

***AN ASSESSMENT OF  
HEALTH NEEDS IN THE  
WEST COAST DISTRICT HEALTH BOARD REGION:  
TE TIROHANGA HAUORA O TAI POUTINI***

Prepared for the West Coast District Health Board

Public Health Consultancy  
Wellington School of Medicine and Health Sciences

Published in October 2001  
By the West Coast District Health Board  
PO Box 387, Greymouth, New Zealand  
ISBN: 0-478-26257-4 (Booklet)  
ISBN: 0-478-26258-2 (Internet)

This document is available on the West Coast District Health Board's Web site:  
<http://www.westcoastdhb.org.nz>

*Kei Te Hauora O Ngai Tahu He Awhina*

*He tautoko mo nga whanau o te rohe*

*O Te Tai Poutini*

*Kia mau nga ahuatanga katoa mai i te Tiriti o Waitangi*

*He akoranga mo nga huihuinga iwi*

*Kia mahi tahi te katoa ki te whakatakoto*

*Tikanga i raro i te poari hauora*

*He whakamohiotanga mo nga awhina e watea*

*Ana mai i nga tari i nga roopu*

*Ki ora ai te iwi Māori tauwiwi ranei*

The West Coast District Health Board and Ngai Tahu support families throughout the district of Tai Poutini – working together towards an understanding, laying down the foundations for progress and promoting and supporting better health practice – under the guidance of the West Coast District Health Board, for the wellbeing of both Māori and Pakeha. The District Health Board and Ngai Tahu recognise the importance of the Treaty of Waitangi and will work together in a spirit that honours the Treaty principles.

## FOREWORD

The purpose of West Coast Health Needs Assessment is to assess population needs in order to provide a platform for future prioritisation of health services in the most equitable, cost-effective way possible to produce health gain and thus better outcomes for the West Coast population.

This report supports the work of the West Coast District Health Board (WCDHB) by informing members of the Board, the staff of the organisation and other interested parties in the district (eg, IPAs, stakeholder groups and individuals in the community). It looks at the health needs of the West Coast from a community perspective, including the perceptions of the people themselves, and benchmarks the West Coast against New Zealand as a whole to achieve a measure of relative health status.

The West Coast has a low socioeconomic status, including significant levels of deprivation, and some of the lowest levels of income and educational achievement in New Zealand. It has the lowest population density of any district health board region in New Zealand. With around 41% of the region's population living rurally, the West Coast needs special attention and resourcing because in a sparsely populated rural area the barriers to health and health care are often greater.

Several provincial DHBs have co-operated with the Wellington School of Medicine to undertake District Needs Assessment. This work forms the basic building block of the WCDHB, providing direction to services required, and especially indicating areas of special needs. The Needs Assessment has involved considerable community input, particularly from health providers and specialist interest groups.

This Needs Assessment is just a beginning. It provides an excellent snapshot of the West Coast's health needs and status. It will be a valuable resource for West Coasters as the changes brought about through the formation of the DHB begin to take effect.



Marian van der Goes  
**CHAIRMAN**



John Luhrs  
**ACTING CHIEF EXECUTIVE**

## ACKNOWLEDGEMENTS

This project has combined the efforts and expertise of the Public Health Consultancy of the Wellington School of Medicine and Health Sciences and the district health boards involved in the Provincial Public Hospital and Community Services Group.

The members of the research team of the Public Health Consultancy were Dr Gary Mitchell (principal researcher), Winnie Chang (researcher) and Paul Hirini (researcher), with support from Bridget Allan (Director, Public Health Consultancy), Jennifer Martin (researcher), Michael Murphy (writer), and Karen Smyth (editor).

The staff of the West Coast District Health Board who were principally involved in the project were Graeme Savage and Trish Turner.

We are very grateful for the oversight and direction given to the project by the Research Advisory Group, particularly for the assistance with methodology, data analysis and interpretation, and for critical review of the reports. The group was comprised of the following people: Dr Cindy Kiro (Senior Lecturer in Social Policy), Associate Professor Philippa Howden-Chapman (Health and Public Policy), Dr Tony Blakely (public health physician and epidemiologist), Tim Rochford (Lecturer in Māori Health), Des O’Dea (health economist), Dr Fran McGrath (public health specialist), Professor Alistair Woodward (epidemiologist), Associate Professor Richard Morgan (Geography), Dr Paul Callister (economist).

We wish to thank our colleagues at Te Rōpū Rangahau Hauora a Eru Pōmare, especially Vera Keefe-Ormsby and Dr Papaarangi Reid, for organising a hui in March 2001 to inform Māori people about the project and to explore methodologies for health needs assessments appropriate for Māori. Thanks to Jacob Tapiata of Te-Pūtahi-ā-Toi (Massey University in Palmerston North) for his valuable guidance with Māori titles in this report.

We are grateful for the assistance that we received from the Ministry of Health, the Land Transport Safety Authority, the Mental Health Commission, and colleagues in the Department of Public Health, Wellington School of Medicine and Health Sciences. Special thanks to Gordon Purdie for statistical assistance, and to Dr Kevin Dew for assistance in training local staff involved in gathering qualitative data.

We wish to thank the Steering Group for their guidance and support throughout the project. The group included representatives from the 12 district health boards: Maree Leonard (Nelson-Marlborough), Joy Robinson (Northland), Brett Paradine (Taranaki), Mary Smith (Lakes), Joy Cooper (Wairarapa), Caroline McElnay and Tracey Adamson (Hawkes Bay), Craig Johnston (MidCentral), Beth Cooper-Liversedge (Whanganui), Margaret Hill (South Canterbury), Derek Bell (Southland), Keriana Brooking (Tairāwhiti), Graeme Savage (West Coast), and Mark Booth (Ministry of Health).

Finally, we would like to express our thanks and admiration for the clarity, purpose and expertise with which Dr Zoran Bolevich (originally from Good Health Wanganui, and now with the Central Region’s Technical Advisory Services) guided the whole project. He ably integrated the needs of the Steering Group with the demands of the research task and the constraints of time and funding, in a way that made the whole project possible.

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## SUMMARY: NGĀ HUA O TE MAHI

The picture of health need for the West Coast District Health Board has been created using both qualitative and quantitative methods. Full details of methodology, findings and discussion are available in the technical report.

West Coast's population of 32 200 is characterised by a lower than average percentage of Māori (10%), a very small but growing Pacific peoples population, an age structure that closely reflects the national age structure, and, unusually, there are more males than females in the region, most notably in the 40 to 75 age group. West Coast has a lower than average birth rate and for some time has had a net loss through migration out of the region, although this has reduced in recent years. The total population is projected to fall in all three of its territorial authorities (TAs) over the next ten years. The Māori population is increasing, although at a slower rate than Māori nationally.

Around 41% of the region's population live rurally (compared with 15% in New Zealand overall), and this proportion is projected to increase. The remainder of the population live in three small main centres and a scattering of rural centres. West Coast is a relatively large and elongated region, spread thinly along the western side of the Southern Alps. It has the lowest population density of any district health board (DHB) region in New Zealand.

Generally, West Coast presents a bleak picture in terms of low socioeconomic status, including very high levels of deprivation, and some of the lowest levels of income and educational achievement in New Zealand. Levels of social and occupational class and the numbers of households with access to cars and telephones are also lower than average. Deprivation is not evenly spread. The Buller TA consistently shows the highest levels of deprivation, which is further exacerbated by its rural isolation, transport and communication difficulties, and a lack of health services.

Two main groups are identified as having high health needs in the West Coast region, those of relatively low socioeconomic status and Māori. While there is interaction and overlap between these two groups, a focus on one alone would miss a large group with high health needs. For example, most people of low socioeconomic status are not Māori, and the health status of Māori is still relatively poor compared to non-Māori, even after controlling for socioeconomic status.

Consistent with the above demographic and socioeconomic issues is the picture of higher morbidity and mortality rates and lower life expectancy on the West Coast compared with the New Zealand average. The overall rate of avoidable hospitalisation is high. Age-standardised rates for nearly all top avoidable hospitalisation diagnoses are higher, and considering the 13 priority objectives in the *New Zealand health strategy, 2000, (NZHS)* of the eight for which there is comparative information, seven are of concern or contain areas of concern. Of particular note are hospitalisations for alcohol-related conditions, poisonings of children, strokes, and low birthweight Māori babies. Of the 26 major diagnostic categories used to classify admission diagnoses, the only categories with lower than average crude rates were pregnancy/birth and newborns, which is likely to be, at least in part, a consequence of the low birth rate in the region.

In addition, where the West Coast region shows statistically significant differences to the New Zealand average, areas of comparative need include hospitalisation rates for the following: injuries, including injuries resulting from motor vehicle crashes; falls in the over 65 age group; pregnancy-related complications in the 15 to 24 age group; and children suffering from poisonings. Other areas of comparative need include the oral health of children; hearing referrals of children; an increase in acute admissions (albeit outside the region); and a low cervical screening rate. Immunisation rates appear low, although data quality is very poor.

The situation of Māori on the West Coast, with respect to some demographic statistics (such as life expectancy, housing and income) and health statistics (such as avoidable hospitalisation - for example for injuries, smoking prevalence, cardiovascular disease, suicides, and breast screening rate), appears to be generally better than for Māori in New Zealand as a whole. Some of the apparent reduced disparity of Māori with non-Māori, however, is a consequence of the generally lower life expectancy, high levels of deprivation, low incomes, low property prices, and high levels of health needs seen in the total West Coast population. Numerator-denominator bias may also play a part in showing reduced disparity (see Appendix 1).

Rural populations appear to have high health needs, and are relatively under-serviced with low numbers per capita of general practitioners (GPs), nurses, dentists and pharmacists, and Māori health providers who are stretched to provide services. West Coast has the lowest numbers per capita of GPs and dentists in New Zealand. Travel times to hospital are significant for much of the West Coast rural population.

The main environmental issues of concern in the West Coast region are substandard water supplies, sewage disposal, and solid and hazardous waste disposal. The concept of 'kaitiakitanga' and the spiritual relationship Māori people have with the land is an illustration of the strong environmental link with health.

Of note is the paucity of information on primary health care, and the difficulties in measuring health disparities between ethnic groups. Also, the small population results in small numbers in various demographic, socioeconomic and health status categories, which presents challenges in interpretation.

## **Recommendations**

The project brief required the research team to make some broad strategic recommendations for health action. The intention is to assist district health boards (DHBs) make decisions about addressing health needs.

Two potential areas of activity are outlined. One involves the DHB working intersectorally with other agencies; the other describes activities the DHB can pursue within its own health services, or by linking with other DHBs and the Ministry of Health (the Ministry). It is acknowledged that many of these activities may be currently happening in the region.

### **Intersectoral activities**

- Improving Māori health by acknowledging the rights of Māori to equality in health status, and supporting tino rangatiratanga whereby Māori gain control over factors that influence their health. This could involve the DHB advocating and working with other organisations such as local iwi and Māori development organisations (MDOs), local authorities, the regional Te Puni Kokiri office and other government agencies, and social services and non-government organisations (NGOs) in the West Coast DHB region.
- Addressing the socioeconomic determinants of health, through advocacy and working with other government agencies (eg, the Ministry of Social Development on benefit entitlements, Housing New Zealand Corporation on further housing initiatives, Child Youth and Family on factors leading to injuries to children, and regional and local authorities on transport issues).
- Reducing smoking, and alcohol and other drug use (eg, through community action projects) and working with relevant agencies such as District Licensing Authorities, the Alcohol Advisory Council, and the Health Sponsorship Council.
- Advocating for protection of the environment, and safe and sustainable use of resources with regional and local councils, iwi and MDOs, and local businesses.

## District health board activities

- Addressing Māori health through such activities as developing closer working relations with Māori in the region, involving Māori in decision-making, increasing the numbers and scope of well-resourced Māori health providers, promoting Māori workforce development in both mainstream and by Māori for Māori sectors, encouraging and resourcing the use of traditional Māori medicine, actively promoting the use of te reo Māori in all health services in the West Coast DHB region, ensuring DHB staff have appropriate cultural training and exploring more holistic ways of measuring Māori health need in future needs assessments.
- Allocating resources according to need. Funding should follow patterns of disadvantage so that groups with higher need (eg, Māori, socioeconomically disadvantaged) receive more resources.
- Focusing on well-resourced primary health care. There is potential for improving health status and reducing avoidable hospitalisations through better access to improved primary care. Working with the Ministry towards affordable primary care services in line with the *Primary health care strategy, 2001*, would improve accessibility to primary care services in the West Coast region. Consideration of using mobile clinics, and/or increasing rurally based services to rural areas would be desirable, as would fostering the interface between primary and secondary health care services.
- Working closely with the local public health service, which has considerable expertise in improving, promoting and protecting health across all the West Coast DHB's priority health gain areas.
- Improving the scope, accuracy and consistency of data collection (eg, ethnicity coding, primary care data and immunisation data).
- Continuing to present the health needs of the people of the West Coast region on a national stage. Although absolute numbers of people with high socioeconomic need are larger in New Zealand's urban areas, rural areas such as West Coast need special attention and resourcing because barriers to health and health care are often greater.

## INTRODUCTION: TE TIMATA

The project grew out of the work of Good Health Wanganui, which completed a ‘first phase’ health needs assessment, jointly with the Wanganui District Council, in 2000. Subsequently, a group of six provincial hospitals contracted the Public Health Consultancy of the Wellington School of Medicine and Health Sciences to carry out a health needs assessment for each of their DHB areas. As the project gained momentum, six other provincial DHBs joined, to make a total of twelve.

The primary intention was to carry out an assessment, which demonstrated a picture of health needs for the population in each DHB region. This project includes most of the smaller DHBs in the country with significant rural hinterland areas. Therefore, issues of assessing and addressing health needs of small or thinly spread populations in remote areas are important factors in these assessments.

The project objectives were:

- To produce relevant and accurate information in a health needs assessment document that can be used for the strategic planning and decision-making process at a local DHB level.
- To develop a ‘standard’ (repeatable) methodology for doing DHB needs assessments.
- To focus primarily on the main population determinants of health, that is social, economic and cultural factors, with the aim of reducing social and economic inequalities in health.
- To carry out the assessment with the involvement of Māori at all levels, so that the final document reflects Māori needs, as defined by Māori.
- To identify gaps in the availability of data and in the capability of providers to supply information relevant to health needs assessment.
- To ensure that the needs assessment is used as a vehicle for consultation and participation with the community and providers, including Māori and Pacific peoples.

Although needs assessments are now a requirement of DHBs, this project was set up in advance of the legal imperative, because the organisations involved realised the importance and value of gathering information on health needs to assist with decision-making. The Ministry has released guidelines for DHBs on how it expects needs assessments to be carried out. These have been followed in this project.

This report describes the health needs of the people of the West Coast DHB region and compares them with the New Zealand ‘average’. It presents information which is consistent with the objectives of the *NZHS*, and which can be used in the monitoring of progress and the planning of services to meet those objectives. A separate disability strategy is being developed by the Ministry. Assessment of the needs of people with disabilities will need to be guided by this strategy, and is beyond the scope of this project.

This report summarises the larger technical report that contains a wide range of descriptive and comparative data, a literature review, the methodology underlying the work, and the report of the project hui which was convened to ensure that Māori concepts of health and measurement of health need were included in the methodology. The reader is referred to these background documents for more detail.

## **PART 1: ASSESSING REGIONAL HEALTH NEEDS: HE TIROHANGA HAUORA**

### **Rationale for needs assessment**

DHBs face difficult decisions in allocating scarce resources to meeting health needs of their resident populations. It is therefore essential to have a transparent process of determining what the health needs are for the DHB population and of dividing up the funding according to priorities. This needs assessment project identifies needs in the DHB region. The process of prioritisation is a separate part of the DHB planning cycle, which draws on the needs assessment, and also involves consideration of community views, current services, and cost-benefit analyses.

Both health and need are ‘slippery’ concepts. There is no right or wrong definition, rather there are a number of ways of thinking about health need which are complementary. Views on this vary between individuals, groups and cultures, as need is a value-laden concept.

Bradshaw’s typology (1972) offers one classification of the different usages of need:

- *Normative need* is what experts define as need (eg completed childhood vaccinations, breastfeeding rates, the 13 priority health gain areas in the *NZHS*).
- *Expressed need* is what can be inferred about need from observing how people use services (so measurement of services and their utilisation is taken to be an indicator of expressed need or demand).
- *Comparative need* infers that the needs arising in one location can be deemed to be similar to those in another location if people have the same sociodemographic characteristics (measured by inter-regional comparisons).
- *Felt need* is what residents in a location say is a need, problem or concern for them (measured by qualitative and social research approaches).

Each type of need has validity. This project takes a broad approach, considering all four of Bradshaw’s concepts of need. Health needs may be measured in many ways. Together with the pragmatic focus on indicators of illness, it is important to bear in mind holistic concepts of wellbeing, and also to look beyond illness status to the determinants of health. By understanding the distribution of social and economic factors within populations it is possible to predict resulting levels of health and illness. Socioeconomic status is recognised as a major source of health needs, incorporating variables such as income, education, employment and deprivation. Ethnicity is another important factor in itself.

DHBs are tasked with protecting, improving and maintaining the health of their geographical populations. Since a large measure of the health of populations is determined by factors outside health services, for DHBs to influence these they need to first understand the broader determinants of health in their region and, secondly, to work intersectorally with other agencies to address these determinants. For example, addressing the health needs resulting from poor housing or overcrowding in the West Coast region would mean both treating resulting illness (such as meningococcal disease and respiratory infections) *and* working with Housing New Zealand Corporation to improve housing conditions.

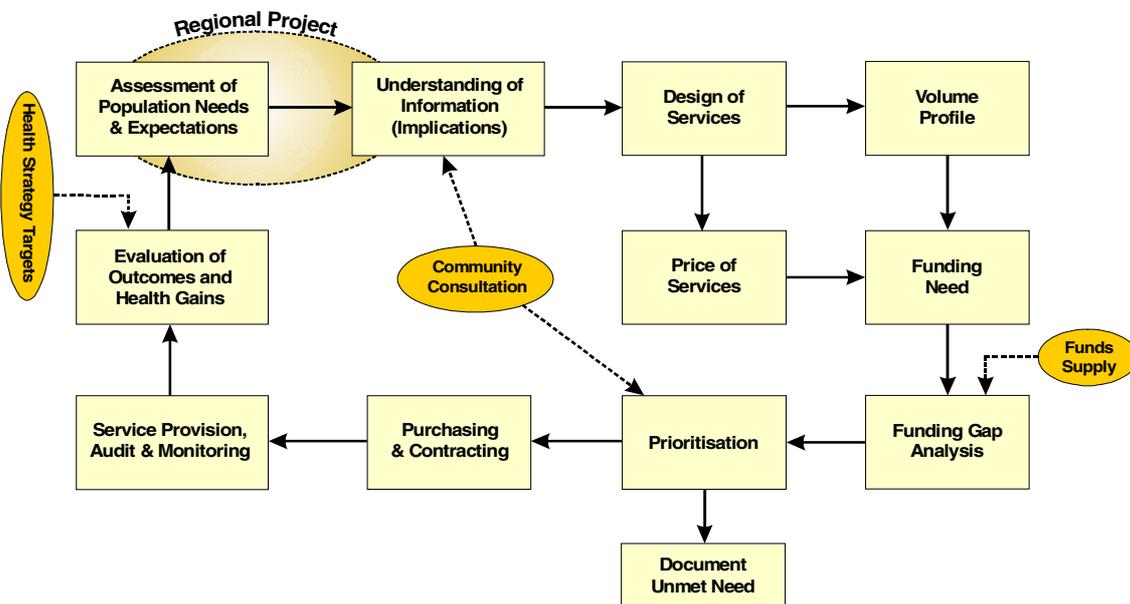
### **Māori health status and health priorities**

Māori concepts of health are holistic, with spiritual, emotional, social and bodily dimensions. The Treaty of Waitangi guaranteed Māori control over and protection of their taonga (treasures), of which health is one. Historically, this protection and control have been breached and eroded, resulting in much of the current state of health for Māori. It is important to acknowledge this in the needs assessment, since it is by rebuilding Māori capacity to protect and control their own health, and factors that influence their health that improvement of Māori health status can happen.

There have been considerable gains in some aspects of Māori health over recent decades, yet Māori health need is still greater than that of any other ethnic group, as shown by measurement against almost every health status and socioeconomic measure. Non-Māori are more favourably spread across the socioeconomic spectrum relative to Māori, yet the poorer health of Māori relative to non-Māori is evident even when socioeconomic factors and risk behaviours are taken into account. How DHBs can help work towards altering the experience of being Māori in ways that improve health outcomes is a challenge. As was noted at the project hui, 'The health of Māori living within a DHB may be looked upon as the ultimate measure of success of DHBs'.

## District health board responsibilities

### The DHB planning cycle



The above figure, supplied by Bolevich (2000), illustrates the part that needs assessment plays in the DHB planning cycle. The main steps in the needs assessment process are data collection and analysis.

While this project has collected and analysed a wide range of data and information, there are still gaps, for example in primary care and mental health data. Further data collection and analysis will be needed in future rounds of the DHB planning cycle, for example analyses using the 2001 Census results, which are not yet available.

## Health priorities for New Zealand

Both the *NZHS* and the Māori health strategy discussion document, *He korowai oranga*, 2001, set out strategic directions for health and health services. They list priority objectives DHBs are expected to focus on initially. These health priorities cover issues that represent a high burden of disease and mortality (eg, cancer, cardiovascular disease and diabetes) and risk factors (eg, smoking, obesity). They also include issues where there are significant disparities (eg, suicide, oral health) and some relatively neglected but important areas, such as rangatahi (youth) health and sexual health.

This needs assessment covers these priority areas, as well as identifying other areas which may lie outside the priority objectives yet seem to indicate significant need within the DHB. The thrust of this

project is broader in scope than the priority objectives of the *NZHS*, which are very disease and risk-behaviour focused. This needs assessment presents a broader socioeconomic and environmental profile, alongside disease-based data.

DHBs have the responsibility for implementing the *Primary health care strategy*, through their funding of primary care services. More accessible and affordable primary care holds the promise of improved health status and reduced avoidable hospitalisations for the populations served (avoidable hospitalisations are those which could be avoided by either preventing the illness or accident that leads to the admission in the first place, such as through the provision of health promotion or disease prevention, or by better management of patients in the community). This health needs assessment summarises the existing primary care data, and identifies the gaps within it.

Pacific and Asian people are present in low numbers on the West Coast, therefore detailed quantitative analysis of rates and figures for these groups is not possible. Nevertheless, DHBs are encouraged to liaise with groups advocating for the health of these populations.

## PART 2: PROFILE OF THE WEST COAST DISTRICT HEALTH BOARD: TE ĀHUA O TE ROHE

### Demographic information

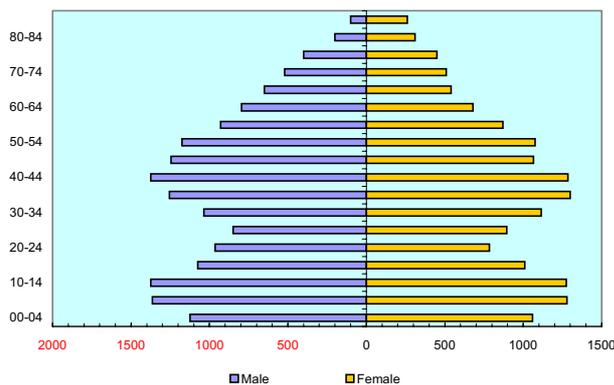
There are about 32 200 people living in the West Coast region in 2001 (projected population). It is the characteristics of this population (age, sex, ethnicity, rurality) together with a summation of influences (socioeconomic and environmental determinants) that determines health needs for West Coast. The projected population in 2001 is 15 765 females and 16 432 males. Of particular note is that males outnumber females in the 40 to 74 age group, in contrast with New Zealand overall.

The proportion of Māori, at around 10%, is lower than in the total New Zealand population (15%). Both the number and proportion of Māori in all age groups are projected to increase in the next ten years, resulting in a total increase of Māori on the West Coast of 15%, in contrast to the total population, which is projected to drop by 2.5%. There is a very small (0.6%), but increasing, population of Pacific peoples.

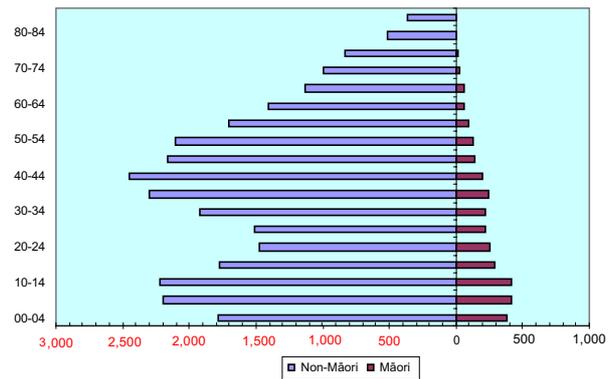
The age structure generally reflects that of New Zealand as a whole, for both Māori and non-Māori. There are slightly greater proportions in the under 15 years, and the 45 to 64 age groups, for both Māori and non-Māori, and slightly lower proportions in the 15 to 44 age range. Proportions over 65 years are the same as for New Zealand as a whole. Māori have a younger population structure than non-Māori, throughout New Zealand, due to a higher birth rate and lower life expectancy.

As for New Zealand as a whole, the increasing proportions of older people in the population will continue to place greater demands upon health services on the West Coast. The over 65 age group has high health needs, and consumes more health services than younger age groups. The increasing proportion of Māori and Pacific populations, who tend to have lower levels of socioeconomic status and poorer levels of health, are also likely to increasingly feature in the health needs of the region.

**Age structure by gender,  
West Coast DHB region, 2001**



**Age structure by ethnicity,  
West Coast DHB region, 2001**



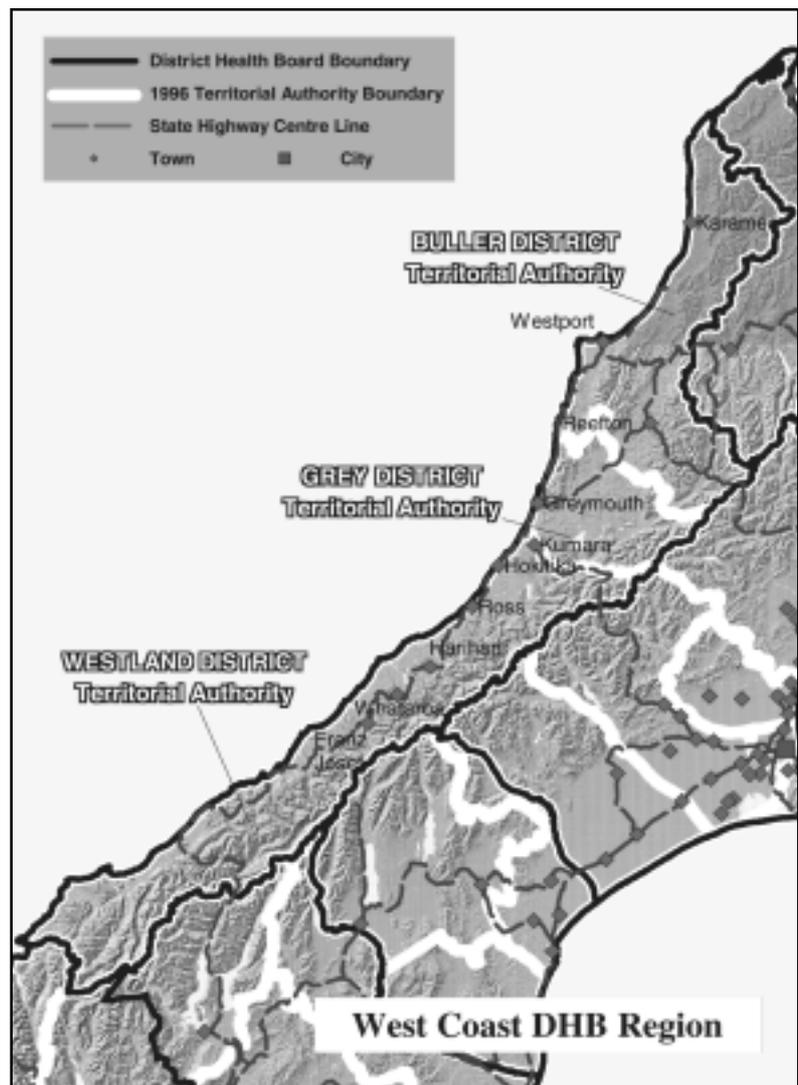
The way a population changes over time is related to fertility, birth rates, death rates and migration patterns. Fertility and birth rates, for the total West Coast population, are significantly lower than the rates for New Zealand. The birth rate for Māori is significantly lower than for Māori in New Zealand overall, though higher than non-Māori. Added to this, the all cause mortality rate is significantly higher than the New Zealand average. For some considerable period, the West Coast has lost population through migration out of the region. During the decade 1986 to 1996 the rate of loss of population slowed dramatically. However, a continuing net loss of population is projected over the next decade.

A full age-sex-ethnicity table for West Coast is given in Appendix 2.

## Geography

West Coast covers the area between Karamea in the north and Haast in the south and extends east to Springs Junction. The length of this landmass is approximately equal to the distance between Auckland and Wellington, with a land area of 2.3 million hectares, much of which is rugged, and through which are scattered small, isolated pockets of population. It is the most sparsely populated DHB in the country with a population density of 1.4 people per square kilometre. As a result of the region's natural beauty it is a popular tourist destination with an average of approximately 4000 visitors every day. The hospitalisation rate of overseas visitors in this region is similar to the national average, and the use of primary care or hospital outpatient/emergency services by tourists is significant, according to local sources.

Rainfall is around twice the national average. The resultant dampness may have implications for people with such illnesses as respiratory diseases, or arthritis. Mean temperatures do not vary greatly from the national means.



## **Local government: the territorial authorities**

Territorial authorities are local council areas for which a range of statistics is available. Within the DHB there is likely to be geographical variation in need, which will not be picked up unless the statistics are broken down by TA. At times this is not possible due to small numbers, or due to unavailability of data. On the West Coast there are three TAs: Buller, Grey and Westland. All three TAs fall neatly within the DHB boundary

## **Economy, industry and occupation**

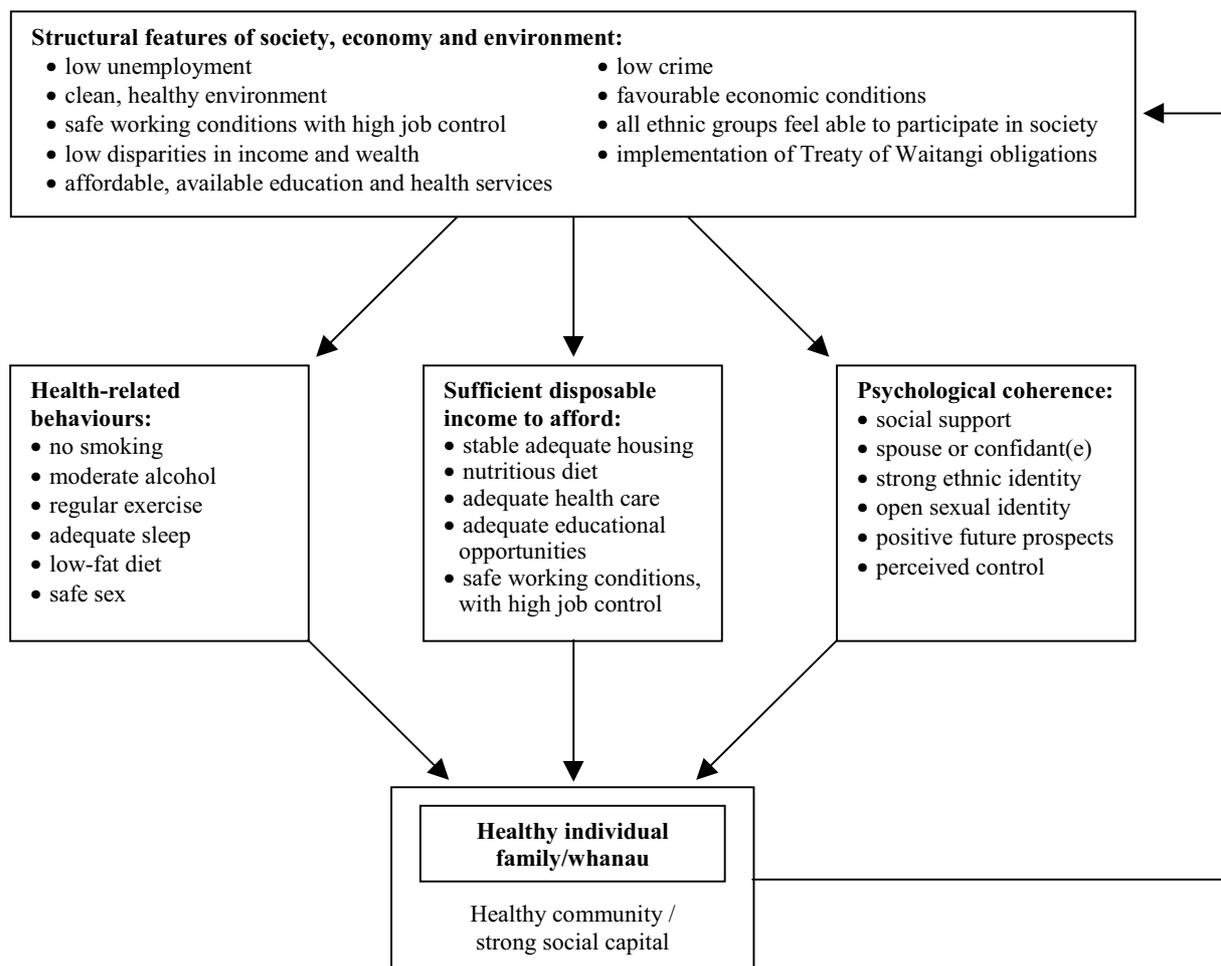
The West Coast economy continues to be underpinned by natural resource extraction. However, other industries such as visitor services, manufacturing, processing and pastoral farming are making major strides both in terms of employment and income generation. There have been some setbacks in terms of coal mine closures, although these have been described as only temporary shutdowns. According to a recent economic survey, the West Coast, as a province, came second in the South Island for its economic growth. Despite structural problems, such as that of isolation, the West Coast is poised to expand. It has huge coal resources which have not been fully tapped, and a recent \$92m Government development grant, which, when appropriately invested in sustainable growth sectors, is expected to give further dividends to the local economy.

## PART 3: SOCIAL, ECONOMIC AND ENVIRONMENTAL DETERMINANTS OF HEALTH: TE TIROHANGA OHAOHA

### Socioeconomic status and health

People who have higher levels of education, higher incomes and live in less socioeconomically deprived neighbourhoods are likely to live longer and enjoy better health than those who have no qualifications, are unemployed or in low-skilled jobs, earn less and live in socioeconomically deprived neighbourhoods. *A wide range of health indices and risk factors have been found to be patterned by socioeconomic factors such as deprivation, income, education, labour force status, housing, and occupational class.*

#### Model of social and economic determinants of health



Source: Howden-Chapman P and Tobias M (eds). *Social Inequalities in Health: New Zealand 1999*, p4.

Lower socioeconomic status is also associated with reduced access to cars and phones, with consequent difficulties in accessing health (and many other) services. Rural populations are particularly disadvantaged as transport costs and travel times to health services are greater for them. The prevalence of unsealed roads adds significantly to the travel time and cost to access services, to the extent that the Ministry of Education has suggested that the isolation index it developed could weight the distance of unsealed over sealed roads by a factor of as much as two.

West Coast has a very high overall level of socioeconomic disadvantage, when compared to the New Zealand average. It has the lowest median household and per capita income in New Zealand, a higher

rate of benefit usage, except for Student Allowances and Domestic Purposes Benefits, and benefit usage tends to be of longer duration. While employment status proportions are similar to national proportions, there is a lower average level of occupational social class. West Coast has one of the highest proportion of people with no secondary or tertiary qualifications in New Zealand.

The level of home ownership is higher than average for both Māori and non-Māori, which may be related to the low average cost of houses in the region. A lower than average proportion of homes are over-crowded, and higher than average proportions of households have no telephone and/or no access to a car. Public transportation systems are very limited, and travel times to the two main hospitals are significant for much of the mainly rural population. The Buller TA is consistently the most socioeconomically disadvantaged within the region, by most measures of socioeconomic status.

The disparity between Māori and non-Māori is less on the West Coast than in New Zealand as a whole, in terms of such measures as income levels, home ownership, occupational class. However, this is largely a consequence of the generally lower socioeconomic status of the entire population in the region. This flows on into the apparent reduced disparity in health status indicators for Māori and non-Māori, and the picture is further clouded by numerator-denominator bias, which makes the true disparity difficult to gauge.

### Various socioeconomic parameters for the West Coast DHB region, 1996

	1996 pop'n	% Māori	Equivalised household income	% Unemployed	% Carless	% Phoneless
<b>Buller District</b>	10 512	8.2%	22 347	9.6%	13.9%	12.3%
<b>Grey District</b>	13 698	7.4%	26 706	7.5%	12.4%	7.6%
<b>Westland District</b>	8280	11.6%	27 370	5.4%	11.1%	9.7%
<b>West Coast DHB</b>	32 493	9%	N/A	7.5%	12.5%	9.7%
<b>New Zealand</b>	-	14%	33 325	7.7%	11.5%	4.9%

Source: Statistics NZ

N/A – Not Available

Note: Equivalised means adjusted for family size.

## Deprivation

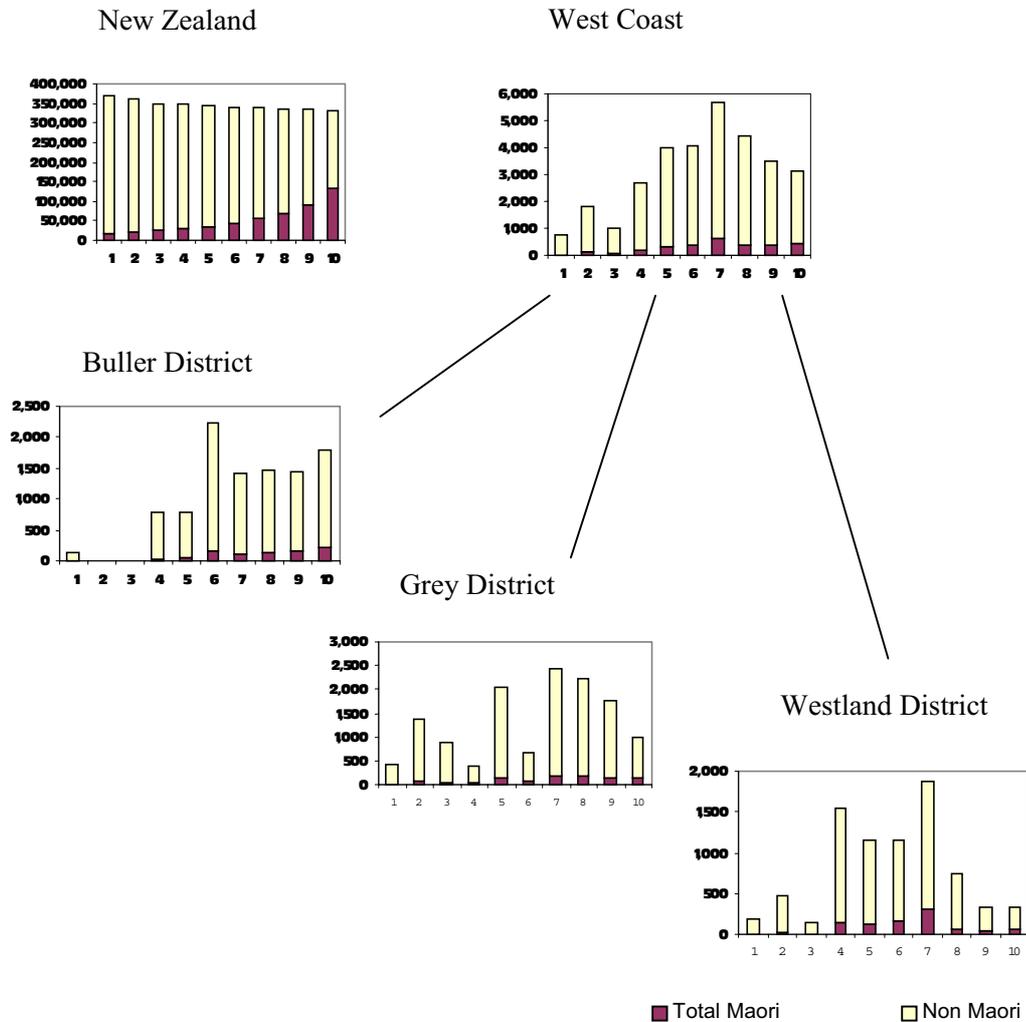
A collection of indicators measured for small geographical areas (usually populations of 100 to 200 people) have been combined into a New Zealand Index of Deprivation 1996 (NZDep96). There is a consistent and pervasive correlation between various health-related parameters and increasing deprivation using the NZDep96 scale. Increasing small area socioeconomic deprivation is consistently associated with decreasing life expectancy, increasing mortality rates, increasing hospitalisation rates and higher smoking rates. *High deprivation areas are therefore an important indicator of likely areas of health needs.*

NZDep96 is one measure of socioeconomic status. It is a relative measure compared to the whole of New Zealand. Individuals residing in a small area cannot be assumed to all have the same socioeconomic status. However, there is a strong correlation between personal socioeconomic status and location of residence.

An NZDep96 map is presented after page 35. On that map areas in red represent areas of relative deprivation. It is important to note that the shaded areas are coded by the average level of deprivation in that locality, but give no indication of the population density.

There are some pockets of high deprivation around the town of Greymouth, and almost all of the Buller TA is an area of very high deprivation. There are areas of moderate-to-high deprivation in the Grey TA and at either end of the Westland TA.

### Deprivation profiles for New Zealand and the West Coast DHB region, 1996



In the graphs above, the horizontal axis shows the NZDep96 index of deprivation scale from 1 (least deprived) to 10 (most deprived) deciles of small area socioeconomic deprivation. The vertical axis shows the number of people in each decile. Note the even distribution of people at the national level by decile (by definition). However, within DHBs the population may be skewed towards either a more or less deprived pattern than the national picture.

The picture for West Coast shows that a major proportion of the population falls into NZDep96 deciles 5 to 10, indicating a *high overall level of deprivation* in the region.

The Buller TA shows extremely high levels of deprivation, with the major proportion of the population in deciles 6 to 10. In the Westland TA the overall degree of deprivation is less severe, although it is still high. The Grey TA shows a greater spread than the other two, though still indicates

a bias towards greater deprivation than is seen in New Zealand overall. Of note is the manner in which Māori and non-Māori follow a more similar pattern to each other than is the case for New Zealand as a whole.

The above NZDep96 analysis uses small areas of one or two meshblocks (100 to 200 people in each). Census Area Units (CAUs) provide a higher level of aggregation, with about 2000 people in each CAU. At this level, there are many CAUs in the West Coast DHB region that are among the 20% most socioeconomically deprived in New Zealand. These are Kumara (in Westland TA), Blackball, Cobden, Greymouth Central and Rununga-Rapahoe (Grey TA), and Granity and Hector-Ngakawau (Buller TA). These areas can be expected to have higher health needs.

## **Environment as an influence on health**

In terms of environmental hazards, food-related illnesses are the most common cause of morbidity in humans. The West Coast has a number of geographically dispersed small-to-medium sized retail and manufacturing food businesses. Transport of food in a safe manner has been identified as an issue requiring on-going attention.

The standard of drinking-water is a concern in the West Coast region. The *Drinking-water standards for New Zealand*, 1995, lists three Priority 1 determinants that are to be tested for at the treatment plant, namely faecal coliforms, giardia and cryptosporidium. These pose the greatest biological risk to human health and are found in high rates on the West Coast, where only one of the 55 treatment plants was fully compliant. This plant supplied water to 22% of the population. On the West Coast, 33% of the population was supplied drinking-water from treatment plants that were not monitored. Probable consequences of this are the high rates of notified cryptosporidiosis and giardiasis on the Coast.

Significant sewage issues on the West Coast include raw sewage discharges into rivers, sewage treatment plants operating inadequately due to storm water intrusion and increased population demands, large numbers of failing septic tank (on-site) disposal systems, and rural/residential subdivision in areas that were previously considered remote but that are becoming built up. Also, trade waste discharges, including blood products and industrial chemicals, are not managed.

Significant population centres that have problems with municipal sewage discharges include Greymouth, Westport and Reefton. Communities that are not on sewerage systems, and in which on-site disposal has failed, include Blackball, Gladstone, Orowaiti and Inangahua Junction. These communities have poor soakage areas. Sewage discharges to the Buller, Inangahua and Grey Rivers are likely to be resolved in the near future with the installation of engineered sewage treatment plants.

Solid waste management is an increasing issue for the larger population centres, such as Greymouth, Westport and Hokitika.

Chemical spills appear to be occurring with increasing frequency on the West Coast. These have the potential to create a significant health risk. Chemical spills on the West Coast within the last two years include a timber treatment chemical spill at Bluff Creek, a diesel spill in Greymouth, and a spill of 1080 poison between Kumara and Christchurch. All these spills were preventable. The use of 1080 is emerging as a contentious issue on the West Coast. Perceived risk of human poisoning from 1080 is greater than the actual risk. There have been no notifications of accidental 1080 poisoning in New Zealand.

Some communicable diseases are notifiable (meaning that diagnosed cases must be reported). However, numbers are generally considered to be under-estimated because of under-reporting, under-diagnosis and the fact that many people with some of these diseases never access health services, either because of barriers to access or lack of serious symptoms. West Coast experiences higher rates

for several enteric preventable communicable diseases than the national average. These diseases include giardiasis, cryptosporidiosis, yersiniosis, and salmonellosis, which have been linked to drinking-water. There have been seasonal outbreaks of campylobacteriosis and cryptosporidiosis during the calving season.

West Coast experienced several outbreaks of pertussis (whooping cough) in 2000 and has the highest rates in the country. Notification rates in adults are high. Immunisation rates appear to be too low to provide adequate protection for the whole community.

## **PART 4: HEALTH STATUS ON THE WEST COAST: TE HAUORA O TE IWI WHĀNUI**

*Much of the information concerning health status uses death and hospitalisation rates. Note that hospitalisation rates can be more a reflection of availability and supply than need. Rarely are true prevalence or incidence rates available for specific diseases and conditions.*

### **Health strategy priority objectives**

The *NZHS* outlines the Government's overall health focus and direction. The strategy outlines more specific goals and objectives to guide action on improving the health of the population, and reducing inequalities in health status between population groups. There are 61 objectives, 13 of which have been highlighted for DHBs to focus on for immediate action.

A number of the priority objectives relate to risk behaviours, which are those behaviours that either protect individuals or put them at risk of illness or injury or death. They are considered to be preventable in the sense that behaviours are modifiable, though for some groups programmes to change lifestyle and behaviour have not been effective.

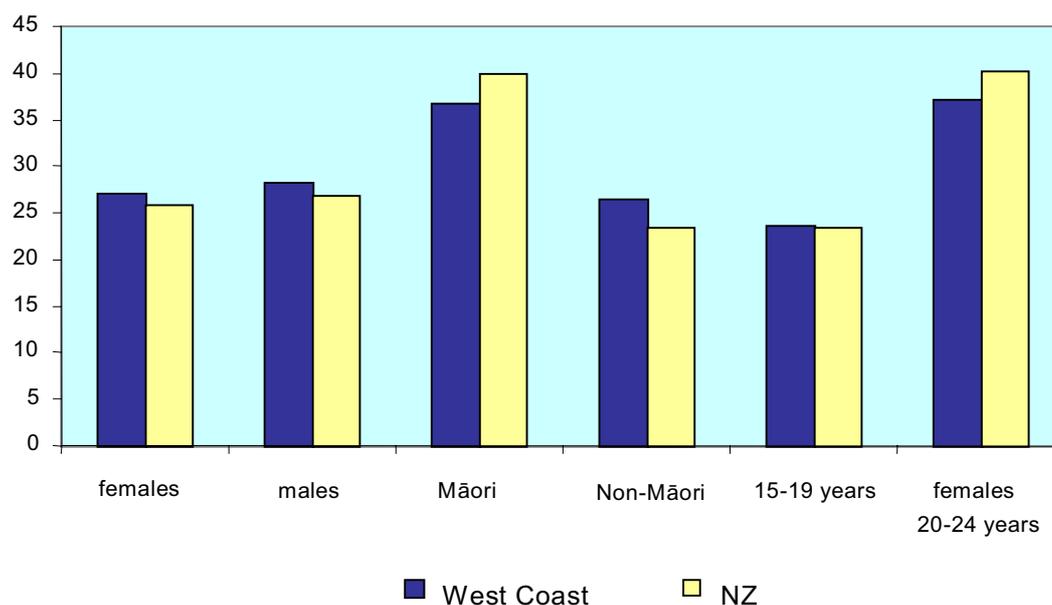
Risk behaviours are usually, with some minor exceptions, more prevalent among groups with lower socioeconomic status. It is important to address the socioeconomic determinants of health, upon which risk behaviours are strongly patterned, in order to reduce obesity, smoking, alcohol and other drug use.

The 13 priority objectives are presented below, together with available data for West Coast.

#### **Priority 1: To reduce smoking**

Smoking is considered to be an intermediate factor between deprivation and morbidity. Smoking is one of the most significant preventable causes of ill health, and remains a considerable burden to the health status of Māori in particular. There are 4700 deaths annually in New Zealand attributable to smoking. Smoking kills one in two smokers, and smokers who die prematurely from smoking-related causes on average die 14 years earlier than non-smokers. Smoking is also an important perinatal and child health risk factor.

### Smoking prevalence (%), West Coast versus New Zealand, 1996



Source: Ministry of Health, from 1996 Census data

On the West Coast, the overall smoking prevalence is slightly higher than the New Zealand average. Higher than average prevalence is seen for non-Māori, both male and female, whereas the smoking prevalence of Māori is lower than for Māori in New Zealand as a whole. The prevalence in the Buller TA is in the top 20% of prevalence rates for TAs in New Zealand, with very high rates among non-Māori, and the highest rate nationally for adolescents.

#### Priorities 2 and 3: To improve nutrition and reduce obesity

Nationally, 15% of males and 19% of females are obese, and 40% of males and 30% of females are overweight (but not obese). Obesity and nutrition have been linked to most major non-communicable diseases including diabetes, most cancers and cardiovascular disease. This is a particularly significant issue for Māori and Pacific peoples. Hypertension, osteoporosis and dental decay are other ailments directly attributable to nutritional status.

Due to a general lower socioeconomic status, and the transport costs added to groceries on the West Coast, basic staple foods are less affordable. Also, because of the geography of the region, people in rural areas have limited access to fresh produce and grocery items. The national marketing of poor food choices has been effective, and counteracting advertising has been minimal.

#### Priority 4: To increase the level of physical activity

Physical activity is important in reducing avoidable mortality and avoidable morbidity, particularly in relation to stroke, high blood pressure, obesity, diabetes and colon cancer. The best available regional data is from the Hillary Commission Push Play survey, carried out every month from May 1997 to April 1998.

Information was collected for 419 adults and 127 young people living in the Canterbury/West Coast region, and this survey indicated that, for this composite region, slightly higher than average proportions of both young people and adults are active. Of these, young people tended to spend more time active than young people nationally, and adults spent time in activity at a similar rate to the national average. Unfortunately, no conclusions can be drawn from these findings regarding the West Coast population.

### **Priority 5: To reduce the rate of suicides and suicide attempts**

New Zealand leads the Organisation for Economic Co-operation and Development (OECD) in suicide rates. In 1998 there were 574 deaths from suicide in New Zealand, compared to 561 in 1997 (a 2% increase). In New Zealand overall, the rate of suicide death in 1998 for Māori was substantially higher than the non-Māori rate. Almost one in four suicides in New Zealand in 1998 were in people aged between 15 and 24 years (140 deaths), of whom three-quarters were males. Recent decades have witnessed increases in suicide rates for young Māori people. Links have been made between cultural alienation and the observed increases in psychological distress among young Māori, as signalled by increasing psychiatric admissions and suicide attempts.

Low numbers overall, and within ethnicity and age sub-groups, mean that no meaningful conclusions can be drawn regarding suicide, in relation to national data. However, there are indications within the statistics that the suicide rate in the region may be high. Of note is that of 26 suicide deaths during the 1996-1998 period, 23 were males and 25 were non-Māori.

### **Priority 6: To minimise the harm caused by alcohol and drug use**

At some time in their life, nearly one in five New Zealanders will suffer an alcohol-use disorder, whether from a disease such as cirrhosis, or an increased risk of some types of cancer, stroke, and heart disease. Alcohol abuse also significantly contributes to death and injury on the roads, drowning, suicide, assaults and domestic violence. While alcohol use can offer some protective effect against heart disease and stroke later in life, the net effect on mortality is negative because so many of the deaths occur at younger ages (particularly from accidents and injuries).

Illicit drug use is difficult to quantify. Daily use of cannabis is recognised as having adverse health effects. Only 1% of people in a New Zealand national sample were daily users. Young people aged between 18 and 24 years have the highest frequency of cannabis consumption and are thus most at risk of adverse consequences. Injecting drug use (IDU) produces serious risks to individuals and society. Current estimates suggest that there are around 15 000 regular IDUs in New Zealand.

The hospitalisation rate for alcohol-related conditions on the West Coast is the highest for any DHB in this project and is higher than the rate for New Zealand as a whole. The mortality rate for alcohol-related conditions might also be high. Provider survey respondents identified the need for more alcohol and drug health promotion in the region.

### **Priority 7: To reduce the incidence and impact of cancer**

Cancer is one of the leading causes of death for middle to older age groups. Māori loss of life from cancer is high in relation to non-Māori.

Small numbers prevent confident interpretation; however, there appears to be a consistent pattern which suggests that the mortality rates from cancer may be higher on the West Coast than the national rates for the population overall, for both Māori and non-Māori, and for males. This consistent, if inconclusive, pattern is also seen in the mortality rates from lung cancer and cervical cancer.

### **Priority 8: To reduce the incidence and impact of cardiovascular disease**

Although cardiovascular disease in New Zealand is declining it is still the leading cause of death, mainly due to ischaemic heart disease and stroke. Nationally, males have over double the rate of hospitalisations than females. Modifiable risk factors for cardiovascular diseases include smoking, obesity, lack of physical exercise, diabetes, stress, diet, and high blood pressure. Māori are known nationally to have higher rates of heart disease, and higher consequent mortality from heart disease, than non-Māori, yet recent research has shown that intervention rates (such as coronary bypass operation rates) are significantly lower for Māori than non-Māori.

The hospitalisation rate for cardiovascular disease for non-Māori on the West Coast is higher than the national rate for non-Māori. The hospitalisation rate for stroke is considerably higher than the rate for New Zealand as a whole.

### **Priority 9: To reduce the incidence and impact of diabetes**

Diabetes is a major cause of morbidity and early mortality, and causes problems for both those affected and their families. The most common of the two types of diabetes is non-insulin-dependent diabetes mellitus (type II), which is a disease of insulin deficiency and resistance and diagnosed most frequently in middle and older age groups. This form of diabetes accounts for nearly nine out of every ten cases of diabetes. Diabetes is rapidly increasing in New Zealand and the incidence is expected to double in the next 20 years. Māori and Pacific peoples are three to four times more likely to develop diabetes than other ethnic groups.

Small numbers on the West Coast lead to difficulties in arriving at conclusions. The hospitalisation rates for diabetes might be lower for both Māori and non-Māori, than the respective national rates. However, as in New Zealand overall, the rate for Māori on the West Coast appears to be as much as three times higher than that for non-Māori (1.7 per 1000 versus 0.58 per 1000).

### **Priority 10: To improve oral health**

Diseases of the teeth and gums are among the most common of all health problems and are experienced by all New Zealanders at some stage of their life. Most dental disease is preventable, and early dental disease can be an indicator of poor overall health status, both present and future. The vast improvement in children's oral health over the last 30 years is due to the improvement in social conditions and the introduction of preventive measures such as fluoridation, fluoride toothpastes, clinical application of fluoride and fissure sealants as well as health promotion, health education and regular dental care.

The dental health of children in the West Coast DHB region is amongst the poorest in New Zealand. The proportions of children who are caries free at ages 5 and 12 years (37.6 and 36.2% respectively), are markedly lower than the national proportions for those age groups (53.6 and 43.0%). Consistent with this, the MFT scores (the number of teeth missing or filled due to caries) are also higher in both age groups (2.8 and 2.0 versus 1.8 and 1.6), although the difference is reduced in the latter. The MFT score for 5-year-olds is one of the worst in the country. There are no fluoridated water supplies in the region.

### **Priority 11: To reduce violence**

There is little data available regarding violence on the West Coast. Over the period 1998 to 2000 the numbers of reported violent crimes in the region have remained relatively constant. During the period 1996 to 2000, there were two children hospitalised as a result of intentional injuries.

## **Priority 12: To ensure access to appropriate child health care**

Achieving good child health is vital for later adult health, as the risk factors for many adult diseases and the opportunities for preventing these diseases arise in childhood. Poor child health and development also have an adverse impact on broader social outcomes, including sexual and reproductive health, mental health, violence, crime and unemployment.

Infant mortality has often been used as a broad indicator of child health. On the West Coast, the infant mortality rate is around average and the child mortality rate appears to be low. The sudden infant death syndrome (SIDS) rate appears to have declined, as it has nationally. Numbers are very low, but the birth rate of low birthweight Māori babies may be trending upward, contrary to national rates for all ethnicities. Breastfeeding rates for babies seen by Plunket appear to be lower than the national rates, for both Māori and non-Māori.

To protect a community, an adequate immunisation rate is 90%. Immunisation rates on the West Coast are well below this level, and the lack of accurate immunisation data is a significant data gap. Numbers of avoidable hospitalisations for immunisation-preventable conditions are too small to make interpretations.

Injuries are the leading cause of death and disability in the age group 1 to 14 years, and are the second leading cause of hospitalisation of children. It is estimated that nearly one-third of child injury deaths are readily preventable. Hospitalisation rates for unintentional injuries on the West Coast are similar to the New Zealand averages for both under 5 years and 5 to 14 years, although the rate for under 5 years might be a little higher than average. The hospitalisation rate for poisonings of children is very high. The proportion of Māori children referred for failed hearing tests at school entry is noticeably higher than for Māori children nationally.

Provider survey respondents expressed concern that there is no resident paediatrician, and waiting times are long for appointments to see the visiting paediatrician.

## **Priority 13: To improve the health status of people with severe mental illness**

Mental health is traditionally a weak area in terms of data for health status profiles. The situation is improving with the setting up of the Mental Health Information National Collection project (MHINC). There is no robust diagnosis data available at this stage. Mental health is considered by some to be the most pressing health need for Māori in current times.

## **Key health issues for Māori**

Māori have the highest health needs of any ethnic group in New Zealand, as shown by health status and health determinant (socioeconomic) statistics. The historical contribution of colonisation to this situation has been touched on earlier, together with the importance of ‘resources following need’, and the ongoing maldistribution of health determinants. An example is research that demonstrates that non-Māori are paid higher incomes than Māori when in similar jobs with similar qualifications.

The growing and ageing Māori population will lead towards greater health needs in future, unless resources and determinants of health are redistributed.

Socioeconomically, Māori are disadvantaged relative to non-Māori. There may be additional influences on health status related to the experience of being Māori that are important. Regaining tino rangatiratanga and control over socioeconomic determinants is a step for Māori towards closing health gaps. DHB activities that would assist this process involve the DHB working closely with Māori and other agencies, both government and non-government.

Although gathering the usual measures of health and health determinants and disparities is important, it was emphasised at the project hui that the usual measures of health fall short in terms of capturing the richness and diversity of Māori understandings and realities in health. Additional suggestions of measures relevant to Māori health service need included:

- Māori consumer satisfaction
- the scope of Māori providers and shared services within DHBs
- funding allocated for local Māori development initiatives
- the organisational promotion of te reo Māori
- the number of DHB staff in Māori cultural training (eg, cultural safety or responsiveness)
- the quality of services and relationships between DHBs and tangata whenua
- the quality of consulting with local tangata whenua
- Māori access patterns to health services
- access also to traditional Māori health practices.

In essence, the project hui recommended that Māori must be a visible Treaty partner throughout the health needs assessment process, and in the implementation of recommendations at local level. This can only be achieved with adequate resourcing to enable genuine Māori involvement. However, detailed measurement of these factors, together with population measures of health (such as strength of Māori community, measures of cultural identity, number of Māori in positions of influence, and value of resources in Māori ownership), is also suggested for future work that builds on this assessment. More detailed information is presented in the technical report and the project hui report.

At the 1996 Census, 14% of Māori in the West Coast DHB region reported some fluency with te reo Māori compared with 25% for New Zealand overall. The proportion of Māori who are affiliated with an iwi is higher than the proportion of Māori in most DHBs, and in New Zealand overall.

*He korowai oranga* lists 20 population health objectives for Māori. Some of these have been discussed elsewhere in the report, and others are discussed below (see items in bold). In nearly all areas where comparative data is available, there is a disparity between Māori and non-Māori health. In many areas data for Māori is not presented because numbers are too low to reach clear conclusions.

In terms of **child health** for Māori, the infant mortality rate on the West Coast appears to be similar to the New Zealand rate, but the statistics are not presented by ethnicity due to low numbers. Hospitalisation rates for **injuries to children**, are not presented by ethnicity, and generally appear to be average, except for poisonings, of which there is a very high rate. For tamariki, rates of referral for failed **hearing** tests are significantly greater for Māori than for non-Māori, and are higher than the national rate for tamariki. **Oral health** status is another need as shown by higher caries rates in tamariki compared with non-Māori. Although data is not presented by ethnicity, the oral health of children is amongst the poorest in New Zealand.

Health of **rangatahi** (young people) is a priority area; however, little specific data is available for the West Coast. The **teenage fertility** rates on the West Coast have been generally higher than national rates over the past decade. Rates are not presented by ethnicity. The rate of **complications of pregnancy** for the 15 to 24 age group in the total West Coast population appears to be slightly higher than average. As for all of New Zealand, **smoking** prevalence among Māori, and especially young Māori, is much higher than for non-Māori. Smoking prevalence for Māori on the West Coast, however, is lower than for Māori nationally. Of 26 **suicides** on the West Coast between 1996 and 1998, only one was Māori.

The all cause rate for **injuries** to Māori may be lower on the West Coast than for Māori nationally, and appears to be similar to that for non-Māori. For **alcohol and drug** problems, there is no breakdown by ethnicity. West Coast, however, has one of the highest hospitalisation rates in New Zealand for alcohol-related conditions. With respect to sexual and reproductive health issues for Māori, the rates of

fetal and infant deaths appear to be low, although, however, the number of **low birthweight** Māori babies may be trending upward, contrary to the national trend.

Major diseases in terms of illness and death for older Māori are diabetes, cancer and cardiovascular diseases. Along with the overall higher rate for West Coast, the mortality rate from **cancer** among Māori may be higher than the rate for Māori nationally. The hospitalisation rate for **cardiovascular disease** among Māori may be lower than the rates for both Māori and non-Māori, nationally. The hospitalisation rate for **diabetes** for Māori may be lower than the national rate for Māori; however, the Māori rate appears to be around three times higher than the non-Māori rate, as it is nationally. The hospitalisation rate for **asthma**, for the total West Coast population, is similar to the rate for New Zealand overall, as is the prevalence of asthma in the region, but, again, it is important to note that the national admission rate for Māori is considerably higher than for non-Māori. There is no data available for West Coast, regarding **nutrition and obesity**. These are risk factors for, among other things, cardiovascular diseases, diabetes and some cancers, all of which affect Māori disproportionately. The final population health objective is disability support, which is not covered by this project.

The situation of Māori on the West Coast, with respect to some demographic and socioeconomic statistics (such as life expectancy, housing and income) and health statistics (such as smoking prevalence, avoidable hospitalisation - including injuries, cardiovascular disease, suicides, and the breast screening rate), appears to be generally better than for Māori in New Zealand as a whole, although the disparity with non-Māori is still clearly evident. Some of the apparently reduced disparity of Māori with non-Māori, however, is a consequence of the generally high levels of deprivation, low incomes, low property prices, and high levels of health needs seen in the total West Coast population. The numerator-denominator effect may also reduce apparent disparity in health status statistics.

The disproportionately low numbers of Māori in the health workforce, both in terms of 'by Māori for Māori' and within mainstream services, is evident from this work. Meaningful Māori involvement in all areas of health from management to service provision, in ways that allow Māori control over how Māori health needs are met, was listed as one potential measure of health need for Māori at the project hui. Adequate resourcing of Māori health initiatives was seen as another vital area.

## Health of young people

West Coast has a slightly lower proportion of young people in the population compared with New Zealand, for both Māori and non-Māori. Māori make up around 10% of the total West Coast population, but the under 25-year-old population is 16% Māori.

The hospitalisation rate for **motor vehicle crashes** for 15 to 24-year-olds is significantly higher than the New Zealand average. The death rate from motor vehicle crashes for this age group also appears to be higher. During the period 1996 to 1998, there were six **suicides** in the 15 to 24 age group. All were male. The attempted suicide rate for young people appears to be similar to the national rate. **Smoking** prevalence is high among teenagers, and females aged 20 to 24 years have a significantly higher prevalence, as they do nationally. The **teenage fertility** rates on the West Coast have been higher than national rates over the past decade, and a lower rate in 2000 does not necessarily signal a trend, since such variation can occur with small numbers. The hospitalisation rate for **pregnancy complications** appears to be higher than the national rate for the 15 to 24 age group. **Sexually transmitted diseases** rates are not available, but are known to be increasing nationally.

## Men's health

Men's health is signalled here as an important, often overlooked area. **Life expectancy** for males is around five years less than for females, and **mortality** rates are generally 50% higher for males. The mortality rate for males on the West Coast is higher than the national rate, and life expectancy for males (and also for females) appears to be around two years less than the New Zealand average. The **avoidable hospitalisation** rate for males is also higher than the national rate for males, and, as is the case nationally, the rate for males (50.8 per 1000) is higher than that for females (44.6 per 1000).

The **labour force** situation for West Coast men is similar to the pattern seen for the whole country, including the proportion of men unemployed. More men than women are in the labour force, and the proportion of workers employed in high-risk industries, such as mining, forestry and fishing, is double the national average. By far the majority of **industrial deaths and injuries** occur in men.

**Unemployment** in New Zealand has been associated with a 50% increased rate of mortality, compared to the employed, among 25 to 64-year-olds. Of particular note is a strong and independent association of unemployment with suicide, with suicide two to three times more common among the unemployed than the employed. The proportion of Māori who are unemployed is much higher than that for non-Māori. This is a particular issue for men, who tend to attempt suicide less than women, but complete suicide more often. Of 26 **suicides** for the years 1996 to 1998, 23 (88%) were males.

**Accidents and motor vehicle crashes** more commonly involve males than females, as do deaths and injuries related to work and sports, and males are over-represented in injuries due to **violence**.

National figures show that **alcohol** and **drugs** are used disproportionately by men, and the death rate from alcohol overuse in men is higher than for women. The top three morbidities of **cancer**, **cardiovascular diseases** and **diabetes** affect men disproportionately. The higher cancer death rates seen for males compared to females in New Zealand are even more evident on the West Coast. Data concerning prostate cancer registrations could be usefully examined in future. Admission rates for cardiovascular diseases are not fully presented by gender. The overall rates are higher than the New Zealand averages, and where numbers are given by gender, the numbers of males are double those of females. Diabetes hospitalisation rates for males and females have not been calculated, though national studies show higher rates for males.

## Women's health

Women are known to be disproportionately located in lower socioeconomic groups in New Zealand. In the workforce, women are proportionately more commonly found in lower occupational classes, and are much more likely to not be employed than men. They are higher users of health services, but have longer life expectancies. Most of the higher utilisation of health services relates to maternity care and 'psychological stress', and also to their longer life expectancy. In addition, women's health in the childbearing years is important because this directly affects the next generation.

Young women, particularly young Māori women, have among the highest **smoking** rates of any subgroup in New Zealand, and this is reflected on the West Coast. The **cervical screening** rate is lower than the New Zealand average (68% versus 72%) and well below the national target of 85%. The Buller TA has the lowest rate at 64%, which may reflect the isolation and transport difficulties in this area. Rates for Māori were not available. The **breast screening** rate is considerably higher than the national rate (92% versus 65%). While lower than the overall rate for the region, the rate for Māori women is also higher than average (57% versus 42%) for Māori women nationally. Low numbers prevented sound calculation of mortality rates for breast cancer and cervical cancer.

Information on reproductive health shows that **birth rates** for the total West Coast population, and for Māori in the region, are both significantly lower than the respective national rates. The percentage of babies born by **caesarean section** deliveries appears to have remained relatively constant during the

last decade, whereas it has trended upward in New Zealand as a whole. The numbers of **low birthweight** Māori babies have increased during recent years, counter to the national trends. The **ectopic pregnancy** rate (a proxy for STD rates) for West Coast may be lower than the national rate, as may be the **abortion** rate for 25 to 40-year-old women. Caution must be exercised when interpreting abortion statistics, however, since women may seek terminations of pregnancy in a region other than the one they normally reside in.

## Health of older people

Good health and quality of life are particularly strongly linked in older age groups. Older people are major users of health services, both in terms of frequency of use and the costs of supplying services. For both these reasons, assisting older people to maintain good health is important.

West Coast has very similar proportions of older people to the New Zealand averages. Non-Māori over 65 years make up 13.2% of the non-Māori population, and Māori over 65 years make up 3.5% of the Māori population.

The total West Coast population over 65 years is projected to increase by 20.9% over the next ten years, a rate that is lower than the projection nationally (23.4%). Within this overall increase, the relatively small Māori population over 65 years is projected to increase by 75% (versus 55% nationally). Māori life expectancy is around eight to nine years less than non-Māori. Diseases affecting older people occur at younger ages for Māori, and the premature death of many Māori kaumatua has serious implications for Māori as a people.

The diseases that dominate the older age group are diabetes, cardiovascular, stroke, and cancer, which are discussed in the 13 priority areas section. National studies have shown respiratory infections to be the most common infectious cause of admission to hospital for older people. Respiratory infections are among several causes of admission to hospital for all age groups, which are higher than the national rates.

Most deaths of older people are caused by gradual-onset, progressive illnesses that are best prevented from an early age. As should be the case in any high-deprivation area, reducing socioeconomic inequalities and improving overall socioeconomic conditions should have a positive impact on the health, quality of life and longevity of older people. Interventions to reduce risk behaviours such as smoking, eating habits and alcohol misuse (which are strongly patterned by socioeconomic factors) may be most beneficial. Attention to Māori health in a holistic sense (improving the control of Māori over factors which influence all dimensions of health) would also be desirable.

The hospitalisation rate from falls for those aged over 65 years is significantly higher than the national rate. Ministry data suggests that the flu immunisation rate in the region is very close to the national rate.

## Health of rural populations

The West Coast has a very large landmass with a very small and diffused population. It has three main towns (Hokitika, Greymouth and Westport) that have populations of more than 4000 people. The rest of the people are scattered amongst the many and varied small communities stretching from Karamea in the north to Haast and Jacksons Bay in the south, a distance of some 550 kilometres. Within the region 40.7% of the population live rurally, compared to 14.6% nationally.

The base hospital is located in Greymouth. On a fine day, with clear roads, Buller Hospital in Westport to the north is 1.5 hours from Greymouth via the coast road. Karamea is another 1.5 hours

beyond Westport. The coast road is subject to delays and closure associated with unfavourable weather conditions, as is the Karamea bluff between Westport and Karamea. It is four hours to Haast in the south via similar terrain, and 3.5 hours to Christchurch in the east, via the Southern Alps. Reefton is one hour away and Hokitika 35 minutes. Bad weather frequently closes Arthur's Pass, and also disrupts both fixed wing and helicopter emergency flights. Only 64% of West Coast residents reside within 60 minutes ('The Golden Hour') travel time by car from secondary hospital services. Only 2% are within 180 minutes travel time by car from the nearest tertiary hospital at Christchurch.

Between 1991 and 1996 the relative proportions of people living rurally on the West Coast increased at rates higher than the increase in New Zealand as a whole. This increase in the rural proportion of the population is of note given that the total population of the region is decreasing, and suggests that most of the region's population loss is from the towns.

The highly rural nature of West Coast, its large overall size and enormous length, and the frequently inclement weather, pose considerable barriers to the accessing of health services by much of the region's population, especially in acute and emergency situations.

## **Avoidable hospitalisations**

Avoidable hospitalisations are those which could be avoided by either preventing the illness or accident that leads to the admission in the first place, such as through the provision of health promotion or disease prevention (eg by preventing lung cancer through smoking education), or by better management of patients in the community (ambulatory-sensitive avoidable hospitalisation). Injuries and accidents are considered to be avoidable but are addressed separately. There is no expectation that avoidable hospitalisations could be avoided altogether. Rather, the concept is useful in guiding interventions to where an improvement could be made.

People from high deprivation population groups have less money to pay for health services, are more likely to smoke and to have a poor diet, tend to have less education regarding health issues and services, and have less access to transport for travel to health services. They tend to have poorer health, access health services at later stages of illness, and therefore have higher rates of avoidable hospitalisations.

There were 6900 avoidable hospitalisations on the West Coast in the four years between 1996 and 2000. These make up 29.3% of all hospitalisations (similar to the New Zealand figure). West Coast has a significantly higher age-standardised avoidable hospitalisation rate for its total population than New Zealand as a whole (47.5 versus 42.5 per 1000). Avoidable hospitalisation rates for Māori are higher than non-Māori in New Zealand as a whole, but on the West Coast the rate for Māori is lower than that for non-Māori (44.6 versus 48.3 per 1000) and significantly lower than the rate for Māori nationally (55.3 per 1000).

**Avoidable hospitalisations, top ten causes by ethnicity, West Coast  
April 1996 to March 2000**

Condition group	West Coast							NZ rate
	Total			Non-Māori		Māori		
	Total no of discharges in DHB	Crude rate in DHB	Total rate	Non-Māori no of discharges	Non-Māori rate	Māori no of discharges	Māori rate	
Angina	827	754.5	459.2	802	461.8	25	315.1	438.7
Respiratory infections	531	406.0	393.2	488	403.2	43	533.7	388.9
Gastroenteritis	403	308.2	334.0	374	347.5	29	228.3	259.1
CORD	367	354.1	180.4	352	176.3	15	251.1	128.4
Ischaemic heart disease	365	483.3	187.8	356	189.2	9	123.9	164.5
Asthma	315	240.9	281.4	287	294.0	28	221.0	286.8
Dental conditions	293	233.7	296.9	257	307.6	36	234.4	169.4
Congestive heart failure	291	438.7	122.1	283	120.1	8	156.1	97.7
ENT infections	269	225.5	275.1	234	279.3	35	245.2	337.1
Stroke	250	288.6	119.6	240	117.1	10	160.7	88.9

Source: National Minimum Dataset, Ministry of Health

Note: Age-standardised to Segi's world population

On the West Coast, the top ten diagnoses within avoidable hospitalisation are given in the table above. Age-standardised hospitalisation rates for all these conditions appear similar to or higher than the New Zealand average, except for ear, nose and throat (ENT) infections. The top ten diagnoses in New Zealand are, in decreasing order of total numbers admitted: angina, respiratory infections, ENT infections, asthma, ischaemic heart disease, gastroenteritis, cellulitis, chronic obstructive respiratory disease (CORD), congestive heart failure and skin cancers.

### Ambulatory-sensitive hospitalisations

Ambulatory-sensitive hospitalisations (ASH) are a category of avoidable hospitalisation that could have been prevented by good access to high quality primary health care and outpatient specialist services. Quality in this sense means not only effectiveness, but also acceptability of services and the removal of barriers to access such as cost and cultural barriers. ASH make up around two-thirds of the total avoidable hospitalisations.

The Māori ASH rate is 29.7 per 1000, while the rate for non-Māori is 31.4 per 1000. Total ASH rates are slightly higher than the New Zealand average (31.0 versus 29.8 per 1000).

### Accidents, injuries and occupational health

The hospitalisation rate for injuries of all causes is lower than the non-Māori rate, and lower than the New Zealand rate for Māori (21.4 versus 26.6 per 1000) and higher for non-Māori (28.5 versus 23.7 per 1000). ACC data indicates that the claim rate for accidents is lower than for New Zealand overall, as is the amount spent per person on new and ongoing claims. As for New Zealand overall, the most common reasons for new ACC claims were, in decreasing order: soft tissue injury; dental injuries; fracture and dislocation; lacerations, wounds and stings; and deafness.

West Coast reflects the national pattern regarding the location of accidents, with the most common accident location being the home. The remainder, in order of decreasing frequency, occurred in a

recreational or sports location, road or street, industrial location, commercial or service location, and farm.

The road fatalities and the reported numbers of serious crashes do not appear to have trended down during the last decade, as they have nationally. Crashes per vehicle kilometre are similar to the national rate, but the crash rate per person is higher. The hospitalisation rate for road crash injuries is significantly higher than the national rate.

### **Occupational health and safety**

The largest industry sectors represented on the West Coast are mining, forestry, hunting and fishing. The proportion of workers in these high-risk industries is considerably higher than is seen for the national picture overall (20% versus 10%). It is difficult to fully establish the levels of occupational diseases because the notification system is voluntary and severely undercounts the cases. Recent data on workplace injuries is also not comprehensive, but ACC data suggests that on the West Coast, agriculture and fisheries workers are particularly at risk.

### **Primary health care utilisation**

The paucity of primary health care data for West Coast, as for New Zealand as a whole, is a clear gap in the needs assessment. Understanding the ways and reasons that people use primary health care services is vital for robust analysis. Increasing the capacity for gathering and sharing primary health care data is an important issue for West Coast.

### **Prescriptions**

The use of prescribed drugs in each DHB can be used as a proxy for utilisation of primary care. From drug usage, inferences can be made about the extent to which need is being met, and/or may prompt questions about diseases and their management in the region.

The total annual per capita expenditure on prescriptions on the West Coast is similar to the national average (\$138.52 versus \$139.30). The average annual number of prescriptions per capita is higher than New Zealand (11.0 versus 10.1). The types of prescriptions for which numbers, and cost per capita, were above average were most notably cardiovascular, followed by respiratory/allergy, blood and blood-forming organs, and nervous system prescriptions. The higher than average levels of deprivation, and consequently, the higher morbidity, would be expected to result in a higher prescribing rate, so it is perhaps surprising that drug prescribing is not higher. This may point to an area of unmet need in the region, in terms of under-utilisation of primary care services.

### **Diagnostic laboratory tests**

Utilisation figures for laboratory tests ordered by referring GPs in the region provide a further component of the health status picture. The average per capita costs of diagnostic laboratory tests on the West Coast were among the lowest in New Zealand for most categories, most notably for cytology and histology tests. It is difficult to draw conclusions from this, but again this may point to an under-utilisation of primary care services.

## Secondary health care utilisation

There were 23 531 admissions to public hospitals of people living in the West Coast region in the four years between 1996 and 2000, an annual average crude rate of 179.9 per 1000 (compared with the New Zealand rate of 150.6). The age-standardised all cause hospitalisation rates for West Coast and New Zealand are 165.0 and 143.1 respectively (SRR = 1.15, 95% CI = 1.14 to 1.17). During that period, nearly all major diagnostic categories showed similar or higher hospitalisation rates compared with New Zealand overall – only admission rates for pregnancy/birth and newborns were lower.

An analysis of case-weighted acute admissions for the period July 1996 to June 1999 revealed that in New Zealand during this period the acute growth is largely an urban phenomenon, whereas many regional providers have experienced falling acute volumes. This is evident on the West Coast where the rate of acute admissions into a hospital in the region fell by 9.0% between 1996 and 2000. However, the number of acute admissions anywhere in New Zealand, from the population normally resident on the West Coast, increased by 9.2% between 1996 and 2000. The number of missions flown from Greymouth Hospital, taking patients to hospitals in other regions, rose from 45 in 1997, to 117 in 2000. The population of the region fell slightly during this period.

Admissions to hospital on the West Coast of patients who normally reside outside the DHB region made up 6.6% of all admissions between 1996 and 2000, compared with the New Zealand average of 17.9%. During this time there was an annual average of 1214 admissions of West Coast residents to hospitals outside the DHB region, compared with an annual average of 329 admissions of people resident outside West Coast to hospital on the West Coast.

## Waiting lists and times

Reducing waiting times is a priority service area for the *NZHS*. The objectives are to have most people (90%) assessed by a specialist within two months of referral, all people assessed by a specialist within six months of referral, and all people assessed by a specialist as meeting the criteria for publicly funded treatment receiving treatment within six months of the assessment.

On the West Coast, numbers on waiting lists and average waiting times appear to have reduced for ENT, general surgery, paediatric, cardiology, orthopaedic and rheumatology clinics. They appear to have increased for ophthalmology, neurology, urology, general medicine, diabetes, dermatology and gynaecology clinics. The numbers of patients waiting more than six months, and more than 12 months, for elective surgery operations, reduced for gynaecology and urology. For general surgical and orthopaedic, the numbers waiting more than six months increased, but numbers waiting for more than 12 months decreased significantly. No data was provided for other surgical categories. It is difficult to know how much of the reduction is due to the introduction of the Clinical Priority Assessment Criteria (CPAC) for managing elective services, and how much is due to people receiving services.

Provider survey respondents considered that waiting times were too long, and the alternative of travel out of the region too expensive.

## Utilisation of other services

Limited data has been obtained concerning utilisation of other service providers such as dentists, Māori health providers, pharmacies, complementary health services, and physiotherapists. This is an area to explore in future needs assessments.

## **PART 5: HEALTH SERVICES STOCKTAKE: NGA HUA O TE REHITA RATONGA HAUORA**

### **Primary health care services**

#### **Māori health providers**

Service responsiveness to Māori includes the promotion of access by Māori health consumers to Māori tohunga for use of rongoa or other specialist/traditional Māori health interventions. Collaborative relationships between local Māori health providers and mainstream providers are ways to improve service access and responsiveness to Māori tangata whaiora/consumers.

The service provider stocktake identified five Māori health service providers on the West Coast:

- Kawatiri Māori Women's Welfare League in Westport provides health promotion and information.
- Rata Branch, Māori Women's Welfare League, in Hokitika, provides Te Waka Hauora mobile health clinic, and health research.
- Rata Te Awhina Trust in Hokitika provides Māori health and social services including screenings, blood pressure and blood sugar checks, smoking cessation, cervical smears, asthma education, Whanau Ora, Tamariki Ora, Well Child checks, Mother & Pepi, a disease state management nurse, health promotion, parenting education, budgeting, whanau support, counselling, advocacy, stopping violence programmes, self esteem for young people, a truancy officer, and Whanau Toko I Te Ora.
- Te Korowai Aroha O Mawhera Whanau Support in Greymouth provides cross-sectoral services, including education, home-based support, parenting skills, youth services, and makes referrals to other agencies.
- Waka Taua Charitable Trust in Greymouth lists amongst its objectives a desire to promote healthier lifestyles for Māori on the West Coast.

#### **Pacific providers**

There are no Pacific peoples health providers in the West Coast region.

#### **General medical practitioners and nurses**

West Coast has the lowest ratio of GPs in New Zealand, at 5.0 per 10 000 population. The average for all 12 DHBs in the project is 7.72 per 10 000. Provider survey respondents considered that there are not enough GPs on the West Coast, and that this results in a lack of continuity for patients, and long waiting lists for appointments. The local independent practitioner association (IPA) on the West Coast is Southlink Health. There are 16 GPs listed in the region, some of whom work in more than one centre. Like GPs in other rural regions, GPs on the West Coast work longer than full-time-equivalent hours (they average 1.18 FTE).

The nursing workforce on the West Coast numbers 465 and, at 144 per 10 000 population (compared to the national average of 106 per 10 000), it has one of the highest ratios of registered nurses per 10 000 population in New Zealand. However, it has one of the lowest ratios of nurses with midwifery qualifications. Although Māori make up around 10% of the West Coast population, only around 5% of nurses in the region are Māori.

## **Dental services**

There are six active dentists listed on the West Coast, with three in Buller, two in Grey, and one in Westland. These low numbers result in the lowest ratio in New Zealand of active dentists per 100 000 population 14 years and over. Provider survey respondents expressed concern regarding the shortage of dentists and dental therapists on the West Coast, and the long waiting times for emergency dental treatment.

## **Rural health services**

Provider survey respondents identified needs regarding the improvement of communication between primary and secondary health services, between both sectors and health promotion and education services, and between West Coast hospitals and Christchurch hospitals.

No data has been presented regarding the location of primary health care services other than the 12 GP practices listed, of which five are in Greymouth, two are in Westport, two are in Hokitika, one is in Karamea, one is in Reefton, and one is in Whataroa; and the five Māori health service providers, not all of which directly provide health services, located in the three main centres.

## **Secondary health services**

The provider stocktake lists four hospitals: Grey, in Greymouth, with 94 establishment beds and eight day beds; Seaview, in Hokitika, with 50 beds; Buller, in Westport, with 30 beds; and Reefton with 10 beds.

## **Accident and emergency services**

The numbers of people presenting to the hospital emergency department has increased from 9643 in 1998/99, to 10 118 in 2000/01. Of these, around 25% were admitted. The Order of St. John has three bases, in Greymouth, Hokitika and Westport. Volunteers provide ambulance services in smaller centres, including Haast, Fox Glacier, Hari Hari, Blackball, Reefton, Granity and Karamea. There is a rescue helicopter based in Greymouth, and there are both fixed wing and helicopter rescue services based in Christchurch. Provider survey respondents identified a need for better communication and co-ordination of emergency services, with clearer call out criteria.

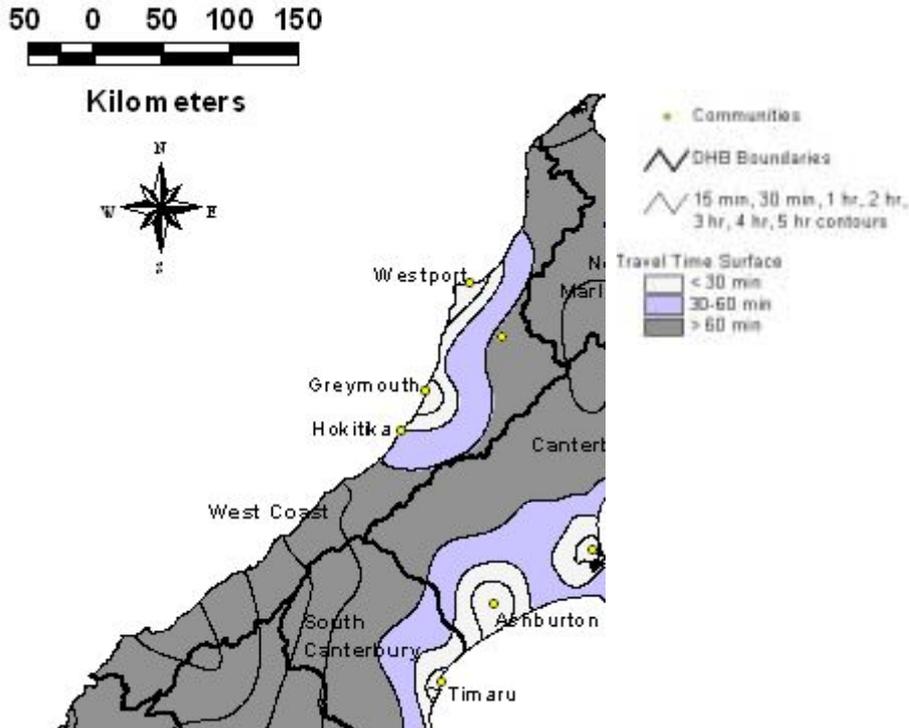
## **Medical specialists**

Within the West Coast DHB region there are four anaesthetists, three general surgeons, three psychiatrists, 2.5 physicians, two orthopaedic surgeons, two obstetricians/gynaecologists, and 0.5 geriatricians. This number represents an average ratio of medical specialists by population numbers; however, provider survey respondents expressed concern that there is no resident paediatrician, and waiting times are long to see the visiting paediatrician.

## Travel times

The following graph shows travel times to hospital for the region.

### Travel time to closest hospital



*Travel time in motor vehicle to nearest hospital (sub-acute or higher). Note that this map provides population level travel estimates across the country; it is not intended that this should be used to predict an individual's travel time.*

For those living in rural areas, travel times to hospital are a major access barrier. Difficulties are compounded for people without access to a car or suitable public transport.

## Mental health services

On the West Coast, the mental health services include:

- adult mental health services, consisting of community mental health and inpatient acute service.
- alcohol and drug services, including a methadone service
- child and adolescent mental health service
- elderly care, composed of inpatient longterm psychiatric, intellectually disabled, and assessment and treatment of dementia services
- triage, assessment crisis and treatment service (which includes a 24-hour psychiatric emergency service) plus short-term case management and ongoing support of severely mentally ill in the community
- crisis and planned respite services.

There have been three full-time-equivalent (FTE) psychiatrists. This will increase to four FTE in October 2001.

## **Complementary health care services**

Data relating to utilisation of complementary health care practitioners is limited. However, there are increasing numbers of alternative health services and practitioners nationwide with significant numbers of people seeking care within these fields. These services therefore need to be considered as part of needs assessments.

On the West Coast, there are four complementary health practitioners affiliated with the New Zealand Charter of Health Practitioners, and there are many more who are not affiliated. Data relating to utilisation is not available at this time.

## APPENDICES

### Appendix 1: A note on the methodology

The following points are important for this report:

- Assessment of the needs of people with disabilities is beyond the scope of this project.
- An economic cost-benefit approach is beyond the scope of this project.
- Both qualitative and quantitative methods are used, because these are seen as complementary.
- References are not given in this report. The reader is referred to the technical report for full references.
- *Ethnicity coding and numerator-denominator bias.* In measuring the health status and disparities in health among ethnic groups, the way people classify themselves, or are classified by others, is important. The way that Māori and Pacific (and others) have been classified differs between health (that is, numerator) and Census (that is, denominator) data used to calculate rates of health events. This is a function of people self-identifying their own ethnicity on the Census, hospital clerks collecting self-identified ethnicity at hospitalisation, undertakers collecting ethnicity at death, and so on. These different systems of data collection, and the different questions they use, have tended to result in marked underestimation of Māori and Pacific health event rates – at least up until 1996. This is called the **numerator-denominator bias**.
  - *Variation in numerator-denominator bias over time.* The ethnicity question in the Census (that is, denominator) has changed a number of times in the last 2 decades. On the other hand, the coding of health status data (that is, numerator data) has also changed over time, most notably in 1995 when the ethnicity question asked by undertakers and hospital admission clerks was changed to be more in line with the Census question. For example, between 1994 and 1996 the number of Māori deaths appeared to increase by 80%. Thus it is difficult to compare rates of health events by ethnicity before and after 1995. The combined effect of changing Census and morbidity/mortality data is that the national age-standardised *mortality rate for Māori appeared to increase by 25% from 1994 to 1996, and the total hospitalisation rate appears to have decreased by about 30%*. Similar changes apply to the Pacific ethnic group.
  - *Variation in numerator-denominator bias by region.* Prior to 1996 the magnitude of the numerator-denominator bias varied by region such that Māori mortality rates in the south of New Zealand were even more underestimated than those in the north. This regional variation may have reduced post-1996, but still probably remains in part. Therefore, even at one point in time comparing Māori mortality rates by region may be biased.
  - *Numerator data from other agencies.* To further complicate things, the myriad of other agencies involved in collecting ethnicity data also vary to greater or lesser extents in their coding practices. For example, primary care services, police, Plunket, Ministry of Social Development, ACC, and so on, all code ethnicity and it is difficult to be sure of the consistency across these agencies.
- *Small numbers.* West Coast has a relatively small population. Calculation of rates based on small numbers can lead to spurious results, because rates can so easily be influenced by a few extra cases here and there. Where rates have been shown to differ with statistical significance this is stated (note that there always remains some risk of error for these rates also), whereas if rates are different but have not been shown with statistical significance they are reported as ‘appearing’ different, or ‘may be’ different. The technical report has more details, including confidence intervals.
- *Age standardisation* has been done using the direct standardisation method, standardising against Segi’s world population. Note that when standardised rates are presented these rates are not real, and are only of value in comparisons (eg, comparing with the New Zealand rate or with other DHBs). Crude rates are not presented, except for admission rates for major diagnostic categories. For the most part, no attempt has been made to standardise for other variables such as gender, socioeconomic status or ethnicity. The technical report contains more detail, including confidence intervals.
- In this report, rates or parameters which are said to be significantly different to national rates are associated with p-values less than 0.05. Rates or parameters which appear higher or lower but

which have not shown statistical significance are prefaced by the phrases such as ‘appear to be’ or ‘may be’. In many cases, statistical significance of higher rates is not possible to demonstrate because of low numbers, and local knowledge, further analysis, or extrapolation from national figures may provide clarification.

- Unless otherwise stated, hospitalisation rates by locality refer to the *usual place of residence* of the patient, not the location of the provider.

## Appendix 2: Projected age structure by gender and ethnicity for West Coast, 2001

Age group	Māori		Non-Māori		Total	
	Female	Male	Female	Male	Female	Male
00-04	180	200	880	925	1060	1125
05-09	210	210	1070	1155	1280	1365
10-14	180	230	1095	1145	1275	1375
15-19	150	140	860	935	1010	1075
20-24	130	130	655	835	785	965
25-29	110	110	785	740	895	850
30-34	120	100	995	935	1115	1035
35-39	130	110	1170	1145	1300	1255
40-44	90	110	1195	1265	1285	1375
45-49	70	70	995	1175	1065	1245
50-54	70	60	1005	1115	1075	1175
55-59	50	50	820	880	870	930
60-64	30	30	650	765	680	795
65-69	20	40	520	610	540	650
70-74	10	20	500	500	510	520
75-79	10	10	440	390	450	400
80-84	0	0	310	200	310	200
85+	0	0	260	100	260	100
<b>Total</b>	<b>1560</b>	<b>1620</b>	<b>14 205</b>	<b>14 815</b>	<b>15 765</b>	<b>16 435</b>

Source: Medium series projected populations, supplied by Ministry of Health.

### Appendix 3: Age structure by ethnicity, territorial authorities, 1996

TA	Buller District				Grey District				Westland District			
	Total Māori	Pacific People	Non-Māori	Total	Total Māori	Pacific People	Non-Māori	Total	Total Māori	Pacific People	Non-Māori	Total
>5	132	3	690	846	156	9	909	1089	135	3	516	666
5-9	126	3	735	915	150	9	954	1158	123	6	501	651
10-14	96	9	672	819	114	15	816	996	108	12	474	615
15-19	69	3	498	606	114	6	783	948	93	3	414	531
20-24	57	9	420	528	69	6	729	849	81	3	390	504
25-29	60	6	552	639	75	3	825	951	84	3	489	612
30-34	75	3	714	822	93	12	966	1116	72	0	603	693
35-39	60	0	756	855	81	3	1032	1158	57	0	594	687
40-44	48	0	702	786	39	6	900	981	42	3	522	585
45-49	45	3	648	726	36	3	837	915	51	0	528	600
50-54	24	0	549	594	27	3	693	753	48	0	441	507
55-59	21	6	486	528	27	0	591	633	18	3	318	357
60-64	21	0	438	477	15	0	492	525	27	0	261	312
65+	27	0	1299	1380	18	3	1533	1623	27	0	870	966
<b>Total</b>	<b>858</b>	<b>48</b>	<b>9162</b>	<b>10 512</b>	<b>1014</b>	<b>78</b>	<b>12 060</b>	<b>13 701</b>	<b>963</b>	<b>39</b>	<b>6921</b>	<b>8280</b>

Source: Stats NZ Census data 1996

Appendix 4: NZDep96 measures of deprivation on the West Coast, 1996

