

CMDHB: Health Service Needs and
Labour Force Projections –

Implications of a
**Growing and
Ageing Population**



March 2006



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Preface

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Foreword

Counties Manukau District Health Board (CMDHB) is committed to living within our means in providing a sustainable base of health services that meet the future needs of our population. We are challenged, however, by a number of factors:

- A rapidly ageing population whose growth is far outstripping our ability to provide services to support it; and
- Increasing health needs that are growing more rapidly than our health workforce.

The reality is we need more people in all professions, doing different things, if we are to sustain health service provision in the future. But where do we start? How many more do we need? In which professional groups? Providing what kind of services?

I wish to acknowledge the work of the New Zealand Institute of Economic Research (NZIER) in completing this important analysis projecting – using our local population demographics - patterns of utilisation unique to our population and projecting forward what our likely needs are. We commissioned the report not to get a scientifically precise answer of what our workforce shortage is likely to be. The purpose was to inform the kind of workforce supply we need to generate with our education partners if we are to be responsive to the needs of our local community.

This report is a companion document to a projection series looking at the Pacific Peoples and Maori workforce. It also accompanies our Community, NGO (Non-Government Organisation) and Primary Care Workforce Census. It presents us with a workforce gap that may scare some of us, even shock. However, it will also generate a sense of urgency – we must not “talk” about workforce shortages, it is time to intervene.

CMDHB will always be looking for health professionals to join our team outside the District and even internationally. This is a reality of modern health systems – some part of our health workforce live and work in a global environment. However, there is plenty of opportunity for us to grow the health workforce from our local community – we want people to work in our services who can reflect the communities we serve. This report affirms for us the need to do all of the above.

We hope you reflect on this report as an important information base for future workforce development in the CMDHB area.

A handwritten signature in black ink, appearing to read 'Ron Dunham', with a stylized flourish extending to the right.

Ron Dunham
Acting Chief Executive Officer
Counties Manukau District Health Board

Executive Summary

This report indicates that Counties Manukau District Health Board could face significant shortages of labour in its hospital workforce. The shortages are projected to start emerging within the next year or two. They are projected to worsen steadily until, by 2021, they are equivalent to around 25% of current hospital employment. The projected shortages are not inevitable, but they will require concerted action to develop and nurture the workforce, if they are to be avoided.

Relative to New Zealand as a whole, Counties Manukau has a young, ethnically diverse and rapidly growing population. However, in common with the nation, Counties' population is ageing. Ageing will affect all the main ethnic groups.

Changes in both the size and age structure of the population will drive increases in the need for hospital services. However, because the population is ageing, the need for services will increase roughly twice as much as the size of the population in the period to 2021. Increases in the need for rehabilitation / intermediary care and adult acute medical services will be especially large. Pacific People's need for services will increase significantly more than the need for services in the population as a whole. Growth in the need for services by Maori will also be relatively large.

Under a medium population growth scenario, the demand for CMDHB hospital labour will grow by 52% in the period to 2021. However, under the same population growth scenario, the potential labour supply will grow by just 29%. The projected labour shortage under this scenario will be just over 800 FTEs (equivalent to roughly 1,200 employees, based on current hours of work patterns). Using low population growth or high population growth scenarios does not affect the projected labour shortage significantly.

The statistical modelling in the report is based on a set of relatively simple, but not rigid, assumptions. Where possible, the effects of varying the assumptions on the size of the projected labour shortages are tested. In several cases the effect is not clear, or alternative assumptions are regarded as unsafe. However, in other cases, the effect on projected labour shortages of applying alternative assumptions is to leave the shortages unchanged or to make them worse (i.e. the projected shortages become larger).

In discussing the implications for CMDHB, the report considers the scope for avoiding labour shortages by means of both demand-side and supply-side action. Future increases in the demand for labour could potentially be constrained by reducing the local population's need for services and /or by increasing labour productivity. However, other CMDHB strategic priorities (e.g. increasing quality of, and access to, services) could actually have the effect of magnifying increases in labour demand. Action on the supply-side, combining efforts to improve the recruitment and the retention of hospital staff, appear more likely to be effective in minimising or avoiding labour shortages.

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1. Introduction

1.1 Background

This report is one in set of four, prepared by the New Zealand Institute of Economic Research (NZIER) for the Counties Manukau District Health Board (CMDHB). The aim of the report is to help CMDHB to consider the future health service needs of a growing and ageing population; and the consequent implications for hospital workforce development.

The set of reports is entitled **Counties Manukau Health Service Needs and Labour Force Projections**. The four reports within the set are:

1. **Implications of a Growing and Ageing Population** (this report).
2. **Implications for the Development of the Pacific People's Workforce.**
3. **Implications for the Development of the Maori Workforce.**
4. **Statistical Modelling Report.**

The first three reports listed above are all relatively succinct, strategy-focused documents. The fourth report is a background document, which contains the statistical details that underpin the other reports.

In this report the focus is largely, but not exclusively, on the Counties Manukau population as a whole. There are some references to different ethnic groups within the population, and how their respective health service needs vary. However, greater detail about the main ethnic groups within the population are included in the Statistical Modelling Report. And, as noted above, there are also separate reports focusing on Pacific Peoples and Maori.

It should be emphasised that the health service needs and labour force projections examined in this report refer to hospital service needs and the hospital workforce. CMDHB is currently enhancing its knowledge of the primary and community health service needs of its population. For example, CMDHB has recently undertaken large scale survey work to gain better understanding of the characteristics of the community workforce and its development needs.

1.2 Methodology

Our methodology for producing the estimates and projections included in this report is detailed in the Statistical Modelling Report. However, in brief and expressed simply, we took the following steps to project future hospital

service needs and to highlight any potential labour shortage problems future service needs might imply:

1. Current service provision, as represented by the number of inpatient and outpatient discharges is assumed to represent current service needs.
2. Using different population growth scenarios, service needs are projected into the future by applying current age, sex and ethnic group discharge rates to the different future populations implied by the growth scenarios.
3. Demand for hospital labour is projected into the future by assuming that current staffing patterns change directly in line with service needs.
4. The supply of hospital labour is projected into the future by assuming that the share of Counties Manukau's working age population that is accounted for by the hospital workforce remains constant.
5. Projected demand for hospital labour is compared with projected labour supply to examine whether and to what extent there will be labour shortages under the different population growth scenarios.

We recognise that the assumptions underlying these steps might be challenged as being unrealistic. However, they are not rigid and they can be varied. The purposes of varying the assumptions are to enable alternative views of the hospital labour market to be considered, and to answer a number of "what if?" questions. For example, we can show what happens to the projected balance between the demand for and supply of hospital labour when we make alternative assumptions about the catchment area from which CMDHB will recruit staff. Indeed, we do this in section 8 of this report.

The structure of the report broadly reflects the five steps above, but we conclude with a brief discussion of the challenges that CMDHB may need to tackle in order to ensure that the future hospital workforce is able to serve the needs of the local population.

1.3 About this report

This report is about projecting the magnitude of staffing problems CMDHB could face, if it does not take concerted action to avoid them. It does not contain forecasts, as such. The purpose of presenting the projections is to provide a stimulus for thinking about what priorities and initiatives could be part of a strategy to ensure that CMDHB has the workforce that will be required to serve the growing and changing needs of its community. In discussing some of the options for action at the end of the report, we acknowledge that CMDHB has already taken some important steps in this direction.

2. The Counties Manukau population

The primary drivers of need for health services in the Counties Manukau area are the size, age structure and ethnic composition of the population, and how these are changing over time. In this section we, therefore, consider the current and future populations that require, and will require, hospital services from the CMDHB.

The structure and composition of the population, as well as its size, are important because each age/sex/ethnic sub-group has its own characteristic service needs. For example, the service needs of young, female Maori are quite different from the needs of middle-aged, male Pakeha. We know, from the CMDHB's Transition database, the current service needs of the various age/sex/ethnic sub-groups in the population. So, if we can project the size, structure and composition of the population into the future, we will be able to project likely future services needs in some detail.

2.1 The current population

The 2001 Census of Population is the most up-to-date official, non-estimated source of detailed breakdowns of specific populations by characteristics such as age/sex/ethnicity.

The Counties Manukau area had the population shown in Table 1 in 2001. The comparison data for New Zealand as a whole emphasise the ethnic diversity of the area: in particular, Counties Manukau has a significantly lower proportion of Europeans and a significantly higher proportion of Pacific Peoples. It should be noted that the ethnic categorisation used in the Census is a subjective one i.e. it seeks the respondents' perception of their ethnicity, rather than necessarily being based on strict genealogical conditions.

Figure 1 compares the age distribution of the Counties Manukau population to that of the total New Zealand population. Whereas Table 1 showed that the area has an ethnically diverse population, this shows that the area also has a relatively young population. Those aged under 20 account for nearly 38% of the population in the Counties Manukau area, but only 30% for New Zealand as a whole. Conversely, the area has a lower proportion of people aged 35+ and a markedly lower proportion of people aged 60+.

Table 1 Counties Manukau population by ethnic group

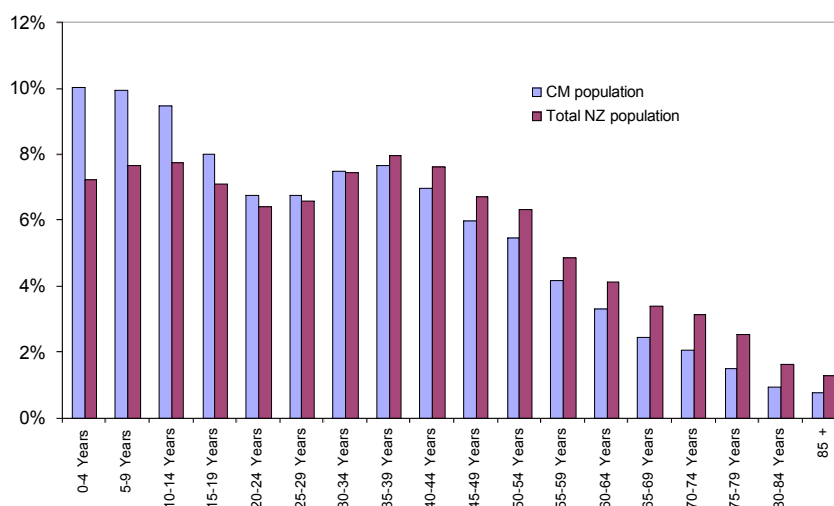
Census 2001

	Number	Proportion (%)	Corresponding proportion: all NZ (%)
Asian (including Indian)	45,189	11	7
European (including other ethnic groups n.e.c.)	211,743	54	71
Māori	61,386	16	15
Pacific Peoples	76,899	20	7
Total	395,217	100	100

Source: Statistics New Zealand

Figure 1 Counties Manukau population by age group compared to total New Zealand population

Census 2001



Source: Statistics New Zealand

Within Counties Manukau the balance between males and females for those aged under 20 years of age is very even. Above this age, the balance shifts towards more females than males – a difference which narrows towards the 60 – 64 year age group, then spreads again noticeably towards the 85+ age group. The number of females aged over 75 years in Counties Manukau significantly exceeds the number of similarly aged males – a difference of nearly 3,000 people. (Further details are included in the Statistical Modelling Report).

The age structures of the different ethnic groups are noticeably different. Māori and Pacific People’s age distributions are skewed heavily toward the younger age groups, particularly those aged under 15 years. By contrast, the

European and Asian populations both have a pronounced 'bulge' in the age distribution around 30 – 50 years.

Since 2001, the population of the Counties Manukau area has grown by approximately 8% (or 2.7% p.a.) to reach a total of over 426,000 by 2004. By comparison, the national population grew by approximately 4.6% (or 1.5% p.a.) during the same period. The rate of growth in the Counties Manukau population is approaching twice the rate of growth in the national population.

2.2 The projected population

The population projections we present here are essentially the same as those used by CMDHB staff in modelling future hospital bed demand.

2.2.1 Key features of the population projections

Table 2 provides a summary of the Statistics New Zealand medium population projections for the Counties Manukau area by ethnic group and aggregated age group. The table indicates that the Pacific Peoples and Asian populations will grow relatively rapidly, the Maori population will grow moderately and the European population will decline slowly.

However, the most striking features of the table are that, **in each ethnic group**:

- the proportion (although not necessarily the absolute number) of people aged 0-14 is projected to decline;
- the proportion (and the absolute number) of people aged 65+ is projected to increase; and
- the median age is projected to increase.

In other words, although we noted earlier that Counties Manukau has a relatively young population, the population is, nonetheless, expected to age.

In the Statistical Modelling Report, we explain in detail the assumptions underlying the population estimates we have used, as well as the caveats that apply to them. In particular, we explain how we projected to 2021, using official population projections that go out only as far as 2016. We also show how we have taken account of the likely effects of the planned Flatbush development.

Table 2 Counties Manukau population projections by ethnicity and broad age group

Medium projection – 2001 and 2016.

	Ethnic group population	Absolute change	Average annual % change	Age group distribution (%)			Median age (years)
				0-14	15-64	65+	
	European						
2001	226,500	-	-	23.2	64.8	12.0	35.7
2016	218,700	-7,800	-0.2	18.1	62.3	19.6	43.1
	Pacific Peoples						
2001	87,500	-	-	39.4	57.2	3.4	20.9
2016	131,300	43,800	3.0	34.0	60.6	5.4	23.1
	Maori						
2001	69,200	-	-	38.5	59.2	2.4	21.4
2016	87,800	18,600	1.5	33.4	61.8	4.8	23.7
	Asian						
2001	51,000	-	-	25.1	70.3	4.6	29.4
2016	107,000	56,000	5.0	21.8	70.5	7.8	33.2

Source: Statistics New Zealand

3. Current hospital service needs

In this section we describe and examine current hospital service provision. For modelling purposes, we assume that current provision of services is the same as current need for services. They might, in reality, be different, but it would be difficult to measure “real” need because some needs are likely to be suppressed or disguised.

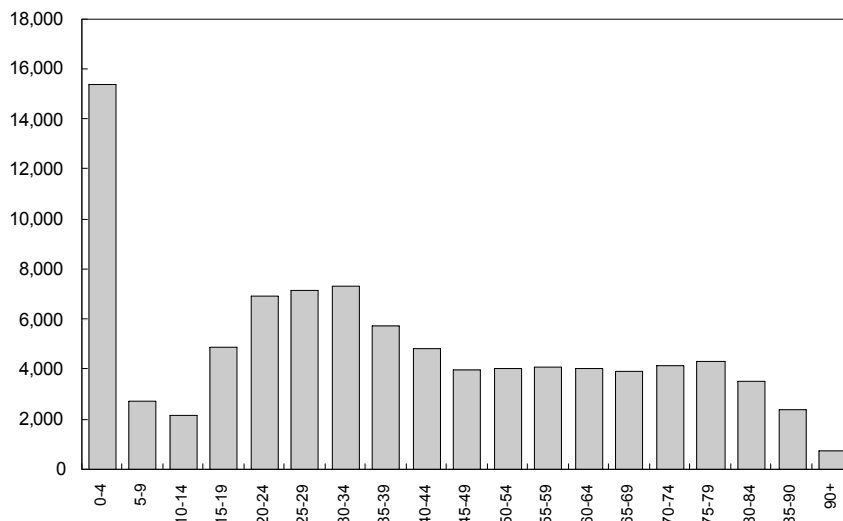
3.1 Analysis of hospital discharges

3.1.1 Inpatients

Figure 2 is a simple disaggregation of CMDHB inpatient discharges by age group in the year to the end of February 2005. It is of interest as it highlights the significant amount of discharges which relate to infants and children aged under 5 – nearly 17% of all discharges. There is another significant contribution to total inpatient discharges by those aged between 20 – 34 years old. For age groups above this, the distribution of discharges is relatively even, although there is a tailing off in the 80+ age groups.

Figure 2 CMDHB inpatient discharges by age group

Year ended 28/02/05



Source: CMDHB – Transition database

The breakdown of inpatient discharges by ethnic group is shown in Table 3. For the purposes of comparison, the table also includes the ethnic breakdown of the local population (taken from Table 1). The comparison indicates that the two distributions are slightly different. Relative to their share of the local population, patients of European origin are slightly under-represented and patients of Pacific Island origin are over-represented.

Females outnumber males in all the ethnic groups shown. The differential is particularly prominent for the Indian ethnic group, with the number of

female inpatient discharges being 67% greater than for Indian males. The difference is also greater than 50% for Asians and Maori. Female discharges for European inpatients are only 21% higher than European male discharges. In aggregate, the number of discharges for female inpatients is 37% larger than the number for males.

Table 3 CMDHB inpatient discharges by ethnic group Year ended 28/02/05

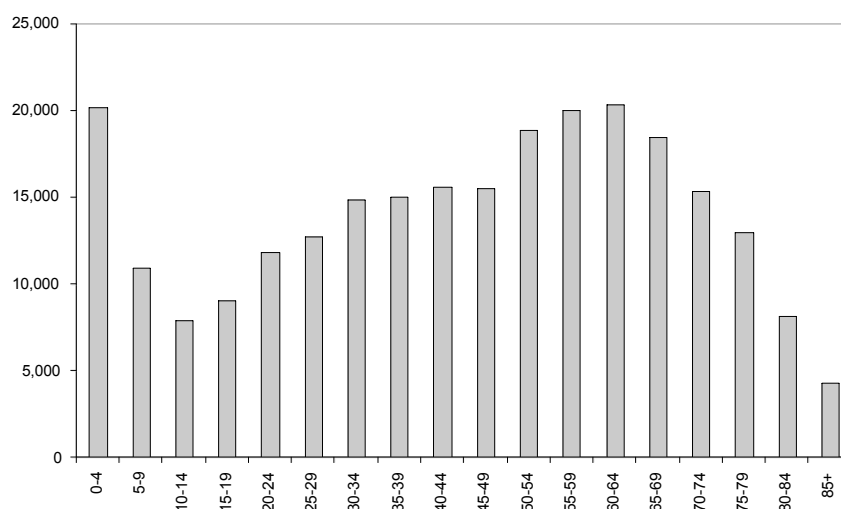
Ethnic group	Number of inpatient discharges	Proportion of total inpatient discharges, %	Proportion of local population, %
Asian (including Indian)	8,136	9	10
European (including other ethnic groups n.e.c.)	43,284	47	54
Maori	16,599	18	16
Pacific Islander	23,281	25	20
Unknown	1,235	1	-
Total	92,535	100	100

Source: CMDHB – Transition database

3.1.2 Outpatients

Figure 3 shows the distribution of outpatient discharges by age group. As with the inpatient discharges, there are a significant number of discharges related to those aged under 5 – around 9% of all outpatient discharges. In contrast to the inpatient discharges though, there is a pronounced peak related to those aged between 50 and 75 years. Correspondingly, there is an absence of a peak in discharges in the 20-40 year old age group.

Figure 3 CMDHB outpatient discharges by age group (Y/e 28/02/05)



Source: CMDHB – Transition database

The distribution of outpatient numbers by ethnic group is shown in Table 4. This indicates that the distribution is almost identical to the ethnic distribution of the local population.

Table 4 CMDHB outpatient discharges by ethnic group

Year ended 28/02/05

Ethnic group	Number of inpatient discharges	Proportion of total outpatient discharges, %	Proportion of local population, %
Asian (including Indian)	25,178	10	10
European (including other ethnic groups n.e.c.)	134,410	53	54
Maori	39,039	15	16
Pacific Islander	53,940	21	20
Total	252,567	100	100

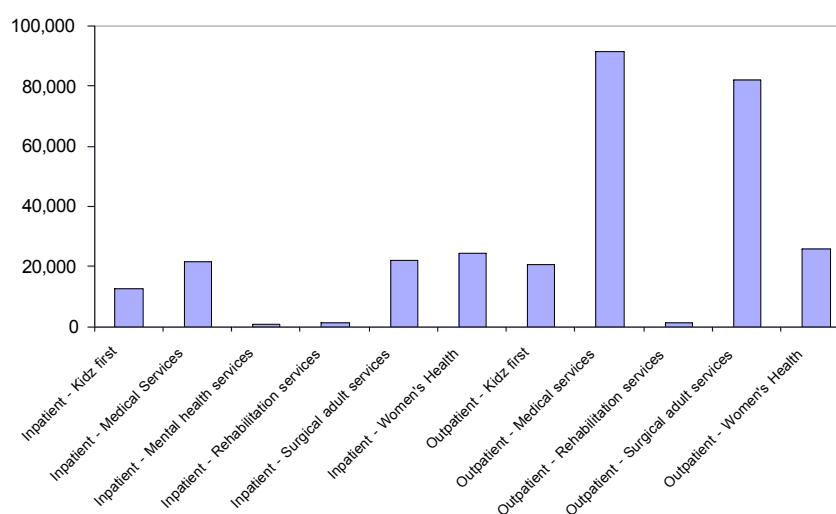
Source: CMDHB – Transition database

3.2 Analysis by service area

Current discharge rates across the different hospital service areas, broken down by age group, sex and ethnic group, are used in conjunction with projections of the future population as the basis for projecting future health service needs later in this report. In this section we describe what the pattern of discharges by service area currently look like.

Figure 4 CMDHB discharges by service area

Year ended 28/02/05

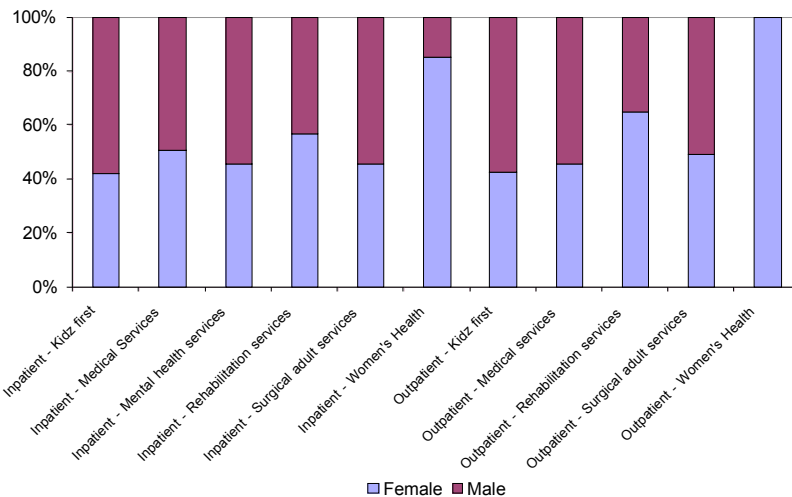


Source: CMDHB – Transition database

Figure 4 shows the number of discharges across the various service areas, identifying inpatients and outpatients separately. Clearly, Outpatient Medical services are the largest contributor to the total number of discharges, contributing nearly 30%. Discharges related to Outpatient Surgical Adult services also contribute significantly to the total - nearly 27%. The remaining 43% of discharges are spread across 9 other inpatient and outpatient service areas.

In terms of the breakdown of discharges by sex, males outnumber females in six out of eleven service areas (see Figure 5), but females outnumber males in terms of their overall contribution to the number of discharges. In terms of both inpatient and outpatient discharges, there are many more males than females in the 'Kidz First' service area, as well as in inpatient mental health, inpatient adult surgical services and outpatient medical services.

Figure 5 CMDHB discharges by service area and gender
Year ended 28/02/05



Source: CMDHB – Transition database

The Statistical Modelling Report details the distribution of discharges across the different service areas, by age and ethnic group.

3.3 Analysis by MDC

It should be noted that the analysis in this sub-section only relates to inpatient discharges. Outpatient discharges are not classified by MDC. This limits the value of analysis by MDC because, in the year to February 2005, inpatients accounted for only around 28% of total patient discharges.

Table 5 shows the discharges by aggregated age groups for the 10 most common MDCs (in terms of number of discharges). These 10 MDC accounted for just under 80% of all discharges for the period.

As would be expected, discharges related to pregnancy and childbirth are dominated by people in their late 20s / early 30s. And, reflecting the relative youth of this ethnic group, Pacific Peoples account for a large share of discharges. The dominance in the youngest age group for the newborn & other neonates MDC (15) is also precisely as would be expected. Diseases of the respiratory system and diseases of the ear, nose and throat peak in the early years. Whilst the incidence of most of the other diseases shown peaks in the middle years (30-64).

Table 5 Counties Manukau DHB inpatient discharges by age group for 10 most common MDC (in terms of number of discharges)

Year ended 28/02/05

MDC	Code	0 - 14	15 - 29	30 - 64	65 +	Total
Pregnancy & childbirth	14	11	6,878	4,718	0	11,607
Disease /musc/skltl syst	08	1,854	2,118	4,189	2,500	10,661
Disease /digestive syst	06	967	1,284	3,933	2,381	8,565
Newborn due to perinatal	15	7,737	0	1	0	7,738
Disease /circulatory syst	05	113	295	3,670	3,461	7,539
Disease /respiratory sy	04	2,782	481	2,029	2,011	7,303
Disease /skin & subc tiss	09	753	810	2,370	1,820	5,753
Disease /ear nose &throat	03	2,512	841	1,086	381	4,820
Disease /nervous system	01	700	699	1,843	1,248	4,490
No Code	0	273	2,396	1,626	69	4,364

Source: CMDHB – Transition database

4. Projected need for hospital services

4.1 Introduction

We now turn our attention to projections of future need for hospital services. As noted earlier, the projections, or need scenarios, are produced by applying current age/sex/ethnic group-specific hospital discharge rates to 3 population projections produced by Statistics New Zealand:

1. **Lower bound scenario** – Low population growth (including an allowance for the Flatbush development), with current age-, sex- and ethnic group-specific discharge rates assumed to continue.
2. **Middle ground scenario** – Medium population growth (including an allowance for the Flatbush development), with current age-, sex- and ethnic group-specific discharge rates assumed to continue.
3. **Higher bound scenario** – High population growth (including an allowance for the Flatbush development), with current age-, sex- and ethnic group-specific discharge rates assumed to continue.

The scenarios are expressed both in terms of need broken down by service area, and need broken down by MDC. Readers are reminded that more detailed results can be found in the Statistical Modelling Report.

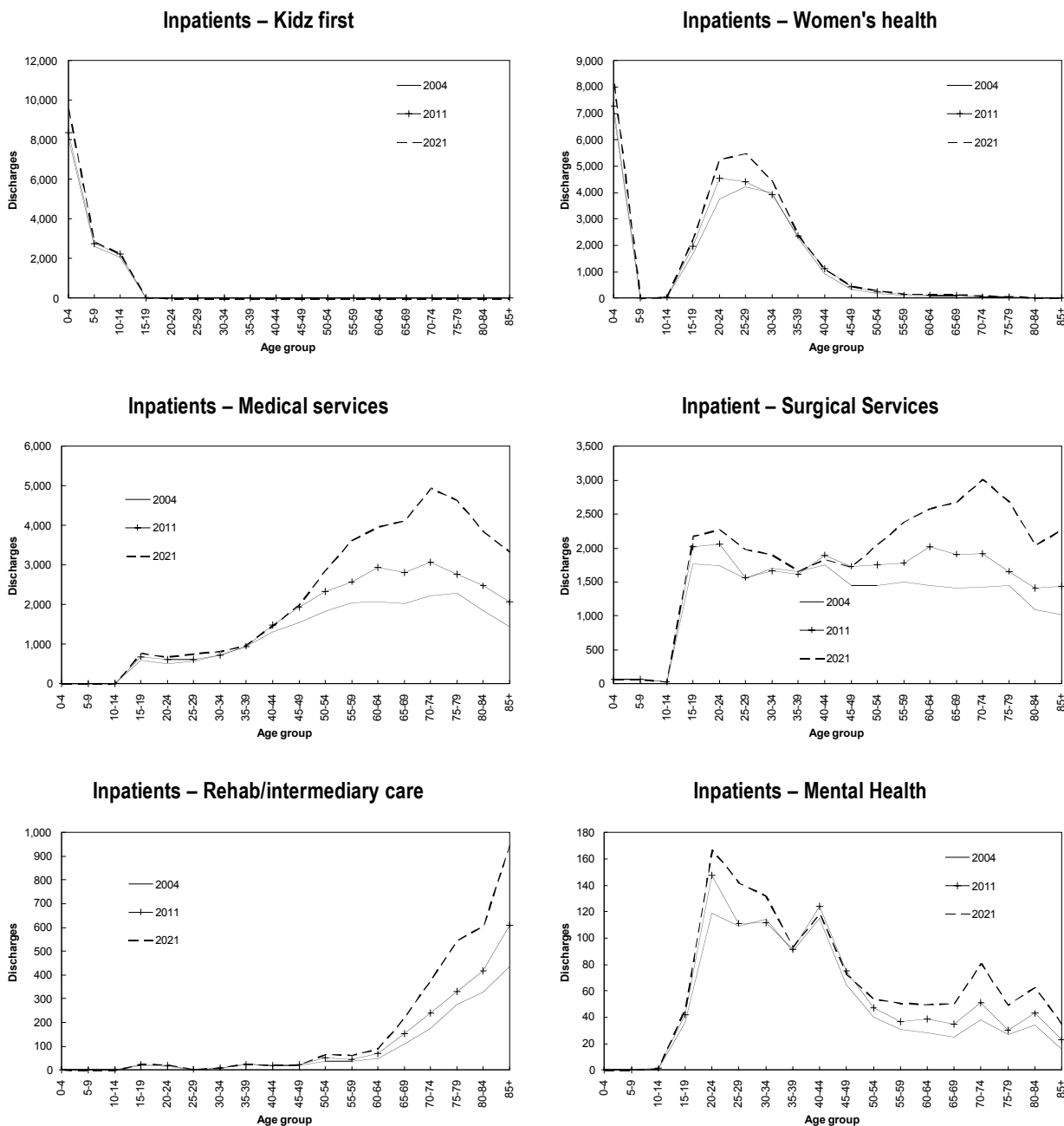
4.2 Analysis by service area

Using the approach outlined above, we are able to project need by service area. Figure 6 and Figure 7 indicate, based on the middle ground scenario, how need for each of the service areas is assumed to change over time. In each chart, a separate line for 2004, 2011 and 2021 is shown to indicate how the pattern and absolute level of need broken down by age group changes over time for each service area.

The area under each line represents the need for the services shown. In general, the age-related peaks in need that exist in 2004 (the base year) are typically accentuated by the population growth and ageing over time. This is particularly the case for service areas where a large proportion of the need relates to those aged over 65 years of age. The higher peaks in the respective charts for inpatient and outpatient medical and surgical services show clearly how needs increase sharply as the populations grows and ages at the same time.

Figure 6 Projections of need (inpatient discharges) by service area – middle ground scenario

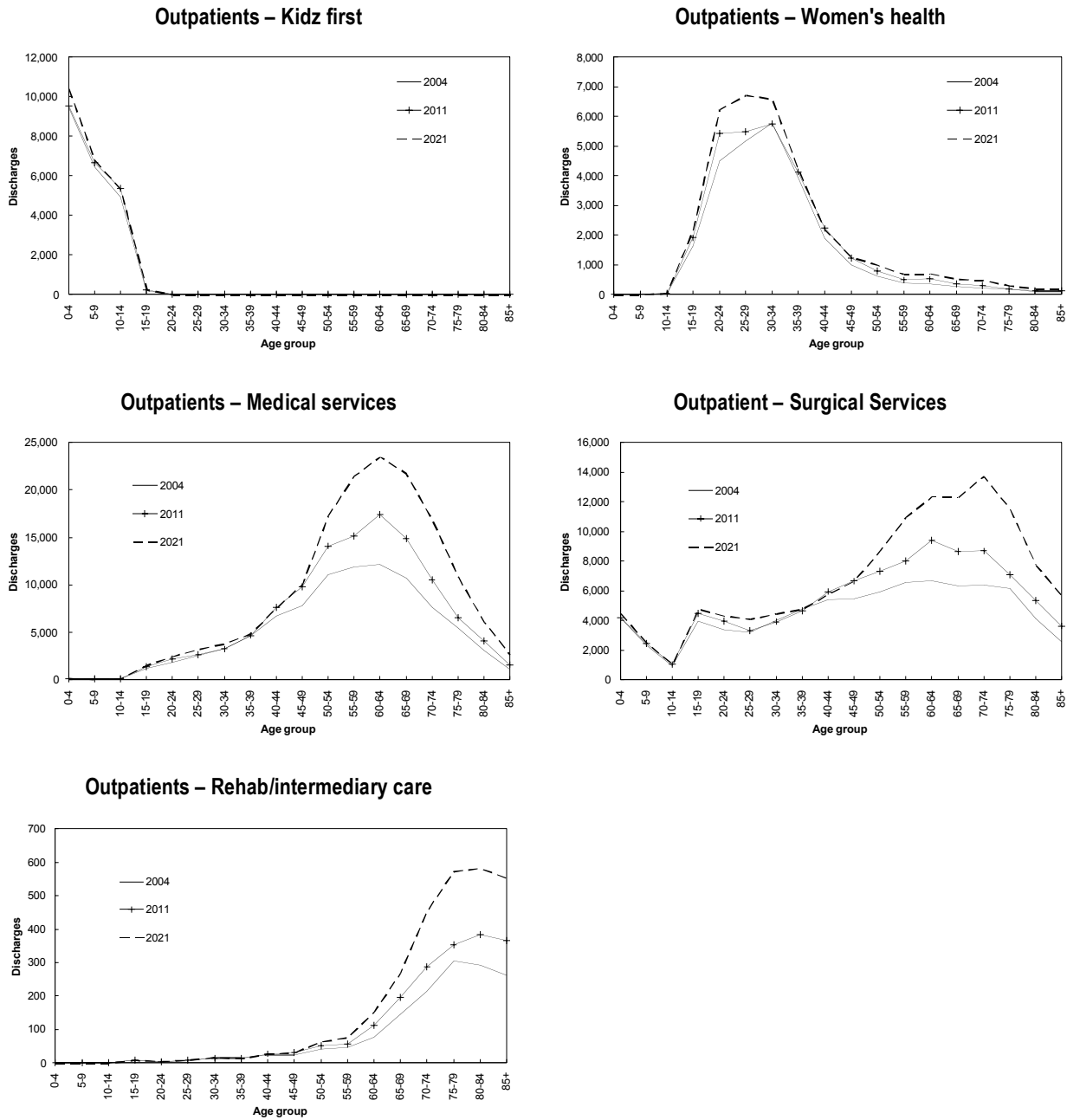
Medium population scenario (Flatbush included) – current incidence.



Source: Statistics New Zealand, CMDHB, NZIER

Figure 7 Projections of need (outpatient discharges) by service area – middle ground scenario

Medium population scenario (Flatbush included) – current incidence.



Source: Statistics New Zealand, CMDHB, NZIER

Table 6 summarises the projections by service area under the middle ground scenario, but unlike the charts above, it combines the numbers of inpatient and outpatient discharges. The table also includes indices of need for different services, with 2004 set to 100. The indices allow easy comparison of growth without reference to the absolute size of a particular group.

The projected need for the rehabilitation/intermediary care service area exhibits the strongest growth: nearly doubling over the 2004 – 2021 period,

albeit from a low base. Growth in need for the acute adult medicine service area is also strong over time, increasing by 70% from its 2004 base. Surgical services is the other area which exhibits more rapid growth than the total for all services combined.

Overall, need is projected here to increase by 50% between 2004 and 2021. By comparison, the population of Counties Manukau is projected to grow by 26%, during the same period. The difference between the growth in need and the growth in population is primarily attributable to changes in the age structure of the population, as described in section 2.

Table 6 Summary of need by service area (inpatients and outpatients) – middle ground scenario (Medium population projection, Flatbush included)

	Number of discharges		Index of need (2004=100)	
	2004	2021	2004	2021
Adult acute medicine	113,647	193,289	100	170
Rehabilitation / Intermediary care	3,037	5,893	100	194
Kidz first	33,705	37,412	100	111
Mental health	888	1,206	100	136
Surgical services	104,891	159,406	100	152
Women's health	50,989	64,024	100	126
TOTAL	307,157	461,230	100	150

Source: Statistics New Zealand, CMDHB, NZIER

Table 7 presents the same need by service area projections, but this time for the lower and upper bound scenarios (i.e. low population growth and high population growth) in index form (2004 = 100).

Under the lower bound scenario the rehabilitation/intermediary care service area is still the strongest in terms of need growth to 2021, increasing by over 80%. The largest service area in terms of absolute levels of need (acute adult medicine) is estimated to grow by around 60% in the 17 years to 2021. In total need as modelled by service area under this lower bound scenario grows by nearly 40% to 2021.

Under the upper bound scenario, total need as modelled by service area increases by around 62% to 2021, with the largest service area more than doubling.

**Table 7 Summary of need by service area (inpatients and outpatients)
– lower bound and upper bound scenarios in index form (2004 = 100)**

	LOWER BOUND SCENARIO		UPPER BOUND SCENARIO	
	2004	2021	2004	2021
Adult acute medicine	100	160	100	180
Rehabilitation / Intermediary care	100	183	100	205
Kidz first	100	96	100	127
Mental health	100	125	100	147
Surgical services	100	142	100	163
Women's health	100	113	100	139
TOTAL	100	139	100	162

Source: Statistics New Zealand, CMDHB, NZIER

4.2.1 Pacific Peoples and Māori – analysis by service area

The Statistical Modelling Report includes projections of need for services separately for Pacific Peoples and for Maori. However, in brief, under the middle ground scenario, Pacific People's need for all services combined is projected to increase to an index level of 174 by 2021 (compared to an index level of 150 for the population as a whole). Their need for rehabilitation / intermediary care services is projected to grow to an index level of 238 (i.e. to considerably more than double), and their need for adult acute medical services is projected to grow to an index level of 203.

Under the same scenario, the need for services amongst Maori is projected to grow to an index level of 162 by 2021, with their need for rehabilitation / intermediary care services projected to grow to an index level of 205. In other words, the need for services amongst Maori is also expected to grow more rapidly than the population as a whole, but not as rapidly as amongst Pacific Peoples.

4.3 Analysis by MDC

The Statistical Modelling Report also includes projections of need according to MDC. However, compared to the projections of need by service area, they are of restricted value in terms of the labour demand and supply modelling which follows because all of the workforce data used (i.e. from the CMDHB hospital workforce census) classifies staff according to the hospital service they work in, rather than according to the MDCs they treat.

5. The demand for labour

In this section we initially examine the current level of demand for labour, which we assume to be equivalent to the base year workforce identified in the CMDHB hospital workforce census. We then examine how this base level of labour demand changes given the projected changes in need for hospital services presented in section 4.

5.1 Existing demand

At the time of the CMDHB hospital workforce census there were 3,514 FTE staff, although the “head count” number of employees was 5,236.

Table 8 below indicates the distribution of the 3,514 FTE staff by occupational group. Nursing staff account for nearly half of the total number of FTEs. And nursing and medical staff combined account for nearly two-thirds of all FTEs.

Table 8 CMDHB full-time equivalent staff by occupational group

Occupational group	Number	Proportion (%)
Medical Personnel	576	16
Nursing personnel	1,686	48
Allied health personnel	502	14
Support personnel	86	2
Management/admin	664	19
Total	3,514	100

Source: CMDHB – survey of CMDHB workforce

Table 9 shows the distribution of the same total FTE staff numbers in terms of their primary ethnicity. Staff representing just over a fifth of the total FTE numbers did not provide an ethnic group identification in the hospital workforce census. However, amongst those who did, New Zealand Europeans accounted for just over half of the total number of FTEs. The Asian ethnic group was the next largest contributor, followed by the Other grouping. Collectively, Māori and Pacific Peoples contributed just 16% to total FTE numbers.

The table also shows the ethnic breakdown of the local population. However, we emphasise that the percentages in the final two columns of the table are not strictly comparable because ‘other’ ethnicities were identified separately in the hospital workforce census, but included with Europeans in the summary 2001 census tables. It is also possible that ‘other’ tended to mean one thing in the 2001 census (e.g. African or American), but another

in the hospital workforce census (e.g. mixed ethnicities). Nonetheless, the tables does seem to suggest that both Maori and Pacific Peoples are significantly under-represented in the hospital workforce, relative to their shares of the local population.

Table 9 CMDHB full-time equivalent staff by ethnic group

Ethnic group	Number	Proportion of those who disclosed an ethnicity, % (Hospital workforce census)	Proportion of local population, % (2001 Census)
Not disclosed	749	n/a	-
NZ European	1,454	53	54
Asian	501	18	11
Other	372	13	-
Pacific	249	9	20
Māori	190	7	16
Total	3,514	100	100

Note: The proportions in the last two columns in the table are not strictly comparable – see text

Source: CMDHB – survey of CMDHB workforce, Statistics New Zealand

Table 10 CMDHB full-time equivalent staff by service area and occupational group

Service Area	Medical Personnel	Nursing personnel	Allied health personnel	Support personnel	Management /admin	Total
Medical services	170	453	33	1	72	729
Int. care/rehabilitation	10	172	41	0	39	263
Kidz first	42	155	27	9	31	264
Mental health	61	202	90	4	61	417
Surgical services	202	374	35	0	78	689
Women's health	32	176	0	1	31	241
Supporting services	58	154	276	71	352	911
Total	576	1,686	502	86	664	3,514

Source: CMDHB – survey of CMDHB workforce

Table 10 presents a cross tabulation of occupational group and service area data, showing the distribution of the total FTE staff numbers. Note that no distinction is made between inpatients and outpatients because staff do not necessarily treat one or other group exclusively. The largest single contributor to total FTE numbers is nursing personnel employed in medical services, although in total across all occupations the medical services

category employs fewer FTE's than the largest service area: – supporting services. Management/administrative staff in this service area are also a significant individual contributor to total FTE numbers. Surgical services is another service area with a significant number of FTE's, with nurses being a relatively large contributor. In fact nursing personnel account for more than half of FTEs in all services areas, apart from mental health and supporting services.

5.2 Projected demand for labour

5.2.1 Projected demand by service area

The indices of projected need by service area summarised in section 4 were applied to the existing labour demand by CMDHB (i.e. the 3,514 FTEs) to produce the projections of future demand for labour. The index for each service area is assumed to apply equally across all occupational groups. For the supporting services group, a composite index of demand is created, using a weighted average of the indices for all service areas. This is done because no service need is specifically attributed to this service area.

Table 11 indicates the indices of labour demand at 2021 for each of the 3 main scenarios. In line with the projected need for services, the index for the middle ground scenario shows growth in total labour demand growth of 50%.

Table 11 Indices of demand for CMDHB full-time equivalent staff by service area – 2021 for all 3 scenarios

Service Area	Base index (2004 = 100)	Lower bound scenario (index at 2021)	Middle ground scenario (index at 2021)	Upper bound scenario (index at 2021)
Medical services	100	160	170	180
Int. care/rehabilitation	100	183	194	205
Kidz first	100	96	111	127
Mental health	100	125	136	147
Surgical services	100	142	152	163
Women's health	100	113	126	139
Supporting services	100	143	153	164
Total	100	139	150	162

Source: CMDHB, NZIER, Statistics New Zealand

Table 12 translates this into the demand for actual workers for the middle ground scenario. It shows the potential demand for workers in 2021 for the

middle ground scenario, and can be compared to the current level of demand shown in Table 10.

The results show a significant increase in the size of demand for labour across a number of service areas for this middle ground scenario in 2021. In total, demand has grown from the 3,514 total FTE in 2004 to over 5,353 FTE in 2021 for this scenario. Given the strong increase in need for the intermediary care/rehabilitation service area, demand for these workers increases from only around 260 workers in 2004 to over 500 in 2021.

Table 12 Projected demand for CMDHB full-time equivalent staff by service area and occupational group – 2021 middle ground scenario

Service Area	Medical Personnel	Nursing personnel	Allied health personnel	Support personnel	Management /admin	Total
Medical services	289	770	56	2	122	1,239
Int. care/rehabilitation	20	334	80	0	76	510
Kidz first	47	172	30	10	34	293
Mental health	82	275	122	5	83	567
Surgical services	307	568	53	0	119	1,048
Women's health	41	221	0	1	39	302
Supporting services	88	235	423	109	539	1,394
Total	875	2,575	764	127	1,012	5,353

Source: CMDHB, NZIER, Statistics New Zealand

For the lower and upper bound scenarios projected total labour demand in 2021 is 4,972 FTEs and 5,748 FTEs, respectively, compared to the 5,353 for the middle ground scenario.

Again, readers should refer to the Statistical Modelling Report for details of projected demand for labour broken down by ethnic group and MDC.

6. The supply of labour

We now produce estimates of the supply of labour under the same three population scenarios as have been used to project service need and demand for labour. To do this, we assume that the existing demand for labour (the current FTE workforce identified earlier – i.e. 3,514 FTE staff) is the same as the supply of labour in the base year (i.e. we assume that there were no labour shortages at the start of the modelling period in 2004). We then use estimates of growth in population to 'grow' this base supply of workers. To create indices of labour supply, we calculate the share of the Counties Manukau area working age population that the hospital workforce accounted for in 2004 and then assume that this proportion will remain constant over time. As the population of working age grows over time (at different rates under the three scenarios) the index of labour supply changes. The index is then applied to the base workforce.

Again, we recognise that the key assumption here (i.e. that the hospital workforce will remain a constant proportion of the Counties Manukau working age population) could easily be challenged as unrealistic. However, we do not present the assumption as rigid, and we show later the effect of varying it.

6.1 Projected labour supply – service area modelling

Table 13 shows the indices of labour supply under each of the three main scenarios. The variation in population – the key driver, clearly impacts on the growth in the supply index. Under the middle ground scenario, we expect the supply of workers to increase by nearly 30% in 2021.

Table 13 Indices of supply of CMDHB full-time equivalent staff by service area –for all 3 scenarios

	Lower bound scenario	Middle ground scenario	Upper bound scenario
2004	100	100	100
2021	118	129	141

Source: CMDHB, NZIER, Statistics New Zealand

Table 14 translates this into the supply of workers for the middle ground scenario. It can be compared to the current supply of workers shown in Table 10 (remembering that, for the base year 2004, it is assumed that demand for labour and supply of labour are in balance).

It should be noted again that the indices shown in Table 13 are applied equally across all service areas and occupational groups because the index relates to growth in the total Counties Manukau working age population.

This means that for each year, the growth rate of each service area/occupational group combination should be the same. Under the middle ground scenario shown in Table 14, the total labour supply increases from 3,514 FTEs in 2004 to 4,547 FTEs in 2021, i.e. by 29%.

Table 14 Projected supply of CMDHB full-time equivalent staff by service area and occupational group – 2021 middle ground scenario

Service Area	Medical Personnel	Nursing personnel	Allied health personnel	Support personnel	Management /admin	Total
Medical services	220	586	43	2	93	943
Int. care/rehabilitation	13	223	54	0	51	340
Kidz first	55	201	35	12	40	342
Mental health	79	262	116	5	79	540
Surgical services	262	484	45	0	101	892
Women's health	42	228	0	1	40	311
Supporting services	75	199	358	92	456	1,179
Total	745	2,181	650	111	859	4,547

Source: CMDHB, NZIER, Statistics New Zealand

Because of the use of the common index across service areas/occupational groups for a particular year, the distribution of workers will not change for different scenarios. What does change though, is the absolute size of each service area/occupational group in terms of FTE workers. Under the lower bound scenario, the total number of FTE workers reaches 4,156 by 2021 (an increase of 18%). Under the upper bound scenario, the labour supply reaches 4,953 by 2021 (an increase of 41%).

6.2 Projected labour supply – MDC modelling

Given that the same supply of workers is used for the service area and MDC modelling, and that the indices of supply relate to growth in the size of the working age population in Counties Manukau (and are used across occupational groups and service areas within a particular year) there is no difference between the service area modelling estimates of supply and the MDC estimates of supply.

7. The supply / demand balance

Now that we have projections of both the demand for and supply of labour under different scenarios, we can examine whether and to what extent CMDHB may face labour shortages in the hospital workforce.

7.1 Modelling by service area

Figure 8 indicates graphically the balance between labour demand and supply under the three main scenarios; and it suggests that there will be a similar outcome under all three. Labour shortages start to emerge after 2006 and become progressively larger over time.

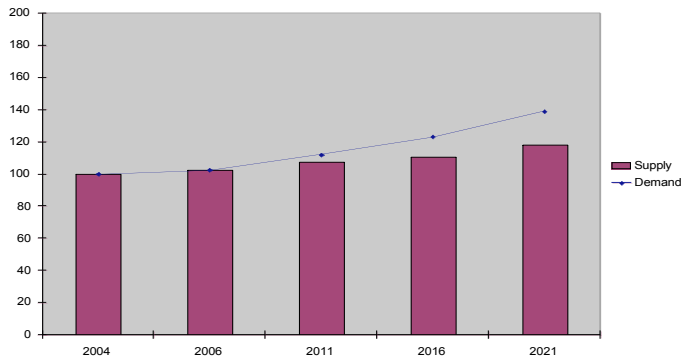
Interestingly, in terms of the size of the shortages, there are no significant differences between the scenarios. This is because, the larger the Counties Manukau population growth, the larger the will be need for services and the larger will be the demand for hospital labour by CMDHB. But, at the same time, the larger the population growth overall, the larger will be the population of working age and, hence, the supply of labour.

In terms of absolute differences between labour demand and labour supply, by 2021 there is a consistent shortage of labour of around 800 FTE across all 3 scenarios. This is equivalent to approximately 23% of the base year number of FTEs.

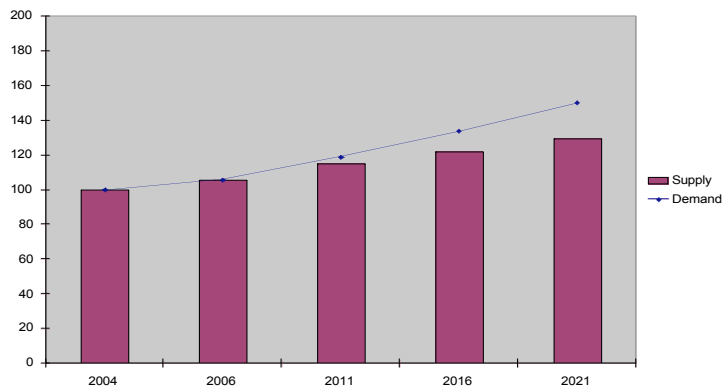
If the current relationship between the number of FTEs and the headcount number of staff remains constant, a shortage of around 800 FTEs would translate into a shortage of approximately 1,200 employees.

Figure 8 Index of labour demand vs. labour supply – 3 scenarios

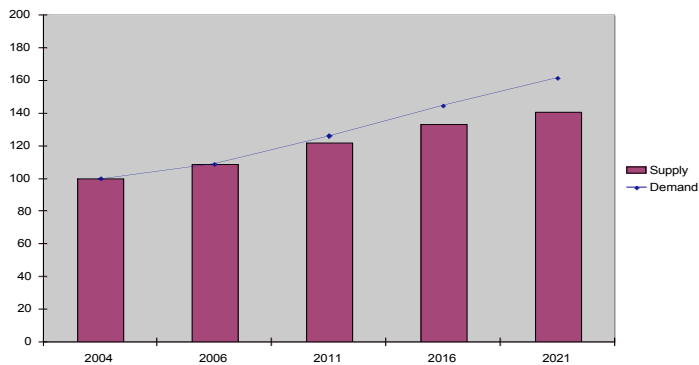
Lower bound



Middle ground



Upper bound



Source: NZIER

8. Varying the key modelling assumptions

8.1 Introduction

As we stated in section 1 of this report, we made a number of key assumptions in order to enable us to model future service needs, labour demand, labour supply and the consequent imbalance between labour demand and supply. We recognised that these assumptions could be challenged, but we also noted that they could, potentially, all be varied, either to present different views of the world, or to answer questions of a “what if?” nature.

In this section we indicate how the assumptions could be varied, and we show what effects the variations would have on projected labour shortages. This enables us to identify some strategic issues for CMDHB in the following section.

Theoretically, a very large number of different modelling outputs could be produced by permutating variants of the key assumptions. However, this would not be practical, and would probably not be helpful. Instead, we simply indicate, where possible, whether making alternative assumptions would increase or decrease the size of the projected labour shortage. In several cases we also illustrate the change more precisely.

8.2 The key assumptions

The key assumptions that could potentially be varied are as follows:

1. **Needs for services change directly in line with changes in population, size, structure and composition.** This means that the rates of patient discharges per thousand people in particular age / sex / ethnic groups remain constant over time. This does not allow, for example, the number of discharges to grow disproportionately as a result of the expected increase in the incidence, earlier onset and more rapid progression of diabetes in the population. However, in order to apply an alternative assumption based on this particular example, we would need some detailed information on the changing epidemiology of the condition and its consequences. Complex patterns of increasing morbidity, followed possibly by increased mortality over an unknown timescale, make the implications for labour demand at any point in time most uncertain.
2. **Labour demand grows directly in line with service needs.** This assumption does not allow for changes in labour productivity which might result, for example, from therapeutic breakthroughs. Conceivably, some breakthroughs could increase labour productivity in some service areas, but decrease it in others. The latter might happen if

medical advances made currently untreatable conditions treatable, albeit resource intensively.

Productivity gains might also be difficult to secure in the face of competing commitments; for example, to increase the quality of service. However, if nothing else happens to influence the projected balance between labour supply and demand, it would require an overall increase in labour productivity of around 18% between 2004 and 2021 (i.e. around 1% p.a.) to avoid a labour shortage under the middle ground scenario.

- 3. Labour supply grows in line with the Counties Manukau population of working age.** This is a relatively weak assumption because there is no reason why CMDHB could or should recruit all its labour locally. More realistic catchment areas for some occupational groups might be Counties plus Waitakere plus Auckland city, or the whole of Auckland region, or the whole of New Zealand. Basing the labour supply modelling on anything other than Counties would tend to exacerbate the projected labour shortages because Counties' population is projected to grow faster over the period to 2021 than most other places.

To illustrate this point, if the supply of hospital labour to CMDHB is modelled on the growth in the population of working age in the Auckland region as a whole, the projected labour shortage under the middle ground scenario grows to 951 FTEs by 2021 (equivalent to 27% of the 2004 base year labour supply). This compares to a shortage of 806 FTEs (equivalent to 23% of the base labour supply), if the labour supply is based on the growth in the population of working age in Counties Manukau. The labour shortage would be even worse if the labour supply were to be modelled on the growth in the working age population in New Zealand as a whole.

- 4. The workforce of Pacific Peoples or Maori origin grows in line with the growth in these ethnic groups locally.** This implies that these two groups will still be under-represented in the CMDHB workforce in 2021, both in relation to their shares of service needs and their shares of the local populations. The two reports on the **Implications for the Development of the Pacific Peoples / Maori Workforce** each ask an important 'what if' question that is answered by varying this assumption. The question is: *"By how much will the numbers of Maori / Pacific People in the CMDHB hospital workforce have to grow in order that, by 2021, neither group is under-represented relative to service needs or population shares?"*
- 5. The pattern of service provision stays constant over time.** This implies that there will be no switching of provision for particular service needs from one service area to another, nor from in-patient provision to

outpatient provision. This assumption is unlikely to hold, but what will actually happen is unpredictable. However, we show in the Statistical Modelling Report that transferring provision of services from surgery to medicine, and vice versa, would have a negligible effect on the projected labour shortage.

One way in which the pattern of service provision is likely to change over time is through increased service delivery in the community (e.g. via GPs and other service providers). This will be for reasons other than workforce management and development, but it could have implications for potential labour shortages in the CMDHB workforce overall (i.e. hospital and community sectors combined). Dispersal of provision could, for example, have a negative effect on labour productivity (and, hence, worsen labour shortages overall), if dispersed provision is associated with diseconomies of scale as compared to centralised hospital provision.

Preventative health care services delivered in the community could also have the effect of actually worsening hospital labour shortages before ameliorating them in the longer term. This could happen if improved health monitoring uncovers problems that would otherwise go untreated, or if the monitoring raises patients' expectations about what health services should do for them.

- 6. The labour inputs associated with any particular intervention do not vary with the age of the patient.** Lastly, we note in this section that an implicit assumption in the modelling is that the labour requirements associated with any given intervention do not vary with the age of the patient¹. This means, for example, that an 80 year old undergoing a hip replacement needs no more care before, during and after the operation than a 60 year old undergoing the same operation. If it is true, however, that older patients do indeed require more care than younger patients for any given intervention, then the fact that the Counties Manukau population is projected to age implies that the projected labour shortages we have shown earlier will understate the problem.

¹ We were unable to ascertain from the CMDHB Transitions database whether this is true or not. However, expert opinion does seem to be that older patients do, indeed, tend to require more care for any given intervention.

9. Implications for CMDHB

Although it is not possible to predict the precise scale of hospital labour shortages that CMDHB will face, it seems very probable that significant shortages will occur if avoiding action is not taken. It also seems possible that the pursuit of important health care strategic priorities (such as improved quality of care, improved access to services, development of community-based provision) could have the tendency to exacerbate any labour shortages that emerge. This is not to say, of course, that other priorities should be sacrificed if they threaten to impose workforce management and development challenges. What it does mean, however, is that CMDHB needs to develop and implement a workforce strategy to co-exist with and complement other strategies for service development.

The purpose of the research leading to this report was not to prescribe what CMDHB should do, but it is fitting to consider some of the implications of the research findings. Throughout this report we have taken the labour market approach that DHBNZ has espoused in its *Future Workforce* initiative. Accordingly, we have examined and compared the demand for hospital labour and the supply of hospital labour. Continuing this approach, we now consider two possible major themes for strategy, within each of which there are two priority areas. The major themes are **Reducing the Demand for Labour** and **Increasing the Supply of Labour**. Within the former, the priority areas are *Reducing the Community's Needs for Services* and *Increasing Labour Productivity*. Within the latter, the priority areas are *Improving Staff Recruitment* and *Improving Staff Retention*.

Given the fact that the population in Counties Manukau is growing and ageing at the same time, we are (strictly speaking) talking here about constraining the growth in the demand for hospital labour, rather than reducing it in absolute terms. Likewise, it is probably more accurate to talk about making more effective use of a given supply of labour, rather than about increasing its size. However, the two shorthand terms we use are helpful in pointing towards the effect on potential labour shortages.

9.1 Reducing the Demand for Labour

9.1.1 Reducing the Community's Needs for Services

Efforts by CMDHB to reduce the community's needs for services are amply justified on other grounds, but success in this area should also have the benefit of ultimately reducing the demand for hospital labour. However, as we suggested in section 8, the labour-related payback from investment in such things as enhanced preventative care and health monitoring might only be received in the longer term (i.e. measured in decades, rather than years). And, as we also suggested, the shorter term effect could be to increase hospital service needs and, hence, hospital labour demand.

9.1.2 Increasing Labour Productivity

We also noted in section 8 that labour productivity improvements would have the effect of reducing the demand for hospital labour, but that they might be difficult to secure in the face of competing pressures to improve the quality of services. Some advances in medical technology could also reduce productivity. However, opportunities to improve productivity without compromising the quality of services will, no doubt, present themselves.

Some of these opportunities will best be observed from a senior management vantage point. But front-line staff are often better placed to spot opportunities in their immediate working environment. Accordingly, CMDHB should adopt a ‘top-down’ and ‘bottom-up’ approach to reducing the demand for labour via productivity improvements.

The difficulty is, though, that important bottom-up messages can be lost or simply not communicated in large and complex organisations, such as modern hospitals. CMDHB, therefore, needs to implement effective and trusted mechanisms to ensure that messages about opportunities to improve labour productivity (or, indeed, about efficiency in general) are articulated, noted and then acted upon. The Business Excellence approach to organisational and personal learning might be useful for these purposes. We also note that CMDHB has committed to undertaking regular staff surveys, and that these surveys provide one means of capturing information and recording learning opportunities. They might, therefore, play a useful part in the productivity improvement process.

9.2 Increasing the Supply of Labour

9.2.1 Improving Staff Recruitment

It is probably already widely understood that CMDHB will need to recruit more staff in the face of competition from other DHBs in the Auckland region. It should also be understood that CMDHB will face stiff competition from other sectors of the economy in Counties Manukau itself. Auckland International Airport, for example, already provides employment for more than 10,000 people², and this total is likely to grow rapidly as the demand for air transport grows. In a region where land suitable for industrial and commercial development is becoming scarce, Counties Manukau is also relatively well-placed to serve as the location for new and relocating activity in sectors such as manufacturing, warehousing, wholesale and retailing. The implication of this is that residents of Counties Manukau are likely to have a relatively good choice of employment opportunities, given reasonable rates of growth in the national and regional economies.

² That is, approximately the same number of people as are employed in the Counties Manukau hospital and community workforces combined.

Competition in the recruitment market means that CMDHB will need to position itself as the DHB of choice amongst people who have decided to work in the health services. It also needs to project itself as the employer of choice amongst people in the local area who are not yet committed to working in any particular sector. In turn this implies that CMDHB will need to maintain a high profile as an employer in the area. More than that, it will probably require establishing close working relationships with education and training providers locally who are preparing potential employees.

Not only to avoid labour shortages, but also to enable the organisation to provide culturally appropriate services, CMDHB will need to get closer to ethnic groups in the community (especially Maori and Pacific Peoples) that are currently under-represented in the workforce. Combined with Census of Population data on ethnicity, data from the hospital workforce and community workforce censuses provide CMDHB with good information on occupations and services where particular ethnic groups are under-represented. CMDHB has invested in collecting data on the workforce and is now in a better position than many other DHBs to target its recruitment efforts.

9.2.2 Improving Staff Retention

Some of the promotional activities that might improve staff recruitment will also contribute something towards improving staff retention. However, it is often the case (not just in health, but also in other public services) that recruitment is relatively easy, but retention of staff is more difficult. CMDHB will, therefore, need to nurture the employees it already has and the recruits it will attract in the future. Good remuneration will help, but nurturing the workforce will extend far beyond this. Job satisfaction probably as important as pay. And this depends, in turn, on such things as feeling empowered, valued and respected.

The DHBNZ's *Future Workforce* report is a strategy document, which suggests priorities and actions to enable sustainable service delivery. The report places particular emphasis on the theme of "*Nurturing and Sustaining the Workforce*". Three of the eight priorities in the report are covered by the theme, as are 16 out of 37 actions. We believe that the report will be particularly helpful to CMDHB in guiding the development of actions to improve staff retention.

9.3 Conclusions

It was not the purpose of this report to provide detailed recommendations for CMDHB to act upon. As we noted at the beginning of the report, its aim was to provide a stimulus for thought about what CMDHB needs to do to ensure that it has the hospital workforce in place to serve the growing and

changing needs of its community. We have shown how a growing and ageing population will change the pattern and volume of service need in the future. We have also been able to illustrate how labour shortages might emerge and how large the shortages might become in the absence of action to prevent them.

Beyond this, we have suggested a labour market framework to guide thinking about what actions related to labour demand and labour supply would alleviate the threat of labour shortages. On balance, it appears to us that efforts to increase the supply of labour will be more effective in helping to avoid labour shortages than efforts to reduce the demand for labour. This is not to say, however, that the latter should be ignored.

Finally, we state that we do not think it inevitable that CMDHB will face labour shortages in the future. However, we are firmly of the view that workforce development must be accorded the highest priority in CMDHB's wider service development strategy. Failure to pay sufficient attention to workforce development will almost inevitably threaten the achievement of every other strategic priority.