healthy for as long as our international peers; New Zealand has been consistently performing below OECD averages for healthy life expectancy, which clearly indicates room for improvement across the Sector.²⁸

1.5. Looking to the Future

The system has numerous future challenges to plan for. The ageing population will continue to place strain on the system's capacity when user expectations for service delivery are only becoming more exacting.

²² Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 15,16.

²³ Ministry of Health, *Subject matter expert interview*, 2021

²⁴ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 15,16.

²⁵ Ministry of Health, "System Level Measures Framework"

²⁶ Ministry of Health, "System Level Measure Framework;"

²⁷ OECD, "Health Care Quality Framework;" OECD, *Health at a Glance 2019*, 20.

²⁸ Treasury, "Living Standards Framework – Dashboard."

Technological advancement has led to a population well informed of their healthcare challenges and service offerings, and in combination with changing care requirements, this will exacerbate the strain on infrastructure. The system will need to carefully consider models of care design to effectively respond to the changing health environment; community-based care, for example, is likely to be of increasing importance and will require infrastructure investment.

MoH estimates more than \$14 billion (excluding repairs and maintenance) will be required over the next decade to respond to the age and condition of the current estate, combined with demands generated by a growing and ageing population.²⁹ This is an unprecedented level of investment and presents many opportunities to improve outcomes. However, realising these opportunities will be dependent on an integrated approach to service delivery and planning, as well as an adequate supply of construction sector capacity and capabilities including national capacity to run multiple large-scale projects at the same time.³⁰

The information revolution is a driver for the system to increase data access, integration, and storage infrastructure to prepare for future challenges, demand requirements, and rapid health technology advancement. Technology will undoubtedly impact the structure and way in which the system functions (with greater use of digital service delivery). Māori consultation will be imperative to address data sovereignty concerns and ensure equitable access to health services. Access to technology will also be critical for Māori and lower socio-economic groups to access health services.

Addressing climate change concerns is a pressing issue across multiple sectors. Climate change has both direct and indirect impacts for future planning across the health and disability System. For instance, increased adverse weather events, air pollution, and new diseases have the ability to impact human health, disrupt the delivery of services, and damage infrastructure.

All the issues noted above will have a disruptive influence on funding structures, service models and the underlying infrastructure. Climate change, technology, and the ageing population will only add pressure to current structures and highlight the need to re-evaluate the system's funding model and approach to planning.

1.6. Key Themes and Policy Implications

Table 1: Key themes and policy implications

Key theme	Policy implication
1. Historic underinvestment in infrastructure, resulting in poor building, sitewide infrastructure, and clinical facility condition	Funding, governance, and regulatory system that plans for, incentivises, and funds appropriate level of capital investment.
2. Health inequities resulting from socio-economic status, gender, disabilities, geographic place of residence, and ethnicity.	Funding, governance, and regulatory system that addresses inequities via, for example, investment in facilities, and new Models of Care that meet diverse population needs.
3. Significant and sustained disparities in health access and outcomes between Māori and non-Māori populations	Te Tiriti o Waitangi The Treaty of Waitangi obligations and Māori perspectives need to be incorporated into long-term infrastructure planning and investment.
4. Current funding models do not support an efficient and effective health system nor are they sufficiently equity based	Funding models need to be adjusted so that they incentivise appropriate capital investment to ensure New Zealand has flexible, fit for purpose facilities.

²⁹ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 230.

³⁰ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 230.

Key theme	Policy implication
5. Demographic change is resulting in an ageing, growing, and more ethnically diverse population	Planning is needed so that health infrastructure is sufficiently flexible and able to respond to geographic shifts/urbanisation of demand and changing models of care (more integrated and community-based care).
6. Facilities are not fit-for-purpose due to inability to keep pace with growing demand and changes in Models of Care, poor strategic asset management, lack of investment, growing diversity, rising rates of chronic disease, and the growing complexities of care.	Improved infrastructure planning, and prioritisation at a national level including better capital appropriation pathways, investment in modern models of care, enabled by new facility design standards, to meet future demand and consumer expectations.
7. Workforce challenges such as attraction and retention, remuneration disputes, limited access to training, ageing workforce, and impact of COVID-19.	Long-term planning and investment in digital technologies and supporting infrastructure to provide an environment and tools that are easy to use, inclusive, and provide confidence to clinicians and other health care staff.
8. Issues with governance and regulatory structures such as the need for clearer accountability systems, more focused leadership throughout the system, inefficient division of functions and structures, a better reflection of Te Tiriti o Waitangi principles, and a lack of cohesive and structured planning frameworks.	Restructured governance and regulatory frameworks to enable better long-term planning, discourage duplication, and support coordinated investment in infrastructure to deliver services. This includes the creation of new authorities such as Health NZ and the Māori Health Authority, the appointment of DHB board members rather than election, as well as more structured long-term planning through a New Zealand Health Plan that looks ahead at least 20 years.
9. Technological advancement is disrupting the sector. For example, artificial intelligence and big data is resulting in increased treatment options, improved diagnosis, and rising cost of technology investments.	Policy and regulatory settings that support investment in: • Data infrastructure and integration, including consultation with Māori to consider Māori data sovereignty, and the need to adopt agreed digital standards and regulations • Virtual care offerings.
10. The impact of climate change on human health and System infrastructure	Incentivise and fund investment/shift towards carbon-neutral infrastructure via, for example, facility design standards.

2. Context

2.1. Who We Are and What We Do

The New Zealand Infrastructure Commission, Te Waihangā is working to improve New Zealanders' lives through better infrastructure. It aims to lift the level at which infrastructure is planned and delivered, taking a strategic approach so that we maximise the social return on our collective dollar and stand well prepared in the face of an uncertain future.

Our Māori name, Te Waihangā, means a cornerstone, or to make, create, develop, build, construct, generate. Te Waihangā therefore reflects the significance of long-term planning in shaping New Zealand's future.

A major part of this work is the development of a 30-year strategy for infrastructure. The strategy will look ahead to 2050, and consider how infrastructure might support environmental, social, cultural and economic wellbeing for all New Zealanders. This will be delivered to the government in September 2021 and will set out how we can make sure our investment in infrastructure delivers what we need, where we need it and is done at the right time.

2.2. About Our Sector State of Plays

We understand that our infrastructure works together - it is a system of systems. Our roads carry pipes and powerlines, and they connect to homes, workplaces, and schools. For this reason, our strategy will focus on cross-cutting themes rather than infrastructure sectors in isolation. However, we believe that it's important we understand the infrastructure we have today, why we have what we have, and how it's already contributing to New Zealanders' wellbeing.

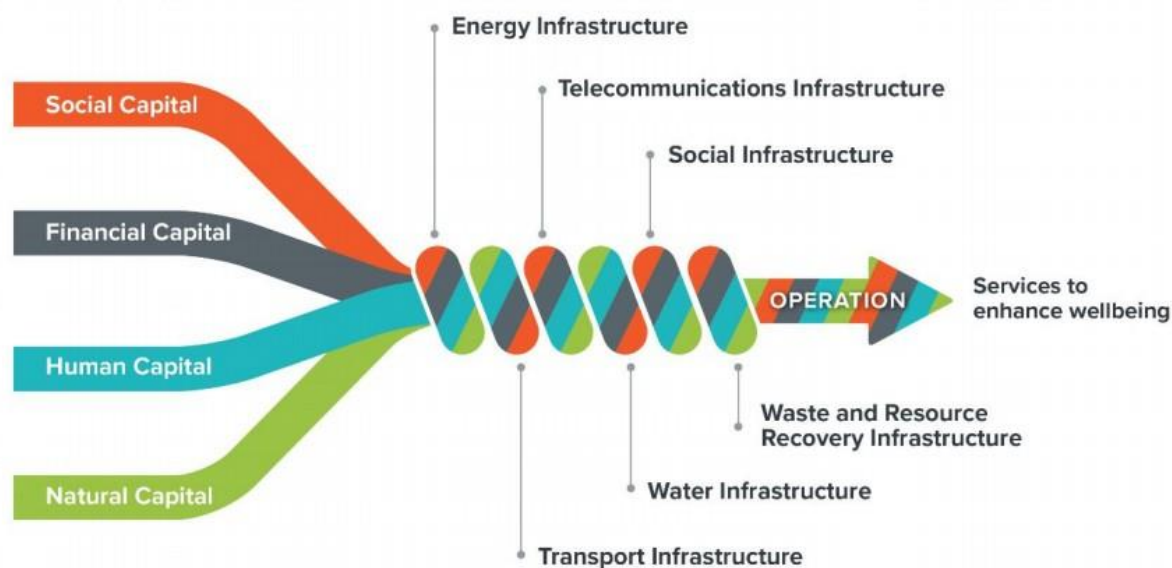
The sector State of Plays are structured around the components of Te Waihangā's working definition of infrastructure, set out in our discussion document, "Infrastructure Under One Roof".³¹ Our definition places wellbeing outcomes at the core, while recognising commonalities, including the use of capital such as financial and environmental resources; the interconnectedness of physical structures; and the delivery of shared services, as well as the wellbeing benefits we get from those shared services. In short, Te Waihangā defines infrastructure as follows:

"A system of inter-connected physical structures that employ capital to provide shared services to enhance wellbeing."

Figure 2 illustrates the components of our working definition, showing how they are related to one another in delivering wellbeing services.

³¹ NZ Infrastructure Commission, *Infrastructure under One Roof: Standardising How We Think about the Shared Services around Us* NZ Infrastructure Commission, December 2020.

Figure 2: Te Waihangā's definition of infrastructure



By defining infrastructure in this way, we have then been able to develop a common framework to think about the integrated management of infrastructure. This considers the relationship between the enabling environment for our infrastructure, the sustainable use of the capitals employed in its development, the investment management process and the wellbeing benefits created by infrastructure services.

Our sector State of Plays are the result of desktop research, augmented by insights from our survey of infrastructure asset owners, and engagement with sector experts. These reports will be updated over time. We want to improve the picture as our understanding grows and different elements come in to focus.

2.3. Our Next Steps

As well as continuing to build on our picture of the State of Play, next steps include building our understanding of future trends and likely challenges, including climate change, incorporation of Mātauranga Māori, demographic change, and the role of technology. We will look at what our way of life might be 30 years from now. Based on all of this, we will begin to make recommendations as to how infrastructure might support New Zealand's future wellbeing.

We'll share our thinking on what will be included in the strategy, focusing on the cross-cutting themes that affect all sectors, the opportunities and challenges we can expect in the future, as well as options for consideration. From there, we'll develop the document that goes to Ministers.

2.4. Have Your Say

We'll share our work as we go and are keen to hear what you think, starting now. Tell us what you think about our State of Play reports – have we got it right or are there issues, information or problems that we've missed?

You'll also have the opportunity to comment on the draft strategy. We'll be continually refining and assessing our work based on the feedback we get from you and others.

3. About the Health and Disability System

The Health and disability sector is defined under the Public Health and Disability Act and is currently inclusive of District Health Boards, PHARMAC, NZ Blood and Organ Service, Health Quality and Safety Commission and various advisory committees. The New Zealand health and disability system is broader in definition; as defined by the Ministry of Health, the health and disability system is a complex network of organisations and people involved in healthcare (beyond the definition of the sectors), including primary health organisations, non-governmental organisations, and regulatory bodies. Where possible, this report aims to provide an overview of the health and disability system on a holistic basis. However, comments on infrastructure largely relate to assets own by crown entities as there is limited understanding of wider system and private facilities – particularly with respect to asset age and condition, future investment plans, and return on investment.

Note: This document was prepared prior to the Government’s health announcements on 21 April 2021. As such, this document reflects the status quo organisation arrangements and is a snapshot in time. The announced changes to the health system’s organisational structure are also not expected to have an immediate effect on physical infrastructure.

3.1. Physical Assets

Health and disability system physical infrastructure includes community-based facilities such as general practice clinics provided through primary health organisations, aged residential care facilities, District Health Board facilities, and private hospital buildings and clinical facilities. There is also underlying infrastructure (mechanical and electrical) supporting these assets. Ambulances, rescue helicopters, and pharmaceutical businesses are not within the scope of this report.

3.1.1. Primary Health Organisations

Primary health organisations support the provision of essential primary health care services, through funding from DHBs. Primary health organisations provide these services to an enrolled population through contracts with providers such as general practices. Primary health organisations vary widely in size and structure – Appendix A details the 30 current primary health organisations as well as the approximate number of general practice clinics they provide services through and the size of the population they service. The number of general practices a primary health organisation contracts with ranges from two clinics to over 40. Infrastructure in general practices is typically privately owned.

In addition to privately owned infrastructure in general practices, there are a number of other private bodies in the health system who own, maintain and invest in their own infrastructure including, for example, laboratories, radiology clinics, pharmacies, non-government organisation mental health and disability services, and private hospitals. Understanding of this infrastructure investment is limited; particularly, its age, condition, and fitness for purpose. Further, the extent to which service funding models incentivise investment in this infrastructure needs to be considered, both now and in the future.

3.1.2. Aged Residential Care Facilities

Aged residential care covers long-term care provided in a rest home or hospital and includes rest home care, continuing care (hospital), dementia care, and specialised hospital care (psychogeriatric).³²

³² Ministry of Health, “Residential care questions and answers.”

New Zealand has approximately 670 aged residential care facilities that provide care for approximately 33,000 aged residential care residents each year. The number of aged residential care facilities has decreased over the last 20 years, with more facilities operated as part of a group.³³ As such, the average care facility size (total beds) has been gradually increasing, with average bed numbers in New Zealand Aged Care Association facilities increasing from 62 in 2018 to 64 in 2020. This is supported by the increase in the median number of beds from 55 in 2018 to 57 in 2020, which also indicates the “typical” care facility is generally and gradually increasing in size.³⁴

Over the last 10 years, the estimated cost of developing new aged residential care capacity has increased. This is a result of residential building cost inflation and increased land acquisition cost.³⁵ New aged residential care beds now cost on average \$245k compared to \$152k in 2014.³⁶

Aged residential care facilities across New Zealand vary widely, and the vast majority are privately owned – as such, understanding the condition and layout of physical infrastructure across aged residential care facilities is difficult.

3.1.3. District Health Board Facilities

New Zealand has 83 public hospitals nationwide. There has been extensive underfunding of these assets over the past 15 years; many are in poor condition and no longer fit-for-purpose. DHBs currently manage buildings with a replacement value of approximately \$24 billion.³⁷

A 2019/20 current state investigation assessed the condition of over 1,000 main hospital campus buildings.³⁷ The report found the average age of DHB buildings to range from 28 years (Waitematā DHB) to 58 years (Southern DHB). Given the useful life of a building is typically 30 to 50 years, this indicates many DHB buildings are at, or approaching, the end of their useful life.³⁸

Although most buildings were found to be in good to average condition, many in average condition had ‘poor’ components, including structural integrity risks, seismic restraints issues, poor passive fire separation, and asbestos. Generally, the older the building, the poorer its condition tended to be.³⁹

Sitewide infrastructure (plumbing, mechanical, and electrical) was highlighted as being in relatively poor condition comparative to main campus buildings. Significant issues with reticulated infrastructure (i.e. electrical systems and pipes) were identified across a number of campuses.³⁹ Appendix C provides a summary of the mean condition of sitewide electrical and mechanical infrastructure of hospital campus buildings⁴⁰ with the poorest mean scores for both electrical and mechanical site wide infrastructure at Palmerston North Hospital, Wellington Regional Hospital and Hillmorton Hospital.

Capital & Coast District Health Board (CCDHB), owner of Wellington Regional Hospital, outlined in their Wellington Hospital Campus Infrastructure and Total Energy Centre Resilience Report that the sitewide electrical infrastructure was between 35 to 40 years old – 5 to 10 years older than the typical useful life of an electrical installation of 30 years. It was also found that the tired electrical infrastructure resulted in high potential for a complete power outage to the hospital during an emergency.⁴¹

In July 2020, Auckland District Health Board (ADHB) reported their energy and water requirements for Auckland City Hospital, Starship Hospital, and other services on the Grafton site. In combination, power,

³³ Ernst & Young, *ARC Funding Model Review*, 13.

³⁴ NZACA, *Industry Profile 2019/20*, 13.

³⁵ Ernst & Young, *ARC Funding Model Review*, 13.

³⁶ Ernst & Young, *ARC Funding Model Review*, 159.

³⁷ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 5.

³⁸ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 20.

³⁹ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 9.

⁴⁰ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 34.

⁴¹ Hunt, “Wellington Hospital's power supply at 'high risk of catastrophic failure'.”

water, medical air, and other utilities use 75 million kWh of energy per annum. This is the rough equivalent of 10,000 average New Zealand households. The hospitals also consume very large volumes of water – the equivalent of two Olympic sized swimming pools each week (6.3 million litres).⁴² This provides an indication of the load on hospital infrastructure services and highlights the need for resilience across sitewide infrastructure. Many systems are therefore at or near end-of-life and can be characterised as low on resilience.

The 2019/20 current state investigation also assessed 80 clinical facilities nationwide, including 56 acute pathway units (emergency departments, operating theatre suites, intensive care units) and 24 mental health units. The assessment identified the relative appropriateness of these clinical facilities to support their models of care. The results of this assessment have been summarised below.³⁹ Generally, these older facilities are not designed or in a condition capable of effectively supporting contemporary models of care and operational requirements. Their existing issues are likely to be further exacerbated by projected future demand requirements, and the continued evolution of care models. The report drew on DHB capital intentions to conclude that \$14 billion is required for buildings and infrastructure investment over the next 10 years (2018 estimates), and \$2.3 billion for IT systems investment (2019 estimates).³⁷

Assessment Summary: Older Clinical Facilities³⁹

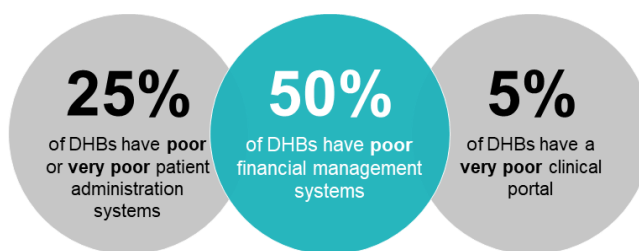
- **Mental health units:** Many mental health facility buildings are in better condition than main clinical blocks due to their location in low-rise and simpler building types, however over two-thirds of older units have inadequate facility designs. Facility interiors were in poorer condition, and their designs do not support client centred modern models of care.
- **Inpatient units:** Older units generally have poor facility designs, small floor areas and they are generally not reconfigurable – which impacts on workforce efficiency, quality, and safety (e.g. infection control), and patient experience.
- **Intensive care units:** Most older units do not meet current guidelines for physical space, configuration, and storage. Other issues include infection control, patient observation, negative-pressure rooms and medical gas and suction services.
- **Operating theatres:** Some older theatre suites are too small or have a mix of acceptable and undersized theatre rooms – this impacts the types of procedures that can be conducted.
- **Emergency Departments:** Most older emergency departments do not meet current guidelines. While most do seem to be managing increased demand, having appropriate spaces to manage people who require a mental health assessment is an issue.

Information Technology

DHBs also face significant technological challenges due to outdated infrastructure and legacy systems. IT infrastructure networks, and security are outdated and unable to adequately support the introduction of new systems or manage increased cyber, security issues. This outdated infrastructure also presents challenges to users accessing and using patient or clinical information across both internal hospital locations and wider health service settings.⁴³ Further, the devolved capital settings for DHBs means that IT investment is largely driven at an organisation level rather than via a national approach to implement the same systems to perform the same functions.

⁴² Auckland District Health Board, "Auckland DHB welcomes \$262m Government investment in facilities infrastructure."

⁴³ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 10.



1 Historic Underinvestment

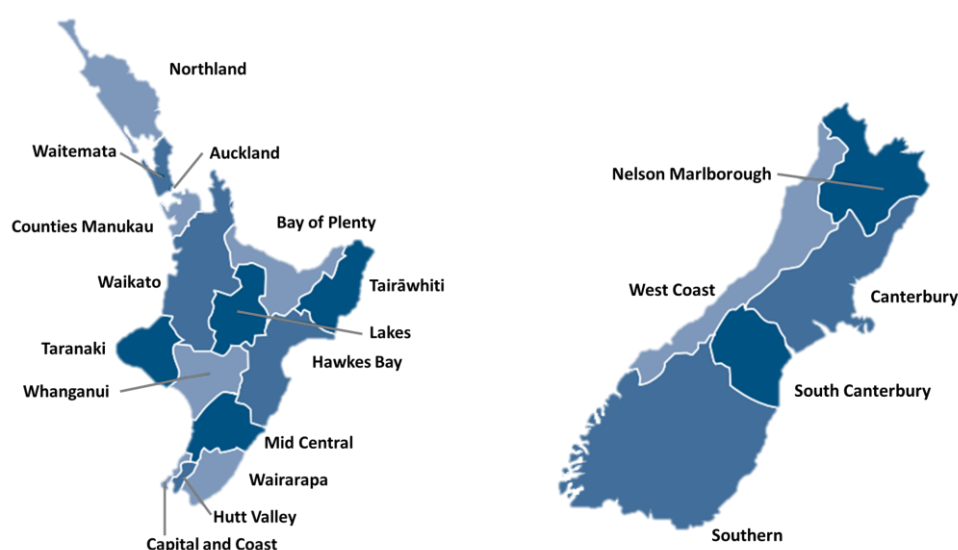
Policy Implication

Funding, governance, and regulatory system that plans for, incentivises, and funds appropriate level of capital investment.

3.1.4. Geographic and Spatial Context

Figure 3 provides an indication of each DHB's geographic catchments. The geographic spread of the New Zealand population has resulted in a spread of infrastructure, which may not necessarily be economic given the size of the population. Further, the implication of demographic shifts and population growth and decline in certain regions for infrastructure investment needs to be considered (especially for those areas of the country with limited population but ageing or not fit for purpose assets).

Figure 3: DHB geographic catchments



high dependency or critical care units. This helps illustrate how access to care can be dependent on where a patient may live.

Table 2 provides an overview of the DHBs with the highest and lowest beds per 1,000 population across a number of specialties. A more detailed presentation of bed numbers per 1,000 population for each DHB has been provided in Appendix B. Generally, DHBs with higher populations (i.e. Waitemata DHB and Counties Manukau DHB) had lower bed rates per 1,000 population across all specialties. DHBs with smaller populations generally have higher bed rates per 1,000 population, but often do not have more specialised or intensive services available. For example, the Whangarei, South Canterbury, Tairāwhiti, and West Coast

DHBs do not have high dependency or critical care units. This helps illustrate how access to care can be dependent on where a patient may live.

Table 2: DHB bed rates by specialisation

Measure	Highest	Lowest
Population	Waitemata DHB	West Coast DHB
Medical Beds per 1,000	Capital and Coast DHB	Nelson Marlborough DHB
Surgical beds per 1,000	Auckland DHB	Waitemata DHB
Paediatric beds per 1,000	Auckland DHB	Waitemata DHB
Maternity beds per 1,000	West Coast DHB	Canterbury DHB
Neonatal beds per 1,000	Capital and Coast DHB	West Coast DHB
Assessment, Treatment, & Rehabilitation per 1,000	South Canterbury DHB	Northland DHB
Theatres per 1,000	West Coast DHB	Waitemata DHB
Procedure Rooms per 1,000	South Canterbury DHB	Tairāwhiti DHB
Intensive Care Unit beds per 1,000	Tairāwhiti DHB	Wairarapa DHB
High Dependency Unit beds per 1,000	Wairarapa DHB	Canterbury DHB
Critical Care Unit beds per 1,000	Hutt Valley DHB	Capital and Coast DHB

Note: Population data was sourced from the Ministry of Health "My DHB" website and was based on 2020/21 projections

3.2. Capital Flows

The Living Standards Framework (LSF) has been developed by the New Zealand Treasury to consider the collective impact of policies on intergenerational wellbeing.⁴⁴ As part of the framework, four capitals (natural, social, human, and physical/financial) have been defined to organise indicators of intergenerational wellbeing. These capitals, as demonstrated in Figure 4, are all interlinked and work together to support wellbeing now and into the future.

⁴⁴ The Treasury, "Our Living Standards Framework."

Figure 4: Treasury's LSF Four Capitals⁴⁵

Natural Capital

All aspects of the natural environment needed to support life and human activity. It includes land, soil, water, plants, and animals, as well as minerals and energy resources.

Human Capital

This encompasses people's skills, knowledge, and physical and mental health. These are the things that enable people to fully participate in work, study, recreation, and society more broadly.

Social Capital

The norms and values that underpin society, including trust, the rule of law, the Crown-Māori relationship, cultural identity, and the connections between people and communities

Financial/Physical Capital

This includes things like houses, roads, buildings, hospitals, factories, equipment, and vehicles. These are the things that make up the country's physical and financial assets, which have a direct role in supporting incomes and material living conditions.



3.2.1. Natural Capital

The flow of natural capital is relatively one-dimensional and includes raw materials consumed in the production of physical assets e.g. hospital buildings, rest homes, and general practice clinics in addition to raw materials consumed to support operation and service delivery. The natural environment also plays an important role in supporting people's everyday health and wellbeing, such as access to clean water.⁴⁶

3.2.2. Social Capital

Social Capital flows within the Health and Disability System are heavily influenced by norms, values, and social connections, which are both sector inflows and outflows. Social connectedness can be defined through three elements: socialising, social support, and sense of belonging.⁴⁷ Social connections are important within the workforce and the general public as they support health and wellbeing. The relationship between Māori and the Health and Disability System is also an important social consideration. The concept of whānau ora (family wellbeing) recognises whānau is the foundation of Māori society and critical for collective and individual wellbeing.⁴⁸ Societal values and norms influence resource allocation and related equity of health outcomes.

3.2.3. Human Capital

Human Capital is a required input to the Health and Disability System due to the requirement for a skilled workforce to deliver Health and Disability services. Staff and skill shortages have the ability to compromise the delivery of health services and put patients at risk.⁴⁹ With a large proportion of the health workforce consisting of overseas-trained workers, the COVID-19 crisis has impacted the input of Human Capital to the system.⁵⁰ Table 3 below summarises key workforce statistics for the Health and Disability System from 2014 to 2019.⁵¹

⁴⁵ The Treasury, "Our Living Standards Framework."

⁴⁶ Ministry of Health, *Health and Independence Report 2018*, 19.

⁴⁷ Ministry of Social Development, "Social Connectedness and Wellbeing."

⁴⁸ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 50.

⁴⁹ Earley, "Auckland DHB nurses say staff shortages putting patients and staff at risk."

⁵⁰ Russell, "Serious health workforce burden looms: Experts say more migrant workers needed."

⁵¹ Medical Council of New Zealand, *The New Zealand Medical Workforce in 2019*, 4.

To sustain the health workforce, strong educational and training infrastructure is also required – a skilled workforce is therefore also an outflow of the system. Combined with the System’s aim to improve the overall wellbeing (including physical and mental) of New Zealanders, Human Capital outflow is high.

Table 3: Growth in the Health and Disability System workforce, including doctor numbers, 2014-2019

	2014	2015	2016	2017	2018	2019
Size of the workforce	14,533	14,737	15,212	15,819	16,292	16,908
Doctors per 100,000 population	317.6	318.1	321.3	327.9	333.5	344.7

3.2.4. Financial / Physical Capital

Financial Capital flows from both public and private sources are well defined within the health and disability system and are combined with physical capital (such as hospitals, general practice clinics and rest homes) to create value for the health system. A specific example that ties financial capital to physical capital are the 102 current infrastructure development projects overseen by the Health Infrastructure Unit within the Ministry of Health, such as the new Dunedin Hospital.⁵²

Outflows of financial capital include income from patient fees due to the consumption of services, such as primary care provider fees and private hospital fees.⁵³

3.2.5. Net Capital Basis

Inflows of natural, financial, social, and human capital produce an outflow of social and human capital in the form of a healthy and productive population, as well as smaller amounts of financial capital.

3.3. Services

As defined in the Review, the health and disability system provides two tiers of service.⁵⁴ Tier 1 services includes services provided in homes, communities, schools, and marae.⁵⁵ This includes (but is not limited to) self-care, mental health care, general practice, community allied health (e.g. physiotherapy, pharmacy), diagnostics (e.g. radiology) and maternity services. Most Māori health services are also located within this tier.⁵⁶ Tier 2 services include public and private hospital and specialist treatment, and specialist diagnostic services provided on a hospital site.⁵⁷

Additionally, services can be broken down into primary, secondary, and tertiary levels of care, as outlined below:⁵⁸

- **Tertiary Care:** specialist services for inpatients, including treatments for serious illnesses and injuries, cancer management, and complex (e.g. heart or brain) surgeries.
- **Secondary Care:** Services provided by medical specialists (e.g. cardiologists, radiologists, speech therapists, and psychiatrists) within a hospital setting.
- **Primary Care:** Professional health care provided in the community, usually from a general practitioner, practice nurse, nurse practitioner, pharmacist or other health professional working within a General Practice⁵⁹

⁵² Ministry of Health, “Health Infrastructure Unit,” Ministry of Health, Health and Disability System: Priority Areas, 7.

⁵³ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 57.

⁵⁴ Health and Disability System Review, Health and Disability System Review Final Report, 97-8.

⁵⁵ Health and Disability System Review, *Health and Disability System Review Final Report*.

⁵⁶ Health and Disability System Review, *Health and Disability System Review Final Report*, 97-8.

⁵⁷ Health and Disability System Review, *Health and Disability System Review Final Report*, 147.

⁵⁸ West Coast District Health Board, “Primary, secondary, and tertiary healthcare.”

⁵⁹ Ministry of Health. “Primary health care.”

DHB owned facilities mainly deliver hospital-based services and DHB provided community, public health and assessment, treatment, and rehabilitation services. Service agreements also occur between DHBs and with private providers and non-governmental organisation providers (e.g. pharmacists, laboratories, radiology clinics, and GPs). DHBs may also act in a monitoring capacity under these agreements to ensure agreed levels of service are upheld and regulated.⁶⁰

Non-hospital services are mainly commissioned by DHBs through national, regional, and local contracts with non-governmental organisations. Primary health organisations provide primary health care services to people enrolled with a primary health organisation, and provide services either directly, or through a contracted provider such as a GP.⁶¹ Primary care mainly covers services in the community provided by, for example, nurses, pharmacists, counsellors, and dentists.⁶² Māori health providers are typically contracted by DHBs to provide health services for Māori.⁶³

Health services therefore exist on a continuum – at one end, is primary and community care and at the other end is hospital-based care. Over the last 20 years, there has been a shift along the continuum with more services now being provided in primary and community care settings (such as diabetes care).

Aged residential care services also exist along a continuum. At one end of the continuum is home-based community care, where support is delivered directly into a person's home, which aligns with the longstanding government priority of supporting older people to age in place.⁶⁴ Older people living at home can use short term respite stays or day programmes offered by an aged residential care facility, to enable them to live in their own home for longer.⁶⁵

Figure 5: Continuum of aged care services in New Zealand



Intermediate care is used in situations when a short stay in an aged residential care facility could prevent a hospital admission or support improved transition home from hospital.⁶⁶ This type of care can be “stepped up” or “stepped down” to best fit the needs of the individual patient.

At the other end of the continuum is long-term residential care. This is for people who can no longer safely remain in their homes for an indefinite period.⁶⁶ In an aged residential care setting, there are four categories of services a person may be allocated to following the needs assessment and service coordination process. These have been briefly described below.⁶⁷ It is also important to note that aged residential care providers can also provide services to younger people with high and complex needs due to physical disability or personal health reasons.

⁶⁰ Ministry of Health, “The structure of the New Zealand health and disability sector.”

⁶¹ Ministry of Health, “About primary health organisations”.

⁶² Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 1.

⁶³ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 47.

⁶⁴ Ernst & Young, *Aged Residential Care Funding Model Review*, 54.

⁶⁵ Ernst & Young, *Aged Residential Care Funding Model Review*, 68.

⁶⁶ Ernst & Young, *Aged Residential Care Funding Model Review*, 54.

⁶⁷ Ernst & Young, *Aged Residential Care Funding Model Review*, 73.

Table 4: Aged Residential Care categories

Care Category	Description
Rest Home Care	Residents are generally independent but need assistance with personal care of supervision of daily living activities. They are unable to live safely in their own homes due to disability needs/ lack of informal supports.
Continuing Care	Also known as hospital level care. Residents have a significant disability (usually in combination with medical problems), which requires 24-hour supervision with registered nurse input for their care (medication, wound care), and mobility assistance.
Dementia Care	The resident is assessed as needing 24-hour supervision, in a secure environment due to risk of wandering or becoming lost due to memory loss or confusion. Dementia residents must be provided care in a facility / annex separate to rest home and continuing care.
Psychogeriatric Care	Also known as specialised hospital care. The resident is assessed as needing 24-hour supervision. This level of care is for people with major behavioural issues (including severe dementia or addictions). They need a high level of specialist nursing care.

3.3.1. Dependencies

The health and disability system has widespread dependencies with other sectors, such as water, energy, telecommunications, education, and housing. Complex systems of sitewide infrastructure are required to support the delivery of DHB services, including medical gases, water, sewer pipes, and electricity.⁶⁸

The health and disability System is particularly reliant on energy infrastructure to power its health facilities and support its infrastructure, such as ventilators, surgical lighting, and temperature control for medicines (e.g. the COVID-19 vaccine). Other dependencies include good housing infrastructure to keep people healthy, the use of telecommunications to connect the health workforce, power, internet and data connectivity, and a heavy reliance on education infrastructure to train and develop the health workforce.

Relationships between sectors can also help to create efficiencies through the sharing of resources such as physical spaces, technology, equipment, and other services such as waste management.⁶⁹

Investment in other infrastructure sectors is also required for health and wellbeing (including keeping people out of hospital). Infrastructure that supports physical activity such as active transport and green infrastructure helps to promote healthy behaviours and benefit the wider determinants of health and wellbeing. Further, investment in housing also is a major determinant of health and wellbeing. According to the World Health Organisation Housing and Health Guidelines, the quality of housing has major implications for people's health. Housing in cities is of particular concern, with the world's urban population predicted to double by 2050 and, with it, the demand for housing. In both developed and developing countries, improving housing conditions and reducing health risks in the home is thus critically important.⁷⁰

⁶⁸ Ministry of Health, *The National Asset Management Programme for district health boards*. Report 1: The current-state assessment, 33.

⁶⁹ Infrastructure Australia, *An Assessment of Australia's Future Infrastructure Needs*, 399-409.

⁷⁰ World Health Organisation, *WHO Housing and Health Guidelines*.

3.4. Wellbeing

Health and wellbeing are interrelated, where health is both an enabler and an outcome of wellbeing.⁷¹ Factors that impact on health and wellbeing are wide ranging and varied – far beyond simply access to, and use of, healthcare services. The World Health Organisation defines the key determinants of health as:⁷²

- The social and economic environment
- The physical environment
- A person's individual characteristics and behaviours

Individuals have varying levels of control over these determinants; to an extent they are embedded in societal and cultural norms.⁷³ While the health and disability system certainly has an important role to play with respect to improving health outcomes, investment across these wider determinants could have a significant impact on the health and wellbeing of New Zealanders. As shown in Figure 6, up to 50% of health determinants are beyond the direct scope of the health and disability system. In particular, investment directed towards reducing poverty, improving educational outcomes, increasing access to healthy housing, reducing homelessness, and tackling family and sexual violence could all significantly support improving health outcomes.⁷⁴

Figure 6 Determinants of health and their relative contribution to health outcomes⁷⁵

Determinants of Health



Similarly, good health infrastructure can result in greater education and employment opportunities as people live longer, healthier lives.⁷⁶ Maintaining investment in equipment, technology, and more purpose-built facilities enables safer environments, better collaboration, and a better quality of service overall.⁷⁷

The current focus of providing infrastructure that ensures communities are at the heart of the health system enables more equitable outcomes and contributes to greater wellbeing.⁷⁸ For example, by providing more integrated and community-based services closer to home, the health and disability system can more effectively provide services regardless of common barriers to care such as: geographic location, ethnicity, socioeconomic status, age, and gender.⁷⁷

Treasury's Living Standards Framework uses the four capitals (natural, social, human, and financial/physical) to inform resource allocation decisions and infrastructure impacts on wellbeing.⁷⁹ Figure 7 and Figure 8

⁷¹ Ministry of Health, *Health and Independence Report 2018*, 9.

⁷² World Health Organisation, *Determinants of Health*.

⁷³ Ministry of Health, *Briefing to the Incoming Minister*, 8.

⁷⁴ Ministry of Health, *Briefing to the Incoming Minister*, 8.

⁷⁵ Ministry of Health, *Briefing to the Incoming Minister*, 8.

⁷⁶ Minister of Health, *New Zealand Health Strategy Future Direction*, 6.

⁷⁷ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 11.

⁷⁸ New Zealand Health and Disability System Review, *New Zealand Health and Disability System Review: Executive Overview*, 4.

⁷⁹ Burton, "The Treasury Approach to the Living Standards Framework."

illustrate New Zealand's performance against four indicators in the health domain. Refer to Appendix D for further detail on the Living Standards Framework Wellbeing Domains.

Figure 7: Health and Mental Health status Living Standards Framework indicators 2011 to 2018

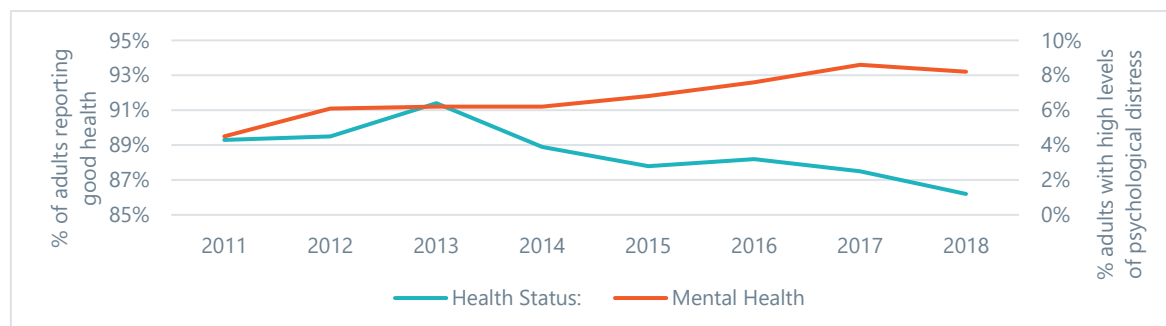
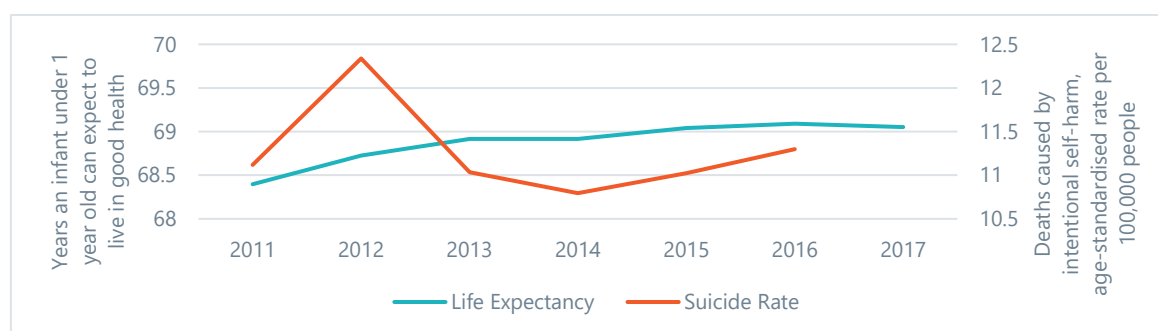


Figure 8: Life Expectancy and Suicide rate Living Standards Framework indicators 2011 to 2017



The Organisation for Economic Co-operation and Development's (OECD's) 'How's Life' framework identified reducing health inequalities and addressing mental health and obesity challenges as key opportunities to improve the wellbeing of New Zealanders.⁸⁰

Three of the Living Standards Framework Health Domain indicators can be compared against OECD countries. Overall, the percentage of adults reporting good or very good health is well above the OECD distribution. The number of years an infant under 1 year old can expect to live in good health is, on average, below the OECD median. The deaths caused by intentional self-harm, age--standardised per 100,000 people is on average above the OECD distribution.⁸¹

3.4.1. Māori Health and Wellbeing

There is not a single way of looking at wellbeing; it is dependent on values, beliefs, and social norms. Whilst sharing some principles with Pasifika communities (for example), the Māori view of wellbeing largely differs to other groups within New Zealand. It is critical therefore that the health and disability system incorporates Māori worldviews alongside western and clinical views of wellbeing in order to improve Māori health outcomes.⁸²

The Ministry of Health draws on three different models to understand the Māori approach to health and wellbeing. The first model considers the concept of 'te whare tapa whā' to understand the four cornerstones of Māori health. The four cornerstones are 'taha tinana' (physical health), taha wairua (spiritual

⁸⁰ OECD, *OECD Economic Surveys: New Zealand 2019*.

⁸¹ The Treasury, "Living Standards Framework – Dashboard."

⁸² Health Quality and Safety Commission, *A Window on the Quality of Aotearoa New Zealand's Health Care 2019*, 49.

health), taha whanau (family health), and taha hinengaro (mental health). It is notable that many Māori health services lack the inclusion of taha wairua (the spiritual dimension).⁸³

A second model of Māori health, 'Te Wheke' (the octopus) is used to understand family health. The head of the octopus represents te whānau, the eyes represent waiora (total wellbeing for the individual and family) and the eight tentacles each represent a specific dimension of health which are interwoven to show the close relationship of each.⁸⁴

The final model the MoH draws on to understand Māori health is 'Te Pae Mahutonga' (Southern Cross Constellation). Within this model, the central stars of the constellation represent the four crucial elements of modern health and health promotion: Mauriora (cultural identity), Waiora (physical environment), Toiora (healthy lifestyles), and Te Oranga (participation in society). Ngā Manukura (leadership) and Te Mana Whakahaere (autonomy) also feature in the model.⁸⁵

He Korowai Oranga (the Māori Health Strategy) was developed across 2013 and 2014 to guide the Government and the health sector to achieve the best health outcomes for Māori and reduce inequities. He Korowai Oranga centres around 'whanau ora', which involves achieving maximum Māori health and wellbeing through supporting Māori families. Pae ora, the Government's Māori health vision, consists of three interconnected elements: mauri ora – healthy individuals, whānau ora – healthy families, and wai ora – healthy environments.⁸⁶ The incorporation of this vision draws on a Māori worldview into health and disability service delivery and will contribute to improved wellbeing outcomes for Māori.

Further to this strategy, the Māori health Action Plan 2020-2025 sets the government direction for the advancement of Māori health and wellbeing by outlining key objectives, priority areas, and tangible outcomes.⁸⁷ There are four key outcomes within this plan:⁸⁸

1. Iwi, hapū, whanau and Māori communities can exercise their authority to improve their health and wellbeing
2. The sector is fair and sustainable and delivers more equitable outcomes for Māori
3. The sector addresses racism and discrimination in all its forms
4. The inclusion and protection of mātauranga Māori throughout the sector

A discussion paper titled "An Indigenous Approach to the Living Standards Framework" proposed that Te Tiriti o Waitangi, te ao Māori, and whanau-centred thinking should be used to inform an indigenous approach to wellbeing and achieve improved health and wellbeing outcomes for Māori.⁸⁹ The following seven wellbeing domains were proposed to consider wellbeing with an indigenous lens:

- Cohesive, resilient, and nurturing
- Confident participants in society
- Confident in language and culture
- Living healthy lifestyles
- Self-managing
- Responsive to the natural and living environment
- Economically secure and wealth creating

⁸³ Ministry of Health, "Māori health models – Te Whare Tapa Whā."

⁸⁴ Ministry of Health, "Māori health models – Te Wheke."

⁸⁵ Ministry of Health, "Māori health models – Te Pae Mahutonga."

⁸⁶ Ministry of Health, "He Korowai Oranga."

⁸⁷ Ministry of Health, *Whakamaua Māori Health Action Plan 2020-2025*, 21

⁸⁸ Ministry of Health, *Whakamaua Māori Health Action Plan 2020-2025*, 23

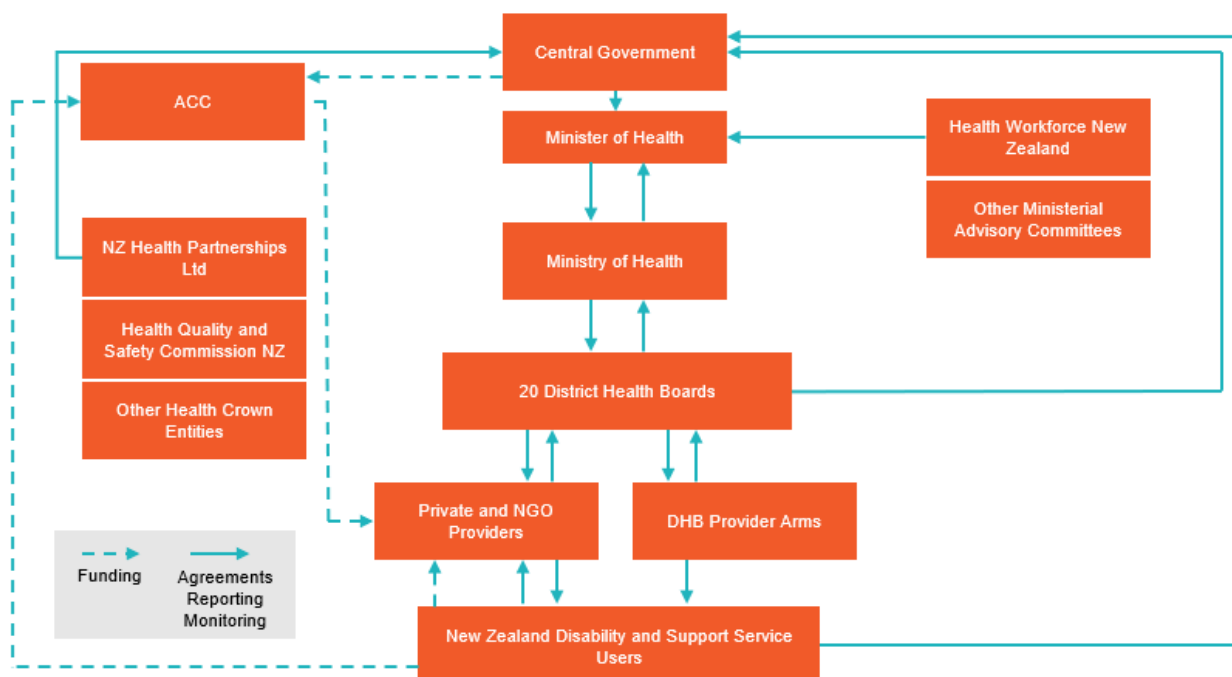
⁸⁹ Te Puni Kōkiri (Ministry of Māori Development), and The Treasury, *An Indigenous Approach to the Living Standards Framework*, 15.

4. What Shapes the Sector Today?

4.1. Ownership and Governance

Health and disability services in New Zealand are delivered by a complex network of organisations and people that work together to achieve better health outcomes for New Zealanders.⁹⁰

Figure 9: Structure of the New Zealand Health and Disability System⁹¹



Overall responsibility for the health and disability system lies with the Minister of Health.⁹² The Minister's functions, duties, responsibilities, and powers are detailed in the New Zealand public health and disability Act and other legislation.⁹³ The Ministry of Health (MoH) leads New Zealand's health and disability system, and has overall responsibility for the management and development of the health system.

The Capital Investment Committee provides advice to the Minister of Health, Minister of Finance, and Director-General of Health on public health capital investment prioritisation and allocation. While the Capital Investment Committee acts in a support and advisory capacity, MoH ultimately oversees and funds the 20 DHBs in New Zealand in addition to monitoring DHB and non-DHB Crown entity performance on behalf of the Minister.⁹⁴

New Zealand's 20 DHBs perform two broad functions:⁹⁵

1. Planning, management, and purchase of health services for their population
2. Provision of secondary and tertiary services for their population.

⁹⁰ Ministry of Health, "Overview of the health system."

⁹¹ Ministry of Health, "Overview of the health system."

⁹² Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 40.

⁹³ Ministry of Health, "Key health sector organisations and people."

⁹⁴ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 41.

⁹⁵ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 44.

The New Zealand Public Health and Disability Act 2000 provides further detail on the breadth of functions that the DHBs perform.

Non-hospital services occur through a series of contracts between DHBs and New Zealand's 31 primary health organisations, who then contract primary health providers (e.g. GPs), to provide services. Additionally, four Māori PHOs owned, governed, and regionally operated also provide services specifically to Māori.⁹⁶ Privately owned health providers and hospitals in New Zealand can also be contracted by MoH to provide services. Key health and disability organisations, agencies, and committees have been summarised in Appendix E.⁹⁷

Health care within New Zealand is also defined by a series of strategies including:

- **The New Zealand Health Strategy and Future Direction 2016:** Sets the direction of health services to improve the health of people and communities.⁹⁸ The New Zealand Health Strategy and Future Direction 2016 refreshes the original Health Strategy and outlines the high-level direction for the 10 years from 2016-2026.⁹⁹
- **The Primary Health Care Strategy:** Developed in 2001 to provide a clear direction for the future development of primary health care in New Zealand. This document outlines the specific contributions primary health care makes to improving health outcomes.¹⁰⁰
- **He Korowai Oranga:** As New Zealand's Māori Health Strategy, He Korowai Oranga sets the overarching framework that guides the Government and the health and disability sector to achieve the best health outcomes for Māori.¹⁰¹
- **Healthy Ageing Strategy:** Sets the strategic direction for the delivery of services to people into and throughout their later years.¹⁰² The vision for the strategy is that: older people live well, age well and have a respectful end of life in age-friendly communities.

Residential care, as defined by the MoH, includes long-term care provided in a rest home or hospital. It does not include living in a retirement village.¹⁰³ The majority (50%) of New Zealand aged residential care facilities are operated as individual or minor group facilities and 49% are operated as part of a major group of care facilities.¹⁰⁴ The remaining 1% are DHB owned.¹⁰⁵ DHBs contract residential care providers eligible for public funding under the Residential Care and Disability Support Services Act 2018.¹⁰⁶ Contracting frameworks and requirements for aged residential care are outlined in the age-related residential care and aged residential hospital specialised services agreements.¹⁰⁷

⁹⁶ Waitangi Tribunal, Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry, 44.

⁹⁷ Ministry of Health, "Key health sector organisations and people."

⁹⁸ Ministry of Health, The New Zealand Health Strategy.

⁹⁹ Ministry of Health, "The New Zealand Health Strategy 2016."

¹⁰⁰ Ministry of Health, The Primary Health Care Strategy.

¹⁰¹ Ministry of Health, "He Korowai Oranga."

¹⁰² Associate Minister of Health, *Healthy Ageing Strategy*.

¹⁰³ Ministry of Health, "Residential care questions and answers."

¹⁰⁴ New Zealand Aged Care Association, Aged Residential Care: Industry Profile 2019-20.

¹⁰⁵ New Zealand Aged Care Association, *Aged Residential Care: Industry Profile 2019-20*, 3.

¹⁰⁶ Ministry of Health, "Residential care questions and answers."

¹⁰⁷ Ernst & Young, *Aged Residential Care Funding Model Review*, 61.

4.1.1. The Health and Disability System Review

Note: This document was prepared prior to the Government’s health announcements on 21st April 2021. As such, this document reflects the status quo organisation arrangements and is a snapshot in time. The announced changes to the health system’s organisational structure are also not expected to have an immediate effect on physical infrastructure.

The recent Health and Disability System Review recommended system-level changes to enable more equitable health and wellbeing outcomes for New Zealanders.¹⁰⁸ Current system limitations and recommended changes were highlighted under the following four key themes:¹⁰⁹

1. Ensuring consumers, whānau and communities are at the heart of the system
2. Culture change and more focused leadership
3. Developing more effective Te Tiriti o Waitangi based partnerships within health and disability and creating a system that works more effectively for Māori
4. Ensuring the system is integrated and deliberately plans ahead with a longer-term focus

Table 5 outlines some of the key governance and operational recommendations from the Review.

Table 5: Key governance and operational recommendations

Key Recommendations

Health NZ	Creation of a new crown entity called Health NZ, which is accountable to the Minister of Health for all clinical and financial service delivery.
Māori Health Authority	The creation of a Māori Health Authority (provisional title) to sit alongside the Ministry of Health and Health NZ. This Authority will be the principal advisor on all hauora Māori issues and lead the development of a strengthened Māori workforce and service offering.
Number of DHBs	The number of DHBs needs to be reduced within the next five years to between 8 and 12 to refocus accountability and leadership.
System Charter	Development of a health and disability system charter outlining shared values, attitudes, and behaviours in order to create a more collective culture.
Population Health	Making population health the key driver of the system (funding, planning and performance measurement).
Te Tiriti o Waitangi Principles	Updating of Te Tiriti o Waitangi principles in key health legislation.
Population-Based Funding	Increasing the ethnicity and socioeconomic deprivation weighting within the population-based funding formula. Ensuring funding is driven by the needs of the population.
NZ Health Plan	Creating a NZ Health Plan that looks ahead by at least 20 years to create a more transparent planning and reporting system.
A more Integrated Tier 1 Environment	Involves planning the full range of primary and community services within the community that are digitally connected and contain an outreach element to connect whanau to the system.

¹⁰⁸ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 3.

¹⁰⁹ Health and Disability System Review, *Health and Disability System Review: Final Report*, 3.

Appoint rather than elect DHB Board Members	Allow the Minister of Health to appoint DHB board members against a set of competencies such as financial and governance experience, and specific Sector knowledge.
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The Review also warns of the possible ramifications of not implementing these changes. For instance, a lack of cultural change, meaningless investment strategies, a lack of confidence in funding structures, and not fully prioritising the promises contained in Te Tiriti o Waitangi.¹¹⁰

The Review also provided key recommendations for health infrastructure. A particular focus in the Review's Executive Overview was ensuring strong infrastructure is present to support the other operational and governmental recommendations mentioned above.¹¹¹ Table 6 outlines some of these recommendations.

Table 6: Health and Disability System Review Infrastructure Recommendations

Key Infrastructure Recommendations

Digital and Data¹¹²	• Health NZ focus on managing and supporting the improved delivery and performance of the system through the effective use of digital technologies. • The Māori Health Authority is responsible for addressing data equality issues for Māori e.g. Māori data sovereignty. • Ensuring interoperability of data across the system (Tier 1 and 2 services). • Consumer control of own health data and information. • Digital system to better support the delivery of virtual care. • Adoption of agreed digital and data standards.
Facilities and Equipment¹¹³	• More transparent planning and better governance. • Health NZ to be responsible for a long-term investment plan for facilities, major equipment, and digital technology. • Health NZ should develop a nationally prioritised significant investment pipeline. • Every DHB should develop a longer-term rolling capital plan. • Better financial and governance expertise on DHB boards for long-term asset management decision-making, as well as investment leadership provided by the Health Infrastructure Unit (HIU). • Further development of the National Asset Management Plan.

4.1.2. He Ara Oranga: Report of the Government Inquiry into Mental Health and Addiction

The recent Government Inquiry into Mental Health and Addiction (the Inquiry) resulted from increasing concern regarding mental health services.¹¹⁴ Every year one in five New Zealanders experience mental illness or significant mental distress; an estimated annual cost burden of \$12 billion.¹¹⁵ COVID-19 also resulted in greater demand for mental health services.¹¹⁶ The Inquiry was tasked to listen to the community, report on New Zealand's prevention and response to the needs of the population, and to recommend changes to improve the sector. The following are notable recommendations emerging from the inquiry:¹¹⁷

¹¹⁰ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 8.

¹¹¹ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 8.

¹¹² Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 16.

¹¹³ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 17.

¹¹⁴ Government Inquiry into Mental Health and Addiction, "Executive Summary."

¹¹⁵ Government Inquiry into Mental Health and Addiction, "Executive Summary."

¹¹⁶ Ministry of Health, *Briefing to the Incoming Minister*, 13.

¹¹⁷ Government Inquiry into Mental Health and Addiction, "Executive Summary."

- The system should have a vision of mental health and wellbeing at its heart – attainable for all, equitable outcomes, and the necessary availability of tools
- People at the centre
- Responsive to different ages, backgrounds, and perspectives
- Community-based
- Providing support for people in a crisis
- Need for a comprehensive harm-minimisation approach to alcohol and drug use
- A broader range of therapies for people who are detained, and support for their transition back to the community.

The Inquiry recommended changes spanning 12 broad areas. These changes have been summarised in Appendix F.¹¹⁸

4.2. Regulatory Environment

There have been four structural transformations of the health sector since 1983.¹¹⁹ In the most recent structural change in 2000, the Labour-Alliance coalition government introduced the New Zealand Health Strategy 2000 in line with their pre-election pledge to re-structure the health system with a focus on patients.¹²⁰

The current structure of the health and disability sector is therefore defined by the New Zealand Public Health and Disability Act 2000.

Figure 10: Summary of key regulatory legislation for the health and disability sector

Regulatory Environment		
New Zealand Public Health and Disability Act 2000	Health Act 1956	Health and Disability Commissioner Act 1994
Health Practitioners Competence Assurance Act 2003	Health and Disability Services (Safety) Act 2001	Code of Health and Disability Services Consumers' Rights
Privacy Act 2020	Crown Entities Act 2004	Specific Legislation for Specific Issues

The Health Act 1956 gives the MoH the function of improving, promoting, and protecting public health and includes provisions governing the disclosure of health information.¹²¹ The Privacy Act 2020 also applies to health information and provides a framework for protecting individual privacy.¹²² The Crown Entities Act 2004 is also relevant as it provides a framework for the establishment, governance, and operation of Crown entities.¹²³

The Health and Disability Commissioner Act 1994 aims to promote and protect the rights of health and disability services consumers as well as facilitating the resolution of complaints. New Zealand has had a Code of Health and Disability Services Consumers' Rights since 1996. Complaints are investigated by the Office of the Health and Disability Commissioner and other professional bodies.¹²⁴ New Zealand also has a

¹¹⁸ Government Inquiry into Mental Health and Addiction, "Executive Summary."

¹¹⁹ New Zealand Parliament, "New Zealand Health System Reforms."

¹²⁰ New Zealand Parliament, "New Zealand Health System Reforms."

¹²¹ Ministry of Health, "Legislation."

¹²² Ministry of Health, "Legislation."

¹²³ Ministry of Health, *The New Zealand Health and Disability System: Handbook of Organisations and Responsibilities*, 3.

¹²⁴ WHO, *New Zealand Health System Review*, xvii.

Health and Disability Services (Safety) Act 2001, the purpose of which is to promote the safe provision of services and enable consistent standards.¹²⁵

The Health Practitioners Competence Assurance Act 2003 outlines the accreditation process for health professionals. The Act provides a framework for the regulation of health practitioners to protect the public from harm.¹²⁶ The 16 authorities created under the Act are responsible for overseeing practitioners and regulations. It is important to note not all health professions are regulated by the Act and some may be regulated by other means.¹²⁷

Other relevant legislation relates to specific issues. For instance, the Mental Health (Compulsory Assessment and Treatment) Act 1992, the Intellectual Disability (Compulsory Care and Rehabilitation) Act 2003, and the Alcoholism and Drug Addiction Act 1966.¹²⁸

While regulation in the aged care sector is largely governed through Services Agreements, the 2020 Briefing to the Incoming Health Minister noted that the aged care sector regulatory structure is fragmented, with differing processes and bodies resulting in reduced coordination and leadership.¹²⁹

8 Governance and Regulatory issues

Policy Implication

Restructuring governance and regulatory structures to meet future challenges as recommended by the Health and Disability System Review – this will enable better long-term planning, discourage duplication, and support infrastructure to deliver services. This includes the creation of new authorities such as Health NZ and the Māori Health Authority, the appointment of DHB board members rather than election, as well as more structured long-term planning through a New Zealand Health Plan that looks ahead at least 20 years.

4.3. Funding

4.3.1. Capital Funding

Capital budgets for health and disability are set as part of the whole-of-government budget process. The current process for capital investment allocation requires DHBs to step through the business case process for prioritised projects.

DHBs typically follow the Treasury Better Business Case Framework (BBC) when submitting a request for capital funding. The BBC has designed the internationally recognised five case model, which builds a business case proposal by answering five core questions:¹³⁰

- What is the compelling case for change? (Strategic Case)
- Does the preferred option optimise value for money? (Economic Case)
- Is the proposed deal commercially viable? (Commercial Case)
- Is the investment proposal affordable? (Financial Case)
- How can the proposal be delivered successfully? (Management Case)

DHB business cases generally focus on key elements of the catchment area and day-to-day operations, including population need, asset condition and service enablers like models of care, workforce, and information and clinical technologies. Business cases have historically been developed in isolation from

¹²⁵ Health and Disability Services (Safety) Act 2001, Section 3.

¹²⁶ Ministry of Health, "Health Practitioners Competence Assurance Act."

¹²⁷ Ministry of Health, "Health Practitioners Competence Assurance Act."

¹²⁸ Human Rights Commission, *Human Rights in New Zealand*, 156.

¹²⁹ Ministry of Health, *Briefing to the Incoming Minister*, 12.

¹³⁰ The Treasury, "Better Business Cases."

DHB neighbours and regional partners. The northern region (Northland, Waitemata, Auckland, and Counties Manukau) DHBs are an exception; in 2016 the four northern DHBs collectively developed the Northern Region Long-Term Investment Plan, which set out a 10-year roadmap for capital investment. More generally, however, there is limited consistency and transparency of information at either the local, regional, or national levels.¹³¹ Efforts are underway to ensure that DHBs submit a prioritised plan for regional investment rather than a combination of individually prioritised investments.

Joint approval from the Ministers of Health and Finance is required for Crown funding or DHB capital investment over \$10 million.¹³²

While capital budgets for DHBs are set and allocated centrally, DHBs have responsibility for governance, planning and decision-making around capital renewal investment and maintenance at the local level. As such, short-term operational pressures have seen DHBs deferring capital maintenance. The Office of the Auditor General states that the total deficit for all 20 DHBs increased significantly in 2016/17 with continued financial pressure making it difficult for DHBs to invest for the future.¹³³ Further, between 2008/09 and 2014/15, internal funding from DHBs' net operating cash flows covered only 55% of their total capital investment needs. Using depreciation as a proxy for how much is being 'consumed', the Auditor-General's analysis also showed that 12 of the 20 DHBs (60%) did not have enough internally generated funds to cover their renewal spending needs.

In late 2019, the Health Infrastructure Unit was established to support, oversee, and standardise DHB capital project design and delivery. The Health Infrastructure Unit is designed to enhance the Ministry of Health's stewardship role and standardise project design and delivery. To date, they have overseen/are overseeing the new Dunedin Hospital project (over \$1 billion, which will be the largest hospital build in New Zealand), the Acute Services Building in Christchurch, and the Greymouth Hospital completion. Since 2018, the Government has invested \$3.5 billion into DHB capital projects.¹³⁴ A depiction of National Asset Management Programme interactions with the Health Infrastructure Unit, Treasury, and DHBs has been provided in Appendix G.

The New Zealand Upgrade Programme

On 29 January 2020, the New Zealand Upgrade Programme was announced, allocating a further investment of \$300 million into modernising our health facilities. Key investments include upgraded neonatal care facilities at Counties Manukau, Auckland, Hutt Valley, and Capital & Coast, investment in upgraded maternity facilities in Tairāwhiti, South Canterbury and Hutt Valley DHBs, new and upgraded mobile dental clinics in Hawke's Bay, Lakes, and Wairarapa.¹³⁵ Additionally, \$96 million has been allocated to fund mental health projects such as new acute mental health facilities in Tauranga and Whakatane, a new acute mental health unit at Hutt Valley DHB, and the refurbishment of the Taranaki mental health facility.¹³⁶

Wellbeing Budget 2020

On 14 May 2020, increased capital investment for DHBs (\$750 million) was announced under the Wellbeing Budget 2020. This builds on the record \$2.45 billion capital investment over the 2018 and 2019 Budgets plus \$1.4 billion announced for the redevelopment of the Dunedin Hospital, and provides a pool of funding to be used for priority capital projects within the health sector. The funding will support the delivery of safe and appropriate healthcare by providing facilities, infrastructure and technology that can appropriately meet current and future demand.¹³⁷

¹³¹ Ministry of Health, *The National Asset Management Programme for district health boards: Report 1*, 17

¹³² Ministry of Health, *The National Asset Management Programme for district health boards: Report 1*, 13.

¹³³ Controller and Auditor-General, "Health Sector: Results of the 2016/17 audits."

¹³⁴ Ministry of Health, "Health Infrastructure Unit."

¹³⁵ The New Zealand Government, "The New Zealand Upgrade Programme."

¹³⁶ The New Zealand Government, "The New Zealand Upgrade Programme."

¹³⁷ The Treasury, "Wellbeing Budget 2020: Rebuilding Together."

4.3.2. Operational/Services Funding

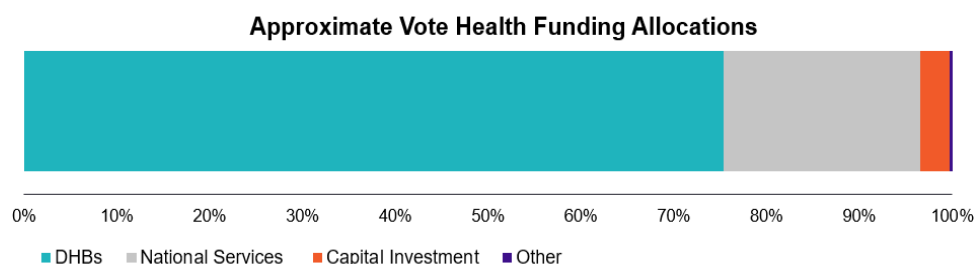
The New Zealand health and disability sector is predominately publicly funded (~80%). Most public funding is through the Ministry of Health under Vote Health. In 2020/21 Vote Health funding totalled \$20,269 million. A detailed breakdown of this funding has been provided in Appendix H. Other significant funding includes ACC, other government agencies, local government, and private sources (e.g. insurance and out-of-pocket payments). These other sources of funding are out of scope for this report. However, they are likely to have potential implications for the scale and quality of infrastructure investment and resulting access to healthcare

MoH allocates over 75% (\$15,274 million in 2020/21) of the public funds it manages through Vote Health to DHBs. This funding is used to plan, purchase, and provide health services within their districts. Approximately 1.2% (approximately \$250 million in 2020/21) of Vote Health funding is dedicated to operational and management expenses for MoH.¹³⁸

In 2020/21 \$3,750 million (18.6%) of Vote Health was apportioned to national level health and disability services managed by the MoH, including:

- Disability support services
- Public health services
- Specific screening programmes
- Mental health services
- Elective services
- Well child and maternity services
- Māori health services
- Postgraduate clinical education/training

Figure 11: Approximate allocation of public Vote Health funds



MoH funds DHBs using a population-based model, which distributes Vote Health funds according to the needs of their geographically defined populations. The formula considers the number of people living in the geographically defined region, age, socio-economic status, ethnicity, and sex. It also accounts for rural communities and levels of high deprivation.¹³⁹

Primary health organisations are funded according to a capitation-based model. Calculated annually, capitation rates provide a specific subsidy for different patient types on the register (e.g. number of patients enrolled with a general practice that is part of a specific primary health organisation).¹⁴⁰ The model uses patient demographics from the national census and accounts for factors such as age and gender.¹⁴¹

In the 2020 Wellbeing Budget, the government announced significant new investment in Vote Health. This included \$3.9 million to DHBs for additional operating support, \$160 million for maintaining and increasing the combined pharmaceutical budget, \$832.5 million in supporting disabled New Zealanders, \$177 million for maternity services, and \$750 million for increased capital investment in DHBs.¹⁴²

¹³⁸ The Treasury, Vote Health: The Estimates of Appropriations 2020/21, 2.

¹³⁹ Ministry of Health, "Population-based funding formula."

¹⁴⁰ Waitangi Tribunal, Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry, 52.

¹⁴¹ Waitangi Tribunal, Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry, 52.

¹⁴² Budget 2020, "Wellbeing Budget 2020."

Significant funding is also derived from the Accident Compensation Corporation (ACC), other government agencies, local government, and private sources.¹⁴³ ACC is funded through levies and investments. Levies are paid on petrol and vehicle registrations, and by employers, employees, and the self-employed.¹⁴⁴

Non-DHB crown agents receive funding from DHBs and additional Ministry contracts. These agents can include PHARMAC, the Health Promotion Agency, the New Zealand Blood Service, the Health Research Council, and the Health Quality and Safety Commission New Zealand.¹⁴⁵

The government does not fund private health services within New Zealand. These services are either paid for by the individual or through private health insurance. There are policies that provide comprehensive cover for all medical costs, and more selective policies that only cover specialist care and/or non-elective surgery.¹⁴⁶

Public funding for aged residential care is supplied through DHBs based on a needs assessment and is therefore demand driven. Older people may choose to enter aged residential care without an assessment; however, they will be required to pay the full costs of their care.¹⁴⁷

DHB funding for aged residential care is based on four categories (accommodation, everyday living services, core support, additional care), each of which has a separate price. Adjustments are also made to the prices based on geographic location (Territorial Local Authority (TLA) prices). Funding is received as a single fee for a defined purchase unit: a bed day. This payment covers resident accommodation, care delivered by provider staff, equipment needs for resident care, availability of onsite amenities, and purchasing or coverage of other defined health services required for residents.¹⁴⁸

Two national contracting frameworks set out the terms and conditions for contracted aged residential care services, including quality and safety. These are the Streamlined Contract Framework and the National Contracts and Service Specifications. Changes to terms and conditions are negotiated annually between DHBs and providers on a national basis.¹⁴⁹

A 2019 report found DHBs spend around \$1.1B per year on aged residential care for older people, with residents contributing a further \$0.8B (excluding extra charges). This equates to about 0.8% of GDP, which is less than in many other OECD countries. Coupled with New Zealand's relatively high per capita use of aged residential care, this suggests less is spent per resident day than in many other countries.¹⁵⁰

4.4. Current Issues

The health and disability system is large and diverse. The system is shaped by many legislative, regulatory, governance and funding structures. As with most health and disability systems in developed countries, demand and supply pressures are putting strain on public finances. Demand pressures relate to demographic changes such as population ageing, increasing prevalence of long-term conditions, rising public expectations, and inequities in access and outcomes. Supply pressures relate to workforce shortages, new clinical and information technologies, and physical infrastructure. The existing funding models used in the sector have been identified as inadequate in managing these issues. Many of these issues are interrelated and most have been exacerbated by the COVID-19 pandemic.

¹⁴³ Ministry of Health, "Funding."

¹⁴⁴ New Zealand Government, "ACC levies."

¹⁴⁵ Minister of Health, *New Zealand Health Strategy Future Direction*, 38.

¹⁴⁶ New Zealand Government, "Paying for healthcare services."

¹⁴⁷ Ernst & Young, *Aged Residential Care Funding Model Review*, 14

¹⁴⁸ Ernst & Young, *Aged Residential Care Funding Model Review*, 14

¹⁴⁹ Ministry of Health, "Contracts and service specifications."

¹⁵⁰ Ernst & Young, *Aged Residential Care Funding Model Review*, 13

4.4.1. Health Inequities

New Zealand has a diverse population and a history of differing health outcomes across population groups. Māori, Pacific peoples, and people from lower socioeconomic groups have worse health on average, and higher amenable mortality rates than other New Zealanders. Geographic areas with lower than average incomes also tend to have higher rates of premature mortality and acute hospitalisations.¹⁵¹

While DHB provided services are largely free for New Zealanders, access to many non-DHB provided services have co-payments. This can create access barriers for people with lower incomes. For example, the 2019/20 New Zealand Health Survey found adults living in the most socioeconomically deprived areas were 1.6 times more likely to have not gone to a GP due to cost than those that live in the least deprived areas.¹⁵² Ethnic identity is also an important dimension of health inequity. A Window on the Quality of New Zealand's Health Care 2019 focuses on the disparity between Māori and non-Māori health equity and includes the following statistics:¹⁵³

- Māori were more likely than non-Māori to cite cost as a barrier to seeing a general practitioner.
- Māori children have a 30% higher rate of hospitalisation for asthma compared with non-Māori children.
- Immunisation rates for Māori children are now nearly 10 percentage points lower than for non-Māori.
- More Māori than non-Māori adults wait more than three months for a specialist appointment.
- Māori live on average seven years less and die from diseases that health care can address at a rate two-and-a-half times higher than non-Māori.

The Health and Disability System Review also highlights the inequities in health outcomes between Māori and non-Māori and noted that the health and disability sector must make changes to fulfil its obligations under Te Tiriti o Waitangi and to implement rangatiratanga and embed mātauranga Māori/ Māori knowledge.¹⁵⁴

The Waitangi Tribunal's Health Services and Outcomes Inquiry (Wai 2575) is an inquiry into claims concerning grievances relating to health services and outcomes of national significance. The stage one inquiry was a discrete and targeted inquiry into the legislative and policy framework of the primary healthcare system. Importantly, it discusses whether the health system, in its current state, aligns with Te Tiriti o Waitangi principles. Key points raised by the inquiry include:¹⁵⁵

- The Public Health and Disability Act 2000 fails to achieve equitable health outcomes for Māori and constitutes a breach of the Treaty principles of good faith and partnership.
- Funding arrangements for the primary health care system do not address Māori health needs and constitute a breach of the Treaty principles of partnership, active protection, equity, and options.
- Health entity accountability does not support equitable Māori health outcomes and constitutes a breach of the Treaty principles of active protection and equity.
- The Primary Health Care Framework does not adequately provide for tino rangatiratanga and mana motuhake of hauora Māori. This constitutes a breach of the Treaty principles of active protection, partnership, equity, and options

Many of the factors that contribute to inequitable access to health care are interrelated including ethnicity, socioeconomic position, age, disability, geographic location, and transport.¹⁵⁶ A summary of these factors is provided in Table 4 below.

¹⁵¹ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 3.

¹⁵² Ministry of Health, "Annual Update of Key Results 2019/20: New Zealand Health Survey."

¹⁵³ Health Quality and Safety Commission, *A Window on the Quality of Aotearoa New Zealand's Health Care 2019*, 9-10.

¹⁵⁴ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 8.

¹⁵⁵ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*.

¹⁵⁶ Health and Disability System Review, *Health and Disability System Review Final Report*, 18.

Table 7: Summary of factors that contribute to inequities in the health system

Factor	Description
Socioeconomic Position	Those living in more deprived communities are more likely to experience unmet health needs. For example, psychological distress is 2.1 times more prevalent in people living in deprived areas. ¹⁵⁷
Gender	Women experience greater unmet need for primary health care services, indicating that they have less access to these services. ¹⁵⁸
Ethnicity	Māori have the poorest health outcomes of any ethnic group within New Zealand ¹⁵⁹ and efforts to improve service quality do not always improve equity for Māori. ¹⁶⁰ Compared to non-Māori populations, Māori have lower access to services, a higher proportion of inaccessible hospital appointments, longer wait times, and lower rates of medicine uptake. ¹⁶¹ Additionally, funding arrangements for the primary health care system disadvantage primary health organisations and providers that predominately serve high-needs populations. ¹⁵⁹
Place of residence	Those in deprived areas experience greater unmet need for primary health care services, indicating they have less access to these services. ¹⁶² Living in rural and disconnected areas results in reduced access to services and lower health outcomes. ¹⁶³
Disabilities	Disabled people are high users of the health system, yet they do not achieve equitable health outcomes. Disabled people currently have some of the worst health statistics and a complex and confusing support system structure. ¹⁶⁴
Transport	Transport barriers are often cited as key barriers to accessing healthcare, and can lead to missed appointments, delayed care, poor management of chronic illness, and ultimately poorer health outcomes. ¹⁶⁵ Improving transport availability and transport time to healthcare could contribute to improved outcomes. Enhanced access to transport may allow individual facilities to service a greater area thereby reducing the need for as many facilities overall.

2 Health Inequities

Policy Implications

Funding, governance, and regulatory system that addresses inequities via, for example, investment in facilities, and new Models of Care that meet diverse population needs

3 Māori Health Disparities

Policy Implication

Te Tiriti o Waitangi | The Treaty of Waitangi obligations and Māori perspectives need to be incorporated into long-term infrastructure planning and investment.

¹⁵⁷ Ministry of Health, "Annual Update of Key Results 2019/20: New Zealand Health Survey."

¹⁵⁸ Ministry of Health, *Health and Independence Report 2018*, 2.

¹⁵⁹ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, xii.

¹⁶⁰ Health Quality & Safety Commission, *A Window on the Quality of Aotearoa New Zealand's Health Care 2019*, 9-10.

¹⁶¹ Health Quality & Safety Commission, *A Window on the Quality of Aotearoa New Zealand's Health Care 2019*, 9; Ministry of Health, *Achieving Equity in Health Outcomes*, 22.

¹⁶² Ministry of Health, *Health and Independence Report 2018*, 2.

¹⁶³ Health and Disability System Review, *Health and Disability System Review: Final Report*, 21.

¹⁶⁴ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 4.

¹⁶⁵ Syed, S., Gerber, B., & Sharp, L., *Traveling towards disease: Transportation barriers to health care access*, 976.

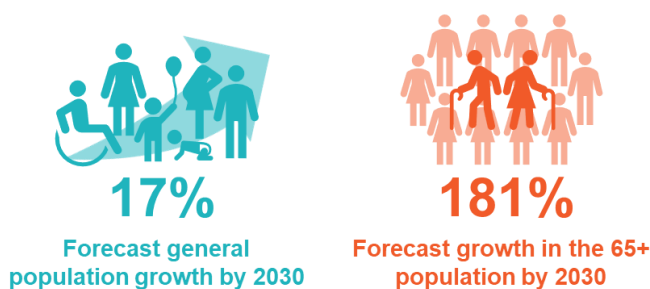
4.4.2. Demographics

The New Zealand health and disability system is facing significant challenges due to demographic changes. Notably, our ageing population is expected to increase the strain the health system is facing. New Zealanders are living longer, and every year the number of New Zealanders aged over 65 increases.¹⁶⁶ It is predicted that by 2050 27% of New Zealand's population will be over 65.¹⁶⁷ This will place greater strain on already pressured services particularly given the increasing prevalence of long-term conditions that predominantly affect the elderly population (e.g.- dementia) and growing case complexity requiring greater monitoring, longer-term care, and more advanced medical technologies. For example, the number of New Zealanders with dementia will rise from about 48,000 in 2011 to approximately 78,000 in 2026.¹⁶⁸

The New Zealand population has also grown much faster than expected, reaching 5 million people at least 20 years earlier than projected in the mid-2000s.¹⁶⁹ This has put strain on the health and disability system, particularly given deferred capital investments over the past decade.

Figure 12 shows population projections for 2030. With 5.09 million people in 2020, New Zealand's general population has a 90 percent probability of increasing to between 5.19 and 5.94 million in 2030. For those aged over 65 (0.79 million in 2020), there is a 90 percent probability of this increasing to between 1.36 and 1.51 million in 2030.¹⁷⁰

Figure 12: 2030 population projections (high estimate)



Given the rapid population growth, particularly with respect to the older population (65+ years), the prevalence of neurological conditions is also likely to increase. A greater proportion of New Zealand's population will likely be living with some form of disability.¹⁷¹ These populations often have greater (and more complex) needs, which will increase demand across the sector. The Health and Disability System Review identified the need to have greater visibility of disability at the system level to improve equity and ensure proper focus on health outcomes for disabled people. More cohesive information, advice, and service delivery within health and across the wider government was also identified as a key challenge for the Sector to address.¹⁷²

5 Shifting Demographics

Policy Implication

Planning is needed so that health infrastructure is sufficiently flexible and able to respond to geographic shifts/urbanisation of demand and changing models of care (more integrated and community-based care).

¹⁶⁶ Ministry of Health, "Challenges and opportunities."

¹⁶⁷ Health and Disability System Review, *Health and Disability System Review: Final Report*, 117.

¹⁶⁸ Ministry of Health, *New Zealand Health Strategy Future Direction*, 9.

¹⁶⁹ Stats NZ, "New Zealand's population passes 5 million."

¹⁷⁰ Stats NZ, "National population projections: 2020(base)-2073."

¹⁷¹ Health and Disability System Review, *Health and Disability System Review: Final Report*, 247.

¹⁷² Health and Disability System Review, *Health and Disability System Review: Final Report*, 128.

4.4.3. Funding Models

There are criticisms of the current funding models, including the capitation¹⁷³ and population-based funding structures¹⁷⁴, the year-by-year funding cycle (which has the potential to stifle the flexibility required to reduce inequities), poor long-term planning, and poor management of, and short-falls in, current funding levels. Recurring criticisms cite that the system needs to operate more efficiently to utilise the funds made available to it.¹⁷⁵ Further, there has been a historical trend of DHB capital underspending, which is typically attributed to timing delays. For the 2019/20 financial year, DHB capital expenditure totalled \$520 million of a budgeted \$740 million; a 30% underspend.¹⁷⁶

Aged residential care funding structures have also received criticism. There is evidence that the current financial returns on operations are not enough to support building new capacity and the replacement of ageing infrastructure.¹⁷⁷ This is concerning as the demand for beds will continue to increase with the ageing population. This is in combination with criticism of the interface between home and community support funding models, the aged residential care funding model, and the retirement village sector.

A common theme across the literature is the need for more deliberate and structured long-term funding and planning, as opposed to short-term operational based planning and funding. This is a fundamental flaw and impacts the distribution of costs across the system, the state of current infrastructure, investment in capital projects, technology and innovation, and the scope and roles of clinical services across hospital sites, as well as between hospitals and community services.¹⁷⁸ As a result, the Health and Disability System Review recommends that the sector needs a new health plan for the next 20 years.¹⁷⁹

4
Inefficient and ineffective funding models

Policy Implication

Funding models need to be adjusted so that they incentivise appropriate capital investment to ensure New Zealand has flexible, fit for purpose facilities.

¹⁷³ Waitangi Tribunal, *Hauora: Report on Stage One of the Health Services and Outcomes Kaupapa Inquiry*, 116.

¹⁷⁴ Health and Disability System Review, *Health and Disability System Review: Final Report*, 60.

¹⁷⁵ Health and Disability System Review, *Health and Disability System Review: Final Report*, 41.

¹⁷⁶ Ministry of Health, *DHB Sector Financial Performance Report Year ended 30 June 2020*, 9.

¹⁷⁷ Grant Thornton, *Aged Residential Care Service Review: Summary of Findings*, 8.

¹⁷⁸ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 7.

¹⁷⁹ Health and Disability System Review, *Health and Disability System Review: Final Report*, 7.

4.4.4. Facilities are not Fit-for-Purpose

Facility Maintenance and Demand Pressures

Funding pressures and a focus on managing short-term operations has resulted in under-investment in infrastructure across the sector which will impact on access to high quality and safe care.

It is estimated that between 2018/19 to 2028/29, approximately \$14 billion of investment will be required for DHB buildings and infrastructure, and \$2.23 billion for DHB information technology.¹⁸⁰

As a result of this under-investment, many facilities are not fit-for-purpose with inflexible underlying infrastructure systems, subsequently restricting the introduction of new models of care and quality innovation.¹⁸¹ This is compounded by the inability of health assets to sufficiently adapt to changing models of care. The life of many health assets is 25 to 40 years (or longer), yet models of care evolve more rapidly in response to emerging trends and patient needs. As such, DHBs are having to adapt existing assets to new models of care in either the absence of funding for significant, new capital investment or until the life of the asset is up for renewal and reinvestment.

Modern Care Models

Existing models of care are often outdated and inadequate to support anticipated future care needs arising from the aging population, increasing ethnic diversity, growing patient complexity, and shifting consumer expectations. DHBs are currently developing and implementing plans to innovate care models and meet these pressing demand requirements.¹⁸² Many DHBs, such as Mid-Central, are focusing their long-term plans around a vision for a more integrated, collaborative, and community-based health service, which will help to ease capacity constraints on hospitals.¹⁸³

New models of care that respond to changing patient needs and expectations are enabled by good facility design including facility design standards. For example, the National Asset Management Programme outlined prevalent issues within mental health facility design, such as inadequate privacy, a lack of consideration for cultural needs, poor lighting, insufficient door sizes and corridor widths, long distances to other clinical services, and inadequate support for staff and patient communication.¹⁸⁴ Counties Manukau's recent Mental Health Unit provides an example of how new mental health facility design can support modern models of care, as demonstrated in the case study below.^{185,186}

Counties Manukau Case Study

Counties Manukau DHB has used a new courtyard model for the design of its Tiaho Mai Mental Health Unit, opened in 2018. The Tiaho Mai Mental Health Unit was developed using a co-design approach with the input of service users themselves, families, staff, and cultural groups. The design incorporates light and natural space, large rooms and corridors, as well as improved safety and visibility

Other features of this design include wide circulation areas around enclosed courtyards; separation of spaces for people acutely unwell and those in step-down care; smaller shared living spaces; separate and therapeutic areas for interaction between the patient, whanau, and staff; off-the-floor staff work areas; separate access pathways for staff, acute admissions and the public; and more subtle security arrangements.

¹⁸⁰ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 5.

¹⁸¹ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 12.

¹⁸² MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 53.

¹⁸³ MidCentral District Health Boards, *Long Term Investment Plan 2016-2026*, 31.

¹⁸⁴ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 40.

¹⁸⁵ Counties Manukau Health, "Counties Manukau Health opens new Tiaho Mai Mental Health Unit."

¹⁸⁶ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 42.

6 Facilities aren't fit-for-purpose

Policy Implication

Improved infrastructure planning, and prioritisation at a national level including better capital appropriation pathways, Investment in modern Models of Care, enabled by new facility design standards, to meet future demand and consumer expectations.

4.4.5. Workforce

Workforce attraction and retention is another key issue the sector faces. For example, Counties Manukau Health recently reported their Mental Health and Addictions Unit has a staff shortage of 121 positions out of 723 (16%) as of September 2020.¹⁸⁷ Contributing factors to attraction and retention challenges include: remuneration and benefit packages compared to other developed countries, limited access to training for care workers, the ageing workforce,¹⁸⁸ COVID-19 limiting critical migrant worker numbers,¹⁸⁹ employment disputes (e.g. nurse strikes over pay),¹⁹⁰ stress levels,¹⁹¹ and the different bodies involved in workforce training and regulation.¹⁹²

The following case study into the midwifery workforce highlights an area with systemic retention and attraction issues:¹⁹³

Wellington Hospital Case Study

There have been numerous reports of a national workforce shortage within midwifery. A news article from February 2021 outlined staff shortages at Wellington Hospital amidst a period of increased birth levels. This led to delays to planned caesareans and inductions. Roughly a third of midwifery positions at Wellington Hospital were vacant, leading to staff feeling overworked and underpaid. Midwives also felt the shortage placed mothers and babies at risk. This problem is set to continue with ongoing issues attractin students to midwifery and COVID-19 restrictions delyainq new graduates from entering the workforce.

The health and disability sector workforce is heavily reliant on infrastructure to deliver services and support their wider training needs. The combination of quality infrastructure with a healthy workforce can aid better health outcomes for all New Zealanders.

7 Workforce Challenges

Policy Implication

Long term planning and investment in digital technologies and supporting infrastructure to provide an environment and tools that are easy to use, inclusive, and provide confidence to clinicians and other health care staff.

¹⁸⁷ Forbes, "DHB data shows scale of staffing shortages in mental health services."

¹⁸⁸ Ministry of Health, "Challenges and Opportunities."

¹⁸⁹ Russell, "Serious health workforce burden looms: Experts say more migrant workers needed."

¹⁹⁰ Wiltshire, "Nurses to strike again after 10 months of 'fruitless' pay parity negotiations."

¹⁹¹ Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 3.

¹⁹² Health and Disability System Review, *Health and Disability System Review: Executive Overview*, 7.

¹⁹³ Witton, "Midwife shortage and more babies creates 'perfect storm' for Wellington hospital maternity ward;" Corlett, "'Crap pay and horrible conditions': Midwives at breaking point in capital DHB."

4.4.6. The Rise of Chronic Disease

Increasing incidences of chronic disease and longer-term conditions leads to higher complexity (requiring more resources) and pressure on the system and its services.¹⁹⁴ For instance, there is a growing health burden associated with conditions such as heart disease, diabetes, depression, dementia, and musculoskeletal conditions.¹⁹⁵ Better community-based care, increased prevention and self-management measures, and integration of care across services and providers will be needed to manage the increased load and complexity on the system. There will also be a need to work with other agencies and sectors to mitigate negative impacts on people's health, for example, the housing sector.¹⁹⁴

4.4.7. Changing Consumer Expectations and Requirements

With the development of new health treatments, growing ethnic diversity, and the increased availability of information, there are greater expectations for the level of care provided by the system.¹⁹⁶ The aging population will also have increased expectations for the health system as incidences of older patients living away from their families is increasing.¹⁹⁷

Mid-Central DHB speculate changing expectations could result in growing demand for expensive interventions, increased pressure to provide more expensive and clinically marginal interventions, a need to enhance clinical networking, a drive to empower people to better manage their health, and necessitate collaboration with other agencies to mitigate social isolation and develop more older person and dementia friendly communities.¹⁹⁷

To respond to health disparities prevalent throughout the health system, there is a strong focus on ensuring communities are at the heart of the health system.¹⁹⁸ Through providing more integrated and community-based services closer to home, the health sector can more effectively provide services regardless of common barriers to care such as: geographical location, ethnicity, socioeconomic status, age and gender. Investing in community based services, reconfiguring models of care, hospital services, equipment, facilities infrastructure, and IT all has the ability to support positive health experiences through increased access to services and information, capacity of services, consumer engagement, early detection, evidence based best practice, and fit-for-purpose facilities.¹⁹⁹

4.5. COVID-19

COVID-19 has had numerous effects on the health and disability sector. These impacts include risk management, financial planning and performance, capital project delays, service delivery, and the need to adapt to new technology and data requirements. COVID-19 has revealed issues within the Sector today and areas the sector needs to address in the future.

In terms of service delivery, the implementation of COVID-19 alert levels saw demand increases in areas such as emergency departments, and the delay of services in other areas. This deferral resulted in notable backlogs to planned medical and surgical hospital care.²⁰⁰

In relation to health equity, COVID-19 highlighted the potential for a pandemic to worsen health inequities for Māori and Pacific, and other groups such as those with mental illness or living in rural areas.²⁰¹ The

¹⁹⁴ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 19.

¹⁹⁵ SuperSeniors, "Our ageing population."

¹⁹⁶ Canterbury District Health Board, *Long Term Investment Plan*, 40.

¹⁹⁷ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 20.

¹⁹⁸ New Zealand Health and Disability System Review, *New Zealand Health and Disability System Review: Executive Overview*, 4.

¹⁹⁹ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 11.

²⁰⁰ Ministry of Health, *Briefing to the Incoming Minister*, 13.

²⁰¹ Health Research Council of New Zealand, "New Studies Put Health Equity at Centre Of COVID-19 Pandemic Response."

impact of the pandemic on mental health may result in higher demand for mental health services.²⁰² The Health Research Council of New Zealand has recently announced funding to promote equitable outcomes during the pandemic recovery.²⁰³

COVID-19 has also highlighted how our current health infrastructure is not properly equipped for emergencies, such as a pandemic. Design and maintenance issues such as older negative pressure rooms, inadequate sizes, lack of anterooms, and problems with door seals and ventilation within the current health infrastructure lead to capacity and operational issues surrounding disease control.²⁰⁴ Technical issues such as a lack of interoperability and integration of telehealth inhibit the ability of the system to provide services in an emergency without the need to visit a physical facility.²⁰⁵

²⁰² Ministry of Health, *Briefing to the Incoming Minister*, 13.

²⁰³ Health Research Council of New Zealand, "New Studies Put Health Equity at Centre Of COVID-19 Pandemic Response."

²⁰⁴ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 10.

²⁰⁵ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 11.

5. How the Sector is Performing Today

5.1. Comparison with International Peers

New Zealand is a member of the OECD – an international organisation that works to establish evidence-based international standards. Among other things, the OECD measures health outcomes and the use of health system resources, and analyses healthcare related policies across all members.

The OECD compares member countries using their Framework for Health System Performance Measurement, which assesses quality, accessibility, and cost / expenditure. Further detail on this framework has been provided in Appendix I. The OECD's Health at a Glance 2019 report detailed comparison of OECD countries across dimensions within this framework.²⁰⁶ Appendix J provides an overview of the population health and health system performance summary indicators evaluated in the report.

Table 8 below summarises the report's 'Dashboard on Health Resources' for New Zealand and selected countries. The report found a positive association between health spend per capita and life expectancy i.e. life expectancy was greater where countries spent more on health. New Zealand, however, was shown to deviate from this relationship; New Zealand's health spend per capita is less than the OECD average,²⁰⁷ but the average life expectancy in 2017 (81.9 years) was greater than the OECD average (80.7 years).²⁰⁸

Table 8 Health Resources Dashboard from OECD Health at a Glance report

Country	Health Spend per Capita (USD)	Health Spend Share (%GDP)	Doctors per 1,000 population	Nurses per 1,000 population
Australia	5,005	9.3	3.7	11.7
Canada	4,974	10.7	2.7	10.0
New Zealand	3,923	9.3	3.3	10.2
Norway	6,187	10.2	4.7	17.7
United Kingdom	4,070	9.8	2.8	7.8
OECD Average	3,994	8.8	3.5	8.8

OECD, Health at a Glance 2019

While New Zealanders may be living longer, our population may not be as healthy as they report. New Zealand performs particularly well against OECD countries under the (self-reported) Health Status indicator, with the highest reports of good or very good health. However, New Zealand performs below average against the healthy life expectancy indicator (see Appendix K).²⁰⁹ Particularly concerning is that, behind the United States and Italy, New Zealand has the third highest proportion of children (aged between five to nine years) that are overweight or obese. In 2016, 41.8% of New Zealand children were classified as overweight compared to an OECD average of 31.4%.²¹⁰ A greater proportion of adults are classified as overweight or obese; 66.6% in 2017 compared to an OECD average of 58.2%.²¹¹

²⁰⁶ OECD, *Health at a Glance 2019*, 20.

²⁰⁷ OECD, *Health at a Glance 2019*, 33.

²⁰⁸ OECD, *Health at a Glance 2019*, 67.

²⁰⁹ The Treasury, "Living Standards Framework – Dashboard."

²¹⁰ OECD, *Health at a Glance 2019*, 99..

²¹¹ OECD, *Health at a Glance 2019*, 97.

One of the most significant consequences of obesity is cardiovascular disease. This was reflected in OECD results for heart disease. Mortality for heart attacks and other ischaemic heart disease in New Zealand was approximately 5.0% greater than the OECD average.²¹²

Arguably, these findings could support calls in the Health and Disability System Review to invest in population health approaches. Population health is a relatively new concept aiming to **prevent** illness and improve the health and wellbeing of local communities. New Zealanders could materially benefit from greater focus on population health, rather than reactive intervention once health issues become serious.

5.2. Industry Performance Measures

Created in 2016, the New Zealand Health Strategy aims for “all New Zealanders to live well; stay well; get well; in a system that is people-powered, provides services closer to home, is designed for value and high performance, and works as one team in a smart system.”²¹³ Non-financial performance measures, including health targets and system level measurements, were defined to work towards achieving this strategy.

5.2.1. Health Targets

Table 9 outlines the health targets Ministry of Health formally used to assess the sector. In January 2021 the Ministry of Health published the new outcomes focussed system level measures.²¹⁴ At the time of drafting, DHB performance against these measures had not been reported, and as such, industry performance has been evaluated using the former health targets measures. The first three are based on patient access, while the others are centred around prevention, reflecting public and Government priorities.²¹⁵

Table 9 Health system metrics measured annually by MoH from 2017

Target	Description
Shorter stays in the ED	To admit, discharge, or transfer 95% of patients from the ED within 6 hours.
Improved access to elective surgery	Elective surgeries should increase by 4,000 discharges per year (on average).
Faster cancer treatment	90% of patients with a high suspicion of cancer (with a need to be seen within two weeks) should receive their first cancer treatment within 62 days.
Increased immunisation	95% of children aged eight months will have received their primary course of immunisation (6 weeks, 3 months, and 5 months immunisations) when required.
Better help for smokers to quit	90% of pregnant women identified as smokers are offered advice and support for quitting smoking and 90% of those enrolled in a PHO who smoke have been given the opportunity to receive assistance from a health care practitioner to help quit.
Raising healthy kids	95% of children identified as obese in the B4 School Check will be offered a referral to a health professional for clinical assessment and family-based nutrition, activity, and lifestyle interventions.

Ministry of Health, “About the health targets.”

Meeting health targets requires whole-of-system improvement and heavily relies on the performance and suitability and flexibility of ICT-related infrastructure.²¹⁶ Improved ICT infrastructure has the potential to

²¹² OECD, *Health at a Glance 2019*, 75.

²¹³ Ministry of Health, “Five strategic themes.”

²¹⁴ Ministry of Health, “System Level Measures Framework”

²¹⁵ Ministry of Health, “About the health targets.”

²¹⁶ Ministry of Health, *Targeting Waiting Times*, 9.

reduce stays in the emergency department, better manage demand fluctuations and reduce over-crowding, thereby improving clinical outcomes as well as patient privacy..²¹⁷

Former Health Minister David Clark claimed the health targets create perverse incentives, encouraging DHBs to achieve targets at the expense of high quality service.²¹⁸ For example, concerns exist that hospitals may discharge acute patients earlier in order to accommodate more elective surgeries, or patients may be admitted for elective surgeries when treatment is possible at the primary or secondary level.²¹⁹ MoH have since been directed to develop a new set of performance measures, however, existing health targets will remain until this process is complete.²²⁰

5.2.2. System Level Measures

System level measures have been nationally set for continuous improvement since 2016, with an overall focus on helping children, youth, and vulnerable populations. They encourage DHBs to work collaboratively with their health partners to improve the current state. Current system level measures are detailed below:²²¹

- Ambulatory Sensitive Hospitalisation Rates per 100,000 for 0-4 years olds
- Total Acute Hospital Bed Days
- Patient Experience of Care
- Amenable Mortality
- Youth Access to and Utilisation of Youth-appropriate Health Services
- Babies in Smoke Free Homes

All DHBs are required to provide an Improvement Plan to MoH to demonstrate how they will progress with System Level Measures, milestones, quality improvement activities, selected contributory measures, and how the regional alliance will use an integrated approach to achieve these measures. These measures do not have specific national targets, however, each DHB is required to set targets based on their current accomplishments.²²²

DHB performance against system level measures is influenced by the state of infrastructure. The Auckland Metro System Level Measure Improvement Plan 2020/21, for example, highlights facility level efficiencies as a contributing factor to the system level measure of acute hospital bed days per capita.²²³

5.3. Sector Performance

MoH has provided health target quarterly progress for each DHB from 2007/08 to 2019/20. Figure 13 below provides the national average performance for all DHBs for cancer and smoking health targets from 2017-2020.²²⁴ There appears to be a national, long-term decreasing trend in annual average performance against these two health targets.

Figure 13 below displays the national average performance for all DHBs' against the health targets of shorter stays in emergency departments, increased immunisation, and raising healthy kids. Against the targets of shorter stays in emergency departments and increased immunisation, DHBs have consistently underperformed between Quarter 1 – 17/18 and Quarter 4 – 19/20.

²¹⁷ Ministry of Health, "Health targets: Shorter stays in emergency departments."

²¹⁸ Kirk, "How's your DHB doing? Govt does away with national health targets."

²¹⁹ Jiang, Nan, and Antony Andrews. "Efficiency of New Zealand's District Health Boards at Providing Hospital Services: A Stochastic Frontier Analysis". *Journal of Productivity Analysis*. 55

²²⁰ Ministry of Health, "About the health targets".

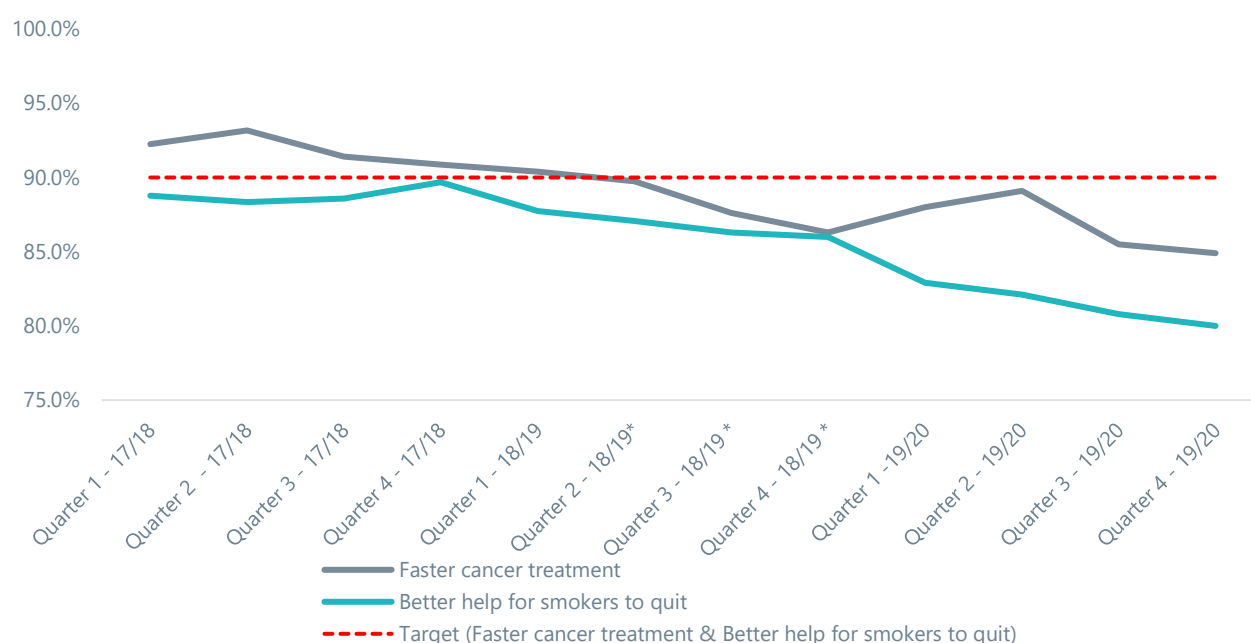
²²¹ Ministry of Health, "About the health targets".

²²² Ministry of Health, "System Level Measures Framework Questions and Answers."

²²³ Auckland, Waitemata & Counties Manukau Health Alliances, *System Level Measures Improvement Plan 2020/2021 Financial Year*, 17.

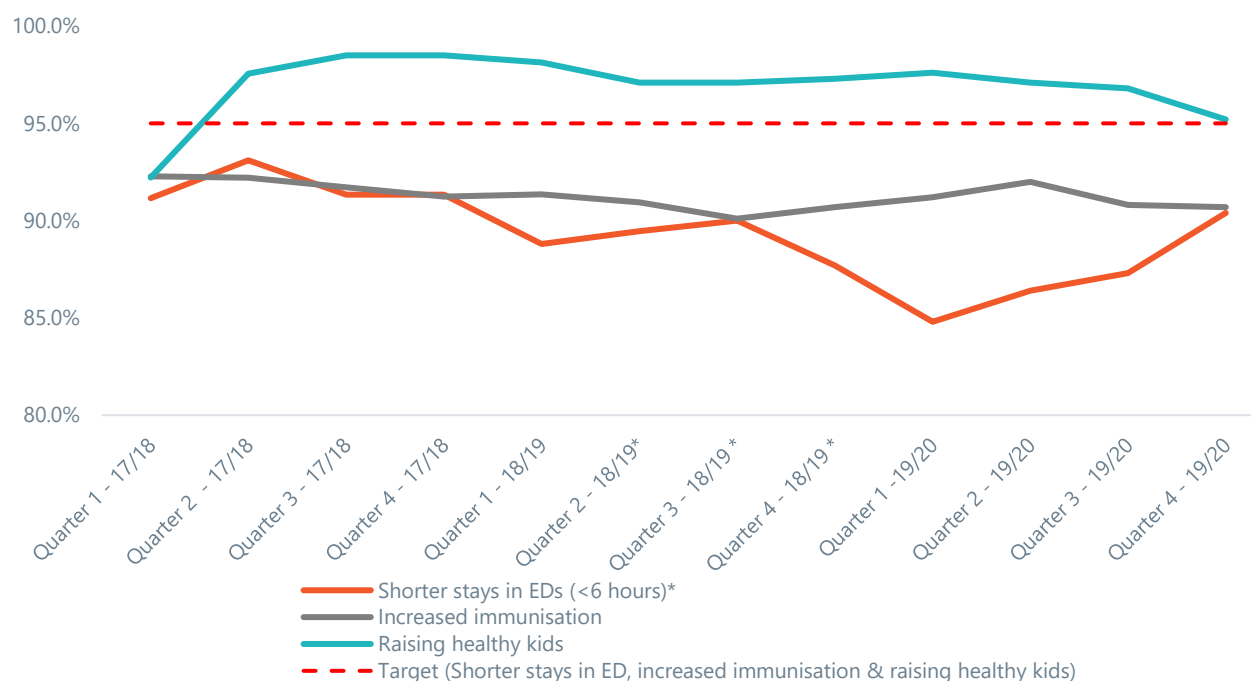
²²⁴ Ministry of Health, "How is my DHB performing?"

Figure 13: National Average Performance of all DHBs against Cancer and Smoking Health Targets from 2017 to 2020²²⁵



* Canterbury DHB was unable to supply data due to new systems issues.

Figure 14: National average performance of all DHBs against emergency department, immunisation and healthy kids health targets from 2017 to 2020²²⁶



* Canterbury DHB was unable to supply data due to new systems issues.

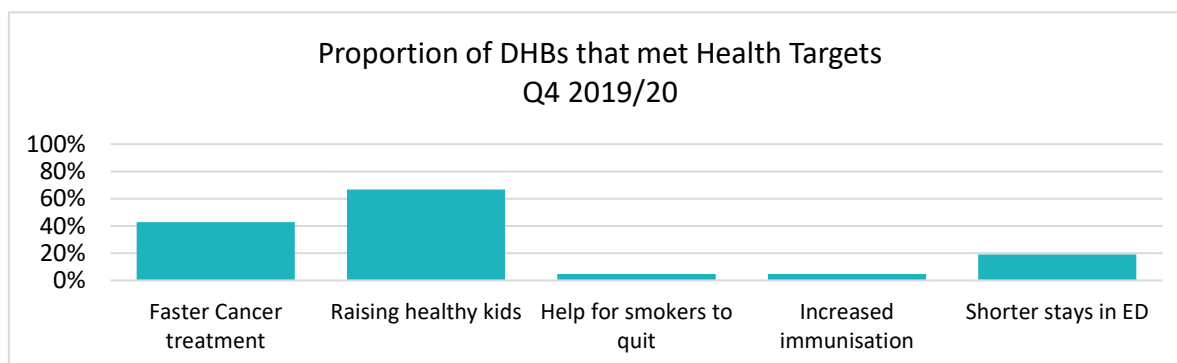
²²⁵ Ministry of Health, "How is my DHB performing?"

²²⁶ Ministry of Health, "How is my DHB performing?"

Figure 15 illustrates the low overall proportion of DHBs that met the health targets outlined in Figure 13 and

Figure 14 for Q4 2019/20.²²⁷

Figure 15: DHB attainment of success measures for Q4 2019/20²²⁸



The poor performance of DHBs overall is the result of a number of interrelated factors, including governance practices and the state of DHB assets. Poor governance and fiscal pressures has meant that resources have historically been redirected into managing short-term operational pressures rather than planning for and investing in long-term, sustainable, infrastructure solutions.²²⁹ In contrast to other jurisdictions where the design and delivery of health infrastructure has been standardised, the New Zealand health system is characterised by devolved governance structures which allows for a bespoke approach to facility development which increases price and makes facilities more inefficient to manage operationally. This is compounded by a lack of investment in health infrastructure expertise (e.g., health planners, architects, design and build contractors). As such, health and disability sector staff are struggling to cope with a growing population with increasingly demanding health needs when facilities are typically in a poor state and not fit-for-purpose.²³⁰ Particularly concerning is the disproportionate impact this could have on Māori health and wellbeing. Whakamaui: Māori Health Action Plan 2020–2025 recognises the importance of providing timely services close to where Māori live, work, and belong in reducing health disparities between Māori and non-Māori populations.²³¹

As highlighted in a national asset current state investigation,²³² many DHBs do not have the capability to support the system transformation required to take advantage of technologies that enable modern models of care including more community-based care, and shorter hospital stays. Significant investment will be required to not only remediate existing issues, but enable DHBs to cater to future demand and take advantage of innovations within the sector.²³³ Investment in digital technologies (especially those that enable telehealth) will be crucial if New Zealand is to achieve better health outcomes.

Supporting the argument that infrastructure is contributing to inefficiencies within DHBs is the research titled “Efficiency of New Zealand’s District Health Boards at Providing Hospital Services: A Stochastic Frontier Analysis”, which evaluated DHB technical and cost efficiency throughout the period between 2011 to 2018.²³⁴ The study found the majority of DHBs perform well in the short-term, however, significant technical inefficiencies were found in the long-term. This was attributed to capacity constraints and a lack of

²²⁷ Ministry of Health, “How is my DHB performing?”

²²⁸ Ministry of Health, “How is my DHB performing?”

²²⁹ Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*, 5.

²³⁰ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 263.

²³¹ Ministry of Health, *Whakamaui Māori Health Action Plan 2020–2025*, 24.

²³² Ministry of Health, *The National Asset Management Programme for district health boards. Report 1: The current-state assessment*

²³³ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 263.

²³⁴ Jiang, Nan, and Antony Andrews. “Efficiency of New Zealand’s District Health Boards at Providing Hospital Services: A Stochastic Frontier Analysis”. *Journal of Productivity Analysis*.

adequate clinical infrastructure. This has led to some commentators concluding that policymakers will need to formulate comprehensive, long-term strategies that facilitate investment in critical infrastructure and capacity improvements to improve the long-run efficiency performance of DHBs.²³⁵

²³⁵ New Zealand Productivity Commission, 'Measuring the persistence of technical inefficiency among NZ District Health Boards.'

6. How the Sector is Responding to What Might Come Next

Before the sector can respond to anticipated future trends and opportunities, it must first address the widely acknowledged existing issues it currently faces. However, there is a lack of confidence in the sector's current capability to effectively address these key issues given current incentives, lack of accountability, long-term planning and system-wide collaboration. Significant investment and a change to how the health and disability system is structured will be required to set the right incentives and ensure an appropriate investment in infrastructure and the wellbeing outcomes of New Zealanders.

6.1. Improving Integration and Capability

While the case for investment in health infrastructure is clear, the required cultural shift from reactive to proactive investment and planning cannot occur without a more integrated and cohesive health and disability system that provides the appropriate incentives for collaboration. The review highlighted the need to improve integration and collaboration between DHBs and public, private, and non-government providers, and to provide clearer direction and accountability for what the system might achieve. Figure 16 provides an illustration of the Review's proposed structure for the health and disability system, including two new bodies that would contribute towards achieving this transparency:²³⁶

- **Health NZ:** A new agency accountable to the Minister of Health for leadership of health service delivery – both clinical and financial. The agency would be responsible for working with all parts of the delivery system to ensure it is operating effectively, fairly, and sustainably
- **Māori Health Authority:** The authority would sit alongside MoH and Health NZ to strengthen leadership for hauora Māori. This authority would be the principal advisor on all Māori issues, and lead the development of a strengthened Māori workforce and growth of kaupapa Māori services

“Unfortunately, the current state of DHB assets is not good and there is little in the way of long-term planning which can give any confidence that the problem is under control ”

– The Health and Disability System Review ²³⁷

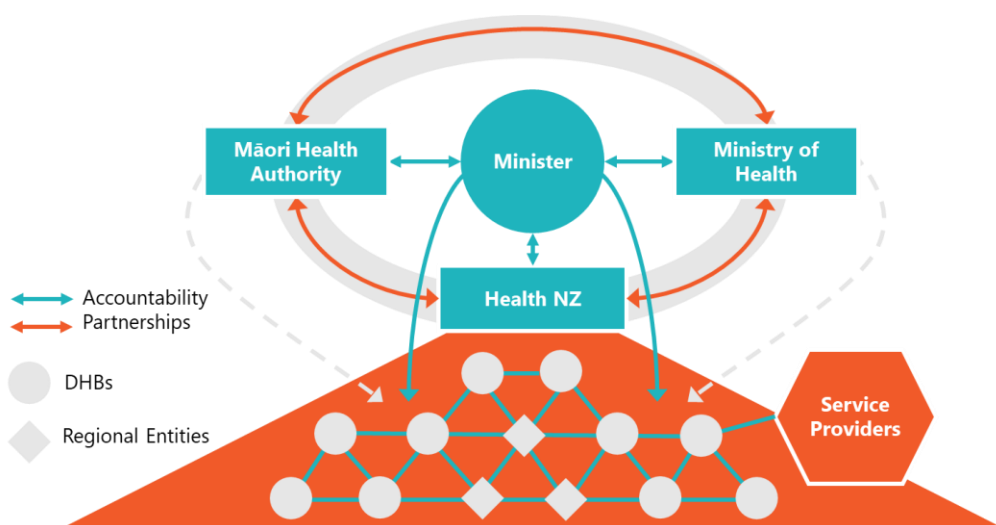
DHBs play a critical role in the delivery and execution of health and disability services, however board members often don't have the requisite expertise to deliver significant infrastructure projects. This leads to inefficient and ineffective design of facilities, late delivery of investments and uncertainty over whether or not investments are delivering on promised health outcomes. Minister appointment of all board members (rather than a combination of election and appointment), as supported in the Review, would ensure boards have the appropriate mix of skillsets (e.g. facility design, financial and governance experience and health sector competencies) and reflect Te Tiriti o Waitangi principles.

Furthermore, aside from the Northern Region Long-Term Investment Plan, regional collaboration between DHBs is not particularly common – financial consequences at the patient service level may be a key impediment. Increasing knowledge sharing between DHBs would facilitate efficiency improvements, reduce costs, and contribute towards fostering a more collaborative culture. Development of a national long-term plan for major sector projects, and a requirement for regional investment plans would better position DHBs to plan investment for their local area, improve national health outcomes, and ensure investment requirements are appropriately reported.

²³⁶ The New Zealand Health and Disability Review, *Health and Disability System Review: Final Report*, 7.

²³⁷ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 263.

Figure 16 Proposed new structure from the Health and Disability System Review



6.1.1. Investment Pipeline

It has also been recognised that capital planning needs to be developed from a system-wide perspective to ensure investments in facilities, equipment, ICT and new workforces are complementary, aligned with new models of care and future service requirements, as well as efficient and effective. A critical component of the planning process would include a prioritised pipeline of major health sector projects. MoH estimates investment of more than \$14 billion (excluding repairs and maintenance) will be required over the next decade. This level of investment is due to the age and condition of the current estate, combined with the demands generated by a growing and ageing population.²³⁸

This level of investment is unprecedented, and while it will be a significant undertaking for the sector, it presents exciting opportunities. The health and disability system has the opportunity to replace ageing facilities with ones designed and planned for the future. Another alternative could include greater investment towards prevention by identifying the root causes of ill health, or by investing in caring for people in safe, healthy, sustainable, and fit-for-purpose homes. New facilities can use technology to support new ways of delivering specialist services, embrace the shift of services closer to home and be a great place for the future health workforce to work in. However, realising these opportunities will be dependent on integrated service delivery and planning.²³⁹ Supply constraints for construction sector capabilities and the national capacity to run multiple, large scale projects is likely to impact on the ability to deliver on the timing of forecast MoH investments.²⁴⁰

6.2. Future Challenges and Opportunities

This section provides a brief overview of opportunities and challenges on the horizon for the health and disability system (refer to Appendix L). While these may not be as pressing to address as the existing challenges the system faces, they still require careful consideration; and it would be beneficial to include these factors in long-term planning.

6.2.1. Ageing Patients and Workforce

New Zealand's aging population is increasing at a much faster rate than any other age group (Figure 17). Declining fertility, the ageing baby boomer generation, and increasing life expectancy are all contributing

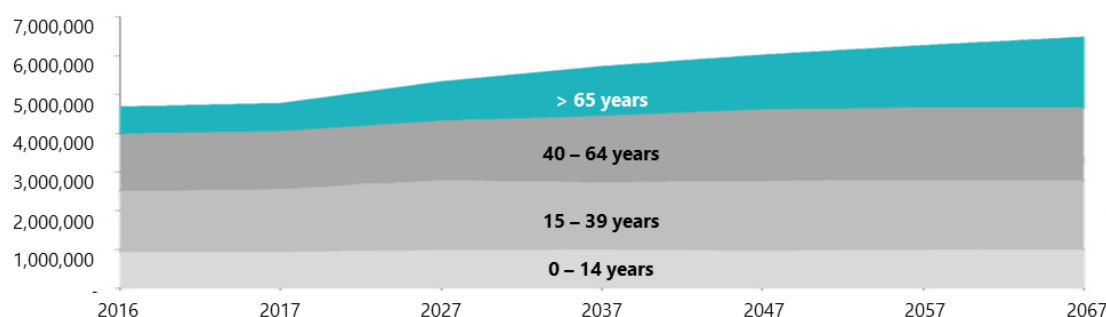
²³⁸ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 230.

²³⁹ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 230.

²⁴⁰ The New Zealand Health and Disability Review, *Health and Disability System Review: Interim Report*, 230.

factors.²⁴¹ This structural shift to a greater proportion of older people will lead to increased prevalence of disability and comorbidities. Patient treatment and / or support will increase in complexity, placing additional service delivery and financial pressures on an already strained system.²⁴²

Figure 17: Comparison of population growth by age group²⁴³



The working population is also ageing and is not forecast to keep up with that of the over 65s. Mid Central DHB stated the average age of their work force was 46.7, nearly a year older than the national average of 45.8.²⁴⁴ Flexibility in the workplace will help address recruitment problems as a result of an ageing workforce. An education and training system that is flexible and responsive to health system needs and mid-career re-training will also be important.

6.2.2. Technology

Technological advancement is increasing rapidly and will undoubtedly impact the way we work, live, and interact in the future.²⁴⁵ Key areas of anticipated technological disruption include artificial intelligence, smart digital assistants, and even virtual hospitals.²⁴⁶

Artificial Intelligence alone has the potential to contribute over \$700 million worth of value and savings to the New Zealand health system by 2026.²⁴⁷ While artificial intelligence adoption and uptake into New Zealand's health and disability system remains nascent, there are isolated incidences of innovation and experimentation, as demonstrated in the MercyAscot case study.²⁴⁸

Future implications of technological advancement in the system may include increasing treatment options, a need for workforce training to keep up with advances, an increasing need for robust prioritisation tools and systems, a rising cost of treatment, and a need to develop national standards and regional approaches to ensure value for money affordability.²⁴⁹

²⁴¹ SuperSeniors, "Our ageing population."

²⁴² Ministry of Health, "Challenges and opportunities."

²⁴³ SuperSeniors, "Our ageing population."

²⁴⁴ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 19.

²⁴⁵ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 18.

²⁴⁶ AI Forum of New Zealand, *Artificial Intelligence for Health in New Zealand*, 7.

²⁴⁷ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 9.

²⁴⁸ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 21.

²⁴⁹ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 20.

MercyAscot Case Study

This private health provider has embraced AI and now hosts their electronic medical record in the cloud. This will enable them to leverage machine learning and advanced analytics tools, and provides the potential for agile development and scale.

Their invoicing system is now totally automated via a software robot named Matilda. This has increased availability for staff to focus on more challenging tasks that otherwise wouldn't get done.

MercyAscot also uses AI image recognition to optimise breast screening imaging and image interpretation. Tools like this have great potential to act as clinical safeguards in the future – far better able to detect discrepancies between images and reports than the human eye.

6.2.3. Information and Big Data

The information revolution has created an opportunity to increase data access and integration between care providers and give people more ownership of their personal health data.²⁵⁰ The health and disability system will need to adopt mobile technologies, increase self-management, enable access to reliable and trusted information, and work with others to ensure consistent access to high speed broadband.²⁵¹

Ethical and sovereignty concerns over big data will also need to be addressed to ensure equitable health outcomes and Te Tiriti o Waitangi obligations are upheld. The recent development of the COVID-19 tracer app highlights the need for effective Māori consultation and engagement; Māori language in email addresses was not recognised and one device per person was required (and assumed) – Māori families often share devices. As a result, many Māori were either unable to, or chose not to, use the app.²⁵²

Technological Advancement

Policy Implication

Policy and regulatory settings that support investment in:

- Data infrastructure and integration, including consultation with Māori to consider Māori data sovereignty, and the need to adopt agreed digital standards and regulations
- Virtual care offerings.

6.2.4. Funding Disruptors

Future disrupters such as technology, climate change, increasing prevalence of mental health, poverty, obesity, and disability, and an ageing population will add pressure to an already strained system. The existing funding and operating model may no longer be appropriate in light of these disruptions. The Health and Disability System Review highlighted the need for a funding system driven by community need, rather than population.²⁵³

Furthermore, in order to keep up with advancing technology, significant digital investment may be required to ensure DHBs are appropriately prepared and can effectively reap the benefits of improved technology at the right time. Investment in digital health delivery (i.e. telehealth) as seen in recent times with COVID-19 also has the potential to significantly improve health outcomes. This is likely to have funding implications, where funds will need to be allocated to digitisation efforts.

²⁵⁰ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 8.

²⁵¹ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 20.

²⁵² Karaitiana Taiuru, "Māori Data Sovereignty and Digital Colonisation."

²⁵³ The New Zealand Health and Disability Review, *Health and Disability System Review*, 4.

6.2.5. Climate Change

Climate change is expected to have both direct and indirect impacts (see below) on the health of New Zealanders and will more broadly have a disruptive effect on funding structures, service models, and underlying infrastructure.²⁵⁴ Adverse impacts on health and wellbeing may include disruption to health services delivery, migration, housing, and livelihood stresses. Health infrastructure will be affected by increasing frequency of fires, floods, storm tides, and high intensity rainfall events.²⁵⁵

- **Direct:** Includes increased exposure to heat waves and weather events, flooding, and fires.
- **Indirect:** Includes increased exposure to microbes, pollen, air pollutants, and new disease carriers.

While the health and disability system deals with the negative effects environmental degradation can have on peoples' health, it is also a significant contributor to carbon emissions in New Zealand. Under the Paris Agreement, New Zealand committed to reducing greenhouse gas emissions 30 percent (from a 2005 baseline) by 2030 – this commitment became legally binding following the introduction of the Climate Change Response (Zero Carbon) amendment bill. As significant contributors to carbon emissions, the health and disability system has a significant role to play (as outlined in the 2018/19 and 2019/20 letters of expectation).²⁵⁶ It is estimated New Zealand's healthcare sector contributes up to eight percent of New Zealand's total greenhouse gas emissions.²⁵⁷ The government's recent initiative – the Carbon Neutral Programme – to combat climate change requires the public sector to achieve carbon neutrality by 2025. Public sector agencies will be required to measure and publicly report on their emissions²⁵⁸ – this presents a significant additional undertaking for DHBs, both in terms of the investment required to achieve carbon neutrality and the additional administration required for measurement and reporting of emissions.

10 Climate Change

Policy Implication

Incentivise and fund investment/shift towards carbon-neutral infrastructure via, for example, facility design standards.

²⁵⁴ Royal Society, *Human Health Impacts of Climate Change for New Zealand: Executive Summary*, 2.

²⁵⁵ Royal Society, *Human Health Impacts of Climate Change for New Zealand: Executive Summary*, 5.

²⁵⁶ Ministry of Health, *Sustainability and the health sector*, 2019.

²⁵⁷ Beehive, "Healthcare sector committed to reducing carbon footprint."

²⁵⁸ Beehive, "Public sector to be carbon neutral by 2025."

7. Conclusions

Health and disability infrastructure has the potential to improve society's quality of life through the provision of healthcare, supported living and end of life care. Health and disability infrastructure – buildings and technologies, skilled workforce, data connectivity and regulations, among other aspects – contribute to wellbeing and health outcomes by enabling a better standard of service delivery.

The current state of physical health infrastructure in New Zealand is poor (with ageing assets, historic under-investment, and deferred maintenance). Health outcomes are mixed with New Zealanders' living longer but not staying healthy for longer. Inequities remain persistent in the sector and Māori continue to experience disproportionately poor health outcomes (in breach of Te Tiriti o Waitangi). Future trends such as shifting demographics (including an ageing population), an increasing prevalence of chronic disease, and higher consumer expectations will only serve to place further strain on infrastructure and a health system that is already stressed. Fit for purpose facilities, along with more transparent planning, governance, and prioritisation of investment at a national level will be required to exploit emerging opportunities and improve the health outcomes of New Zealanders.

New Zealand is about to embark on an unprecedented programme of investment in health infrastructure (\$14 billion over the next decade excluding repairs and maintenance). Addressing current issues with the state of infrastructure as well as responding to future trends and opportunities (such as digital service delivery) will require an integrated and strategic approach to service delivery and planning, improved capability and governance (especially at the local level) and adequate construction capabilities and capacity including capacity to run multiple large scale projects at the same time.

Appendix A. Primary Health Organisations (PHOs)²⁵⁹

PHO Name	Location and Population
Alliance Health Plus Trust	Auckland network of 36 General Practices, services over 109,000 patients.
Auckland PHO Limited	Auckland network of 23 General Practices, 70 GPs, 50 Practice Nurses, services 64,000 enrolled patients.
Christchurch PHO Limited	Christchurch network of 6 General Practices.
Tū Ora Compass Health	Wellington, Porirua, Wairarapa and Kāpiti areas. Services a population of 331,000 through 58 medical practices.
Comprehensive Care PHO	Auckland based with around 46 practices.
Cosine Primary Care Network Trust	Based in Wellington and Lower Hutt with 2 large provider practices.
East Health Trust	Represents 18 general practice clinics in the East Auckland and Franklin area with a patient population of 113,539.
Eastern Bay Primary Health Alliance	Based in Whakatāne and contracted to deliver services to over 48,550 people. Currently has 9 medical practices.
Hauraki PHO	HPHO serves a population of approximately 64,000 people enrolled through a network of five General Practices operating from 19 clinics.
Health Hawke's Bay Limited	Provides services to the Central Hawke's Bay, Hastings, Napier, and Wairoa area through 27 medical practices.
Kimi Hauora Wairau (Marlborough PHO Trust)	Provides services to a population of around 48,000 people through 9 General Practices in Blenheim, Picton, Renwick, and Havelock.
Mahitahi Hauora	Northland based PHO that provides services through 40 practices.
Pinnacle Midlands Health Network	Provides services to a population of over 500,000 through 86 practices in Gisborne, Taranaki, Rotorua, Taupō-Turangi, Thames-Coromandel and the Waikato.
National Hauora Coalition	Provides services to a population of over 226,000 enrolled patients through 54 clinics in the Auckland, Waikato and Whanganui regions.
Nelson Bays Primary Health	Provides services to a population of over 105,000 enrolled patients in the Nelson and Tasman regions through 22 General Practices.
Nga Mataapuna Oranga Limited	Provides services to the Western Bay of Plenty region to a population of over 11,000 enrolled patients through 4 General Practice Clinics.
Ngati Porou Hauora Charitable Trust	Provides services to the East Coast region and is one of the smallest providers in the country. It is a charitable trust and the only Māori owned and operated hospital in the world.
Ora Toa PHO Limited	The only Māori owned and run PHO in the Wellington region with four medical centres.
Pegasus Health (Charitable) Limited	Provides services to the Canterbury region with over 445,000 enrolled patients

²⁵⁹ Ministry of Health, "About primary health organisations."

PHO Name	Location and Population
Procare Networks Limited	Provides care for the Auckland region to more than 800,000 enrolled patients
Rotorua Area Primary Health Services Limited	Provides care to about 72,000 people in the Rotorua region through 15 medical centres.
South Canterbury Primary and Community	Provides services to the South Canterbury region through 40+ GPs.
Te Awakairangi Health Network	Provides services to the Lower Hutt region through around 23 medical centres.
THINK Hauora	Provides services to the MidCentral region through around 31 medical centres.
Total Healthcare Charitable Trust	Provides services to the Counties Manukau, Auckland, and Waitemata regions and serves over 230,000 patients through around 40 providers.
Waitaha Primary Health Ltd	Provides services in the Canterbury region through around 16 General Practices.
WellSouth Primary Health Network	Provides services to the Southern region – Central Otago, Clutha, Dunedin, Invercargill, Queenstown lakes, Southland/Gore, Waitaki/North Otago.
West Coast PHO	Provides services to the West Coast region through 14 GP clinics.
Western Bay of Plenty Primary Health Organisation Limited	Provides funding to 31 general practices in the Bay of Plenty region.
Whanganui Regional PHO	Provides health services to the Whanganui region through 13 medical centres.

Appendix B. Bed Rates by DHB

Measure	Population	Medical beds per 1000	Surgical beds per 1000	Paediatric beds per 1000	Maternity beds per 1000	Neonatal beds per 1000	Assessment, Treatment, & Rehabilitation	Theatres per 1000	Procedure Rooms per 1000	Intensive Care Unit beds per 1000	High Dependency Unit beds per 1000	Critical Care Unit beds per 1000
Waitemata DHB	628770	0.487	0.324	0.052	0.099	0.038	0.172	0.030	0.011	0.010	0.013	0.010
Counties Manukau DHB	578650	0.404	0.546	0.114	0.121	0.066	0.230	0.041	0.012	0.024	0.019	0.031
Canterbury DHB	578290	0.555	0.595	0.105	0.078	0.071	0.304	0.040	0.019	0.040	0.000	0.016
Auckland DHB	493990	0.500	0.737	0.328	0.140	0.081	0.200	0.085	0.051	0.057	0.022	0.047
Waikato DHB	435690	0.627	0.606	0.129	0.158	0.106	0.186	0.060	0.046	0.046	0.037	0.018
Southern DHB	344900	0.429	0.458	0.101	0.162	0.081	0.299	0.043	0.006	0.046	0.023	0.023
Capital and Coast DHB	320640	0.814	0.418	0.147	0.137	0.125	0.125	0.056	0.006	0.081	0.056	0.000
Bay of Plenty DHB	259090	0.371	0.502	0.143	0.170	0.062	0.127	0.042	0.012	0.046	0.012	0.039
Northland DHB	193170	0.652	0.559	0.140	0.155	0.062	0.083	0.041	0.016	0.041	0.000	0.026
Midcentral DHB	186190	0.526	0.440	0.140	0.150	0.091	0.285	0.038	0.011	0.043	0.000	0.032
Hawke's Bay DHB	176110	0.522	0.494	0.091	0.125	0.068	0.170	0.040	0.028	0.034	0.028	0.034
Nelson Marlborough DHB	159360	0.251	0.464	0.126	0.151	0.082	0.201	0.038	0.006	0.044	0.044	0.000
Hutt Valley DHB	156790	0.344	0.491	0.153	0.134	0.089	0.242	0.051	0.006	0.051	0.000	0.077
Taranaki DHB	124380	0.563	0.482	0.177	0.137	0.064	0.241	0.048	0.016	0.024	0.064	0.032
Lakes DHB	116370	0.473	0.438	0.206	0.137	0.086	0.180	0.052	0.052	0.043	0.000	0.043
Whanganui DHB	68395	0.497	0.512	0.117	0.146	0.058	0.234	0.058	0.015	0.088	0.000	0.000
South Canterbury DHB	61955	0.387	0.646	0.161	0.178	0.032	0.323	0.065	0.081	0.129	0.000	0.000
Tairāwhiti DHB	49755	0.482	0.442	0.241	0.161	0.100	0.161	0.060	0.000	0.141	0.000	0.000
Wairarapa DHB	48480	0.392	0.392	0.144	0.124	0.041	0.309	0.062	0.021	0.000	0.124	0.000
West Coast DHB	32550	0.614	0.522	0.123	0.246	0.000	0.246	0.092	0.031	0.123	0.000	0.000
National	5013525	0.507	0.516	0.139	0.132	0.074	0.211	0.048	0.021	0.043	0.020	0.024

Average Condition Score

Very poor Poor Average Good Very good

Hospital	Average Condition Score	Category
Hillmorton Hospital	3.5	Poor
Palmerston North Hospital	3.4	Poor
North Shore Hospital	3.3	Poor
Timaru Hospital	3.2	Poor
Nelson Hospital	3.2	Poor
Gisborne Hospital	3.2	Poor
Wellington Regional Hospital	3.2	Poor
Nelson Breamer Hospital	3.1	Poor
Waikare Hospital	3.1	Poor
Greenlane Clinical Centre	3.0	Average
Point Chevalier Rehabilitation	3.0	Average
Taranaki Base Hospital	2.9	Average
Southland Hospital	2.9	Average
Wakari Hospital	2.8	Average
Wairarapa Hospital	2.7	Average
Whanganui Hospital	2.7	Average
Wairau Hospital	2.7	Average
Auckland City Hospital	2.7	Average
Hutt Hospital	2.7	Average
Rotorua Hospital	2.7	Average
Kenepeku Hospital	2.6	Average
Ratonga Rua O Porirua	2.6	Average
Christchurch Hospital	2.5	Average
Hawke's Bay Hospital	2.4	Average
Grey Base Hospital	2.4	Average
Hamilton Hospital	2.4	Average
Auckland Spinal Rehabilitation	2.3	Average
Whangarei Hospital	2.3	Average
Tauranga Hospital	2.2	Average
Manakau Super Clinic	2.1	Average
Middlemore Hospital	2.0	Good

Average Condition Score

Legend: Very poor (black), Poor (red), Average (orange), Good (green), Very good (light green)

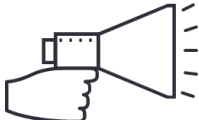
Hospital	Average Condition Score (approx.)	Category
Wellington Regional Hospital	3.3	Poor
Timaru Hospital	3.0	Average
Nelson Hospital	3.0	Average
Gisborne Hospital	3.0	Average
Hillmorton North Hospital	2.8	Average
Palmerton North Hospital	2.8	Average
Auckland City Hospital	2.8	Average
Taranaki Base Hospital	2.7	Average
Nelson Breamer Campus	2.5	Average
Wairau Hospital	2.5	Average
Greenlane Clinical Centre	2.4	Average
Christchurch Hospital	2.4	Average
Wakari Hospital	2.3	Average
North Shore Hospital	2.3	Average
Waikare Hospital	2.0	Good
Rotorua Hospital	2.0	Good
Ratonga Rua Oronua	2.0	Good
Keneupuru Hospital	2.0	Good
Hawke's Bay Hospital	2.0	Good
Whangarei Hospital	2.0	Good
Manakau Super Clinic	1.8	Good
Tauranga Hospital	1.6	Good
Whanganui Hospital	1.5	Good
Grey Base Hospital	1.5	Good
Hamilton Hospital	1.5	Good
Hutt Hospital	1.4	Good
Middlemore Hospital	1.4	Good
Southland Hospital	1.0	Very good
Auckland Spinal Rehabilitation	1.0	Very good

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Appendix D. LSF Wellbeing Domains and Indicators²⁶¹

Domain	Description	Indicators
Civic Engagement & Governance 	Aims to measure people's engagement with governance, how "good" New Zealand's governance is perceived to be, and the procedural fairness of our society.	• Perceived corruption • Trust in government institutions • Voter turnout
Cultural Identity 	Aims to measure whether people have a strong sense of identity, belonging and ability to be oneself, and the value of cultural taonga.	• Ability to express identity • Te Reo Māori speakers
Environment 	Aims to measure how the natural and physical environment impacts on people's current levels of wellbeing.	• Access to the natural environment • Air quality • Perceived environmental • Water quality (swimmability)
Health 	Aims to measure indicators of both mental and physical health.	• Health status • Healthy life expectancy Mental health • Suicide rate
Housing 	Aims to measure the quality, sustainability, and affordability of the homes we live in.	• Household crowding • Housing cost • Housing quality
Income and Consumption 	Aims to measure disposable income, how much people spend, and how many material possessions they have.	• Child poverty - material hardship • Consumption • Disposable income • Financial wellbeing • Household net worth
Jobs and Earnings 	Aims to measure the quality of people's jobs, work environment, ease of finding suitable employment and freedom from underemployment.	• Employment rate • Hourly earnings • Unemployment rate • Youth NEET rate

²⁶¹ The Treasury, "Living Standards Framework – Dashboard."

Domain	Description	Indicators
Knowledge and Skills 	Aims to measure indicators of educational performance and qualifications.	• Cognitive skills at age 15 • Educational attainment of the adult population (tertiary) • Educational attainment of the adult population (upper secondary)
Safety 	Aims to measure indicators of people's safety and security (real and perceived) from domestic, other violent crime, and safety in the workplace.	• Domestic violence • Feeling safe • Intentional homicide rate • Workplace accident rate
Social Connections 	Aims to measure indicators around positive social contacts and support networks.	• Discrimination • Loneliness • Māori connection to marae • Social network support
Subjective Wellbeing 	Aims to measure overall life satisfaction and sense of meaning and self.	• Family wellbeing • General life satisfaction • Sense of purpose in one's life
Time Use 	Aims to measure the quality and quantity of people's leisure and recreation time.	• Leisure and personal care • Paid work • Satisfaction with work-life balance • Unpaid work

Appendix E. Summary of Key Health Organisations

Table 9: Summary description of key health organisations

Organisation(s)	Description
Accident Compensation Corporation	The Accident Compensation Corporation (ACC) funds accident services, which can include treatment, help at home or work, and income support.
DHBs	DHBs are responsible for providing or funding the provision of most health services in their district. They are governed by boards of elected and appointed members that are accountable to the Minister of Health.
Crown entities and agencies	Crown entities like the Health Quality and Safety Commission are part of New Zealand's state sector and are responsible to the Minister of Health
Capital Investment Committee	The Capital Investment Committee (CIC) is a Section 11 committee that provides advice to the Ministers of Health and Finance on the prioritisation and allocation of funding for capital investment and health infrastructure
Mental Health Review Tribunal	The Mental Health Review Tribunal is an independent body appointed by the Minister of Health under the Mental Health (Compulsory Assessment and Treatment) Act 1992
National Ambulance Sector Office	The National Ambulance Sector Office (NASO) is a joint office between ACC and the Ministry of Health
NGOs	NGOs receive significant funding from MoH and DHBs. Many are not-for-profit, and along with providing services to consumers, they are a valuable contact at community level.
Public Health Units	Public health units deliver regional public health services. They focus on environmental health, communicable disease control, tobacco control and health promotion
Health Alliances	Health alliances are nine networks of primary health care providers and district health boards that are implementing the Government's 'Better, Sooner, More Convenient' care initiatives
PHOs	PHOs support general practices to provide primary health care services
Professional and Regulatory Bodies	Health regulatory authorities are responsible for specific health professions. They describe scopes of practice, issue annual practising certificates and more
Ministerial Health Committees	Health committees provide the Minister of Health with independent expert advice and offer a forum for representatives of the sector to have a role in decision-making

Appendix F. Summary of He Ara Oranga Recommendations²⁶²

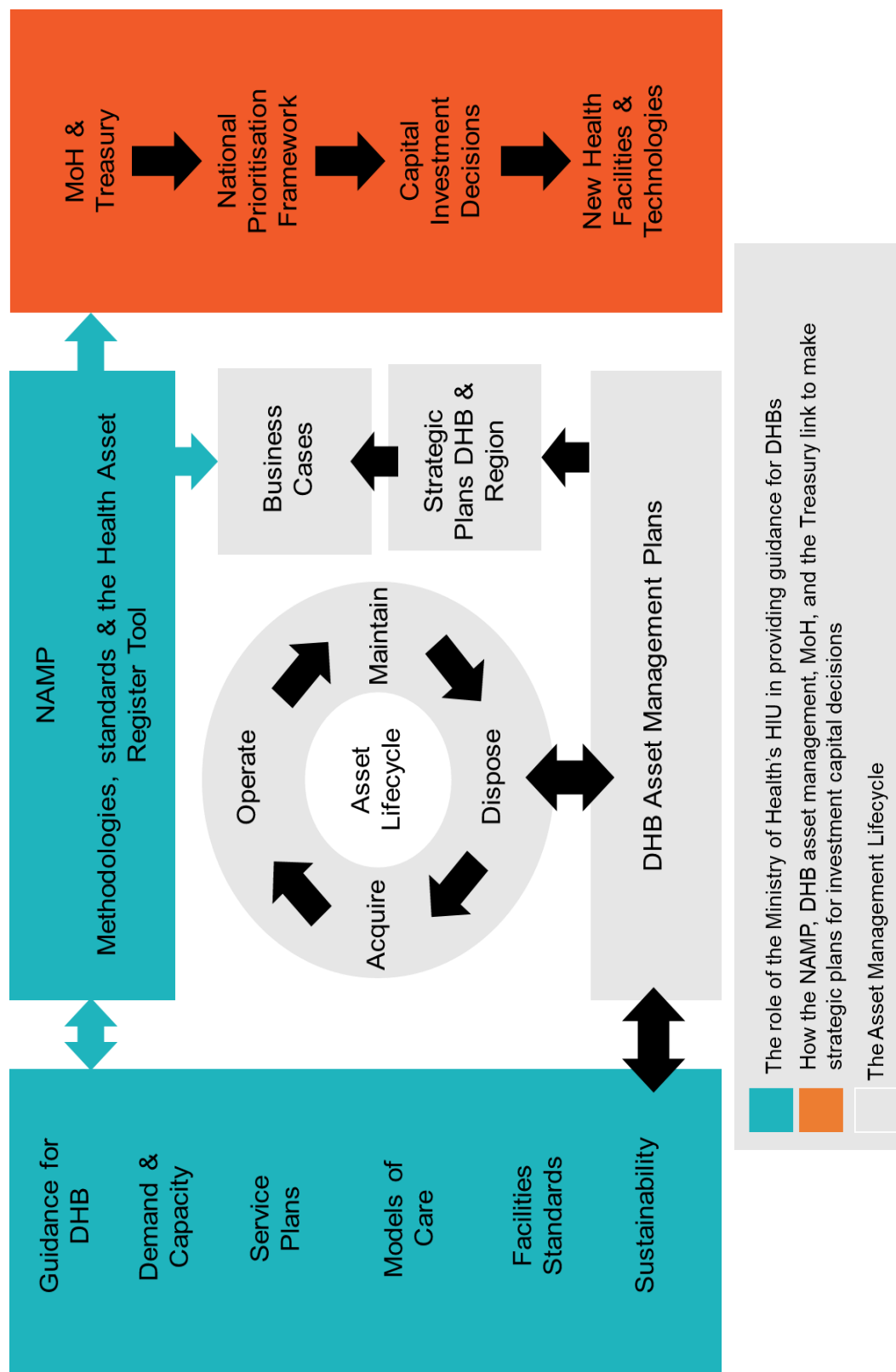
Area	Summary
Expand Access and Choice	• Expand access from the current target of 3% of the population being able to access specialist services - an indicative access target may be 20% within the next five years • Set an explicit new access target
Transform Primary Health care	• Enable people to get skilled help within their communities in order to prevent and respond to mental health and addiction problems • Enhance the capability of the workforce with additional mental health training • Affordability • Integration of primary, community and secondary services
Strengthen the NGO Sector	• Support the role of NGOs in shifting to more community-based services • Create a clear stewardship role within central government to support NGO development and sustainability
Take a Whole-of-Government Approach to Wellbeing	• To address social determinants and prevention • Shift the balance to prevention and long-term investment • Propose a social wellbeing agency to provide clear responsibility within central government
Facilitate Mental Health Promotion and Prevention	• Leadership and oversight from a new commission • An investment and quality assurance strategy for mental health promotion and prevention • More organised approach
Place People at the Centre	• Strengthen the consumer voice and experience • A review is needed into wellbeing support provided to families and whanau
Take Strong Action on Alcohol and other Drugs	• Enact a stricter regulatory response to the sale and supply of alcohol • Replace criminal sanctions for the possession for personal use of controlled drugs with civil responses • Establish clear cross-sector leadership and coordination • Investment in more addiction services
Prevent Suicide	• Implement a national suicide prevention strategy with a target of a 20% reduction in suicide rates by 2030 • Better coordination and resources • Support for suicide bereaved families and whanau
Reform the Mental Health Act	• Replace the Mental health Act 1992 to reflect a human rights approach, support decision-making, align with a recovery and wellbeing model, minimise coercive/compulsory treatment

²⁶² Government Inquiry into Mental Health and Addiction, "Executive summary."

Area	Summary
Establish a new Mental Health and Wellbeing Commission	• To act as a watchdog and provide leadership • Publicly report on progress
Refer to the Health and Disability Sector Review	• For structural and systems issues • Broader issues such as the future structures, roles and functions within the health and disability system
Establish a Cross-party working group on Mental Health and Wellbeing	• Reflect the shared commitment of different parties to improved mental health and wellbeing in New Zealand • Cross-party working group to provide an opportunity for members of the House of Representatives to collaborate and advocate for mental health and wellbeing

Appendix G. NAMP Interactions

Figure 20: NAMP, asset management, and investment decisions²⁶³



²⁶³ Ministry of Health, *The National Asset Management Programme for district health boards: Report 1*, 19.

Appendix H. Vote Health Funding Estimates 2020/21²⁶⁴

Location of Funding	Description	Services Supported
20 DHBs	\$15,274 million (75.4% of the Vote)	Meet the needs of each geographically defined DHB population including: • Aged care • Mental health • Primary care services • The combined pharmaceuticals budget Some public health services.
MoH managed Health and Disability Services	\$3,760 million (18.6% of the Vote)	• National Disability Support Services (\$1,707 million or 8.5% of the Vote) • Public Health Service Purchasing (\$469 million or 2.3% of the Vote) • National Planned Care Services (\$425 million or 2.1% of the Vote) • Primary Health Care Strategy (\$367 million or 1.8% of the Vote) • National Mental Health Services (\$208 million or 1.0% of the Vote) • National Maternity Services (\$205 million or 1.0% of the Vote) • National Emergency Services (\$148 million or 0.7% of the Vote) • National Child Health Services (\$112 million or 0.6% of the Vote) • National Personal Health Services (\$67 million or 0.3% of the Vote) Other National Services (\$52 million or 0.3% of the Vote).
Support, oversight, governance, and development of the Health and Disability Sectors	\$529 million (2.6% of the Vote)	• Ministry of Health operating costs (\$250 million or 1.2% of the Vote) • Health Workforce Training and Development (\$219 million or 1.1% of the Vote) • Monitoring and Protecting Health and Disability Consumer Interests (\$26 million or 0.1% of the Vote) • Other services (\$34 million or 0.2% of the Vote).
Other Expenses	\$55 million (0.3% of the Vote)	• \$45 million for Provider Development

²⁶⁴ The Treasury, *Vote Health: The Estimates of Appropriations 2020/21*.

Location of Funding	Description	Services Supported
Capital Investment	\$651 million (3.1% of the Vote)	• Sector capital investment (\$583 million or 2.9% of the Vote) • Equity Support for deficits (\$39 million or 0.2% of the Vote) • Residential Care Loans (\$20 million) • Ministry of Health capital expenditure (\$9 million)

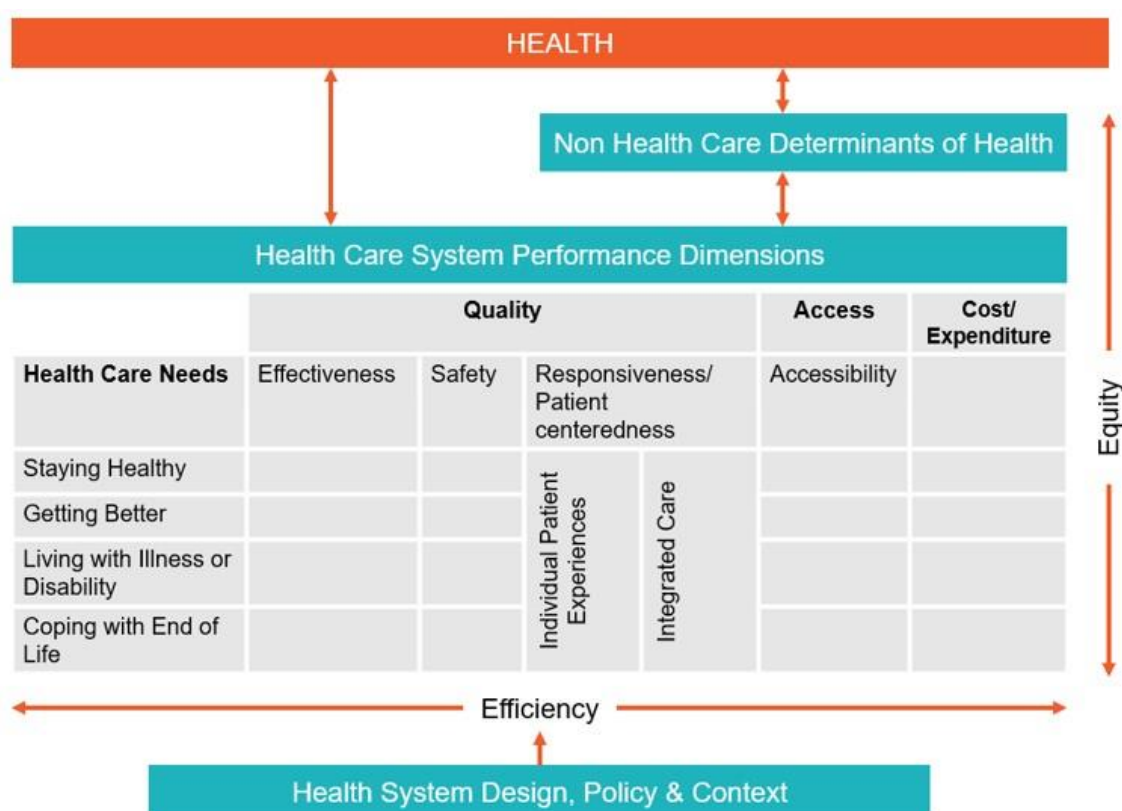
Appendix I. OECD Framework for Health System Performance

The OECD Framework for Health System Performance Measurement suggests that measurements for a quality health system should focus on quality, accessibility, and cost/expenditure. Quality can be further broken down to consider the following dimensions:²⁶⁵

- **Effectiveness:** Achieving desirable outcomes, given the correct provision of evidence-based healthcare services to all who could benefit, but not to those who could not benefit
- **Safety:** Reducing harm caused in the delivery of health care processes
- **Responsiveness / Patient centeredness:** Placing the patient/user at the centre of its delivery of healthcare

Figure 21 shows how health system (including infrastructure) design influences efficiency and equity, which is further influenced by wider health and wellbeing determinants e.g. socioeconomic position.

Figure 21: OECD Framework for Health Performance Measurement²⁶⁶



Comparing the OECD Framework for Health System Performance Measurement to the New Zealand Health Targets and System Level Measurements, it is clear the New Zealand measures very specifically address the OECD measurements of effectiveness and accessibility. However, they do not encompass the breadth of issues the OECD framework attempts to address. Furthermore, none of the targets attempt to tackle the responsiveness, safety, and cost-effective outcomes of the OECD framework.

²⁶⁵ OECD, "Health Care Quality Framework."

²⁶⁶ OECD, "Health Care Quality Framework."

Conversely, other countries have nearly identical overall targets to the OECD framework in addition to personalised and more specific targets. Australia's Health Performance Framework²⁶⁷ details the effectiveness, safety, accessibility, and cost targets, with a mixture of underlying outcome and process driven targets. The Canadian Health System Performance Indicators²⁶⁸ have targets for all the OECD targets as well as their own personalised indicators. These are acceptability, accessibility, appropriateness, competence, continuity, effectiveness, efficiency, and safety.

²⁶⁷ Australian Institute of Health and Welfare. "Australia's health performance framework"

²⁶⁸ Canadian Institute for Health Information, *National Consensus Conference on Population Health Indicators Final Report*, 9-36

Appendix J. Population Health and Health System Performance Measures

Dimension	Indicator	Measure
Health Status	Life expectancy	Years of life at birth
	Avoidable mortality	Deaths per 100,000 people (age standardised)
	Chronic disease morbidity	Diabetes prevalence (% adults, age standardised)
	Self-rated health	Population in poor health (% population aged 15+)
Risk factors for health	Smoking	Daily smokers (%population aged 15+)
	Alcohol	Litres consumed per capita (population aged 15+)
	Overweight/obese	Population with BMI >25kg/m ² (% population aged 15+)
	Air pollution	Deaths due to pollution (per 100,000 population)
Access to care	Population coverage	Population eligible for core services (% population)
	Financial protection	Expenditure covered by prepayment schemes (% total expenditure)
	Service coverage, primary care	Needs adjusted probability of visiting a doctor (% population aged 15+)
Quality of care	Safe prescribing	Antibiotics prescribed (defined daily dose per 1,000 people)
	Effective primary care	Avoidable asthma/COPD admissions (per 100,000, age-sex-standardised)
	Effective secondary care	30-day mortality following AMI (per 100,000, age-sex-standardised)
	Effective cancer care	Breast cancer 5-year net survival (% , age-sex-standardised)
Healthcare resources	Health spending	Per capita (USD based on purchasing power parities)
	Health spending share	% GDP
	Doctors	Number of physicians (per 1,000 people)
	Nurses	Number of practising nurses (per 1,000 people)

Table by OECD, Indicator Overview²⁶⁹

²⁶⁹ OECD, *Health at a Glance 2019*, 20.

Appendix K. OECD Indicator Performance²⁷⁰

Figure 22: Health Status Indicator

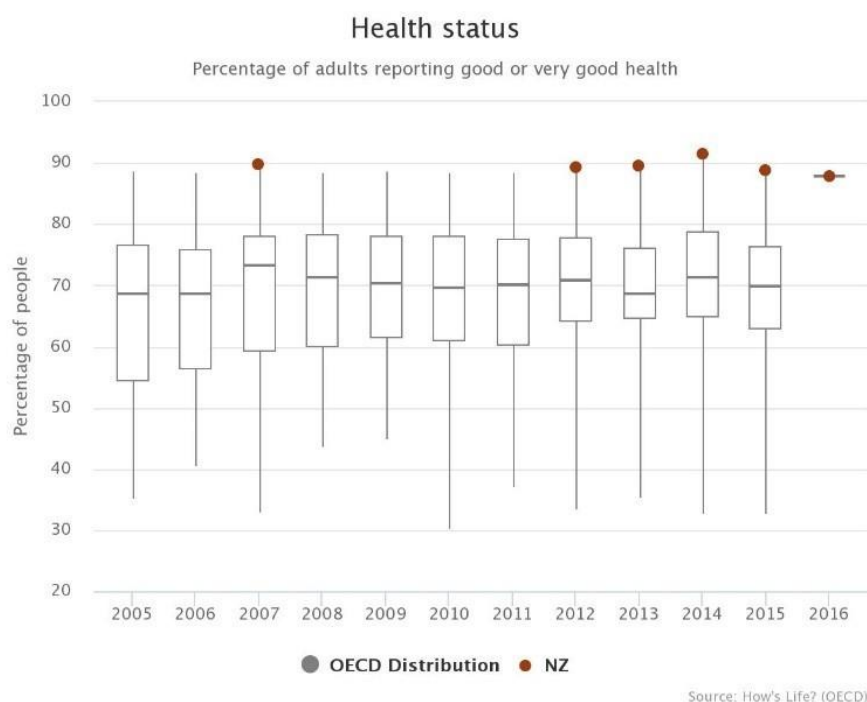
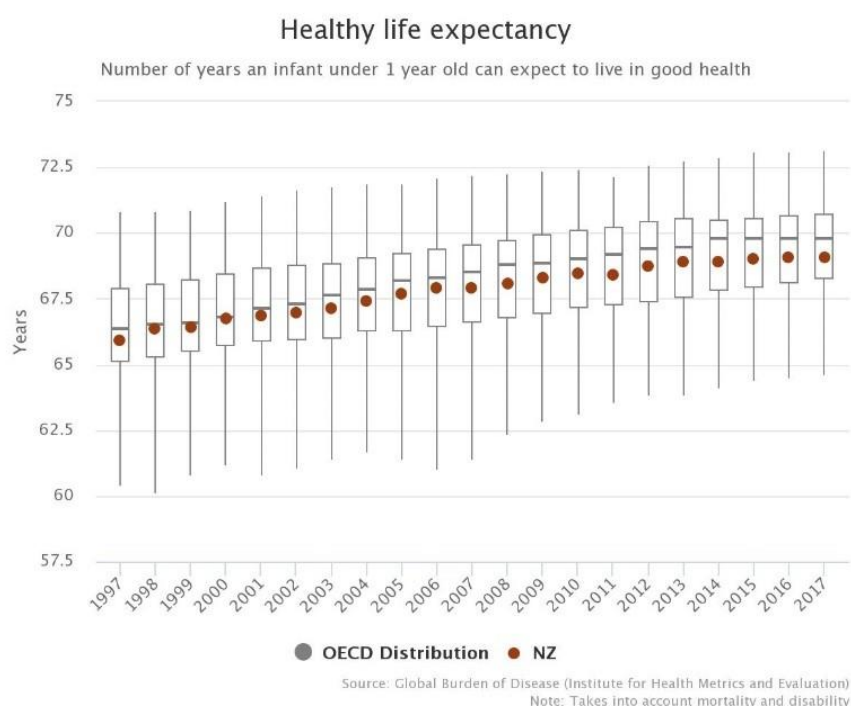


Figure 23: Healthy life expectancy indicator



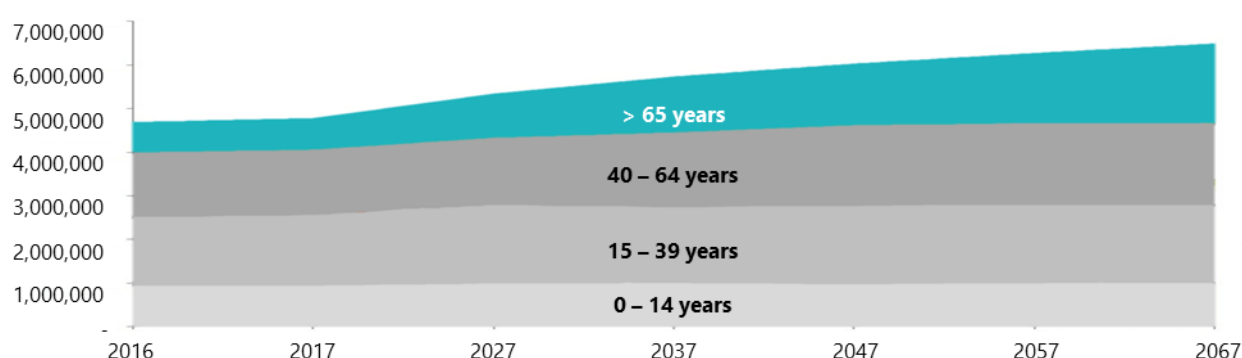
²⁷⁰ The Treasury, "Living Standards Framework Dashboard: Health."

Appendix L. Future Challenges and Opportunities

L. 1. Ageing Patients and Workforce

Like most of the world, New Zealand has an ageing population. Declining fertility, the ageing of the baby boom generation, and increasing life expectancy all contribute to New Zealand's changing population structure. The rate at which the over 65 years population is expected to increase is much greater than any age group, as illustrated in Figure 24.²⁷¹

Figure 24: Comparison of population growth by age group²⁷¹



As the population ages so does the number of older people in the community who require support services. This may place further strain on the health system and consideration needs to be given to how these services can be sustainably provided, with the best possible use of resources.²⁷² Additionally, those over 85 years tend to be higher needs patients due to greater incidence of disability. This support will be costly to meet.²⁷³

It should also be noted that despite publicly funded health and welfare support for older citizens, the aging experience differs across ethnic groups. This creates opportunities and challenges for health and social services to deliver culturally safe and equitable care for all older New Zealanders.²⁷⁴

Older people and their relatives have the right to expect that residential care facilities will provide a safe and caring environment. As more older people receive support services at home, staff training and standards for the home-based care industry will be just as important as those required for the residential care facilities.

General population ageing will also have an impact on the workforce. The working age population is not forecast to keep up with that of the over 65s. In their Long-Term Investment Plan 2016-2026, Mid Central DHB stated that their "workforce is ageing with an average age of 46.7 slightly over the average of 45.8".²⁷⁵ Flexibility in the workplace and for those people embarking on retirement will also help to address recruitment problems as a result of an ageing workforce. An education and training system that is flexible and responsive to health system needs and mid-career re-training will also be important.

²⁷¹ SuperSeniors, "Our ageing population."

²⁷² Ministry of Health, "Challenges and opportunities."

²⁷³ Ministry of Health, *New Zealand Health Strategy Future Direction*, 9.

²⁷⁴ Parr-Brownlie et al., "Aging in New Zealand: Ka haere ki te ao pakeketanga," 812.

²⁷⁵ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 19.

L. 2. Technology

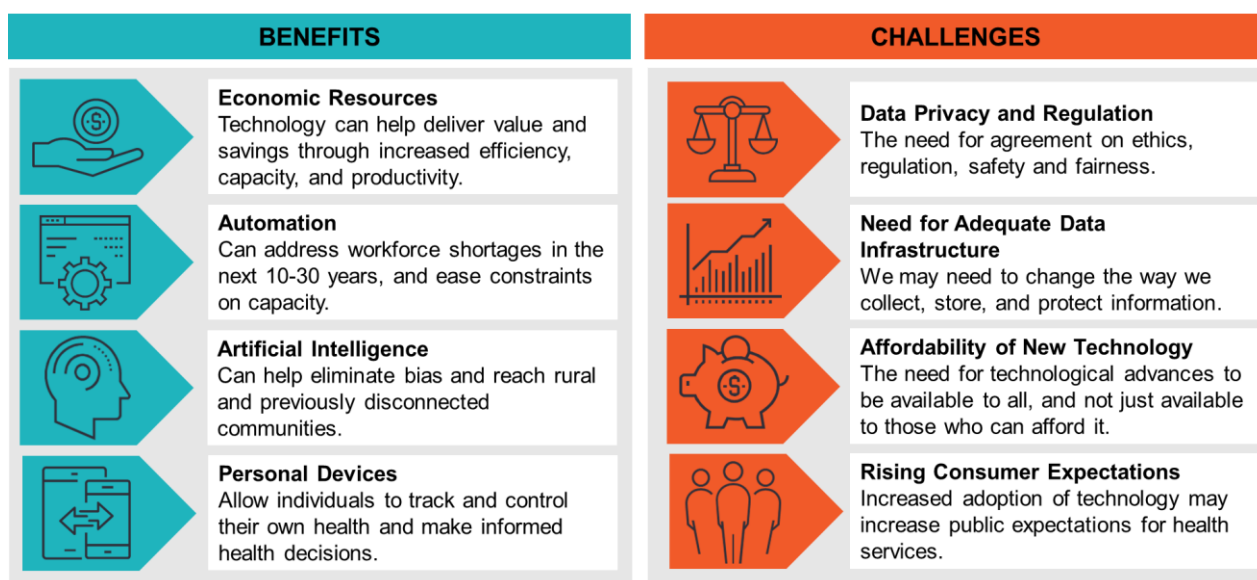
Technological advancement is increasing by leaps and bounds and will undoubtedly impact the way we work, live, and interact in the future.²⁷⁶ Key areas of anticipated technological disruption include artificial intelligence (AI), smart digital assistants, and even virtual hospitals.²⁷⁷

The NZ Vision for Health Technology document discussed how the health and disability sector may be influenced by technology in the future.²⁷⁸ The document speculates what a digital future in healthcare could look like, with prominent themes being more effective multi-agency healthcare collaboration, efficiencies from greater utilisation of mobile / wearable devices, and personalised healthcare.

Mid Central DHB also outlined several implications of advancing technology on the sector in their LTIP. These include increasing treatment options, a need for workforce training to keep up with advances, an increasing need for robust prioritisation tools and systems, a rising cost of treatment, and a need to develop national standards and regional approaches to ensure value for money affordability.²⁷⁹

Figure 25 outlines potential benefits and challenges the health system may be exposed to due to advancing technology.^{280,281,282,283,284}

Figure 25: Technological advancement benefits and challenges



²⁷⁶ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 18.

²⁷⁷ AI Forum of New Zealand, *Artificial Intelligence for Health in New Zealand*, 7.

²⁷⁸ Ministry of Health, *NZ Vision for Health Technology*, 3.

²⁷⁹ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 20.

²⁸⁰ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 36.

²⁸¹ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 6.

²⁸² AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 9.

²⁸³ Infrastructure Australia, *An Assessment of Australia's Future Infrastructure Needs*, 406.

²⁸⁴ Infrastructure Victoria, *Victoria's Draft 30-Year Infrastructure Strategy*, 66.

(i) Artificial Intelligence

AI has the potential to contribute over \$700 million worth of value and savings to the New Zealand health system by 2026.²⁸⁵ This value could be delivered through key areas of impact such as keeping well, early detection and diagnosis, and improved decision-making.²⁸⁶ While AI adoption and uptake into New Zealand's health system remains nascent, there are isolated incidences of innovation and experimentation, as demonstrated in the MercyAscot case study.²⁸⁷

AI is expected to impact on every aspect of the Health and Disability sector, from fundamental research, through to product development, and service delivery.

Outlined below are a sample of potential future use cases for AI in health. Please note that this list is not exhaustive, and many other use cases exist.

- Literature mining
- Drug discovery
- Understanding disease
- Improved teamwork
- Workforce and efficiency
- Disease prevention
- Screening and diagnosis
- Clinical decision support

MercyAscot Case Study

This private health provider has embraced AI and now hosts their electronic medical record in the cloud. This will enable them to leverage machine learning and advanced analytics tools, and provides the potential for agile development and scale.

Their invoicing system is now totally automated via a software robot named Matilda. This has increased availability for staff to focus on more challenging tasks that otherwise wouldn't get done.

MercyAscot also uses AI image recognition to optimise breast screening imaging and image interpretation. Tools like this have great potential to act as clinical safeguards in the future – far better able to detect discrepancies between images and reports than the human eye.

L. 3. Information and Big Data

The information revolution has meant that there is an opportunity to increase data access and integration between care providers and give people more ownership of their personal health data.²⁸⁸

This has several implications for the future of the health sector. There will be an increasing need to adopt mobile technologies, greater requirement for self-management, increased need to enable access to reliable and trusted information, and a need to work with other agencies/sectors to ensure consistent access to high speed broadband – particularly for rural areas.²⁸⁹

There are concerns surrounding ethical implications of big data, including Māori data sovereignty concerns. Māori data sovereignty refers to "the inherent rights and interests Māori, whānau, hapū, iwi and Māori organisations have in relation to the creation, collection, storage, access, analysis, interpretation, management, dissemination, re-use and control of data relating to Māori, whānau, hapū, iwi and Māori organisations as guaranteed in Article II of Te Tiriti/Treaty of Waitangi".²⁹⁰

²⁸⁵ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 9.

²⁸⁶ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 17.

²⁸⁷ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 21.

²⁸⁸ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 8.

²⁸⁹ MidCentral District Health Board, *Long Term Investment Plan 2016-2026*, 20.

²⁹⁰ Karaitiana Taiuru, "Māori Data Sovereignty and Digital Colonisation."

A recent example of where Māori sovereignty has not been upheld was the development of the COVID-19 tracer app. The development process lacked any effective Māori consultation and engagement, leading to multiple design flaws. For example, the app requires (and assumed) one device per person, however, it is common for Māori to share a device within families. The app also failed to recognise Māori language in email addresses. These flaws resulted in many Māori either unable to use the app or not wishing to.²⁹¹ This highlights the need to involve and empower Māori within and across the extent of our health system so we can achieve equitable health outcomes and close the gap of health disparities present in New Zealand.

Additionally, widespread adoption of big data across the health system could introduce significant risk, particularly around privacy and cyber-crime. Privacy violations with respect to health data can be defined as consequentialist or deontological. Consequentialist concerns result from negative consequences that affect the person whose privacy has been violated e.g. a person's long-term insurance premium increases as a result of a privacy breach making additional information available. Consequences can also be more far reaching and affect other aspects of a person's life – for example employment discrimination, increased susceptibility to identity theft, and increased emotional distress due to a data breach. Deontological concerns pertain to a person being *wronged* but not necessarily *harmed* due to a privacy breach. For example, private information may be made available to a party via unscrupulous means. They may review the data, decide it provides no value, and consequently destroy it. While no harm has been done to the individual's data, the loss of control of personal data and the invasion is still ethically problematic.

L. 4. Funding Disruptors

Future disruptors such as technology, climate change and an ageing population will add pressure to an already strained system. The existing funding and operating model may no longer be appropriate in light of these disruptions. The health and disability system review highlighted the need for a funding system driven by community need, rather than population.²⁹²

The Canterbury District Health Board (CDHB) highlighted the growing sector-wide financial pressure emerging from growing demand, rising wage settlements, increasing treatment costs, and greater public expectation. In their LTIP 2019-2029, CDHB stated their normal capital expenditure and maintenance budgets are insufficient to fund repair costs from the Christchurch earthquake necessary to address population growth capacity constraints.²⁹³

Technology has the potential to heavily impact funding. Figure 26 summarises the potential changes to funding outlined by the AI Forum New Zealand.²⁹⁴ Furthermore, in order to keep up with advancing technology, a significant digitisation undertaking may be required to ensure DHBs are appropriately prepared and can effectively reap the benefits of improved technology at the right time.

Figure 26: Potential funding responses to AI and technological advancements

Planning and funding will need to pre-empt the arrival of transformative AI applications. PHO funding by capital may not be optimal within the context of digital assistant providers. Similarly, DHBs may need to redirect funding from hospital care to community monitoring as AI systems facilitate care closer to home

Advances in diagnostic tools, including AI applications, may increase diagnosis rates, leading to identification of a large amount of unmet need that needs to be addressed. Diagnosis of unmet need has the potential to raise costs.

²⁹¹ Karaitiana Taiuru, "Māori Data Sovereignty and Digital Colonisation."

²⁹² The New Zealand Health and Disability Review, *Health and Disability System Review*, 4.

²⁹³ Canterbury District Health Board, *Long Term Investment Plan*, 4.

²⁹⁴ AI Forum New Zealand, *Artificial Intelligence for Health in New Zealand*, 44.

Additional investment in research, development, and evaluation of novel solutions will be needed so that AI and new technological solutions truly add clinical value, enhance patient experience, or reduce costs.

Data infrastructure projects will need to be advanced to capture and store the vast health data upon which successful AI systems can learn. Additional Government investment may be required to progress these foundational data steps.

L. 5. Climate Change

Addressing climate change concerns is a pressing issue across multiple sectors. Climate change has both direct and indirect impacts for future planning across the health and disability sector. A Royal Society Report into the Human Health Impacts of Climate Change (2017) outlines how climate change will impact the health of New Zealanders over time. These have been defined as either:²⁹⁵

- **Direct:** Includes increased exposure to heat waves and weather events, flooding, and fires
- **Indirect:** Includes increased exposure to microbial contamination, pollen, particulate air pollutants, and carriers of new diseases

Further adverse impacts of climate change on health and wellbeing may include disruption to health services delivery, migration, housing, and livelihood stresses. Health infrastructure will also be impacted by increasing frequency of fires, floods, storm tides, and high intensity rainfall events.²⁹⁶ This will have a disruptive influence on funding structures, service models and the underlying infrastructure.

²⁹⁵ Royal Society, *Human Health Impacts of Climate Change for New Zealand: Executive Summary*, 2.

²⁹⁶ Royal Society, *Human Health Impacts of Climate Change for New Zealand: Executive Summary*, 5.

Appendix M. Process, Assumptions, and Limitations

M. 1. Our Process

This State of Play was developed between December 2020 and March 2021 drawing on publicly available information. Key data sources included:

- The National Asset Management Programme for District Health Boards Report 1: The current-state assessment
- The Health and Disability System Review
- The Waitangi Tribunal's Health Services and Outcomes Inquiry (Wai 2575)
- Ministry of Health
- Treasury's Living Standards Framework Dashboard
- Aged Residential Care Funding Model Review
- A Window on the Quality of New Zealand's Healthcare 2019

A full list of all literature cited can be found in the reference list (Appendix O).

On completion of the initial draft, we also met with individuals from a range of organisations across the Sector to get their views on a high-level summary of our findings, and to understand their thoughts on current challenges. A draft of the complete report was peer reviewed by Te Waihangā's Board and by a sector expert.

M. 2. Limitations

While every effort is made to ensure the accuracy of the information contained herein, Te Waihangā, its officers, employees and agents accept no liability for any errors or omissions or any opinion expressed, and no responsibility is accepted with respect to the standing of any firms, companies or individuals mentioned. Te Waihangā reserves the right to reuse any general market information contained in its reports.

Appendix N. Glossary

Acronym	Definition
ACC	Accident Compensation Committee
ADHB	Auckland District Health Board
AI	Artificial Intelligence
ARC	Aged Residential Care
BBC	Better Business Case Framework
BC	Business Case
CCDHB	Capital & Coast District Health Board
CDHB	Canterbury District Health Board
CIC	Capital Investment Committee
DHB	District Health Board
GP	General Practitioner
LSF	Living Standards Framework
LTIP	Long-Term Investment Plan
MoC	Models of Care
MoH	Ministry of Health
NAMP	National Asset Management Plan
NASC	Needs Assessment and Service Coordination
NGO	Non-Governmental Organisation
NZACA	New Zealand Aged Care Association
OECD	Organisation for Economic Co-operation and Development
PHO	Primary Health Organisation
SLM	System Level Measures
TLA	Territorial Local Authorities

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