

The New Zealand Health Care and Disability System

It is important to address the financial, structural and attitudinal barriers to good quality health care in order to improve the health of New Zealanders.

By Durga S. Rauniyar*

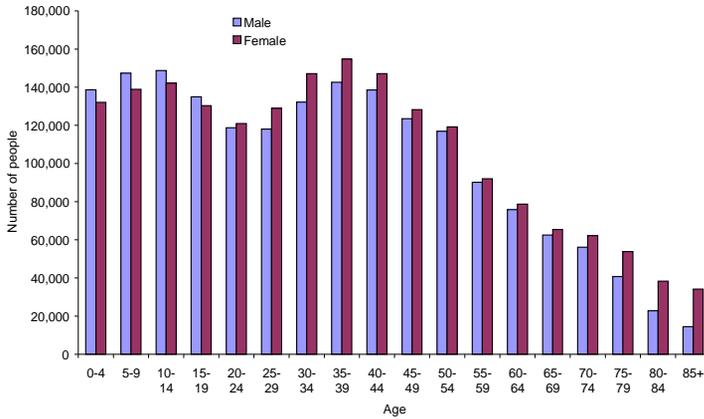
The purpose of this paper is to give a general overview of the New Zealand health and disability system. It provides a brief description of the demographics of the population and the health and disability status of New Zealanders by focusing on some important health outcome measures. It addresses some emerging issues and the Government's initiatives to promote the health and well-being of all New Zealanders.

Population in New Zealand

New Zealand had a population of just over 4 million in 2005. The age-sex distribution shows that 22 per cent of the total population is aged below 15 years, 66 per cent is in the age group 15-64 years and the remaining 12 per cent aged 65 years and older, based on the 2001 Census data (figure 1).

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Figure 1. Age-sex distribution of New Zealand population, 2001



Source: Statistics New Zealand (2001), *Census of Population and Dwellings 2001* (Wellington: Statistics New Zealand).

Figure 2 shows the estimated and projected population distribution by broad age groups from 1951 to 2051. The overall New Zealand population is projected to grow slowly, but the proportion of older people is expected to increase at a faster rate, particularly from about 2010 onward, as the baby-boom generation begins to reach 65 years of age. By around 2021 there will be more people over the age of 65 than under the age of 15. By 2051, 26 per cent of the population will be aged 65 and older (Statistics New Zealand, 2002).

New Zealand has a multi-ethnic population. The 2001 census revealed that 15 per cent of the total population is Māori¹, 7 per cent of Pacific origin and another 7 per cent Asian. The Māori, Pacific and Asian ethnic groups tend to have a younger population compared with the New Zealand European group. As a result, those ethnic groups make up a much smaller proportion of the older population in New Zealand. For example, in 2001, Māori, Asian and Pacific people represented 3.9, 2.2 and 1.6 per cent, respectively, of the people aged 65 and older. New Zealand's publicly funded health-care system, which provides free hospital services, accident compensation and care from

non-subsidized general practitioners and other allied care providers, such as physiotherapists, serves the New Zealand population.

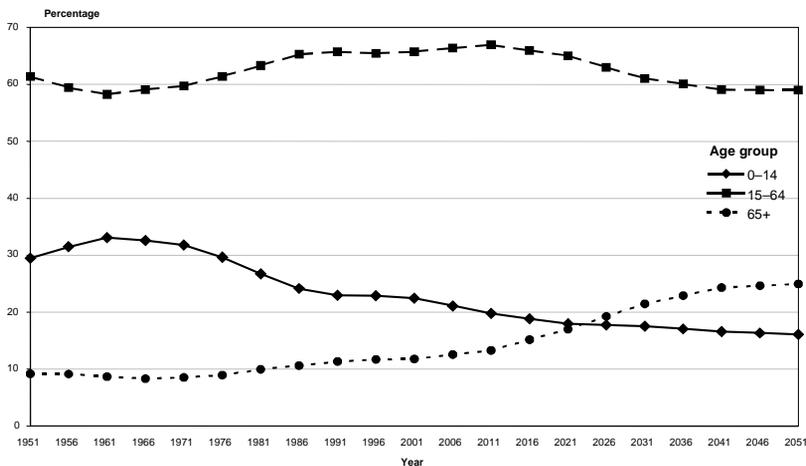


Figure 2. Percentage age distribution of New Zealand population: 1951 to 2051

Source: Statistics New Zealand, *Census of Population and Dwellings 1951–1991 and Population Projections* (1999 base assuming medium fertility, mortality and migration).

The health status of the New Zealand population

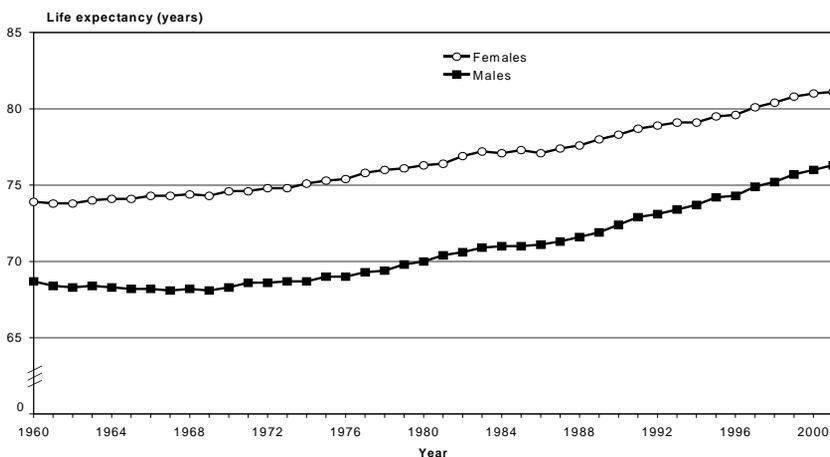
Currently, a single measure of health status has not been developed, in part because health status is multidimensional; however, there is a general consensus that the measure of health status should embrace physical, mental and social dimensions. The physical dimension of health status is commonly used as data have become easily available, particularly in the areas of mortality, morbidity and disability. In this paper, physical health status is indicated by life expectancy, rates of disability and morbidity. Those measures also indicate the contribution of the health and disability system in New Zealand. Wherever possible, the trend analysis of selected health outcomes is presented by ethnicity and the New Zealand Deprivation Index² in recognition of the association between those factors and the greater extent of disparities in health.

Mortality

In New Zealand, about 4,700 people die each year from cancers, cardiovascular diseases, chronic obstructive pulmonary diseases and other diseases caused by personal risk behaviours such as smoking. In this paper, mortality is indicated by life expectancy (LE) and independent life expectancy (ILE) as those two measures calculate the average number of years a person can expect to live from the stated age, assuming specific mortality levels remain constant.

Life expectancy

Life expectancy at birth for the total population of New Zealand was 78.7 years at the beginning of the current decade. It was 76.3 years for males and 81.1 years for females based on deaths in the period 2000-2002 (Statistics New Zealand, 2004). Life expectancy at birth has improved at a generally increasing rate over the last two decades, during which time the life expectancy of males has improved



more than that of males (figure 3). Females could expect to outlive males by 4.8 years in the period 2000-2002, down from the peak of 6.4 years in the period 1975-1977.

Figure 3. Life expectancy at birth, by sex, 1960-2000

Source: Statistics New Zealand life tables. Life expectancy data for 1961, 1966, 1971, 1976, 1981, 1986, 1991 and 1996 are from complete life tables. Life expectancy data for all other years are from abridged life tables.

Life expectancy for Māori and Pacific people is still lower than for the general population, owing to their higher mortality rates at younger ages. From the 1950s to the mid-1980s, life expectancy at birth for Māori males increased by 13 years and for Māori females by 16 years. Yet, Māori life expectancy at birth is about 8.5 years lower than that of non-Māori. The life expectancy for Māori females and males was 73.2 years and 69.0 years, respectively, compared with 81.9 years for non-Māori females and 77.2 years for non-Māori males. Although the gap in life expectancy between Māori and non-Māori has closed slightly, a wide gap still remains (Statistics New Zealand, 2004). In a recent analysis of ethnic-specific mortality rates, only a small decline in the mortality rates for people of Māori and Pacific ethnicity was observed over the two decades 1980-1999 (Ajwani and others, 2003). Life expectancy at birth for the Pacific people is slightly higher than for the Māori people, being 70 years for males and 76 years for females, but those figures are still lower than the New Zealand average.

Independent life expectancy (ILE)

Life expectancy does not take account of the quality of life. Two indicators of the quality of life associated with increasing longevity are independent life expectancy and disability requiring assistance. Independent life expectancy combines fatal and non-fatal health outcomes. ILE at birth measures the number of years a newborn can be expected to live independently, i.e. have a life free of any disability requiring assistance (table 1) and Māori have a lower ILE than non-Māori. In particular, the difference in ILE between Māori females and non-Māori females is much greater than the difference between Māori males and non-Māori males. A shorter life expectancy for Māori is reflected in the fewer years of independent life expectancy at age 65 years (an additional 7.4 years for Māori men compared with 9.9 for all men and 7.5 years for Māori women compared with 11.9 for all women) (Ministry of Health, 2002). Information on independent life expectancy is not available for people in the Pacific ethnic group.

Table 1. Independent life expectancy at birth, in years, 2001

	Māori	Non-Māori	Total
Male	57.5	65.0	64.6
Female	58.6	68.1	68.4

Source: Ministry of Health (2002). *Health of Older People in New Zealand: A Statistical Reference, 2002* (Wellington: Ministry of Health).

Disability

Limitation in functional activities in the context of health experiences affects the quality of life. Disability requiring assistance (DRA) is the term used to categorize those people who have a disability and require assistance either daily or intermittently. Approximately 9 per cent of all New Zealanders aged 85 years or younger have a DRA (table 2). A report on disability in New Zealand shows that DRA increased among males between 1996 and 2001 and decreased among females. However, the change is small in both sexes (Ministry of Health, 2002). The severity of disability also increases significantly³ with age. About 36 per cent of all people aged 75 years and older had a moderate disability (requiring some assistance or special equipment, but less often than daily) and 18 per cent had a severe disability (requiring daily assistance).

Table 2. Percentage prevalence of disability requiring assistance (0-85 years), 2001

	Māori	Non-Māori	Total
Male	13.5	9.4	9.7
Female	14.2	8.6	8.9
Total	13.9	9.0	9.3

Source: Ministry of Health (2002). *Health of Older People in New Zealand: A Statistical Reference, 2002* (Wellington: Ministry of Health).

Morbidity

In broad terms, New Zealanders regard their health highly. More than 90 per cent of adults aged 15 and older reported their health was good, very good or excellent in the 2002/2003 New Zealand Health Survey. However, a high prevalence of chronic diseases was also reported. Almost one in two people reported that they had one or more chronic or long-term diseases.³ Although the prevalence of chronic diseases increases with age, it appears that the prevalence of having at least one chronic disease is high even among young adults (table 3). The high prevalence rate of chronic diseases among young people is associated with high rates of asthma (25 per cent); and other chronic diseases are migraine, eczema and other skin disorders.

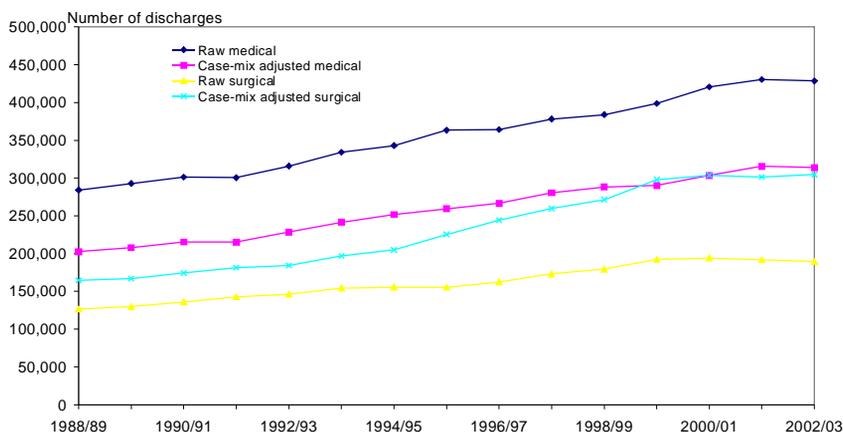
Table 3. Prevalence of chronic diseases, by age groups, 2003

Age group	Chronic conditions				Total (N)
	Non (Percentage)	One (Percentage)	Two (Percentage)	Three or more (Percentage)	

15-24	64.03	29.03	6.36	0.58	1,557
25-44	61.06	28.67	8.25	2.02	5,005
45-64	41.56	33.46	16.5	8.48	3,667
65 years and over	19.07	29.57	25.73	25.64	2,161
Total (N)	5,989	3,753	1,673	975	12,390

Source: 2002-2003 New Zealand Health Survey.

The prevalence of those chronic diseases is related to the broader picture of the common causes of death or hospitalization in New Zealand. Those are ischaemic heart disease, circulatory disorders, stroke, respiratory diseases and



cancer. Morbidity analyses are carried out by using hospital discharge data. The number of people being treated in New Zealand's public hospitals has been increasing steadily. Between 1988/1989 and 2002/2003, both the raw and case-mix adjusted⁴ number of medical and surgical discharges rose consistently, although the number of surgical discharges did not increase during the mid-1990s (figure 4).

Figure 4. Total medical and surgical hospital discharges, 1988/1989-2002/2003

Source: Data extracted from *National Minimum Data Set, 2004*, New Zealand Health Information Service, Ministry of Health.

Several factors may explain the increase in hospitalization, including changes in admission practices, increases in day treatment and reductions in length of stay in the hospital, technological changes and funding initiatives from the late

1990s intended to reduce waiting times (Ministry of Health, 2003). Since the early 1990s, there has also been an increase in the complexity and cost of hospital treatment, with the introduction of more sophisticated surgical techniques and increases in both cardiac and orthopaedic surgery (ibid.).

All hospitalizations can be categorized as either potentially avoidable or unavoidable (Ministry of Health, 1999). However, the distinction between avoidable and unavoidable hospitalization is a theoretical one based on the patient's main diagnosis and does not necessarily reflect individual circumstances. Beyond the age of 75, the classification becomes increasingly problematic owing to the increasing prevalence of co-morbidities; thus, the calculations used in this section are restricted to people under the age of 75.

The two indicators of avoidable hospitalization are population-preventable hospitalizations that could be prevented through population health strategies⁵ and ambulatory-sensitive hospitalizations (ASH) that could be prevented through interventions delivered through primary health care. Evidence from international studies suggests that there is a strong relationship between ASH and the utilization of primary health care.

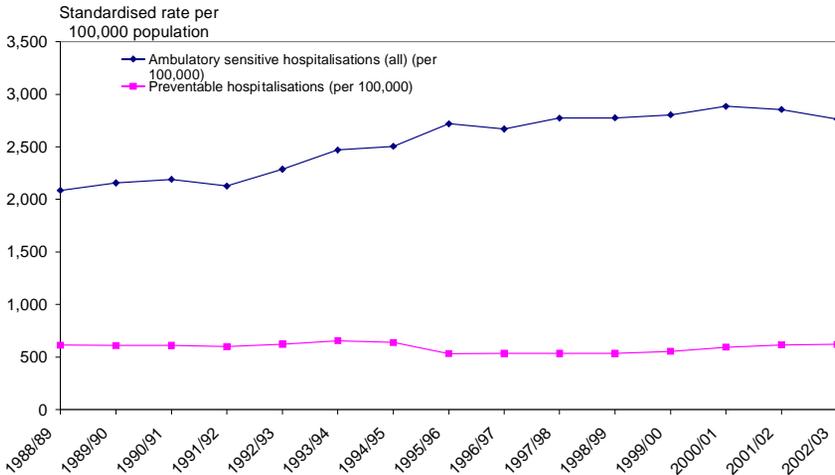
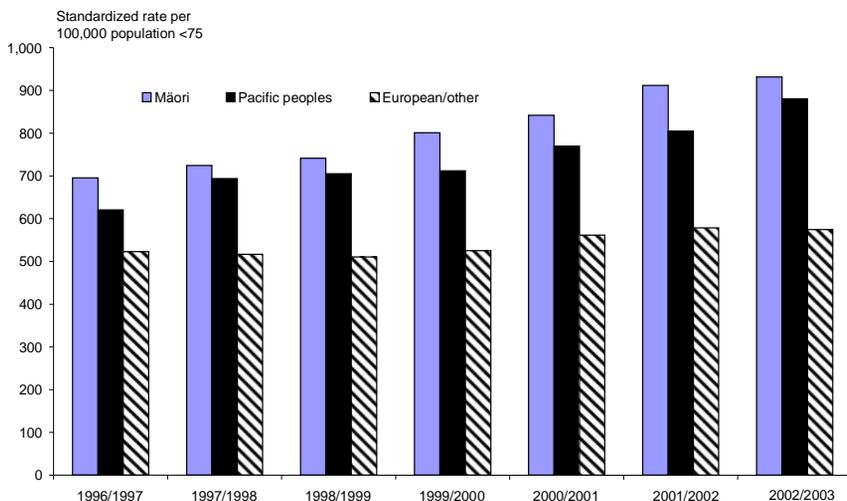


Figure 5 shows the standardized discharge rates for both of those indicators. Some examples of population-preventable diseases are smoking-related diseases, gastroenteritis, respiratory infections, asthma, and heart diseases.⁷ Those population-preventable hospitalisations have increased steadily since 1995/1996 at the rate of 2.4 per cent per year.

Figure 5. Standardized discharge rates for ambulatory-sensitive and population preventable hospitalizations, 1988/1989-2002/2003

Source: Data extracted from National Minimum Data Set, 2004, New Zealand Health Information Service, Ministry of Health.

The general increase in ambulatory-sensitive hospitalizations indicates that more people are being hospitalized for conditions that could be treated through primary health care. However, in recent years the rates of ASH have been decreasing. This suggests that primary health-care strategies are moving in the right direction in treating more people through primary care. Some researchers also have associated differential rates of ASH with health reforms (Dharmalingam and others, 2004). However, the true effects of the Primary Health Care Strategy will

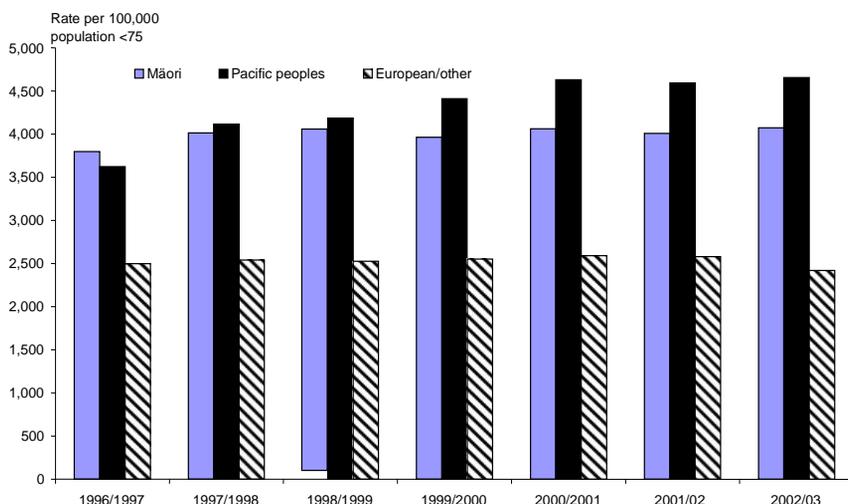


be understood when the results evaluating the Strategy become available.

Figure 6 shows that the rates of population-preventable hospitalizations increased for all ethnic groups between 1996/1997 and 2002/2003. However, the rate of increase has been three times higher among people of Māori and Pacific ethnicity than for Europeans and others. Part of the increase for the Māori and Pacific peoples may be a result of changes in the coding of ethnicity. Given the increase over time across all ethnic groups, the trends reflected in those figures are likely to be broadly correct.

Figure 6. Standardized discharge rates for population-preventable hospitalizations, by ethnicity, 1996/1997–2002/2003

Source: Data extracted from *National Minimum Data Set, 2004*, New Zealand Health Information



Service, Ministry of Health.

The rise in ambulatory-sensitive hospitalizations has differed across ethnic groups (figure 7). Between 1996/1997 and 2002/2003, ambulatory-sensitive hospitalizations for people of Māori and Pacific ethnicity increased annually by 1.6 and 4.3 per cent, respectively, compared with a 0.5 per cent decrease for Europeans and others. Māori and Pacific peoples have greater rates of ambulatory-sensitive hospitalization compared with European and other people. Apart from Māori (among whom rates are similar between the

sexes), males have slightly higher ambulatory-sensitive hospitalization rates than females.

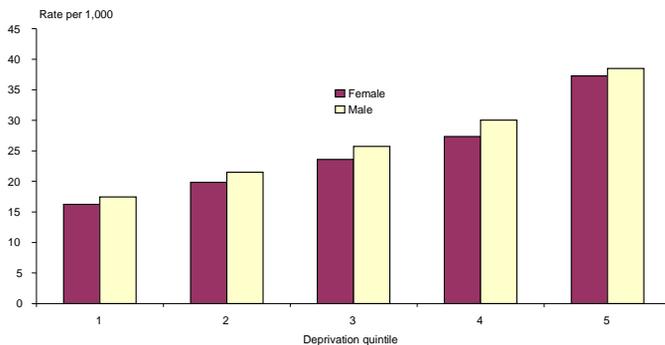


Figure 7. Standardized discharge rates for ambulatory-sensitive hospitalizations, by ethnicity, 1996/1997-2001/2002

Source: Data extracted from *National Minimum Data Set, 2004*, New Zealand Health Information Service, Ministry of Health.

Those data suggest that people of Māori and Pacific ethnicity may not be receiving adequate access to primary health care. Ambulatory-sensitive hospitalizations increase with high levels of area deprivation (figure 8). People living in the most deprived quintile have ambulatory-sensitive hospitalization rates twice that of those living in the least deprived quintile. Ambulatory-sensitive hospitalizations increase steadily with increasing deprivation.

Figure 8. Ambulatory-sensitive hospitalizations, by deprivation area of residence and sex, rate per 1,000, 2001-2003

Source: Data extracted from *National Minimum Data Set, 2003*, New Zealand Health Information Service, Ministry of Health.

Note: Rates are age-standardized using the 1996 census population.

Emerging issues

In recent years significant achievements have been made in the New Zealand health sector, as can be seen from the improvement in life expectancy. However, the relative increase in avoidable hospitalizations indicates that a greater proportion of people are being hospitalized for conditions that could theoretically be treated through primary health care, possibly in combination with support services. While the Government continues to foster innovation and quality improvement, there remain some issues for which continuous effort is required in order to achieve the desired outcomes. Some of those issues are discussed below.

Issues related to population characteristics

New Zealand has an ageing population. Considerable concern has been expressed about the ageing of the population and the impact that this might have on the demand for health services. One possibility is that a larger number of older people will result in increased morbidity and therefore an increased demand for services. Another possibility is that, although the population is ageing, the experience of ill health will continue to be compressed into the last few years of life rather than extended across a larger number of years in old age. International studies provide some support for the second hypothesis in the Australian population (Giles, Cameron and Crotty, 2003). In addition to changes in the level of demand, ageing of the population also has the potential to affect the mix of service types provided.

Despite considerable attention at the national policy level, there has been relatively little systematic analysis of data relating to demographics and the use of health services, with the exception that some analysis has been done with regard to likely future costs for hospital care and overall health costs (Johnston and Teasdale, 1999). It is also important to examine the effects of ageing on the use of general practice services. Given that 80 per cent of New Zealanders aged 70 and older live independently rather than in residential care facilities (Ministry of Health, 2002), monitoring the use of general practice services by different age groups becomes an important part of planning for the ageing of the population.

Issues related to access to health-care services

The strength of New Zealand's health system is that it provides access to hospital care services free of cost to patients, as well as other subsidized health-care services such as immunization, screening and reduced-cost general practice services. In the 2002/2003 New Zealand Health Survey, respondents reported greater satisfaction with general practitioner services. The majority of New Zealanders were very satisfied (48 per cent) or satisfied (45 per cent) with their general practitioners at their last visit (Ministry of Health, 2004). While no

question was asked in this survey regarding satisfaction with the overall health-care system, high levels of dissatisfaction with the health-care system were noted in a survey of “sicker adults” commissioned by the Commonwealth Fund in 2002 (Blendon and others, 2003). However, no conclusive reasons were provided for this finding (Ministry of Health, 2003). This leads to the necessity of examining critical issues in access to health-care services.

There are well-documented disparities in the accessibility and availability of health care in New Zealand. Health accessibility is a multidimensional concept. From an economic point of view, barriers to access are associated with both supply- and demand-side factors. Supply-side factors are broadly related to service availability, the level and allocation of financial and human resources for health care, the existence of waiting times for treatment, especially in allied health services, outpatient medical specialist services and elective procedures.

With regard to service availability, analyses of data from the Organisation for Economic Cooperation and Development (OECD) in 2001 indicate that New Zealand has a relatively high number of general practitioners (0.8 per 1,000 population) and practising certified nurses (9.6 per 1,000). However, they are not equally distributed. The Government recognizes the fact that most of the health services are located in urban or suburban areas. Difficulties in attracting general practitioners and other health professionals to rural areas and the problems of high doctor turnover and continuity of care are often experienced. Therefore, access to hospital and primary health-care services in rural communities is perceived to be a problem in New Zealand (Ministry of Health, 2003). Problems with access to hospital services may be understandable because specialist services need to be concentrated in order to achieve economies of scale and this expertise is available in only a limited number of tertiary hospitals. However, as in Australia, small rural communities value their local hospital highly, largely because of the hospital’s perceived role as a source of emergency care; thus, the closure of any rural hospitals is contested politically (Duckett, 2004). In addition, there are issues concerning major inequities between district health boards with regard to health services such as referred services, and this situation poses a critical challenge for the Government (Malcolm, 2002).

A recent OECD report showed that New Zealand had relatively lower rates of measles immunization compared with the OECD average (85 per cent vs. 90 per cent) in 2001. Childhood immunization is often used as an indicator of the effectiveness of health-service delivery. Besides service availability issues, long waiting time is another critical issue facing the New Zealand health system. Waiting time for elective surgery is also an indicator of the effectiveness of the

health system. Among those needing elective surgery, one in four respondents reported waiting over four months for elective surgery (OECD, 2003).

Demand-side factors can also restrict access to health care. For example, an individual's ability to pay for health services and other personal characteristics (knowledge, beliefs, information, preferences and opportunity costs) are likely to influence the use of health services. The cost of health care generally is incurred in two ways. The first way is when costs are incurred for treatment, for example, prescribed drugs including co-payments for seeing a general practitioner. Second, costs are incurred when patients are referred from primary care to services such as allied health, medical specialists, or private health care. Cost may be a barrier to access and this problem may be aggravated by poor access to public transport and isolated populations in rural settings (Barnett and Coyle, 1998). Such problems are evident in the recent New Zealand Health Survey 2002/2003. One in eight adults said that they needed to see a general practitioner in the previous 12 months, but did not see one and reported a financial constraint as one of the main reasons for not seeing a general practitioner (Ministry of Health, 2004). As such, financial barriers limit the utilization of needed services.

The existence of a barrier to access often depends on the complex interaction of both supply- and demand-side factors, and they in turn determine the extent to which access to health care is equitable. Thus, the concern about how to get the best out of the health system persists in New Zealand as in many other countries in the world.

Issues related to population health outcomes

The Government recognizes that good health and well-being rely not only on access to health care but also on a range of other factors. As such, the picture in terms of equity of outcomes is less clear in part because outcomes are affected not only by service availability or quality of care but also by other individual or environmental factors. Therefore, the challenges in improving population health and reducing disparities are ongoing concerns for the Government.

Analyses of life expectancy, disability and morbidity rates show disparities by ethnicity. It is important to understand what is contributing to those disparities. Numerous studies have pointed out various determinants of health status to explain health disparities. Those factors range from definition of ethnicity, particularly changes in the definition of the Māori ethnic group in various censuses, to the prevalence of chronic diseases and lower socio-economic status (Ajwani

and others, 2003). Other researchers have linked disparities to health-system reforms (Dharmalingam and others, 2004; Laugesen and Salmond, 1994).

Although there was no formal evaluation of the impact of the reforms on the utilization of health services, it has been argued that the reforms were likely to have had the deleterious effect of severely limiting access to primary care (Dharmalingam and others, 2004). This was not only due to the increases in fees for general practitioner services but also owing to policies to cut welfare services, which affected people's ability to access health services (Barnett and Coyle, 1998). Those research findings suggest that, in order to reduce observed disparities in health, broader socio-economic factors need to be taken into consideration as a part of any strategy to improve health status.

Government initiatives and recommendations

To address some emerging issues, the Government has implemented a number of strategies under the framework of the New Zealand Health Strategy to improve the health of all New Zealanders. In this section, a few selected examples of steps taken by the Government are provided.

Initiatives

The Government has launched the Health of Older People Strategy. This strategy provides national direction for an integrated approach to planning, funding and delivering services to older people. This strategy is consistent with the policy framework launched by the World Health Organization at the Second World Assembly on Ageing held in Madrid in April 2002.

The Government is committed to reducing the health disparities that exist between the Māori and the non-Māori populations by developing an effective partnership with Māoris and seeking active Māori involvement in the sector. One of the main initiatives to reduce those disparities includes implementation of *He Korowai Oranga* (Māori Health Strategy) and its accompanying action plan, *Whakatataka* (the implementation plan for the Strategy) (Minister of Health and Associate Minister of Health, 2002a and 2002b). Other initiatives include the implementation of the Primary Health Care Strategy in 2001 and Intersectoral Community Action for Health. It is evident from international studies that improvement in population health is possible through a well-performing primary health-care system (Veugelers, Alexandra and Elliott, 2004). The Primary Health Care Strategy takes a population health approach and

gives more emphasis to health education and health promotion. It is designed to reduce barriers to primary health services and improve their quality. Most of all, it encourages multidisciplinary approaches and coordination (Ministry of Health, 2001) to improve the health of the New Zealanders by dealing with risk factors at the point of first contact. Primary health organizations are the main structures to achieve the success of the Strategy. Progress in establishing those organizations has been rapid since the first two were formed in July 2002.

Unlike previous health reforms, the Health Reforms 2001 Research Project was undertaken to evaluate the progress of health reform under the New Zealand Public Health and Disability Act 2000 (Health Reforms 2001 Research Team, 2003). The research project involves a three-year evaluation with interim findings being fed to the sector as the evaluation progresses. In addition, the Health Research Council, the Ministry of Health and the Accident Compensation Corporation are funding a number of evaluations and related research focused on the implementation and impact of the Primary Health Care Strategy over three years from 2003. Findings of the evaluation programme will be used to inform further developments in primary care.

It is the Government's expectation that all patients seeking publicly funded services will be clearly advised about whether they will receive treatment and when that treatment will occur. The Government is committed to improve the health of all New Zealanders by emphasizing key priorities such as reducing waiting times for elective surgery, improving the quality of health care and addressing rural workforce issues. In addition, the Government has launched a number of population risk-specific strategies, such as the New Zealand Cancer Control Strategy; Healthy Eating Healthy Action: *Oranga Kari, Oranga Pumau: A Strategic Framework*; and Improving Quality: A Systems Approach for the New Zealand Health and Disability Sector.

Recommendations

As described above, the New Zealand Health Strategy and the New Zealand Disability Strategy provide the framework for the overall direction of the health and disability sector. To meet the goals of those strategies, the Government has implemented a number of population, service and disease-based strategies and action plans. Based on the analysis contained in this paper, a number of recommendations are listed below.

There are disparities in health status among different groups of New Zealanders and disparities between people living in the most deprived areas and

people living in affluent areas. Health disparities persist despite ongoing efforts of the Government to reduce them. In order to address the disparity issue, it is necessary to address the determinants of health. As health is influenced not only by the health sector but also by other sectors, continuation of intersectoral collaboration is highly recommended. Intersectoral collaboration is an approach that seeks to influence the many determinants that have an impact on health from outside the health sector by working collaboratively with sectors such as education, housing, transport, employment and justice.

Access to health-care services in New Zealand varies geographically. One way to deal with this disparity is to target disadvantaged communities and populations with specific health programmes and services such as travel assistance. In order to ensure fair access to services, the Government should continue targeting such populations.

It is important to address the financial, structural and attitudinal barriers to good quality health care in order to improve the health of New Zealanders. For this to be possible, along with service provision, socio-economic data should be routinely recorded and analysed.

As there is increasing evidence that effective primary health-care services have an influence on secondary care outcome, it is recommended that efforts be geared towards more integrated and influential primary health-care services. Along with the efforts to promote innovative and good quality health care, efforts to reduce the waiting list for elective services should be continued in order to improve the health of people in New Zealand.

In conclusion, the New Zealand Health and Disability Support System is moving in the right direction to achieve the health goals specified in the New Zealand Health Strategy.

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Endnotes

1. There have been several changes in the classification and coding of ethnicity on birth and death registrations over the last 30 years. A major change occurred in 1995 when classification changed from a “biological” classification to one based on the concept of self-identification. This paper uses ethnicity data that have been prioritized; for details, refer to the methodology set out in appendix 1b of *Health of Older People in New Zealand: A Statistical Reference, 2002* (Ministry of Health, 2002).
2. The New Zealand Deprivation Index (NZDEP) was developed in 1996 and revised in 2001. It is an area-based measure of socio-economic deprivation that uses nine variables (access to a telephone or a car; unemployment; government income subsidies (support), proportion of people living in a low-income or single-parent family, no educational qualifications, live in non-tenured homes, and live in crowded households) obtained from census data to provide a summary deprivation score for each meshblock in New Zealand (a meshblock is a census collection area of 50-60 households, i.e., the smallest geographical unit for which statistical data are collected). The meshblocks are ranked into deciles, with 1 being the least deprived and 10 being the most deprived. Studies that used the NZDEP index as sole indicator of socio-economic status have shown a strong relationship between NZDEP score and health outcomes (Blakely and Pearce, 2002). However, the results need to be interpreted with caution since the majority of Māori ethnic groups tend to live in the most deprived areas (Reid, Robson and Jones, 2000). For instance, a study in the United Kingdom of Great Britain and Northern Ireland found that uptake of income support offers a better explanation of health disparities among older people than standard indicators of deprivation (O’Reilly, 2002).
3. A significance level of 95 per cent has been used for comparisons of disability survey data.
4. Chronic diseases included are heart disease, stroke, diabetes, asthma, chronic bronchitis, arthritis, back or neck problem, osteoporosis, cancer, or other long-term mental or physical conditions.
5. Case weights for this section are based on Victorian (Australian) cost weights (WIES8) modified by the Ministry of Health for deriving 2001/2002 contracted prices with district health boards. Case weights exclude the costs of adjustments paid to district health boards for: complexity (tertiary), rurality, diseconomies of scale, Māori health, capital adjustment, acute demand and blood.
6. Excludes hospitalizations preventable by strategies for injury prevention.
7. Ischemic heart disease subdivided into myocardial infarction, angina and heart failure to distinguish first episodes of IHD (which are preventable) from subsequent management of chronic IHD (which is ambulatory sensitive).

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