Otago District Health Board:
Clinical Services Plan

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About LECG

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Executive summary: A window of opportunity to pre-empt future pressures

This is the first Clinical Services Plan for the Otago District Health Board. The plan seeks to map out the main issues facing the DHB in its provision of health care in the Otago region and for its population. The Plan outlines how the DHB intends to meet those issues to ensure that health services remain sustainable and that the best possible health is secured in the region.

Clinical Leaders and Managers from Dunedin hospital were interviewed for their views on the future pressures on health care in Otago. The Otago/Southland Executive Management Group oversaw the development of the Plan and ensured that it is consistent with the DHBs’ other strategic planning documents.

The qualitative interviews carried out with the main clinicians and managers from the services in Dunedin hospital underlined three principal themes that will influence the future direction of service delivery:

• Equity of access given the rural nature of the region.
• The relationship with Southland and the future of integrated regional services.
• Workforce challenges to maintain service quality, considering partnerships across public-private health providers in the region (Mercy, Queenstown hospitals).

Quantitative review of population forecasts and the resulting demand for health care show that the population is ageing, but not growing. There will be a steady increase in demand for health care and support for older people, and a fall in need for health services for children and newborns. However history tells us that even though population forecasts indicate a reduction in need for services for the young, our experience has been that it will remain static.

The review of the current state, along with the forecasts, suggest that while overall capacity in Dunedin hospital is reasonable for the next few years, it will face increasing strain from increased demand from the ageing population if the current models of service delivery are retained.

Some trends create a pressure to develop hospital care out of Dunedin. Along with technology shifts that are moving more care out of traditional hospitals, most of the combined Otago / Southland region’s population growth is expected to be in the Central Otago and Queenstown-Lakes regions. The Medical School also wants to increase its use of community facilities as it seeks to anticipate where future medical care will be delivered.

Acting in the opposite direction are the potential economies of scale and scope from further concentrating services in Dunedin. This applies particularly to workforce, with Dunedin being the only centre in the region that can easily sustain a professional working population, including opportunities for their families. Also, the development of regional services, while strictly outside
the scope of this review, could also increase the use of Dunedin facilities to compensate for relatively low hospital resources in Southland.

Otago DHB is in an excellent position to invest now to sustain its health services over the next two decades. It is free from the acute pressures or ‘burning platforms’ that affect many other DHBs: funding is adequate for current service levels; clinical performance indicators are good; the population lacks the chronic disease issues seen in many other districts; and the workforce is stable and maintains good relationships with management.

We believe that the DHB has a window of about three to five years in which to prepare for the pressures of the next twenty years, of which this plan has found the most important to be:

- The ageing of the population.
- The population growth in Central Otago.
- A need to upgrade ageing facilities within a ‘grid-locked’ hospital site.
- Pressures to improve health services in Southland DHB.

The DHB can pre-empt these pressures by continuing and expanding on its initiatives to:

- Strengthen primary and community care
  - develop Integrated Medical Centres and move services to them;
  - broaden the scope of practice of primary care practitioners;
  - improve collaboration with the Rural Trusts;
  - develop ambulatory care and community birthing facilities in Dunedin and the region; and
  - continue to strengthen mental health services generally and for the increased prison population.

- Strengthen prioritisation and investment processes:
  - Centralise and coordinate decision-making about investment and disinvestment in services, technologies, new processes, and models of care; and
  - Proactively work with the private sector, especially on facility and technology investments, and on recruitment and employment.

- Develop regional services with Southland DHB, starting with a joint Clinical Services Plan.

In five years’ time, we expect that Otago DHB will be well-placed to meet the challenges of the following decades. It will have built on its traditional base as a teaching and tertiary hospital.
centre, and will be delivering and funding a wide range of services across the region that are strongly placed to maintain and improve the population’s health over the next twenty years.
1 Introduction

The purpose of this clinical services plan (hereafter called “CSP” or “the Plan”) was to develop a fifteen to twenty year “look-up” to allow Otago DHB to match its current activities with its future health demands.

1.1 Developed jointly with the DHB and LECG

The report has been developed jointly between Otago DHB and LECG. The team that has worked on the project has been made up of team members from both organisations.

1.2 An evolutionary approach

The CSP is the first for the DHB and, as such, should be seen as a step on the way to the next CSP. This CSP has been developed with the benefit of service level interviews and with extensive input from the management team of the DHB. However, the CSP has been developed largely internally. The next CSP should include an appropriate level of community consultation, consultation with primary care participants, and consultation with non-government organisations (NGOs).

This CSP is intended as a strong base for those further discussions. In particular, this CSP sets out the following:

• analysis of population patterns;
• analysis of probable demand patterns;
• a statement of major issues facing the DHB;
• a statement of the major development steps for health services;
• an explicit statement of the planning assumptions underpinning the CSP.

The focus of this CSP has been on Otago DHB and its population. It is our strong view that a second generation CSP should consider Otago and Southland as a whole, working from an Otago/Southland catchment to allow for a clearer picture of the impact of demand for services on the DHB, from inside as well as outside Otago.

The planning assumptions that underpin the development of a service strategy for the DHB were established in discussion with the management team and are presented at the beginning of Section 2.4.
1.3 Guide to this report

The report is organised as follows:

• The first sections of this report describe Otago District Health Board from a health funder’s point of view. We first note the key features of the District’s geography and population (Section 3), then review the services provided by Otago DHB and their linkages to other service providers including the rural hospitals within Otago, other DHBs, and primary care and other private providers (Section 4). The supporting infrastructure – facilities, information services, workforce, and transport – is described in Section 6.

• Section 7 reviews the wider trends affecting the future of clinical services as well as some issues specific to Otago, including changes in technology, changes in models of care, social changes such as lifestyle choices of patients, and demographic pressures. Section 5 quantifies some of the effects of forecast demographic and other change on the demand for health services.

• In Section 8 we bring the information together to identify which issues will be the most important for Otago DHB to respond to the set of challenges it faces over the next fifteen years.
2 Methods and materials

2.1 Project goals

The purpose of the project was to develop a Clinical Services Plan in collaboration with the Otago DHB. The goal is to provide a CSP that informs further service development, an Asset Management Plan, an Affordability Framework and Master Site Plan so that Otago DHB can successfully apply for capital expenditure funding from the Ministry of Health in August 2008.

2.2 Project approach

The approach was a highly interactive one. An initial meeting with key members of the Otago DHB set the broad directives for the CSP.

To describe the current and 20 year state for clinical services, a qualitative and quantitative approach was used. On the qualitative side, structured interviews were carried out at a service level within the provider arm, as well as with some other key individuals, for example, Primary Care Advisor, Dean of Dunedin Medical School, and the Regional General Manager Planning and Funding. A targeted literature review was also carried out based on the principal issues raised during this process. To predict service demand over the 20 year timeframe for individual inpatient services, the quantitative work took population projections along with the current rates of service utilisation and forecast demand for these services.

The results of this were discussed with the Otago DHB management team and in two workshops held in Dunedin. The management team of Southland DHB was also present. Key areas of concern were identified and further quantitative analysis was carried out to create a deeper understanding of these and the implications both for service configuration and ‘bricks and mortar’ planning in the future.

We thank the clinical teams who gave us detailed information and opinions on the issues facing the Otago DHB, and the Otago DHB management team who supported us through this project with information and guidance.

2.3 Data

The population projections used for this Plan are the sub-national projections issued by Statistics New Zealand in December 2007. These projections are based on the 2006 Census.

Data on current services were provided by Otago DHB. This included data on inpatient outpatient, and community services delivered by the DHB and the rural trusts.
2.4 Planning assumptions

To complete any assessment of future trends it must be decided what to consider as potential changes, and what to leave out. As the focus of the CSP is to set directions under current national and regional policy settings, we made the following assumptions. In the case that events undermine these assumptions, the plan should be reviewed to allow for the new circumstances.

- University and medical school will retain the current configuration.
- Service levels remain at or above national levels.
- There are no structural changes to inflows or outflows for Inter-District Flows (IDFs). That is, Otago will not seek to outsource any other services to other DHBs, nor to seek to deliver new services to residents of other DHBs.
- Population projections are based on the 2005 Census and Statistics NZ 2006-base sub-national population projections, medium growth scenario.
- The price of transport does not change significantly (air, road fuel costs; road & rail networks remain in current state; existing domestic and international air services remain).
- The plan covers all funding sources (ACC, MOH, etc).
3 People and places served by the Otago District Health Board

3.1 New Zealand’s third largest DHB area

Otago DHB serves a land area of 31,990 square kilometres, approximately 12% of New Zealand’s land area, and is physically the third largest DHB in New Zealand. Just under 180,000 people live in the four districts included in the Otago DHB region: Central Otago, Waitaki, Clutha, Dunedin city, plus the Wanaka ward of the Queenstown-Lakes district. Almost 70% of the DHB population live in or around Dunedin city. Otago is more rural than the average DHB, with 35% of the population living in towns of fewer than 30,000 people, compared to 31% nationally. Some residents live more than five hours’ drive from Dunedin.

Figure 1: Map of Otago DHB

3.2 Southland DHB

It is useful to document the Southland DHB population and region along with Otago’s. People living near the border between the two DHBs can and do access health services in both DHBs. Also, Dunedin is the tertiary referral centre for most services.

The Queenstown-Lakes Territorial Authority spans the two DHBs, with the Queenstown basin being in Southland DHB and the Wanaka area in Otago DHB. Also, services such as Public Health and the new Regional Cancer Service span the two Districts, and more may move to this regional model.

3.3 Urban and rural populations

179,300 people live in the area served by Otago DHB, and 117,230 in the neighbouring Southland DHB’s catchment. There are also significant visitor populations, especially in the Queenstown-Lakes area.

Only 6.4% of the Otago DHB population identify as Māori, and 1.5% as Pacific people. This is much lower than the national figures of 15.4% and 5.5% respectively. Māori are fairly evenly represented in all four of the Territorial Authorities within Otago DHB.

<table>
<thead>
<tr>
<th>DHB</th>
<th>Territorial Authority</th>
<th>Population</th>
<th>% of DHB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Otago</td>
<td>Central Otago District</td>
<td>17,060</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Clutha District</td>
<td>17,230</td>
<td>10%</td>
</tr>
<tr>
<td></td>
<td>Dunedin City</td>
<td>122,350</td>
<td>69%</td>
</tr>
<tr>
<td></td>
<td>Waitaki District</td>
<td>20,660</td>
<td>12%</td>
</tr>
<tr>
<td></td>
<td><strong>Otago Total</strong></td>
<td><strong>177,300</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

| Southland | Gore District | 12,360 | 11% |
|           | Invercargill City| 51,600 | 44% |
|           | Queenstown-Lakes District | 24,090 | 21% |
|           | Southland District    | 29,180 | 25% |
|           | **Southland Total**   | **117,230**| **100%** |

All population figures are for usually resident population at 30 June 2006, unless otherwise specified. Projections are sub-national population projections released by Statistics NZ in December 2007. The tables assume that the whole population of the of the Queenstown-Lakes territorial authority live in the Southland DHB; in reality about 10,000 of these people are in the Otago DHB.
31% of the Otago DHB population and 76% of the Southland population live outside the two main cities of Dunedin and Invercargill. Table 1 shows the absolute and relative number of people in each of the eight Territorial Authorities within the Otago and Southland DHB areas.

Apart from Dunedin, the main towns are Oamaru (Waitaki District); Cromwell and Alexandra (Central Otago District); Queenstown and Wanaka (Queenstown-Lakes District); Gore (Gore District); and Balclutha (Clutha District).

### 3.4 A population ageing in place

Statistics New Zealand expects that the total populations of both Otago and Southland will remain approximately constant over the next 25 years. However, it predicts a significant increase in average age.

**Figure 2: Otago population by age, 2006 and 2026**

Figure 2 shows the current and projected age distribution for Otago in 2006 and 2026. It clearly shows Dunedin’s student population as a peak between the ages of 15 and 29, and a large ‘baby boom’ cohort up to the age of sixty. Statistics NZ’s projections show that it expects population growth over the next twenty years to be dominated by the ageing of this post-war birth cohort.

Statistics New Zealand provides three main population scenarios, labelled High, Medium, and Low. The “high” scenario assumes a high, but plausible, level of migration and births, along with relatively low mortality. The “low” scenario assumes low migration and births and high mortality. Statistics NZ emphasises that all are plausible, and also that other combinations of mortality, fertility, and migration are possible.

The implications of the different scenarios are moderately different for Otago and Southland. Table 2 below shows the change in population expected between 2026 and 2006 in each scenario.
Under the “low” scenario, populations are expected to fall in all of the Territorial Authorities within Otago and Southland DHBs, with the notable exception of Queenstown-Lakes.

In the “medium” scenario, populations fall in the rural areas and increase in the cities and in Queenstown-Lakes.

In the “high” scenario, there are still two areas where populations are expected to decline. The number of permanent residents in Queenstown-Lakes could reach 80% of the population of Invercargill, implying that it could exceed Invercargill if tourists and other visitors were included.

Table 2: 20 year resident population changes in each Territorial Authority, by Scenario

<table>
<thead>
<tr>
<th>District</th>
<th>Territorial Authority</th>
<th>Scenario</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Otago</td>
<td>Central Otago District</td>
<td>(1,740)</td>
</tr>
<tr>
<td></td>
<td>Clutha District</td>
<td>(2,570)</td>
</tr>
<tr>
<td></td>
<td>Dunedin City</td>
<td>(4,510)</td>
</tr>
<tr>
<td></td>
<td>Waitaki District</td>
<td>(3,870)</td>
</tr>
<tr>
<td><strong>Otago Total</strong></td>
<td></td>
<td><strong>(12,690)</strong></td>
</tr>
<tr>
<td></td>
<td>Gore District</td>
<td>(2,560)</td>
</tr>
<tr>
<td></td>
<td>Invercargill City</td>
<td>(10,950)</td>
</tr>
<tr>
<td></td>
<td>Queenstown-Lakes District</td>
<td>7,350</td>
</tr>
<tr>
<td></td>
<td>Southland District</td>
<td>(3,310)</td>
</tr>
<tr>
<td><strong>Southland Total</strong></td>
<td></td>
<td><strong>(9,470)</strong></td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td><strong>(22,160)</strong></td>
</tr>
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Statistics NZ projects that births will decline in all but its highest-growth scenario. All three scenarios are shown in Figure 12.

### 3.5 Queenstown – Lakes: rapid growth and many visitors create stress for health services

A major theme emerging from our interviews with Otago DHB service leaders was the importance of the changes in the Queenstown-Lakes region. Although representing about 8% of the combined total population of the Otago and Southland DHBs, the rapid growth in both Wanaka and Queenstown is challenging the current models of service in Queenstown-Lakes and the neighbouring Central Otago District.

Statistics New Zealand expects the Queenstown-Lakes District to have the fastest population growth in the country over the next 25 years. It projects that the population will rise from its current 24,000 to somewhere between 31,000 and 41,000 usual residents. Table 3 shows that this corresponds to growth of between 30% and 70% over current levels. The wide range in estimates indicates Statistics New Zealand’s lack of confidence in picking the trends in the country’s fastest-growing area.
Table 3: Percentage change in Territorial Authority populations in next twenty years, by Statistics NZ scenario

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<thead>
<tr>
<th>DHB</th>
<th>Territorial Authority</th>
<th>Scenario</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Otago</td>
<td>Central Otago District</td>
<td>-10%</td>
<td>15%</td>
<td>42%</td>
</tr>
<tr>
<td></td>
<td>Clutha District</td>
<td>-15%</td>
<td>-6%</td>
<td>3%</td>
</tr>
<tr>
<td></td>
<td>Dunedin City</td>
<td>-4%</td>
<td>5%</td>
<td>14%</td>
</tr>
<tr>
<td></td>
<td>Waitaki District</td>
<td>-19%</td>
<td>-12%</td>
<td>-4%</td>
</tr>
<tr>
<td></td>
<td>Otago Total</td>
<td>-7%</td>
<td>3%</td>
<td>13%</td>
</tr>
<tr>
<td></td>
<td>Gore District</td>
<td>-21%</td>
<td>-12%</td>
<td>-4%</td>
</tr>
<tr>
<td></td>
<td>Invercargill City</td>
<td>-21%</td>
<td>-7%</td>
<td>7%</td>
</tr>
<tr>
<td></td>
<td>Queenstown-Lakes District</td>
<td>31%</td>
<td>50%</td>
<td>71%</td>
</tr>
<tr>
<td></td>
<td>Southland District</td>
<td>-11%</td>
<td>-3%</td>
<td>6%</td>
</tr>
<tr>
<td></td>
<td>Southland Total</td>
<td>-8%</td>
<td>5%</td>
<td>19%</td>
</tr>
<tr>
<td></td>
<td>Grand Total</td>
<td>-8%</td>
<td>4%</td>
<td>15%</td>
</tr>
</tbody>
</table>

The Queenstown-Lakes District Council believes that permanent resident population growth will be faster than Statistics NZ expects even in its highest scenario, and has supplied its own population projections to Otago DHB.

The Council projects both the permanent and the visiting population. The permanent population corresponds to the Statistics New Zealand “usually resident” concept. Visitors include both holiday-makers and seasonal residents from other areas of New Zealand, and overseas tourists.

The Council suggests on an “average day”, resident numbers are currently slightly below the Census estimate of 24,000. However it finds that on an average day, there are another 12,000 or so visitors. It expects resident and visitor numbers to rise steadily, reaching 45,000 residents and another 30,000 visitors on an average day by 2026. The resident number alone is higher than Statistics New Zealand’s highest prediction of 41,000 usual residents.

The Council also points out that peak day numbers are significantly higher. Peak day numbers already exceed 75,000. It predicts this to reach 145,000 by 2026 – which would make it the largest ‘city’ south of Christchurch.

There are several implications for health services.

Although the visitor population is relatively healthy, it does place significant seasonal demand on services in Queenstown, Wanaka, and Cromwell. The most affected are primary care and accident-related services. However service leaders also reported noticeable demand from older New Zealand residents who spend some of the summer months inland. It is not clear whether there is a corresponding decrease in demand for services in coastal centres such as Dunedin and Invercargill.

The Queenstown population is viewed as having different needs and expectations of health care services. There is interest from private hospital providers in extending elective care there, both
for the “medical tourism” market in elective (especially cosmetic) procedures, and for the relatively highly-insured immigrant population. Primary care providers find that the overseas and winter visitors create a significant market for accident and other casual medical services.

The Queenstown-Lakes Council has formally expressed the view that the District Health Boards should invest in secondary services equivalent to those currently provided in Invercargill.

There are major uncertainties in how the health needs of the Queenstown-Lakes population will develop, and how they should be met. It is conceivable that retirees will ‘retreat’ to centres such as Dunedin as their aged-care needs increase; alternatively, the development of secondary and aged-care services in the region could stimulate further inwards migration. It may be also possible for health professionals to follow the seasonal movements of the population they serve between Dunedin and the inland regions.

The health and health service implications of this forecast growth are further discussed in section 5.

### 3.6 Deprivation

The deprivation level of a community is a socio-economic indicator which takes into account a large number of factors related primarily to income levels and home ownership. It also considers employment status, level of qualifications, access to a car and telephone, and living space\(^3\). The deprivation score ranges from 1 to 10 with 1 being well off and 10 being poor. Deprivation scores have been found to correlate strongly with indicators of poor health and under-use of preventive health services\(^4\).

Table 4 below shows the deprivation profile for the Otago region in 2001. Broadly speaking, compared to New Zealand as a whole, the Otago DHB population lies in the centre of the deprivation scale, with fewer people living in regions that are in the levels of deprivation 1 and 10. The average score is slightly over the New Zealand average of 5. The proportion of the population living in regions with a deprivation score of 9 or 10 is just over 10%, compared with just over 19% in the rest of New Zealand. Most of the areas with the highest levels of deprivation are in Dunedin city.

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3 Salmond C, Crampton P “NZDep 2001 Index Of Deprivation” (August 2002). Department of Public Health, Wellington School of Medicine and Health Sciences.

3.7 Population characteristics

Otago DHB’s population is predominantly of European origin, 93.7% of the population identified with this group in the last census. As described in section 3.2, some 69% of the population resides in Dunedin city and the rest of the population is distributed across Central Otago (10%), Clutha District (10%) and Waitaki District (12%).

The median age is 36.5 years for people in Otago. The age distribution is consistent with the national picture, with the exception of the over 65 age band and the 15-24 band. In the first instance, it has a larger proportion of older people: 14% of people in Otago were aged 65 years and over compared with 12.1% for New Zealand in the 2001 census. The high number of people in the 15–24 band is a direct result of the large number of tertiary students residing in Dunedin city for 9 to 10 months of the year. Otago has the lowest fertility rate in the country of 1.54 births per woman. Along with a relatively constant total population, this means that the proportion of older people is increasing steadily.

Health statistics indicate that Otago’s residents have a higher level of deaths from cardiovascular disease, higher hospital admissions due to smoking, and a higher level of self-inflicted injuries compared to the rest of New Zealand. However, they have better access to health professionals and better cancer measures.

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5 Otago DHB District Strategic Plan 2005 – 2015, page 11
In terms of median income, Dunedin, with the majority of Otago’s population, lies significantly below the New Zealand average ($14,500 compared to $18,500 respectively). This is a significant statistic because it seems that income is a determining factor on health and one related to many other determining factors (diet, education levels, quality of housing and overcrowding, and access to private health care). In terms of house ownership Otago has a relatively high rate and has relatively low median weekly rents in Dunedin compared to the other major cities in New Zealand.

### 3.8 Older people

On a global scale, those aged 65 years or over make up 15% of the Western world’s inhabitants. All territorial authorities will be home to more people aged 65 years and over in 2026, when compared with 2001. This constitutes a significant difference with the former level of 3% in the post-war era, and poses obvious challenges to the infrastructure of the care facilities for the elderly as older people utilise health services at a higher rate than younger people. Otago faces a situation similar to that of the other DHBs. The 2001 census shows that 14% of people in Otago were aged 65 years and over compared with 12.1 per cent for all of New Zealand. In 2007, the proportion of Otago residents aged 65 and over rose to 15%, with almost one in eight of these people being at least 85 years old. This trend is predicted to continue. By 2026, the over 65 age group in Otago is expected to increase by 58% and the 85 and older group by 90%. These groups are high users of services and the impact on demand for services can therefore be expected to increase significantly over the next 20 years despite a relatively stable population over this period.

In Dunedin, conditions and pathologies concerning people of over 65 years of age come under the banner of ‘Older People’s Health’. Currently older people have better access to aged care services compared to the rest of New Zealand, mostly thanks to good access to residential and home-based care.

### 3.9 Māori health

The Otago DHB funds and intends to continue to fund a range of Māori health and disability services to enable Māori health levels to be comparable to those of other New Zealanders. The Māori population in Otago is relatively small compared to other DHBs, but it is expected to increase to 16,600 by 2021 and will represent some 9% of the Otago population. Māori in Otago are relatively younger – 18% are aged under 15 compared with 10% of non-Māori people, and only 3% of Māori are over 65 years old compared with 11% of non-Māori. Māori in Otago are more highly educated on average with lower unemployment rates than Māori in the rest of the

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country, however they have higher deprivation rates than non-Māori in Otago. This can be seen in Table 5 below which looks at the whole Otago-Southland region in terms of key socio-economic indicators: Māori are worse off than the total population but better off (or the same) compared with Māori nationally.

Table 5: Socio economic status indicators for Māori

<table>
<thead>
<tr>
<th>Socio-Economic Status Indicators</th>
<th>Otago Southland Māori</th>
<th>National Māori</th>
<th>Otago Southland Total</th>
<th>National Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking</td>
<td>39%</td>
<td>41%</td>
<td>22%</td>
<td>22%</td>
</tr>
<tr>
<td>Unemployed</td>
<td>11%</td>
<td>11%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td>Receiving income support</td>
<td>43%</td>
<td>46%</td>
<td>38%</td>
<td>35%</td>
</tr>
<tr>
<td>Personal income of $30 000 or more</td>
<td>14%</td>
<td>13%</td>
<td>18%</td>
<td>22%</td>
</tr>
<tr>
<td>Tertiary education</td>
<td>4%</td>
<td>2.6%</td>
<td>7%</td>
<td>8%</td>
</tr>
<tr>
<td>No secondary or tertiary qualifications</td>
<td>43%</td>
<td>47%</td>
<td>35%</td>
<td>32%</td>
</tr>
<tr>
<td>Own home</td>
<td>62%</td>
<td>52%</td>
<td>71%</td>
<td>68%</td>
</tr>
<tr>
<td>Do not own a car</td>
<td>15%</td>
<td>18%</td>
<td>13%</td>
<td>12%</td>
</tr>
<tr>
<td>Households with a telephone</td>
<td>89%</td>
<td>83%</td>
<td>93%</td>
<td>91%</td>
</tr>
<tr>
<td>Households with children under 5 years</td>
<td>24%</td>
<td>29%</td>
<td>14%</td>
<td>16%</td>
</tr>
<tr>
<td>Households with superannuants</td>
<td>7%</td>
<td>8%</td>
<td>13%</td>
<td>13%</td>
</tr>
</tbody>
</table>

Source: Māori Health Profile, Ministry of Health, July 2001

Life expectancy for Otago Māori is expected to continue to rise, increasing the numbers in the 65 and older age group. By 2021 there may be three to four times as many Māori and Pacific people aged 65 or more compared to now, although this comes from a small base, with just 1170 Māori and 190 Pacific people currently aged 65 or more.

Otago has a small Pacific population of approximately 2,300 people, who are well represented in terms of Primary Health Organisation (PHO) enrolment. The DHB has a good working relationship with the Otago Pacific People’s Health Trust.

3.10 Funders

3.10.1 Ministry of Health and other DHBs
The Ministry of Health is the DHB’s main funder. In 2007, it funded 97% of inpatient discharges (but only 87% of inpatient bed-days), 91% of outpatient services, and 93% of community services.
These figures include IDFs. IDFs are Ministry-funded services that are delivered to patients from other DHBs, as detailed in Section 4.3.

### 3.10.2 ACC

ACC funds 2% of the DHB’s inpatient discharges, but 7% of its bed-days, indicating that its patients have relatively long stays. ACC funds 8% of the DHB’s outpatient services, and 6% of its community services.

ACC also funds many primary care services. Nationally, it funds about 6% of personal health care, with the largest categories being general practitioner and physiotherapy services. We would expect the proportion of ACC-funded primary care to be similar in the Otago DHB.

43% of ACC-funded inpatient bed-days were in Physical Rehabilitation, 43% in Older People’s Health, 7% in Orthopaedics, and 3% in each of Psychogeriatric and Intellectual Disability services.

The pattern by case-weight (which is proportional to funding) is very different, due to the different costs per bed-day in each service. On this measure, 35% of ACC funding goes to Physical Rehab, 32% to Older Peoples Health, and 28% to Orthopaedics.

The pattern for ACC-funded outpatient services is similar to that for inpatients. 41% of ACC-funding outpatient services are in the Allied Health category, and 39% in Orthopaedics. 4% were Rehabilitation services, and 3% were in the Emergency Department. However, another 5% of ACC funded discharges are not coded to a service.

### 3.10.3 Private funding

Privately funded services are negligible for Otago DHB. There are also a few overseas patients who are eligible for care under the reciprocal agreements, who represent less than 0.5% of the DHB workload – about one inpatient and a couple of outpatient visits per week.

### 3.11 Transport

The road network between Dunedin and the surrounding towns is well maintained. The geographical area is very large which translates into several hours travel time by car to Dunedin for some residents. Dunedin city has a good public transport system, served by many bus lines within the city and to the neighbouring suburbs. The transit time by road from Dunedin to Invercargill is approximately 3 hours; to Oamaru it is 1 hour and 40 minutes, to Queenstown 4 hours, and to Dunstan-Clyde approximately 3 hours and 10 minutes.

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Air New Zealand operates daily flights between the main centres Auckland, Wellington and Christchurch to Dunedin. Mainland Air, based in Dunedin began operating two return flights in November 2007, three times a week between Dunedin, Alexandra, and Queenstown. If demand proves to be sufficient the flight frequency will be increased and a larger 18 seat aircraft used, with the service extended to flights between Dunedin and Invercargill and between Dunedin and Wanaka. Mainland Air is also considering similar services linking Dunedin and Invercargill and a Friday afternoon, Monday morning return service to Wanaka. There are no longer any passenger train services in Otago.

Air ambulance services are operated by the Otago Rescue Helicopter Trust and by Garden City Helicopters (Christchurch based). In addition, Queenstown-Lakes district also has the Lakes District Air Rescue Trust.

Queenstown and Dunedin both have international airports. About 200 international flights a year link Queenstown directly to Sydney, Melbourne, and Brisbane, carrying 54,000 passengers. Dunedin’s international flights are aimed at the tourist market, with Freedom Air offering flights to and from Brisbane, the Gold Coast, Sydney and Melbourne “on a weekly basis”.

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9 Queenstown Airport Corporation Limited 2007 Annual Report

4 Current health services

The Otago DHB vision is “Working together to promote Wellness and Independence”.

4.1 Hospital and health services

Dunedin & Wakari hospitals provide a full range of hospital medical and surgical services, including medical subspecialties, radiation oncology, neurosurgery, and burns as listed in Table 1. There are no transplant services provided in Otago. Some Paediatric services are provided at Canterbury and Auckland DHBs. Dunedin hospital is one of New Zealand’s four main teaching hospitals, sharing many staff and resources with the University of Otago Medical School.

<table>
<thead>
<tr>
<th>Mental Health</th>
<th>Consultation and Liaison Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute and Intensive Care Inpatient Units Clinical</td>
<td>Child and Youth Service</td>
</tr>
<tr>
<td>Rehabilitation Beds</td>
<td>Alcohol and Drug Service</td>
</tr>
<tr>
<td>Community Mental Health Teams</td>
<td>Residential Supported Accommodation (Level 3+)</td>
</tr>
<tr>
<td>Emergency Psychiatric Service</td>
<td>Te Oranga Tonu Tanga</td>
</tr>
<tr>
<td>Forensic Service; encompassing Medium Secure Unit</td>
<td>Early Intervention Team</td>
</tr>
<tr>
<td>and Forensic Community Team</td>
<td>Respite Care</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Medical and Surgical services</th>
<th>Nephrology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaesthesia</td>
<td>Neurology</td>
</tr>
<tr>
<td>Cardiology</td>
<td>Neurosurgery</td>
</tr>
<tr>
<td>Cardiac</td>
<td>NICU</td>
</tr>
<tr>
<td>Dermatology</td>
<td>Oncology</td>
</tr>
<tr>
<td>Diabetic</td>
<td>Ophthalmology</td>
</tr>
<tr>
<td>Dietetic</td>
<td>Orthopaedics</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>Otorhinolaryngology</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>Paediatric Surgical</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>Paediatric Medical</td>
</tr>
<tr>
<td>General Surgery</td>
<td>Respiratory</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>Rheumatology</td>
</tr>
<tr>
<td>Haematology</td>
<td>Secondary Maternity</td>
</tr>
<tr>
<td>Immunology</td>
<td>Tertiary Maternity</td>
</tr>
<tr>
<td>Infectious Diseases</td>
<td>Termination of Pregnancy</td>
</tr>
<tr>
<td>Infertility</td>
<td>Urology</td>
</tr>
<tr>
<td>Intensive Care Services inc Emergency retrieval</td>
<td></td>
</tr>
</tbody>
</table>

Table 1: Otago DHB provider arm Services
Dunedin hospital is a 400-bed facility that provides secondary services to the Otago region and tertiary services to the Otago and Southland regions. It is a small tertiary hospital and lacks the economies of scale that larger hospitals have. It is unlikely that tertiary services would be provided in Dunedin if the Medical School was not present.

Table 6 below shows the total numbers of health services delivered in 2007 in the Otago DHB’s facilities including the three rural hospitals. The inpatient figures count discharges and case-weights. Outpatient and community services are in their ‘natural unit of measure’; while for many services this unit will be patient visits, in some services it is clinic hours or a similar metric. Hence the totals cannot be meaningfully compared across service lines.

Table 6: Throughput by service class and clinical business group, year to June 2007

<table>
<thead>
<tr>
<th>Service Class</th>
<th>Inpatient Services</th>
<th>Sum of Volume</th>
<th>Sum of Case weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>21,170</td>
<td>26,968</td>
</tr>
<tr>
<td></td>
<td>Emergency, Medicine, Surgery</td>
<td>21,170</td>
<td>26,968</td>
</tr>
<tr>
<td></td>
<td>Mental Health, Community, Health Older People</td>
<td>2,551</td>
<td>4,600</td>
</tr>
<tr>
<td></td>
<td>Outsourced to Dental School</td>
<td>356</td>
<td>290</td>
</tr>
<tr>
<td></td>
<td>Women’s Health, Children’s Health, Public Health</td>
<td>7,158</td>
<td>5,085</td>
</tr>
<tr>
<td></td>
<td>Inpatient Total</td>
<td>31,235</td>
<td>36,942</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service Class</th>
<th>Outpatient Services</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Otago District Health Board: Clinical Services Plan
### 4.1.1 Benchmarks of hospital capacity and throughput

Two recent studies give some benchmarks of the hospital’s capacity and workload. The three Auckland DHBs have studied hospital bed numbers across the country\(^\text{11}\). Secondly, the Ministry of Health calculates standardised discharge rates (SDRs) for each speciality in each DHB.

The Auckland regional study estimated a standardised measure of bed numbers relative to population, after adjusting for the population’s age structure and for IDFs. The report excluded private beds and also “rural” beds as its aim was to assess the need for hospital capacity in metropolitan Auckland.

The Auckland report found that there were on average 1.66 public inpatient beds per 1,000 people across the whole of New Zealand. Using population estimates released by Statistics New Zealand in 2006, it found that Otago DHB had more beds per person than the national average, whereas Southland DHB had fewer beds per person.

We have updated the Auckland model by combining the Otago and Southland DHBs. We assumed that all inpatient episodes funded by Southland DHB were delivered in either Otago or Southland. Overall, the ratio of beds to 1,000 people across the two DHBs combined is 1.60, lower than the national ratio of 1.66 and slightly lower than Auckland regional ratio of 1.61.

Table 7 below shows the number of beds per 1,000 people for Otago and Southland DHBs, individually and combined, and compares them to the national level. For the two DHBs combined, surgical, CCU, maternity, women’s health, and neonatal beds are above national average capacity; while medical, ICU, gynaecology and paediatric bed numbers are relatively low. Shaded cells indicate a ratio that is below the national average.

The balance of high surgery to low medical bed-ratios may in part be due to differences in how beds are classified by different DHBs.

\(^\text{11}\)“A regional perspective on service growth and capital needs for the Auckland Metropolitan Area” Waitemata, Auckland and Counties Manukau DHB Provider Arm Services (July 2006)
### Table 7: Bed to population ratios, Otago and Southland compared to national levels (population estimates dated 2006)

<table>
<thead>
<tr>
<th>Bed type</th>
<th>Age range</th>
<th>Auckland analysis for 2006</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>New Zealand</td>
</tr>
<tr>
<td>Adult medicine</td>
<td>15+</td>
<td>0.68</td>
</tr>
<tr>
<td>Adult surgery</td>
<td>15+</td>
<td>0.69</td>
</tr>
<tr>
<td>CCU</td>
<td>15+</td>
<td>0.05</td>
</tr>
<tr>
<td>ICU</td>
<td>15+</td>
<td>0.06</td>
</tr>
<tr>
<td>Total adult med-surg</td>
<td>15+</td>
<td>1.48</td>
</tr>
<tr>
<td>Paediatrics</td>
<td>0-14</td>
<td>0.80</td>
</tr>
<tr>
<td>Maternity</td>
<td>15-44 female</td>
<td>0.93</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>15-64 female</td>
<td>0.13</td>
</tr>
<tr>
<td>Women's health</td>
<td>15-64 female</td>
<td>0.81</td>
</tr>
<tr>
<td>Neonates</td>
<td>0</td>
<td>5.89</td>
</tr>
<tr>
<td>Total inpatients</td>
<td>All ages</td>
<td>1.66</td>
</tr>
</tbody>
</table>

Table 8 below shows Otago DHB’s standard discharge ratios (DHB of domicile) for certain surgical procedures provided to people in the Otago DHB area compared to DHBs in other parts of New Zealand. The ratio has been standardised (it takes into account the particular sex, age, ethnicity and social deprivation mix of the Otago DHB population). As can be seen, for the majority of procedures Otago DHB is providing more than the average rate in New Zealand (greater than 1, the national mean).
Table 8: Standardised discharge ratios, Otago DHB

<table>
<thead>
<tr>
<th>Surgical procedure</th>
<th>2004/05</th>
<th>2005/06</th>
<th>Jul 2006-Jun 2007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coronary artery bypass grafts (CABG)</td>
<td>1.57</td>
<td>1.69</td>
<td>1.42</td>
</tr>
<tr>
<td>Angioplasties</td>
<td>1.42</td>
<td>1.21</td>
<td>1.50</td>
</tr>
<tr>
<td>Total hip replacement</td>
<td>1.35</td>
<td>1.35</td>
<td>1.32</td>
</tr>
<tr>
<td>Total knee replacement</td>
<td>1.09</td>
<td>1.10</td>
<td>1.16</td>
</tr>
<tr>
<td>Prostatectomies</td>
<td>0.78</td>
<td>0.96</td>
<td>0.69</td>
</tr>
<tr>
<td>Cataracts</td>
<td>1.27</td>
<td>1.35</td>
<td>1.11</td>
</tr>
<tr>
<td>Grommets</td>
<td>1.56</td>
<td>1.60</td>
<td>1.35</td>
</tr>
<tr>
<td>Repairs of hernia</td>
<td>1.23</td>
<td>1.13</td>
<td>1.10</td>
</tr>
<tr>
<td>Tubal ligation</td>
<td>1.06</td>
<td>0.81</td>
<td>1.56</td>
</tr>
<tr>
<td>Hysterectomies</td>
<td>1.20</td>
<td>1.33</td>
<td>1.09</td>
</tr>
<tr>
<td>Cholecystectomy</td>
<td>1.00</td>
<td>0.98</td>
<td>0.99</td>
</tr>
<tr>
<td>Tonsils and adenoids</td>
<td>1.76</td>
<td>1.71</td>
<td>1.55</td>
</tr>
<tr>
<td>Carpal tunnel procedures</td>
<td>1.97</td>
<td>1.63</td>
<td>1.67</td>
</tr>
<tr>
<td>Heart valve replacements and repair</td>
<td>1.19</td>
<td>1.21</td>
<td>1.28</td>
</tr>
</tbody>
</table>

Source: NZ Health Information Service: http://www2.nzhis.govt.nz/stats/surgical/index.html

4.1.2 Tertiary services with a teaching base
The University of Otago and Otago DHB have a mutually dependent relationship, working together to provide a teaching hospital producing clinical graduates for the country, and services for the people of Otago and Southland. The sharing of staff between the Otago DHB and the University of Otago Division of Health Sciences provides economies of scale and allows both organisations to deliver high quality services, teaching and research.

There are many advantages for both parties with this arrangement including:

• Recruitment of clinical staff who might otherwise not come to Dunedin.
• Sharing of posts, increasing the numbers available for on-call.
• Service availability that might otherwise not be available in a city with the population of Dunedin.
• Research that addresses local issues.
• Retention of staff and the number of students that return as house surgeons and other health professionals.

Disadvantages include the increased time required for teaching during ward rounds and other components of clinical service delivery.
4.1.3 One city, two sites

Within Dunedin hospital services are provided from two sites – Dunedin city and Wakari. Dunedin hospital is based in the city and is constricted within the current site for any expansion. The site is adjacent to the University of Otago providing benefits to the staff with joint appointments and to students with access to services.

The Wakari site is five km away on a large underutilised site. This site provides challenges in the winter as it is on the hill and snow and ice make access difficult. The site is classified as residential which poses its own challenges when it comes to redevelopment.

The Otago DHB has approved the ‘one city two sites’ concept for Dunedin and Wakari hospitals but has indicated this does not preclude the option of ‘one city one site’ configuration in the future.

Wakari hospital currently provides mental health services and Assessment Treatment and Rehabilitation (ATR). A number of DHB departments and services are in the process of being transferred to Wakari including:

- All mental health crisis and community teams
- DHB Planning & Funding and Corporate service
- Transport and Rehabilitation Equipment
- Public Health South Services

4.1.4 Rural services

Otago has over 50,000 people living in rural areas. There are three rural hospitals. Each is owned and operated by a local trust: Dunstan provides services to the Central Otago population (19,000), Oamaru serves the Waitaki population (20,000) and Balclutha serves the Clutha population (17,000).

Laboratory, radiology, community services and visiting outpatient clinics are provided on site at all facilities. The role of rural hospitals appears to be vital in maintaining equitable access to health care and can result in adapted solutions for the community. There is sometimes difficulty in delivering services close to site therefore these regional hospitals help this. However, population-based funding does not reflect this reality and there will continue to be a huge deficit at this level given salary demands.

The GPSI (GP with Special Interest) initiative (for example, minor surgery, long term contraceptive services at local clinics) will take pressure away from hospitals and represents a base for a model of future care in the rural context.

A new facility in Dunstan-Clyde opened in November 2005. This is a 24 bed facility providing secondary services including general medical, general surgical, high dependency unit and palliative care services. A haemodialysis unit is available on site for local and visiting renal patients who can independently dialyse. Dunstan is 221 km from Dunedin, 62 km from Queenstown and 55 km from Wanaka. Primary care services are not provided on site.
Oamaru hospital provides ED services and has 24 beds for palliative and ATR. Emergency Department and primary maternity services. Medical staffing is supported by a physician and a semi-retired orthopaedic surgeon. Primary care services are not provided on site. Oamaru is 115 km along State Highway 1 north of Dunedin. The road may be closed a few times a year due to snow.

Balclutha hospital provides primary and secondary services from the facility. There are 13 acute, 4 non acute (ACC rehabilitation beds), and two primary maternity beds. Balclutha is 80 km from Dunedin, along good roads that are only rarely closed. Balclutha is an integrated primary and secondary service.

There are also specialist services based in the rural areas, such as Public Health Nurses and Mental Health teams.

Communities in rural areas wish to determine services and fundraise for equipment to allow service delivery in their area. This may not be the most efficient use of funds. For example, Oamaru raised funds for a CT scan machine which will be operational in March 2008. Involving the DHB in discussions may lead to a different option that could be of benefit for a greater number of people within the region. Issues such as this one require increased coordination between the rural hospitals and the DHB so that complex technology can be best utilised for the population, balanced with the need for accessible services in rural areas.

4.1.5 Private hospital services
Private hospital services in Dunedin are provided at Mercy hospital, with a future development proposed for Queenstown. Private hospital services include: anaesthesia, cardiology, cosmetic surgery, obstetrics, gynaecology, dermatology, endocrinology, endoscopy, ENT, gastroenterology, general medicine, general surgery, neurology, neurosurgery, ophthalmology, oral surgery, orthopaedics, physiotherapy, rheumatology, urology, radiology and paediatrics.

There is also a private mental health facility, Ashburn Clinic.

Despite this comprehensive list of services the volume of service is small when compared to that of other New Zealand cities with private tertiary health services. This may, in part, impact on the standardised discharge ratios (SDR) provided in the public system which indicate the level of elective services provided in Otago DHB is higher than in other New Zealand DHBs.

4.1.6 Mental health services
Acute Mental Health services are undergoing review with the move to the Wakari site. There is a Mental Health facility redesign and relocation project to determine requirements by reviewing the current function of acute Mental Health Services and identifying the appropriate models of care for the future. This information will determine the requirement for Mental Health service facilities with the planned relocation to the Wakari site.

This project runs for 36 months from July 2007 – June 2010. Work streams include all aspects of adult Mental Health services including the NGO sector through focus groups. These work streams consider the:
• redesign of inpatient ward;
• process for access to emergency psychiatric service;
• model for community care provision; and the
• model for day programmes and outpatients.

4.1.7 Aged care
Aged care services provided within the provider arm currently are managed independently of
other provider arm medical, surgical and rehabilitation services. With the ageing of the
population there are opportunities to consider models of care that support integrated and
collaborative care, both within the provider arm and into the community.

The DHB’s aged care actions to date include managing the current over-capacity in the
residential care sector. Needs Assessment and Service Coordination (NASC) are part of the
provider arm service and responsible for managing the decrease in beds.

Support options that allow patients to remain in their own home may include a mobile nurse
service. A community geriatrician would also help to take the pressure off medical and surgical
services.

Otago’s ageing population will place pressure on its health services and create challenges for
care distribution across the continuum of care, from hospital tertiary services right through to
community care, in order to manage the higher demand and ensure older people are well and
independent.

The increase in the number of older people will also mean a higher level of chronic diseases such
as cancer, and these will increasingly be associated with other co-morbidities such as renal and
vascular conditions.

It will be vital to create close working relationships between the hospital service, PHOs and rest
homes to ensure that older people receive sufficient and preventive care. There have been
situations where elderly patients are admitted into the ED due to inappropriate care in rest homes.

4.1.8 Public health
Public Health South comprises two services: the Public Health Service and the Primary Service.

The Public Health Service (unit) provides public health services across the Otago and Southland
districts. It is the only service formally coordinated over both regions and has been so for the last
seven years. The service has strong linkages with community based organisations and has staff
working across the two regions working from offices in Dunedin, Invercargill and Queenstown.
The Public Health unit is largely funded directly by the Ministry of Health Public Health
Operations division through one base (core) contract and side contracts. Other contracts are held
with the New Zealand Food Safety Authority, PHOs and ESR.

The Public Health Service provides health protection and health promotion services via
multidisciplinary teams comprised of Medical Officers of Health, Health Protection Officers,
Health Promotion Advisors, Communicable Disease Nurses and administrative staff.
The service is reorientating its practice framework to a public health outcomes focused service delivery model. Three multidisciplinary teams have recently been established, Settings and Lifestyles, Food Safety and Communicable Disease and Healthy Environments. Service delivery spans the core service delivery lines of alcohol and other drugs, tobacco control, nutrition and physical activity, well child, food safety, communicable disease, sexual health promotion, physical environments, injury prevention, social environments, health promoting schools, and mental health promotion.

The Public Health South Primary Service mostly provides health services to improve the health of children up to the age of 18 years for the Otago DHB and is largely funded by the DHB. Services include vision and hearing screening, public health nursing, adolescent health clinics, administration of the NIR (national immunisation register) immunisation outreach, school dental service, and a sexual health service to a tertiary level.

The primary service also provides cervical and breast screening, health promotion services that cover both Otago and Southland, and administers the cervical screening register for Otago and Southland and some North Island DHBs.

Looking to the future:

- The strong population growth in Central Otago and Queenstown-Lakes will require greater public health and primary service capacity, including larger office space and more FTE staff.
- The Dunedin and Invercargill offices lease agreements expire at the beginning of 2009. Most of the Dunedin office will relocate to the Wakari site in 2008 with sexual health and public health information services to stay on the Dunedin site.
- Given the recognised importance of healthy lifestyle choices in disease prevention (obesity and tobacco leading to diabetes and cancer, for example) and the role that public health plays in encouraging behaviour change, it seems logical for future health funding to take into account the importance of public health initiatives.
- Public health nursing as well as vision and hearing screening are currently based with public health but may be provided by the PHO in the future or by school-based nurses.
- As part of the Ministry of Health led reorientation of community oral health services, school dental services will require a total upgrade of facilities.

4.2 Community services

There are a number of NGOs who have contracts with Otago DHB to deliver services. There has been no detailed discussion about the services provided as part of this service plan development. Few specific issues have been identified other than those identified here. The provider arm also provides a range of community services.
4.2.1 Primary care

There are five PHOs in the Otago DHB. Four subcontract their management services to Health Management Services, which is a division of the Independent Practitioner Association, South Link Health. Currently only general practices are included in Primary Health Organisations, although community and iwi representatives are included at board level.

The five Primary Health Organisations are: Dunedin PHO, Otago Southern region PHO, Rural Otago PHO, Taieri and Strath Taieri PHO, and Mornington PHO. According to the Ministry of Health, total PHO enrolment in Otago DHB was 164,329 Enrolled Service Users (ESUs) in October 2007 for approximately 146 GPs and 144 practice nurses. This is about 93% of the usually resident population, although it should be noted that approximately 17,000 resident students are enrolled with Student Health in Dunedin city, which is not included in the five PHOs above.

Rural Otago PHO has just over 39,000 ESUs in 13 practices with 37 GPs and 46 Practice Nurses. The Rural Otago area covers Wanaka, Cromwell, Alexandra, Ranfurly, Clyde, Lake Hawea, Oamaru, Hampden, Kurow, Otamatata, Omarama, Herbert, Maheno, Moeraki, and Duntroon.

Taieri and Strath Taieri PHO cover the Mosgiel and Middlemarch areas within Dunedin.

Mornington PHO is based around a single practice in the suburb of Mornington with 12 to 13 general practitioners.

The ratios of primary health professionals and practices to population in the different PHOs are shown in Table 9 below.

<table>
<thead>
<tr>
<th>PHO</th>
<th>Dunedin</th>
<th>Taieri and Strath Taieri</th>
<th>Mornington</th>
<th>Rural Otago</th>
<th>Otago Southern Region</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrolled population</td>
<td>77,074</td>
<td>13,806</td>
<td>15,516</td>
<td>39,131</td>
<td>17,283</td>
<td>162,810</td>
</tr>
<tr>
<td>General Practitioners (not full-time equivalent)</td>
<td>73</td>
<td>13</td>
<td>12</td>
<td>36</td>
<td>12</td>
<td>146</td>
</tr>
<tr>
<td>Locums</td>
<td>18</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>21</td>
</tr>
<tr>
<td>Practice nurses</td>
<td>55</td>
<td>13</td>
<td>7.7</td>
<td>46</td>
<td>23</td>
<td>144.7</td>
</tr>
<tr>
<td>Number of practices</td>
<td>29</td>
<td>3</td>
<td>1</td>
<td>13</td>
<td>14</td>
<td>60</td>
</tr>
</tbody>
</table>

These numbers do not necessarily indicate FTE general practitioners, although most are.

According to information given by Student Health in Dunedin, December 2007.
<table>
<thead>
<tr>
<th>PHO</th>
<th>Dunedin</th>
<th>Taieri and Strath Taieri</th>
<th>Mornington</th>
<th>Rural Otago</th>
<th>Otago Southern Region</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>GP per 1000</td>
<td>0.95</td>
<td>0.94</td>
<td>0.77</td>
<td>0.92</td>
<td>0.69</td>
<td>0.90</td>
</tr>
<tr>
<td>GP and locums per 1000</td>
<td>1.18</td>
<td>1.01</td>
<td>0.77</td>
<td>0.92</td>
<td>0.81</td>
<td>1.03</td>
</tr>
</tbody>
</table>

Source: PHOs update report to CPHAC/DSAC, August 2007

OECD data from 2005 lists 2.2 physicians entitled to practice per 1,000 people for New Zealand, however the Royal College of General Practitioners in New Zealand states the national average at 0.77 and between 0.74 and 0.52 for the rural average\(^\text{14}\). From this perspective, Otago is above average in terms of GP access.

As defined in section 4.1.4 on rural services, there are three rural hospitals, in Balclutha (Clutha), Oamaru (Waitaki) and Dunstan (Central Otago).

The region’s only community birthing facility is the Charlotte Jean Maternity hospital, in Alexandra. However both Balclutha and Oamaru hospitals have birthing facilities.

There are 50 residential aged care facilities funded by the DHB throughout the region.

The DHB funder arm’s primary care strategy is based on encouraging PHOs to move towards larger “ polyclinic” facilities, similar to the Mornington model, to position them to be able to move beyond GP-dominated models of care.

**Mental health community services**

A review was completed in 2005 of Blueprint target figures in the medium – long term rehabilitation beds at Wakari hospital. The process resulted in beds being closed as bed occupancy had been significantly under-utilised for a period of time. Following this there has been a considerable amount of work done to assess the consumer need within specific sectors of the community. From this work several proposals were put forward to develop home based treatment services, the Planning and Funding team are currently working through the potential configurations for the 2008-09 year.

**4.2.2 Other NGOs**

Otago DHB contracts with private providers for other services including pharmacy, mental health and aged care. At this time the sector undergoing most change is the residential care sector to bring the bed numbers into line with the recommended levels and provide support to achieve support to keep people at home.

\(^{14}\)Fretter J, Pande M. “Forecasting GP workforce capacity” RNZCGP Policy Unit, (July 2006)
4.3 Inflows and outflows

4.3.1 Southland DHB
The Southland and Otago DHBs have a very close working relationship. Dunedin hospital is heavily dependent on Southland’s population to maintain its tertiary services and ensure clinicians retain their skills and expertise. Southland DHB’s population was 117,230 in mid 2006, with a socio-demographic profile similar to that of Otago.

Southland is experiencing rapid change due to the expansion of dairy farming and the population growth in the Queenstown area. In the near future, it may be affected by the development of an oil exploration industry.

From a health needs perspective, the Otago and Southland region are very similar, and are thought of as one region by many.

As a provider of health services, Southland DHB is relatively small, and along with similar hospitals in smaller New Zealand cities, faces challenges in sustaining its clinical workforce and its capacity to provide high-quality secondary services. One response to its situation is to consider the development of regional services that span the Otago and Southland regions. The Southern Regional Blood and Cancer service is the first to reach implementation stage.

9% of Otago DHB’s inpatient case-weighted discharges are for people who live in the Southland DHB region, and are funded as IDFs. However Southland DHB patients account for only 4% of all discharges, indicating that they travel to Otago for relatively complex services.

Southland DHB residents also use 2.4% of Otago DHB’s outpatient services.

Figure 3: Inpatient discharges by DHB of patient residence, 2007
4.3.2 Canterbury DHB

Christchurch is the main hospital centre in Canterbury, and Otago relies on the expertise of Canterbury DHB for some specialist services. Although there is no formal initiative to collaborate with Canterbury region at this stage (with the exception of child cancer services and renal transplants), the South Island Shared Service Agency Limited (SISSAL), a joint venture of all the South Island DHBs, supports a range of joint planning and funding activities.

Otago DHB supplies some services to residents of Canterbury and South Canterbury DHBs, totalling about 1.1% of inpatient discharges (but 2.0% of inpatient case weights), and 0.9% of outpatient visits.

4.4 A centre for tertiary training

Otago DHB is a centre of training for health services. The various professional schools have been a major influence on the DHB’s development, and strongly affect the nature of the workforce and the services it provides.

At the clinical level, it appears that the joint clinical and teaching roles attract clinicians who are professionally motivated by research and teaching. This may correlate with the relatively low rates of private secondary services in the region.

Because Dunedin is a national training centre for many health professions, recruitment at all levels is boosted by students from other areas choosing to stay or return to Dunedin after graduation.

4.4.1 University of Otago

Dunedin hospital’s main site borders the University of Otago campus. The School of Medicine occupies about 15% of the main hospital buildings. The University funded 20% of the original building costs, and was allocated 20% of the space. Some of the hospital’s senior clinicians are jointly appointed by the University, and have teaching and/or research commitments. The University and the DHB agree that this dual arrangement facilitates staff recruitment and retention in both organisations.

The University has the country’s national school of dentistry, the largest school of pharmacy, and a school of physiotherapy. The University also offers degrees in medical laboratory sciences and clinical psychology. Dunedin is the main site for the University of Otago’s School of Medicine pre-clinical training, and one of its three sites for clinical training. The Faculty of Medicine also offers postgraduate training in nursing.

The University plans to keep overall student numbers close to current levels. It will seek growth in research, especially translational research, with corresponding increases in staffing, buildings and other resources.

4.4.2 Otago Medical School: “teach where the patients are”

The Medical School plans to continue both its preclinical and clinical training in Dunedin for the foreseeable future. Current enrolments are 240 trainees per year in the preclinical programme.
and 80 per year in the clinical programme. The other preclinical students move on to Otago’s Christchurch and Wellington campuses.

The School is seeking to move significant parts of the training out from the academic setting to “teach where the patients are”. At the pre-clinical level, this includes experiences in community health settings, and early patient contact and clinical skills training.

At the clinical level, the School wishes to place trainees at all stages of the patient journey. Compared to traditional training, this means less time in the inpatient settings, and more in outpatient clinics and with other community-based providers.

The Department of General Practice is increasing its rural training. A ‘Rural Immersion’ programme has been initiated where some fifth year students spend their whole year in a rural setting. Two of the centres for this programme are in Otago. This programme complements a shorter rotational programme, with all students spending time in a rural health setting predominantly in Otago/Southland. The RNZCGP is also increasing its rural training. Rural registrar places are being raised by 50%; this corresponds to 38 rural GP registrars and 12 rural hospital placings across the whole country each year.

The implications for Otago DHB of the University’s strategic plans include:

- GP clinics need to increase in size, to include space for training for students from second year onwards.
- The School would seek to include academic space in any major facility developments such as Wakari.
- The School will seek more teaching space in outpatient facilities, including the hospital Emergency Department, some or all of the rural hospitals, and Southland DHB facilities.
- The School and the wider University expects to need more facilities for clinical and translational research.
- Service provision, teaching and research need to be co-located.

4.4.3 Otago Polytechnic

Otago Polytechnic teaches undergraduate nursing, under- and post-graduate midwifery, occupational therapy, and social services (including rest home work and care for people with disabilities).

The School of Nursing trains approximately 96 nurses per year, who also complete much of their practical training within the Otago DHB’s services, although the Polytechnic reports that the number of clinical placements within the Otago DHB has been lower since 2005. It graduates between 65-80 nurses per year who are also of strategic importance to the country’s health workforce.
The School of Midwifery offers a three year bachelor programme in midwifery. The number of graduates ranges between 15 and 20 per year, with 16 midwives graduating in 2007. This number is expected to remain constant in 2008, however the number of students and therefore graduates may increase in 2009 due to the planned adoption of a distance learning option for the course. Graduates are all employed immediately after graduation due to the current shortage of midwives in New Zealand.

The School of Occupational Therapy offers courses at undergraduate and postgraduate level. In 2007 there were 53 graduates at the undergraduate level.

4.5 Current performance indicators

It is useful to situate the efficiency of Otago’s hospital services in the context of national benchmarks as well as the level of services it delivers in an absolute sense. This section gives some key performance indicators.

4.5.1 Throughput

In Figure 4 below we give the total case weighted discharges for Otago from 2001 until April 2007. This information comprises medical, total surgical, and surgical elective case-weighted discharge delivery data. To better understand the volume of work we have thought it useful to include Southland’s data on the same graph, with a graph of national activity below for the same period.

Figure 4: Monthly case-weighted discharges 2001 – 2007, Otago and Southland DHBs

Although it is perhaps of little use to look at absolute levels of activity given the difference in population levels over the regions, it is interesting to observe the trend in activity over the period. There appears to be a loose element of seasonality in the first half of the period (2001 to 2004)
for Otago with lower discharges in the new year/summer periods. Southland on the other hand does not seem to follow the same trend.

Figure 5 below shows national case-weighted discharges. It shows a slight upward linear trend over the period but also demonstrates a seasonal drop in discharges in the early summer months of the year.

Figure 5 Monthly case-weighted discharges 2001 - 2007, all of New Zealand

![Graph showing national case-weighted discharges with a slight upward linear trend and a seasonal drop in early summer months.]

4.5.2 General performance indicators
Table 10 below shows Ministry of Health measures of quality and efficiency for hospitals, including emergency triage times, patient satisfaction, acute readmission rates, average length of stay, and rate of day case procedures.

For the July – September 2006 quarter, Otago performs relatively well compared to all DHBs, particularly in emergency triage times. The length of stay however as well as the day case procedures rate shows room for improvement compared to the national average. Some of these indicators are explored in more depth in Figure 6, Figure 7, and Figure 8 below.
Table 10: Selected Otago DHB performance indicators, 3 months to September 2006

<table>
<thead>
<tr>
<th>Measure</th>
<th>Expressed as</th>
<th>Result</th>
<th>All DHBs</th>
<th>Target</th>
<th>Rank</th>
<th>Trend</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Organisational Health</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Staff Turnover</td>
<td>resignations for quarter as % of total headcount</td>
<td>2.66</td>
<td>2.79</td>
<td>-</td>
<td>12(19)</td>
<td>▼</td>
</tr>
<tr>
<td>Sick Leave**</td>
<td>sick leave hours as % of accrued Full Time Equivalent hours</td>
<td>3.73</td>
<td>-</td>
<td>-</td>
<td>13(19)</td>
<td>-</td>
</tr>
<tr>
<td>Workplace Injuries or Illnesses</td>
<td>injuries/illnesses per 1,000,000 hours worked</td>
<td>10.52</td>
<td>7.27</td>
<td>-</td>
<td>16(20)</td>
<td>▲</td>
</tr>
<tr>
<td><strong>Quality and Patient Outcome</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergency Triage Times</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triage 1</td>
<td>% triage 1 patients treated immediately</td>
<td>100.0</td>
<td>88.4</td>
<td>100.0</td>
<td>1(19)</td>
<td>▼</td>
</tr>
<tr>
<td>Triage 2</td>
<td>% triage 2 patients treated within 10 minutes</td>
<td>75.7</td>
<td>63.0</td>
<td>80.0</td>
<td>10(19)</td>
<td>▼</td>
</tr>
<tr>
<td>Triage 3</td>
<td>% triage 3 patients treated within 30 minutes</td>
<td>41.9</td>
<td>51.3</td>
<td>75.0</td>
<td>15(19)</td>
<td>▼</td>
</tr>
<tr>
<td>Patient Satisfaction</td>
<td>aggregated % satisfaction score</td>
<td>90.1</td>
<td>88.0</td>
<td>-</td>
<td>5(20)</td>
<td>▼</td>
</tr>
<tr>
<td>Acute Readmissions**</td>
<td>readmissions per 1,000 discharges</td>
<td>28.5</td>
<td>30.6</td>
<td>-</td>
<td>7(21)</td>
<td>-</td>
</tr>
<tr>
<td><strong>Process and Efficiency</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Length of Stay</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual average length of stay</td>
<td>average days stayed per discharged inpatient</td>
<td>4.57</td>
<td>4.09</td>
<td>-</td>
<td>19(21)</td>
<td>▼</td>
</tr>
<tr>
<td>Average length of stay rate</td>
<td>actual ALOS as % of expected (casemix adjusted)</td>
<td>97.1</td>
<td>-</td>
<td>-</td>
<td>8(21)</td>
<td>▼</td>
</tr>
<tr>
<td>Daycase Procedures**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual daycase procedures rate</td>
<td>daycases as % of all elective procedures</td>
<td>47.7</td>
<td>51.6</td>
<td>-</td>
<td>18(21)</td>
<td>-</td>
</tr>
<tr>
<td>Daycase procedures rate</td>
<td>actual daycases as % of expected (casemix adjusted)</td>
<td>100.0</td>
<td>-</td>
<td>-</td>
<td>15(21)</td>
<td>-</td>
</tr>
<tr>
<td>Did Not Attends**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% rate of non-attendance for specialist appointments</td>
<td>9.08</td>
<td>9.22</td>
<td>-</td>
<td>10(20)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Day of Surgery Admissions**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual day of surgery admissions rate</td>
<td>day of surgery admissions as % of all inpatient surgery</td>
<td>41.5</td>
<td>42.1</td>
<td>-</td>
<td>15(21)</td>
<td>-</td>
</tr>
<tr>
<td>Day of surgery admissions rate</td>
<td>Actual DOSA as % of expected (casemix adjusted)</td>
<td>89.6</td>
<td>-</td>
<td>-</td>
<td>16(21)</td>
<td>-</td>
</tr>
</tbody>
</table>

The table contains the summary of Otago DHB results against all HBI performance measures. The trend indicator arrows show either a trend up over four quarters or a trend down over four quarters, and a square indicates no change to the level of 2 significant figures. Ranking provides a simple performance-related index.

4.5.3 Patient satisfaction
Otago consistently shows a higher level than the average for all DHBs although patient satisfaction varies. The satisfaction rating is obtained from questionnaires that ask patients to rate their overall satisfaction with services.

Figure 6: Patient satisfaction: Sept 2003 – Sept 2006


4.5.4 Length of stay
Figure 7 below shows the average length of stay (ALOS) expressed as a percentage of the expected average length of stay, weighted to take account of the DHB hospital case mix. One hundred percent is the sector average. Over the three-year period, the average length of stay follows a fairly constant trend below the sector average, indicating that Dunedin hospital is more efficient than many other DHB hospitals.

Figure 7: Average length of stay
4.5.5 Emergency Department performance

Emergency triage rates are rated across three levels in terms of acuteness and indicate the percentage of patients who begin assessment and treatment within the times recommended for each code by the Australasian College of Emergency Medicine (ACEM). For the triage 2 rate, the ACEM recommendation is that 80% of triage 2 patients should be seen within 10 minutes. Over the three-year period Otago shows greater than average efficiency, although its rate is falling.

Figure 8: Emergency Department: Triage level 2 clearance rate, Otago DHB and National

5  Future demand for health services

This section outlines our forecast for demand in Otago. Not surprisingly, given the demographic changes outlined in section four, we can see an increase in demand for services for the elderly, and a fall in demand for services for young people and infants.

5.1  Forecast under status quo

In the next fifteen years, the effect of the ageing population alone is expected to raise demand for inpatient services by 30%. Bed-days used – a measure of the demand for facilities – are projected to rise by 25% if current technologies and models of service delivery are retained.

Demand for outpatient services will rise by around 16%. Community services – which are mostly used by older people – could increase by around 50% within fifteen years.

The base forecast also shows expected changes in IDF's, based on changes in populations in the other DHBs and Otago’s current rates of treatment.

5.2  Key assumptions

The base forecast is a projection of the effects of demographic changes on demand for health services, assuming that models of care, technology, and disease incidence and prevalence remain constant.

The key exogenous assumptions are the population projections produced by Statistics New Zealand. We use the medium growth scenario of the sub-national population projections that were released on 3 December 2007. These projections are based on the March 2006 Census, updated with births and deaths to June 2007. They measure the “usually resident” population in June 2006. Tertiary students are included at their current residence; this is a change from some earlier Census measures which counted students in their home region.

We supplement the projections of resident population with an estimate of overseas visitor numbers. In the base scenario, the number of overseas visitors by age is held constant; we test the effect of changes in visitor numbers in a sensitivity analysis.

The sub national projections are available by age and sex for all regional councils and territorial authorities. Unfortunately, projections by ethnicity are not available at this level of detail. Given the relatively low proportion of Māori in the Otago population, and the suggestion that there is less disparity in use of health services by ethnicity in Otago compared to other regions, the projections assume that all ethnicities make the same demands on health services.
Key assumptions in the Statistics NZ forecasts include:

- That fertility rates are peaking, and will not continue to rise after 2011.
- Net migration that is slightly higher than recent levels, with net migration of 46,000 in the five years to 30 June 2011 and 50,000 in each subsequent five-year period.
- Continuing but slowing increases in life expectancy.

Figure 2 earlier on in this report shows the population by age in both 2006 and 2026. However, as health services are predominantly used by older people, it is useful to look at the changes relative to 2006, as shown in Figure 9.

**Figure 9: Otago DHB, projected populations by age group, relative to 2006**

![Population projection chart](image)

*Statistics New Zealand sub-national population projections, medium scenario, December 2007*

The number of people aged over 85 will double a few years before 2030. The number of people aged 65 – 84 will rise by more than half within twenty years. All other age groups will decline by 2026.

Statistics NZ projects that births will decline in all but its highest-growth scenario. All three scenarios are shown in Figure 10.
The population projections are converted to weights for each future year, age group, sex, and ethnicity. These are multiplied by the current level of service for the same age group, sex, and ethnicity to calculate projections of future demand.

Hence the projections are largely determined by the current demand for health services in each age group. The following two charts show how three different measures of inpatient service volume currently vary by age. The rates have been normalised, so that the area under each curve adds up to one.

There are some differences between the three measures: case-weights put more emphasis on services used by young children; bed-days and discharges give greater weight to services used by the oldest age groups. Teenage females appear to have a relatively high case-weight per discharge or bed-day.
The relatively high level of male bed-days in the 30 - 50 age range is almost entirely in the Intellectual Disability and Mental Health areas.

Whichever of the three measures is chosen, it is clear that any projection of demand for health services will be extremely sensitive to the expected number of older people.
5.4 Summary of best estimate

Table 11 shows the projected increase in demand for inpatient services, as measured by case-weight. Table 12 shows the increase measured in bed-days. Case-weights give an indication of the demand for overall resource use and funding; bed-days indicate demand for physical ward space.

Table 11: Forecast demand for inpatient services, by case-weight

<table>
<thead>
<tr>
<th>Service</th>
<th>2011</th>
<th>2016</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychogeriatrics</td>
<td>12%</td>
<td>25%</td>
<td>66%</td>
</tr>
<tr>
<td>Older Peoples Health</td>
<td>11%</td>
<td>25%</td>
<td>65%</td>
</tr>
<tr>
<td>Mental Health</td>
<td>9%</td>
<td>21%</td>
<td>56%</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>10%</td>
<td>22%</td>
<td>53%</td>
</tr>
<tr>
<td>Urology</td>
<td>11%</td>
<td>22%</td>
<td>48%</td>
</tr>
<tr>
<td>Cardiothoracic</td>
<td>9%</td>
<td>20%</td>
<td>45%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>8%</td>
<td>18%</td>
<td>45%</td>
</tr>
<tr>
<td>Cardiology</td>
<td>9%</td>
<td>19%</td>
<td>40%</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>8%</td>
<td>18%</td>
<td>38%</td>
</tr>
<tr>
<td>Haematology</td>
<td>9%</td>
<td>18%</td>
<td>37%</td>
</tr>
<tr>
<td>General Surgery</td>
<td>7%</td>
<td>15%</td>
<td>34%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>6%</td>
<td>15%</td>
<td>32%</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>6%</td>
<td>12%</td>
<td>27%</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>4%</td>
<td>10%</td>
<td>24%</td>
</tr>
<tr>
<td>Oncology</td>
<td>6%</td>
<td>14%</td>
<td>22%</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>8%</td>
<td>14%</td>
<td>22%</td>
</tr>
<tr>
<td>ENT</td>
<td>4%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>Pain</td>
<td>3%</td>
<td>14%</td>
<td>19%</td>
</tr>
<tr>
<td>Renal</td>
<td>6%</td>
<td>10%</td>
<td>18%</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>4%</td>
<td>7%</td>
<td>16%</td>
</tr>
<tr>
<td>Neurology</td>
<td>4%</td>
<td>8%</td>
<td>11%</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>3%</td>
<td>4%</td>
<td>10%</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>2%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>1%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>Physical Rehab</td>
<td>5%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>Dental</td>
<td>1%</td>
<td>-1%</td>
<td>-4%</td>
</tr>
<tr>
<td>Maternity</td>
<td>-1%</td>
<td>0%</td>
<td>-4%</td>
</tr>
<tr>
<td>NICU - Paediatrics</td>
<td>5%</td>
<td>0%</td>
<td>-5%</td>
</tr>
<tr>
<td>Paediatric Medicine</td>
<td>0%</td>
<td>-3%</td>
<td>-7%</td>
</tr>
<tr>
<td>Paediatric Surgery</td>
<td>-3%</td>
<td>-5%</td>
<td>-8%</td>
</tr>
<tr>
<td><strong>Inpatient total</strong></td>
<td>7%</td>
<td>14%</td>
<td>30%</td>
</tr>
</tbody>
</table>

Measured by case-weights, population pressures are projected to increase demand for inpatient services is projected to rise by 30% by 2026. However Table 12 shows that demand for bed-days would be slower, with a rise of 24% after 20 years.
### Table 12: Projected cumulative changes in inpatient bed-days

<table>
<thead>
<tr>
<th>Service</th>
<th>Increase in bed-days</th>
<th>Relative to base year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2011</td>
<td>2016</td>
</tr>
<tr>
<td>Older Peoples Health</td>
<td>1,615</td>
<td>3,625</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>1,546</td>
<td>3,321</td>
</tr>
<tr>
<td>General Surgery</td>
<td>840</td>
<td>1,990</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>682</td>
<td>1,528</td>
</tr>
<tr>
<td>Cardiac Surgery</td>
<td>463</td>
<td>1,018</td>
</tr>
<tr>
<td>Cardiology</td>
<td>454</td>
<td>942</td>
</tr>
<tr>
<td>Psychogeriatrics</td>
<td>330</td>
<td>730</td>
</tr>
<tr>
<td>Mental Health</td>
<td>162</td>
<td>754</td>
</tr>
<tr>
<td>Respiratory</td>
<td>197</td>
<td>473</td>
</tr>
<tr>
<td>Urology</td>
<td>167</td>
<td>334</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>118</td>
<td>293</td>
</tr>
<tr>
<td>Oncology</td>
<td>130</td>
<td>313</td>
</tr>
<tr>
<td>Renal</td>
<td>154</td>
<td>253</td>
</tr>
<tr>
<td>Haematology</td>
<td>107</td>
<td>195</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>92</td>
<td>180</td>
</tr>
<tr>
<td>ENT</td>
<td>74</td>
<td>154</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>45</td>
<td>112</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>29</td>
<td>56</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>42</td>
<td>78</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>38</td>
<td>64</td>
</tr>
<tr>
<td>Neurology</td>
<td>25</td>
<td>58</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>15</td>
<td>20</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Dental</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Physical Rehab</td>
<td>423</td>
<td>360</td>
</tr>
<tr>
<td>Paediatric Surgery</td>
<td>-11</td>
<td>-16</td>
</tr>
<tr>
<td>Paediatric Medicine</td>
<td>0</td>
<td>-68</td>
</tr>
<tr>
<td>Intellectual Disability</td>
<td>-216</td>
<td>-170</td>
</tr>
<tr>
<td>NICU - Paediatrics</td>
<td>258</td>
<td>14</td>
</tr>
<tr>
<td>Maternity</td>
<td>-1</td>
<td>-48</td>
</tr>
<tr>
<td>Inpatient total</td>
<td>7,783</td>
<td>16,568</td>
</tr>
</tbody>
</table>
Outpatient services can only be projected by ‘volumes’, which are usually outpatient visits. However, the unit of measure may differ from service to service, so the bottom line should be interpreted with some caution. Those caveats aside, Table 13 shows the projected changes in demand for outpatient services relative to current 2007 levels. Overall, demand is projected to increase by about 20% by 2026.

Table 13: Outpatient services: projected volume changes relative to 2007

<table>
<thead>
<tr>
<th>Speciality</th>
<th>2011</th>
<th>2016</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older Peoples Health</td>
<td>10%</td>
<td>23%</td>
<td>63%</td>
</tr>
<tr>
<td>Psychogeriatrics</td>
<td>9%</td>
<td>21%</td>
<td>59%</td>
</tr>
<tr>
<td>Radiation Oncology</td>
<td>10%</td>
<td>20%</td>
<td>42%</td>
</tr>
<tr>
<td>Cardiothoracic</td>
<td>8%</td>
<td>19%</td>
<td>41%</td>
</tr>
<tr>
<td>Urology</td>
<td>9%</td>
<td>19%</td>
<td>39%</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>7%</td>
<td>14%</td>
<td>32%</td>
</tr>
<tr>
<td>Oncology</td>
<td>8%</td>
<td>17%</td>
<td>31%</td>
</tr>
<tr>
<td>Cardiology</td>
<td>7%</td>
<td>15%</td>
<td>29%</td>
</tr>
<tr>
<td>Rural Hospital</td>
<td>6%</td>
<td>13%</td>
<td>27%</td>
</tr>
<tr>
<td>General Surgery</td>
<td>6%</td>
<td>12%</td>
<td>27%</td>
</tr>
<tr>
<td>Haematology</td>
<td>7%</td>
<td>14%</td>
<td>27%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>6%</td>
<td>13%</td>
<td>26%</td>
</tr>
<tr>
<td>Rheumatology</td>
<td>6%</td>
<td>12%</td>
<td>22%</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>6%</td>
<td>10%</td>
<td>22%</td>
</tr>
<tr>
<td>Emergency Department</td>
<td>5%</td>
<td>10%</td>
<td>21%</td>
</tr>
<tr>
<td>Renal</td>
<td>4%</td>
<td>12%</td>
<td>20%</td>
</tr>
<tr>
<td>ENT</td>
<td>5%</td>
<td>9%</td>
<td>19%</td>
</tr>
<tr>
<td>Endocrinology</td>
<td>5%</td>
<td>11%</td>
<td>19%</td>
</tr>
<tr>
<td>Allied Health</td>
<td>4%</td>
<td>8%</td>
<td>15%</td>
</tr>
<tr>
<td>Gastroenterology</td>
<td>4%</td>
<td>8%</td>
<td>15%</td>
</tr>
<tr>
<td>Dermatology</td>
<td>3%</td>
<td>6%</td>
<td>15%</td>
</tr>
<tr>
<td>Physical Rehab</td>
<td>4%</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>Neurosurgery</td>
<td>5%</td>
<td>9%</td>
<td>13%</td>
</tr>
<tr>
<td>Orthopaedics</td>
<td>2%</td>
<td>5%</td>
<td>9%</td>
</tr>
<tr>
<td>Neurology</td>
<td>3%</td>
<td>5%</td>
<td>8%</td>
</tr>
<tr>
<td>Gynaecology</td>
<td>1%</td>
<td>3%</td>
<td>4%</td>
</tr>
<tr>
<td>Pain</td>
<td>0%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Maternity</td>
<td>-3%</td>
<td>-1%</td>
<td>-3%</td>
</tr>
<tr>
<td>Child Development - Paediatrics</td>
<td>4%</td>
<td>0%</td>
<td>-4%</td>
</tr>
<tr>
<td>Sexual Health</td>
<td>2%</td>
<td>0%</td>
<td>-6%</td>
</tr>
<tr>
<td>Paediatric Surgery</td>
<td>0%</td>
<td>-3%</td>
<td>-7%</td>
</tr>
<tr>
<td>Paediatric Medicine</td>
<td>-1%</td>
<td>-3%</td>
<td>-7%</td>
</tr>
<tr>
<td><strong>Outpatient total</strong></td>
<td>5%</td>
<td>10%</td>
<td>20%</td>
</tr>
</tbody>
</table>
Community services provided by Otago DHB are projected to increase by 49%. Table 14 shows the projected increase in each category of community services. “Older people’s health” could increase by two-thirds in 20 years time.

Table 14: Projected increase in volume of community services

<table>
<thead>
<tr>
<th>Forecast year</th>
<th>2011</th>
<th>2016</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Older People’s Health</td>
<td>12%</td>
<td>27%</td>
<td>67%</td>
</tr>
<tr>
<td>Psychogeriatrics</td>
<td>9%</td>
<td>22%</td>
<td>61%</td>
</tr>
<tr>
<td>Community Services</td>
<td>9%</td>
<td>20%</td>
<td>48%</td>
</tr>
<tr>
<td><strong>Community Services Total</strong></td>
<td><strong>9%</strong></td>
<td><strong>20%</strong></td>
<td><strong>49%</strong></td>
</tr>
</tbody>
</table>

5.5 Projected Inter-District Flows

Applying each DHB’s population projections to the number of its residents who are treated by Otago DHB gives a forecast of Otago’s inwards IDFs. Figure 13 shows the forecasts for each of the Southern Region DHBs, and for each of the other regions. The figure in brackets after the DHB or region name is the current proportion of Otago’s IDFs that come from that region.

Southland DHB residents currently make up 54% of IDFs treated in Otago. They are expected to rise by over 30% by the year 2031, slightly faster than the increase in services to Otago residents. Demand from Canterbury and South Canterbury patients will increase at a slightly lower rate than demand from Otago residents. Demand from the Central Region will increase slightly faster.

Demand from Midland and Northland is not significant in absolute terms. However the rapid projected increase in IDFs from the Northern Region reflects the rapid population growth expected in the Auckland DHBs; this could translate to more demand for services in the Otago DHB if there were major constraints on supply in Auckland.
5.6 Uncertainties and sensitivity analyses

5.6.1 Population scenarios
Statistics NZ provides three population scenarios to give some idea of the range of possible outcomes under differing assumptions for migration, births, and deaths. The following table summarises the effects on the demand projections under Statistics New Zealand’s high, medium, and low population growth scenarios.

The range of projected increases for inpatient discharges is 8% and 31%; case-weighted discharges might increase between 19% and 42%; and annual bed-days might increase between 13% and 36%.

Table 15: Sensitivity of inpatient projections by population scenario

<table>
<thead>
<tr>
<th>Measure</th>
<th>2007</th>
<th>2011</th>
<th>2016</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discharges</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>31,235</td>
<td>31,714</td>
<td>32,344</td>
<td>33,855</td>
</tr>
<tr>
<td>Medium</td>
<td>31,235</td>
<td>32,714</td>
<td>34,140</td>
<td>37,325</td>
</tr>
<tr>
<td>High</td>
<td>31,235</td>
<td>33,722</td>
<td>35,939</td>
<td>40,952</td>
</tr>
<tr>
<td>Cumulative change in discharges, relative to 2007</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>2%</td>
<td>4%</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>Medium</td>
<td>5%</td>
<td>9%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>8%</td>
<td>15%</td>
<td>31%</td>
<td></td>
</tr>
</tbody>
</table>
The range of outpatient volume projections is very similar to that for inpatients, ranging from a 9% to a 31% increase by 2026.

Table 16: Sensitivity of outpatient volume projections by population scenario

<table>
<thead>
<tr>
<th>Measure</th>
<th>Projection</th>
<th>Year</th>
<th>2006</th>
<th>2011</th>
<th>2016</th>
<th>2026</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sum of Volume</td>
<td>Low</td>
<td></td>
<td>197,051</td>
<td>200,741</td>
<td>205,650</td>
<td>214,931</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td></td>
<td>197,051</td>
<td>206,346</td>
<td>216,471</td>
<td>236,273</td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
<td>197,051</td>
<td>211,960</td>
<td>227,287</td>
<td>258,274</td>
</tr>
<tr>
<td>Increase in volume, relative to base year</td>
<td>Low</td>
<td></td>
<td>2%</td>
<td>4%</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Medium</td>
<td></td>
<td>5%</td>
<td>10%</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High</td>
<td></td>
<td>8%</td>
<td>15%</td>
<td>31%</td>
<td></td>
</tr>
</tbody>
</table>

5.6.2 Other drivers of change

The model presented in this Clinical Services Plan could be expanded in several ways. It projects current disease patterns and current models of prevention and treatment, and varies the number of people in each category.

Changes in disease patterns are important for their effect on different services, although the net effect on longevity and need for care is less. For example, rates of coronary heart disease have halved over the last twenty years. While this reduces the need for acute services such as cardiac surgery, it can lead to an increase in chronic treatments such as medical management of cholesterol levels in survivors of heart attacks, and in the incidence of heart failure.
Declines in one condition can paradoxically cause an increase in the number of cases of other conditions. Cancer incidence is increasing at over 1% per year\textsuperscript{15}, largely due to the decline in “competing risks” from heart disease and other causes of death; however cancer mortality rates are decreasing as treatment improves. Again, the net effect is an increase in the demand for cancer services.

An increase in diabetes is a major problem across New Zealand. While diabetes in Otago is not approaching the crisis level occurring in some District Health Boards, obesity and other risk factors for diabetes continue to rise.

Changes in methods of treatment can have major effects on the resources needed to deliver health services. Elsewhere in this Plan we discuss opportunities to integrate primary and secondary care to prevent and better treat many conditions. Within the 15-year span of this Plan there will also be significant changes in diagnostics, medicines, and surgical technologies. We have captured some of these in the service interviews.

Overall, the changes in health care can lead to two possible futures: an “expansion of morbidity”, where people live longer and consume much more health care; or a “compression of morbidity”, where people live longer in better health, and the need for intensive health care remains concentrated in the last few years of life. Empirical studies in New Zealand indicate that the two effects appear to balance out, and people’s need for care over a longer time will be offset by an increase in general levels of health\textsuperscript{16}.

\textsuperscript{15}“Cancer in New Zealand: Trends and projections” Ministry of Health (2002)

\textsuperscript{16}Graham et al. “Compression, expansion, or dynamic equilibrium? The evolution of health expectancy in New Zealand” Epidemiology Community Health (online) 8.58: 659-66
6 Infrastructure to support current health services

6.1 Southern Alliance

Southern Alliance is the Otago and Southland DHBs’ virtual shared services entity, which commenced on 1 February 2007. Southern Alliance represents a new, formal era of collaboration between the two DHBs and is the vehicle that will promote greater day-to-day working regional relationships between Otago DHB and Southland DHB.

6.2 Facilities

This CSP focuses on the publicly-owned, hospital providers. This section briefly describes them, and then lists the main facilities in the district that are funded by the DHB to provide personal health services.

As at October 2007, the Otago DHB directly employed 2198 FTE staff. Most of these are employed in health service delivery, but the total also includes its management and the Planning and Funding arm. Most work at the Dunedin hospital and Wakari sites. More detail is given in Section 6.4 below.

Dunedin hospital is a 400 bed facility providing secondary and tertiary services.

Wakari hospital has approximately 100 resourced beds, of which 75% are used for mental health, and the remaining 25% are for physical rehabilitation patients. The Wakari campus will continue to be the base for community mental health services.

6.3 Information Systems (IS)

The Southern Alliance is integrating Otago and Southland DHBs’ information systems to support common platforms. A Regional Chief Information Manager was appointed in May 2007 to lead the integration process.

A regional IS structure should support regional alignment, enable successful regional clinical services and improve efficiency and effectiveness through greater value for money as resources are shared across the region. The IS plan seeks to move from a concentrated level (functional or departmental) to a wider level (enterprise–wide, process oriented).

Otago and Southland are also working with other DHBs as set out in the national network strategy developed in 2005. For example, they provide database administration support to the West Coast DHB; and they are connected to the secure DHB One Office (DHBOO) network that enables sharing of large files between South Island DHBs as well as with radiology and pathology providers.

6.3.1 Current IS state
The Southern Alliance is responsible for over 30 applications used in the region. iSOFT HealthViews is the Clinical Information System that allows all clinical departments to access patient information. The HealthViews system is remotely accessed by the Dunedin After-Hours Doctors Clinic as well as the Dunedin and Invercargill Hospices.

Through this iSOFT system, discharge summaries are sent directly to GP Patient Management Systems. The functions of iSOFT include Forms Toolkit and eOrdering for laboratory and radiology tests. Electronic versions of existing services such as eLabs and eDischarge Summaries are fully implemented in Otago for inpatient areas and will be extended into Southland DHB.

The Emergency Department and theatres in Otago use the Hospital Administration Software Solutions (HASS), the Emergency Department Information System; is being considered for adoption by Southland DHB. It will be integrated with HealthViews to provide up-to-date clinical information in the Emergency Departments. Mental health uses a locally developed MHSmart product. The laboratory system currently uses TripleG. Other specific department systems will be integrated to the iSOFT clinical viewer over time.

Wireless access points have been provided throughout the Dunedin hospital ward block and will be added to relevant clinical areas in Wakari hospital. Wireless networking enables clinical staff to access patient records from mobile computers during ward rounds.

It appears that regional access to broadband is reasonable. Telecom offers moderate speed broadband to any town with a telephone exchange, which should cover all general practices. The government has also committed to improved regional broadband through Project Probe.

6.3.2 Future IS state
Southern Alliance intends to work with SouthLink Health to enable all primary providers to access hospital medical records through HealthViews.

In the future, eOrdering is expected to reduce paper dependence for pathology and radiology, and the Forms Toolkit will allow more effective processes between departments and support services such as Allied Health. E-Pharmacy through e-prescribing is due to be trialled in 2008 and with electronic administration of drugs should reduce adverse drug events.
The picture Archiving and Communication System (PACS) will be used across both regions to replace paper x-rays with the images being available through the HealthViews platform. It is currently being used in Southland and will be available in Otago from mid 2008.

Wireless services will be extended to cover all areas of Dunedin and Wakari hospital.

6.3.3 Corporate systems
The Otago DHB intranet is the principal tool to deliver management reports and information to all internal staff. Rostering and time and attendance recording is carried out using the OneStaff system. In the future, digital dictation will be introduced and improvements will be made on the Oracle Procurement system.

6.3.4 Communications infrastructure
The success of the above IS advances depends on high quality communications infrastructure. General practices and other community providers will need broadband with capacity of around 10Mbps if it they are to be able to access the Otago DHB systems. Higher speed access may be needed for telepresence, videoconferencing, and access to PACS images18.

Communications and data transfer capacity has been greatly enhanced since 2005 as a result of the PROBE project through which almost 900 isolated rural schools in NZ received access to broadband Internet services. In addition, Telecom now offers ADSL broadband in most rural towns, certainly in those large enough to sustain a general practice.

6.4 Workforce
Otago DHB has a relatively mature, but stable clinical workforce. About one-third of both the nursing and other health professional workforces will reach retirement age within fifteen years, as will 43% of specialists. While retirement is not compulsory, presumably the majority will exercise the option.

During the next two decades, the working-age population in Otago will not change significantly, while demand for health services will increase. Otago DHB may therefore find it harder to recruit generalist and nursing staff as time goes on.

The labour market for clinicians is less affected by local labour supply, and more by training rates and by competition from other employers in New Zealand, Australia, and internationally.

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We understand that Otago DHB has the lowest turnover of any DHB in the country. Many clinical staff stay with Otago DHB for some time, with the average length of service being almost ten years. After removing training positions from the data, the average length of service would be considerably longer.

The medical workforce overall is dominated by house surgeons and registrars, who are all relatively young. The number of registrars is about twice the number of consultants and specialists, implying that Otago DHB will have a steady supply of medical staff who would be eligible to fill the senior roles as they fall vacant.

The DHB’s workforce data indicate that just to maintain current staff numbers, Otago DHB will have to replace at least one-third of its clinical workforce during the scope of the Clinical Services Plan, even before taking account of any increases in staff numbers that may be required to meet projected demand for services.

Table 17 shows the total workforce as at October 2007, classified by clinical category, with management roles separated from operational roles.

Table 17: Otago DHB workforce by type of role

<table>
<thead>
<tr>
<th>Status</th>
<th>Management</th>
<th>Operational</th>
<th>Grand Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sum of FTEs</strong></td>
<td>Administration</td>
<td>22</td>
<td>443</td>
</tr>
<tr>
<td></td>
<td>Clinical support</td>
<td>4</td>
<td>268</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>2</td>
<td>282</td>
</tr>
<tr>
<td></td>
<td>Nurse</td>
<td>37</td>
<td>794</td>
</tr>
<tr>
<td></td>
<td>Other Health Professional</td>
<td>34</td>
<td>313</td>
</tr>
<tr>
<td><strong>Sum of People</strong></td>
<td>Administration</td>
<td>22</td>
<td>593</td>
</tr>
<tr>
<td></td>
<td>Clinical support</td>
<td>4</td>
<td>399</td>
</tr>
<tr>
<td></td>
<td>Medical</td>
<td>4</td>
<td>360</td>
</tr>
<tr>
<td></td>
<td>Nurse</td>
<td>39</td>
<td>1,074</td>
</tr>
<tr>
<td></td>
<td>Other Health Professional</td>
<td>34</td>
<td>443</td>
</tr>
<tr>
<td><strong>Total Sum of FTEs</strong></td>
<td>99</td>
<td>2,099</td>
<td>2,198</td>
</tr>
<tr>
<td><strong>Total Sum of People</strong></td>
<td>103</td>
<td>2,869</td>
<td>2,972</td>
</tr>
</tbody>
</table>

The full-time equivalent (FTE) status is based on contracted hours of employment, not actual hours worked.

6.4.1 Workforce demographics
The different clinical categories have quite different age profiles, as shown in Figure 14 below. Medical staff numbers decline with age, while nursing, administration, and clinical support staff numbers peak at around 50 years of age. Other health care professionals peak at both mid/late twenties and at age 50, perhaps reflecting a trainee and a continuing workforce.
Figure 14: Age distribution of operational workforce

The high average age of staff implies that many may retire during the 15 year scope of the Clinical Services Plan. Table 18 looks at the number and proportion of staff who will become eligible for National Superannuation in each of the next 0, 5, 10, and 15 years.

Table 18 indicates that one-third (36%) of nursing staff may retire within fifteen years, along with 34% of other health professionals and 41% of clinical support staff.

Table 18: Staff who may retire within fifteen years

<table>
<thead>
<tr>
<th>Category</th>
<th>FTE Staff aged over:</th>
<th>Administration</th>
<th>Clinical support</th>
<th>Medical</th>
<th>Nurse</th>
<th>Other Health Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>189</td>
<td>112</td>
<td>56</td>
<td>297</td>
<td>118</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>119</td>
<td>68</td>
<td>30</td>
<td>145</td>
<td>59</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>58</td>
<td>32</td>
<td>14</td>
<td>57</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>65</td>
<td>13</td>
<td>6</td>
<td>5</td>
<td>15</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% of FTE staff aged over:</th>
<th>Administration</th>
<th>Clinical support</th>
<th>Medical</th>
<th>Nurse</th>
<th>Other Health Professional</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>41%</td>
<td>41%</td>
<td>20%</td>
<td>36%</td>
<td>34%</td>
</tr>
<tr>
<td>55</td>
<td>26%</td>
<td>25%</td>
<td>10%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>60</td>
<td>12%</td>
<td>12%</td>
<td>5%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>65</td>
<td>3%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>1%</td>
</tr>
</tbody>
</table>
While the overall proportion of medical staff who will reach 65 during the next 15 years is relatively low, this is concentrated among the more senior staff. Five full-time equivalent specialists are already aged over 65, and another forty (38%) will reach 65 in the next fifteen years.

Table 19: Medical staff who may retire with fifteen years

<table>
<thead>
<tr>
<th>FTE Staff aged over:</th>
<th>House Officers</th>
<th>MOSS</th>
<th>Registrars</th>
<th>Specialists</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>-</td>
<td>4</td>
<td>4</td>
<td>45</td>
</tr>
<tr>
<td>55</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>60</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>13</td>
</tr>
<tr>
<td>65</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% of FTE staff aged over:</th>
<th>House Officers</th>
<th>MOSS</th>
<th>Registrars</th>
<th>Specialists</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>0%</td>
<td>81%</td>
<td>3%</td>
<td>43%</td>
</tr>
<tr>
<td>55</td>
<td>0%</td>
<td>51%</td>
<td>1%</td>
<td>23%</td>
</tr>
<tr>
<td>60</td>
<td>0%</td>
<td>23%</td>
<td>0%</td>
<td>12%</td>
</tr>
<tr>
<td>65</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>5%</td>
</tr>
</tbody>
</table>

6.4.2 Workforce length of stay
As can be seen in Table 20 below, the average length of service is highest in operational nursing roles, where it is 10.4 years. However more than a quarter of nurses have been employed for 2 years or less. Figure 15 below shows that medical staff have the shortest length of service. However, most of this is due to the frequent turnover in the House Surgeon category. The Clinical Support category is the most stable. The longest-serving employee is a receptionist who was first employed in 1957.
Medical staff have the shortest average length of service, with 36% having been employed for two years or less. However 35% have been with Otago DHB for more than ten years. Six (3%) have been employed for more than 25 years.
However, a different pattern appears when medical staff are classified by seniority (Table 21).

House officers (the most junior medical staff) have all been employed for two years or less. Nearly three-quarters of Registrars have been with Otago for less than five years.

The specialist workforce is the most stable of the medical groups, with 45% of specialists having been with Otago DHB for more than ten years.

**Table 21: Medical staff turnover**

<table>
<thead>
<tr>
<th>Title</th>
<th>2-</th>
<th>5-</th>
<th>10-</th>
<th>25-</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Officers</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>MOSS</td>
<td>13</td>
<td>63</td>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>Registrars</td>
<td>70</td>
<td>26</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Specialists</td>
<td>19</td>
<td>31</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>29</td>
<td>32</td>
<td>3</td>
</tr>
</tbody>
</table>

*Operational roles only*

More detail on the workforce analysis, including data and methods, is in the working report “Otago DHB Clinical Services Plan: Workforce”.

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**Otago District Health Board: Clinical Services Plan**

56
7 Trends and issues in service provision

This section discusses:

- generic issues and general trends in clinical services; and
- specific issues in the delivery of services in Otago, based on the themes that have emerged from interviews with service leaders and with the management team.

7.1 Workforce developments and issues

7.1.1 New models of service delivery

Over recent years there has been a shift in emphasis towards prevention and early intervention, on the basis that prevention can produce better outcomes at less cost. In New Zealand, policy influences are attempting to shift the balance from hospital-based care towards primary healthcare with a population health focus. Further, models of care and patterns of service delivery are changing, if not because of in part, then at least alongside, difficulties in recruitment of qualified and stable health care professionals. Models of care are moving towards integrated, multidisciplinary services, often with the focus in primary care.

According to the Ministry of Health, best practice models of care require greater flexibility from clinicians and nurses in terms of working alongside teams of professionals from different points along the continuum of care; working outside of their ‘normal’ geographical context; and extending their responsibility to different contexts. Specific examples include clinics led by nurses as opposed to specialists, specialists working on rotation to visit rural communities or consulting via telecommunications, or specialists relying more on general practice to manage pre and post intervention care.

7.1.2 Workforce pressures

There is an increasing role for non-physician providers such as Nurse Practitioners in the health workforce, although the role of physicians remains central. Workforce shortages are a significant source of worry. New Zealand, with its isolated position and relatively small population, is more at risk than larger countries in this respect.

Hospitals throughout the country suffer from difficulties in recruitment and bonding of health care professionals. Concerns address, in particular:

- The tendency for migration of skilled practitioners overseas due to higher salaries and professional experience offered in larger economies.
- Attracting staff to rural areas in New Zealand. The constraint of working in a rural setting and the commitment to working long hours can cause students to flee the rural setting in search of a perceived better work life balance.
- Integration of practitioners from overseas into the domestic setting.
• Sub-specialisation pressures. The decision of how far to take sub-specialisation within specialist services is not easy as hospitals try to adapt to international trends and standards with a relatively small pool of clinical staff. The balance is a difficult one with the demand for sub-specialisation in cities needing to be balanced against the demand for generalists in rural locations. The ownership structure of GP practices may play an important part in this equation, with the ratio of practice owners to employees becoming lower and lower. Ownership of these clinics by PHOs or possibly the DHB could make it easier to attract generalists by reducing the ownership risk and responsibility.

The demographic profile of New Zealand is reflected in its ageing workforce. As mentioned in section 5.4.1, approximately one-third of both the nursing and other health professional workforces will reach retirement age by 2022, as will 43% of specialists in Otago. Retaining medical registrars and nurse trainees is essential to respond to demand and presents a challenge to the region.

A coordinated approach to recruitment seems necessary in association with other DHBs on a national level, over both the public and private domain, with close coordination with the training institutions in the region. Recruitment challenges stood out time and time again during interviews when clinicians were asked for their views on what the future challenges would be in their service areas. It is possible that the attractiveness of Otago would be increased for clinicians if they were offered the diversity and scope of working over different providers in the private sector.

7.1.3 Sustainable services and workforce in Otago

It is becoming more difficult for Otago DHB to sustain services as the workforce issues are faced in both the rural and urban areas. Due to the small numbers of SMOs in many services the loss of one individual can mean the need to contract out the service to another DHB. This is currently the situation with neurosurgery where the resignation of a neurosurgeon means that the service may not be offered in Otago. Rather, patients will travel to a better resourced neurosurgical unit in a larger tertiary hospital. There is a clear linkage between scale on the one hand and ability to provide a local service on the other.

The close relationship between the Otago School of Medicine and the Hospital provides both opportunity and issues. The opportunity is the increased likelihood that students trained will return, and that programmes can be developed to deal with local issues felt nationally, such as the challenge of appropriate preparation for rural situations. Further, the additional capacity required for teaching means that additional, specialist services are provided. On the other hand, the DHB also has to meet the teaching expectations of many of its SMOs.

The issues and impacts are summarised in the table below.
Retaining and recruiting medical staff
There are recruitment and retention issues in most services in both senior and junior doctor rankings.

Ability to deliver services is wholly dependent on the SMOs and the level of service is dependant on the availability of the junior doctors. Doctors are trained but go elsewhere.

Recruiting and retaining technicians and nurses
There is a shortage of technicians and nurses in most services.

Ability to deliver services is impaired.

Expectations set by being a teaching hospital
Medical staff will give up private income and will be more stable if they have better access to teaching and leadership opportunities.

Decrease in perverse incentives where private and public services delivered by same personnel.

### 7.2 Technological advances

Medical technologies have been one of the major drivers of healthcare change since the introduction of effective pharmacological agents in the early part of last century. As the pace of technological development accelerates over the next 10 to 20 years, we may see further significant impacts on the pattern of service provision. Technological changes, including medical advances and the development of new drugs, play a key role in influencing patterns of service delivery and future healthcare expenditure\(^{19}\). These developments can have a significant impact on cost – both the cost of providing the new technologies themselves and the other associated costs. Clinicians are now able to treat a wider range of conditions, with improved survival rates and often there are significant on-going health needs for patients.

It is very difficult to assess the impact of technological change on both healthcare expenditure and population health status, given the complex flow-on effects involved. Examples include the increasing costs of treating long-term impacts of radical interventions and the new health status impacts of on-going treatment regimes. Although the real impact of these changes remain difficult to predict, it seems necessary at least for health care institutions to maintain an adaptive capacity to respond to new technologies as they become available.

On top of this complex picture, there is the further difficulty of predicting the rate of diffusion of particular technologies. It may be particularly difficult to assess the rate of diffusion of technologies to the New Zealand market in general and to Dunedin hospital in particular. This may be slow given our relative isolation, our small population and lack of opportunity to exploit economies of scale. On the other hand, New Zealand can provide a small relatively easily controlled ‘test’ environment that can be ideal for running controlled trials.

However, against the backdrop of these provisos, the Australian Productivity Commission made an assessment of when groups of technologies are likely to be available to treat patients, depending on the current state of development and whether there may be significant ethical or privacy concerns that may impede progress.

The table below summarises these.

<table>
<thead>
<tr>
<th>Stage of development</th>
<th>Possible timing</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Currently used or in late stage trials</td>
<td>2005 – 2010</td>
<td>• Minimally invasive surgery • ICT developments • Computer aided robotic surgery • Rational drug design • Tissue engineering • New vaccines • Genetic testing</td>
</tr>
<tr>
<td>Currently in early to medium stages of development with some successes already reported or trials taking place</td>
<td>2010 – 2020</td>
<td>• Imaging advances • Blood substitutes • Bioengineered and artificial organs • Gene therapy • Pharmacogenomics</td>
</tr>
<tr>
<td>Currently in very early stages of development and/or facing significant barriers</td>
<td>2020+</td>
<td>• Nanomedicine • Xenotransplantation • Stem cell developments</td>
</tr>
</tbody>
</table>

20 Adapted from the Australian Productivity Commission report (2005)
A study undertaken by the Centre for Medicare and Medicaid Services in the USA\textsuperscript{21} identified potential biomedical advances that would affect the health and life expectancy of the elderly. 33 were identified that would become commonplace in the next two decades. Those breakthroughs most likely to be widespread in clinical practice addressed coronary heart disease and cancer, for example, Magnetic Resonance Angiography (as a replacement for coronary catheterization), Telomerase Inhibitors, Oestrogen Receptor Modulators (SERMS), and Antiangiogenesis. Advances like these have significant health benefits for the elderly. For example, the Centre states that Telomerase Inhibitors will enable 50% of patients to be cured, with 50% having a 25% prolongation of life.

The study mentioned that prevention and screening for chronic diseases could be effective public health measures, but that they may not eliminate the high costs incurred in the final year of life for such conditions.

Ironically, these treatments will keep people alive longer, but may come at the cost of a higher long-term health budget as people will incur more health costs for longer. They may be healthier but they will have longer to incur costs.

7.2.1 Technology pressures in Otago

Otago DHB service leaders identified a number of specific technologies for which they may seek funding in the next few years. The full list is included in Section 8.3.3.

As a hospital providing tertiary services there is some pressure to keep up with the latest in technology to support the service. To support a national approach the New Zealand DHBs and the Ministry of Health have established a framework to assess proposals for new interventions or service reconfigurations\textsuperscript{22}. The Service Planning and New Health Intervention Assessment framework (SPNIA) covers regional and national collaborative decision-making in two related areas:

- new health interventions (including a new method of delivering an existing treatment)
- service reconfiguration (including the introduction of a new service, cessation of a service, service expansion, quality change or change of providers).

The issues and impacts of technologies are summarised in the table below.

\textsuperscript{21} Goldman DP et al. “Future Health and Medical Care Spending of the Elderly” Rand Health (2005)

\textsuperscript{22} “Service Planning and New Interventions Assessment: Framework for collaborative decision-making” District Health Boards New Zealand Inc and Ministry of Health (2005)
<table>
<thead>
<tr>
<th>Issue</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Possible adoption of new diagnostic technologies or better diffusion of existing technologies</td>
<td>Greater specificity of care. Increased cost of diagnosis.</td>
</tr>
<tr>
<td>Possible adoption of a range of technologies from regional access to PET scanning, to adoption of ultrasound technologies in gastroenterology or vascular surgery (for instance), greater use of diagnostics in primary care</td>
<td>Increased cost to DHBs through drug cost, outpatient visits and drug infusion costs.</td>
</tr>
<tr>
<td>Possible adoption of therapeutic technologies</td>
<td></td>
</tr>
<tr>
<td>Therapeutic technologies such as pharmacological interventions, such as cancer drugs, will continue to emerge.</td>
<td></td>
</tr>
<tr>
<td>Day care surgery</td>
<td>Reduced cost of care. Reduced patient stay. Increased surgery cost.</td>
</tr>
<tr>
<td>Day care surgery may increase by up to 30% with full uptake of laparoscopic surgery.</td>
<td></td>
</tr>
</tbody>
</table>

7.3 Demographic changes

The balance of old and young is expected to change sharply over the next twenty years. Otago’s older populations will increase, while the number of children and possibly working-age people will fall.

This challenge is not unique to Otago. In fact, the increase in numbers of older people will be much faster in many other regions of the country, such as Tauranga.

There are a number of implications for Otago. For instance, one of Otago’s challenges is to develop an Older Person’s Health Strategic Plan that conforms to government policy and to satisfy the population-based funding constraints.

7.3.1 Demographic pressures in Otago

Queenstown- Lakes

The Queenstown-Lakes and Central Otago areas have the biggest population growth within the region. Many of the immigrants are in the 20 to 40 age range, attracted by opportunities in the service and tourism industry although many may be relatively itinerant. There may also be significant retirement into the region, although it is unclear whether these people will remain in the region as their health declines. Visitors to the region place high seasonal loads on primary care and accident and emergency services now, and the pressures will increase if the numbers grow as predicted.

Planning documents supplied to Otago DHB by the Queenstown-Lakes District Council predict that the permanent resident population could rise from its current 17,000 to 45,000 by 2026. The Council expects growth rates to be similar in both the Wanaka
(Otago DHB) and Wakatipu (Southland DHB) regions. The Council predicts daily visitor numbers in the two regions to average 30,000 over a full year, compared to about 10,000 now. The peak summer day population could be over 140,000, compared to 60,000 now.

A major uncertainty in the projections is the extent to which the growth in resident numbers will be driven by migration from outside the Otago DHB, and how much will be from people retiring from Dunedin to a second home in the Queenstown or Wanaka region.

In the service interviews, DHB clinical leaders stated that the peaks in tourist numbers in these regions do impact on service demand and workforce planning but are not accounted for in regular projections and funding. Queenstown’s population triples in peak periods and creates higher demand in Dunedin for acute services due to accidents, as well as higher demand in General Surgery.

The demand is particularly felt in terms of pressure on primary care in Central Otago. The consequence of higher demand from the summer population falls on the local residents. For example, residents from Wanaka or Dunstan must currently try to schedule regular check up appointments during low-peak periods as resources become too stretched in peak times.

Tourist peak demand at these times also creates pressure on staff, for example, ruling out annual leave, and operational capacity issues in terms of ensuring a sufficient supply of doctors and nurses in the high-demand centres. Staff mobility is difficult given the characteristics of the nursing staff who tend to settle in one place and fall into an older age demographic (the average age is approximately 48). It is also possible that the quality of care may be sacrificed when medical staff are displaced to work in high-demand centres over the peak season due to the lack of continuity of care.

**Ageing population**

Section 3.4 above showed that the population served by Otago DHB is expected to age, but not grow overall during the next twenty years. Numbers of people in older age groups will rise, offset by falls in the number of younger people.

The number of people aged over 85 will double a few years before 2030. The number of people aged 65 – 84 will rise by more than half within twenty years. All other age groups will decline by 2026.

The effect of the ageing population alone is expected to raise demand for inpatient services by 26% in fifteen years. Demand for outpatient services will rise by around 16%. Community services – which are mostly used by older people – could increase by around 50% within fifteen years.

**Births**

There is a low birth rate in Otago DHB but a higher than average intervention rate and low birth weight. The high intervention rate leads to high demand for the NICU facilities.
There is no community based maternity facility within Dunedin City, but beds are available within the rural facilities.

7.3.2 Rurality
Over one-third of the population in the Otago & Southland DHB region live outside Dunedin and Invercargill. In Otago approximately 80,000 people live outside Dunedin city, while in Southland around 40,000 live outside of Invercargill. The rural hospitals in Otago provide facilities for outreach clinics but all services are contracted with the DHB, not through the provider arm.

The Otago DHB contracts with each of the three community hospitals for the provision of health services, both on an inpatient and an outpatient basis. The range of services delivered to the rural communities is based on historical activity, there has not been a DHB wide review of service delivery.

Resourcing of the outpatient services can be challenging at times, the majority of the visiting specialists come from Dunedin hospital. As we are aware there are several vacancies across the specialties for Senior Medical Officers. Often those patients from the rural areas are asked to travel to clinics at Dunedin, rather than the clinician travelling to the rural trust, in an attempt to best utilise their time. This is not an ideal situation.

The impacts of the demographic changes are summarised in the table below.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ageing population</td>
<td>A growing and predictable call on health services. A rising incidence of cancer, diabetes and need for aged care mental health services; a possible increase in the prevalence of heart disease.</td>
</tr>
<tr>
<td>Rurality of services</td>
<td>The need for outreach services. The need for innovation in service delivery such as telemedicine. Strong integration with Southland.</td>
</tr>
<tr>
<td>A growing conurbation in Queenstown</td>
<td>Growing demand for health services in an area that is currently serviced by a small 18-bed hospital facility.</td>
</tr>
</tbody>
</table>
7.4 Social factors: lifestyle choices and consumer expectations

The importance of lifestyle factors and consumer choice in affecting the future disease burden and service need is increasingly being recognised. Key modifiable risk factors include physical inactivity and poor nutrition, particularly given the increasing prevalence of obesity in both adults and children within New Zealand. Obesity is identified as a primary risk factor for many chronic diseases including heart disease, type II diabetes, hypertension and stroke, gallstones and some cancers.

Also, with increasing levels of education and greater access to information, today’s consumers are more likely to have an influence on the shape and quality of health care services. Much has been written about the potential to improve health outcomes by helping people to become ‘expert patients’ and more proactive in their healthcare management, particularly in relation to chronic diseases. In order to realise this potential, services need to be designed in a way that provides appropriate advice, support and facilities (including, for example, substitution of laboratory tests with home-based testing regimes). Further, we are beginning to see evidence of the influence of consumer demand in the way services are organised and accessed. An example of this is in the UK, where the NHS National Booking System was introduced. This greater consumer involvement can lead to both increased demand for services and raised expectations regarding service responsiveness.

The Rand Health study on health care spending of the elderly identified obesity as a key factor that, if prevented, will diminish health care costs because it reduces co-morbidities but doesn’t imply higher longevity. In the study, Medicare spending was predicted to be about 35% higher for an obese person from age 70 than for a person of normal weight, however the research underlines the absence of a causal link between obesity and health differences.

As we have seen, the predicted growth in chronic diseases and cancer combined with the costs of an ageing population imply significant difficulties in future service delivery. and call for greater individual responsibility in health care. Prevention and management of disease and its underlying causes are therefore a key part of the Government’s New Zealand Health Strategy. Some factors linked with these diseases such as a low socio-economic status are beyond the scope of the DHB to affect, but other initiatives can have a beneficial effect in educating the public so that their lifestyle is more conducive to health.
a low-use of health services. The DHB can help to implement the national Healthy Eating-Healthy Action Plan (HEHA) with collaboration from other stakeholders in the community and through this, try to reduce obesity and smoking (particularly amongst younger people). Another way is to collaborate closely with PHOs to target people in their youth, when healthy eating and exercise habits become ingrained. Community dieticians are also a key initiative that can have a real impact on public understanding of what constitutes a healthy diet.

As people become more concerned about their own health management they become proactive in seeking to understand the conditions that they or their family may suffer from. Thanks to the speed and availability of information on the internet regarding medical equipment and advances in technology, the public is aware of cutting-edge techniques. However, this can also translate into high, and sometimes unreasonable, expectations around the standard of treatment available to them in the context of the New Zealand system. As we have noted above, new clinical techniques can take a long time to be actively used in hospitals, even when they are deemed to warrant the cost. High expectations and ensuing disappointment from patients can cause tension in the health care system which can only be mitigated by good communication and the understanding of the public around the issues involved in new treatments.

Bariatric surgery to support the management of obesity is currently being considered under the SPNIA framework and a proposal is out for consultation in January 2008. Otago DHB is currently one of only two DHBs offering this service in the public sector.

### 7.5 Service provision across continuums – shift of emphasis to primary care initiatives

Otago faces decreased funding in the future in the context of the population based funding. In view of the resource and financial pressures placed on the hospitals in terms of tertiary and secondary care, strategic thinking both at hospital and government level has identified detection and prevention to be the way of the future in health care. The Government’s Primary Health Care Strategy involves all the DHBs and aims for people to have regular access to primary care to prevent or detect conditions that could evolve into serious and life-disturbing illness requiring complex and costly care. There are approximately 4,000 people (excluding the students enrolled with Student Health) who are still not enrolled in a PHO in Otago and these are largely itinerant people. This notwithstanding, Otago has made good progress in its approach to Primary Health Care with some 94% of its residents enrolled with a Primary Health Organisation. Otago’s aim is ultimately to reduce dependency on hospital services. The development of Primary Health Care programmes is therefore a priority but there have been no concrete measure to address this as yet. It would seem that primary health care has been driven by funding imperatives rather than strategic concerns about future requirements. An exception is that of the Mornington General Practice which has been very successful in implementing the PHO model.
New models of care encourage care to be provided in the community whenever possible in terms of clinical safety. The mix of community care versus hospital care can be expected to change in the future and will depend largely on technology, recruitment strategies and funding incentives formulated at a national level. For example, a key measure is to accompany the shift in delivery of care to the primary sector all the while avoiding disincentives at secondary and tertiary level to participate in the process. In such models, people would have a choice to be either referred privately, to the hospital on a waiting list, or to a GPSI. Referral would still be via the hospital and assessed by the specialist consultant or the appropriately credentialed GPSI who would then pass the referral onto the appropriate doctor or nurse in the region. This model exists in the ‘see and treat’ clinic. For this change to be accepted, it is essential that patients understand the benefit created for them as well as the fact that it will create much less disturbance in their life.

Studies undertaken overseas can be of interest (at least) and a source of practical inspiration (at best) to motivate change in NZ. For example, the Institute for Public Policy Research in the UK assessed the current and expected pressures on future hospitals in the UK in September 2006. The report addressed the reconfiguration of hospital services. They found there was an over supply of general hospitals cumulated with the need to divide the continuum of care (tertiary, secondary and primary) into specialised geographical areas with a decreasing geographical concentration from tertiary care down. For example, acute care, A & E and specialist surgery would ideally be concentrated in a given geographical centre in order to enable the appropriate professional and technical expertise through economies of scale.

Other, less complex secondary and primary services could safely be provided outside these general hospitals in community centres, providing the advantage of being more easily accessible to people outside of major cities.

The recommendation was for a hospital with A&E departments and emergency surgery to serve a minimum catchment population of 300,000 people. This argument is driven by the logic that surgery is safer when specialist services are concentrated in one site – services become interdependent and their regrouping creates safety; surgeons are more experienced and therefore more highly skilled. For example, A&E services are required to back up other surgery if something goes wrong. However, it does state that improved clinical outcomes are not synonymous with bigger hospitals – this is dependent on the type of procedure considered. For example, studies have shown that pancreatic surgery, hip fracture and cataract surgery can be safely done in smaller hospitals. The implication is that many services currently carried out in general hospitals could be devolved further to local community hospitals and clinics while still maintaining quality care. This model implies fewer larger, acute services and smaller community hospitals.

It suggests that certain specialities would benefit from greater centralisation: interventional cardiology, neurosurgery, liver transplants, major vascular surgery and some cancer surgery. It also suggests that devolving care to community centres would help to prevent some conditions by increasing responsiveness and keeping people
healthier longer, thereby avoiding the need for hospital services at all, along with providing cost savings, or in the words of the report:

“A preventative health system would need to be primary and community-care led, with a shift in resources from hospitals to community and primary care.”

Staffing shortages and expertise combined with the high cost of medical equipment all point towards further concentration of services in major centres. A trade off is required for some specialities between quality and distance. These will not always be easy trade offs and the configuration depends on consultation between the public, clinicians and government, and on the cost/benefit they place on the quality of service as opposed to geographical proximity of services. The advice is not to close hospitals in New Zealand as is being suggested in the UK, but to acknowledge the validity of the case for change.

In another study, A Framework for Action, London’s healthcare is addressed and how it needs to change over the next ten years. The new models of care are highly relevant to New Zealand challenges and include the following points:

• Community based care must follow a new framework, one that falls between the current GP practice and the traditional district hospital.

• Care provided in hospitals must be more specialist and prioritise complex cases. Fewer, more specialised hospitals are needed to provide the most complex care with some necessarily working with universities to develop research.

These two principles imply a shift of care into the following, in terms of frequency of care:

• Home based care. More births, deaths, and post-op recovery should take place in the home.

• Polyclinics offering a large range of services for health checks and GP visits, antenatal and postnatal care, community mental health care, specialist advice and diagnostic services. A ‘one stop shop’ centre for the community is the philosophy behind polyclinics.

• Local hospitals offering non-complex general services, and A&E.

25 “Hospital reconfiguration – an ippr briefing” Institute for Public Policy Research
www.ippr.org (Sept. 2006)

26 Darzi, A “A framework for action” National health service
www.healthcareforlondon.nhs.uk/framework_for_action.asp
• Elective centres would handle most high-throughput surgery (joint replacements, cataract surgery) to release pressure from local hospitals.

• Major acute hospitals would handle complex treatment/surgery, serious A&E and trauma, and most NICU cases.

Such a model would allocate valuable health dollars in the most efficient way and would allow greater quality of care under the current constraints. This alternative model proposed in London is also cost-effective because it suggests A&E services can be produced more cheaply when they are concentrated, and that polyclinics too are more cost-effective than hospitals in that they can produce the same services more cheaply. Lastly, this model represents budget economies because it implies that some demand will no longer exist, for example in follow-up appointments over different services or follow up care which is managed at home.

Steps to develop and study the feasibility of such models in New Zealand include:

• Identify best practice primary care models capable of encompassing broad range of services.

• Transfer secondary services from hospitals to GP practices through the development of GFSIs.

• Transfer of ED patients to primary care when their treatment does not require hospital treatment.

The Primary Health Care strategy seems to be an essential component of the Otago DHB’s capacity to deliver quality health service in light of its funding constraints.

7.5.1 Regional services
Otago DHB and Southland DHB are pursuing a relatively unique approach to development of clinical services for the region as opposed to clinical services for one or other DHB.

**Southern Blood & Cancer**
A regional service integrating oncology and haematology is being implemented this financial year.

The service will feature a single booking and triage service for patients in both the Otago and Southland districts. One panel of specialists will prioritise cases across both regions. Clinical management will also be centralised in Dunedin, although at least one specialist will remain based in Invercargill.

Southland DHB currently treats about 50% of cancer cases in its district. The regional service will initially aim to lift Southland’s referral rates to 80%, the same level as in Otago. As budget permits, it will then aim to raise both referral rates towards 100%.
Two more regional services by 2008
The DHBs have committed to developing two more regional services. There is no decision at this time as to what those services will be, although ophthalmology has been suggested as an option.

7.5.2 Opportunities to integrate across organisation boundaries
We have identified that there is considerable opportunity both within national strategies and within DHB specific strategies to integrate across organisation boundaries. Those opportunities occur across chronic care management programmes, in the context of aged care services and to relieve pressure on hospital services. Much of this opportunity lies with a different and more complex relationship with primary care and possibly with displacement of some services from the hospital and into the community. Primary care needs to be in a position where it is able to deliver those services which may, in turn, imply some degree of centralisation of primary care services such as in super clinic concepts. We set out the range of opportunities and issues that face the DHB.

7.5.3 Integration with Regional Trusts
One of the challenges is that each of the rural trusts wants to ensure that they provide the best for their community, and this may not always have been considered in conjunction with the Otago region. A recent example is community support with the installation of a CT scanner in the Waitaki District. However, consideration of the overall region’s needs for CT capacity was not part of the process.

Some specific issues from interviews are summarised below.

<table>
<thead>
<tr>
<th>Issue</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronic care management</td>
<td>Hospital interviews are very much focussed, in the main, on providing a quality service to those who need it, rather than working beyond the boundaries of the hospital.</td>
</tr>
<tr>
<td>Aged care services</td>
<td>Too much resource is invested in aged care facilities where quality of life and independence would be enhanced</td>
</tr>
<tr>
<td>Pressure on accident and emergency care</td>
<td>High cost of provision of care. A and E time taken up with admissions that could be dealt with elsewhere.</td>
</tr>
<tr>
<td>Issue</td>
<td>Impacts</td>
</tr>
<tr>
<td>--------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Collaboration with regional trusts</td>
<td>Limited funding resource should be spent to gain the best outcome for the people of the Otago district.</td>
</tr>
</tbody>
</table>
8 Responding to the challenge

The review of the current state, along with the forecasts, suggest that while overall capacity in Dunedin hospital is reasonable for the next few years, it will face strain from increased demand from the aging population if the current models of service delivery are retained. This demand will also be faced by the primary and community sectors.

Some trends create a pressure to develop hospital care out of Dunedin. Along with technology shifts that are moving more care out of traditional hospitals, most of the combined Otago / Southland region’s population growth is expected to be in the Central Otago and Queenstown-Lakes regions. The Medical School also wants to increase its use of community facilities as it seeks to anticipate where future medical care will be delivered.

Acting in the opposite direction are the potential economies of scale and scope from further concentrating services in Dunedin. This applies particularly to workforce, with Dunedin being the only centre in the region that can easily sustain a professional working population, including opportunities for their families. Also, the development of regional services, while strictly outside the scope of this review, could also increase the use of Dunedin facilities to compensate for relatively low hospital resources in Southland.

Collaborative approaches will be required to deliver health services to the population needs of the future. The relationships should be established as soon as possible to ensure the pressures including: workforce shortages, a growing proportion of older people and a potential shift in the population to the Queenstown-Lakes region, can be met in a timely fashion.

The Otago DHB does not currently have a primary care or chronic diseases strategy and development of these will support the relationships and the ability to meet service needs. Relationships with the community trusts that manage the rural facilities appear to be purely contractual in some instances. Inclusion of these trusts in DHB strategy development will be an important approach to gain support for collaborative developments in meeting service needs.

Otago DHB has some initiatives underway to increase the provision of services in the community, which have the potential to both prevent and substitute for secondary and tertiary services. The rest of this section discusses Otago’s current initiatives, outlines areas where they could be extended, and notes other possible areas of activity.

The question that this Clinical Services Plan poses is whether these initiatives will be implemented soon enough and effectively enough to reduce hospital admission and treatment rates before the effect of an aging population raises total demand for health services to the point that hospital capacity needs to be increased.
8.1 Impact of changing models of care (shift from secondary to primary care): pre-empting the risks in Otago

Some services are being provided in the hospital that could be provided in the primary health sector. A collaborative approach across the primary / secondary sectors will help identify which services are best provided by primary care according to its skills, competence and infrastructure.

Integrated medical centres are a part of the Otago DHB’s medium-term strategy to improve and support primary health care. These centres are expected to be in Dunedin, North Otago, Central Otago and West Otago by 2009/2010 according to the 2005 District Strategic Plan.

True community input is essential in the success of the health system in the future. There is a silo model at the moment and current funding models support this approach. In the future, a key area to progress will be cooperation between hospitals and communities, with hospitals providing tertiary highly technical services and most others provided in the community. However one of the associated risks is that community health providers (NGOs, voluntary groups, GPs and nurses) perceive this as shifting the cost onto them. Therefore it will be necessary to consult with them and ask them to identify what expertise and funding they need to provide the service. This process will challenge people’s ‘comfort zone’: their financial and service boundaries will be altered.

The Otago DHB has four pilots to ensure that the primary sector is part of the continuum of mental health care from Tertiary to General Practice care. This involves a number of Dunedin PHO practices, the North and South Community Mental Health Teams, and the Emergency Psychiatric Service.

8.1.1 Managing demand by boosting services in the community

Managing demand for the population over the long term requires a collaborative approach from all health sectors. As the specialist resource becomes harder to recruit the option to transfer services to others with the skills and competence must be considered.

GPs have traditionally referred patients to hospital services once they can no longer treat or are unable to make a diagnosis and require additional tests and or expertise. In the current environment hospitals return patients to general practice care if they are unable to see them within six months. The funding streams into general practice do not encourage inter-GP referrals as there is a perception that patients will transfer registration to the new GP. Some GPs have more knowledge and expertise in some services than others and utilising this expertise is seen in many primary care initiatives.

Two GP Liaisons are employed at Otago DHB, one working in the Emergency Department, then other for the DHB. A number of new initiatives are underway to use GPs who have a special interest in a particular area developing by those skills further and so they become part of the service team. This type of initiative should be
encouraged and the types of initiatives developed in conjunction with the GP Liaisons and the Primary Health Organisations, including those working in the rural communities.

GP s are also in demand. One response is to move the boundary of the scope of care within the primary care workforce. Nursing staff are moving into some roles traditionally undertaken by general practitioners. Examples include

- nurse led clinics, particularly for chronic disease monitoring;
- nurse practitioners who specialise in a particular field;
- nurses taking coordination and case-management roles across sectors.

8.1.2 Primary and secondary clinical initiatives

Examples of primary and secondary clinical initiatives include:

1. GPSI providing minor surgery procedures within hospital environment
2. GPSI providing cardiology follow-up clinics
3. GPs receiving advice and support from cardiologists by email and or phone (virtual clinics)
4. GP management of long term contraceptive options.
5. GPSI for chronic pain management

Other primary secondary initiatives include:
6. Electronic discharge summaries
7. Hospital in the Home and Community Primary Options (PHO based service) collaborative approaches
8. Acute care management
9. After-hours collaborative approaches

Potential opportunities, in some of which early discussions have taken place, include:

10. Linkages between clinical nurse specialists and practice nurses
11. District nurses and practice nurses
12. Joint / shared rehabilitation programmes for cardiac and pulmonary diseases
13. Care co-ordinators for cancer services
14. Case management for chronic disease
15. Shared components of medical records

The NHS Keeping it Personal report suggests that the evolution of primary care is designed to take the pressure of acute services and recognises that 21st Century hospitals should be centres of excellence but only for care that has to be delivered there i.e. emergency and core specialist services.

8.1.3 Chronic care management

With the growth in the older population in Otago there will inevitably be a greater burden of chronic disease. There is a large body of literature that shows that preventive and better management of chronic disease is expected to support patients to remain independent for longer, to delay the onset and stages of disease progression, and decrease hospital admissions.

Chronic disease is a national priority and improving health and independence for people with chronic conditions is a key outcome for Otago DHB. The World Health Organisation has also identified elements required to improve population health status, see detail below.

World Health Organisation

In 2002, the World Health Organisation published a report Innovative Care for Chronic Conditions: Building Blocks for Action alerting decision makers to the reality that the management of all chronic conditions is one of the greatest challenges facing health care systems globally, and to present health care solutions for managing the rising burden placed on systems by the dramatic increase in chronic conditions. The report predicts that as long as the acute model continues to dominate health systems, health care expenditure will continue to escalate but improvements in populations’ health status will not.

The WHO report identifies the following eight essential elements for taking action to better manage chronic conditions:

1. Support a paradigm shift

Health care services which are organised around an acute, episodic model of care no longer meet the needs of many patients, especially those with chronic conditions. Patients, healthcare workers and decision makers must recognise that effective chronic

References


condition care requires a different kind of healthcare which is extended and regular in its nature.

2. Manage the political environment
For change in the care of chronic conditions to be successful, it is crucial to build consensus and political commitment among stakeholders.

3. Build integrated health care
Care for chronic conditions needs integration to ensure shared information across settings and providers and across time (from the initial patient contact onwards).

4. Align sectoral policies for health
The policies of all sectors which affect health need to be aligned to maximise health outcomes.

5. Use health care personnel more effectively
Organisations require team care models and evidence-based skills for managing chronic conditions. Advanced communication skills, behaviour change techniques, patient education and counselling skills are necessary in helping patients with chronic conditions. Clearly workers do not have to be physicians to provide such services and healthcare personnel with less formal education and trained volunteers have critical roles to play.

6. Centre care on the patient and family
Emphasis must be placed on the patients’ central role and responsibility in healthcare because the management of chronic conditions requires lifestyle and daily behaviour changes. This will require a shift in the current clinical practice of many healthcare workers and systems which relegate the patient to the role of passive recipient of care.

7. Support patients in their communities
Healthcare has to extend beyond the clinic walls and permeate patients living and working environments. Communities can fill a crucial gap in health services that are not provided by organised healthcare.

8. Emphasise prevention
Strategies for reducing onset and complications of many chronic conditions include early detection, increasing physical activity, reducing tobacco use and limiting prolonged unhealthy nutrition. Prevention should be a component of every health care interaction.
Chronic Care Intervention Outcomes

The Surrey and Sussex health community commissioned a review that looked at 35,520 studies about care for people with long-term conditions. The review focused on interventions targeting the way care for people with long-term conditions is organised, the systems used to provide chronic care, and strategies for involving people with long-term conditions in their own care.

Table 22 summarises evidence from the studies reviewed on chronic care.

### Table 22: Summary of Evidence about Initiatives to Transform Chronic Care

<table>
<thead>
<tr>
<th>Components</th>
<th>Impact on patient experiences</th>
<th>Impact on quality of care</th>
<th>Impact on clinical outcomes</th>
<th>Impact on resource use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broad managed care programmes</td>
<td>Improved satisfaction</td>
<td>Improved quality of care</td>
<td>Some improved outcomes</td>
<td>Some reduced costs</td>
</tr>
<tr>
<td>Integrated care</td>
<td>Multidisciplinary teams may improve patient satisfaction</td>
<td></td>
<td></td>
<td>Reduced resource use and costs</td>
</tr>
<tr>
<td>Greater use of primary and community care</td>
<td></td>
<td></td>
<td></td>
<td>May reduce overall healthcare costs</td>
</tr>
<tr>
<td>New models of commissioning</td>
<td></td>
<td></td>
<td></td>
<td>Different models after cost of care</td>
</tr>
<tr>
<td>Identifying those most at risk</td>
<td></td>
<td></td>
<td></td>
<td>Reduced resource use</td>
</tr>
<tr>
<td>Case management for the most vulnerable</td>
<td>Improved satisfaction</td>
<td>Targeting people at high risk may improve clinical outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evidence-based care pathways</td>
<td>May improve care processes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Appropriate data collection/monitoring</td>
<td>Improved quality of care</td>
<td>Some improved outcomes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Learning and sharing among professionals</td>
<td>Some improved quality of care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Involving patients in decision-making</td>
<td>Improved satisfaction and empowerment</td>
<td></td>
<td>No net changes</td>
<td></td>
</tr>
<tr>
<td>Accessible structured information</td>
<td>Improved knowledge</td>
<td>Improved adherence to medication</td>
<td>No net changes when used alone</td>
<td></td>
</tr>
<tr>
<td>Self-management education</td>
<td>Improved self-care and overall satisfaction</td>
<td>Improved quality of care</td>
<td>Some improved clinical outcomes</td>
<td>Reduced resource use and costs</td>
</tr>
<tr>
<td>Self-monitoring and referral systems</td>
<td>Improved quality of care</td>
<td></td>
<td>Improved clinical outcomes</td>
<td></td>
</tr>
</tbody>
</table>

Note: Blank spaces mean there is insufficient evidence to draw conclusions.

8.1.4 Ambulatory care

Ambulatory care is any non-emergency medical care. Many medical and clinical conditions do not require hospital admission and can be managed by visiting the hospital for consultations and tests. Many forms of medical investigations can be performed on

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29 Singh D. “Transforming Chronic Care: Evidence about improving care for people with long term conditions” University of Birmingham (2005)
http://www.hsmc.bham.ac.uk/news/TransformingChronicCare.pdf
an ambulatory basis, including blood tests, X-rays, endoscopy and even biopsy procedures of superficial organs. The full range of allied health can also be offered via ambulatory care – e.g. physiotherapy, speech and language therapy, and occupational therapy.

Other procedures able to be carried out from (or in) an ambulatory centre include chemotherapy, day surgery, blood transfusions for certain conditions, renal dialysis, wound clinics, and a range of assessment, treatment and rehabilitation modalities (AT&R). Additionally many specialty services such as cardiac, diabetes and respiratory rehabilitation may also be delivered from an ambulatory care centre.

The grid-locked site of the Dunedin hospital facility requires review of location for ambulatory services delivery, whether on or off-site, together with the options for co-location of other services to maximise efficiency in service delivery.

8.1.5 Disinvestments and continuous improvement

In prioritising investments into new technology and clinical practice consideration for disinvestment should be included. Prioritisation systems will be required to consider the needs of patients and providers, the DHB wide impact of implementation, financial and workforce capacity requirements and the priorities of the service. Disinvesting in health interventions that offer no or low health gains allow for better/ targeted resource allocation and reinvestment of any savings into uptake of new technology and clinical practice.

Disinvesting in technology and clinical practices, even when shown to offer low or no health gain, is not an easy process and often focus on non-controversial practices which generally result in little opportunity for future investment. National systems in Australia and the United Kingdom have made no significant disinvestment decisions. In 2006 the South Birmingham Primary Care Trust determined a list of procedures in would only invest in under certain criteria. This list includes arthroscopic debridement and washout, insertion of grommets, tonsillectomy and hysterectomy for menorrhagia.

Opportunities and challenges for disinvestment identified by the Victorian Government Department of Human Services are listed below.

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**Opportunities arising**

Key opportunities arise for disinvesting health interventions that offer no or low health gain, including development of guidance and protocols to assist health services discontinue their use. Principle benefits resulting from disinvesting health services of health interventions could include:

1. Increasing patient safety and quality of care
2. Reducing unnecessary referrals
3. Optimising availability of resources for appropriate patients
4. Ensuring appropriate patients receive treatments promptly
5. Ensuring that only proven, clinically effective and cost effective health interventions are undertaken
6. Improving efficiency
7. Potential savings from reduced costs associated with undertaking inappropriate health interventions and reduced waiting lists
8. Lower costs associated with health services independently implementing new technology (i.e. improved purchasing power)
9. Lower cost associated with reducing the introduction of clinical practices that do not meet appropriate effectiveness criteria.

**Challenges for disinvesting technology and clinical practice**

1. How do the different stakeholders (i.e. clinicians, health service managers, consumers, and policy makers) view or define a health intervention that offers no or low health gain?
2. Developing agreed criteria for health interventions that offer no or low health gain
3. Identifying health interventions that offer no or low health gain
4. Prioritising these health interventions
5. What consideration should be given to inform a decision to disinvest?
6. What processes, strategies or frameworks should be developed to support such a decision?
7. What would these consider/comprise?
8. Would buy in from clinicians and health services affected by ‘disinvesting’ (and professional bodies?)
9. Incentives for clinicians and health services to ‘disinvest’
10. Who/how should such a disinvestment be managed? And by whom?
11. What resources would be required to support stakeholders in this venture?
12. Assurance that any savings are reinvested to support appropriate uptake and diffusion of new technology or clinical practice that leads to improved health outcomes

13. Quantifying outcomes associated with disinvesting these health interventions

**8.2 Integration of services with Southland**

Given the common challenges that Southland shares with Otago (staff shortages, funding challenges, rurality), regional integration seems an inevitable and positive approach to mitigating these future challenges. Establishing services across the two regions will create operational and administrative efficiencies through sharing services. For example, Southern blood and cancer is a regional incentive with a manager based in Otago DHB. This incentive allows greater freedom for patients to move across borders. For greater acceptance from Southland, a similar service must be started up with Southland-based management. In the next 20 years, other services should be developed according to the same logic, as well as support services (HR, IS, Planning and Funding administration) to use economies of scale and decrease costs. Ophthalmology and internal medicine could be the next services to centralise across the region, with the head of the service based in Invercargill for ophthalmology. A tertiary element of internal medicine is provided at Dunedin at the moment.

Cooperation and attitude change is required between the two districts for integration to succeed, starting from the regional executive level, so that Southland does not see Otago as a competitor. A particular example is General surgery. Both clinicians and the public would resist it being transferred to Southland. Cooperation is required mainly by clinicians in Otago, otherwise in practical terms the integration will not happen and Southland’s population will support the redistribution of the required skill set of clinicians.

Tertiary services do need to be specialised and this is currently the case for certain services in Canterbury (e.g. Paediatric oncology). Canterbury and Otago are tertiary providers, with Southland patients accessing tertiary services in Otago on a first choice of referral basis. In the future secondary services should be spread out over the region with some speciality centres providing secondary care, and some providing tertiary services. For example, a secondary care centre could be in Southland and a tertiary level centre could be in Otago in order to rationalise service provision in the medium term. Regrouping the population around these centres would allow the expertise of staff to be concentrated in one centre. Urology could prove to be a good example of this. For example, three urology experts could work in one centre allowing for greater efficiency.

The political framework is very restrictive and makes integration of services more difficult. A potential solution is to amalgamate the boards in Otago and in Southland, however this won’t be possible for at least the next 18 months.

Part of the fundamental change will come from having one Planning and Funding team. The combined team will be able to ensure the best access to services and the best use of
the clinical skills and resources in the combined districts, rather than having to support the full range of services in each DHB.

### 8.3 Improving the supporting infrastructure

#### 8.3.1 DHB – capital investment in Wakari

The housing of clinical services in some instances is non compliant and goes beyond the capacity of the hospital to deliver safe and efficient care. Otago DHB is fortunate to have the opportunity to develop the Wakari hospital site to provide extra capacity for services at Dunedin hospital.

#### 8.3.2 Planned reconfiguration of services to Wakari

The Master Site Planning project includes several sub-projects which will move a wide range of health delivery and rehabilitation services across different health groups to the Wakari site. The planning and execution process started in 2006 and is planned to end by May 2010. The services that will relocate to Wakari include:

- mental health;
- Public Health South,
- Planning and Funding;
- finance;
- payroll;
- Corporate Services;
- Information Systems;
- part of Building and Property Services; and
- DHB Board meetings.

The specific facilities that will be relocated or developed are listed in the following table.

<table>
<thead>
<tr>
<th>Wakari site - redevelopment</th>
<th>Dunedin site – operational capital projects and hospital development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building Property services to relocate into the existing transport and short term loan equipment store building. Construction of this facility is currently underway. Food services, staff café and mental health services to be located on the ground floor of the main block.</td>
<td>Hospital staff cafeteria – possibly to move to pebble garden to allow for NICU redevelopment.</td>
</tr>
<tr>
<td>Wakari site - redevelopment</td>
<td>Dunedin site – operational capital projects and hospital development</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Ward 1A (acute inpatient ward) in Dunedin hospital will relocate to the existing Ward 8 building. This project is scheduled for construction is April 2008.</td>
<td>Staff Library will be part of the Knowledge Centre. To move to Fraser building in the short term.</td>
</tr>
<tr>
<td>Conference and Meeting Rooms – upgrade of existing rooms.</td>
<td>Endocrinology/rheumatology office relocation – relocate within the Ward block to allow room for NICU.</td>
</tr>
<tr>
<td>Main ward block foyer – upgrade.</td>
<td>NICU Redevelopment - to move to 1st floor Ward block.</td>
</tr>
<tr>
<td>Offices for community health services – upgrade.</td>
<td>Medicine Day Unit – to move to ground floor from the 1st floor of the Oncology building.</td>
</tr>
<tr>
<td>Corporate and board room – shift from 1st floor at Dunedin hospital to 2nd floor of main block at Wakari.</td>
<td>ICU/MDU Redevelopment – redevelopment for existing service on the 5th floor.</td>
</tr>
<tr>
<td>Registrar Training Unit- to move from Dunedin hospital to 1st floor, Wakari.</td>
<td>Corporate Offices/ Dean of School of Medicine’s Office – paediatric services to occupy this space.</td>
</tr>
<tr>
<td>DAMHS and Records – to move from Dunedin hospital to 1st floor Wakari.</td>
<td>Paediatrics – to relocate to 1st floor ward block.</td>
</tr>
<tr>
<td>Rehabilitation Service Alterations – alterations to existing area in ward 12.</td>
<td>Accreditation Team –To be relocated to psychiatric services building.</td>
</tr>
<tr>
<td>Gibson Psychogeriatric Day Hospital/ Gibson Rehabilitation Centre – Relocated from the Dunedin site to the ground floor main block at Wakari.</td>
<td>NASC Team – to move to psychiatric services building.</td>
</tr>
<tr>
<td>Mental Health: South Community and North Community Mental Health Teams to be relocated to the 1st floor main block Wakari.</td>
<td>IT Training Suite – to move to psychiatric services building.</td>
</tr>
<tr>
<td>Public Health South – shift to 2nd floor of main block from Hanover Street, Dunedin.</td>
<td>Fraser building office relocations – to move to psychiatric building.</td>
</tr>
<tr>
<td>Support services office – upgrade of existing rooms.</td>
<td>Knowledge Centre – possibly to the Children’s pavilion.</td>
</tr>
</tbody>
</table>
Transport
The timetable of the existing shuttle between Wakari and Dunedin hospitals will be increased to accommodate the higher transportation needs between the two sites.

Workforce
It is critical that there is early recognition of the skills and competencies required for service delivery. Where there are shortages of specific health professionals and other support staff there must be time to determine options and opportunities to provide services.

At one level, this means continuing to support the close integration of medical training facilities to support the critical mass needed for delivery of the range of services currently offered. At another level, it means ensuring that the workforce in the community is integrated into service development programmes to ensure that the workforce skills are developed to support changing models of care. This will include recognition of increasing scope of practice required for some health professionals and the acknowledgment of the role of the family, whānau and lay carers in the community.

Information Systems
The Information Service Strategic Plan (ISSP) contains the board’s direction for IS services in the future. Besides the advances in medical technology that separate capital funding will need to address, Otago has implemented various frameworks to facilitate the sharing of information on patients within the region.

8.3.3 New technologies sought by clinical staff
Clinicians and management want or are intending to invest in a range of major new technologies and equipment. The following table lists the items raised in the interviews for the CSP. Some more general changes in modes of care or in technology, also from the interviews, are listed after the table.
<table>
<thead>
<tr>
<th>Technology / Equipment</th>
<th>Benefits</th>
<th>Possible cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>PET Scanner</td>
<td>To improve the diagnosis, staging and treatment of a large number of patients with cancer</td>
<td></td>
</tr>
<tr>
<td>Cardiac CT</td>
<td>(CT colonography, whole body scanner, Breast scanner, Cardiac CT scan as a regional resource over SDHB and Otago DHB to avoid invasive procedures like angiograms; use in Haematology, Gastroenterology)</td>
<td></td>
</tr>
<tr>
<td>Implantable Defibrillator</td>
<td>Insertion of these at Dunedin, rather than send patients to Canterbury DHB</td>
<td>Cost of Training, as all other costs already being incurred</td>
</tr>
<tr>
<td>RFA Radiology</td>
<td>To allow the treatment of some cancers that otherwise would need surgical intervention</td>
<td>$9k for Radioactive Beads per person and capital investment</td>
</tr>
<tr>
<td>CT Cholangiography</td>
<td>Non invasive imaging of the biliary tree</td>
<td></td>
</tr>
<tr>
<td>CT Colonoscopy</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Endoscopic Bronchial ultrasound</td>
<td>Less invasive, patient only requires mild sedation</td>
<td></td>
</tr>
<tr>
<td>Portable INAV</td>
<td>Central system approx $500k</td>
<td>Ward based system approx $1m</td>
</tr>
<tr>
<td>Robotic Dispensing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DSA Machine - Upgrade</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robotic Surgery</td>
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</tr>
</tbody>
</table>

The interviews also revealed a range of more general technology needs and plans. Some are included in current capital plans; others may be introduced within existing service budgets; others depend on the DHB’s information system plans.
Clinicians expect to make more use of telehealth technology to communicate with rural patients and rural health practitioners. Mobile services are also seen as key to accessing rural patients.

As services such as OPH (Older People’s Health) move to a community framework, they will need improved mobile communication technology, such as laptops and online solutions to avoid paper.

Access to imaging technology will be critical in the next 20 years. In particular, access to PET scanning will be important and would make it possible to diagnose certain cancers. Currently a few patients are sent to Brisbane for their scan. PET CT scans are sometimes needed and are available in Melbourne. There is a form of PET scanning in Wellington but it is more expensive and perhaps not as useful.

It is interesting to note that business cases are done for items such as investment in PET scanning, but services initiating changes in procedural costs (for example, stapler costs in gynaecological operations or radiation costs) are not required to make business cases even though the cumulative costs may be just as high.

Vascular studies are currently carried out by the University of Otago as a weekday service. There are opportunities for the DSA machine to be involved with the provision of the service, allowing for a seven-day week service. This would have an impact on the University service, and potentially decrease the cost to the DHB. A new DSA machine is planned as part of the upcoming capital plan.

New technology is changing to allow less invasive techniques. This creates the challenge of up-skilling staff to enable them to cope with the new technology.

**8.4 Changes in health requirements specific to the Otago population**

**8.4.1 Private – public sector interaction**

Otago DHB has a very publicly minded community environment with pressure to develop the private sector being very recent (beginning in the last five years). One of the main concerns in terms of funding has been to reduce the over-funding deficit while maintaining quality of care. Otago is still over-delivering in care with higher intervention rates compared to other regions. This may reflect an efficient operational team at hospital level, but it is also likely to be reflective of a less active private sector. The Otago DHB would like to maintain elective levels (as long as break-even status is maintained) even though these are above funding levels.

In other regions, particularly Auckland, more care is provided through private health insurance where the public health system is unable to satisfy demand. There is a private hospital in Dunedin, Mercy hospital. Some clinicians, mainly surgeons, employed by the Otago DHB also work privately at the current time and the possibility to do so appears to be an attractive feature in terms of recruitment. However, it has been expressed by clinicians that there is sometimes undue transfer of the burden of care from Mercy
hospital to Dunedin hospital when private insurance companies refuse to cover care, with ACC funding used instead.

Otago DHB proposes a pragmatic approach. The cost of certain technologies, PET CT scans for example, is a good reason for the two to work as complementary partners. Ophthalmology is an interesting service to study in Otago as public care has been successfully restricted in this area and people receive care through private means.

8.5 Establishment of the Otago Corrections Facility at Milton

Prior to the opening of the new Milburn Prison (Otago Corrections Facility - OCF), the Otago Regional Forensic Service, and Community Alcohol and Drug (CADS) provided a prison liaison and inpatient beds for the Dunedin and Invercargill prisons. Dunedin Prison had 59 remand inmates and Invercargill 180 medium secure inmates. This totaled a 239 muster.

The OCF has 335 inmates, a mixture of remand and medium secure inmates. This has therefore moved the total inmate muster for the Regional Forensic and CADS services to 515. This has significantly increased the demand for services within these two areas. Although additional resource is currently being considered for CADS, the Forensic service is currently resourced for this level of input.

It is proposed that the OCF will increase the prison muster to 500 by mid 2009, adding a further 165 inmates. This will further increase demand on these two services and additional resources will be required to manage this demand. This includes additional inpatient beds in the medium secure forensic ward, increased FTE staff for prison liaison and CADS. The Ministry of Health Effective Interventions Initiatives to be implemented in 2008 will further increase the demand for the CADS service. Effective interventions include providing early intervention for offenders in the criminal justice system.

8.6 Collaborative approaches to future challenges

The development of Southern Alliance is a positive initiative for the long term delivery of health services for the Otago and Southland DHB populations. It will be critical to ensure the approach developed for Southern Blood and Cancer can be shown to have positive outcomes to facilitate the approach into other service areas.

Collaborative approaches will be required to deliver health services to the population needs of the future. These relationships should be established as soon as possible to mitigate the pressures of workforce, a growing proportion of older people and a potential shift in the population to the Queenstown-Lakes region. Relationships will be critical between the primary and secondary sectors to support strategic and operational approaches to these challenges.

Otago DHB does not currently have a primary care or chronic diseases strategy and these are examples of opportunities where collaborative approaches in the development of such strategies could support long term positive relationships. Relationships with the
prison will entail the need for a collaborative approach to staff sharing. A strategy is needed to identify the service needs to plan for these.

The relationship with the community trusts that manage the rural facilities appear to be purely contractual in some instances. The rural nature of the DHB means there are a number of small communities who have the interest of their population’s health at heart. There is a need for the DHB to be an integral part of the discussions and for it to carry out consultation about service needs and options for these areas.
9 Appendices

9.1 Survey questions

<table>
<thead>
<tr>
<th>Clinical service area</th>
<th>Form completed by</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Name:</td>
</tr>
<tr>
<td></td>
<td>Role:</td>
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<tr>
<td></td>
<td>Contact number:</td>
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<tr>
<td>If applicable, people</td>
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<td>consulted in</td>
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<tr>
<td>(please provide name</td>
<td></td>
</tr>
<tr>
<td>and role):</td>
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</tr>
</tbody>
</table>

What is the core aspect or focus that the CSP should address in your opinion? And who (what groups of people) should be involved from within and outside the DHB?

Give a brief description of the overall model of care that the DBH currently delivers? (service delivery e.g. collaborative, community integrated, hospital only, multi site)

What do you consider to be the key components within your service we should focus on (and why)?

Has there been any service review work completed in the DBH either locally or regionally? (If yes, please provide relevant reference material.)

What are the key strengths of your service currently in operation?

What are the current key issues and risks facing, 1) your Service, 2) the DHB, and 3) the community locally? What are the pressure points?

Do you think the key issues/challenges facing the Otago DHB which are unique to your service or do you think that they are the same throughout NZ (and internationally)? What issues spring to mind?
What factors are driving the change in the DHB? [Examples may include: changing models of care, advances in technology, workforce developments etc] [Please point us in the direction of any key references.]

How is this changing? E.g. Is it progressive, is it becoming more centralised or regionally focused?

What are the key future opportunities within the region including Southland?

What are the key future challenges and issues within the DHB area?

What would be the ideal future state or the best conditions of care in the future within this service area?

Is there anything else you wish to add?
9.2 Bibliography

Below is a selection of documents and sources that we consulted during the CSP project.

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Diagnostic Imaging Review – Otago DHB (project brief)
Health Profile: Otago District Health Board (September 2005)
Otago DHB Activity plans for all services
Otago DHB Strategic Plan 2005 – 2015
Otago DHB website www.otagodhb.govt.nz

Southland and Otago DHBs Information Systems Strategic Plan 2007 - 2009

Other DHB documents

HV DHB “Hutt Hospital Clinical Services Plan: 2006 – 2016”
LECG “Developing clinical services planning within Hawkes Bay DHB” (July 2007)
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