COUNTIES MANUKAU HEALTH

Healthy Together

Strategic Assessment

Immediate Demand Programme

Document Control

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Acronyms and Definitions

Acronyms

ACS	Acute Coronary Syndrome
AR&F	Audit Risk and Finance Committee (of the CMDHB Board)
ARHOP	Adult Rehabilitation and Health of Older People
BAU	Business As Usual
CCL	Cardiac Catheter Laboratory
DHB	District Health Board
ED	Emergency Department
FMP	CM Health Facilities Master Plan
ICR	Investor Confidence Rating
ICT	Information and Communication Technologies
ILM	Investment Logic Map
LTIP	Long Term Investment Plan
MOH	Ministry of Health
MRO	Maintenance, Repairs and Operations
NRA	Northern Regional Alliance
NRLTIP	Northern Region Long Term Investment Plan
P3M3	Portfolio, Programme and Project (P3) Management Maturity Model (M3)
YTD	Year to date

Definitions

Facilities
Buildings and related core infrastructure supporting building services

Gastroenterology procedures
Gastroenterology procedures include Colonoscopy, Gastroscopy, Top and Tail, and Other Procedures (which includes Endoscopic Retrograde Cholangiopancreatography and Endoscopic Ultrasound, Shearwave Elastography, Pill Cam, Ph. Study, Flexi sigmoidoscopy).

Hospital Full Day (otherwise known as a 'Dot Day')
The following parameters are used to define a Full Day:

- Occupancy of Medicine and Surgical wards combined is greater than 100 percent
- All over census beds are full, and there may be patients in unofficial clinical areas
- Over 20 patients in the Emergency Department are waiting for a bed
- The Medical Assessment Unit is greater than 75 percent full
- Theatre minutes are greater than 5000

Contents

Executive Summary

CM Health's population continues to grow - with high and complex healthcare needs.

1. The population served by Counties Manukau Health (CM Health) grows annually at a rate of 2 percent overall (or additional 10,000+ people per annum) and 4 - 5 percent for people aged over 65 years. Over a third of CM Health's local population lives in New Zealand's most socioeconomically deprived areas – CM Health estimates this is over 196,000 adults and children, and with Maaori and Pacific peoples over represented. These factors combined, result in a large number people with a range of complex health conditions that are limiting both the length and quality of their lives. This growth and complexity of need, in turn, translates into demand growth for healthcare services.

Historic facility master plans identified significant service expansions that were not funded.

2. Detailed master planning in 2008 and 2010 outlined significant investment required in CM Health's acute (Middlemore) and elective (Manukau) site services to serve what was then identified as high population growth. To achieve this, the preferred way forward included demolition or replacement of older buildings close to, or beyond, their economic life.

3. This approach was to include buildings supporting clinical services on the Middlemore site i.e. Colvin (Adult Rehabilitation and Health of Older People), Galbraith (Maternity, Birthing, Gynaecology, Radiology, day procedures and infusions). Other sites with buildings beyond their economic life and assessed as not fit for clinical service use and/or uneconomic to reinvest to bring up to standard for long-term occupancy include the Papakura Maternity Unit and Franklin Memorial Hospital. Lack of funding to achieve planned demolition or replacement has meant that services have remained operational in these buildings – the average age of CM Health's clinical buildings on the Middlemore Hospital site is 40 years.[1]

Significant shifts in operational funding assumptions reduced capacity to invest.

4. Between 2008 and 2012 the funding signals for the health system, and consequently CM Health, significantly shifted. The 2008 global financial crisis and catastrophic Christchurch earthquake in 2011 resulted in significant constraints on Crown capital availability. In addition, CM Health experienced reduced annual operating revenue growth (4.5 percent growth to 2.6 percent from 2013/14) that impacted on forecast investment affordability. CM Health responded by reprioritising planned investments and accelerating demand management strategies to live within its means. CM Health has made trade-offs by limiting investment at strategic, tactical and operational levels to balance service demand risks.

A key trade off was to deprioritise facilities maintenance and hospital services expansion to grow more integrated community services to reduce acute demand growth.

5. CM Health's strategic priority of the last five years has been to grow community health services with the aim of reducing acute demand on hospital services and delay requirements to expand acute hospital services. To afford this, CM Health prioritised baseline capital funding for clinical equipment to sustain frontline services, Information and Communication Technologies (legacy of underinvestment regionally) and focus CM Health discretionary funding on community service integration, model of care change and capacity expansion.

[1] This is calculated from the June 2017 Darroch valuation reports denoting the age of CM Health's buildings

6. Together with CM Health's community services focus and strong hospital service efficiencies and operational demand management strategies, we were able to hold off investing in new major facilities on hospital sites over the last five years. The trade-off has been an underinvestment in a portfolio of (ageing) buildings in an environment of legislation amendments resulting in higher statutory non-compliance risks. Some clinical buildings are potentially unsuitable for immediate service expansion, or deteriorating at a rate faster than their original anticipated useful life.

CM Health's capacity to meet demand has now reached saturation in a number of key hospital services.

7. CM Health needs to act now to shore up essential enabling facilities infrastructure to ensure continuity of existing services and to target different options to expand services to maintain access. To date, demand has been managed by maximising opportunities for efficiency gains though a number of tactics. Key approaches include pooling resources such as inpatient medical and surgical beds and centralising hospital bed management reporting and resource allocations. Investment has also been made in growing quality and safety improvements, co-design with patients to optimise care processes and flow between services across their health services journey. More detailed production planning enabled us to identify how we could better deploy CM Health's workforce, available facilities and resources more efficiently.

8. The areas of investment that will address these immediate needs are to provide additional capacity for inpatient beds for acute care, facilities for specialist medical services, and supporting clinical diagnostic services. CM Health continues to work with the Northern Region to leverage capacity options across the Auckland-metro region.

Unprecedented levels of demand have challenged CM Health's ability to provide adequate and safe care.

9. CM Health has reached a tipping point, however, where the demand from population growth has overwhelmed the existing infrastructure and investment can no longer be delayed. Demand for acute and planned (elective) healthcare services have significantly exceeded that of previous years. The volume, acuity, and complexity of this demand has stretched CM Health's capacity – particularly for adult inpatient beds, acute and elective surgery, and some specialty inpatient services and procedures (e.g. gastroenterology, radiology). These pressures were collectively reflected by the 43 days in 2017 where Middlemore Hospital has been 'Full' – over two and a half times the number of full days recorded in 2016 and well above the benchmark of peak operational efficiency of 11 Full Days a year. Sustained high demand and occupancy at this level has system-wide impacts and leads to a range of related inefficiencies and risks to patient safety.

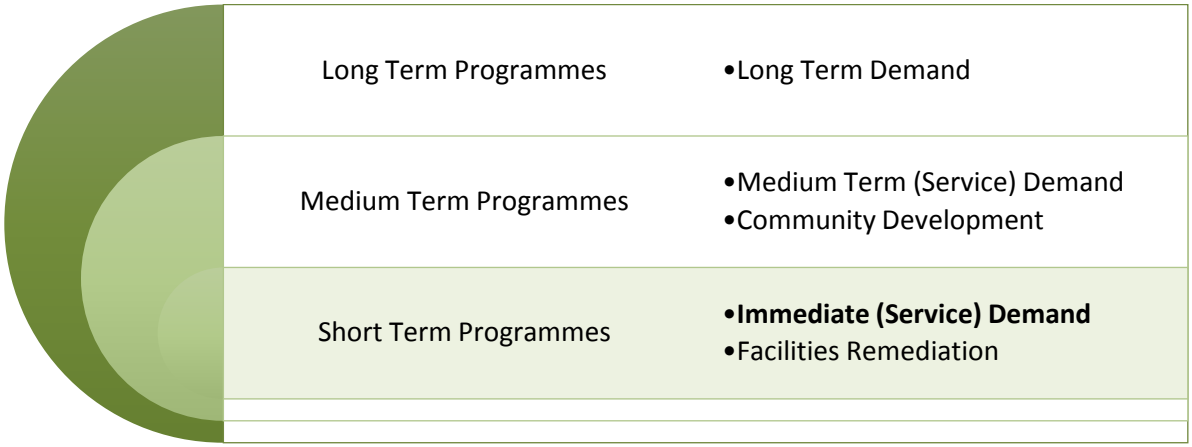
CM Health requires urgent investment in the expansion of acute clinical capacity to meet the demands of winter in the short term

10. CM Health's recent experience coupled with projected increases in demand tell us that we have, or are at high risk of, exceeding CM Health's capacity for the quality and safe delivery of essential healthcare services. This case should be read alongside the Auckland-metro region's Northern Region Long Term Investment Plan (NRLTIP). The NRLTIP assumes that local investment responses are required to meet short-term demand within individual DHBs.

11. CM Health's immediate response will consider a wide range of options; from changing staffing and service delivery models to building new facilities. CM Health will need to consider what can be practicably achieved at a local level, if and how CM Health's Auckland-metro DHB colleagues can assist, and what investments will require financial support from Crown funding. This is against a context where all Northern DHBs face similar population growth pressures.

Two facilities master plan programmes have been prioritised for 2017 development.

12. This Immediate Demand Programme is one of a suite of five, and is prioritised for immediate development alongside the Facilities Remediation Programme.



13. These Programmes are essential components of CM Health's overarching LTIP that includes other investment categories such as workforce, Information and Communication Technologies (ICT), clinical equipment and related operational impacts. In reality, many of these investments are dependent on each other to achieve high value investment benefits. Others have less complex investment relationships but potentially complicated implementation requirements.

14. **The Immediate Demand and Facilities Remediation Programmes have significant dependencies in terms of solution options, financial planning, affordability and implementation planning. For these reasons CM Health recommends that both Strategic Assessments are reviewed together.**

Introduction

15. This Strategic Assessment outlines the strategic context and rationale (case for change) for investing in short-term service capacity and related building services core infrastructure. It seeks approval to develop more detailed Programme Business Cases.

    Specifically, this Strategic Assessment:

    - provides context for this Programme and the rationale for why investment in health services expansion to meet immediate demand is needed, and
    - actions the next stages of investment as outlined in the 2016 CM Health LTIP and 2017 NRLTIP.

16. CM Health's Executive Leadership Team has **prioritised this Immediate Demand Programme and the Facilities Remediation Programme** for progression to Programme Business Case development.

17. **CM Health has an urgent requirement to expand key services to meet peak winter demand in 2018-19.** Winter 2017 challenged CM Health's hospital services with unprecedented levels of demand. Presentation volumes were the highest ever recorded, and were of a level of increased acuity and complexity. This demand stretched CM Health's ability to provide an adequate and safe level of care for the population, and placed an unsustainable level of pressure on frontline workforces.

18. These demand challenges are not unique to CM Health. The Auckland-metro DHBs (Auckland, Waitemata, and Counties Manukau) are taking a more aligned and collaborative approach to future service planning. Through this planning, the region has collectively recognised the need for individual DHBs to **rapidly implement local service delivery solutions** to ensure they are prepared for their respective immediate demand challenges ahead of next winter.

19. CM Health recognises capital investment in facilities alone will not address immediate demand problems. Decisions made will have ongoing resourcing implications for operating expenditure. Work is in progress to build a five-year financial model that will incorporate all planned facility related investments and their associated operational cost impacts alongside these Programme Cases. This modelling will be a key consideration for CM Health as it progresses to critically assessing its investment options. **CM Health's short-term response (one to four years) is to invest in a variety of options to manage demand.**

20. The Immediate Demand Programme will identify and assess a variety of service delivery solutions, potentially ranging from increased outsourcing through to the fast-tracking of new clinical facilities. Most options are likely to be dependent on the **utilisation of our existing facilities**.

21. The Immediate Demand Programme forms one of five workstreams being progressed by CM Health as part of a wider Facilities Master Planning Project. These workstreams consider facility investment requirements (from immediate through to longer term), and whether remediation of

existing facilities will enable service delivery solutions that demonstrate value for money and are in alignment with regional planning. Further information on CM Health's Facilities Master Planning Project underway is attached as Appendix 1.

Strategic Context

22. The strategic context laid out below provides a brief introduction to the organisation, the population served and organisation objectives. Refer to CM Health's 2016 LTIP for a more detailed summary of CM Health's strategic and organisational context.

CM Health's organisation

23. CM Health is one of 20 DHBs established under the New Zealand Public Health and Disability Act 2000 (NZPHD Act 2000) to plan and fund the provision of personal health, public health and disability support services for the improvement of the health of the population.

24. CM Health's functions comprise 'planner', 'funder' and 'provider' of health and disability services to an estimated 545,720[2] people in 2017 who reside in the local authorities of Auckland, Waikato, and Hauraki District. As a DHB, we have an annual budget of over $1.6 billion to cover the provision and funding of health services for the people living in the Counties Manukau district. This includes funding for primary care, hospital services, some public health services, aged care services, and services provided by other non-government health providers including Maaori and Pacific providers. Collectively, we refer to this as the Counties Manukau Health system.

25. Some specialist services are provided for CM Health's population by other DHBs through regional and national contracts. CM Health also provides regional and national services for people from other DHBs for specific specialties e.g. regional spinal service, National Burn Centre.

26. CM Health's Crown-owned buildings and related core infrastructure (such as building services and plant) are essential to business continuity, patient, visitor and staff safety, and future service expansion options. Services operated by CM Health are largely delivered from seven inpatient facilities and 18 leased or owned outpatient and community health facilities across the district. Manukau SuperClinic and Middlemore Hospital sites contain the largest elective, ambulatory, and inpatient facilities. In addition, a range of DHB and contracted community services are provided across the district e.g. Community Mental Health, Kidz First Community and others

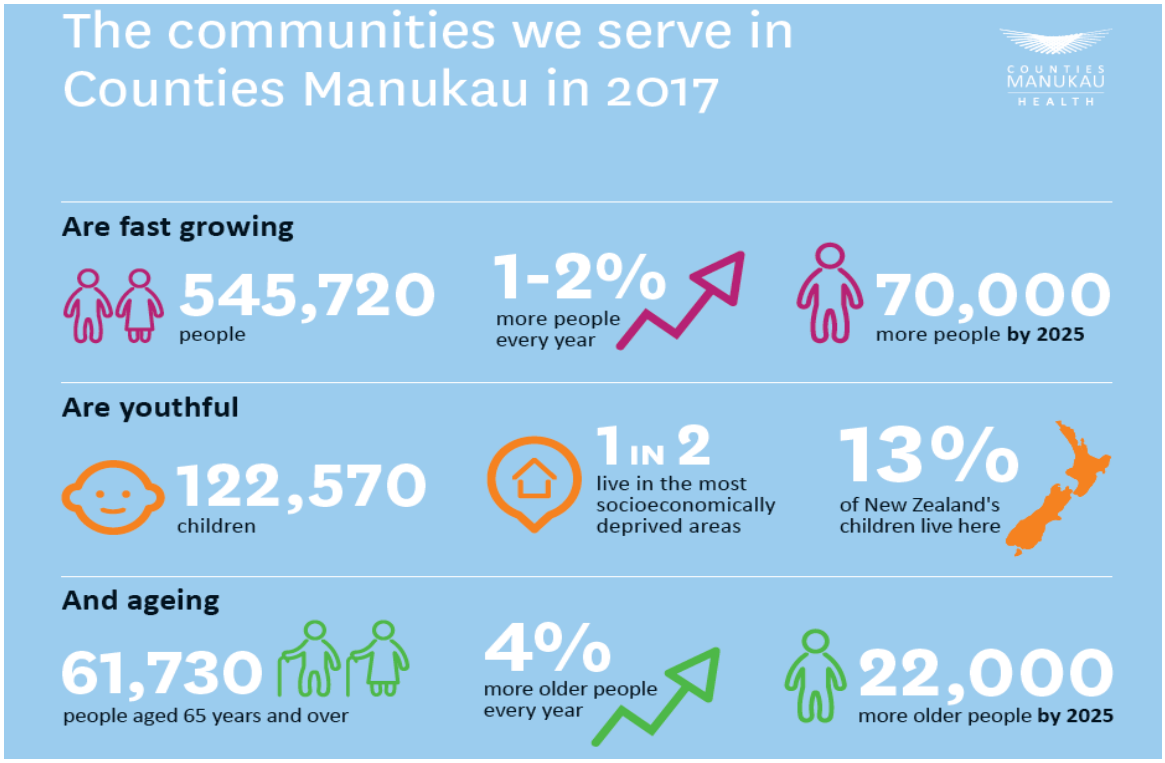
27. Over 6,600 people are employed by CM Health in addition to those employed by primary and community health services across the district. Nursing, Midwifery, and Health Care Assistant staff are by far the largest clinical workforce comprising 45 percent of DHB employed staff, medical 14 percent, and allied health and technical 18 percent.

[2] Statistic New Zealand Census 2013 population forecast update October 2016.

CM Health's population

28. The Counties Manukau district is one of the fastest growing in New Zealand. It has the most ethnically diverse population in New Zealand with a youthful and ageing community. Counties Manukau is home to New Zealand's second largest Maaori population, largest population of Pacific peoples, as well as fast growing Asian communities.

29. **CM Health expects to serve a further 70,000 people by 2025.** The burden of poor health is unevenly distributed among CM Health's populations. Over 122,000 children live in Counties Manukau, with almost one in two (approximately 45 percent) living in areas of high socioeconomic deprivation (NZDep2013 9&10). There is an eight year life expectancy difference between Maaori and non-Maaori/non-Pacific, and six years between Pacific and non-Maaori/non-Pacific.



30. On the basis of the NZDep2013 measure, Otara, Mangere and Manurewa - home to many Maaori and Pacific communities - are the most socioeconomically deprived areas in the Counties Manukau district. Related to these inequities, the Counties Manukau population experiences relatively high rates of ill-health risk factors (such as smoking, obesity, hazardous alcohol use) for a 'package' of long-term physical conditions that are responsible for the majority of potentially avoidable deaths.

31. The steady rate of population growth within Counties Manukau, coupled with the high levels of socioeconomic deprivation, is driving an unprecedented and sustained rise in demand (both volume and complexity) for CM Health's services.

CM Health's strategic direction

32. CM Health's strategic direction assumes that system integration is central to medium to long term management of CM Health's health system demand challenges. The following summary of the Healthy Together strategic plan assumes that all three strategic action areas are interdependent and impact on each other. Facility development is an enabler for healthy services – providing a setting where the healthcare workforces are equipped to deliver the best quality care.

33. The Healthy Together Strategic Plan 2015-2020 has three strategic objectives underpinning a goal of achieving equity in key indicators for Maaori, Pacific and other communities with health disparities. Strategic priorities across these objectives are to:
    - provide high-quality and high-performing modern specialist and hospital-based services,
    - strengthen primary and community-based services to reduce the burden of disease and prevent ill health, and
    - achieve health improvement for all with targeted support for CM Health's most vulnerable people and communities.

CM Health's Long Term Investment Plan 2016

34. The LTIP signalled a strong intention to expand prioritised hospital services and improve CM Health's asset performance measurement framework, increase building maintenance funding, and key building cladding (planned maintenance) projects over the next five years. This reflected the age of facilities (average building age is 40 years on the Middlemore site) and others planned for demolition/repurposing.

35. The preferred way forward within the LTIP was to enable service expansion and asset improvements as follows:
    - **Staged increase in a range of hospital services experiencing high service growth,** e.g. cardiology, gastroenterology, radiology, adult inpatient beds and others
    - **Sustain existing clinical service continuity** through planned remedial and improvements i.e. an estimated $28m over seven years for major building re-cladding on CM Health's two major hospital sites (Middlemore and Manukau)
    - An increase of approximately $5m each year in recognition of the rising costs of **major diagnostic and other clinical equipment** to sustain excellent and safe service delivery
    - An uplift of approximately $5m each year (50:50 operational and capital investments) to **maintain facilities assets and infrastructure** over the medium to long term
    - Planned **replacement of substandard facilities** rated as 'poor or very poor' that were deemed unfit (or uneconomic) to support clinical services in the short to long term e.g. Spinal Unit relocation to a new Specialised Rehabilitation and Living Well facility, Papakura Community Maternity renewal, Pukekohe Hospital and Botany site campus developments as Community Hubs, Middlemore Radiology lift and shift into an Importance Level (IL) four building and others

- Significant **ICT investment** was flagged as an enabler for efficient use of assets and new (more mobile) service delivery models

What is different in 2017 compared to July 2016 when the LTIP was completed?

36. CM Health has worked hard to invest its limited resources in early intervention, and while there have been some particularly effective community/locality based initiatives implemented, **this is no longer enough to offset the growth in demand at CM Health's front door.** To address these changes CM Health has prioritised investment in facilities remediation and hospital services requiring immediate demand management solutions. In line with the Healthy Together strategic plan (see below), it will take a whole-of-system and district response to successfully manage demand and maintain service quality, safety, and the patient and whaanau experience of care.

Alignment with existing strategy

Healthy Together 2020 Strategic Direction

37. To deliver on CM Health's *Healthy Together 2020* strategic direction, CM Health has established three structured portfolios of work to integrate all related programme and project delivery activities.

38. The three Healthy Together portfolios of work are:
    - **Excellent Care Portfolio** - promotes whole-of-system coordinated care services (including contracted providers) that transcend traditional divisional and organisational structures. Related programmes and projects will focus on improving health outcomes and the patient and whaanau experience through the improvement of care models; improved access to information (and enabling technologies) and services.
    - **Infrastructure and Assets Portfolio** - focuses on effective and fit for purpose management (business) processes, information and communication technologies (ICT) upgrades, local and regional planning for major capital developments of facilities and related assets.
    - **Business as Usual (BAU) Portfolio** - designed to ensure that while CM Health is transforming the health system for the future, it is not losing focus on the need to continuously improve services today. The BAU portfolio will therefore encompass all programmes and projects that are seeking to deliver iterative improvements in quality, safety, and efficiency of existing services.

39. The Immediate Demand Programme will support and enable the delivery of projects and programmes across two key portfolios; Excellent Care and BAU. This aligns with the **New Zealand Health Strategy strategic theme of 'Value and Performance'**

40. The major changes in CM Health's indicative investment requirements compared to those signalled in the LTIP relate to a more detailed range of remediation projects where there are concerns regarding their condition (e.g. structural integrity, asbestos). This will also be reflected in the NRLTIP.[3]

[3] The first NRLTIP was reviewed by the Regional Governance Group in September 2017, and will be tabled with the **DHB Boards for sign off in late October/early November 2017**. The national Capital Investment Committee (CIC) will receive the first NRLTIP in November 2017. The national expectation is that major DHB business cases requiring Crown approval

Northern Region Investment Objectives

41. The investment objectives for the NRLTIP reflect the agreed themes of *fix*, *future-proof*, and *accelerate*. These themes and the related investment objectives are to guide planners and decision makers to ensure their investment decisions are aligned with regional strategic priorities. These objectives underpin the NRLTIP Prioritisation Framework that CM Health has adopted locally.

42. Development of an Immediate Demand Programme Business Case will ensure the Region's investment objectives are fully considered as part of CM Health's options assessment process.

43. The NRLTIP proposes a preferred way forward that concurrently invests in remediating existing infrastructure and **future proofing for growth by investing in new sites and changes to models of care.**

44. The regional investment objectives, associated investment logic map, and sequencing timeline for the NRLTIP investment path are attached as Appendix 3. CM Health's Immediate Demand Programme problem statements that add to the NRLTIP investment logic are outlined in Appendix 5. Key investment logic alignments are outlined below and will be further developed as part of the Programme Business Case.

NRLTIP Investment Objectives	Aligned NRLTIP investment drivers	CM Health's Strategic Responses
Design a system with the flexibility, capacity and capabilities to meet the needs of our future populations	• Ensuring capacity on current sites to deliver an agreed set of core services for the local population as well as any designated Regional services • Exploring all forms of funding provision models (e.g. private capacity) to ensure a full range of options is considered when exploring new facilities and services. • Developing flexible designs so buildings can be repurposed as required into the future.	• Maximise use of existing capacity and regional opportunities • Expand service and workforce capacity and capability • Maximise service demand and quality improvement approaches • Establish effective health and safety performance management
Strengthen our foundations to ensure service provision as the future model of care is implemented.	• Undertake backlog remediation work in regard to key sites across the Region • Decongest and repurpose our existing hospital sites to address current capacity constraints	• Fast track prioritu enablers (facilities & ICT)

and/or funding will be identified in the NRLTIP. The region will continue to update the NRLTIP as more detailed information is available through programme and business case development.

Treasury Investment Management - Investor Confidence Rating (ICR) in 2016

45. CM Health's ICR assessment is comprised of a number of key elements and related targets. The 2016 ICR assessment identified improvements in asset management maturity Portfolio, Programme and Project (P3) Management Maturity Model (M3) among other actions that include:

- Development of an asset criticality framework (to support service continuity)
- Establishment of an organisation-wide Risk Committee with Risk Champions
- Implementation of a project prioritisation framework and benefits reporting.

These will be important to growing a more systematic and robust investment management system to implement these investments effectively and to maintain the value of CM Health's investments.

Rationale for Investment

Overview

46. **Unprecedented demand growth is challenging hospital service performance.** Over the past four years, CM Health has experienced a 16 percent growth in Adult Emergency Department (ED) presentations, a 2.8 percent growth in paediatric presentations, and a 17 percent growth in acute surgery volumes. This increased acute demand has created significant challenges in maintaining standards of service delivery and quality of care.

CMH	2013 Actual	2014 Actual	2015 Actual	2016 Actual	2017 Actual	Growth over 4 Years	Avg growth per year
Adult ED Presentation Growth	73,856	77,422	80,026	84,948	85,891	16.3%	4.1%
Paeds ED Presentation Growth	27,428	27,393	29,428	29,767	28,206	2.8%	0.7%
Acute Surgical Growth	21,567	23,606	23,801	25,011	25,231	17.0%	4.1%

47. Currently, CM Health resources between 1037 and 1071 beds (for summer and winter periods respectively) across the Middlemore Hospital and Manukau SuperClinic sites; in total there is capacity for 1,117 beds (the 46 unresourced beds are distributed across MSC, Kidz First, Neonates, and other areas). Where possible, beds are pooled to provide flexibility in occupancy (particularly across Medicine, Surgery, and ARHOP services), however, many beds are specialty specific (meaning they cannot be flexed e.g. Mental Health).

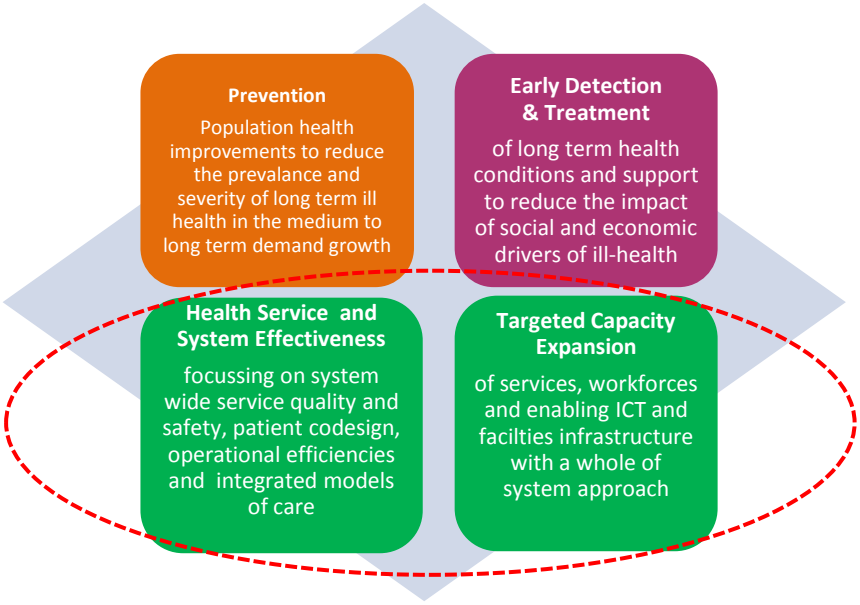
Total Inpatient Beds (MMH and MSC sites)		**Totals**		
Ward Type	Ward Group	Summer	Winter	Maximum
Emergency and short stay beds	Emergency Department/ Acute Medicine	66	66	66
	Short Stay Units (SAU, MAU, ASS, PSS)	80	80	80
Adult inpatients	Adult Medical and Surgical (incl TNBC)	423	441	442
	ARHOP	112	116	120
	Manukau Surgical Centre	54	54	78
	Women's Health – Maternity	72	72	72
	Women's Health – Gynaecology	15	15	15

Total Inpatient Beds (MMH and MSC sites)		Totals		
	Critical Care	18	18	18
Mental Health (incl MHSOP)		70	70	70
Kidz First	Kidz First	49	61	66
	Neo Natal	26	26	38
Women's Health – Babies (cots)		70	70	70
Total		**1037**	**1071**	**1117**

48. Historically, occupancy of 85 percent has been considered the optimum level within a hospital environment to support efficient and effective patient flow. This, however, requires a level of spare capacity which is not financially sustainable or viable within the current operating environment. CM Health aims to operate at an occupancy rate of around 90 percent – ensuring resources are optimally utilised, while allowing for some redundancy within the system to support a patient's movement throughout their hospital stay. Operating consistently at 90 percent or more reduces the level of resilience in the system to be able to cope on a daily basis as well as with significant disasters or emergencies.

49. Since 2014, the number of combined hospital bed days for Medicine, Surgery and ARHOP has grown by 4.4 percent. Throughout winter 2017, combined occupancy across these services frequently exceeded 99 percent of resourced occupancy. This loss of redundancy manifested in system-wide impacts, particularly in the ED where patients requiring admission were held for extended periods of time until an inpatient bed became available (sometimes in excess of 50 patients).

50. CM Health is adopting a matrix approach to balance investment in demand management. This approach is summarised in the following diagram, and is aligned with the Healthy Together Strategy (Healthy Communities; Healthy People, Whaanau and Families; and Healthy Services). The red dotted line indicates demand management and tactical investment related to the Immediate Demand Programme Business Case



51. CM Health has implemented a number of hospital and community initiatives to assist in managing acute demand at the front door. Despite an overall increase in ED presentation volumes, investment in further capacity within the ED itself is not considered necessary in the short-term. They key to managing ED demand effectively will be the continued scaling-up of community-based initiatives to prevent presentations and/or admissions, and improving patient flow throughout the hospital to enable faster decanting of patients from the ED.

52. Regional demand forecasting and bed modelling processes currently underway will inform medium to longer term capacity and service delivery solutions, and will ultimately be reflected in the agreed NRLTIP. Regionally, there is an acknowledgement that local investments are required to meet short-term demand pressures.

53. To ensure CM Health can sufficiently respond to the demand anticipated for coming winters, the Executive Leadership Team has recognised the need for immediate investment in the expansion of CM Health's clinical capacity.

54. In order to support effective patient flow in the short-term, critical capacity needs have been identified in the following areas:
    - Medical, Surgical, and Adult Rehabilitation and Health of Older People (ARHOP) beds
    - Acute and Elective theatres
    - Other specialist procedural services – notably gastroenterology, inpatient dialysis, and cardiology

    Each area of demand is briefly summarised under the headings to follow. A summary of indicative additional hospital capacity required is attached as Appendix 2. Further local critical capacity needs may be identified as the regional bed modelling process progresses.

55. **CM Health can most effectively implement demand response options through an overarching programme framework.** A Programme Business Case is being developed because CM Health's options for expanding immediate clinical capacity are wide ranging and varied, for which many will have complex interdependencies with other investment decisions (both locally and regionally). CM Health's investment decisions will have ongoing resourcing implications beyond upfront capital requirements, and will be a critical consideration when assessing the value proposition of any given option.

56. Immediate Demand Programme investment project tranches may change as the Programme Business Case economic case assesses options for the preferred way forward.

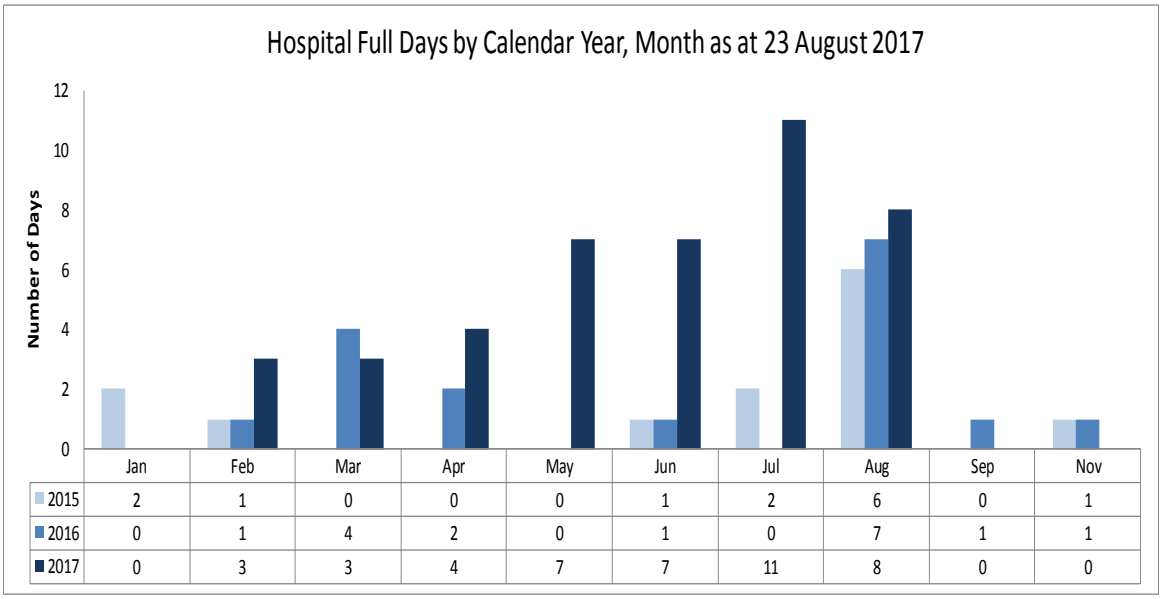
Medical, Surgical, and Adult Rehabilitation bed numbers are insufficient to meet demand

The Hospital is 'Full'

57. A Hospital 'Full Day' is CM Health's operational capacity indicator of acute capacity (see Acronyms and Definitions). CM Health has modelled forecast capacity for the last five years and found a strong correlation between the number of Full Days and capacity to manage peak

demand. This modelling has shown that the hospital experiences inefficiencies when the number of Full Days per year exceeds 11 (refer to CM Health's 2016 LTIP for a more detailed explanation).

58. Between January and August 2017, CM Health experienced 43 Full Days – two and a half times the number of Full Days experienced in the total 2016 calendar year.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Nov
2015	2	1	0	0	0	1	2	6	0	1
2016	0	1	4	2	0	1	0	7	1	1
2017	0	3	3	4	7	7	11	8	0	0

59. The benefits of timely patient flow extend beyond efficiency and operational gains. Timely admissions, safe transitions of care, and the ability to provide 'the right care in the right place at the right time' is an essential component of ensuring patients receive a quality healthcare experience and are given the best chance of achieving optimal outcomes. Some system resilience is also important in ensuring staff have sufficient periods of rest and recovery between demand surges.

Occupancy in Medical, Surgical and ARHOP services is higher than ever before

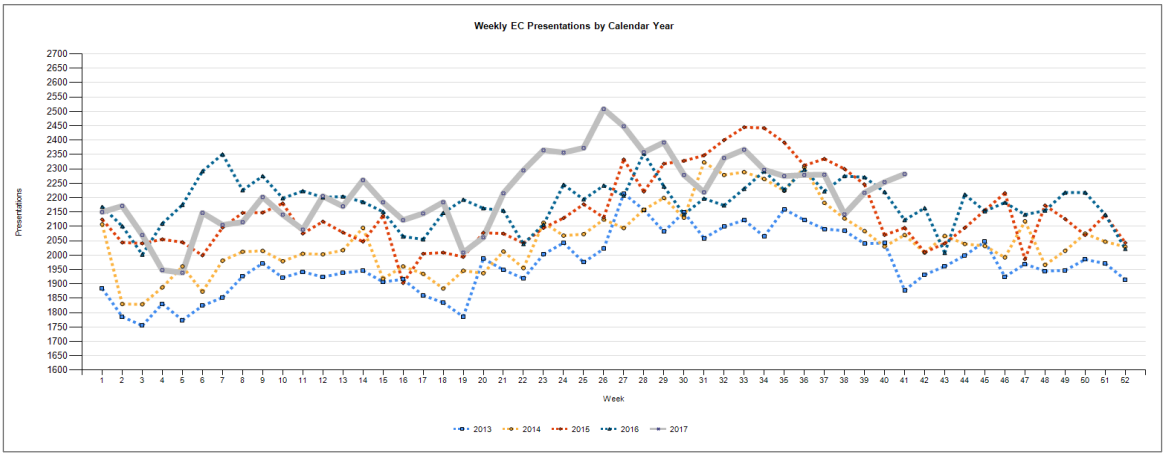
60. Despite resourcing an additional 60 beds above normally resourced capacity levels, CM Health's **combined** inpatient occupancy for these services frequently exceeded 99 percent of resourced capacity throughout the 2017 winter period. During this period occupancy within these services peaked at a new record level of 540 beds per day – 36 beds per day higher than the previous record set in August 2015. Overall, the number of beds occupied at midnight has grown by 4.4 percent since 2014.

61. The total number of occupied acute beds on the Middlemore site during peak demand periods (winter) across these three services is provided in the table below. Further occupancy information for Medical, Surgical, and ARHOP services is attached as Appendix 4.

Month	2014	2015	2016	2017	Trend
April	14,636	14,152	15,100	15,465	
May	14,236	14,894	15,404	16,165	
June	14,664	14,743	15,006	16,081	
July	15,504	15,125	14,813	17,094	
August	15,851	15,642	15,784	16,754	
September	15,425	15,272	14,722	15,673	

Demand for inpatient services starts at the front door

62. At the end of August 2017, year-to-date (YTD) presentations at the ED had reached 30,914 – representing a 5.5 percent increase from YTD 2016 volumes. This demand has significantly exceeded that of previous years, and also peaked much earlier than in previous years. The grey line in the following graph represents the current calendar year, and clearly demonstrates both the earlier peak and higher levels of demand.



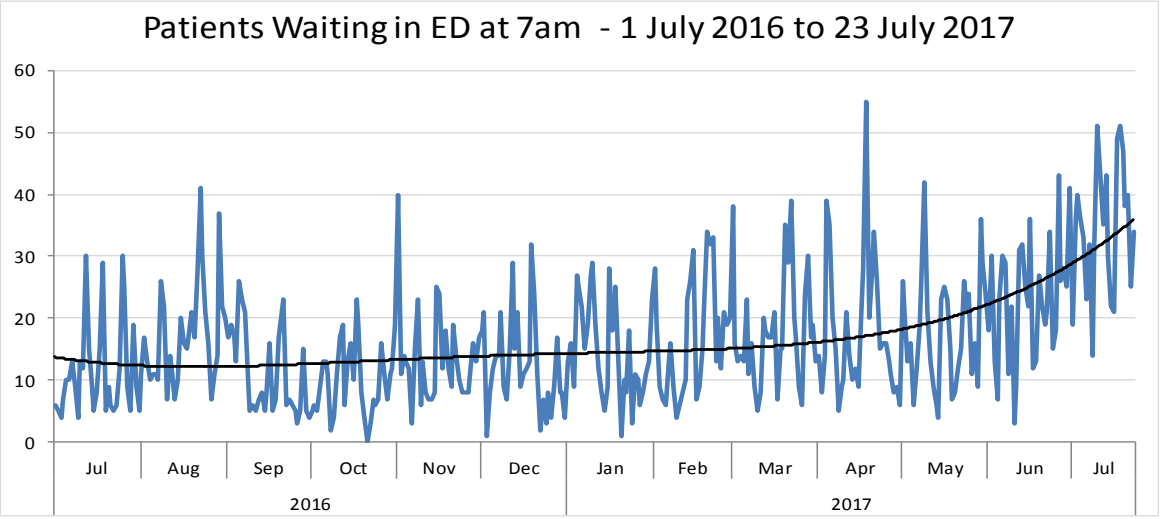
63. In July (at the peak of this demand), ED was processing 350 patients per day, with approximately 34 percent of these patients requiring an inpatient bed. CM Health's projections suggest that this demand at CM Health's front door, and subsequent requirement for inpatient services, will further grow next year.

		Actual			Projected	Avg Annual Growth
Area	Specific measure	FY2015	FY2016	FY2017*	FY2018	
Emergency Department	Presentations - Adults	83,609	88,610	89,291	92,304	3.37%
	Presentations - Paeds	25,845	26,105	23,905	23,018	-3.71%
	Presentations - Total	109,454	114,715	113,196	115,322	1.90%
	% Patients referred to inpatient services	63.40%	64.80%	65.20%	66.12%	1.41%
	% Patients discharged from ED*	37.00%	37.00%	39.00%	40.05%	2.70%
* Number of patients discharged from ED as a physical space						

**annualised as at the end of May 2017*

64. The peak in ED demand and increase in acute bed occupancy is placing significant pressure on patient flow across CM Health's system. As a result the number of patients in ED waiting longer than six hours for a bed is steadily increasing. As a result CM Health has failed to meet the national shorter stays ED target consistently over the last six months (April – September). It is

not uncommon for the ED to be holding roughly the equivalent of a ward full of patients at 7.00am each morning (the highest number of patients waiting for a bed at 7.00am in August 2017 was 57).



65. To retrieve the ED's performance against the national six hour target, additional capacity within the hospital is required to enable timely admission of patients from the ED. CM Health will also continue to accelerate other initiatives targeted to reducing demand at the front door and improving patient flow (examples include System Level Measures for reducing acute hospital bed days, redesign of the Kidz First ED to support a fast-track service delivery model, and the Front Door programme).

CM Health's theatres are at capacity and can no longer effectively respond to demand

Theatre efficiency and productivity gains within existing budgets have been exhausted

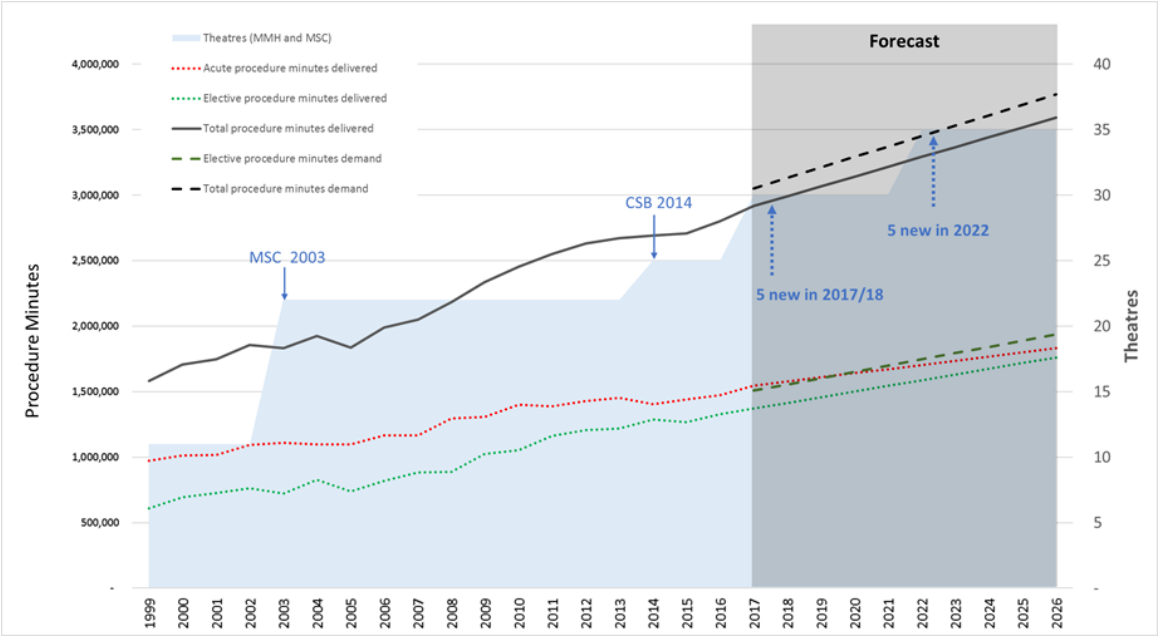
66. CM Health provides surgery across two sites; Middlemore Hospital (acute and elective) and Manukau Surgery Centre (elective only). Historic master planning has always provisioned for increased surgical capacity across both sites. As with many other planned clinical expansions, surgical expansion was deferred within the constrained funding environment.

67. The graph below models projected surgical demand through to 2026 based on historical delivery trends.

Key points to note include:

- The solid black line demonstrates a level of service delivery well in excess of what would typically be expected from CM Health's current theatre capacity (indicated by the area shaded blue) - this can largely be attributed to the focus on optimising theatre capacity.
- To sustain the current level of combined surgical demand an additional five theatres (or equivalent level of service delivery) are required. By 2018, those additional five theatres would already be insufficient to meet projected demand.
- The green dotted lines indicate the shortfall between the level of elective demand and the level of elective service delivery. Drivers of elective demand are further discussed below.

- Acute demand is forecast to rise, though at a relatively low rate when compared to that of elective demand – by 2021 the level of elective delivery is expected to surpass that of acute.



68. The 2008 business case for stage one of the clinical services block (CSB – now known as the Harley Gray Building) identified that 30 theatres would be required by 2020 to meet projected demand – based on these projections CM Health currently has a deficit of six theatres. Without capital investment in new theatre facilities to meet this demand, CM Health has focussed heavily on maximising efficiency and productivity within existing capacity. These efforts have been very successful, with monthly combined theatre utilisation consistently exceeding 85 percent.

69. The upside of increased optimisation has been a higher level of service delivery for the Counties Manukau population. Between January and September 2017, 68,826 more acute theatre minutes have been delivered when compared to the same nine-month period in 2016. Elective productivity has also improved, with an increase of 12,000 more minutes delivered over the last 12 months from that of the previous 12 months.

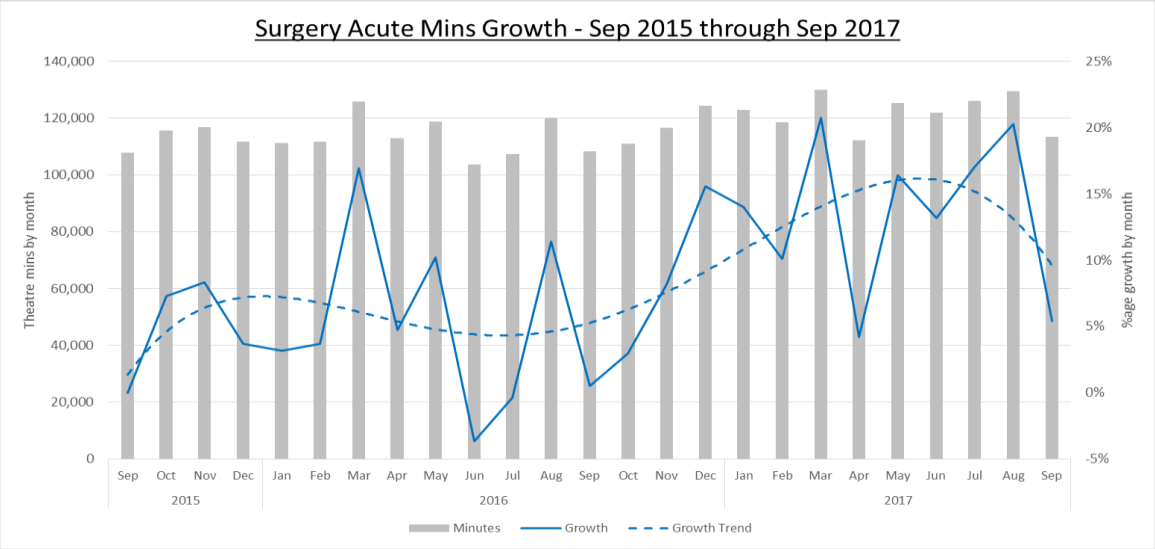
70. The downside of this increased utilisation has been a loss of redundancy within the system. Acute demand is inherently unpredictable – this means that CM Health must always have sufficient theatre capacity available to respond immediately. Without this redundancy, CM Health was forced to cancel some elective procedures during the 2017 winter period to meet acute demand; a trade-off which CM Health believes is unacceptable.[4]

Acute demand is growing and remains subject to large fluctuations

71. The demand for acute surgery continues to rise – for the period January to September 2017, CM Health's acute delivery has risen by eight percent compared to the same period for 2016.

[4] During the Immediate Demand Investment Logic Mapping workshop held on 13 October 2017, senior hospital managers and clinicians unanimously agreed that cancelling elective procedures to meet acute demand was an unacceptable compromise in terms of quality, risk, and service coverage.

72. Acute demand is subject to large fluctuations, with variations of up to 15,000 minutes recorded from one month to the next. Accordingly, planning and resourcing to meet this demand is an extremely difficult task. The service's ability to respond is largely dependent on sufficient redundancy within the system to ensure sufficient capacity and resourcing is available at any given time.



73. The histogram above highlights the overall increase in demand, as well as its unpredictable and variable nature. There is no evidence to suggest these demand patterns will smooth – the preferred option for CM Health being to create an environment that supports variable acute delivery through sufficient system redundancy.

74. CM Health's production planning calculations based on a resource provision of 85 percent utilisation suggests we should run 9.7 acute lists every day to ensure we consistently meet the acute peak demand of 5,500 - 6,000 minutes per day. Currently, seven acute theatres are run every weekday, and three on each acute weekday evening. This provides 3,360 minutes of daylight acute operating time every day.

75. Without an increase in acute theatre lists, CM Health will be unable to meet its goal of ensuring all acute surgical patients booked and ready for surgery receive their operation within 48 hours (timeliness to surgery within the acute environment is critical to ensuring optimum outcomes for patients).

Elective demand is growing, and becoming increasingly complex

76. In addition to the displacement of elective surgery to respond to acute demand, CM Health's ability to deliver adequate levels of elective surgical intervention for the Counties Manukau population is further challenged by an increasing level of demand and a rising level of complexity.

77. Recently, there has been pronounced growth in elective theatre minutes, with the total nine-month rolling rate increasing by 6.1 percent as at March 2017. At speciality level, the greatest growth is seen in elective Plastics, where a nine-month rolling rate increase of 12.2 percent has been recorded. Additionally, significant growth rates have been recorded in elective orthopaedic minutes, with a nine-month rolling rate increase of 5.1 percent. Demand for elective surgical services are, in part, driven by population growth (particularly the four to five percent annual growth in 65 years and older) and early detection programmes leading to the need for surgical intervention (e.g. BreastScreen, National Bowel Screening).

78. Another significant contributing factor to the growth in elective demand is a rise in case complexity. This increase in complexity can primarily be attributed to CM Health's delivery of spines, head and neck, and mangled limbs; where the use of microvascular surgery is used in the reconstruction of soft tissue injuries.

79. Between 2011 and 2016, orthopaedic surgery minutes where the time in theatre was greater than three hours increased by 56.2 percent overall, and notably by 76 percent for orthopaedic elective cases. The increase in case complexity has meant that:
    - Due to the close proximity of diagnostic and support services required for complex procedures, the growth in overall elective procedures performed at Middlemore has been significant. Between 2010 and 2016 elective growth at Middlemore was 45 percent (compared with elective growth at Manukau Surgical Centre of only four percent).
    - The growth in elective procedures performed at Middlemore where the case-length is three hours or more has been even more pronounced. Between 2010 and 2016, the number of these procedures at Middlemore increased by 83 percent (compared with a five percent reduction for the same period at Manukau).

80. To effectively respond to rising surgical demand, CM Health will need to consider a range of short and long-term service solutions e.g. extended operating hours, increased elective and/or procedural capacity to decant theatres, outsourcing (to other DHBs or private providers), changing models of care (e.g. the successful implementation of the Plastics See and Treat Unit).

Other key clinical services are confined by facilities that are no longer fit for purpose

81. Beyond CM Health's pressing need for theatres and beds, we also immediately require some speciality-specific clinical capacity to respond to growing and/or changing demand patterns and support the associated service delivery solutions. Key areas identified for immediate investment include Gastroenterology, Inpatient Dialysis, and Cardiology.

Gastroenterology services are constrained by their current footprint

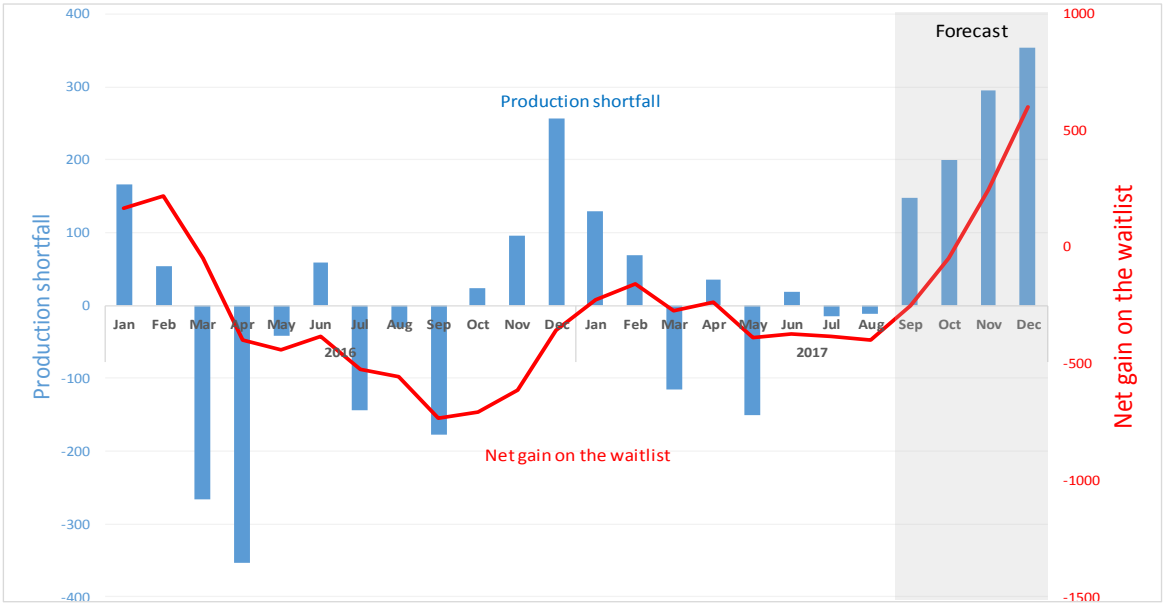
82. CM Health has recently experienced significant growth in demand for gastroenterology procedures (see Acronyms and Definitions). Of particular note is the rise in demand for gastroscopy and colonoscopy procedures, and Endoscopic Retrograde Cholangiopancreatography.
    - Symptomatic colonoscopy and 'top and tail' (gastroscopy and colonoscopy) procedures experienced a significant spike in demand over the past year – this was particularly apparent

in the period June to March 2017, where overall demand for these procedures rose by 33 percent. CM Health's forecasting suggests that this demand will level out to an annual increase of six percent, however this does not account for the likely increase resulting from the introduction of the National Bowel Screening Programme.

- ERCP lists have been performed by Gastroenterologists in Radiology three times per week for a number of years. This is due to the required radiological equipment (image intensifier) not being mobile, and the technology being inadequate to safely perform these acute complex procedures in the Gastroenterology Department. Radiology is now experiencing capacity issues due to a considerable rise in demand for Interventional Radiology due to the high acuity of ERCP patients, beds are increasingly occupying space in the cramped Radiology bed bay areas, with the workload associated with the monitoring of these acute patients usually falling on the already over-extended Radiology staff.

83. Demand modelling for elective Gastroenterology procedures shows a level of forecasted demand well beyond CM Health's existing capacity. Year on year growth modelling for the service has been completed, and suggests that additional facilities, staff, and equipment resources will be required from 2018 to adequately respond to demand. By 2020 the service will need additional capacity for five bowel screening lists per week and three ERCP lists per week (note that this modelling assumes Bronchoscopy – currently delivered within the Gastroenterology department – could be delivered elsewhere).

84. As at the end of August 2017, the waitlist for Gastroenterology procedures was sitting at 1,919 patients; this is predicted to rise to 2,663 patients by December 2017. High inpatient numbers are driving an increase in demand for acute procedures above the levels typically reserved acute procedural slots. This is resulting in the cancellation of elective procedures, and accordingly is driving waitlist numbers higher.



Delayed Cardiology interventions are compromising patients' outcomes

85. Heart or cardiovascular disease remains the highest cause of early death in Counties Manukau, particularly for Maaori and Pacific populations - around a third of Maaori deaths in 2014 were

caused by diabetes and cardiovascular disease. These patients are also dying younger as a result – 48 percent of Maaori deaths were under 65 years of age. In contrast, 49 percent of the New Zealand European deaths were in people over 85 years of age; only seven percent of Maaori died at 85 years or older.

86. Middlemore Hospital delivers secondary and tertiary care for CM Health residents with coronary artery disease, acute coronary syndrome (ACS), myocardial infarction, cardiac arrhythmia, heart failure, and many other cardiac illnesses.

87. CM Health currently has one Cardiac Catheter Laboratory (CCL) that has operated since 2005 and delivered more than 17,000 procedures since it opened. Compared to other regional and national cardiac services:
    - Counties Manukau has the highest rate of ACS in New Zealand (greater than 600 per 100,000 of population) and the highest demand for CCL procedures – refer to map on next page;
    - Rates of coronary angiography are 20-30 percent lower than other Northern region hospitals. Patient throughput has reached the maximum capacity of approximately 1,450 procedures (of all types) per year, having plateaued for more than five years;
    - Counties Manukau has the largest population of Maaori and Pacific people who have higher prevalence of heart disease and are being underserved – Maaori and Pacific people are 30 percent less likely to undergo coronary angiography and up to 50 percent more likely to die within the first year after ACS.

88. A 2016 Cardiology departmental accreditation report highlighted the safety hazards of having a single CCL serving a population the size of Counties Manukau. This included the reliance on one set of equipment that may put a patient's life at immediate risk and the safety risks of transfer that may occur.

89. In addition, given the volume and capacity at which the CCL is working, and the demand presented in the population, only one patient can be treated at a time.

90. Regional transfers have not always worked well for CM Health patients; an increase in regional demand has resulted in capacity constraints for CM Health patients who are experiencing delayed time for transfers and disruption for families and patients due to travelling distances.

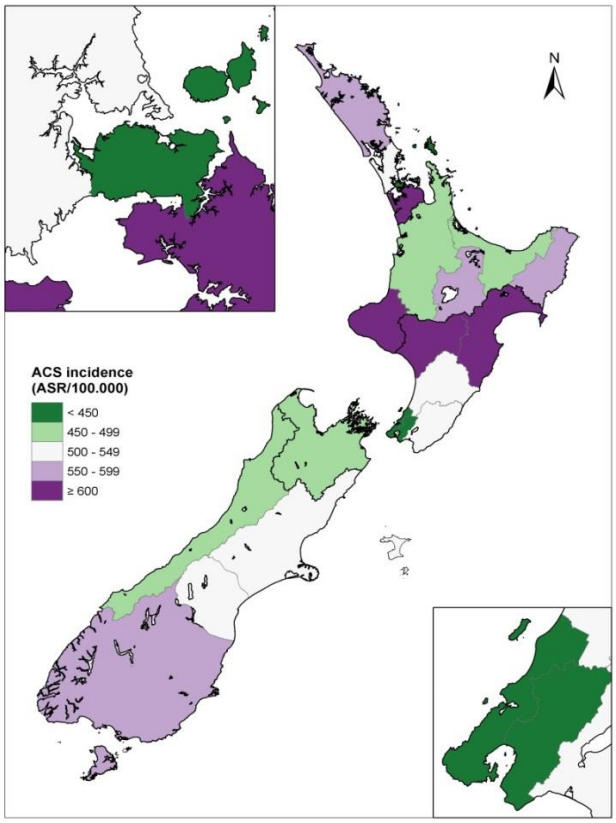


Figure: Incidence of ACS by geography - inset shows CM Health highest at greater than 600/100,000

91. Currently, CM Health provides coronary intervention at Middlemore between 8.00am and 5.00pm, Monday to Friday, with a team of three Interventional Cardiologists. During these hours, coronary intervention bypasses the ED and transfers patients directly to theatre to reduce the wait time for patients in coronary distress. After-hours coronary intervention is provided at Auckland City Hospital via a regional Interventional Cardiologist on-call roster

92. An additional CCL and supporting services at Middlemore would mean:
    - Increased capacity to treat more people who present locally;
    - Equity of access to CCL procedures particularly for Maaori and Pacific populations and a reduction in early deaths for those groups;
    - CM Health can meet demand with increased patient safety and service resilience including from reduced need for patient transfers to Auckland City Hospital; and
    - Improve access to pacemaker and cardiac device implantation that, again, extends life.

93. CM Health, like all DHBs, has used System Level Measures to guide and target work to slow progression of cardiovascular disease in the community and better manage risk in primary care settings. Similar to the hospital, however, population growth is also overwhelming primary care efforts and may not accelerate at a rate to reduce the likely need for additional hospital capacity in the near future.

94. Recently, the Northern Regional Alliance (NRA) in conjunction with the Northern Region Cardiac Network analysed capacity, utilisation, and demand for CCL services across the region to inform future service delivery planning. Modelling completed through this process identified that the preferred way for CM Health to meet MoH's required intervention rate would be through the addition of a second CCL at Middlemore Hospital.

95. The NRA and the Northern Region Cardiac Network have concluded that investing in more CCL capacity in the Northern region is required, and that this would be through the construction and resourcing of an additional CCL at ***both*** Northland DHB and CM Health.

CM Health's inpatient dialysis unit no longer safely supports CM Health's inpatient mix

96. The Scott Dialysis Unit is located at the northern end of the Scott Building adjacent to Ward 1 (inpatient renal ward) on the Middlemore Hospital site. The unit was built in 2002 and was designed to accommodate 20 patients with 14 chairs and six beds. Since 2002, the acuity of patients dialysing has steadily increased and today 90 percent of the unit's patients are dialysing in beds.

97. Patients dialysing in the unit are generally either acute or high acuity patients who the clinical team have judged to be not suitable to be dialysed in other CM Health facilities (i.e. RITO or Diaverum). Of these patients, those dialysing in beds (rather than chairs) do so because they:
    - are acutely unwell and have been transferred for dialysis treatment by bed;
    - require a hoist transfer;
    - have a medical or physical condition preventing them from using a chair (e.g. chronic back pain/injury, amputee, epilepsy, require bed rails due to risk of fall etc);
    - have frequent syncope/drop their blood pressure during dialysis; and/or

- weigh more than 240 kilograms.

98. The CM Health catchment is characterised by a population that is relatively young, multi-ethnic, and socioeconomically deprived. This is a high prevalence of obesity, diabetes mellitus, and cardiovascular disease, which all contribute to the highest prevalence of end stage Kidney failure in the country.

99. The change in patient mix over the past 14 years means there are now significant space constraints which compromise clinical practice and patient care (including infection control and emergency management of patients) as well as health and safety of staff. With the current patient mix, the unit does not meet Australasian Health Facility standards with chair and bed spaces being approximately 30 percent less than guidance in these standards (the unit was built prior to these standards being established). The entire unit is only 62 percent of the size of that recommended by accepted standards. A recent clinical architectural review concluded the unit is not fit for purpose.

100. CM Health's demand modelling for In-Centre Dialysis reflects continued volume growth of between 5.5 – 6 percent per year with 13 percent of CM Health's dialysis patients being acute or high acuity. It should be noted, however that over the past 12 months growth has reduced to a rate of 2 percent growth. It is difficult to know whether this lower growth rate is an aberration or will be sustained; CM Health's view is that demand is likely to increase back up over time to at least 4 percent per year.

101. As described with the Cardiology need, CM Health has also implemented a range of strategies to reduce inpatient dialysis demand. Initiatives have included:
    - promotion of improved health and independent self-care through home dialysis for all patients with Kidney disease;
    - establishing an acute/preemptive peritoneal dialysis unit;
    - partnering with the local renal charity, The Kidney Society Auckland, to expand the provision of community dialysis houses which currently enable 100 people to perform their own independent haemodialysis at timings of their own choosing; and
    - renal transplantation – through direct funding from MoH, CM Health has achieved a fourfold increase in renal transplantation rates.

102. Many of these developments note CM Health's strong focus on providing as much service as possible in a non-acute setting. There is, however, a small but growing number of patients requiring hospital-based dialysis.

103. CM Health's current Board has recently prioritised and approved an expansion to the Scott Dialysis Unit - this will involve extending the footprint of the building to the North. It is anticipated, though not yet economically assessed, that to accommodate an additional CCL (discussed above) the Cardiology unit would also be extended to the North above the Dialysis expansion.

104. It is considered appropriate to consider both projects as part of the wider Immediate Demand Programme as:
- both services have critical investment needs that require capital funding in the short-term;
- the combined value will trigger the Capital Investment Committee approval process;
- the Scott building has known remediation requirements (link to the Facilities Remediation Programme);
- will impact CM Health's baseline operating expenditure; and
- the increase in patient throughput will have flow on effects to other site services e.g. parking.

Key Stakeholders

105. A comprehensive stakeholder engagement plan will be developed as part of the Programme Business Case.

106. The first Investment Logic Mapping session was held with senior hospital leaders and clinicians on 13 October 2017 – this process will continue concurrently with the development of the Immediate Demand Programme Business Case. Refer to Appendix 5 for a copy of the working draft Investment Logic Map (ILM) for this Programme Case

107. A signal of the Facilities Master Plan and associated programme initiatives has been provided to both the Ministry of Health and The Treasury.

Next Steps

108. Following the Treasury investment process means a number of review and approval stages. Below are the key activities and decision points. To achieve these, Board support will be required to fast track review and endorsement processes through the respective Northern Region forums for the **Immediate Demand** and **Facilities Remediation Programmes**.

Ref	Treasury Stage	Activity/Decision	Owner/ Forum	Target Date	Actual Status
Facilities Master Plan Programme Level Steps					
1.	Initiation	Risk Profile Assessment & Point of Entry forms	Chief Financial Officer & Chief Executive Officer	05/10/17	Completed
		Treasury Submission	Director Population Health & Strategy (SRO)	12/10/17	Completed
2.	Planning	Strategic Assessments	ELT	10/10/17	Completed
			Board	25/10/17	Completed
			Regional Capital Group	10/11/17	Completed
			Regional Executives Forum	17/11/17	Completed
			Regional Governance Group	30/11/17	Scheduled

Ref	Treasury Stage	Activity/Decision	Owner/ Forum	Target Date	Actual Status
			Treasury & MOH (for agency briefing)	24/11/17	Completed
			Capital Investment Committee	08/12/17	Completed

Note: Programme Business Case timelines have been extended to allow for scenario testing of Galbraith building seismic vulnerability assessment outcomes and related impacts. These timeframes will be reflected in the 2018 Immediate Demand Programme Business Case.

Appendix 1: Facilities Master Plan overview of progress to date

We have structured our 2017 Facilities Master Plan into groups of projects to allow us to get on with our most urgent demand pressures and building remediation concerns. A refresh of our forecast demand model is in progress and aims to better reflect the significant increase in volumes experienced since winter 2016. This work aims to not only inform our local demand planning, but to support regional modelling capability with a view to collaboration for a refresh of the Northern Region LTIP in 2018.

The practical realities of planning facilities investments on pre-existing sites/buildings and long standing service delivery structures is that there are important and challenging dependencies in developing options to address current and future demand. This includes:

- **Condition assessment of our buildings and assets:** to better understand and address seismic, asbestos, general condition (including weather tightness, cladding) and ongoing maintenance we have a rolling series of assessments in progress. These assessments may determine how wise it is to invest in some short term or interim solutions to our demand pressures, e.g. refurbishing level 1 of the Galbraith building.
- **Dependent facility development options:** some facility development options that are dependent on one another for development and are more effectively managed together, e.g. a new Catheter Laboratory built on top of a ground floor expansion of the Scott Dialysis unit. We have structured our FMP Programmes to bring related projects together.
- **With delayed major investment for five years (in accordance with the NRLTIP), we need interim and longer-term solutions:** Our FMP includes a number of facilities investments to shore up services experiencing the highest demand pressures now, plus medium to longer term investments that will align and leverage regional service models and capacity.

To prioritise these demand pressures and improve the cohesion and efficiency of business case development, we have organized a ten-year view of facilities investment into five Programmes. These timelines and indicative capital requirements were presented to our Audit Risk and Finance Committee 04 October 2017.

Unapproved Programme Cases - Indicative Capital Requirements ($m)

Investment Programme	Financial Year (ending 30 June) $m				Indicative Capital
	16/17	17/18	18/19 - 21/22	22/23+	
Immediate Demand Programme		*14.85*	42.00		**56.85**
Remediation Programme		*23.92*	89.68	9.80	**123.40**
Community Development Programme			52.20	104.00	**156.20**
Medium Term Demand Programme			312.90	177.00	**489.90**
Long Term Demand Programme				224.20	**224.20**
Unapproved Facilities Programme Total	**0.00**	**38.77**	**496.79**	**515.00**	**1050.55**
Approved Standalone Projects (see below)	*16.50*	*43.67*	*17.20*		*77.37*
Facilities Programme Grand Total	**16.50**	**82.44**	**513.99**	**515.00**	**1127.92**

Note: *Indicative capital requirements are a mixture of independent capital estimates at different stages of facility solution design and internal "best estimates" by our facilities team. This is normal for every facilities project as increased definition of the facility to be developed will increase the accuracy of the capital requirement.*

These programmes will be refined as Programme Business Cases are progressed. **This will impact project tranche definitions and indicative capital requirements.** For some investments, there is a significant time lag between starting the business case and opening a new facility. This is particularly relevant for major investments (> $10m capital) that require regional and national Capital Investment Committee approvals.

Appendix 1

Indicative Facilities Capital Requirements for the Immediate Demand Programme

Investment Programme & Projects	Financial Year (ending 30 June) $m 2016/17	17/18	18/19 - 21/22	22/23+	Indicative Subtotals	Indicative TOTALS
Immediate Demand Programme						
2nd Catheter Laboratory			7.70		**7.70**	
Galbraith Level 1 Refurbishment		4.80			**4.80**	
Galbraith Level 5 Ward Refurbishment		0.20			**0.20**	
Gastro. Unit Expansion		4.40			**4.40**	
Histology Expansion		1.75			**1.75**	
Kidz First ED (2 Stages)		1.00	5.00		**6.00**	
Manukau Theatre (Interim)			28.50		**28.50**	
Scott Dialysis Expansion		2.70	0.80		**3.50**	
Immediate Demand Programme Total		**14.85**	**42.00**			**56.85**

Appendix 2: Indicative Immediate Demand Requirements

BEDS BY SERVICE**	Actual Beds Sep-17	Additional beds / theatres we need 17/18	18/19	19/20
Medical Services				
Medicine Adults	215	30	20	0
Critical Care (ICU/HDU)	24	0	8	0
Surgical Services				
Acute Operating Theatres	7	2	1	0
Surgical Beds Middlemore	219	20	10	0
Elective Operating Theatres	17	0	2	0
Elective Surgical Bed Manukau	78	-34*	20	0
Adult Rehab. & Older People				
Middlemore	113	15	5	5
Auckland Spinal Unit	20	4	2	4
Older People Mental Health	18	0	0	0
Acute Mental Health adults	52	6	2	0
Women's Health Middlemore	87	0	0	5
Note: Preliminary Requirements - revised bed model Nov-2017 to inform ongoing LTIP update.				

OTHER REQUIREMENTS	Actual Capacity Sep-17	Additional Capacity Needed 17/18	18/19	19/20
Mental Health Community Beds (NGOs)	37	0	8	0
Radiology				
CT	4	0	0	1
MRI	2	1	0	0
Procedural & Day Services				
Catheter Laboratory	1	0	1	0
Dialysis - Middlemore	20	0	2	1
Dialysis - Community	88	0	0	TBC
Gastro. rooms (and other procedures)	4	1	1	0
Note: Requirements based on regional service planning and local production planning.				

Note*: The -34 beds surgical beds at Manukau in 2017/18 reflects unresourced physical beds as at Sep. 2017

Note **: Bed requirements forecast will be updated in November 2017 as we revise our bed model based on actual 01/09/2016 to 31/8/2017 bed utilisation.

Note ***: We will align our demand options with the Northern Region LTIP

Note that Acute Mental Health and MRI demand requirements have already been approved and progressed through separate, but aligned business case processes.

Appendix 3: Regional Investment Objectives and Sequencing Timeline

Source: Investment Logic Map presentation (file name: ILM v5 171002)

Accelerate model of care change programmes to maximise health outcomes

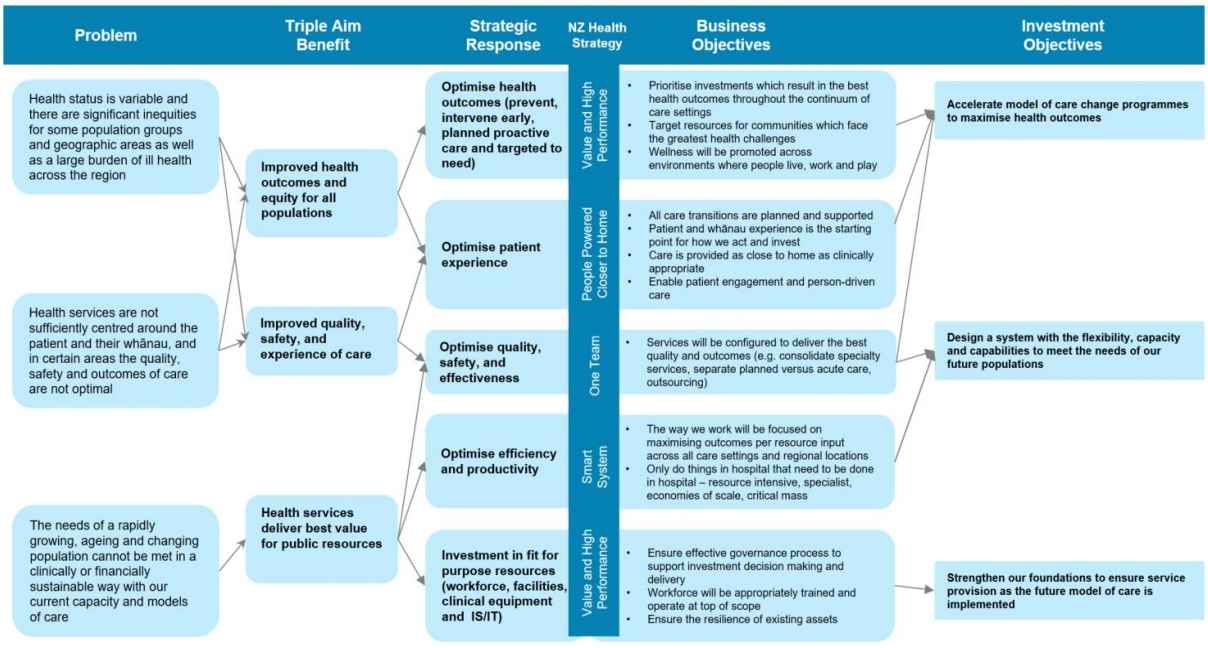
- Enable self-directed care
- Expand care across a wider continuum of non-hospital options, including public health, primary, community and home care, to enable more services to be delivered in the most appropriate setting.
- Leverage patient technologies which provide new opportunities to capture, relay and present clinical and non-clinical information, both in the home and other care settings.
- Provide mobile services and telehealth to ensure the needs of our isolated populations are met.
- Utilise information systems which support new models of care and provide patients and care teams with full, timely access to health information.
- Develop our non-hospital workforce to support the delivery of new models of care (incl GPs, nurses, pharmacists, other allied health and specialist medical practitioners, volunteers, whānau etc.).

Design a system with the flexibility, capacity and capabilities to meet the needs of our future populations

- Ensure capacity on current sites to deliver an agreed set of core services for the local population as well as any designated Regional services.
- Add new acute hospital site(s) to the Regional network to deliver services for a local population where required and purchase land where necessary.
- Stream elective surgery/procedures/services to specific sites across the Region where it makes most sense.
- Increase patient access to care providers by creating more options to access care (e.g. virtual / phone), extending hours of operation and delivering care closer to home where appropriate.
- Explore all forms of funding and provision models (e.g. private capacity) to ensure a full range of options are considered when exploring new facilities and services.
- Expand our clinical and non-clinical workforce to support growth in service delivery where aligned to future models of care.
- Develop flexible designs so buildings can be repurposed as required in to the future.
- Invest in community hubs.

Strengthen our foundations to ensure service provision as the future model of care is implemented

- Undertake backlog remediation work in regard to key sites across the Region.
- Decongest and repurpose our existing hospital sites to address current capacity constraints.
- Maintain and replace current assets to ensure they are fit for modern purpose and aligned with future models of care.
- Strengthen ICT foundations to increase the resilience of our systems, reduce risk and improve efficiency and effectiveness.



Appendix 3

Regional preferred investment path and sequencing timeline

This timeline has been redacted as the version was from October 2017 and it has been superseded by the 2018 Northern Region Long Term Investment Plan (NRLTIP).

Appendix 4: Additional Occupancy Information

Acute Bed Day Demand: Combined Medicine, Surgery, and ARHOP (Middlemore)

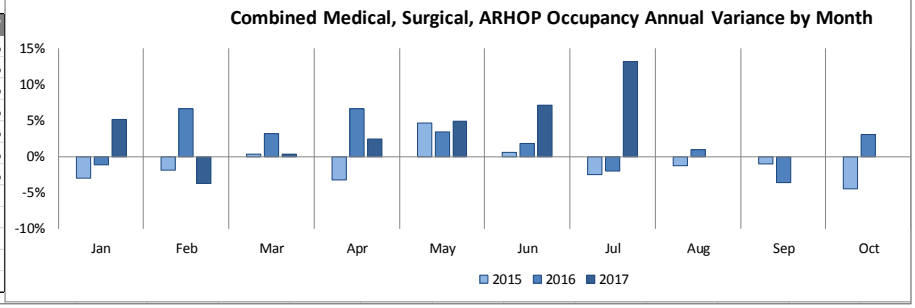
The number of combined bed days occupied at midnight (by calendar year - for adults), has grown by 4.4% since 2014.

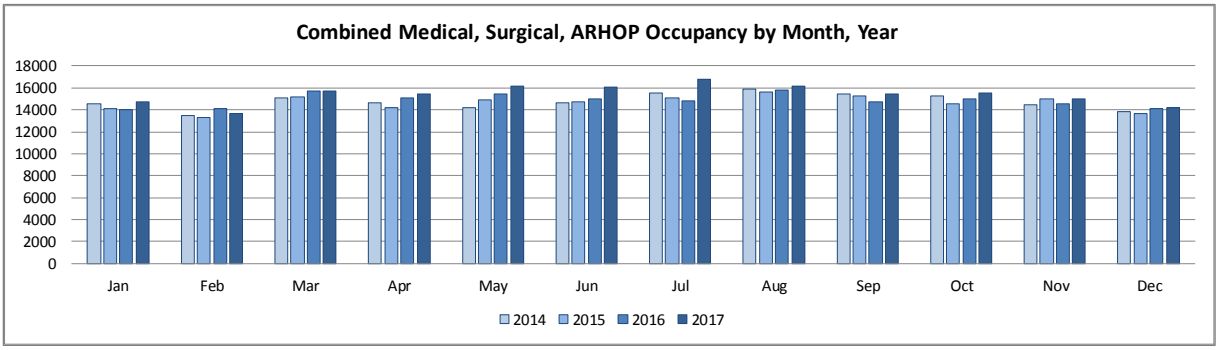
Actual Occupancy to 23 July 2017, Forecast Occupancy From 24 July 2016				
	2014	**2015**	**2016**	**2017**
12 Month Variance		-0.8%	1.5%	3.7%
Occupancy	177,052	175,689	178,336	184,919

The graphs below further depict the increase in combined occupancy when compared to previous years.

Combined Medical, Surgical, ARHOP by Month

12 Month Variance	2015	2016	2017
Jan	-3.0%	-1.1%	5.2%
Feb	-1.9%	6.6%	-3.7%
Mar	0.4%	3.2%	0.3%
Apr	-3.3%	6.7%	2.4%
May	4.6%	3.4%	4.9%
Jun	0.5%	1.8%	7.2%
Jul	-2.4%	-2.1%	13.2%
Aug	-1.3%	0.9%	
Sep	-1.0%	-3.6%	
Oct	-4.5%	3.0%	
Nov	3.9%	-3.0%	
Dec	-1.0%	3.2%	



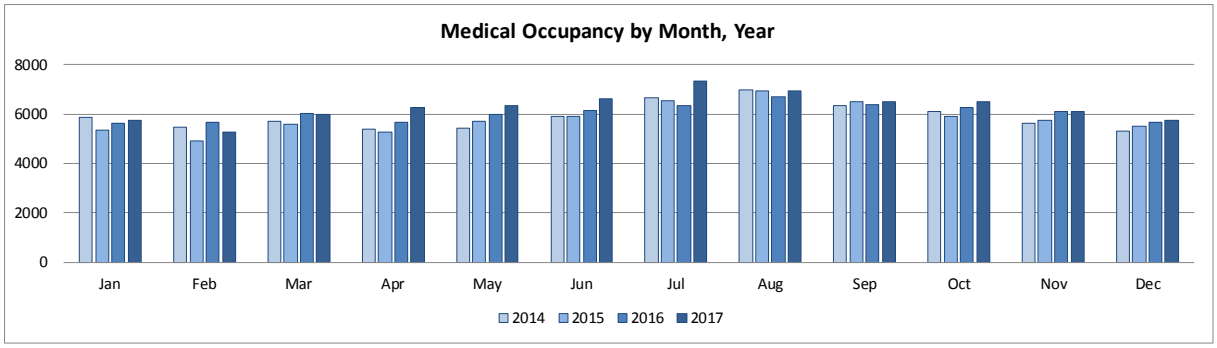


Acute Bed Day Demand: Medicine (Middlemore)

Actual Occupancy to 23 July 2017, Forecast Occupancy From 24 July 2017				
	2014	**2015**	**2016**	**2017**
12 Month Variance		-1.3%	3.9%	3.8%
Occupancy	70,896	69,964	72,675	75,449

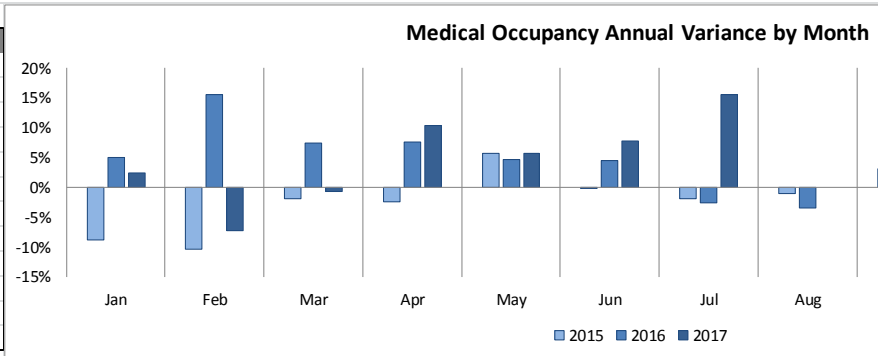
As shown in the table above, the number of acute medical bed days by calendar year for adults occupied at midnight has grown 6.4 percent since 2014. A report run on 24 July 2017 (shown below) demonstrates a significant monthly increase in acute medical bed days in April (10.4 percent), May (5.8 percent), June (7.8 percent), and July (15.6 percent) - placing significant pressure on acute patient flow.

Appendix 4



Medicine by Month

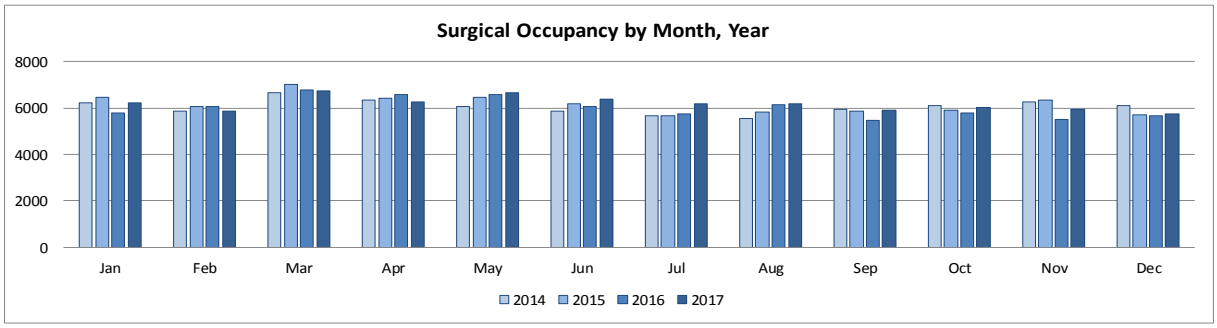
12 Month Variance	2015	2016	2017
Jan	-8.9%	5.1%	2.4%
Feb	-10.4%	15.5%	-7.3%
Mar	-2.0%	7.5%	-0.6%
Apr	-2.4%	7.7%	10.4%
May	5.6%	4.6%	5.8%
Jun	-0.2%	4.4%	7.8%
Jul	-1.9%	-2.6%	15.6%
Aug	-1.0%	-3.5%	
Sep	3.1%	-1.9%	
Oct	-3.5%	6.2%	
Nov	2.1%	5.7%	
Dec	3.9%	3.1%	



Acute Bed Day Demand: Surgical (Middlemore Hospital)

Actual Occupancy to 23 July 2017, Forecast Occupancy From 24 July 2016				
	2014	**2015**	**2016**	**2017**
12 Month Variance		1.7%	-2.4%	2.7%
Occupancy	72,750	74,016	72,246	74,228

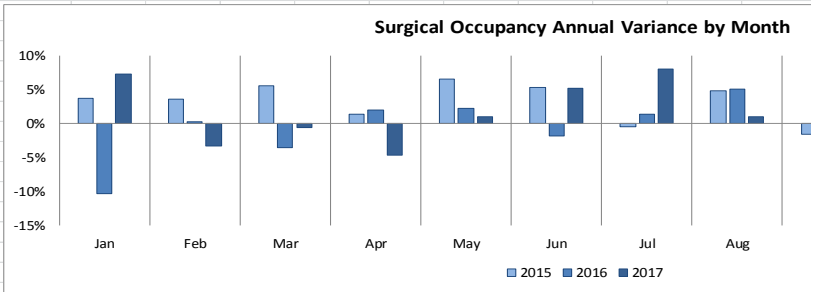
As shown above the Surgical bed day occupancy at Middlemore has grown by 2 percent since 2014. Monthly patterns shown below demonstrate a lot of variation with the greatest occupancy typically seen in March, and then May each year. This year is no exception however with the early winter increase also described in Medicine above, the combined bed demand for April and May has heightened the inpatient bed pressures.



Appendix 4

Surgical Services by Month

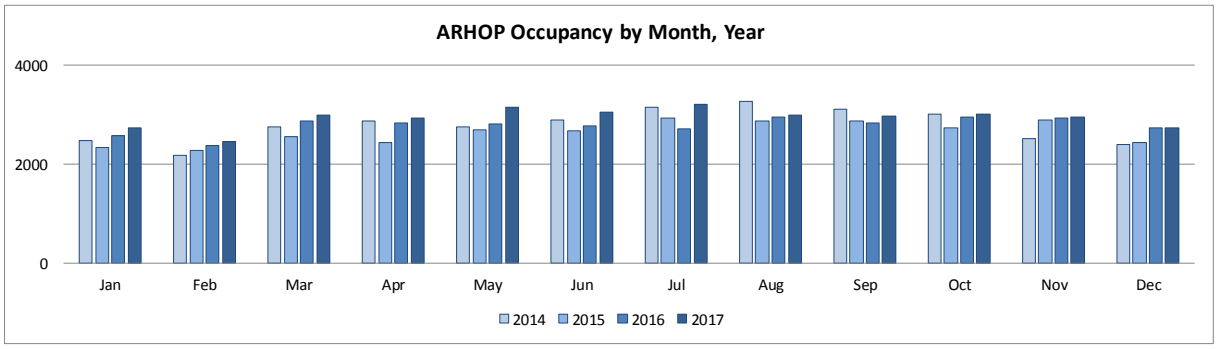
12 Month Variance	2015	2016	2017
Jan	3.8%	-10.4%	7.3%
Feb	3.7%	0.2%	-3.2%
Mar	5.7%	-3.5%	-0.6%
Apr	1.4%	2.0%	-4.7%
May	6.6%	2.2%	1.0%
Jun	5.4%	-1.8%	5.3%
Jul	-0.4%	1.3%	8.1%
Aug	4.9%	5.1%	1.1%
Sep	-1.6%	-6.5%	
Oct	-3.3%	-2.5%	
Nov	1.1%	-13.1%	
Dec	-6.3%	-0.5%	



Acute Bed Day Demand: ARHOP (Middlemore)

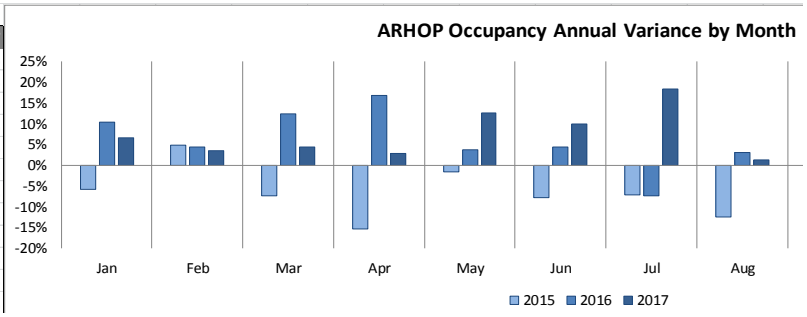
Actual Occupancy to 23 July 2017, Forecast Occupancy From 24 July 2016				
	2014	**2015**	**2016**	**2017**
12 Month Variance		-5.1%	5.4%	5.5%
Occupancy	33,406	31,710	33,415	35,244

As shown above the ARHOP bed day occupancy at Middlemore has increased by 5.5 percent since 2014. Monthly variance shown below demonstrates a significant increase in March, April and May with 20 stroke beds opened in Ward 31 moved from Medicine to ARHOP. Medicine retained the 10-15 stroke beds transferred to ARHOP as additional acute medical beds.



ARHOP Services by Month

12 Month Variance	2015	2016	2017
Jan	-5.8%	10.5%	6.6%
Feb	4.8%	4.5%	3.5%
Mar	-7.4%	12.4%	4.3%
Apr	-15.4%	16.9%	2.9%
May	-1.6%	3.8%	12.5%
Jun	-7.8%	4.3%	9.9%
Jul	-7.2%	-7.5%	18.5%
Aug	-12.6%	3.1%	1.2%
Sep	-8.2%	-1.4%	5.2%
Oct	-8.9%	8.2%	2.1%
Nov	15.1%	2.0%	0.3%
Dec	2.0%	12.4%	-0.4%



Appendix 5: Draft CM Health Investment Logic Map

Workshops have started with key stakeholders to prepare an Investment Logic Map (ILM). It is important that this directly aligns and supports the Northern Region Investment Logic provided in Appendix 3. Two ILM workshops have been held to date and the working draft ILM below will be refined further in the Programme Business Case.