

A Portrait of Health

**Key results of the 2002/03
New Zealand Health Survey**

**Public Health Intelligence
Occasional Bulletin No 21**

Citation: Ministry of Health. 2004. *A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey*. Wellington: Ministry of Health.

Published in August 2004 by the
Ministry of Health
PO Box 5013, Wellington, New Zealand

ISBN 0-478-28299-6 (Website)
HP 3869

This document is available on the Ministry of Health's website:
<http://www.moh.govt.nz>



MANATŪ HAUORA

Foreword

To improve its health and participation outcomes for New Zealand, the Ministry of Health and District Health Boards need valid and reliable evidence on population health status, risks to health, and access to and utilisation of health services. This information is required to monitor trends and inequalities, project future needs for health services, and evaluate the effectiveness and efficiency of current approaches. To meet these information needs, the Ministry has developed a set of health information tools, including the New Zealand Health Monitor. The New Zealand Health Monitor is a co-ordinated 10-year cycle of health-related surveys, and includes as its centrepiece the New Zealand Health Survey.

The 2002/03 New Zealand Health Survey is the third national population-based health survey to be carried out by the Ministry, the earlier surveys having been fielded in 1992/93 and 1996/97. The current survey represents an extension and improvement on these earlier surveys, while still retaining comparability with them to the greatest extent possible. Major developments in the current survey include a more comprehensive assessment of health status and of the prevalence of chronic diseases, questioning about a wider range of health services, and inclusion of measured weight, height and waist circumference to enable more frequent monitoring of the obesity epidemic.

The 2002/03 New Zealand Health Survey included face-to-face interviews with more than 12,000 New Zealand adults and included more Māori, Pacific and Asian participants than ever before. To everyone who gave so freely of their time to answer a multitude of questions about their health and lifestyle and allowed themselves to be weighed and measured – thank you.

Provisional results from the survey, covering the key findings, have already been released by the Minister of Health. The current report, *A Portrait of Health*, now updates this information and provides final results on a much wider range of topics. Yet even this report cannot do justice to the richness of the information potentially available from this survey. Rather, it is intended to draw the attention of users and researchers to the survey and encourage them to undertake or commission more detailed analysis. The Ministry will provide access to the dataset in several ways, including datacubes, a data laboratory facility, and confidentialised unit record files. The Ministry will also undertake analytic studies itself, as well as producing District Health Board level results based on small area estimation methods.

The survey findings – both the descriptive statistics presented in this report and the analytic studies to come – will provide valuable evidence to guide the implementation, evaluation and further evolution of the New Zealand Health Strategy. With regular repetition of the survey over time, its usefulness as a monitoring tool will grow. In this way, the New Zealand Health Survey will help address the Ministry of Health's societal and systemic outcomes of better health, reduced inequalities, and equity and access.

Karen O Poutasi (Dr)
Director-General of Health
Ministry of Health

Acknowledgements

This report was prepared by the Public Health Intelligence Group of the Ministry of Health.

We are grateful to the participants of the survey who freely gave their time to take part in the survey.

Contents

Foreword	iii
Chapter 1: Introduction and Methodology	1
Introduction	1
Methodology	3
Dissemination of data	32
References	35
Chapter 2: Chronic Diseases	36
Introduction	36
Results	37
Chapter 3: Risk and Protective Factors	68
Introduction	68
Results	69
References	105
Chapter 4: Health Service Utilisation	106
Introduction	106
Results	107
Chapter 5: Self-reported Health Status	143
Introduction	143
Results	145
References	153

List of Tables

Table 1:	Content of 2002/03 New Zealand Health Survey	2
Table 2:	Institutions survey frame	5
Table 3:	Summary of sample sizes	6
Table 4:	Institutions survey – design details	11
Table 5:	Institutions survey – number of respondents selected per establishment	13
Table 6:	Prevalence (percent) of chronic diseases, by ethnic group, males (crude)	64
Table 7:	Prevalence (percent) of chronic diseases, by ethnic group, females (crude)	65
Table 8:	Prevalence (percent) of chronic diseases, by ethnic group, males (age-standardised)	66
Table 9:	Prevalence (percent) of chronic diseases, by ethnic group, females (age-standardised)	67
Table 10:	Classifications of overweight and obesity according to BMI (kg/m ²)	84
Table 11:	Prevalence (percent) of risk and protective factors, by ethnic group, males (crude)	101
Table 12:	Prevalence (percent) of risk and protective factors, by ethnic group, females (crude)	102
Table 13:	Prevalence (percent) of risk and protective factors in adult males, by ethnic group (age-standardised)	103
Table 14:	Prevalence (percent) of risk and protective factors in adult females, by ethnic group (age-standardised)	104
Table 15:	Utilisation (percent) of selected health services and health checks in the last year, by ethnic group, males (crude)	139
Table 16:	Utilisation (percent) of selected health services and health checks in the last year, by ethnic group, females (crude)	140
Table 17:	Utilisation (percent) of selected health services and health checks in the last 12 months, by ethnic group, males (age-standardised)	141
Table 18:	Utilisation (percent) of selected health services and health checks in the last 12 months, by ethnic group, females (age-standardised)	142
Table 19:	Item groupings and abbreviated item content for the SF-36	144
Table 20:	Mean SF-36 scores, by ethnic group, males (crude)	151
Table 21:	Mean SF-36 scores, by ethnic group, females (crude)	151
Table 22:	Mean SF-36 scores, by ethnic group, males (age-standardised)	152
Table 23:	Mean SF-36 scores, by ethnic group, females (age-standardised)	152

List of Figures

Figure 1:	Heart disease in adults, by ethnic group and sex (age-standardised)	38
Figure 2:	Heart disease in adults, by age group and sex	39
Figure 3:	Heart disease in adults, by NZDep2001 quintile and sex (age-standardised)	39
Figure 4:	Medical treatment for heart disease in adults, by ethnic group and sex (age-standardised)	40
Figure 5:	Stroke in adults, by ethnic group and sex (age-standardised)	41
Figure 6:	Stroke in adults, by age group and sex	42
Figure 7:	Stroke in adults, by NZDep2001 quintile and sex (age-standardised)	42
Figure 8:	Medical treatment for stroke in adults, by ethnic group and sex (age-standardised)	43
Figure 9:	Diabetes in adults, by ethnic group and sex (age-standardised)	44
Figure 10:	Diabetes in adults, by age group and sex	45
Figure 11:	Diabetes in adults, by NZDep2001 quintile and sex (age-standardised)	45
Figure 12:	Medical treatment for diabetes in adults, by ethnic group and sex (age-standardised)	46
Figure 13:	Asthma in adults aged 15–44 years, by ethnic group and sex (age-standardised)	47
Figure 14:	Asthma in adults aged 15–44 years, by age group and sex	48
Figure 15:	Asthma in adults aged 15–44 years, by NZDep2001 quintile and sex (age-standardised)	48
Figure 16:	Medical treatment for asthma in adults aged 15–44 years, by ethnic group and sex (age-standardised)	49
Figure 17:	Chronic obstructive pulmonary disease in adults aged over 45 years, by ethnic group and sex (age-standardised)	50
Figure 18:	Chronic obstructive pulmonary disease in adults aged over 45 years, by age group and sex	51
Figure 19:	Chronic obstructive pulmonary disease in adults aged over 45 years, by NZDep2001 quintile and sex (age-standardised)	51
Figure 20:	Medical treatment for chronic obstructive pulmonary disease in adults aged over 45 years, by ethnic group and sex (age-standardised)	52
Figure 21:	Arthritis in adults, by ethnic group and sex (age-standardised)	53
Figure 22:	Arthritis in adults, by age group and sex	54
Figure 23:	Arthritis in adults, by NZDep2001 quintile and sex (age-standardised)	54
Figure 24:	Medical treatment for arthritis in adults, by ethnic group and sex (age-standardised)	55
Figure 25:	Spinal disorders in adults, by ethnic group and sex (age-standardised)	56
Figure 26:	Spinal disorders in adults, by age group and sex	57
Figure 27:	Spinal disorders in adults, by NZDep2001 quintile and sex (age-standardised)	57
Figure 28:	Osteoporosis in adults, by ethnic group and sex (age-standardised)	58
Figure 29:	Cancer in adults, by ethnic group and sex (age-standardised)	60
Figure 30:	Cancer in adults, by age group and sex	60
Figure 31:	Cancer in adults, by NZDep2001 quintile and sex (age-standardised)	61
Figure 32:	Serious mental disorders in adults, by ethnic group and sex (age-standardised)	62
Figure 33:	Migraine in adults, by ethnic group and sex (age-standardised)	63
Figure 34:	Identified high blood pressure in adults, by ethnic group and sex (age-standardised)	71
Figure 35:	Identified high blood pressure in adults, by age group and sex	71
Figure 36:	Identified high blood pressure in adults, by NZDep2001 quintile and sex (age-standardised)	72
Figure 37:	Identified high cholesterol in adults, by ethnic group and sex (age-standardised)	73
Figure 38:	Identified high cholesterol in adults, by age group and sex	74
Figure 39:	Identified high cholesterol in adults, by NZDep2001 quintile and sex (age-standardised)	74

Figure 40:	Vegetable intake (three or more servings per day) in adults, by ethnic group and sex (age-standardised)	75
Figure 41:	Vegetable intake (three or more servings per day) in adults, by age group and sex	76
Figure 42:	Vegetable intake (three or more servings per day) in adults, by NZDep2001 quintile and sex (age-standardised)	76
Figure 43:	Fruit intake (two or more servings per day) in adults, by ethnic group and sex (age-standardised)	77
Figure 44:	Fruit intake (two or more servings per day) in adults, by age group and sex	78
Figure 45:	Fruit intake (two or more servings per day) in adults, by NZDep2001 quintile and sex (age-standardised)	78
Figure 46:	Physically active adults, by ethnic group and sex (age-standardised)	80
Figure 47:	Physically active adults, by age group and sex	80
Figure 48:	Physically active adults, by NZDep2001 quintile and sex (age-standardised)	81
Figure 49:	Sedentary adults, by ethnic group and sex (age-standardised)	82
Figure 50:	Sedentary adults, by age group and sex	82
Figure 51:	Sedentary adults, by NZDep2001 quintile and sex (age-standardised)	83
Figure 52:	Overweight in adults, by ethnic group and sex (age-standardised)	85
Figure 53:	Overweight in adults, by age group and sex	85
Figure 54:	Overweight in adults, by NZDep2001 quintile and sex (age-standardised)	86
Figure 55:	Obesity in adults, by ethnic group and sex (age-standardised)	87
Figure 56:	Obesity in adults, by age group and sex	87
Figure 57:	Obesity in adults, by NZDep2001 quintile and sex (age-standardised)	88
Figure 58:	Adult weight gain, by ethnic group and sex (age-standardised)	89
Figure 59:	Adult weight gain, by age group and sex	89
Figure 60:	Adult weight gain, by NZDep2001 quintile and sex (age-standardised)	90
Figure 61:	Past year alcohol use in adults, by ethnic group and sex (age-standardised)	91
Figure 62:	Past year alcohol use in adults, by age group and sex	92
Figure 63:	Past year alcohol use in adults, by NZDep2001 quintile and sex (age-standardised)	92
Figure 64:	Potentially hazardous drinking pattern in adults, by ethnic group and sex (age-standardised)	93
Figure 65:	Potentially hazardous drinking pattern in adults, by age group and sex	94
Figure 66:	Potentially hazardous drinking pattern in adults, by NZDep2001 quintile and sex (age-standardised)	94
Figure 67:	Current smoking, by ethnic group and sex (age-standardised)	95
Figure 68:	Current smoking, by age group and sex	96
Figure 69:	Current smoking, by NZDep2001 quintile and sex (age-standardised)	96
Figure 70:	Passive smoking in adult non-smokers, by ethnic group and sex (age-standardised)	97
Figure 71:	Passive smoking in adult non-smokers, by age group and sex	98
Figure 72:	Passive smoking in adult non-smokers, by NZDep2001 quintile and sex (age-standardised)	98
Figure 73:	Regular marijuana smoking in adults, by ethnic group and sex (age-standardised)	99
Figure 74:	Regular marijuana smoking in adults, by age group and sex	100
Figure 75:	Regular marijuana smoking in adults, by NZDep2001 quintile and sex (age-standardised)	100
Figure 76:	Have usual health practitioner, by ethnic group and sex (age-standardised)	108
Figure 77:	Health checks in the last 12 months, by sex (age-standardised)	109
Figure 78:	Mammogram or cervical smear in the last three years, by ethnic group (age-standardised)	110

Figure 79:	Mammogram or cervical smear in the last three years, by NZDep2001 quintile (age-standardised)	111
Figure 80:	Type of health care worker seen at Māori health provider, by Māori adults, by sex (age-standardised)	112
Figure 81:	Reasons for last visit to Māori health provider, by Māori adults, by sex (age-standardised)	113
Figure 82:	Seen a general practitioner in the last 12 months, by ethnic group and sex (age-standardised)	116
Figure 83:	Seen a general practitioner in the last 12 months, by age group and sex	117
Figure 84:	Seen a general practitioner in the last 12 months, by NZDep2001 quintile and sex (age-standardised)	118
Figure 85:	Seen more than one general practitioner in the last 12 months, by ethnic group and sex (age-standardised)	119
Figure 86:	Reasons for last visit to general practitioner, by sex (age-standardised)	120
Figure 87:	Cost of last visit to general practitioner, by sex (age-standardised)	121
Figure 88:	Unmet need for general practitioner in last 12 months, by ethnic group and sex (age-standardised)	122
Figure 89:	Unmet need for general practitioner in last 12 months, by age group and sex	123
Figure 90:	Unmet need for general practitioner in last 12 months, by NZDep2001 quintile and sex (age-standardised)	123
Figure 91:	Seen medical specialist in the last 12 months, by ethnic group and sex (age-standardised)	124
Figure 92:	Seen nurse in the last 12 months, by ethnic group and sex (age-standardised)	125
Figure 93:	Seen pharmacist or chemist in the last 12 months, by ethnic group and sex (age-standardised)	127
Figure 94:	Prescription item in the last 12 months, by ethnic group and sex (age-standardised)	128
Figure 95:	Uncollected prescription in the last 12 months, by ethnic group and sex (age-standardised)	129
Figure 96:	Uncollected prescription in the last 12 months, by age group and sex	130
Figure 97:	Uncollected prescription in the last 12 months, by NZDep2001 quintile and sex (age-standardised)	131
Figure 98:	Seen a complementary and alternative health care provider in the last 12 months, by ethnic group and sex (age-standardised)	132
Figure 99:	Seen dentist or dental therapist in the last 12 months, by ethnic group and sex (age-standardised)	133
Figure 100:	Seen an optician or optometrist in the last 12 months, by ethnic group and sex (age-standardised)	134
Figure 101:	Seen a physiotherapist in the last 12 months, by ethnic group and sex (age-standardised)	135
Figure 102:	Used telephone helpline in the 12 months, by ethnic group and sex (age-standardised)	136
Figure 103:	Public hospital use in the last 12 months, by ethnic group and sex (age-standardised)	137
Figure 104:	Private hospital use in the last 12 months, by ethnic group and sex (age-standardised)	138
Figure 105:	Mean SF-36 scores, by sex (age-standardised)	145
Figure 106:	Mean SF-36 scores, by ethnic group, males (age-standardised)	146
Figure 107:	Mean SF-36 scores, by ethnic group, females (age-standardised)	147
Figure 108:	Mean SF-36 scores, by age group, males	148
Figure 109:	Mean SF-36 scores, by age group, females	149
Figure 110:	Mean SF-36 scores, by NZDep2001 quintile, males (age-standardised)	150
Figure 111:	Mean SF-36 scores, by NZDep2001 quintile, females (age-standardised)	150

Chapter 1: Introduction and Methodology

Introduction

This chapter overviews the 2002/03 New Zealand Health Survey (NZHS), including its aims, background, content and methodology, and the dissemination of its results.

Aims

The aims of the 2002/03 NZHS were to:

- measure the health status of New Zealand adults, including their self-reported physical and mental health status, and the prevalence of selected health conditions
- measure the prevalence of risk and protective factors associated with these health conditions
- measure the use of health services, including satisfaction with health services and barriers to accessing health services
- examine differences between population subgroups (as defined by sex, ethnicity, age and the New Zealand Deprivation Index 2001 (NZDep2001))
- examine changes over time.

Background

The 2002/03 NZHS is part of the *New Zealand Health Monitor* (Ministry of Health 2002), a programme of population health surveys used by the Ministry of Health to monitor New Zealanders' health.

The 2002/03 NZHS was the third national health survey of New Zealanders aged 15 years and over. The two previous surveys were the 1992/93 Household Health Survey (Statistics New Zealand and Ministry of Health 1993) and the 1996/97 New Zealand Health Survey (Ministry of Health 1999). The 1992/93 survey involved telephone interviews with 7065 adults. The 1996/97 survey involved face-to-face interviews with 7862 adults. The 2002/03 NZHS involved face-to-face interviews with 12,929 adults.

All people aged 15 years and over who were usually resident within permanent private dwellings were eligible for selection in the 2002/03 NZHS. In addition, a separate study of people living in institutions was undertaken.

A key objective of the 2002/03 NZHS was to improve the quality of ethnic estimates. Māori, Pacific and Asian ethnic groups were over-sampled to provide more reliable results. As a result, more Māori, Pacific and Asian people participated than ever before. The Chatham and Pitt Islands were also over-sampled.

The 2002/03 NZHS was similar to the two previous national health surveys, particularly the 1996/97 survey. However, the 2002/03 NZHS differs from the previous survey by including a wider range of chronic conditions and risk and protective factors associated with these conditions, additional measures of self-reported physical and mental health status, a wider range of health care services, and height, weight and waist circumference measurements.

Statistics New Zealand developed and tested the 2002/03 NZHS questionnaire. National Research Bureau Ltd (NRB) was contracted to field the 2002/03 NZHS questionnaire. NRB's role included designing the sampling methodology, piloting the questionnaire, obtaining ethical approval, interviewing respondents, processing data and providing a dataset with appropriate documentation to the Ministry of Health.

Survey content

The 2002/03 NZHS has four health-related modules and a sociodemographic module (Table 1).

Table 1: Content of 2002/03 New Zealand Health Survey

Module	Topics	Details
Chronic disease	Heart disease, stroke, diabetes, asthma, chronic obstructive pulmonary disease, arthritis, spinal disorders, osteoporosis, cancer, other long-term illnesses.	Prevalence, age at diagnosis, treatments.
Health service use	Māori health providers, Pacific health providers, general practitioners, medical specialists, nurses, pharmacists and prescriptions, complementary and alternative medicine providers, other health providers, telephone and internet helplines, hospitals.	Frequency of contact, reasons for visit, satisfaction levels and reasons for dissatisfaction, unmet need and barriers to access.
Risk and protective factors	High blood pressure, high blood cholesterol, overweight and obesity, physical activity, tobacco smoking, marijuana smoking, vegetable and fruit intake, alcohol use, gambling.	Prevalence.
Self-reported health status	General health, vision, hearing, digestion, breathing, pain, mental health, sleep, energy and vitality, understanding and remembering, communicating, physical functioning, self-care, usual activities, social functioning.	SF-36 Health Status Questionnaire embedded within the World Health Organization Long Form Health Status Questionnaire.
Sociodemographic	Age, sex, ethnicity and responses to ethnicity, country of birth, household characteristics, education, income support, employment, income, medical insurance, NZDep2001 (from meshblock).	

Methodology

The following discussion explains the survey design methodology for the main survey, which includes the Chatham and Pitt Islands over-sample, and the separate institutions survey. These surveys were conducted from September 2002 to January 2004.

Population and frame

Target population

For the main survey the target population was the New Zealand adult population (ie, people aged 15 years and over) living in permanent private dwellings. The target population was approximately 2.6 million people according to the March 2001 New Zealand Census of Population and Dwellings (2001 Census).

For the institutions survey the target population was all people aged 15 years and over who were resident with relative permanency in hospitals and IHC and rest homes, or who were 'dependent persons'. The 'dependent persons' group refers to people primarily released into communities during the phasing out of the large mental health residential institutions. This group may include people with mental health, drug or alcohol problems, or the residual effects of these.

Survey population

Main survey

Geographic coverage

For practical reasons a few households that were part of the defined target population were excluded from participating in the survey, but were accounted for in the final estimates via the survey weights. These included households not resident on the main islands of New Zealand (North, South and Waiheke) and the Chatham and Pitt Islands, such as those located on other off-shore islands, on-shore islands, waterways and inlets.

Dwellings coverage

The survey covered the eligible population living within permanent, private dwellings. Private dwelling types that were not included in the survey were temporary private dwellings such as caravans, cabins or tents in a motor camp, or boats. All non-private dwellings were excluded from the survey such as hotels, motels, guest houses, boarding houses, homes for older people, hostels, motor camps, hospitals, barracks and prisons.

Eligible respondents

All people aged 15 years and older who were usually resident within permanent private dwellings were eligible for selection as respondents. The term 'usually resident' excluded people who were present within the dwelling at the time of interview but who usually resided elsewhere (either within New Zealand or overseas).

Institutions survey

The survey population consisted of all persons aged 15 years and over who were resident at the time of the survey with relative permanency in health-related residential establishments known by the Ministry of Health.

Sample frame

Main survey

The survey frame was an area-based frame. The frame was the list of small geographic areas (meshblocks) defined by Statistics New Zealand that fall within the geographical coverage of the survey. Meshblocks were the primary sampling units (PSUs).

The survey frame provides the first stage in the sampling process that proceeds to dwelling selection within the meshblock and then respondent selection within the dwelling. The procedure for this selection process is described in the sample design section.

All New Zealand households were geographically clustered to avoid having to list and maintain a frame of all households in the country. Lists of dwellings were only enumerated within selected PSUs. The cost of interviewing was reduced since the selected households were geographically clustered and travelling costs were reduced within clusters.

Meshblocks vary in both population and area size. When the New Zealand-wide standard meshblock system was established in 1976, urban meshblocks contained an average of 150–200 people, while rural meshblocks generally had 100–150 people. Subsequent division of meshblocks and changes in population patterns have resulted in meshblock population counts having considerable range. Some meshblocks have a nil population and some contain more than 500 people.

Ideally, the PSUs would be defined to be less variable in terms of the number of in-scope persons. However, to develop such a frame for this iteration of the survey was not viable due to cost and timeliness constraints.

Institutions survey

The overall frame was made up of four independent non-overlapping frames provided by the Ministry of Health. For each frame there was a list of establishments, along with contact details and the number of residential beds. The four frames were hospitals (330 establishments), IHC homes (345), rest homes (506) and dependent persons (524).

The hospital frame, which initially contained 444 elements, was used in a preliminary census to establish the number of long-term residential beds in use. The results showed that 330 of the 444 establishments in the initial frame had at least one such bed. The remaining three frames were accepted as accurate with respect to the number of occupied residential beds.

The final frame consisted of 1705 establishments containing 36,698 beds (Table 2).

Table 2: Institutions survey frame

Frames	Number of establishments	Number of residential beds
Hospitals	330	15,138
IHC homes	345	1,859
Rest homes	506	15,494
Dependent persons	524	4,207
Total	1705	36,698

Sample design

Overview

Main survey

The main survey used a complex sample design to provide high quality estimates for minimal cost and acceptable respondent burden. Population characteristics from the 2001 Census were used in the sample design and sample selection.

All New Zealand dwellings were geographically clustered to avoid having to list and maintain a frame of all dwellings in the country. Lists of dwellings were then enumerated and sampled within selected geographic areas. The cost of interviewing was reduced since the selected households were geographically clustered and travelling costs were reduced within clusters. To minimise respondent burden only one eligible person was selected from each sampled dwelling.

A total of 12,929 people responded to the survey, of whom 4369 were Māori, 910 Pacific peoples and 1173 Asian peoples. These are total response ethnicity counts, where people who reported more than one ethnic group are counted in each group they reported.

Unlike the rest of the population where a sample survey was used, the Chatham and Pitt Islands over-sample was a census. Every dwelling was visited and every usually resident person that could be contacted was asked to participate.

Institutions survey

The institutions survey used a stratified sample design. Institutions were stratified according to four types. For each strata, establishments were randomly selected from lists provided by the Ministry of Health. These establishments were then visited and a small number of residents were randomly selected and interviewed from each. A total of 1076 residents responded to the survey.

Summary of sample sizes

Table 3: Summary of sample sizes

Survey	Total sample size	Ethnicity (total response)		
		Māori	Pacific	Asian
Main survey (excluding Chatham and Pitt Islands over-sample)				
Design requirement	12,000	4000	1000	1000
Achieved	12,529	4120	908	1172
Chatham and Pitt Islands over-sample				
Achieved	400	249	2	1
Institutions survey				
Design	1000			
Achieved	1076	97	13	6

Main survey (excluding Chatham and Pitt Islands over-sample)

Background

Originally, the proposed sample for the survey was 10,000 containing a minimum of 1500 Māori. After NRB won the tender, the sample was boosted to 11,000 and the stratification was to yield a minimum of 3000 Māori, 1000 Pacific peoples and 1000 Asian peoples. At this point no sampling had taken place.

After starting the sampling NRB was asked to boost the sample further by an additional 1000 Māori (ie, the total sample becoming 12,000). NRB continued with the targeting approach designed for the 11,000 sample. Concurrently, analysis was undertaken with respect to the expected design effects (DEFFs). Analysis showed inefficiencies in this design and a combination of targeting and screening was recommended instead.

Once this sample design change was agreed to, NRB stopped issuing more meshblocks and the recommended method was implemented.

Sample design objectives

Sample size requirements

A requirement of the survey was a final sample size of at least 12,000. Within this total there were to be minimum subsamples of respondents belonging to following ethnic groups:

Māori (total response)	4000
Pacific (total response)	1000
Asian (total response)	1000

The expression 'total response' allows for respondents to nominate themselves as belonging to more than one ethnic group.

Response rate requirements

A requirement for this survey was a minimum true response rate of 70 percent.

Expected sample sizes and accuracies

Sample size

To achieve the survey objectives, NRB worked out that 1200 PSUs or meshblocks would need to be sampled. NRB estimated that each PSU would yield an average of eight interviewed respondents, giving a minimum sample of 9600. In addition, a minimum of 2400 further people would be over-sampled by screening from a subset of the 1200 sampled meshblocks, by calling at each dwelling not already selected.

Expected relative sampling errors

After allowing for an estimate of the reduced efficiency of the sample arising from the stratification and clustering of the sample, NRB estimated that the following relative sampling errors (RSEs) would apply to the ethnic subsamples:

- Māori: up to 15 percent – within one of four equally sized age groups within gender.
- Pacific and Asian peoples: up to 20 percent – within one of two equally sized age groups within gender.

Sample design – general comments

A stratified design was used. The strata were defined according to the ethnicity variable defined by Question 11 in the Individual Form in the 2001 Census.

The population density thresholds, which determine to which stratum a PSU belonged, were selected with the following points in mind:

- If the density threshold was set too high, there would be insufficient PSUs meeting that criterion to enable the final sample to yield the required ethnic subsample minimums.
- There was likely to be a direct relationship between increased density threshold and increased sample inefficiency. It was assumed that ethnic similarity within a PSU may well correspond with less variation in responses obtained for the variables being measured.

For some strata the PSUs could not be selected with probability proportional to size (in terms of the number of permanent private dwellings) due to the large number of PSUs required relative to the total number available within the strata. It would have resulted in larger PSUs having the possibility of being selected more than once. Hence, an equal probability of selection was chosen and offset by taking a fixed proportion of dwellings (ie, a constant sampling fraction) from each PSU to give equal probability of selection for all dwellings within a particular stratum.

Due to a change in the survey objectives shortly after the field work started the main survey has two sample designs.

Initial sample design

The initial design consisted of four strata:

- Māori
- Asian
- Pacific peoples
- Other.

The Māori stratum consisted of all PSUs containing 60 percent or more eligible persons who identified themselves as Māori, according to the 2001 Census. In other words, the Māori stratum contained a high proportion of Māori people. PSUs were selected with equal probability. For each chosen PSU one out of two dwellings was selected. While 696 out of 861 PSUs were selected, only 32 were surveyed before the design changed.

The Asian stratum consisted of all PSUs containing 40 percent or more eligible persons who identified themselves as Asian. PSUs were selected with equal probability. For each chosen PSU two out of nine dwellings were selected. While 189 out of 340 PSUs were selected, only two were surveyed before the design changed.

The Pacific peoples stratum consisted of all PSUs containing 55 percent or more eligible persons who identified themselves as Pacific peoples. PSUs were selected with probability proportional to size. For each chosen PSU a constant sample of 12 dwellings was selected. While 125 out of 439 PSUs were selected, only three were surveyed before the design changed.

The Other stratum consisted of all remaining PSUs. PSUs were selected with probability proportional to size. For each chosen PSU a constant sample of 12 dwellings was selected. While 490 out of 36,712 PSUs were selected, only 77 were surveyed before the design changed.

Latter sample design

The latter design consisted of two strata:

- Māori
- Other.

The Māori stratum consisted of all PSUs containing 70 percent or more eligible persons who identified themselves as Māori. In other words, the Māori stratum contained a high proportion of Māori people. PSUs were selected with equal probability. For each chosen PSU two out of three dwellings were selected. This sampling fraction was reduced in later stages of the survey to one in seven as a result of obtaining more Māori than expected. This change was referred to as “Māori modified”.

The Other stratum PSUs were selected with probability proportional to size. For each chosen PSU a constant sample of 12 dwellings was selected.

In addition to the two strata there were three ethnic over-samples within the Other stratum:

- Māori
- Pacific peoples
- Asian.

The sole purpose of the ethnic over-samples was to increase the number of respondents identifying themselves as Māori, Pacific peoples or Asian. Within these selected PSUs, all dwellings that had yet to be selected were screened. In other words all dwellings not already selected in the Other stratum were screened, resulting in some dwellings having more than one chance of selection.

For the Māori over-sample only respondents identifying themselves as Māori, Pacific or Asian were eligible for interview. The Māori over-sample consisted of all PSUs in the Other stratum containing 10 percent or more eligible respondents who identified themselves as Māori, according to the 2001 Census.

For the Asian over-sample only respondents identifying themselves as Asian or Pacific were eligible for interview. The Asian over-sample consisted of all PSUs in the Other stratum not already over-sampled and containing 30 percent or more eligible respondents who identified themselves as Asian, according to the 2001 Census.

For the Pacific peoples over-sample only respondents identifying themselves as Pacific were eligible for interview. The Pacific peoples over-sample consisted of all PSUs in the Other stratum not already over-sampled and containing 25 percent or more eligible respondents who identify themselves as Pacific peoples, according to the 2001 Census.

When the later design was implemented, NRB also over-sampled PSUs in the Other stratum who had been selected and surveyed in the initial design.

Sample selection

Primary sampling unit

The first stage of sampling took place at the meshblock level. A systematic sample was taken from each stratum starting from a random point. Every meshblock within each stratum had a known, non-zero probability of selection. No meshblock, either within a stratum or across the strata, had more than one chance of selection.

For some strata, meshblocks were selected with a probability proportional to their size in terms of the number of eligible persons; whereas, for other strata, meshblocks were selected with equal probability.

The following describes the method for selecting meshblocks from a stratum with a probability proportional to their size. For selecting meshblocks with equal probability of selection the method is equivalent if each meshblock is treated as having just one permanent, private dwelling.

The probability of selection for each meshblock is in direct proportion to the number of eligible dwellings within the meshblock. This unequal probability of selection was necessary to compensate for the fixed cluster size of interviews to be carried out within each meshblock. These two factors ensured equal probability of selection for every dwelling within the target population within each stratum.

For each stratum the meshblocks to be sampled were selected systematically, according to the following steps:

1. The list of meshblocks was sorted in order of District Health Board (DHB), but randomly within. This was to ensure a good representation of DHBs.
2. For each meshblock on the sorted list the cumulative number of permanent private dwellings was calculated according to 2001 Census estimates.
3. The skip (k) was chosen – the overall cumulative permanent private dwellings total was then divided by the number of PSUs that were to be drawn from it.
4. The initial sampling point was chosen – a random number (r) was generated with a value greater than zero but less than or equal to the skip (k).
5. The meshblock was selected by the one containing the rth private dwelling on the list being selected, then every kth unit down the list was selected. In other words the rth unit, r+kth unit, r+2kth unit etc were selected.
6. Continue skipping down the list until the required sample size was attained. This should be the point at which no more skips were possible.

Secondary sampling unit

The secondary sampling unit is the dwelling. Each PSU is exactly described according to the streets, side of street and portion of the street that belong to the area.

Each PSU was assigned a sampling fraction. This sampling fraction was translated into an integer, which indicated the step between successive dwellings that were to be selected for inclusion in the survey. This integer was also designed to ensure complete coverage of the PSU.

Each selected PSU was visited and enumerated and the dwellings for inclusion in the survey were identified. This step ensured the number of eligible dwellings was updated from the census counts and enabled selection of a random starting dwelling.

Respondent sampling

The final sampling stage was selecting the respondent. Within each dwelling all eligible people (ie, people those aged 15 years and over who lived at that dwelling) were identified. Within each selected dwelling one eligible person was selected. The Kish Grid was used to select the single eligible person from each selected dwelling. The names of all eligible respondents were listed in descending order of age onto the sampling grid. The respondent who was to be asked for an interview was the person whose name fell alongside a predetermined indicator.

Chatham and Pitt Islands over-sample

The Chatham and Pitt Islands over-sample was a census of all permanent private dwellings visited. Every usually resident person who could be contacted was asked to participate.

A design requirement for this component of the survey was to achieve a minimum true response rate of 70 percent.

Institutions survey

Sample design objectives

Sample size requirements

A requirement of the survey was a final achieved sample size of at least 1000 records. The decision was made on cost, rather than accuracy.

Response rate requirements

A requirement for this survey was a minimum true response rate of 70 percent.

Sample design

The stratified sample design used a list-based frame. The four strata were:

- hospitals
- IHC homes
- rest homes
- dependent persons.

Establishments were chosen and then a fixed sample size of respondents was randomly selected from within the establishments. To ensure a minimum sample size of 1000 a larger sample size was targeted to allow for non-response. More respondents were selected in the hospitals and rest homes strata as these establishments accounted for more residential beds in the population. Details of the sample design are recorded Table 4.

Table 4: Institutions survey – design details

Strata	Required achieved respondent sample size	Estimated number of establishments selected*	Required targeted respondent sample size**	Achieved respondent sample size	Achieved response rate (%)
Hospitals	300	100	429	340	92.6
IHC homes	200	67	286	209	88.9
Rest homes	300	100	429	322	89.0
Dependent persons	200	67	286	205	79.2
Total	1000	334	1430	1076	88.0

* Selecting an average three respondents per establishment (achieved).

** To allow for non-response of 30 percent.

Sample selection for each stratum

The first stage of selection was choosing the establishments, the PSUs. Establishments were selected with probability proportional to their size, according to the number of residential beds. This resulted in larger establishments, in terms of the number of beds available, having a greater chance of selection. For each stratum the PSUs were sorted according to broad area, using telephone area codes.

Cumulative totals of residential beds were calculated, so each establishment was allocated a bed number range. A systematic sample was then taken, from a random start point, with the probability of selection for an establishment being proportional to size, as defined by the number of beds.

The sampling fraction used in the systematic procedure meant it was possible for establishments with numbers of beds greater than the sampling fraction to be selected more than once. This was permitted.

For most establishments respondents were selected using an alphabetical listing or bed number or room number system. When no such system existed, a random start point was chosen with the x th residents identified as the respondents.

Where residents were segmented into, for example, disability-type wards, a destratification of the wards and beds into an alphabetic or a number series needed to be undertaken before a random entry point was chosen and every x th person sampled.

Sampling anticipated a 70 percent response rate initially. However, participation rates proved to be higher resulting in the sampling fraction being altered during the course of the study, to prevent over-interviewing. Sample sizes of four, three and two respondents per establishment were applied as fieldwork progressed. Table 5 shows the number of establishments of each of the four types at which interviews were conducted, for each of the three cluster sizes, the yield and the response rates.

Table 5: Institutions survey – number of respondents selected per establishment

Respondents selected per establishment	Number of establishments selected (unique)	Number of persons approached	Number of achieved interviews	Response rate (%)
Clusters of four				
Hospitals	75 (71)	300	279	93.0
IHC homes	43	172	156	90.7
Rest homes	70	280	244	87.1
Dependent persons	58	232	180	77.6
Clusters of three				
Hospitals	17	51	47	92.2
IHC homes	15	45	35	77.8
Rest homes	21	63	61	96.8
Dependent persons	9	27	25	92.6
Clusters of two				
Hospitals	8	16	14	87.5
IHC homes	9	18	18	100.0
Rest homes	9	18	17	94.4
Dependent persons	–	–	–	–
Total		1222	1076	88.1

Note: A large hospital could be selected more than once.

Substitution

For both the main and institution surveys no substitution occurred in cases of non-response.

Sample allocation

Ideally, samples should be allocated in such a way as to ensure that seasonal effect on health variables do not bias estimates produced from the survey. With the main survey more respondents were surveyed in the later half of the interview period, particularly more Asian peoples, Pacific peoples and Māori. Introducing a seasonality adjustment in the survey weighting was investigated, but seasonality was found to have no significant effect on any of the estimates examined. Nevertheless, care should be taken when analysing health data in which seasonality may be a factor.

Questionnaire

The 2002/03 NZHS has four health-related and one demographic module. Most questions in the 2002/03 NZHS were drawn from health surveys used overseas or locally or had been compiled by researchers with expertise in the topics being addressed.

A copy of the 2002/03 NZHS questionnaire is available on the Ministry of Health's website: <http://www.moh.govt.nz/phi>

Main questionnaire

Chronic diseases

This module measured the self-reported prevalence of selected chronic diseases, including heart disease, stroke, diabetes, asthma, chronic obstructive pulmonary disease (COPD), arthritis, spinal disorders, osteoporosis and cancer. This module expanded the 1996/97 NZHS, which only included questions on diabetes and asthma.

Questions on chronic diseases were taken or adapted from previous New Zealand or international surveys on these topics after consultation with experts within and outside of the Ministry of Health. Almost all of the items are similar conceptually and in wording to those used in the 'Preliminary common instrument for chronic physical conditions' of the EUROHIS Project (Nosikov and Gudex 2003).

Health service utilisation

This module measured the use of a wide range of health services, including general practitioners (GPs), Māori and Pacific health care providers, medical specialists, nurses, pharmacies and prescriptions, complementary and alternative medicine (CAM) providers, other health care providers (ie, physiotherapists, dieticians, dentists, opticians, social workers, occupational therapists, speech therapists and midwives), telephone or internet helplines, and public and private hospitals.

Questions covered frequency of contact, reasons for contact, satisfaction with services and reasons for any dissatisfaction, unmet health need, and reasons for unmet health need. This module expanded the 1996/97 NZHS, which focused on GPs, prescriptions and hospital use, and briefly covered other selected health care providers (ie, pharmacists, dentists, medical specialists, nurses, optometrists and physiotherapists).

Questions on use of GP and specialist services, use of other health services, prescriptions and over-the-counter medicines were taken or adapted from the 1996/97 NZHS (which had derived them from the 1992/93 Household Health Survey).

Questions on health services and providers not included in earlier surveys were developed in consultation with researchers with experience in these areas.

Additional items also had to be constructed for use of telephone and internet helplines. Some questions were modified so as to be consistent with those asked in the post-census Household Disability Surveys conducted in 1996 and 2001.

Risk and protective factors

This module measured the prevalence of a range of health risk and protective factors, including high blood pressure, high cholesterol, overweight and obesity, adult weight gain, weight cycling, physical activity, tobacco smoking, marijuana smoking, vegetable and fruit intake, alcohol use and gambling. This module expanded the 1996/97 NZHS, which included only high blood pressure, smoking, physical activity and alcohol.

Questions about blood pressure, blood cholesterol, body weight, and vegetable and fruit intake were taken or adapted from previous New Zealand surveys, including the 1996/97 NZHS and 1997 National Nutrition Survey (Russell et al 1999). As with the chronic disease questions, they were largely compatible with the 'common instrument' being developed as part of the EUROHIS project (Nosikov and Gudex 2003).

The physical activity questions comprised the New Zealand Physical Activity Questionnaire Short Form, a local adaptation of the International Physical Activity Questionnaire that the Ministry of Health had developed in partnership with Sport and Recreation New Zealand and Statistics New Zealand and that the University of Auckland had validated (University of Auckland 2003). The physical activity questions differed from those used in the 1996/97 NZHS.

The tobacco smoking module was an adaptation of the World Health Organization (WHO) recommended instrument (WHO 1998). The alcohol module is the WHO Alcohol Use Disorders Identification Test (AUDIT) questionnaire (Babor et al 1992; Saunders et al 1993).

Questions on marijuana use were adapted from previous New Zealand drug surveys. Gambling questions were adapted from previous New Zealand and international gambling surveys.

Self-reported health status

This module measured self-reported health status and covered general health, vision, hearing, digestion, breathing, pain, mental health, sleep, energy and vitality, understanding, communication, physical functioning, self-care, usual activities, and social functioning. The questions were derived from the SF-36 Health Status Questionnaire and the WHO Long Form questionnaire on health status. This section expanded the 1996/97 NZHS, which used only the SF-36 questionnaire. The reason for this change was because the SF-36 questionnaire did not reliably measure health status among Māori and Pacific peoples and because the WHO Long Form covered more health domains than the SF-36, so gives a better overall measure of self-reported health status.

Most new questions on health status were taken or adapted from the WHO Long Form instrument developed in association with the World Health Survey and based on the International Classification of Functioning, Disability and Health (WHO 2001). The SF-36 questions (version 1, Australia and New Zealand adaptation) were embedded in the WHO Long Form by slightly modifying, when necessary, the wording or response categories of the WHO Long Form items.

Demographics

This module included standard sociodemographic variables such as age, gender, ethnicity and responses to ethnicity, country of birth, household characteristics, education, income support, employment, personal and household income, medical insurance and geographical area unit (for rural/urban and NZDep2001).

The demographic and socioeconomic questions were taken from the 2001 Census and/or the Household Labour Force Survey to ensure comparability with other major surveys. Minor variation in some questions (eg, ethnicity) was required to change from a self-completed to interviewer-administered format. The responses to ethnicity module derived some items from the United Kingdom Fourth National Survey of Minorities and others from the corresponding module of the United States Behavioral Risk Factor Surveillance System.

Institutions and Chatham Islands questionnaires

The questionnaire used for the institutions survey was largely unchanged from the main survey.

The Chatham and Pitt Islands questionnaire was also largely unchanged. However, a few additional questions of local interest were added.

Data collection

Collection mode (method)

The collection mode chosen was face-to-face interviewing, using trained interviewers. The reasoning behind choosing face-to-face interviewing instead of telephone interviewing was:

- The 2001 Census showed that 3.7 percent of households in private occupied dwellings did not have access to a telephone.
- It has become accepted wisdom in the telecommunications industry, although not well quantified, that a proportion of homes no longer use landline phones, instead opting for a cell phone only approach (eg, younger households, single-person households and student flats).
- From an analysis that NRB commissioned on the Statistics New Zealand Household Income Survey (now the Household Economic Survey), non-ownership is markedly skewed to those Māori and Pacific peoples in the lower income groups (rather than those in the middle or higher), so the phone sample frame prejudices the people most in need of fair representation in the NZHS sample.

Using face-to-face interviewing can minimise this under-coverage, which has potential to bias the results. Face-to-face interviewing also ensures comparability with the previous health survey.

Interview selection, training and performance

Selection of interviewers

Selection of competent interviewers was a key step to obtaining a good response rate. NRB analyses every survey it conducts in terms of the individual response rate achieved by each interviewer. Factoring in the urban/rural dimension, interviewers are ranked on their ability to achieve responses. Not all interviewer applicants will, even after specific training, achieve the necessary response rate. Selection tools by way of attitude and cognitive tests help reduce the number, but like most psychometric tests are only a modest help in field performance prediction. This means interviewers need to be screened, trained and monitored, and then exited or removed to less demanding commercial or phone assignments, where 50 percent is considered acceptable by the market. Replacement, new training and “recovery” sweeps over the exited person’s work

are required. This select, train, trial, emit, reselect and recovery activity is costly, but produces high response rates.

For the Chatham and Pitt Islands over-sample, interviewers were drawn from the mainland to avoid local staff inevitably interviewing people they knew about possibly sensitive health matters.

Training and in-field support

Interviewers need to have a strong sense of 'entitlement' to approach homes, a strong sense of the 'value of the survey' to sell participation to the household, and a versatile selection of 'engagement options' with which to ensure they can find an intercept between the eligible person's time/place/attitude configuration, and the time required for the interview.

In-field support included assistance with the names of occupants of persistently empty homes. The electronic electoral role was searched for the name, then the telephone book for the telephone number, and then the person was contacted for an interview time. This was then fed back to the interviewer to implement. Similar strategies were used to contain dogs in some areas and to access apartment blocks in built-up areas.

Interviewers and field supervisors received a two-day training course on how to conduct interviews. Material used in the training included:

- a meshblock map for household enumeration and selection
- instructions for sampling dwellings
- a letter from the Ministry of Health
- a brochure describing the survey
- a Kish Grid for respondent selection
- a consent form
- the questionnaire
- show cards
- scales for weight and a portable stadiometer for height
- two tests to assess trainees' pick-up of training
- thank you cards.

Field supervisors also received additional training on:

- contact and support with interviewers
- progress and evaluation forms for interviewers.

Performance

The interviewers' performance was regularly monitored. They were rewarded for *applying* their training successfully.

Call pattern

In addition to good interviewer preparation the call pattern is an important component of achieving higher response performance.

Number of calls

The 'call' refers to one visit on one day during a particular time band, eg, 5–8 pm. While a second or third attempt might be made to a given dwelling while the interviewer was in the area, these were attempts and not calls in the current definition. The reason for this distinction was that the second and subsequent attempt on a given day was less productive. NRB conducted a total of up to 10 calls at each sampled dwelling before accepting that dwelling as a non-contact dwelling. (Ten calls might entail up to 20 or more attempts.)

Spacing of callbacks

Making all 10 callbacks within a fortnight does not capture people who are away from their dwelling for a fortnight or longer. Therefore, the procedure was to make six calls in the survey month that the meshblock was issued, pause for three to four weeks, attempt two more calls, and finally pause a further three to four weeks before implementing the final two callbacks. This helped not only in the case of people temporarily away, but also with people who were in a burst of activity work-wise, socially or for family reasons when their dwelling was first approached.

The interviewing team made two separate visits to the Chatham and Pitt Islands. The purpose of the second visit was to do additional callbacks at homes 'too busy', vacant or 'unavailable' at the first visit, and to attempt refusal recovery. The first sweep yielded 348 interviews and the second 52 interviews, a total of 400.

Recovery attempts

When a meshblock or interviewer-meshblock combination produced a below standard response rate, it was identified in the field manager's computer tracking of the response rate. After investigation, a different interviewer might have been assigned to re-visit that meshblock to re-attempt the refusals, generally with an explanation to refusers why an interviewer was approaching them again.

Invigilation

This step refers to the field supervisor in each area phoning back the household to confirm the interview was done and check the respondent was the one stated. It is rare for interviewers who are properly trained and field-supported to falsify interviews, but nevertheless NRB perform a 15 percent field check on each interviewer as a precautionary measure.

Enumeration and pre-survey letter

In implementing a meshblock sample, two steps were helpful in improving the capture of the interviews. The first was to re-enumerate the meshblocks to take into account the number of new dwellings built, or in some cases the number of buildings demolished, over the period since the last pre-census enumeration. This was a period of about two years. The second was to drop a pre-survey letter at those dwellings that fell on the 'every-xth' dwelling sampling fraction. An advance letter has been shown to improve response rates in some cases, although the improvement is more marked for phone interviewing than face-to-face interviewing.

Consent

The survey was voluntary. Adults who were selected were told about the survey and given an information brochure. If they agreed to take part, they were asked to sign a consent form. Information brochures and consent forms were available in a range of languages other than English. It was also possible to match respondents and interviewers by language, ethnicity and sex.

Proxy reporting

With the exception of the institutions survey no person answered questions on behalf of another person. For the institutions survey caregivers were able to provide responses on behalf of the person for whom the interview was taking place. Of the 1076 responses, 734 (68.2%) were proxies (521 required substantial assistance and 213 required some assistance). Cases where proxy reporting was used were recorded and flagged in the final dataset.

Field dates

The pilot test (sample size, n=114) was conducted from August to September 2002.

The main survey was undertaken from September 2002 to January 2004, with the Chatham and Pitt Islands over-sample (n=400) completed from September 2002 to November 2002.

The institutions survey (n=1076) was undertaken from December 2002 to May 2003.

Field testing

Cognitive pilot test

This was a test of the acceptability and understandability of the questions carried out by NRB in July 2002. Respondents were 12 focus groups covering a range of ages, both genders and four ethnic groups.

In summary, none of the focus groups experienced much difficulty with any of the questions in terms of meaning, comprehensibility or sensitivity. However, the wording of a few questions and some interviewer instructions and show cards were slightly amended.

Conventional pilot test and dress rehearsal

This was a test of the performance of the questionnaire and the survey design as a whole. NRB completed the pilot (sample size = 114) from August to September 2002 and achieved a 72 percent response. Although naturally small in scale, the pilot engaged the full range of survey materials and processes proposed for the national rollout. This extended all the way to the production of a unit record dataset and a data dictionary, and a small selection of tables for proofing purposes.

The objectives of the pilot test were to:

- check the response rate to participation in a one-hour long interview with particular reference to the key performance requirement of 70 percent
- check the participation in the more sensitive questions in the questionnaire, in particular marijuana use, weight measurement and personal income
- determine whether every question, disregarding choice of words, had a code for every response option or a provision for other responses
- examine the effectiveness of the Kish Grid in its doorstep implementation by interviewers for delivering age and gender spreads approximating the New Zealand population
- capture the data from a sample of more than 100 interviews to ensure every answer option could be scanned or punched into the electronic dataset, and to prepare a selection of percentage tables enabling examination of the completeness of the data when expressed in its final end-use format
- develop a final dataset layout.

Testing region

The pilot was implemented in the Wellington Regional Authority area. The reason for using this area was that the Wellington Ethics Committee was able to give approval for the pilot within its jurisdiction, whereas formal signoff from the other ethics committees was pending. This region also provided a good composition of persons from different ethnic and socioeconomic groups.

Meshblock selection

To reflect a reasonable comparison with the national field task, the 15 meshblocks were selected to reflect variation in ethnicity and socioeconomic status:

- three were chosen with a Pacific peoples emphasis
- two were chosen with an Asian peoples emphasis
- 10 were chosen with a socioeconomic emphasis.

Respondent selection

The Kish Grid was used as a means of selecting one person to interview from all of those eligible in the household. The Kish Grid is a method of selecting a person, free from interviewer bias, and free from 'door opener' bias or biases generated by the availability or preferences of the occupants.

The performance of the Kish Grid was monitored, particularly gender balances and cultural effects. As a result of the field test, enhancements were made to training, monitoring and procedures.

Interviewer training

Seven interviewers were trained over two days to conduct the pilot interviews. Three field supervisors received the same training plus additional training.

Questionnaire

Most questions asked were drawn from health surveys used overseas or locally or had been compiled by researchers who specialised in the topics being addressed. Given this background, it was not expected that many question changes would emerge from the field pilot.

Refusal of specific or sensitive questions within the questionnaire was very low. A few refusals were received for some of the sensitive questions. NRB's quality controls traced these to an interviewer effect. Procedures were taken to ensure no repeat of such effects in the main survey. As a result of the field trial a few changes were made to the questionnaire.

Response rate

The key performance indicator for the survey was a true response rate of at least 70 percent. This response rate was achieved, notwithstanding the shorter callback period due to containing the time-frame for the pilot. The response rate at the cut-off was 72 percent. The response rate was monitored and analysed by meshblock and interviewer.

Data processing

The data from the pilot interviews were electronically captured, edited and formatted. A few unweighted tables were produced. No weighting estimation was performed for the field pilot.

Response rates and respondent load

Response rates

Not only was the survey well received by the New Zealand public, but most of the respondents agreed to be contacted again in two to three years:

- 72 percent of eligible people approached for the main survey (excluding the Chatham and Pitt Islands over-sample) completed a questionnaire, with 88 percent of these respondents agreeing to be contacted again in two to three years
- 73 percent of eligible people approached for the Chatham and Pitt Islands over-sample completed a questionnaire, with 99 percent of these respondents agreeing to be contacted again in two to three years
- 88 percent of eligible people approached for the institutions survey completed a questionnaire, with 81 percent of these respondents agreeing to be contacted again in two to three years.

There were essentially four components to the response rate calculation:

1. Ineligibles (eg, vacant sections, vacant dwellings and non-residential dwellings).
2. Eligible responding.
3. Eligible non-responding.
4. Unknown eligibility (eg, non-contacts and refusals who provide insufficient information to determine eligibility).

The response rate was calculated as follows:

$$\text{Response rate} = \frac{\text{number of eligible responding}}{\left[\begin{array}{c} \text{number of eligible} \\ \text{responding} \end{array} \right] + \left[\begin{array}{c} \text{number of eligible} \\ \text{non-responding} \end{array} \right] + \left[\begin{array}{c} \text{estimated number of eligibles} \\ \text{from the unknowns} \end{array} \right]} \times 100$$

The justification for this response rate was that a proportion of the unknowns were likely to be eligible if contact could have been made. As we were not able to make contact with the estimated number who would be eligible, they were classified as non-respondents.

$$\left[\begin{array}{c} \text{Estimated number} \\ \text{of eligibles from the} \\ \text{unknowns} \end{array} \right] = \left[\begin{array}{c} \text{number} \\ \text{of} \\ \text{unknowns} \end{array} \right] \times \frac{\left[\begin{array}{c} \text{number of eligible} \\ \text{responding} \end{array} \right] + \left[\begin{array}{c} \text{number of eligible} \\ \text{non-responding} \end{array} \right]}{\left[\begin{array}{c} \text{number of eligible} \\ \text{responding} \end{array} \right] + \left[\begin{array}{c} \text{number of eligible} \\ \text{non-responding} \end{array} \right] + \left[\begin{array}{c} \text{number of} \\ \text{ineligibles} \end{array} \right]}$$

The official response rate measure used unweighted counts, which are useful for monitoring field operations. A minimum response rate of 70 percent was a design requirement of the survey. The response rate was monitored and analysed by PSU and by interviewer throughout the survey collection period.

Unweighted response rates, computed using the number of people selected, reflect the success of the operational aspects of the study (ie, getting the selected people to participate). Response rates weighted to reflect the probability of being selected into the sample describe the success of the study in terms of the population being measured.

The unweighted and weighted response rates will be the same when every person selected for the survey has the same chance of selection. However, if people are selected with different chances of selection, there will be a difference in the response rates.

Future iterations of the survey will use weighted counts as the official measure.

Respondent load (burden)

The high response rate and high proportion of people agreeing to be contacted again in two to three years indicate that the survey was well received by the public.

For the main survey, the median time taken by participants to complete the interview was 60 minutes, with the lower and upper quartiles being 46 and 70 minutes and the longest, 205 minutes.

For the institutions survey, the median time taken to complete the interview was 50 minutes, with the lower and upper quartiles being 40 and 65 minutes and the longest, 205 minutes.

Measures used to maximise response and minimise respondent load

The survey and processes were carefully designed to ensure the impact on respondents was minimised. The following measures were used to maximise the response rate.

- Only one eligible person was selected per dwelling.
- A well-tested and largely well-proven questionnaire was used.
- Skilled interviewers carried out the interviews.
- Appointments were taken for interviews.
- Interviews were accepted away from the dwelling in special circumstances.
- Language, ethnicity and sex matching of eligible respondent and interviewer were used where necessary.
- Well-designed call pattern processes were used.
- Interviewers had in-field support.
- Interviewers were monitored and, if found to be underperforming, were removed or replaced if necessary.

Data processing

NRB was responsible for data capture, editing and coding.

Data capture

The data collected via a pen and paper questionnaire was captured electronically using systems tested in the pilot test.

Editing

The unit record datasets provided to the Ministry of Health were edited for range and logic. Any inconsistencies found have been remedied by returning to the questionnaire and, if necessary, to the respondent for clarification and correction.

Imputation

No explicit unit record or item imputation was used in the survey to deal with unit record or item non-response. However, non-response has been implicitly adjusted for in the weighting estimation by benchmarking the survey population to an estimate of the target population.

All respondents who had covered all the questions (regardless of whether each response was don't know, not specified or refused) and who had provided their sex and year born were included in the weighting estimation. Otherwise, they were excluded from the weighting estimation and treated as non-respondents.

Coding

Most of the questions used a single tick box, although some questions:

- Asked for the person's age when a disease was diagnosed or for the number of visits to a particular health provider.
- Offered an 'other' category where respondents could specify non-standard responses. Each other category response was recorded and later analysed. Each response was categorised to an existing code, coded to a newly set up 'standard' code or coded as other.
- Allowed multiple responses. For these questions, all responses were retained with each response shown as a separate variable on the data file (ie, Q12_01, Q12_02, Q12_03, etc).

Dataset delivery

NRB was contracted to deliver the following interim and final datasets and accompanying documentation (data dictionary) to the Ministry of Health:

- pilot
- main survey (interim datasets every 2000 records)
- Chatham and Pitt Islands
- institutions.

The Ministry of Health received the final datasets and documentation for the main survey, institutions survey, and Chatham and Pitt Islands in February 2004.

Quality control

Quality control of data and processes was an integral component of the survey implementation. It was implemented through comprehensive testing, ongoing performance monitoring, peer review, using standard classifications and concepts (where possible), and using specialist staff.

Interviewers

Quality control of interviewers meant interviewers:

- were selected after taking a written test and having a personal interview to screen for above average aptitudes
- received explicit stepwise training in each identified task and risk element
- were tested after training to check on their uptake and retention
- were monitored in the field and, when necessary, were removed and replaced if under-performing.

Interviewing

Quality control of the interviewing meant:

- field checking of 15 percent of completed interviews to ensure fidelity

- an area supervisor monitoring and counselling on in-the-field issues day to day
- support to the field interviewers from a trouble-shooter at head office to raise the field success rate
- recovering interview reattempts and refusals.

Call pattern

Quality control of the call pattern meant:

- undertaking callbacks at different times of the day or different days of the week
- separating the first and subsequent visits to maximise the opportunity to contact the occupants
- taking appointments for interviews
- accepting interviews away from the dwelling in special circumstances to maintain sample mix.

Field work allocation

Quality control of the field work allocation meant:

- visually matching the meshblock label against the interviewer's recorded meshblock to ensure they were correct to eliminate transcription errors
- visually matching the interview number against the sample sheet number to ensure the household was correctly numbered
- checking the address of each interview to ensure each interviewer had not strayed outside their given meshblock.

Outcomes

Quality control of the outcomes meant:

- continuously monitoring the response rate per meshblock
- matching the language, culture or gender of an eligible respondent and an interviewer to minimise non-response bias.

Editing

Quality control of the editing meant:

- field editing by area supervisors to ensure completion
- supervisors re-contacting respondents if data was missing data
- an electronic edit to determine whether there were duplicate serial numbers or non-eligible serial numbers, reverting to paper copies if an error was found
- running an electronic check over the branching 'skip to' instructions throughout the questionnaire to identify overfills for removal and underfills for return to the field for follow up (generally by phone)
- running an electronic range check to ensure all data fell within the permissible code range, then checking the questionnaire or re-contacting the respondent if necessary

- checking the range and logic to identify inconsistencies and errors, then checking the questionnaire or re-contacting the respondent if necessary
- checking interview start and finish times to correct errors made by interviewers using the 24-hour clock.

Dataset and documentation

Quality control of the dataset and documentation meant:

- creating a selection of tables to check that row and column totals balanced and were correct compared with total records captured, including examining cell counts in cross tabulation to ensure integrity of the tables
- carrying out independent pen and paper calculations on a selection of interviews for derived variables to check against SAS program creation of these same scores
- creating a data dictionary including a detailed description of each variable and response value.

Weighting estimation

The Ministry of Health carried out the weighting estimation once quality checks were completed.

Main survey (excluding Chatham and Pitt Islands over-sample)

Selection weight

As the survey was conducted on a sample of respondents, each person represented a number of other people in the population. Therefore, each respondent had a weight that indicated how many population units were represented by the sample unit.

Survey weights allow a sample to be used to produce estimates for the entire population. The selection weight (SELWGT) is the sample design weight before any adjustment for unit record non-response and post-stratification.

The calculation of the selection weight was complex. The methodology was complicated by having a 'main' sample and an over-sample component. The following is a general description of the methodology.

For each stratum, the probability of selecting a person for the 'main' sample = $W1 \times W2 \times W3$.

Where:

$W1$ = (total number of chosen 'main' sample dwellings in the stratum/total number of dwellings in the stratum). This is the probability of selecting the PSU, but using dwelling counts instead of PSUs to account for the PSUs not being of equal size in terms of dwellings.

$W2$ = (number of chosen dwellings in the selected PSU/total number of dwellings in the selected PSU). This is the probability of choosing a dwelling within a selected PSU.

$W3 =$ (number of chosen eligible persons in the selected dwelling/total number of eligible persons in the selected dwelling). This is the probability of choosing an eligible person within a selected dwelling.

However, due to over-sampling within some PSUs the calculation gets more complex, as some respondents have more than one chance of selection.

As noted in the sample design section the following over-samples existed:

- Māori (the eligible were Māori or Pacific or Asian peoples)
- Asian (the eligible were Pacific or Asian peoples)
- Pacific (the eligible were Pacific peoples).

For PSUs where over-sampling occurred the above eligible persons had two chances of selection: selection for the 'main' sample and selection for the over-sample.

For PSUs where over-sampling occurred the probabilities of selection were:

$$\begin{aligned} \text{Probability of selection} &= \left[\begin{array}{c} \text{probability of selecting a} \\ \text{respondent for the 'main' sample} \end{array} \right] + \left[\begin{array}{c} \text{probability of selecting a respondent} \\ \text{from screened dwellings} \end{array} \right] \\ &= (W1 \times W2 \times W3) + (W1 \times W2_s \times W3_s) \\ &\text{Where, M = main sample and S = over-sample (screened).} \end{aligned}$$

For example, PSUs selected where Asian over-sampling occurred the probability of selection was:

- For Asian or Pacific respondents, regardless of whether they were selected from a screened or non-screened dwelling:
Probability of selection = $(W1 \times W2 \times W3) + (W1 \times W2_s \times W3_s)$
- For non-Asian and non-Pacific respondents:
Probability of selection = $(W1 \times W2 \times W3) + 0$
= $(W1 \times W2_s \times W3_s)$

Similarly, for PSUs where other over-sampling occurred.

The inverse of the probability of selection is the survey weight. In other words, the selection weight is one divided by the probability of selection.

Due to a change in the survey objectives shortly after the field work started two sample designs were implemented. Several PSUs selected in the initial design were surveyed before the change in sample design. These PSUs had no chance of selection in the later design.

The samples from each design were weighted so that as a whole they represented the New Zealand population, with the original design's selection weights preserved. The selection weights for the later design were calculated so they accounted for that part of the population not covered by the initial design.

Non-response adjustment

No explicit non-response adjustment was performed.

Final weighting

The final stage of the weighting process is a weighting adjustment using generalised regression to ensure the final weighted totals of eligible adult respondents are consistent with independent population estimates. The 2002/03 NZHS was benchmarked to the 2001 Census population.

This adjustment also adjusts for under-coverage in the frame and non-response and reduces the level of sampling error for benchmark variables.

Generalised regression weighting is an improvement on more traditional post-stratification weighting, by allowing the flexibility to incorporate several population benchmarks. The initial selection weights were modified to produce final survey weights that aggregate to independent population estimates (or benchmarks).

The following benchmarks were used for the number of people aged 15 and over living in permanent private dwellings:

- by sex by 10-year age group (15–24, 25–34, 35–44, 45–54, 55–64, 65–74, 75+)
- by sex by prioritised ethnicity (Māori, Pacific peoples, Asian peoples and European/Other) by lifecycle age groups (15–24, 25–44, 45–64, 65+)
- by sex by NZDep2001 deciles.

Chatham and Pitt Islands over-sample

As this was a census all respondents had equal probability of selection with a selection weight of one. However, not all eligible persons responded to the survey. Therefore, a post-stratification adjustment was made to ensure the final weighted totals of eligible adult respondents were consistent with independent population estimates from the 2001 Census.

The post-stratification factors were calculated for sex by ethnicity (Māori, non-Māori) by age group (15–24, 25–34, 35–44, 45–54, 55–64, 65+).

Once the weighting for the main survey (excluding the Chatham and Pitt Islands) and the Chatham and Pitt Islands over-sample components were weighted the resulting datasets were joined.

Institutions survey

As the institutions survey was conducted on a sample of respondents, survey weights were calculated for each respondent to the survey.

For each of the four strata, the probability of selecting a person = $W1 \times W2$.

Where:

$W1 = (\text{total number of chosen residential beds within the stratum} / \text{total number of residential beds within the stratum}).$

As establishments were selected with probability proportional to size, then:

$= ((\text{number of PSUs chosen}) \times (\text{total number of residential beds within the selected PSU})) / (\text{total number of residential beds within the stratum}).$

This is the probability of selecting the PSU, but using residential bed counts instead of PSUs to account for PSUs not being of equal size.

$W2 = (\text{number of residential beds chosen within the selected PSU} / \text{total number of residential beds within the selected PSU}).$ This is the probability of choosing a person within a selected establishment.

Note:

$W1 \times W2 = ((\text{number of PSUs chosen}) \times (\text{number of residential beds chosen within the selected PSU})) / (\text{total number of residential beds within the stratum})$

The inverse of the probability of selection is the survey weight. In other words, the selection weight is one divided by the probability of selection.

Age-standardised weights

Age is an important determinant of health status. Therefore, when making comparisons between males and females, and between different ethnic groups, the different age distribution of the comparison population must be taken into account. Age-standardisation was performed by the direct method using the WHO world population age distributions applied to population counts from the 2001 Census. In addition to the New Zealand population survey weight an age-standardised weight exists.

For each prioritised ethnic group (Māori, Pacific peoples, Asian peoples and Other) and sex, the New Zealand population age distributions were adjusted to match the WHO world standard population distribution. Therefore, each prioritised ethnic group was treated as having the same age structure for each sex. By using age-standardised weights any differences between ethnic groups for either sex, cannot be attributed to differences in the age structure, as this factor has been accounted for.

Replicate survey weights

The unit record data contains replicate survey weights to enable confidence intervals to be calculated easily.

Data reliability

Two types of error are possible in an estimate based on a sample survey: sampling error and non-sampling error.

Estimates from this survey are subject to sampling errors or variability because they are based on information relating to a sample of persons rather than a full enumeration. That is, they may

differ from the estimates that would have been produced if the information had been obtained for all people. The method for estimating sampling errors is outlined below.

Other inaccuracies can occur because of insufficient coverage of respondents, inadequacies and imperfections in answers provided by respondents, and errors made when coding and processing data. Such inaccuracies are referred to as non-sampling errors and may occur in any enumeration regardless of whether it is sample or full enumeration. Significant efforts have been made to reduce non-sampling errors by carefully designing and testing the survey, questionnaire and processes, and ensuring detailed quality control of procedures and data.

Sampling errors

Main method

The Ministry of Health calculated sampling errors for survey estimates using a replicated method, called the Delete-a-Group (DAG) jackknife method (Kott 1998). The idea behind the replication approach was to divide the sample into G random groups, and then estimate the variance of full sample survey estimate. For the 2002/03 NZHS, 100 random groups were chosen (G=100).

Calculation of the replicate weights

G subsamples were produced by deleting one group at a time from the full sample. Each member of the full sample was assigned to a group in a way that mirrored the sample design. This was done so each subsample replicated the design of the full sample, but contained slightly fewer members. Each subsample was then reweighted to the population using exactly the same weighting estimation methodology as for the full sample.

Therefore, each record on the unit record dataset has G 'replicate weights' associated with it in addition to the 'main weight'. The replicate weights enable calculation of the confidence interval on each estimate.

Calculation of the confidence interval using the replicate weights

For each estimate another G replicate estimate was calculated using the G replicate weights. The variance of the full sample statistic was estimated using the variability among the G replicate estimates. This was done by taking the sum of the squared differences between the G replicate estimates and the original full sample estimate, and multiplying this by (G-1)/G.

To summarise, the formulae for calculating the variance of an estimate using this method are:

$$\text{variance } (y) = \frac{(G-1)}{G} \times \sum_g (y_g - y)^2$$

where

G = 100 (the number of replicate groups)

g = 1, 2, ..., G

y_g = weighted estimate, having applied the weights for replicate group g

y = weighted estimate from the full sample.

For the 95 percent confidence interval:

Sampling error (y) = $1.96 * \sqrt{\text{variance}(y)}$

Confidence interval (y) = $y \pm \text{sampling error}(y)$.

The near unbiasedness of the DAG jackknife requires the number of first-phase samples in each stratum to be large, say, greater than five.

The sampling errors have been represented as 95 percent confidence intervals. The 95 percent confidence interval of a survey estimate provides an indication of the margin of sampling error for that estimate. We are 95 percent certain that the true estimate lies within this range.

Method for quantiles

An indirect method known as the Woodruff method has been used for quantiles. See Sarndal et al (1992) for details about this method, which is a transformation process, incorporating the DAG jackknife approach.

The Woodruff method indirectly estimates the variance of a quantile by calculating a confidence interval on the quantile from a cumulative density function (CDF) and then using the width of the confidence interval to derive a variance estimate. Thus, the variance is not estimated directly from the variation of the replicate estimates.

The Woodruff method was used because it was not clear that the DAG jackknife method would provide reliable estimates for the variance of quantiles, such as medians (Rao et al 1992).

Classifications and standards

Standard classifications have been used where appropriate to promote comparability and data consistency.

Security of information

Any information collected in the survey that could be used to identify individuals has been treated as confidential. Names and addresses of people and households collected in the survey have not been stored with their responses. No information will be released in a way that would enable an individual or a household to be identified.

Unit record data is stored in a secure area and is accessible on a restricted 'needs to know' basis only. All applications by academics or researchers to access anonymised unit record files will be assessed according to predefined criteria. If successful, applicants will be required to sign an agreement to ensure no breach of confidentiality occurs in regards to the storage of, and access to, the data and their outputs.

Liability

Care and diligence has been taken to ensure the information in this document is accurate and up to date. However, the Ministry of Health accepts no liability for the accuracy of the information, its use or the reliance placed on it.

Dissemination of data

The Ministry of Health has planned a series of outputs based on the 2002/03 NZHS findings. Where appropriate, collaboration will occur within the Ministry of Health and with external experts.

The first publication, *A Snapshot of Health: Provisional results of the 2002/03 New Zealand Health Survey*, was released in December 2003 (Ministry of Health 2003). This report was based on provisional data (ie, an incomplete dataset and an interim survey weighting estimation) and included selected key results stratified by gender and ethnicity.

The second publication is this descriptive report and datacubes containing additional descriptive results. This report comprises five chapters: introduction and methodology, chronic diseases, risk and protective factors, health service utilisation, and self-reported health status. The report is based on data from 12,929 adults living in private houses in New Zealand (including the Chatham and Pitt Islands).

Other planned outputs include estimates for DHBs, comparisons with previous surveys, results for the separate institutions survey, additional self-reported health status results, and results from more in-depth analyses examining interrelationships between the various health modules (eg, chronic diseases will be examined in relation to the prevalence of biological and behavioural risk factors for these diseases). All future outputs and information about how to obtain these outputs will be available on the Ministry of Health's website: <http://www.moh.govt.nz/phi>

This report

The purpose of this report was to disseminate survey results as quickly as possible in an easily accessible format. Therefore, this report is purely descriptive, with sufficient commentary to facilitate understanding of the data. Even with analyses restricted to key sociodemographic indicators (ie, sex, age, ethnicity and NZDep2001), not all results could be included in the report. However, additional results are included in the datacubes.

It is hoped that this report, together with the datacubes, will meet the needs of most people and organisations. For those who are interested in more detailed information, the various methods for obtaining this, including how to access the dataset, are outlined on the Ministry of Health's website: <http://www.moh.govt.nz/phi>

Data analysis

Survey weights

Survey weights were applied to all analyses to produce nationally representative estimates. Survey weights were unique to each respondent and adjusted for individual probability of selection and differential non-response. The method used to calculate survey weights is described in the methodology section.

Data reliability

Ninety-five percent confidence intervals were used to represent sampling error. The 95 percent confidence interval of the survey estimate provides an indication of the margin of sampling error for that estimate. The method used to estimate sampling error is described in the methodology section.

Ninety-five percent confidence intervals are presented for all descriptive results, either following the estimate in the text or summary tables at the end of the chapter, or as error bars in graphs. In this report, when a difference between population subgroups is referred to as significant, it means the difference is statistically significant at the 95 percent confidence level (ie, the 95 percent confidence intervals do not overlap).

When an unweighted individual cell contained a value of less than 10, results were suppressed for reasons of reliability and confidentiality.

Age-standardisation

Age is an important determinant of health status and health risks. Therefore, when making comparisons between population subgroups (eg, between sex or ethnic groups), the different age distribution of the comparison populations must be taken into account.

A process called age-standardisation was used to adjust for the differing age distributions of population subgroups. Age-standardisation was performed by the direct method using the WHO World Population as the standard population. The methods used for age-standardisation are described in the methodology section.

Subgroup analyses

An objective of the survey was to examine differences between population subgroups (ie, sex, ethnicity, age and NZDep2001).

Sex

Most results were stratified by sex. All sex-specific estimates presented in the body of the report are age-standardised. Crude sex-specific estimates are in summary tables at the end of each chapter or in the datacubes.

Age

Age was calculated using information on year of birth and date of interview. Where possible, age-specific estimates were calculated for the following 10-year age groups: 15–24, 25–34, 35–44, 45–54, 55–64, 65–74 and 75+. Otherwise the following lifecycle age group were used: 15–24, 25–44, 45–64 and 65+.

Ethnicity

The classification of ethnic group was based on respondents indicating with which ethnic group or groups they identified. When only one ethnic group was given, that group was assigned. When two or more ethnic groups were given, a single ethnic group was assigned using the following priority rules:

- If Māori was one of the groups reported, the respondent was assigned to 'Māori'.
- If any Pacific ethnic group was reported, the respondent was assigned to 'Pacific'.
- If any Asian ethnic group was reported, the respondent was assigned to 'Asian'.
- All other respondents were assigned to 'European/Other'.

When possible, ethnic-specific estimates were calculated for Māori, Pacific, Asian and European/Other ethnic groups. When Pacific and Asian ethnic groups were not represented in adequate numbers for reliable estimates they were combined with European/Other to give a non-Māori ethnic group or suppressed. All ethnic-specific estimates included in the body of this report are age-standardised. Crude ethnic-specific estimates are in the summary tables at the end of each chapter or in the datacubes.

Deprivation

NZDep2001 was used as the key indicator of socioeconomic status. It is an area-based index of deprivation that measures the level of deprivation for each meshblock, according to a combination of Census 2001 variables (ie, income, transport (access to car), living space, home ownership, employment status, qualifications, support (sole-parent families) and access to a telephone).

There are 10 NZDep2001 categories (deciles), with decile 1 representing the least deprived 10 percent of small areas and decile 10 representing the most deprived 10 percent of small areas. For this report, NZDep2001 deciles were aggregated into quintiles 1–5, with quintile 1 being the least deprived quintile and quintile 5 being the most deprived. All results presented by NZDep2001 quintile in this report are age-standardised.

Interpretation of results

All results presented by sex, ethnicity and NZDep2001 in the body of this report have been age-standardised. This is to allow comparisons between population subgroups without differences in the age distribution of the comparison populations influencing results. Therefore, to compare one population with another, use the age-standardised estimates. However, note that age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates.

If you want to know the actual burden experienced by the population of interest (eg, the prevalence of obesity or diabetes in males or females), use the crude results shown in the summary tables at the end of the relevant chapter or in the datacubes.

References

- Babor TF, de la Fuente JR, Saunders J, et al. 1992. *AUDIT. The Alcohol Use Disorder Identification Test. Guidelines for Primary Care*. Geneva: World Health Organization.
- Kott PS. 1998. *Using the Delete-A-Group Jackknife Variance Estimator in NASS Surveys*. RD-98-01. Washington, DC: USDA.
- Ministry of Health. 1999. *Taking the Pulse: The 1996/97 New Zealand Health Survey*. Wellington: Ministry of Health.
- Ministry of Health. 2002. *The New Zealand Health Monitor*. Public Health Intelligence Occasional Bulletin No 13. Wellington: Ministry of Health.
- Ministry of Health. 2003. *A Snapshot of Health: Provisional results of the 2002/03 New Zealand Health Survey*. Wellington: Ministry of Health.
- Nosikov A, Gudex C (eds). 2003. EUROHIS: Developing common instruments for health surveys. *Biomedical and Health Research* 57. Amsterdam: IOS Press.
- Rao JNK, Wu CFJ, Yue K. 1992. Some recent work on resampling methods for complex survey. *Survey Methodology* 18: 209–17.
- Russell DG, Parnell WR, Wilson NC, et al. 1999. *NZ Food: NZ People: Key results of the 1997 National Nutrition Survey*. Wellington: Ministry of Health.
- Sarndal CE, Swensson B, Wretman J. 1992. *Model Assisted Survey Sampling*. New York: Springer.
- Saunders JB, Aasland OG, Babor TF, et al. 1993. Development of the Alcohol Use Disorders Screening Test (AUDIT). WHO collaborative project on early detection of persons with harmful alcohol consumption. II. *Addiction* 88: 791–804.
- Statistics New Zealand, Ministry of Health. 1993. *A Picture of Health*. Wellington: Statistics New Zealand and Ministry of Health.
- University of Auckland. 2003. Validation of MOH-short and SPARC-long physical activity questionnaires. Unpublished report to the Ministry of Health and Sport and Recreation New Zealand.
- WHO. 1998. *Guidelines for Controlling and Monitoring the Tobacco Epidemic*. Geneva: World Health Organization.
- WHO. 2001. *International Classification of Functioning, Disability and Health*. Geneva: World Health Organization.

Chapter 2: Chronic Diseases

Introduction

A chronic disease is a physical or mental illness that has lasted, or is expected to last, for more than six months. The symptoms may come and go or be present all the time.

In this survey, the prevalence of chronic diseases was determined by asking participants if a doctor had ever told them they had any of the selected chronic diseases. This will underestimate the true prevalence of most chronic diseases, as not all people with the disease will have been diagnosed. The proportion of people who are not diagnosed will vary by disease depending on several factors, such as the presence and severity of symptoms.

Participants who said they had been diagnosed with a particular chronic disease were asked additional questions, including how old they were when that disease was diagnosed, what treatments they now have for that disease, and whether they had ever had surgery for that disease. Information on the proportion of adults who received medical treatment for each disease (current pharmacological treatment or previous surgery for that disease) is also reported here.

All results are presented by sex and ethnic group. Where possible, the following four ethnic groups are used: European/Other, Māori, Pacific and Asian. However, when Pacific and Asian ethnic groups were not represented in adequate numbers for reliable estimates they were combined with European/Other to give a non-Māori ethnic group. Selected results are also presented by sex and 10-year age group, and by sex and NZDep2001 quintile. Additional results are included in datacubes.

Ninety-five percent confidence intervals are presented for all descriptive results after the estimate in the text or summary tables at the end of the chapter, or as error bars in graphs. When a difference between population subgroups is referred to as significant, it means the difference is statistically significant at the 95 percent confidence level (ie, the 95 percent confidence intervals do not overlap).

All results presented by sex, ethnicity and NZDep2001 in the body of this report have been age-standardised by the direct method using the WHO World Population as the standard population. This is to allow comparisons between population subgroups without differences in the age distribution of the comparison populations influencing results. However, age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup with another.

If you want to know the actual burden experienced by the population of interest (eg, the prevalence of diabetes in males or females), use the crude (unadjusted) rates shown in the summary tables at the end of this chapter or in the datacubes.

Results

Key points

- One in 10 adults had been diagnosed with heart disease.
- Males were significantly more likely than females to receive medical treatment for heart disease.
- One in 48 adults had been told by a doctor they had had a stroke.
- One in 23 adults had been diagnosed with diabetes.
- The prevalence of diabetes was significantly higher in Māori and Pacific peoples than in the European/Other ethnic group.
- One in five adults aged 15–44 years had been diagnosed with asthma.
- The prevalence of asthma was about four times higher in the European/Other and Māori ethnic groups than in the Pacific and Asian ethnic groups.
- One in 18 adults aged over 45 years had been diagnosed with chronic obstructive pulmonary disease.
- One in six adults had been diagnosed with arthritis.
- The most common type of arthritis in adults was osteoarthritis, followed by rheumatoid arthritis.
- One in four adults had been diagnosed with chronic neck or back problems.
- One in 42 adults had been diagnosed with osteoporosis.
- Females were four times more likely than males to have been diagnosed with osteoporosis.
- One in 20 adults had been diagnosed with cancer.
- One in 40 adults had been diagnosed with a serious mental disorder (ie, depressive disorder, bipolar disorder or schizophrenia).
- One in 17 adults had been diagnosed with migraine headaches.

Heart disease

Introduction

The most common cause of heart disease is the narrowing or blocking of the coronary arteries that supply blood and oxygen to the heart. Coronary heart disease can cause angina and heart attack and lead to heart failure. Heart disease is the leading cause of mortality in New Zealand, with coronary heart disease accounting for about 25 percent of all mortality.

Heart disease is caused by a combination of genetic and environmental factors. Modifiable risk factors for heart disease include high blood cholesterol, high blood pressure, tobacco smoking, overweight and obesity, physical inactivity, diabetes, high blood homocysteine, and inadequate vegetable and fruit intake.

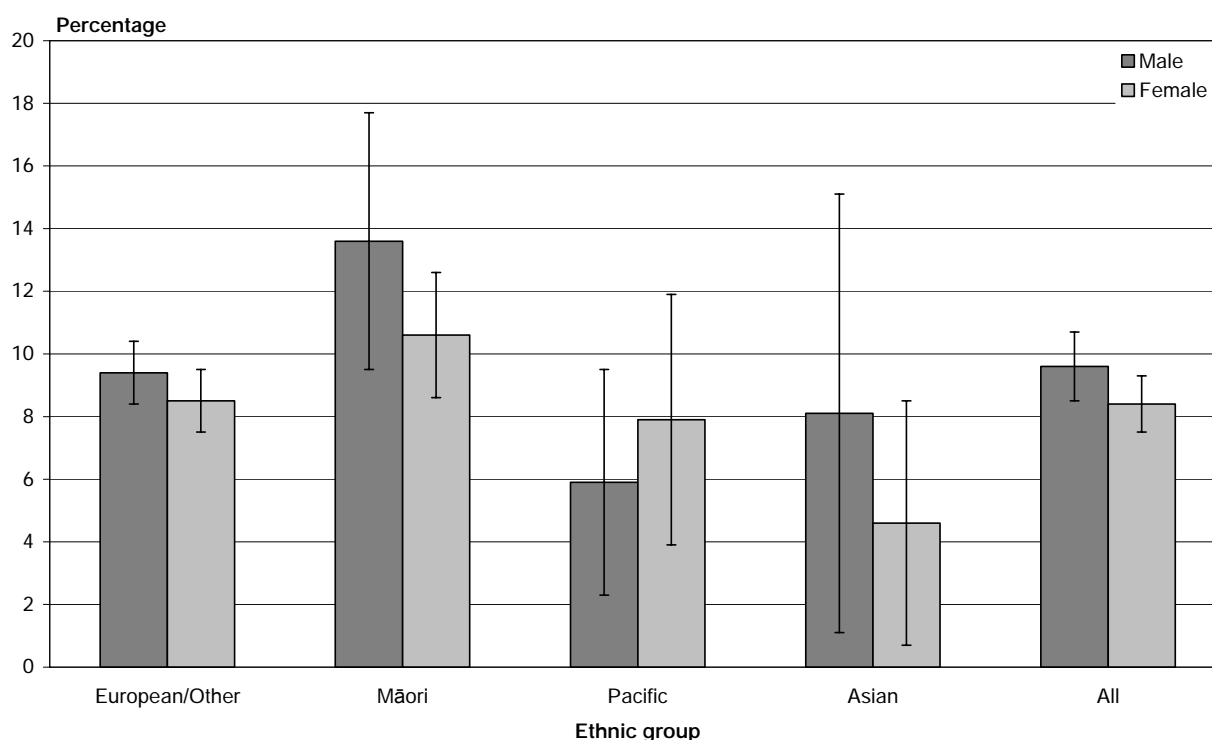
Prevalence

Overall, one in 10 adults (10.4%; 9.7–11.1) had been diagnosed with heart disease (ie, heart attack, angina, abnormal heart rhythm or heart failure).

There was no significant difference in the prevalence of heart disease in males (9.6%; 8.5–10.7) and females (8.4%; 7.5–9.3).

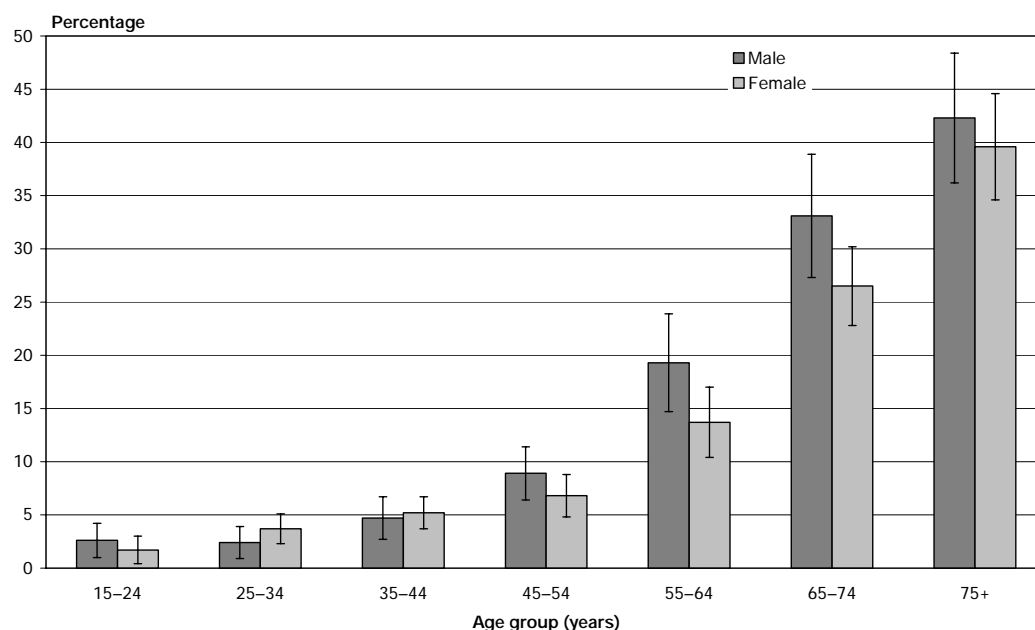
In males, the prevalence of heart disease was highest in Māori, followed by European/Other, Asian and Pacific ethnic groups, although these ethnic differences were not significant (Figure 1). In females, the prevalence of heart disease was highest in Māori, followed by European/Other, Pacific and Asian ethnic groups, but these differences were not significant.

Figure 1: Heart disease in adults, by ethnic group and sex (age-standardised)



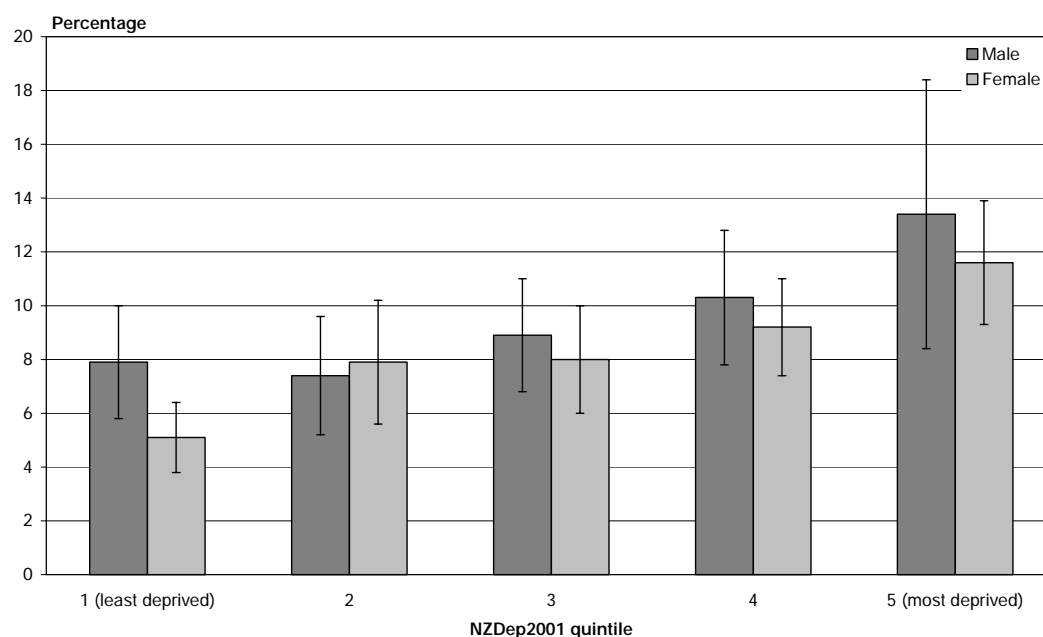
In both males and females, the prevalence of heart disease increased significantly with age, peaking in the 75+ years age group (Figure 2).

Figure 2: Heart disease in adults, by age group and sex



In males, there was no significant difference in the prevalence of heart disease between NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived), although the prevalence of heart disease tended to increase as the level of deprivation increased (Figure 3). In females, the prevalence of heart disease was significantly higher in NZDep2001 quintile 5 than in quintile 1.

Figure 3: Heart disease in adults, by NZDep2001 quintile and sex (age-standardised)

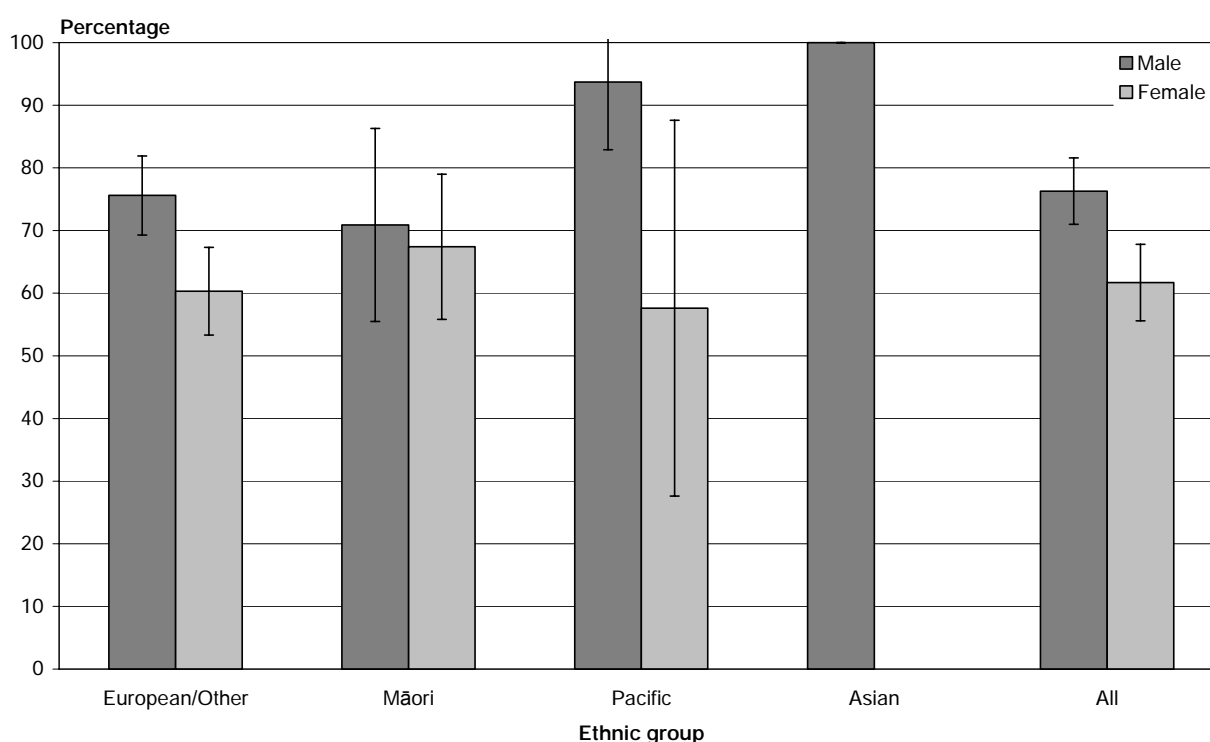


Medical treatment

Among adults diagnosed with heart disease, males (76.3%; 70.9–81.6) were significantly more likely than females (61.7%; 55.6–67.9) to receive medical treatment (aspirin, other medicines, tablets or pills, bypass surgery or angioplasty).

In males, the proportion receiving medical treatment for heart disease was highest in the Asian ethnic group, followed by Pacific, European/Other and Māori ethnic groups, although these differences were not significant (Figure 4). European/Other, Māori and Pacific females were similarly likely to receive medical treatment for heart disease.

Figure 4: Medical treatment for heart disease in adults, by ethnic group and sex (age-standardised)



Note: Data are not shown for Asian females due to low numbers.

Stroke

Introduction

Stroke refers to the sudden interruption of the blood supply to the brain that can cause permanent damage. The interruption of the blood supply can be caused by either blood clots (ischaemic stroke) or bleeding in the brain (haemorrhagic stroke). Most strokes are due to blood clots. Stroke is one of the leading causes of death in New Zealand, and contributes to about 10 percent of all deaths. Stroke is also an important cause of severe disability.

Stroke is caused by a combination of genetic and environmental factors. Modifiable risk factors for stroke include high blood pressure, high blood cholesterol, smoking, high alcohol consumption, overweight and obesity, and physical inactivity.

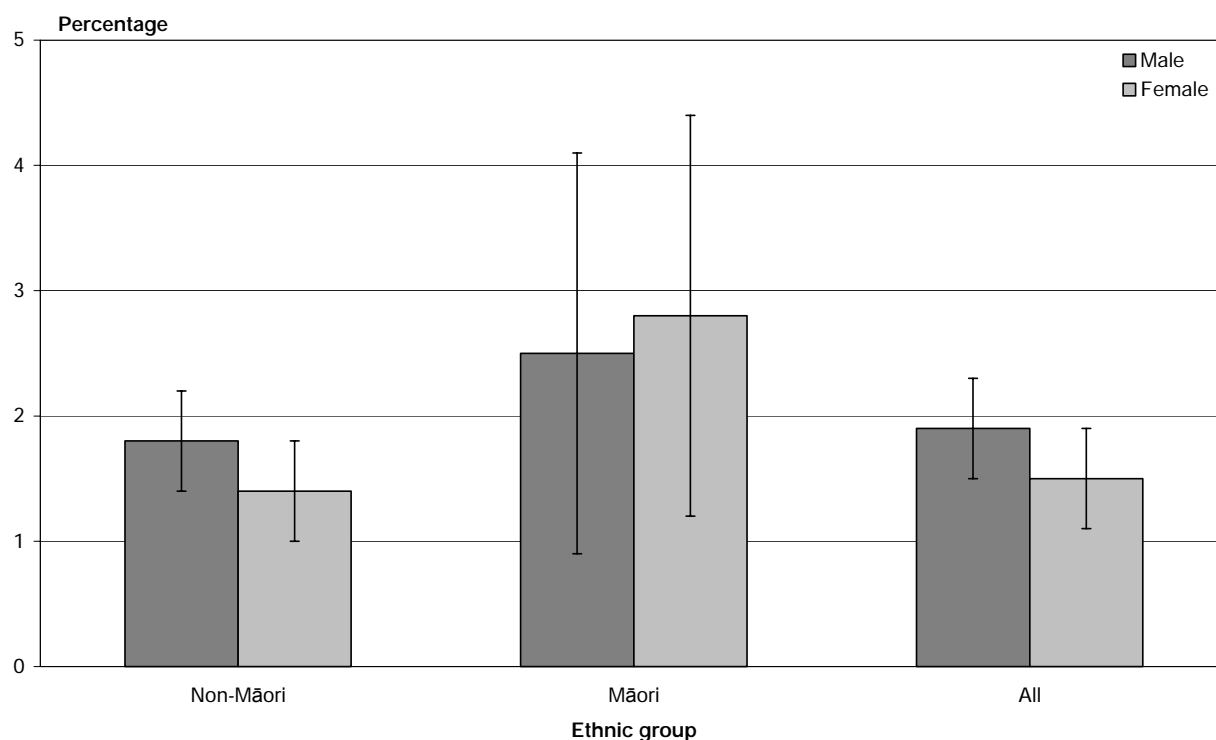
Prevalence

Overall, one in 48 adults (2.1%; 1.8–2.4) had been diagnosed with stroke (excludes transient ischaemic attack or mini-stroke).

There was no significant difference in the prevalence of stroke between males (1.9%; 1.5–2.3) and females (1.5%; 1.2–1.8).

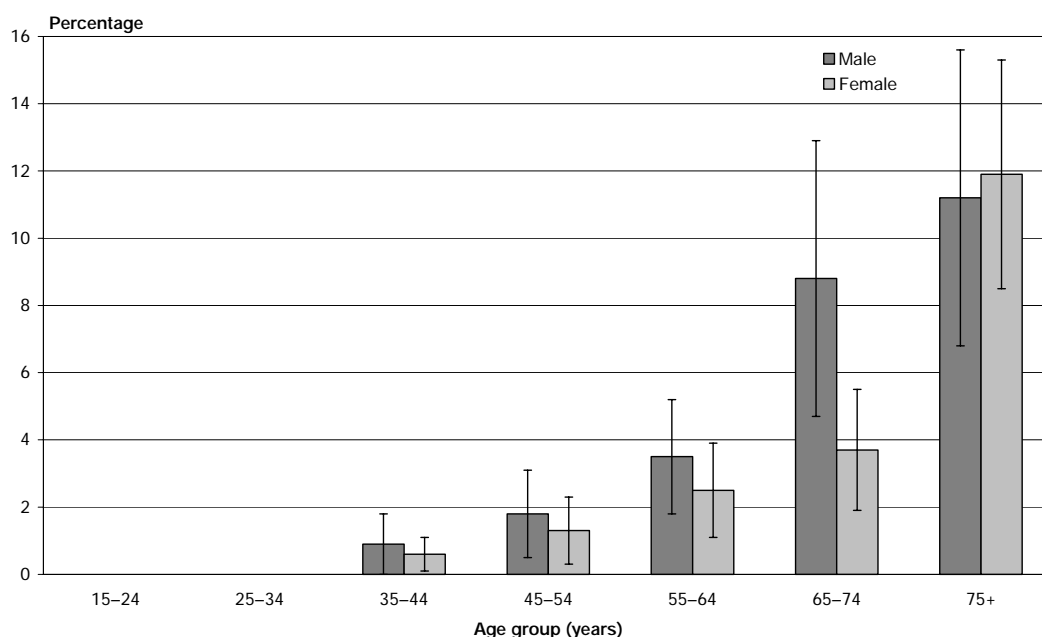
In both males and females, the prevalence of stroke was higher in Māori than non-Māori (Figure 5), although these ethnic differences were not significant.

Figure 5: Stroke in adults, by ethnic group and sex (age-standardised)



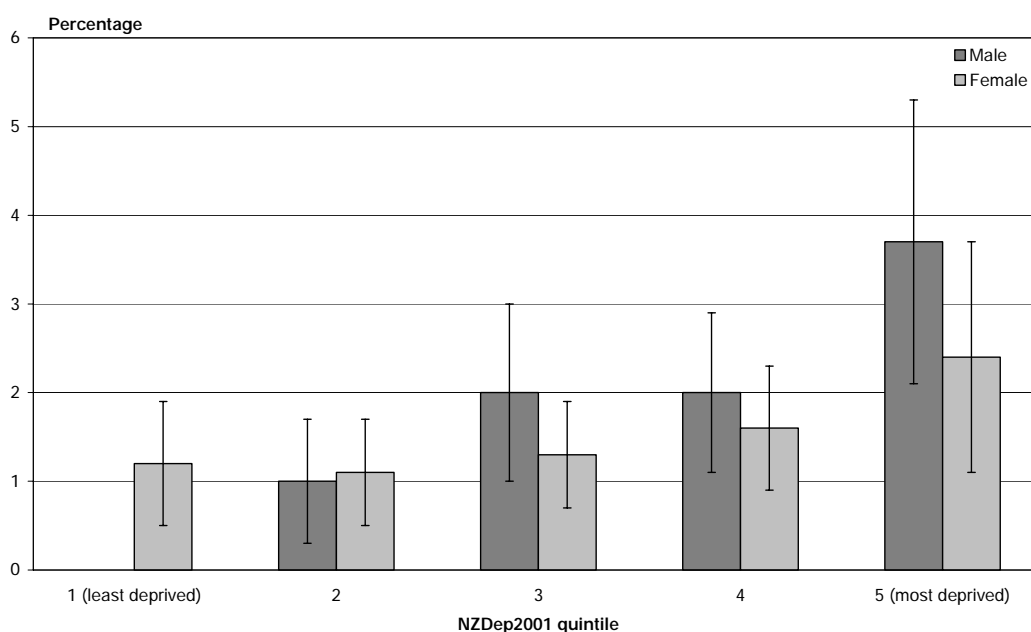
In both males and females, the prevalence of stroke increased with age, peaking in the 75+ years age group (Figure 6).

Figure 6: Stroke in adults, by age group and sex



In both males and females, the prevalence of stroke was higher in the most deprived NZDep2001 quintile than in the least deprived quintile (quintile 2 for males), although these differences were not significant (Figure 7).

Figure 7: Stroke in adults, by NZDep2001 quintile and sex (age-standardised)



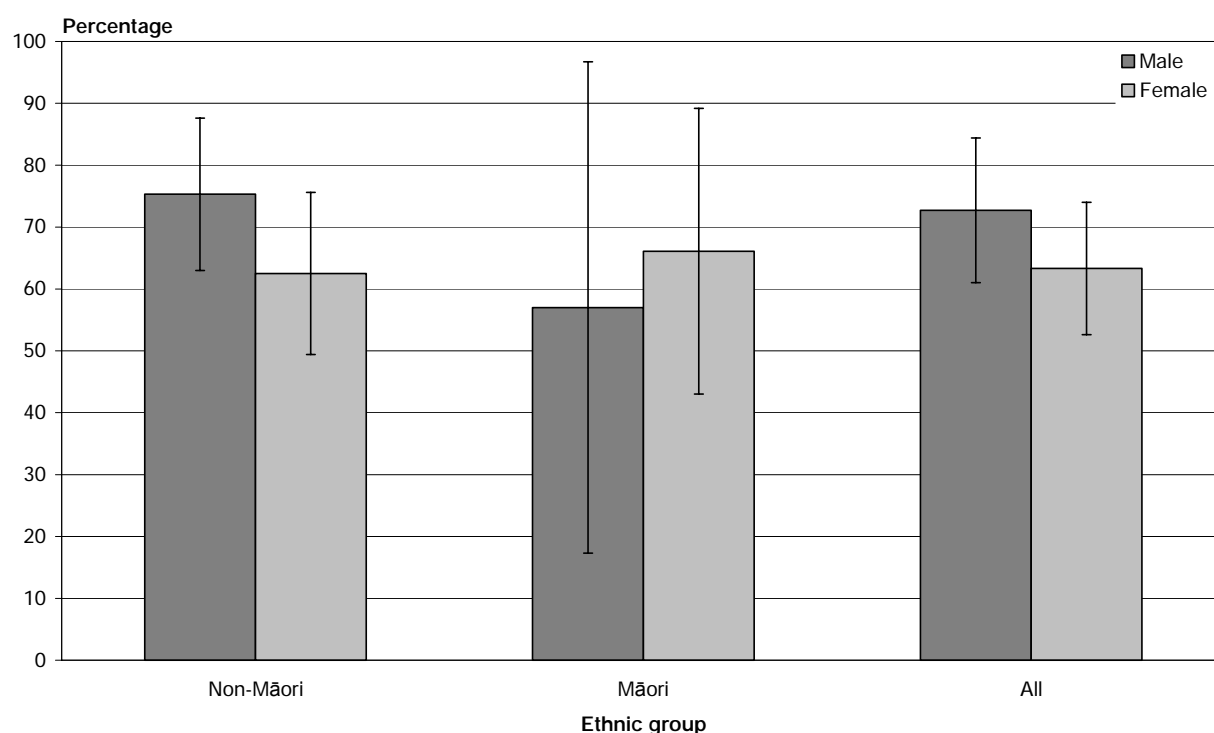
Note: Data are not shown for males in quintile 1 due to low numbers.

Medical treatment

Among adults diagnosed with stroke, there was no significant difference in the proportion of males (72.7%; 61.0–84.4) and females (63.3%; 52.5–74.0) receiving medical treatment (aspirin or other medicines, tablets or pills).

In males, non-Māori were more likely to receive medical treatment for stroke than Māori, although this difference was not significant (Figure 8). In females, non-Māori and Māori were similarly likely to receive medical treatment for stroke.

Figure 8: Medical treatment for stroke in adults, by ethnic group and sex (age-standardised)



Diabetes

Introduction

Diabetes is characterised by raised blood glucose due to insulin deficiency, insulin resistance or both. There are two main types:

- Type 1 diabetes usually develops in childhood and is caused by the destruction of insulin-producing cells, resulting in insulin deficiency. Daily insulin injections are usually required to sustain life.
- Type 2 diabetes usually develops in adulthood and is associated with insulin resistance leading to a relative insulin deficit. Although it is a serious condition, many people with type 2 diabetes do not know they have it. Type 2 diabetes accounts for most (85–90 percent) cases of diabetes.

Diabetes is an important cause of morbidity and mortality, including cardiovascular disease, blindness, kidney disease and vascular insufficiency of the legs, which may lead to nerve damage in, or amputation of, lower limbs. The major risk factors for type 2 diabetes are obesity and physical inactivity.

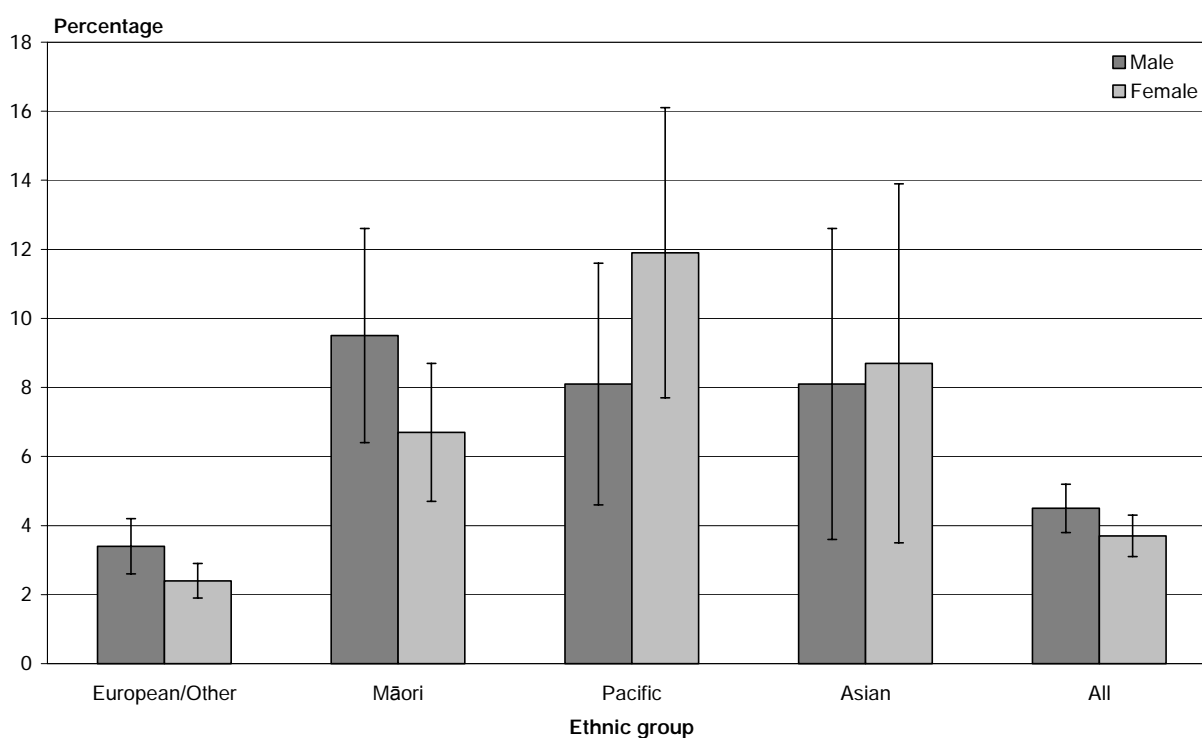
Prevalence

Overall, one in 23 adults (4.3%; 3.7–4.8) had been diagnosed with diabetes (other than during pregnancy).

There was no significant difference in the prevalence of diabetes between males (4.5%; 3.8–5.3) and females (3.7%; 3.1–4.3).

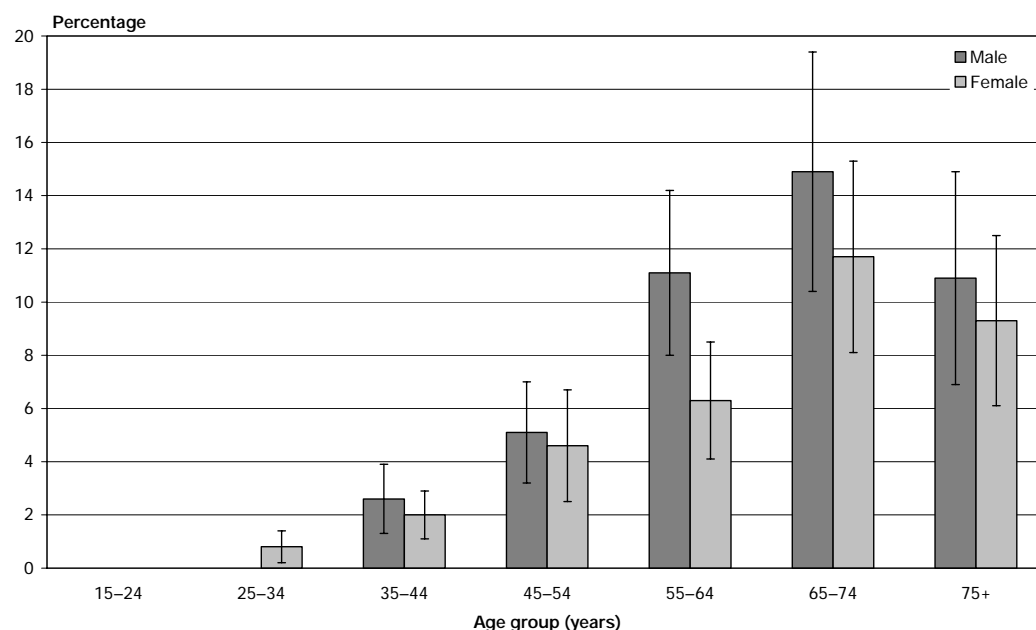
In males, the prevalence of diabetes was significantly lower in the European/Other ethnic group than in Māori and Pacific ethnic groups (Figure 9). In females, the prevalence of diabetes was significantly lower in the European/Other ethnic group than all other ethnic groups.

Figure 9: Diabetes in adults, by ethnic group and sex (age-standardised)



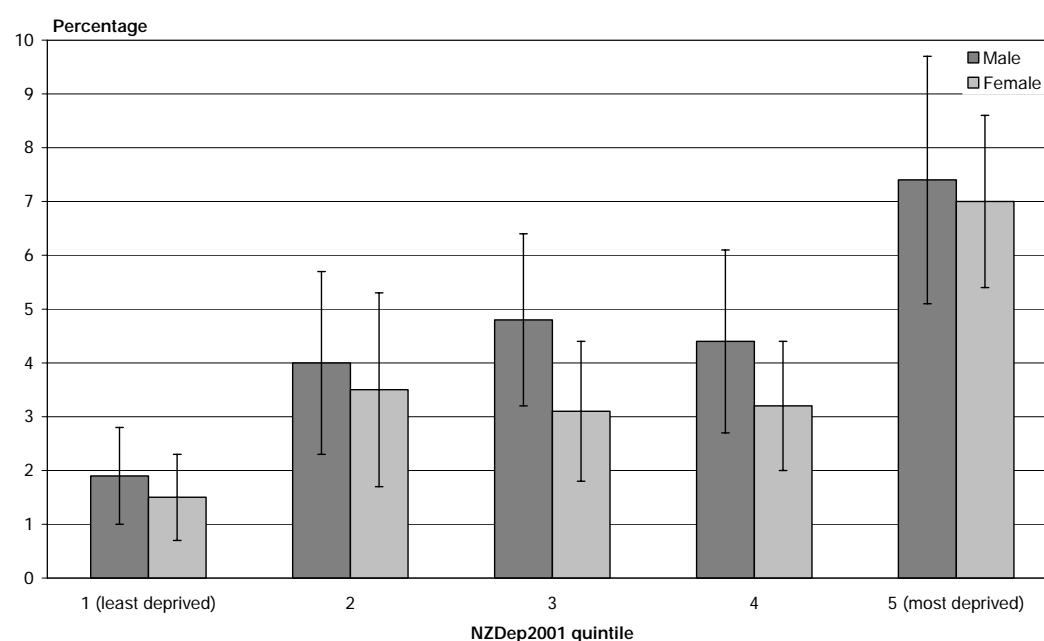
In both males and females, the prevalence of diabetes increased with age, peaked in the 65–74 years age group, and then declined slightly in the 75+ years age group (Figure 10).

Figure 10: Diabetes in adults, by age group and sex



In both males and females, the prevalence of diabetes was about four times higher in NZDep2001 quintile 5 (most deprived) than in quintile 1 (least deprived), and these differences were significant (Figure 11).

Figure 11: Diabetes in adults, by NZDep2001 quintile and sex (age-standardised)

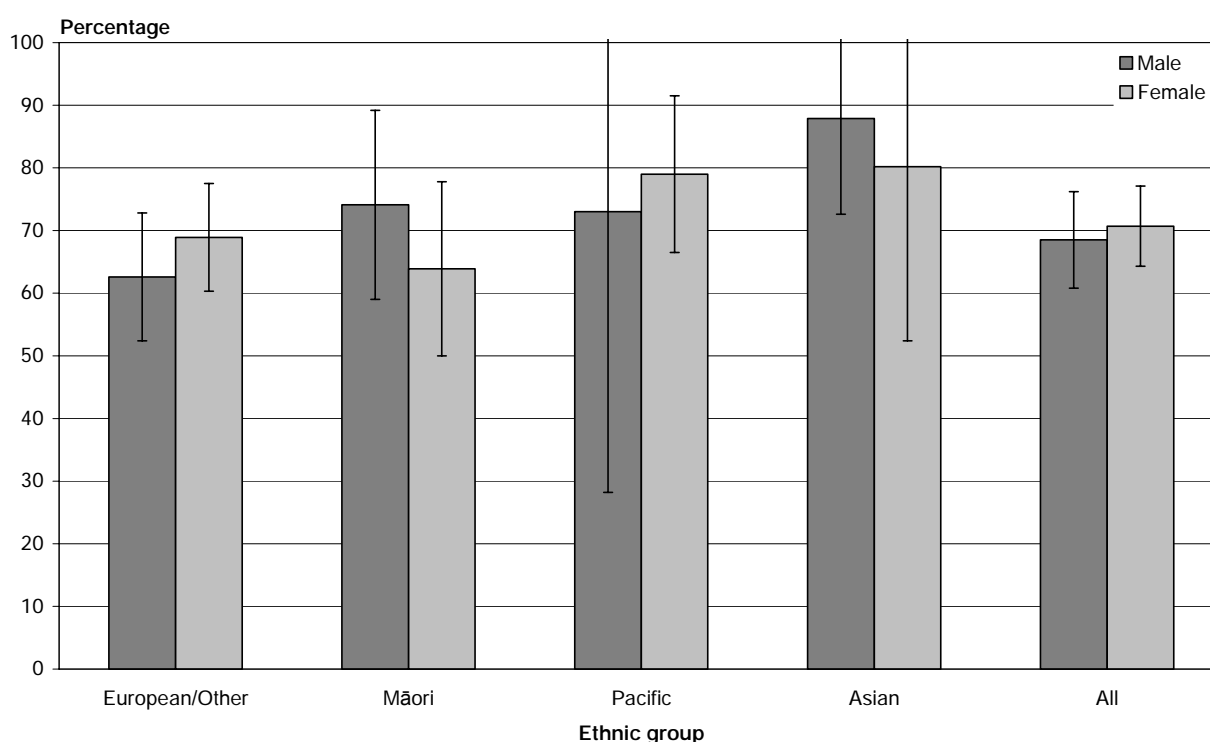


Medical treatment

Among adults diagnosed with diabetes, there was no significant difference in the proportion of males (68.5%; 60.9–76.2) and females (70.7%; 64.4–77.1) who received medical treatment (ie, insulin injections, other medicines, tablets or pills).

In males, the proportion receiving medical treatment for diabetes was highest in the Asian ethnic group, intermediate in Pacific peoples and Māori, and lowest in the European/Other ethnic group (Figure 12). In females, the proportion receiving medical treatment was highest in Asian and Pacific peoples, intermediate in the European/Other ethnic group and lowest in Māori. The differences between ethnic groups were not significant.

Figure 12: Medical treatment for diabetes in adults, by ethnic group and sex (age-standardised)



Asthma

Introduction

Asthma is an inflammatory disorder of the airways that causes airflow in to and out of the lungs to be restricted. It is characterised by periodic attacks of wheezing, breathlessness and coughing and is reversible with appropriate treatment. Asthma attacks can last minutes or days. The cause of asthma is unknown, but once it has developed symptoms can be triggered by allergens, respiratory infections, exercise, cold air, tobacco smoke and other pollutants.

About half of people with asthma develop it before age 10, and most develop it before age 30. In this survey, adults aged 15–44 years were asked if a doctor had ever told them they have asthma.

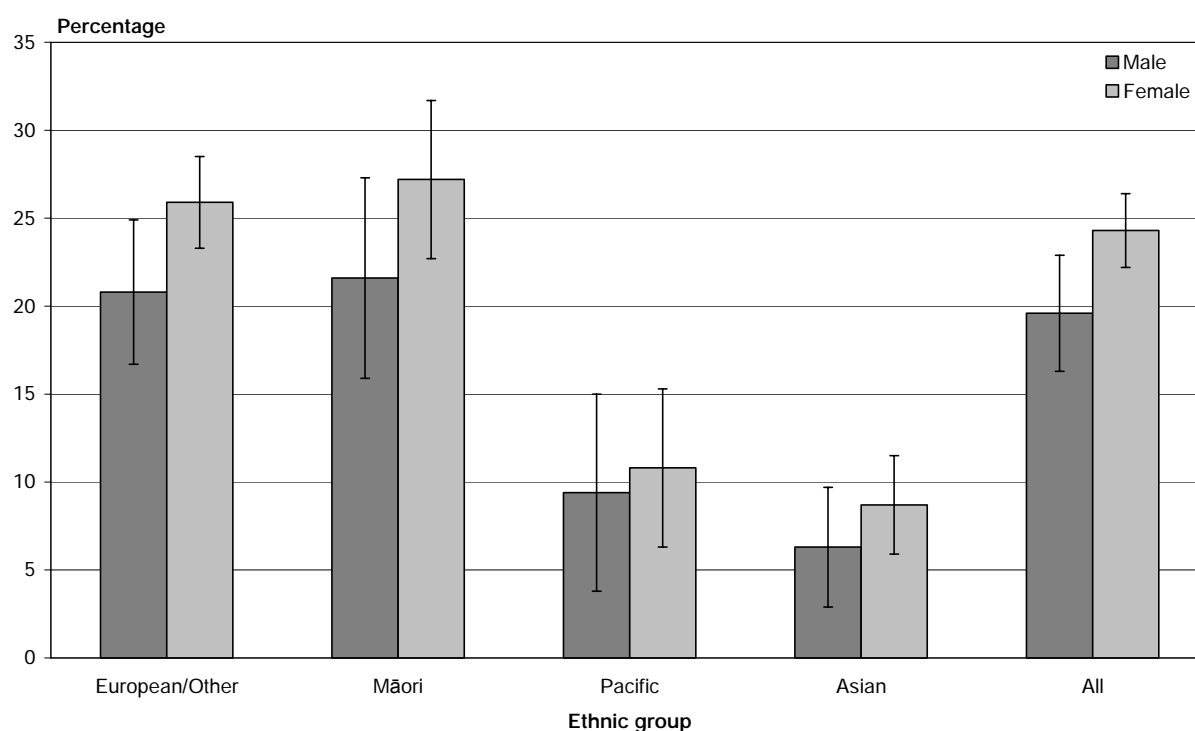
Prevalence

Overall, one in five adults aged 15–44 years (20.7%; 19.0–22.3) had been diagnosed with asthma.

There was no significant difference in the prevalence of asthma in males (19.6%; 16.3–22.9) and females (24.3%; 22.1–26.4) aged 15–44 years.

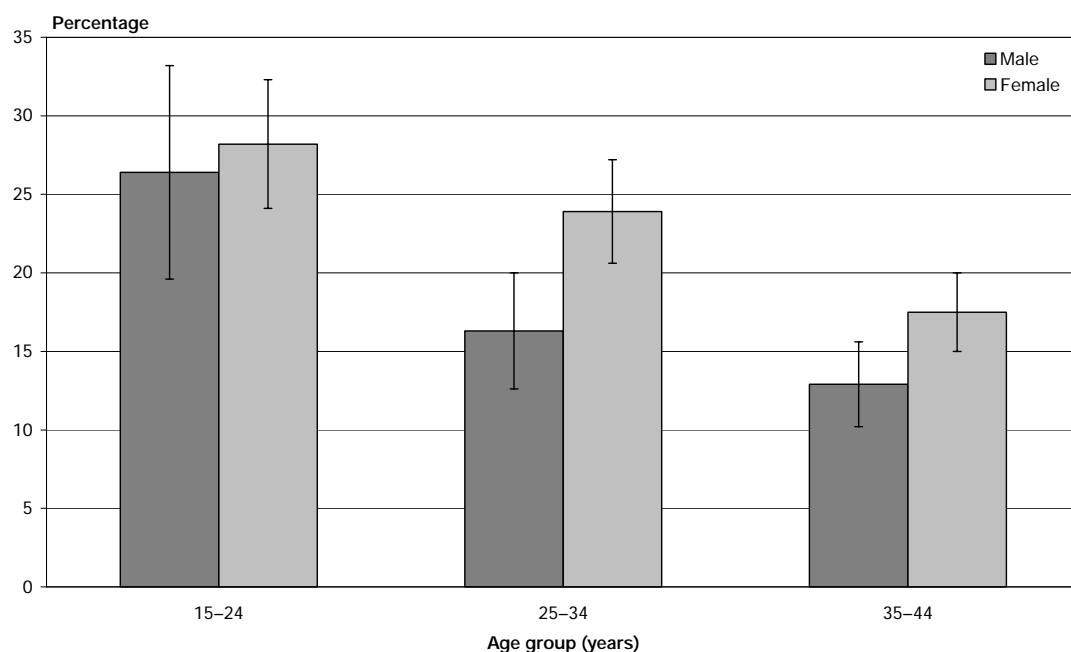
In both males and females, the prevalence of asthma was significantly higher in the Māori and European/Other ethnic groups than in Pacific and Asian ethnic groups (Figure 13).

Figure 13: Asthma in adults aged 15–44 years, by ethnic group and sex (age-standardised)



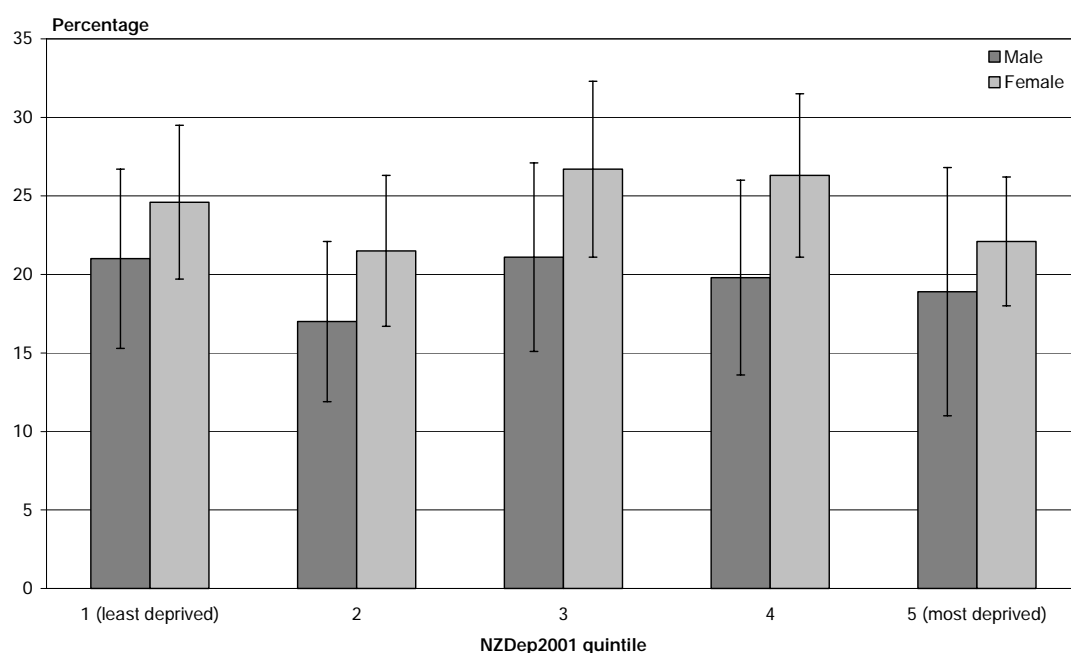
In both males and females, the prevalence of asthma was highest in the 15–24 years age group, and then decreased with age (Figure 14).

Figure 14: Asthma in adults aged 15–44 years, by age group and sex



In both males and females, there was no significant difference in the prevalence of asthma across NZDep2001 quintiles (Figure 15).

Figure 15: Asthma in adults aged 15–44 years, by NZDep2001 quintile and sex (age-standardised)

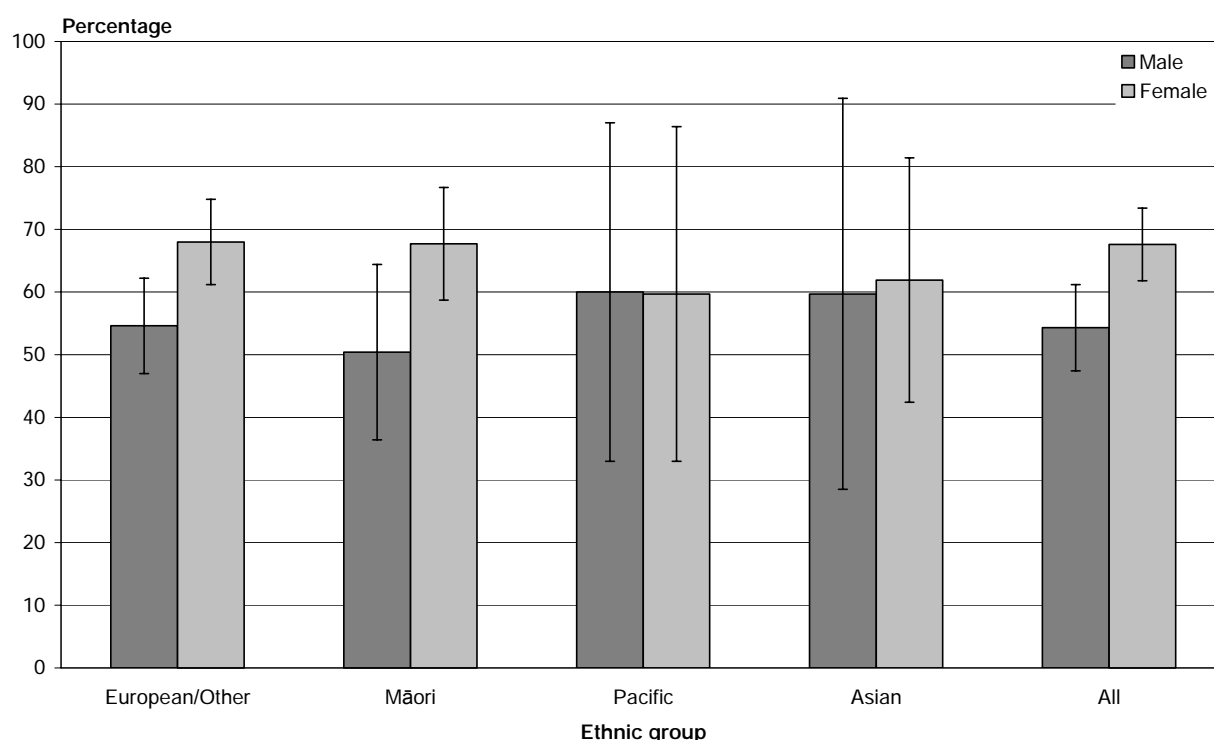


Medical treatment

Among adults diagnosed with asthma, males (54.3%; 47.4–61.2) were less likely than females (67.6%; 61.9–73.4) to receive medical treatment (ie, inhalers, aerosols or tablets).

There were no significant differences between ethnic groups in the proportion receiving medical treatment for asthma (Figure 16).

Figure 16: Medical treatment for asthma in adults aged 15–44 years, by ethnic group and sex (age-standardised)



Chronic obstructive pulmonary disease

Introduction

Chronic obstructive pulmonary disease (COPD) refers to several chronic lung disorders that are characterised by non-reversible airflow restriction in to and out of the lungs. Emphysema and chronic bronchitis are the most common forms of COPD. Chronic bronchitis occurs when the airways to the lungs become narrow and clogged with mucus. Emphysema occurs when some of the air sacs deep in the lungs have been damaged. The main risk factor is tobacco smoking.

In this survey, adults aged over 45 years were asked if a doctor had ever told them they have chronic bronchitis, emphysema or asthma. However, asthma is reversible, so it has not been included in our definition of COPD (which is permanent).

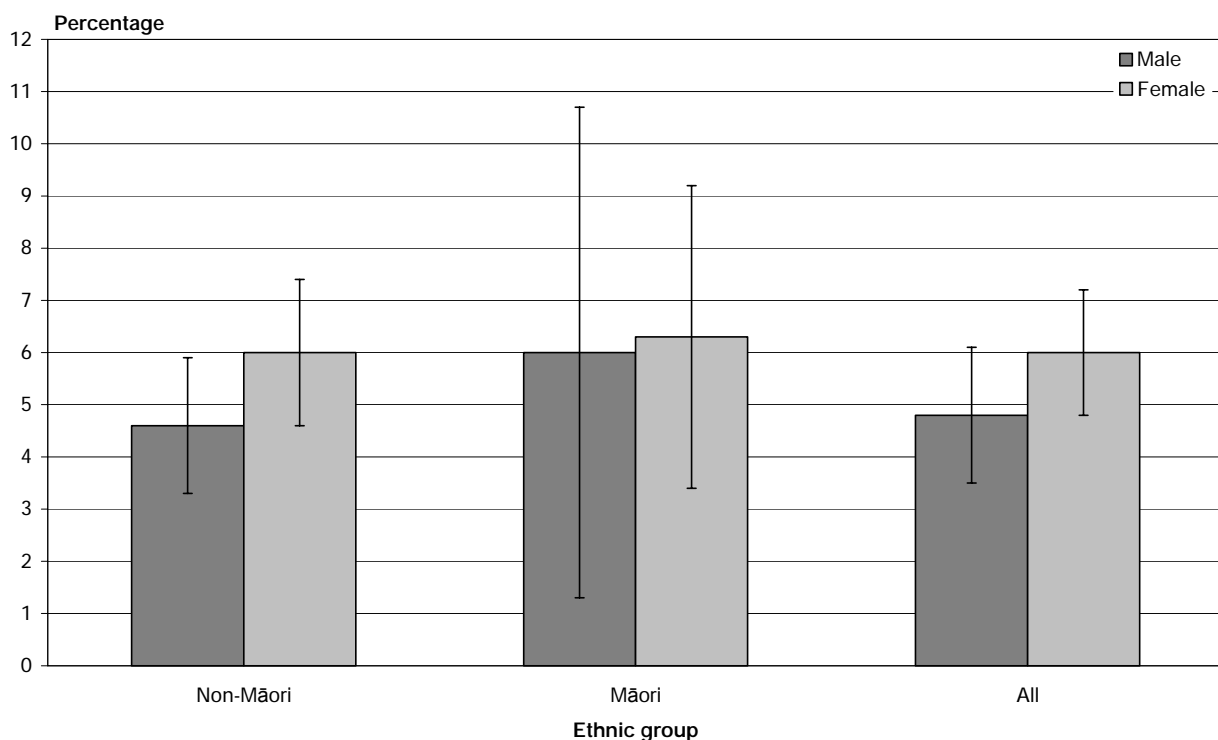
Prevalence

Overall, one in 18 adults aged over 45 years (5.5%; 4.6–6.3) had been told by their doctor they have COPD (emphysema or chronic bronchitis).

There was no significant difference in the prevalence of COPD in males (4.8%; 3.5–6.1) and females (6.0%; 4.8–7.3).

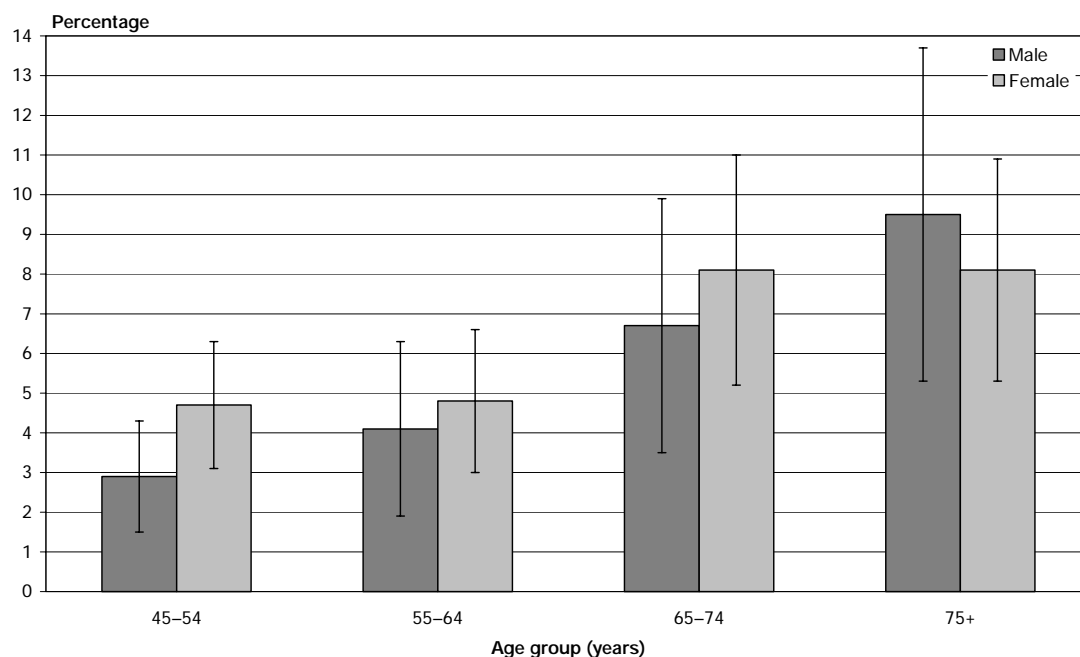
In both males and females, there was no significant difference in the prevalence of COPD between non-Māori and Māori (Figure 17).

Figure 17: Chronic obstructive pulmonary disease in adults aged over 45 years, by ethnic group and sex (age-standardised)



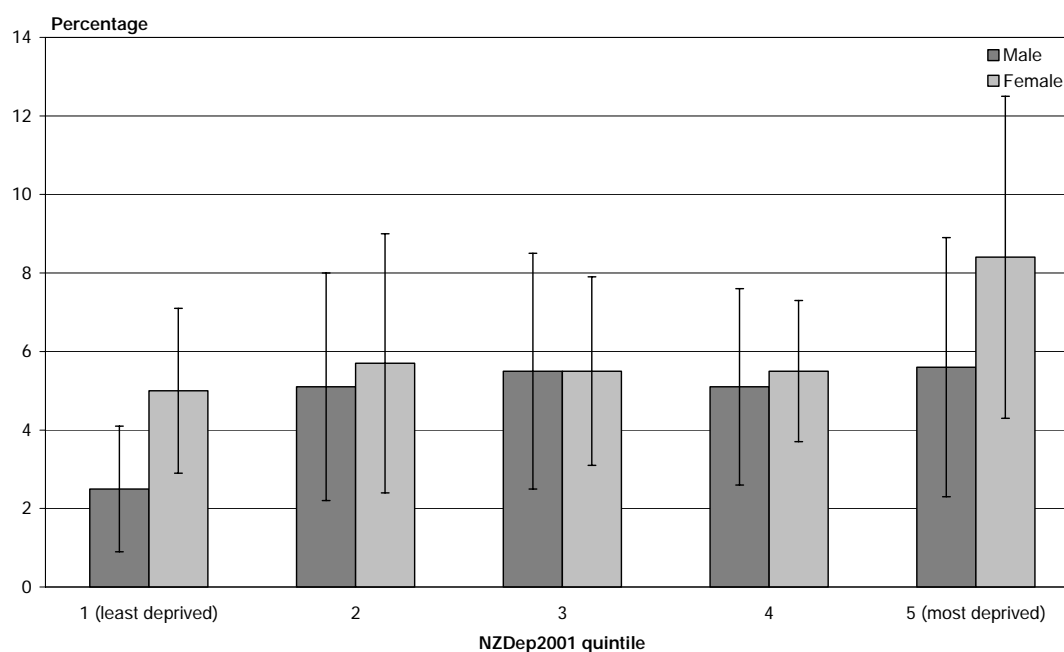
In both males and females, the prevalence of COPD increased with age (Figure 18).

Figure 18: Chronic obstructive pulmonary disease in adults aged over 45 years, by age group and sex



In both males and females, there was no significant difference in the prevalence of COPD between NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived) (Figure 19).

Figure 19: Chronic obstructive pulmonary disease in adults aged over 45 years, by NZDep2001 quintile and sex (age-standardised)

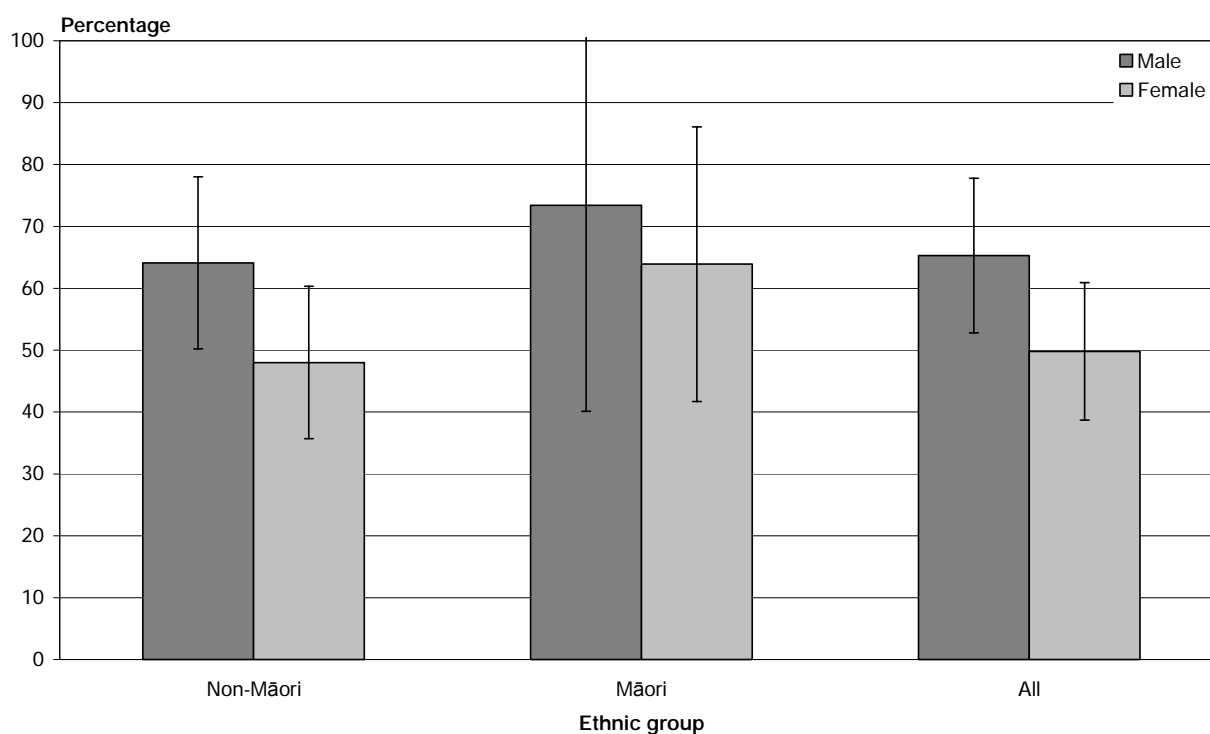


Medical treatment

Among adults diagnosed with COPD, there was no significant difference in the proportion of males (65.3%; 52.8–77.8) and females (49.8%; 38.7–60.8) receiving medical treatment (ie, inhalers, aerosols or tablets).

In both males and females, Māori were slightly more likely than non-Māori to receive treatment for COPD, although these differences were not significant (Figure 20).

Figure 20: Medical treatment for chronic obstructive pulmonary disease in adults aged over 45 years, by ethnic group and sex (age-standardised)



Arthritis

Introduction

Arthritis is a group of diseases that involve inflammation of one or more joints. This joint inflammation may occur in response to a mechanical injury to a joint, the presence of an infection, an attack on the joint by the body (autoimmune disease) or accumulated wear and tear on joints. Chronic arthritis occurs when prolonged inflammation results in long-term pain and deformity.

Osteoarthritis is the most common type of arthritis and usually results from accumulated wear and tear. Osteoarthritis is common in the elderly and usually affects the hip and knee joints. Other types of arthritis include rheumatoid arthritis (caused by autoimmune disease) and gout (caused by uric acid crystals forming in the joints and leading to inflammation).

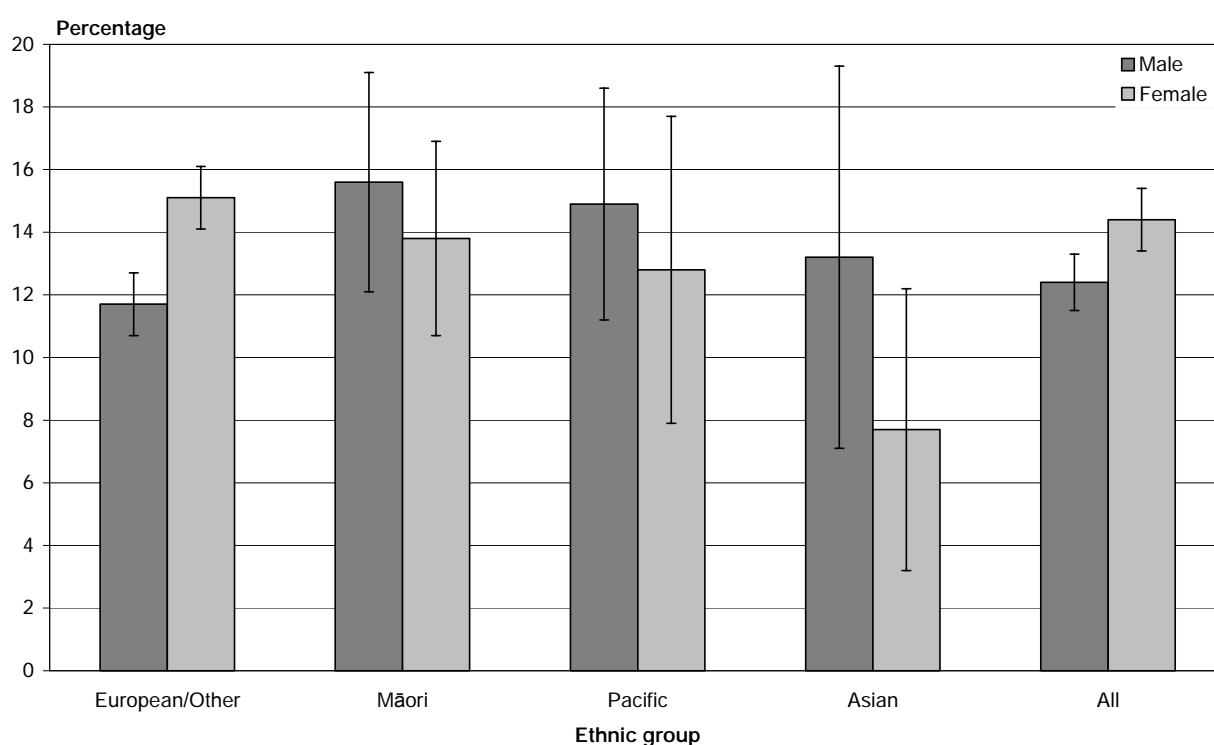
Prevalence

Overall, one in six adults (15.7%; 15.0–16.4) had been told by their doctor they have arthritis. The most common type of arthritis was osteoarthritis (7.7%; 7.2–8.3), followed by rheumatoid arthritis (3.2%; 2.8–3.6).

The prevalence of arthritis was higher in females (14.4%; 13.4–15.4) than in males (12.4%; 11.4–13.3).

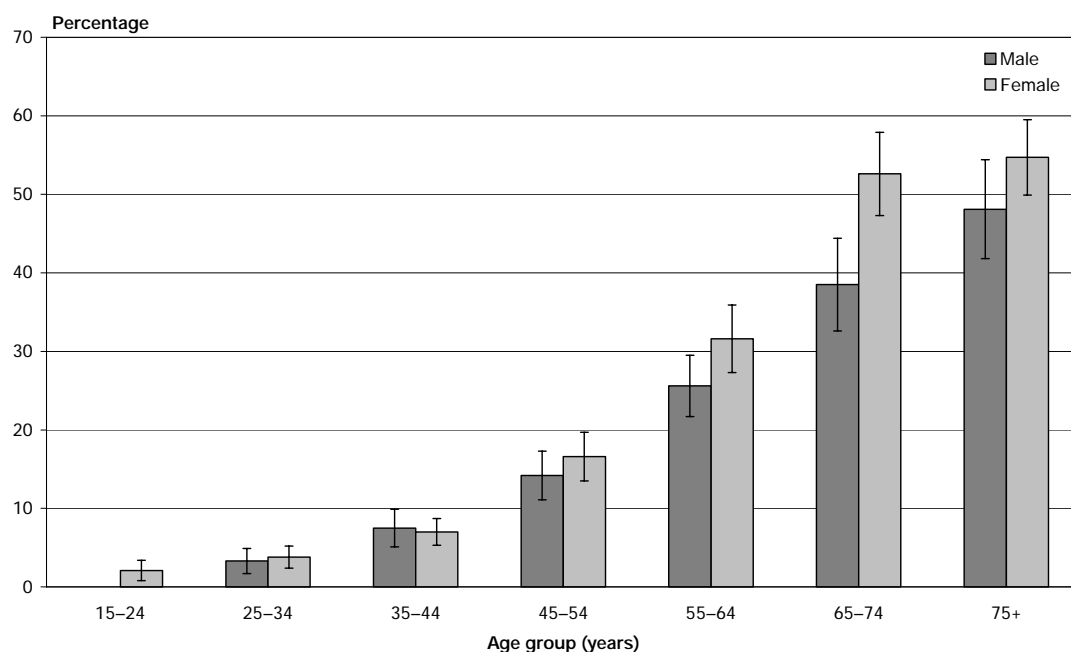
In males, there was no significant difference in the prevalence of arthritis between ethnic groups (Figure 21). The prevalence of arthritis was significantly lower in Asian females than in European/Other females.

Figure 21: Arthritis in adults, by ethnic group and sex (age-standardised)



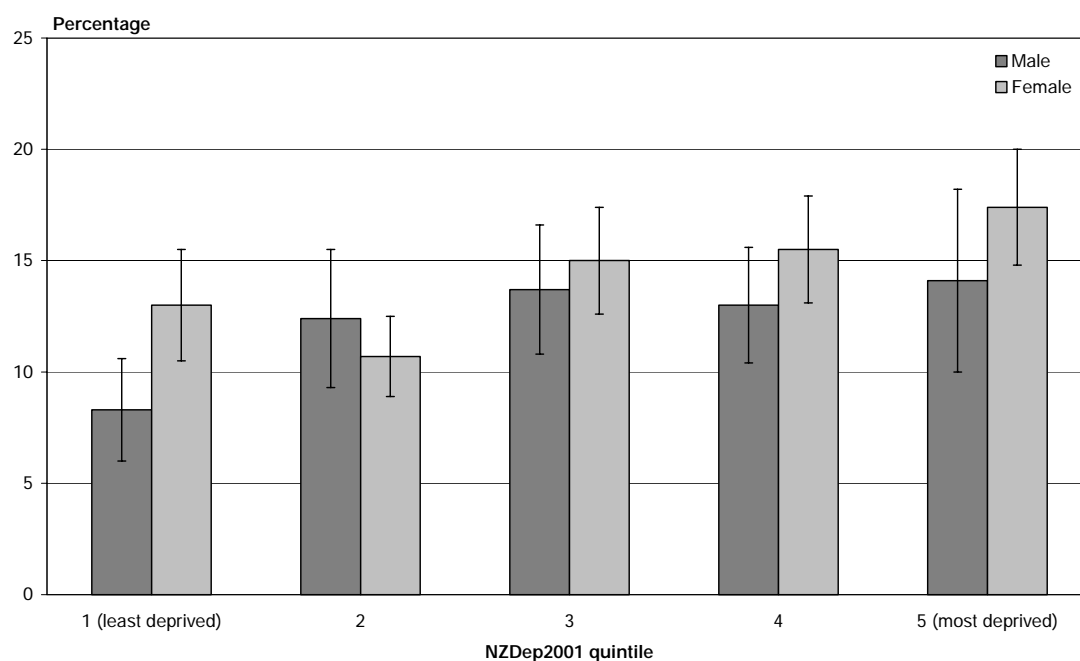
In both males and females, the prevalence of arthritis increased with age, peaking in the 75+ years age group (Figure 22).

Figure 22: Arthritis in adults, by age group and sex



In both males and females, the prevalence of arthritis was higher in NZDep2001 quintile 5 (most deprived) than in quintile 1 (least deprived), but these differences were not significant (Figure 23).

Figure 23: Arthritis in adults, by NZDep2001 quintile and sex (age-standardised)

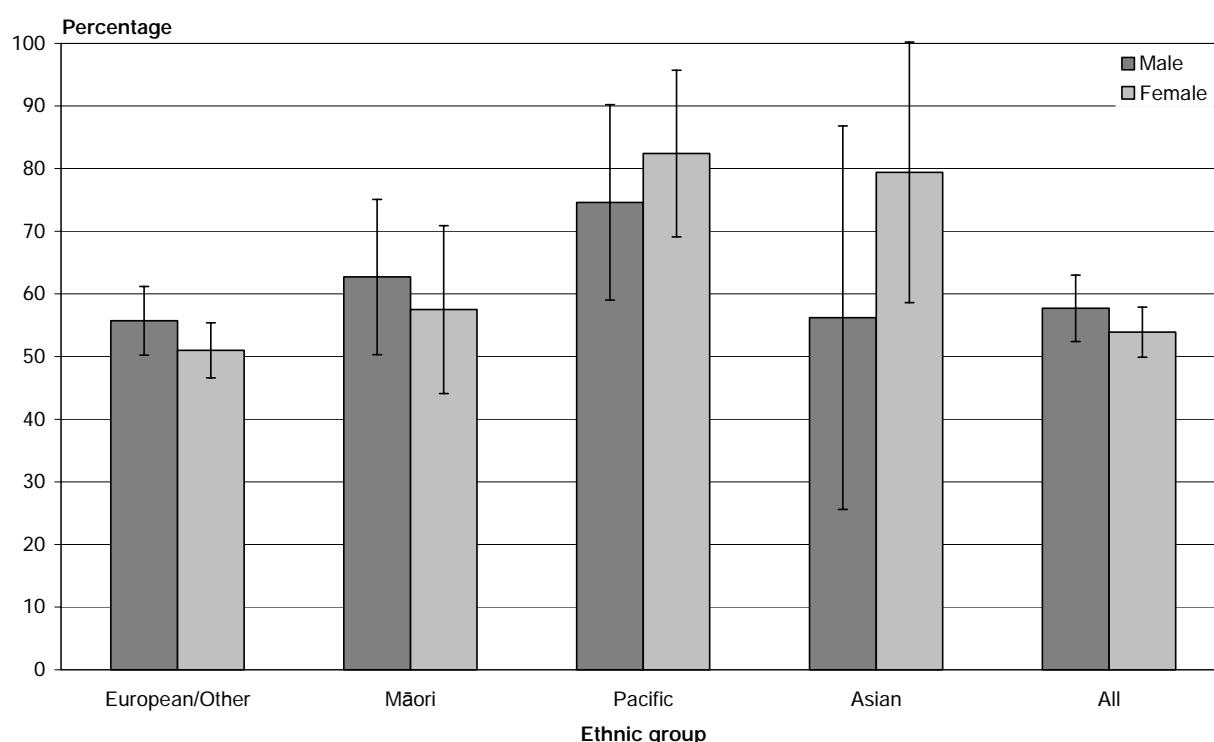


Medical treatment

Among adults diagnosed with arthritis, there was no significant difference in the proportion of males (57.7%; 52.3–63.0) and females (53.9%; 49.9–57.9) receiving medical treatment (ie, medicines, tablets or pills, steroid injections, surgery).

Pacific males were more likely to receive medical treatment for arthritis than males in other ethnic groups, although these ethnic differences were not significant (Figure 24). Pacific and Asian females were significantly more likely to receive medical treatment for arthritis than European/Other females.

Figure 24: Medical treatment for arthritis in adults, by ethnic group and sex (age-standardised)



Spinal disorders

Introduction

Spinal disorders include disorders of the back or neck (eg, lumbago, sciatica, chronic back or neck pain, and vertebrae or disc problems). Spinal disorders are usually caused by injury, overuse, muscle disorders, pressure on a nerve or poor posture. Many people will experience spinal disorders at some time, but fewer experience symptoms for six months or more. Chronic spinal disorders are painful and can be debilitating.

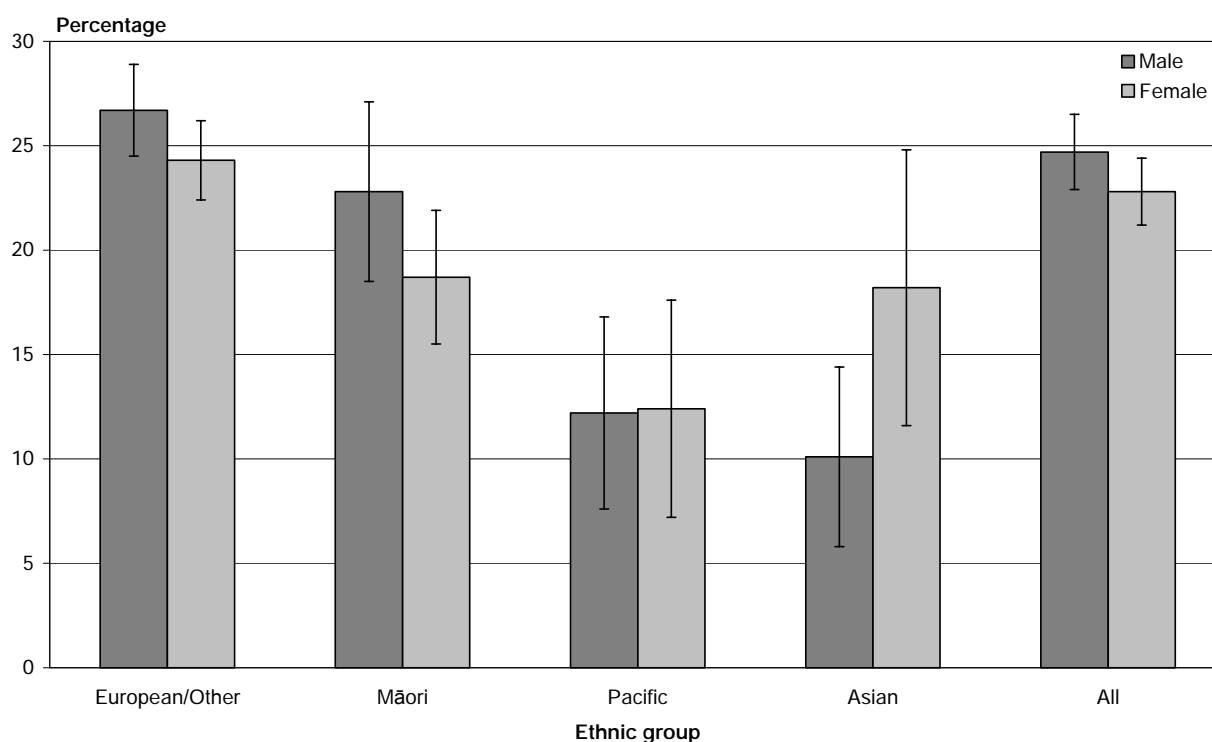
Prevalence

Overall, one in four adults (24.9%; 23.8–26.1) had been diagnosed with a chronic disorder of the back or neck.

There was no significant difference in the prevalence of spinal disorders between males (24.7%; 22.9–26.5) and females (22.8%; 21.2–24.4).

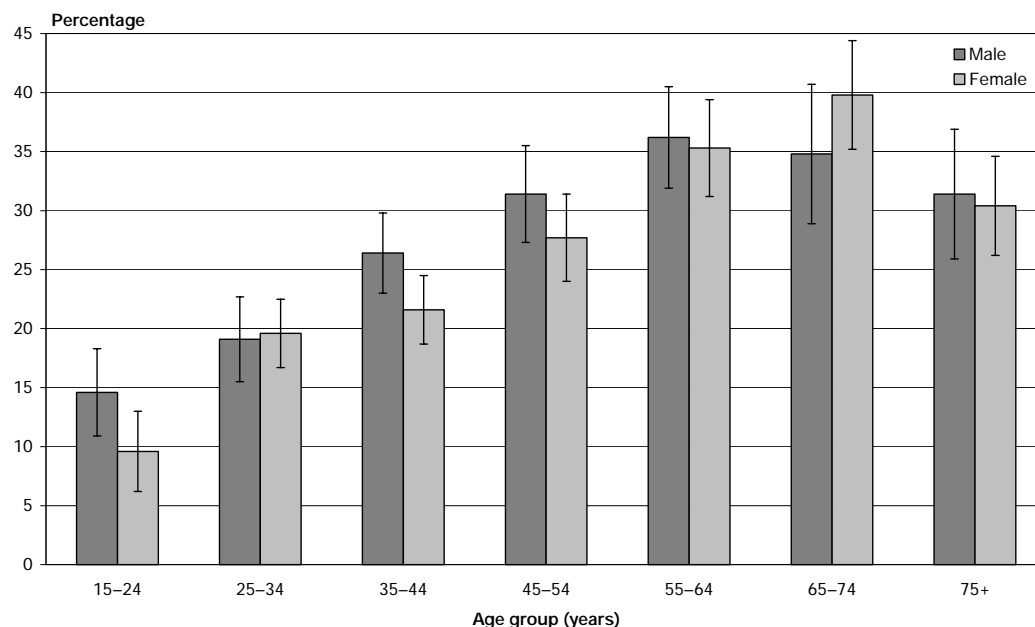
In males, the prevalence of spinal disorders was significantly higher in the European/Other and Māori ethnic groups than in Pacific and Asian ethnic groups (Figure 25). In females, the prevalence of spinal disorders was significantly higher in the European/Other ethnic group than in Māori and Pacific ethnic groups.

Figure 25: Spinal disorders in adults, by ethnic group and sex (age-standardised)



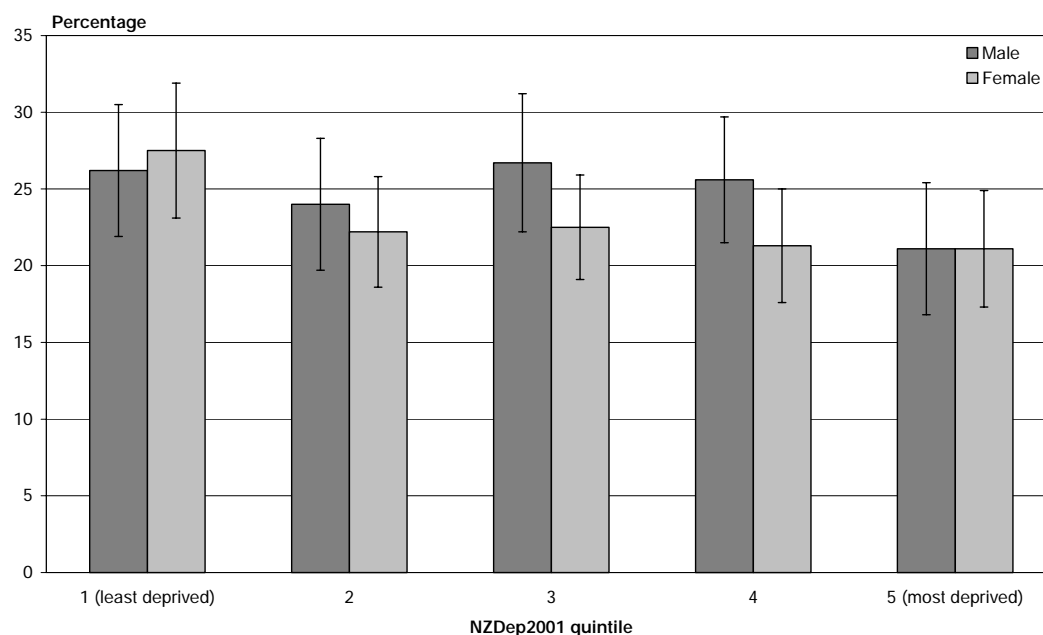
In males, the prevalence of spinal disorders increased with age until the 55–64 years age group and then declined slightly in the two oldest age groups (Figure 26). In females, the prevalence of spinal disorders increased with age until the 65–74 years age group and then declined slightly in the oldest age group.

Figure 26: Spinal disorders in adults, by age group and sex



In both males and females, the prevalence of spinal disorders was slightly higher in NZDep2001 quintile 1 (least deprived) than in quintile 5 (most deprived), but these differences were not significant (Figure 27).

Figure 27: Spinal disorders in adults, by NZDep2001 quintile and sex (age-standardised)



Osteoporosis

Introduction

Osteoporosis is the thinning of bones resulting in a loss of bone density. It occurs when not enough new bone is formed, too much bone is reabsorbed, or both. Osteoporosis causes bones to become brittle and fragile, which can lead to fractures even in the absence of trauma. Most people will not know they have osteoporosis until they break a bone. The most common fracture sites are the wrist, spine and hip. Osteoporosis usually develops slowly and is most common in older people.

Women are particularly prone to osteoporosis as the drop in oestrogen that occurs at menopause results in accelerated bone loss. Other risk factors for osteoporosis include ethnicity, family history, tobacco smoking, eating disorders, low body weight, low calcium intake, heavy alcohol consumption and physical inactivity.

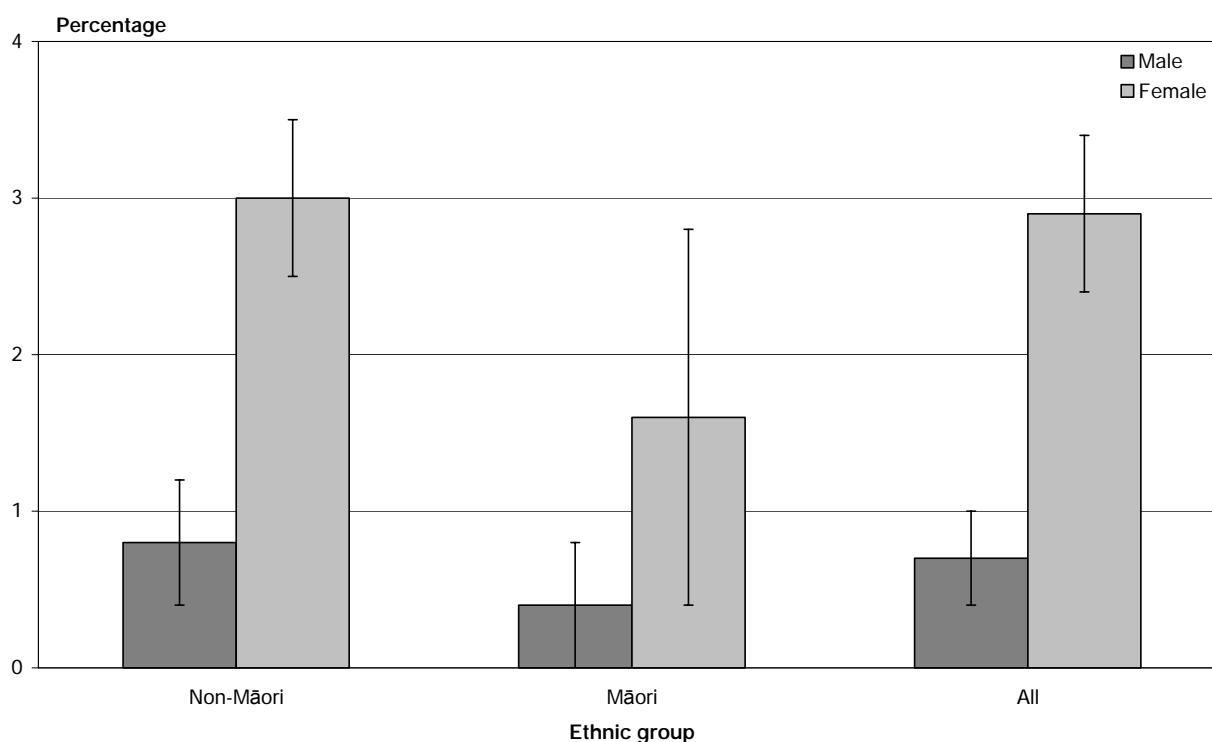
Prevalence

Overall, one in 42 adults (2.4%; 2.1–2.7) had been diagnosed with osteoporosis.

The prevalence of osteoporosis was significantly higher in females (2.9%; 2.4–3.4) than in males (0.7%; 0.4–1.1).

In both males and females, the prevalence of osteoporosis was twice as high in non-Māori as in Māori, although these differences were not significant (Figure 28).

Figure 28: Osteoporosis in adults, by ethnic group and sex (age-standardised)



In males, it was not possible to examine differences in the prevalence of osteoporosis across age groups due to low numbers. In females, osteoporosis first appeared in the 35–44 years age group (0.6%; 0.1–1.1) and the prevalence increased with age, peaking in the 75+ years age group (18.1%; 14.2–21.9).

In males, it was not possible to examine differences in the prevalence of osteoporosis across NZDep2001 quintiles due to low numbers. In females, there was no significant difference in the prevalence of osteoporosis between NZDep2001 quintile 1 (2.6%; 1.6–3.5) and quintile 5 (2.5%; 1.1–3.9).

Medical treatment

Among adults diagnosed with osteoporosis, there was no significant difference in the proportion of males (57.6%; 39.5–75.6) and females (64.5%; 55.2–73.8) who received medical treatment.

In males, it was not possible to examine ethnic differences in the proportion receiving medical treatment for osteoporosis due to low numbers. In females, non-Māori (66.6%; 58.5–74.7) were more likely than Māori (33.5%; 0.0–70.5) to receive medical treatment for osteoporosis, although this difference was not significant.

Cancer

Introduction

Cancer involves the uncontrolled growth of cells, which can prevent the normal function of vital organs. There are at least 200 different kinds of cancer and they can develop in almost any organ or tissue. Cancer is an important cause of morbidity and mortality in New Zealand. Collectively, cancers account for about a quarter of deaths, with the major sites being lung, colon, breast and prostate.

The following results are for all cancers except non-melanoma skin cancer, not differentiated by site.

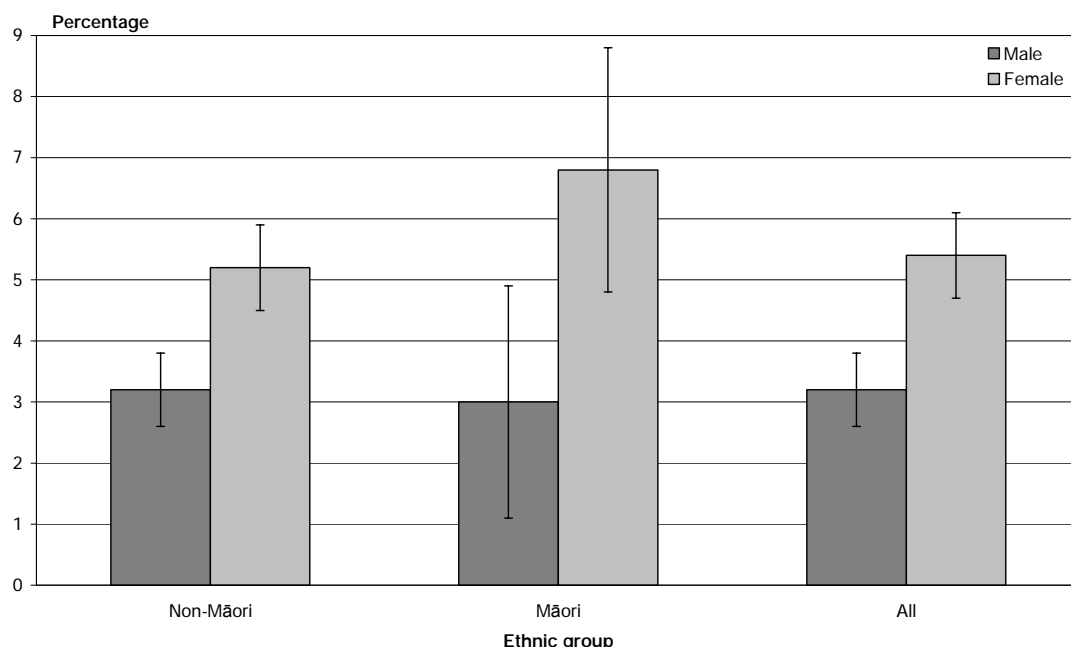
Prevalence

Overall, one in 20 adults (5.0%; 4.6–5.5) had ever been diagnosed with cancer.

Females (5.4%; 4.6–6.1) were significantly more likely than males (3.2%; 2.6–3.7) to have been diagnosed with cancer.

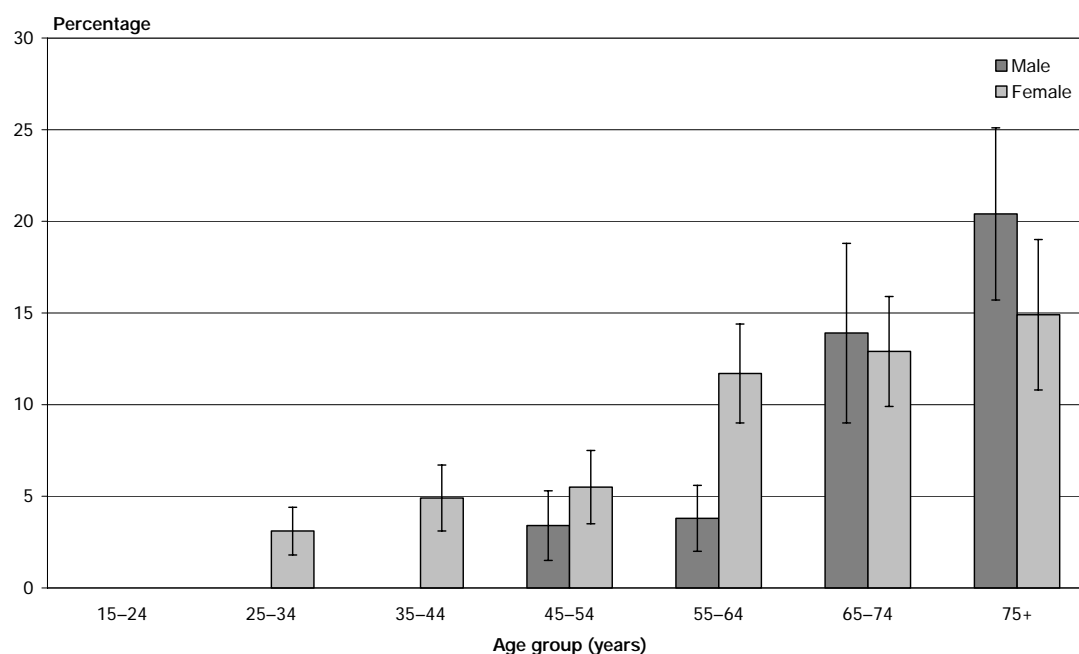
In males, the prevalence of a cancer diagnosis at any time was similar in non-Māori and Māori (Figure 29). In females, the prevalence of cancer was slightly higher in Māori than in non-Māori, although this difference was not significant.

Figure 29: Cancer in adults, by ethnic group and sex (age-standardised)



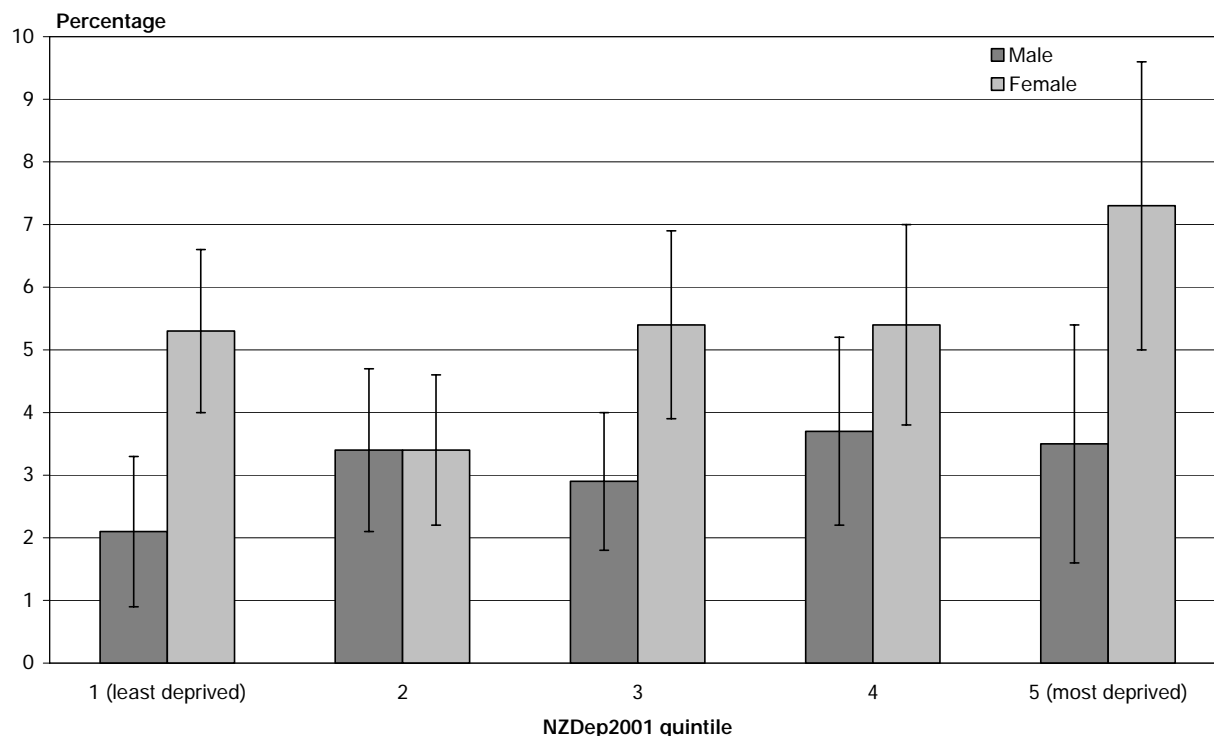
In both males and females, the prevalence of a cancer diagnosis at any time increased with age, peaking in the 75+ years age group (Figure 30).

Figure 30: Cancer in adults, by age group and sex



In both males and females, the prevalence of a cancer diagnosis at any time was slightly lower in NZDep2001 quintile 1 (least deprived) than in quintile 5 (most deprived), although these differences were not significant (Figure 31).

Figure 31: Cancer in adults, by NZDep2001 quintile and sex (age-standardised)



Serious mental disorders

Introduction

Serious mental disorders include depressive disorder, bipolar disorder and schizophrenia. Depressive disorders affect the way a person feels about themselves and how they think about things, and is associated with feelings of sadness, hopelessness and helplessness. Bipolar disorder (manic depression) is characterised by periods of excitability (mania) alternating with periods of depression, often with abrupt changes between the two moods. Schizophrenia is a serious disorder of thinking and feeling, typically including auditory hallucinations.

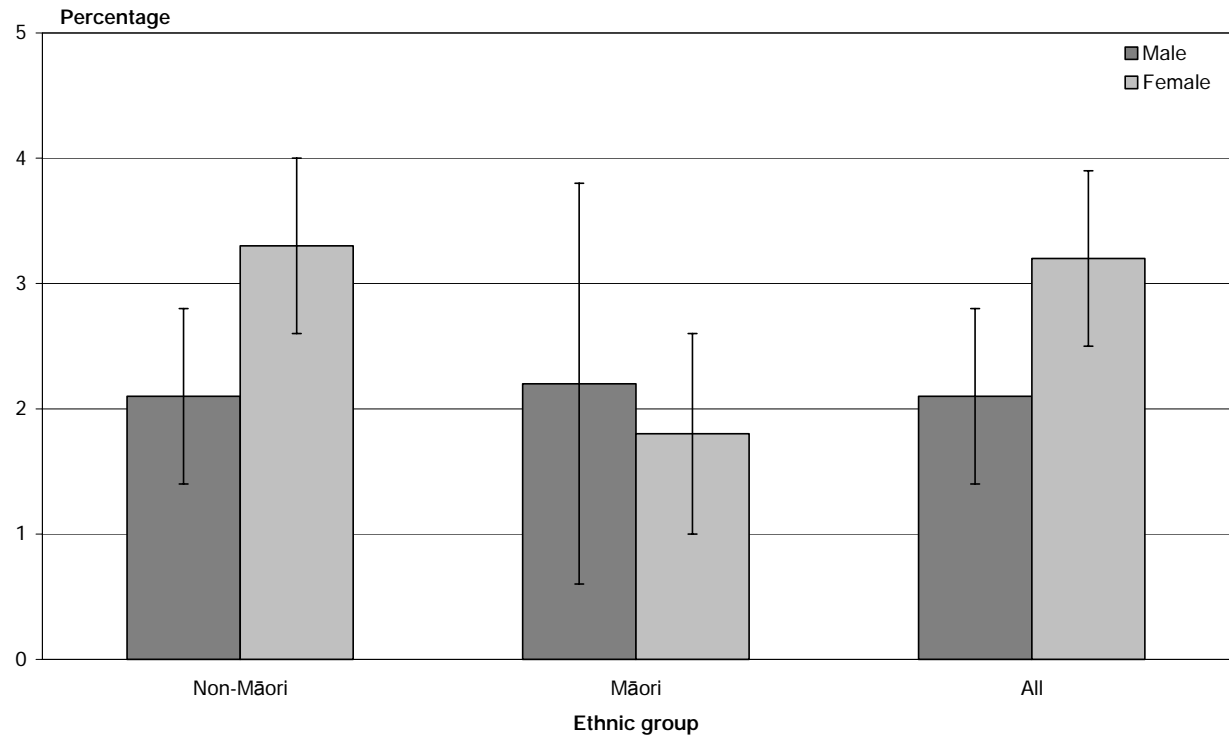
Prevalence

Overall, one in 40 adults (2.5%; 2.1–2.9) had ever been diagnosed with a serious mental disorder (ie, depressive disorder, bipolar disorder or schizophrenia). Depressive disorders were most common (1.9%; 1.6–2.2), followed by bipolar disorder (0.5%; 0.3–0.7) and schizophrenia (0.2%; 0.1–0.4).

There was no significant difference in the prevalence of serious mental disorders between males (2.1%; 1.4–2.8) and females (3.2%; 2.5–3.8).

In males, there was no significant difference in the prevalence of serious mental disorders (ie, a diagnosis of serious mental disorder at any time) between Māori and non-Māori (Figure 32). In females, non-Māori were nearly twice as likely as Māori to have been diagnosed with a serious mental disorder, although this difference was not significant.

Figure 32: Serious mental disorders in adults, by ethnic group and sex (age-standardised)



Migraine

Introduction

Migraine headaches occur repeatedly in some people. They are different from other headaches because they typically occur with nausea, vomiting or sensitivity to light.

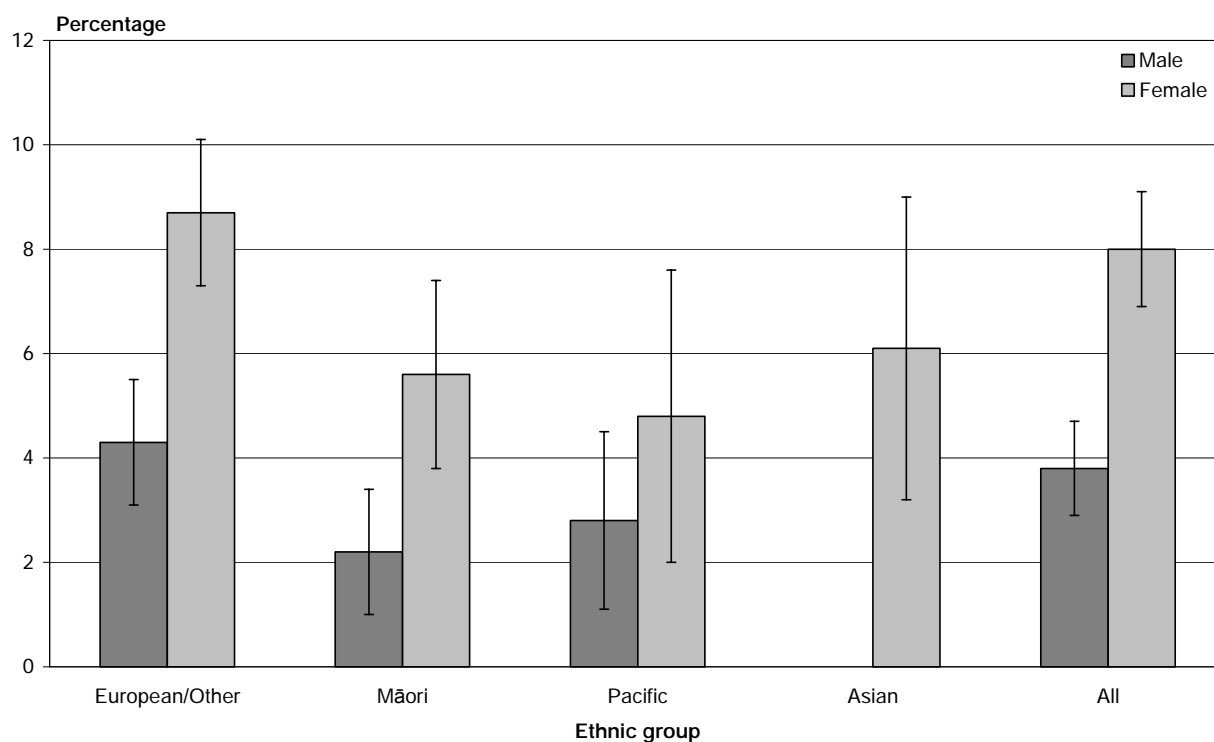
Prevalence

Overall, one in 17 adults (5.8%; 5.2–6.5) had been diagnosed with migraine headaches.

Females (8.0%; 6.8–9.1) were significantly more likely than males (3.8%; 2.9–4.8) to have been diagnosed with migraine headaches.

In both males and females, there were no significant differences in the prevalence of migraines between ethnic groups (Figure 33).

Figure 33: Migraine in adults, by ethnic group and sex (age-standardised)



Note: Data are not shown for Asian males due to low numbers.

Summary tables

Table 6 (male) and Table 7 (female) summarise the crude prevalence of selected chronic diseases by ethnic group. Use these crude estimates if you want to know the actual burden experienced by the population of interest, but do not use them to compare one population subgroup (sex or ethnicity) with another.

Table 6: Prevalence (percent) of chronic diseases, by ethnic group, males (crude)

	European/ Other	Māori	Pacific	Asian	All
Heart disease	11.7 (10.6–12.8)	10.8 (7.1–14.4)	4.3 (1.8–6.9)	5.0 (1.0–9.0)	10.9 (9.9–11.9)
Stroke	2.6 (2.0–3.2)	2.1 (0.5–3.7)	–	–	2.3 (1.8–2.9)
Diabetes	4.3 (3.4–5.2)	7.3 (4.7–9.9)	4.0 (2.2–5.8)	6.7 (3.0–10.5)	4.7 (3.9–5.5)
Asthma (15–44 years)	19.5 (15.9–23.1)	21.9 (16.1–27.8)	9.5 (4.0–15.0)	6.1 (2.7–9.4)	18.3 (15.5–21.1)
COPD (≥ 45 years)	4.9 (3.5–6.3)	5.9 (1.2–10.6)	–	–	4.9 (3.6–6.2)
Arthritis	14.6 (13.4–15.8)	12.4 (9.3–15.5)	9.5 (6.5–12.6)	9.7 (5.1–14.2)	13.9 (12.9–14.8)
Osteoarthritis	6.8 (6.0–7.7)	4.1 (1.9–6.3)	–	–	6.0 (5.2–6.7)
Rheumatoid arthritis	2.6 (1.9–3.3)	2.5 (1.1–4.0)	–	–	2.6 (2.0–3.2)
Spinal disorders	28.6 (26.6–30.6)	21.9 (17.6–26.2)	8.2 (4.5–11.8)	10.7 (5.9–15.5)	26.0 (24.3–27.6)
Osteoporosis	0.9 (0.5–1.3)	0.3 (0.0–0.6)	–	–	0.8 (0.5–1.1)
Cancer	4.4 (3.7–5.1)	2.0 (0.7–3.3)	–	–	3.8 (3.2–4.4)
Migraine	4.2 (3.1–5.2)	2.3 (1.0–3.7)	2.8 (1.0–4.7)	–	3.8 (2.9–4.6)
Serious mental disorders	2.2 (1.5–2.9)	2.3 (0.7–4.0)	–	–	2.0 (1.4–2.6)

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Table 7: Prevalence (percent) of chronic diseases, by ethnic group, females (crude)

	European/ Other	Māori	Pacific	Asian	All
Heart disease	11.0 (9.9–12.0)	7.8 (6.3–9.4)	6.2 (2.8–9.6)	2.6 (0.5–4.7)	9.9 (9.0–10.8)
Stroke	2.0 (1.5–2.5)	2.1 (1.0–3.2)	–	–	1.9 (1.5–2.3)
Diabetes	3.2 (2.5–3.8)	5.2 (3.5–6.8)	9.4 (2.1–8.2)	5.2 (6.2–12.7)	3.8 (3.2–4.4)
Asthma (15–44 years)	24.5 (22.2–26.8)	27.1 (22.6–31.6)	10.9 (6.4–15.4)	8.6 (5.9–11.4)	22.8 (21.0–24.7)
COPD (≥ 45 years)	6.1 (5.0–7.3)	5.6 (2.9–8.2)	–	–	6.0 (5.0–7.1)
Arthritis	19.7 (18.5–20.9)	10.4 (7.9–12.9)	9.6 (5.5–13.7)	4.9 (2.2–7.6)	17.3 (16.3–18.4)
Osteoarthritis	11.1 (10.0–12.2)	4.1 (2.5–5.7)	3.7 (0.9–6.5)	1.7 (0.0–3.5)	9.4 (8.5–10.3)
Rheumatoid arthritis	3.9 (3.3–4.5)	3.9 (2.1–5.7)	3.8 (1.2–6.5)	–	3.7 (3.2–4.2)
Spinal disorders	26.6 (24.9–28.4)	16.8 (13.7–19.9)	10.8 (6.0–15.5)	13.6 (9.0–18.3)	24.0 (22.5–25.5)
Osteoporosis	4.6 (3.9–5.3)	1.1 (0.3–2.0)	–	–	3.9 (3.3–4.5)
Cancer	6.7 (5.8–7.5)	6.2 (4.2–8.3)	2.5 (0.9–4.1)	2.2 (0.0–4.3)	6.2 (5.4–6.9)
Migraine	8.5 (7.2–9.8)	5.4 (3.7–7.2)	4.1 (1.8–6.4)	5.9 (3.1–8.8)	7.8 (6.7–8.8)
Serious mental disorders	3.5 (2.8–4.2)	1.9 (1.1–2.8)	1.1 (0.0–2.2)	–	3.0 (2.4–3.6)

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Table 8 (male) and Table 9 (female) summarise the age-standardised prevalence of selected chronic diseases by ethnic group. Note that age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup (sex or ethnicity) with another.

Table 8: Prevalence (percent) of chronic diseases, by ethnic group, males (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Heart disease	9.4 (8.4–10.5)	13.6 (9.6–17.7)	5.9 (2.4–9.5)	8.1 (1.1–15.1)	9.6 (8.5–10.7)
Stroke	2.0 (1.5–2.4)	2.5 (0.9–4.1)	–	–	1.9 (1.5–2.3)
Diabetes	3.4 (2.6–4.2)	9.5 (6.4–12.6)	8.1 (4.6–11.5)	8.1 (3.6–12.5)	4.5 (3.8–5.3)
Asthma (15–44 years)	20.8 (16.7–24.9)	21.6 (15.9–27.3)	9.4 (3.8–15.0)	6.3 (2.9–9.6)	19.6 (16.3–22.9)
COPD (≥ 45 years)	4.6 (3.3–6.0)	6.0 (1.3–10.8)	–	–	4.8 (3.5–6.1)
Arthritis	11.7 (10.7–12.8)	15.6 (12.1–19.2)	14.9 (11.2–18.6)	13.2 (7.1–19.3)	12.4 (11.4–13.3)
Osteoarthritis	5.3 (4.6–6.0)	5.4 (2.5–8.3)	–	–	5.0 (4.4–5.7)
Rheumatoid arthritis	2.2 (1.6–2.9)	2.9 (1.4–4.4)	–	–	2.4 (1.9–3.0)
Spinal disorders	26.7 (24.6–28.9)	22.8 (18.4–27.1)	12.2 (7.6–16.8)	10.1 (5.9–14.4)	24.7 (22.9–26.5)
Osteoporosis	0.8 (0.4–1.2)	0.4 (0.0–0.7)	–	–	0.7 (0.4–1.1)
Cancer	3.4 (2.8–4.0)	3.0 (1.2–4.9)	–	–	3.2 (2.6–3.7)
Migraine	4.3 (3.1–5.5)	2.2 (0.9–3.4)	2.8 (1.1–4.5)	–	3.8 (2.9–4.8)
Serious mental disorders	2.3 (1.5–3.1)	2.2 (0.6–3.7)	–	–	2.1 (1.4–2.8)

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Table 9: Prevalence (percent) of chronic diseases, by ethnic group, females (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Heart disease	8.5 (7.5–9.4)	10.6 (8.5–12.6)	7.9 (3.9–11.9)	4.6 (0.7–8.6)	8.4 (7.5–9.3)
Stroke	1.4 (1.1–1.8)	2.8 (1.5–4.2)	–	–	1.5 (1.2–1.8)
Diabetes	2.4 (1.9–2.9)	6.7 (4.7–8.6)	11.9 (7.7–16.2)	8.7 (3.5–14.0)	3.7 (3.1–4.3)
Asthma (15–44 years)	25.9 (23.3–28.5)	27.2 (22.7–31.6)	10.8 (6.3–15.2)	8.7 (5.9–11.5)	24.3 (22.1–26.4)
COPD (≥ 45 years)	5.9 (4.8–7.1)	6.3 (3.4–9.1)	–	–	6.0 (4.8–7.3)
Arthritis	15.1 (14.0–16.1)	13.8 (10.6–16.9)	12.8 (8.0–17.7)	7.7 (3.2–12.1)	14.4 (13.4–15.4)
Osteoarthritis	8.0 (7.1–8.8)	5.5 (3.5–7.5)	5.1 (1.2–9.0)	2.0 (0.1–4.0)	7.2 (6.4–8.0)
Rheumatoid arthritis	3.1 (2.6–3.6)	4.7 (2.7–6.7)	4.6 (1.7–7.4)	–	3.2 (2.8–3.7)
Spinal disorders	24.3 (22.5–26.2)	18.7 (15.6–21.9)	12.4 (7.2–17.6)	18.2 (11.6–24.7)	22.8 (21.2–24.4)
Osteoporosis	3.2 (2.7–3.7)	1.6 (0.4–2.9)	–	–	2.9 (2.4–3.4)
Cancer	5.5 (4.7–6.2)	6.8 (4.8–8.8)	3.0 (1.1–4.9)	3.1 (0.0–6.7)	5.4 (4.6–6.1)
Migraine	8.7 (7.2–10.1)	5.6 (3.8–7.4)	4.8 (2.0–7.6)	6.1 (3.2–9.0)	8.0 (6.8–9.1)
Serious mental disorders	3.7 (2.8–4.5)	1.8 (1.0–2.7)	1.1 (0.1–2.0)	–	3.2 (2.5–3.8)

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Chapter 3: Risk and Protective Factors

Introduction

Risk and protective factors are biological factors (eg, blood pressure) or behavioural factors (eg, physical activity) that are causally associated with health outcomes. The relevance of each risk or protective factor to health is summarised at the beginning of each section.

The accurate and objective measurement of biological risk factors is difficult and generally involves physical measurements, which are beyond the scope of this survey (except body weight, height and waist circumference). Similarly, for behavioural factors, observation of behaviour is difficult. Instead, this survey uses a series of questions to determine the prevalence of self-reported risk and protective factors in adults. This approach tends to either underestimate or overestimate the true prevalence of these risk or protective factors, with the direction of the bias related to whether the behaviour is harmful or beneficial to health. In general, when asked about behaviours that are harmful to health (eg, smoking) people tend to underestimate their exposure. In contrast, when asked about behaviours that are beneficial to health (eg, physical activity) people tend to overestimate their participation.

All results are presented by sex and ethnic group. The following ethnic groups are used: European/Other, Māori, Pacific and Asian. Selected results are also presented by sex and 10-year age group, and by sex and NZDep2001 quintile. Additional results are included in datacubes.

Ninety-five percent confidence intervals are presented for all descriptive results, following the estimate in the text or the summary tables at the end of the chapter, or as error bars in graphs. When a difference between population subgroups is referred to as significant, it means the difference is statistically significant at the 95 percent confidence level (ie, the 95 percent confidence intervals do not overlap).

All results presented by sex, ethnicity and NZDep2001 in the body of this report have been age-standardised by the direct method using the WHO World Population as the standard population. This is to allow comparisons between population subgroups without differences in the age distribution of the comparison populations influencing results. However, age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup with another.

If you want to know the actual burden experienced by the population of interest (eg, the prevalence of obesity in females), use the crude (unadjusted) estimates shown in the summary tables at the end of this chapter or in the datacubes.

Results

Key points

- One in five adults had been told by a doctor they have high blood pressure; of these, two-thirds were taking pills for high blood pressure.
- One in six adults had been told by a doctor they have high cholesterol; of these, four out of 10 were taking pills for high cholesterol.
- Two out of three adults ate the recommended three or more servings of vegetables each day.
- Just over half of adults ate the recommended two or more servings of fruit each day.
- Females were significantly more likely than males to eat the recommended number of servings of vegetables and fruit each day.
- Three out of four adults did at least 2.5 hours of physical activity in the last week.
- Males were significantly more likely than females to be physically active.
- One in eight adults did less than 30 minutes of physical activity in the last week.
- One in three adults was overweight (excludes obese).
- One in five adults was obese.
- Adults living in NZDep2001 quintile 5 (most deprived) were twice as likely as adults living in quintile 1 (least deprived) to be obese.
- Over half of all adults had gained 10 kg or more since age 18 years.
- Eight out of 10 adults had had a drink containing alcohol in the last year.
- One in six adults who had consumed alcohol in the last year had a potentially hazardous drinking pattern.
- Male drinkers were more than twice as likely as female drinkers to have a potentially hazardous drinking pattern.
- About one in four adults was a current smoker.
- Adults living in NZDep2001 quintile 5 (most deprived) were twice as likely as adults living in quintile 1 (least deprived) to be current smokers.
- One in 15 adult non-smokers was exposed to cigarette smoke inside their home.
- One in seven adults had smoked marijuana in the last year and one in 19 adults smoked marijuana regularly (ie, daily, weekly or fortnightly).

High blood pressure

Introduction

High blood pressure (hypertension) is an important risk factor for cardiovascular disease, particularly stroke. Modifiable determinants of blood pressure include diet, body weight and physical activity.

The best way to determine the true prevalence of high blood pressure in the community is to take blood pressure measurements, but this was beyond the scope of this survey. Instead, participants were asked if they had ever been told by a doctor they have high blood pressure (other than during pregnancy) and whether they currently took or had ever taken medication for this condition. This will underestimate the true prevalence of high blood pressure, as not all people with high blood pressure will have been diagnosed.

Prevalence of high blood pressure

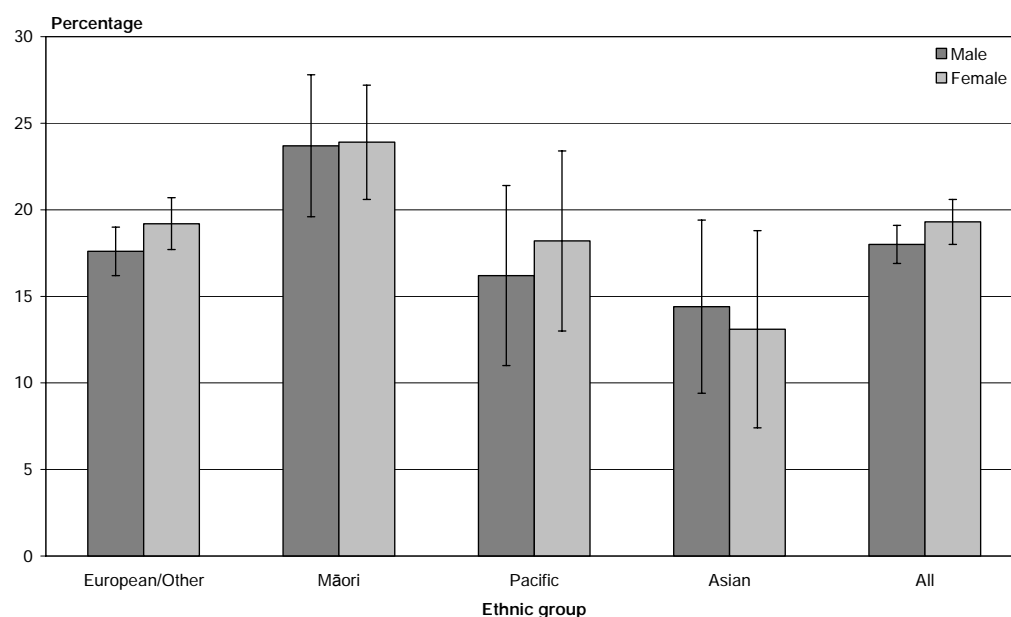
Overall, one in five adults (20.8%; 20.0–21.6) had been told by a doctor they have high blood pressure.

There was no significant difference in the prevalence of identified high blood pressure in males (18.0%; 16.9–19.1) and females (19.3%; 18.0–20.5).

Of adults with identified high blood pressure, two-thirds (65.2%; 62.5–67.8) had ever taken pills regularly for high blood pressure and about six out of 10 (58.5%; 55.7–61.3) currently took pills regularly for high blood pressure.

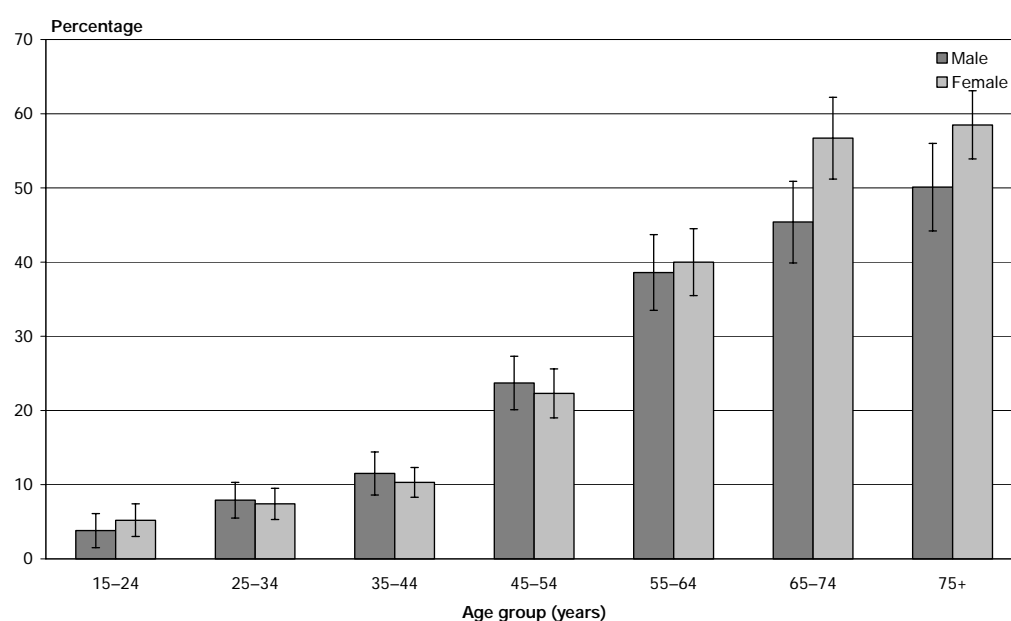
In both males and females, the prevalence of identified high blood pressure was highest in Māori, followed by European/Other, Pacific and Asian ethnic groups, although most ethnic differences were not significant (Figure 34). Note that these ethnic differences may reflect differences in the proportion of adults that have been diagnosed, rather than differences in the true prevalence of high blood pressure.

Figure 34: Identified high blood pressure in adults, by ethnic group and sex (age-standardised)



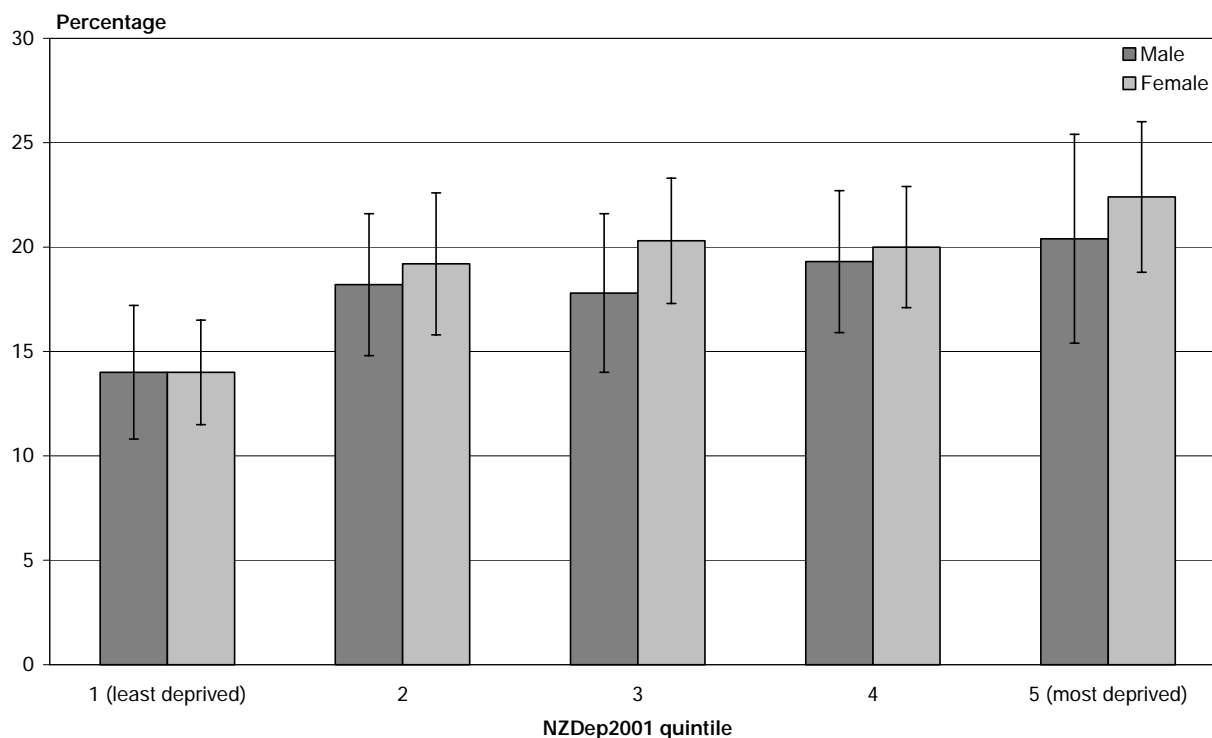
In both males and females, the prevalence of identified high blood pressure increased with age, peaking in the 75+ years age group (Figure 35).

Figure 35: Identified high blood pressure in adults, by age group and sex



In both males and females, the prevalence of identified high blood pressure was lower in NZDep2001 quintile 1 (least deprived) than quintile 5 (most deprived), although this difference was not significant for males (Figure 36).

Figure 36: Identified high blood pressure in adults, by NZDep2001 quintile and sex (age-standardised)



High cholesterol

Introduction

High blood cholesterol is an important risk factor for cardiovascular disease, particularly ischaemic heart disease (IHD). Modifiable determinants of blood cholesterol include diet, body weight and physical activity. Dietary fats are the most important modifiable determinant of blood cholesterol.

The best way to determine the true prevalence of high cholesterol in the community is to take blood samples and measure cholesterol (and other blood lipid and lipoprotein) levels, but this was beyond the scope of this survey. Instead, participants were asked if they had ever been told by a doctor that they have high cholesterol and whether they currently took or had ever taken medication for this condition. This will underestimate the true prevalence of high cholesterol, as not all people with high cholesterol will have been diagnosed.

Prevalence of high cholesterol

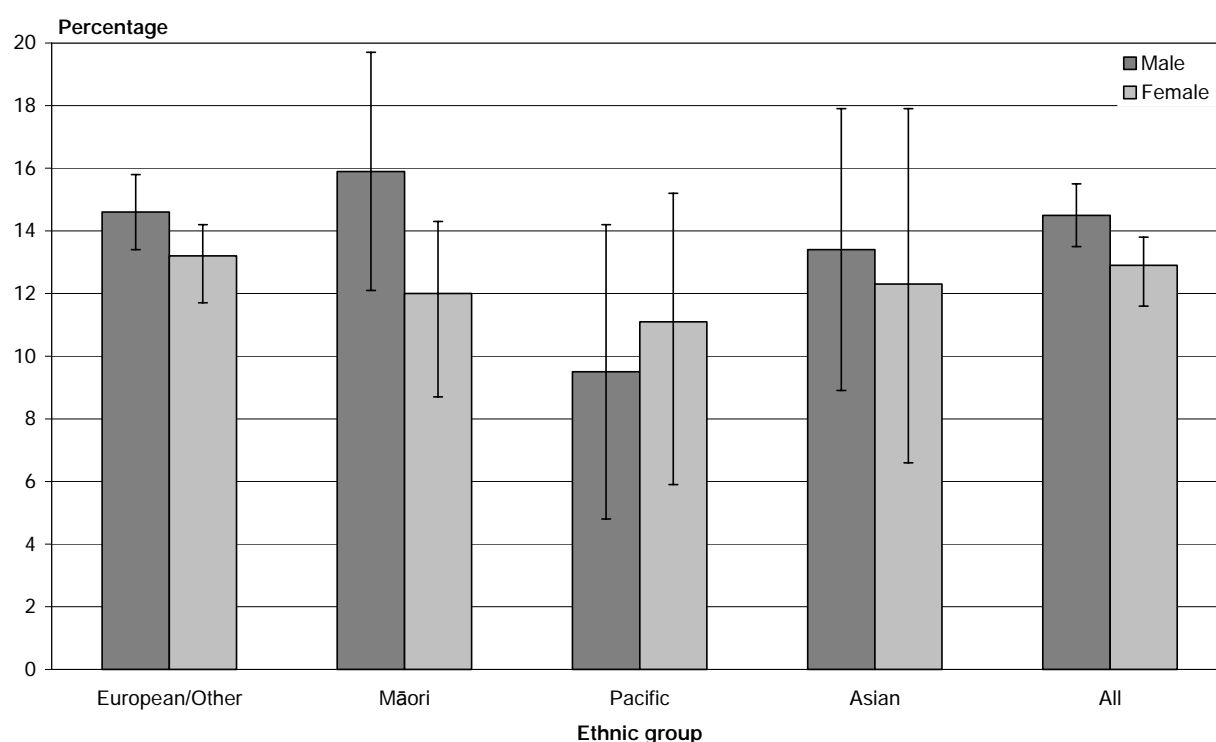
Overall, one in six adults (15.5%; 14.7–16.2) had ever been told by a doctor they have high cholesterol.

There was no significant difference in the prevalence of identified high cholesterol in males (14.5%; 13.4–15.5) and females (12.9%; 12.0–13.8).

Of adults with identified high cholesterol, almost half (46.1%; 43.3–48.8) had ever taken pills regularly for high cholesterol and about four out of 10 (41.2%; 38.2–44.2) currently took pills regularly for high cholesterol.

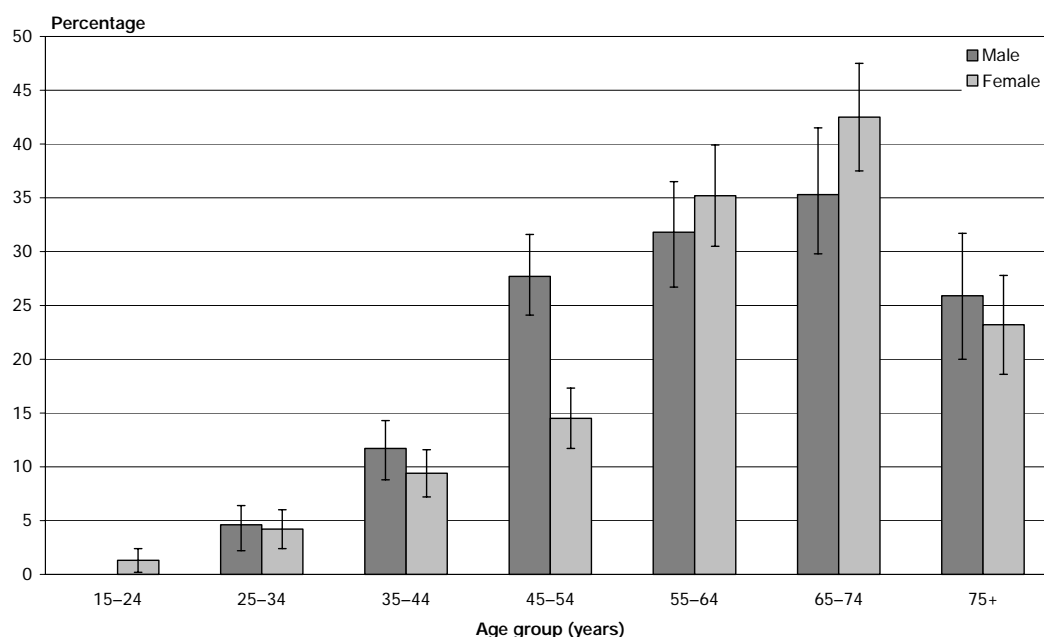
In both males and females, there were no significant differences between ethnic groups in the prevalence of identified high cholesterol (Figure 37). Note that any ethnic differences may reflect differences in the proportion of adults who have been diagnosed, rather than differences in the true prevalence of high cholesterol.

Figure 37: Identified high cholesterol in adults, by ethnic group and sex (age-standardised)



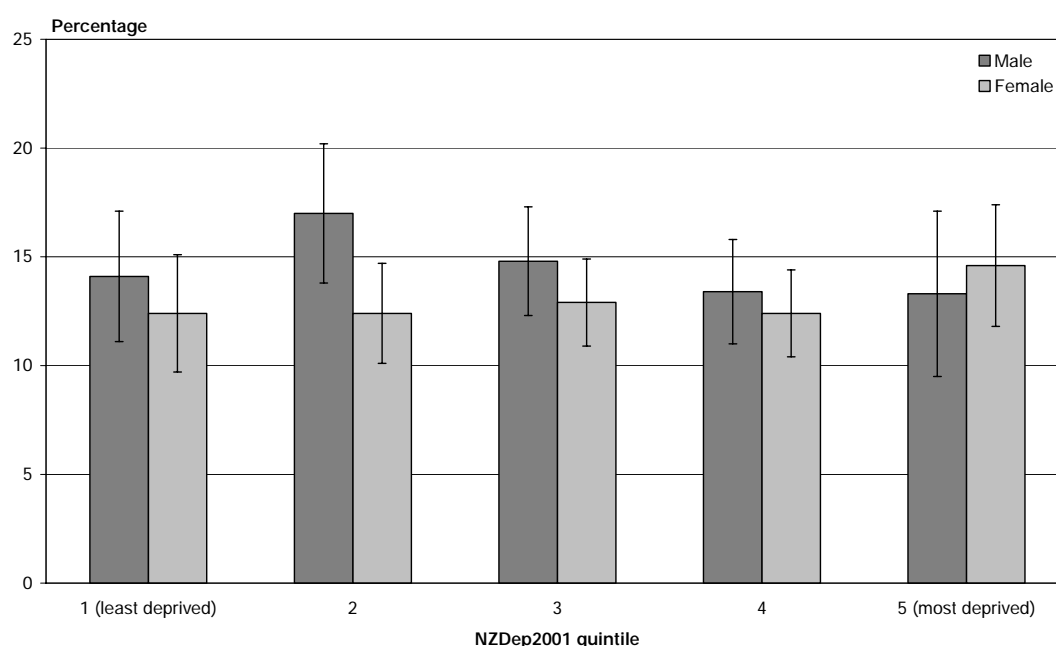
In both males and females, the prevalence of identified high cholesterol increased with age until the 65–74 years age group, and then declined in the 75+ years age group (Figure 38).

Figure 38: Identified high cholesterol in adults, by age group and sex



In both males and females, there was no significant difference in the prevalence of identified high cholesterol between NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived) (Figure 39).

Figure 39: Identified high cholesterol in adults, by NZDep2001 quintile and sex (age-standardised)



Vegetable and fruit intake

Introduction

Vegetables and fruit are highly nutritious and have been shown to protect against a range of chronic diseases, including heart disease, stroke and many cancers. In New Zealand, it is recommended that adults eat at least three servings of vegetables and at least two servings of fruit each day (Ministry of Health 2003).

In this survey, vegetable and fruit intake was measured by asking participants how many servings of vegetables they eat each day on average and how many servings of fruit they eat each day on average. Participants were provided with information on serving size and the range and type of vegetables and fruit to include (photographs of vegetables and fruit were not included).

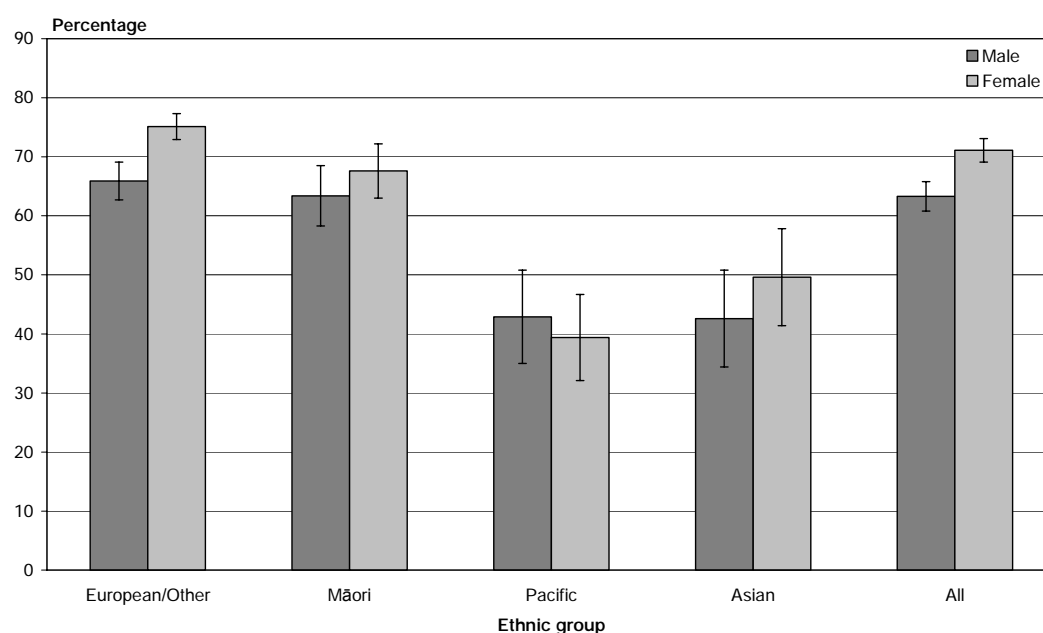
Prevalence of adequate vegetable intake

Overall, two-thirds of adults (68.6%; 67.0–70.1) ate the recommended three or more servings of vegetables each day.

Females (71.1%; 69.1–73.1) were significantly more likely than males (63.3%; 60.8–65.8) to meet the recommendation for vegetable intake.

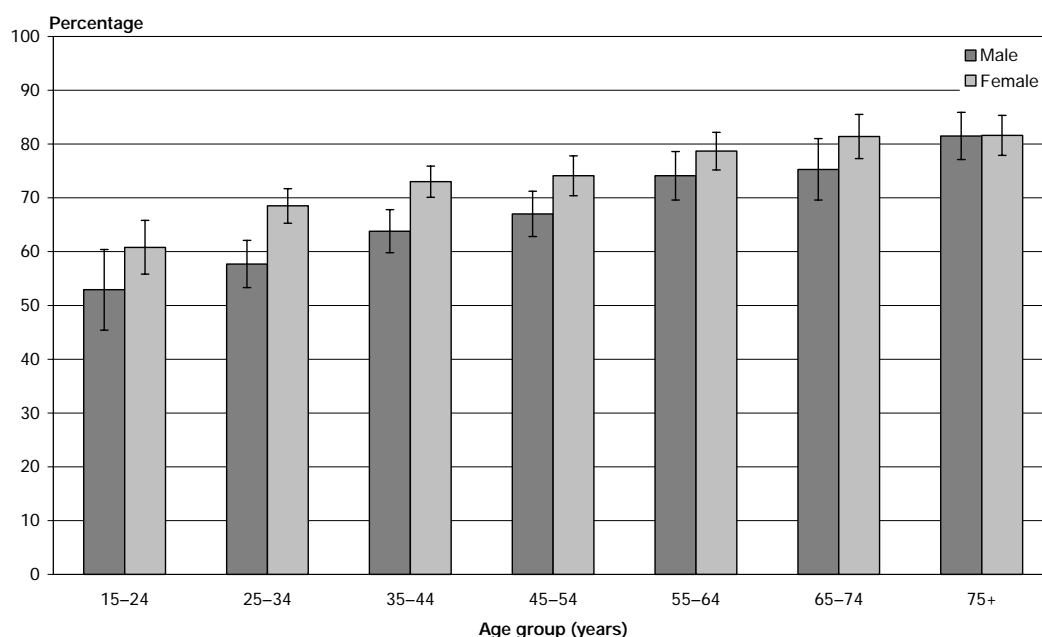
In males, European/Other and Māori ethnic groups were significantly more likely than Pacific and Asian ethnic groups to eat three or more servings of vegetables each day (Figure 40). In females, European/Other were significantly more likely than all other ethnic groups, and Māori were significantly more likely than Pacific and Asian ethnic groups, to eat three or more servings of vegetables each day.

Figure 40: Vegetable intake (three or more servings per day) in adults, by ethnic group and sex (age-standardised)



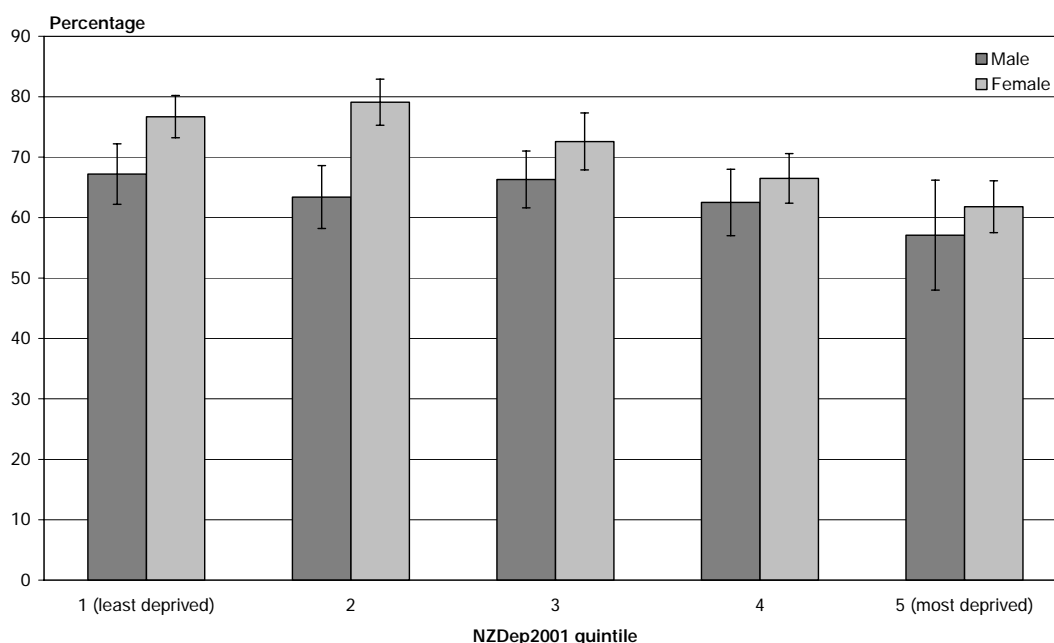
In both males and females, the proportion of adults eating three or more servings of vegetables each day increased with age (Figure 41).

Figure 41: Vegetable intake (three or more servings per day) in adults, by age group and sex



In both males and females, the proportion of adults eating three or more servings of vegetables each day was higher in NZDep2001 quintile 1 (least deprived) than in quintile 5 (most deprived), although the difference was significant only for females (Figure 42).

Figure 42: Vegetable intake (three or more servings per day) in adults, by NZDep2001 quintile and sex (age-standardised)



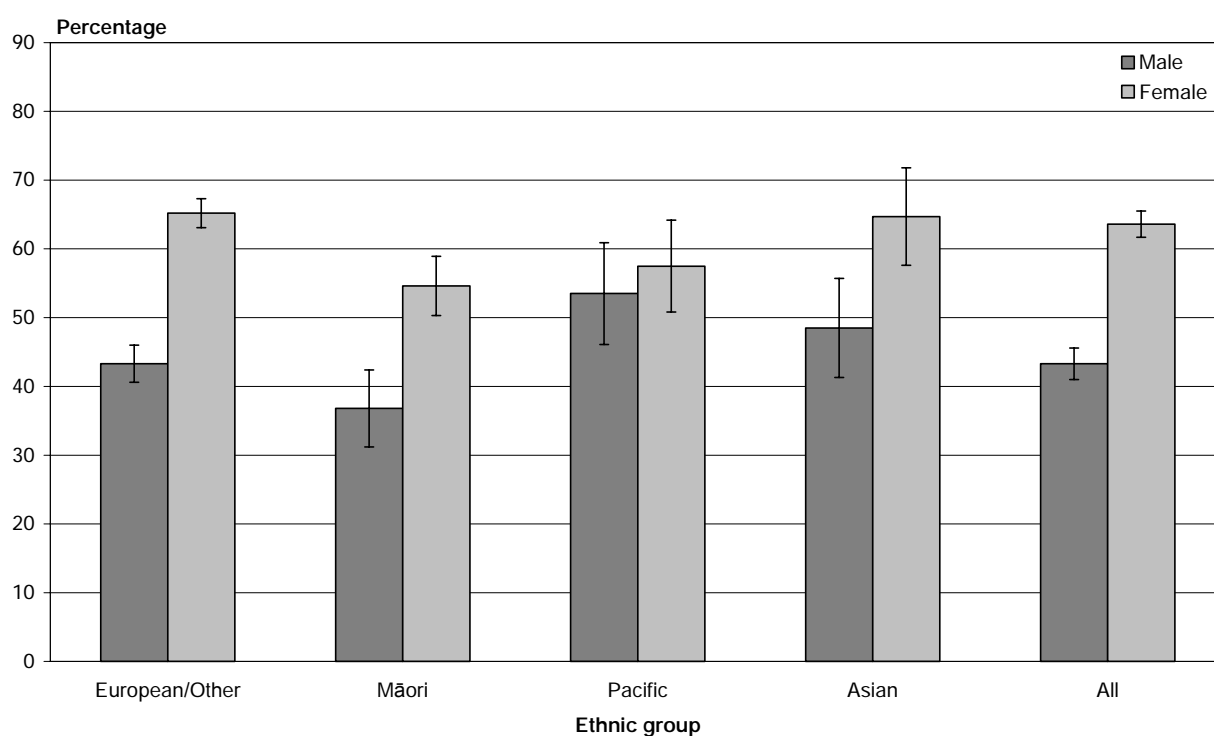
Prevalence of adequate fruit intake

Overall, just over half of adults (54.6%; 53.3–55.9) ate the recommended two or more servings of fruit each day.

Females (63.6%; 61.8–65.5) were significantly more likely than males (43.3%; 41.1–45.6) to meet the recommendation for fruit intake.

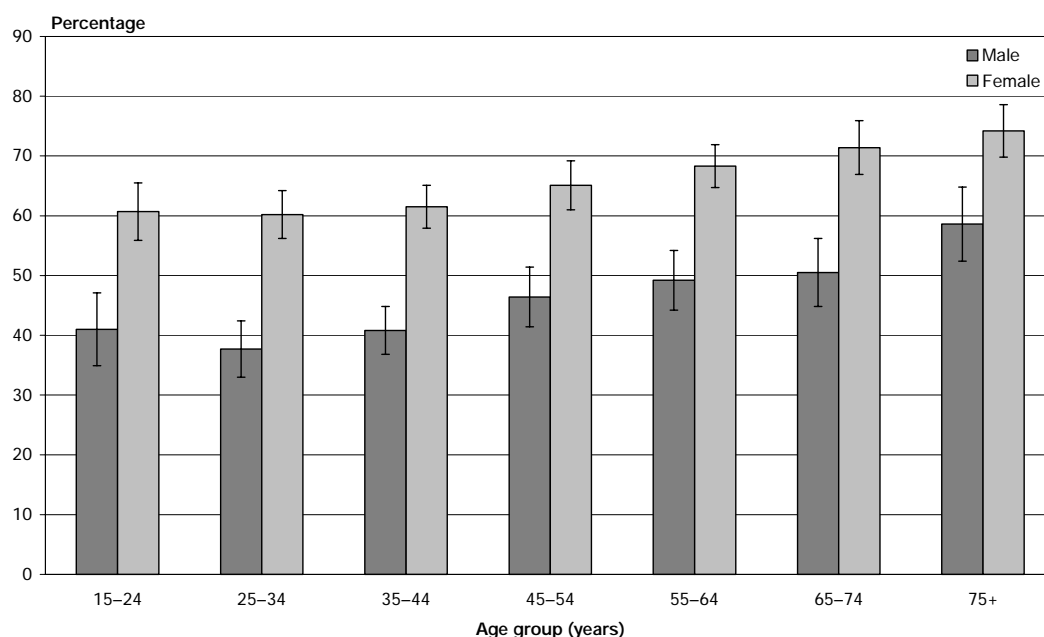
Pacific males were significantly more likely than European/Other and Māori males to eat two or more servings of fruit each day (Figure 43). European/Other females were significantly more likely than Māori females to eat two or more servings of fruit each day.

Figure 43: Fruit intake (two or more servings per day) in adults, by ethnic group and sex (age-standardised)



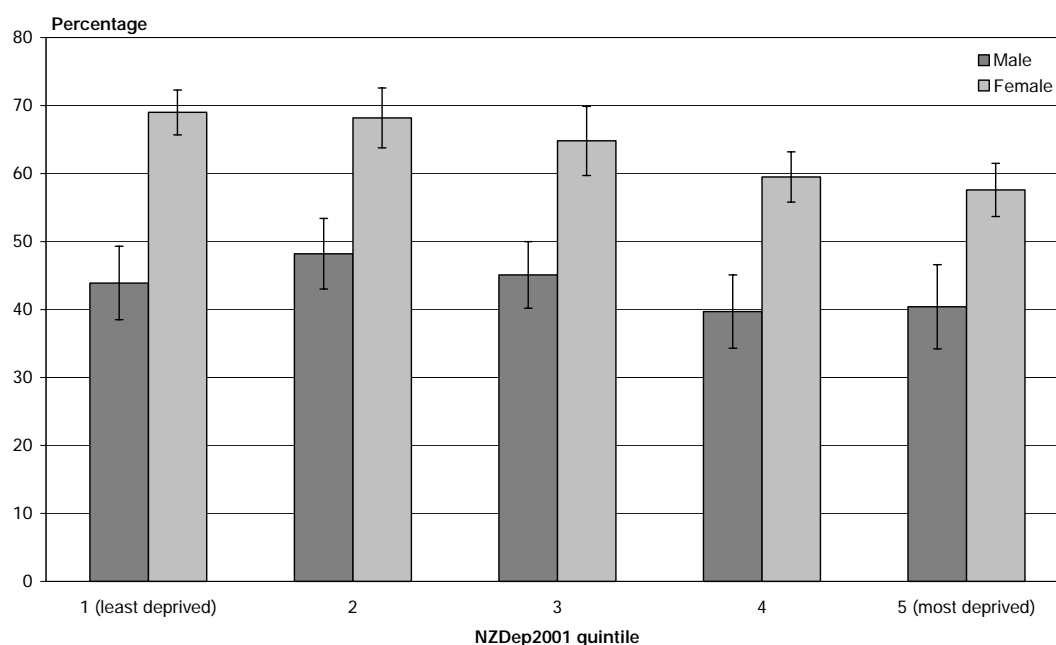
In both males and females, the proportion of adults eating two or more servings of fruit each day was lowest in the 25–34 years age group, and then increased with age (Figure 44).

Figure 44: Fruit intake (two or more servings per day) in adults, by age group and sex



In males, the proportion eating two or more servings of fruit each day was similar in all NZDep2001 quintiles (Figure 45). Females living in NZDep2001 quintile 1 (least deprived) were significantly more likely than females living in quintile 5 (most deprived) to eat two or more servings of fruit each day.

Figure 45: Fruit intake (two or more servings per day) in adults, by NZDep2001 quintile and sex (age-standardised)



Physical activity

Introduction

Physical activity is protective against chronic diseases such as heart disease, stroke, certain cancers and type 2 diabetes. Physical activity also helps lower risk factors for these diseases, such as high blood pressure and high cholesterol.

Physical activity refers to all movement produced by skeletal muscles that increases energy expenditure, whether it is incidental, occupational or recreational. To adequately measure physical activity, information needs to be collected on the intensity, frequency, type, context and duration of activity. Unfortunately, there is no universal or commonly used measure for investigating each of these five dimensions.

In this survey, physical activity was measured by asking participants how much physical activity they had done in the last seven days, with separate questions for brisk walking, moderate activity and vigorous activity. Total physical activity (minutes per week) was calculated as: minutes of brisk walking + minutes of moderate activity + (minutes of vigorous activity x two) (ie, one minute of vigorous activity is equivalent to two minutes of moderate intensity activity). Participants were also asked on how many of the last seven days they were active.

Sport and Recreation New Zealand recommends that adults do at least 30 minutes of moderate intensity physical activity (equivalent to brisk walking) on most (at least five), if not all, days of the week (Hillary Commission 2001). It is also recommended that, when possible, vigorous exercise is added for extra fitness and health benefits.

The following definitions are used:

- Physically active – at least 2.5 hours of physical activity in the last week, with exercise accumulated on one or more days of the week.
- Regularly physically active – at least 2.5 hours of physical activity in the last week, comprising at least 30 minutes of physical activity per day on five or more days of the last week.
- Sedentary – less than 30 minutes of physical activity in the last week.

Prevalence of physical activity

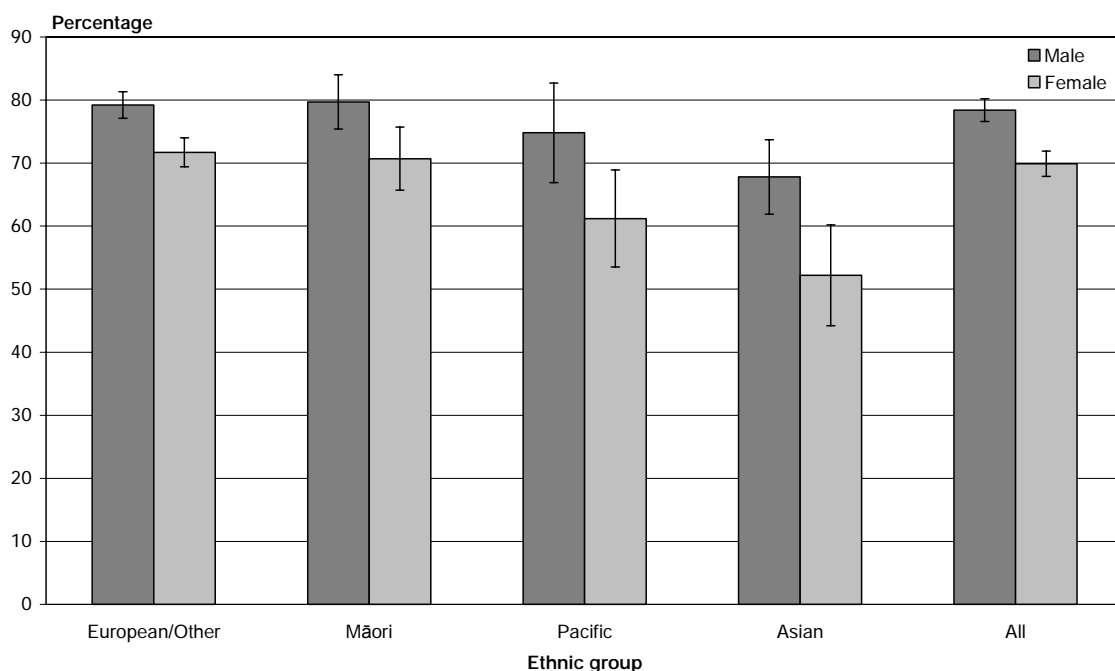
Overall, three out of four adults (73.4%; 72.0–74.8) were physically active.

Males (78.4%; 76.6–80.2) were significantly more likely than females (69.9%; 67.9–71.9) to be physically active.

A smaller proportion of adults (52.1%; 50.7–53.6) were regularly physically active. Males (56.7%; 54.5–58.9) were significantly more likely than females (48.6%; 46.5–50.6) to be regularly physically active.

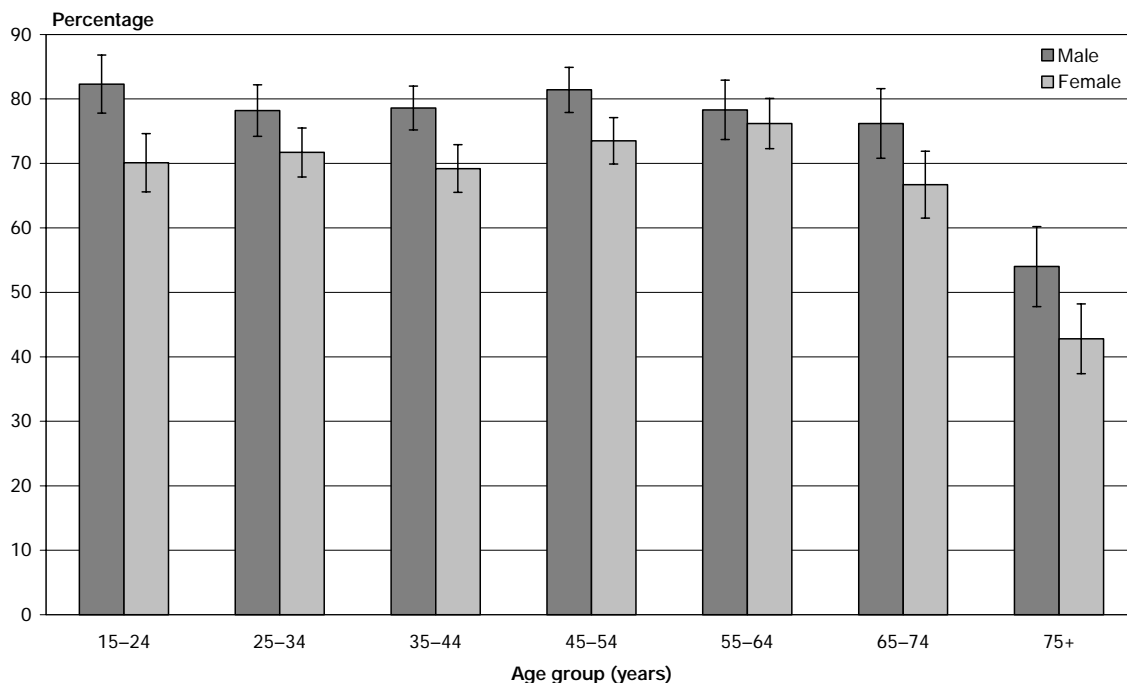
In both males and females, Asian peoples were significantly less likely to be physically active than European/Other and Māori ethnic groups (Figure 46).

Figure 46: Physically active adults, by ethnic group and sex (age-standardised)



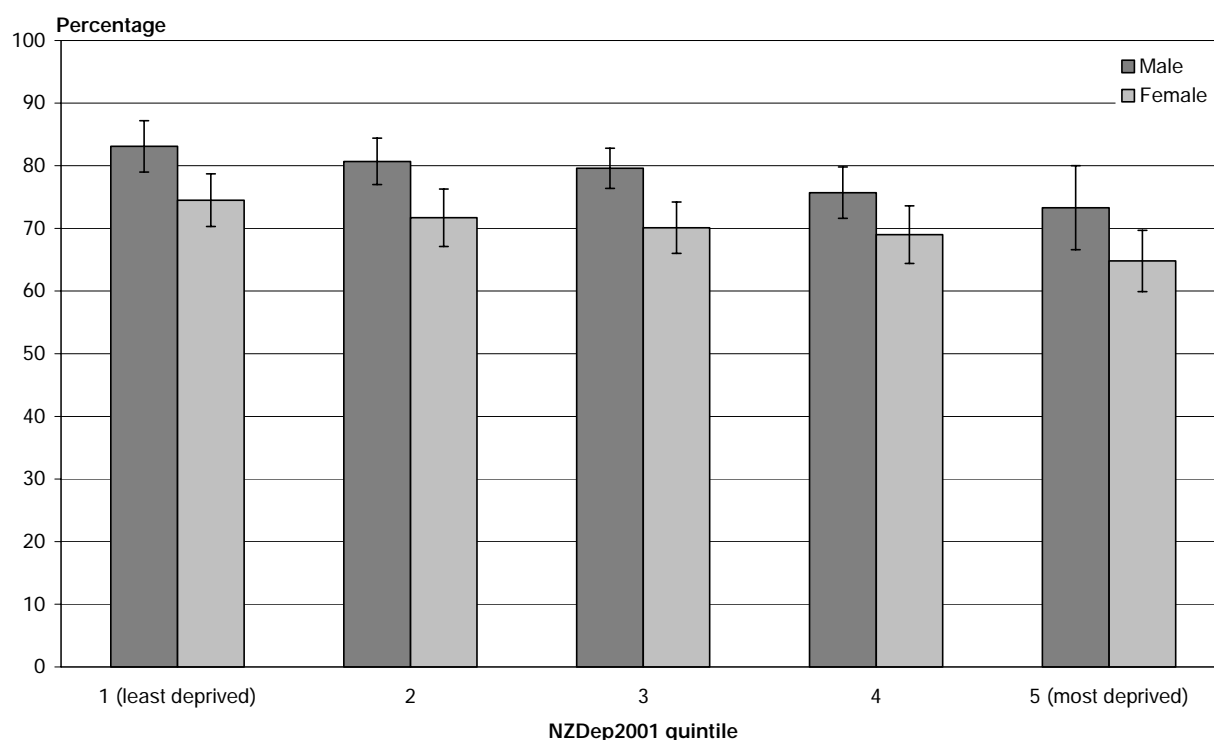
In both males and females, physical activity levels were relatively stable across all age groups from age 15 to 74 years, decreasing significantly in the oldest age group (Figure 47).

Figure 47: Physically active adults, by age group and sex



In both males and females, adults living in NZDep2001 quintile 1 (least deprived) were more likely than adults living in quintile 5 (most deprived) to be physically active, although this difference was not significant for males (Figure 48).

Figure 48: Physically active adults, by NZDep2001 quintile and sex (age-standardised)



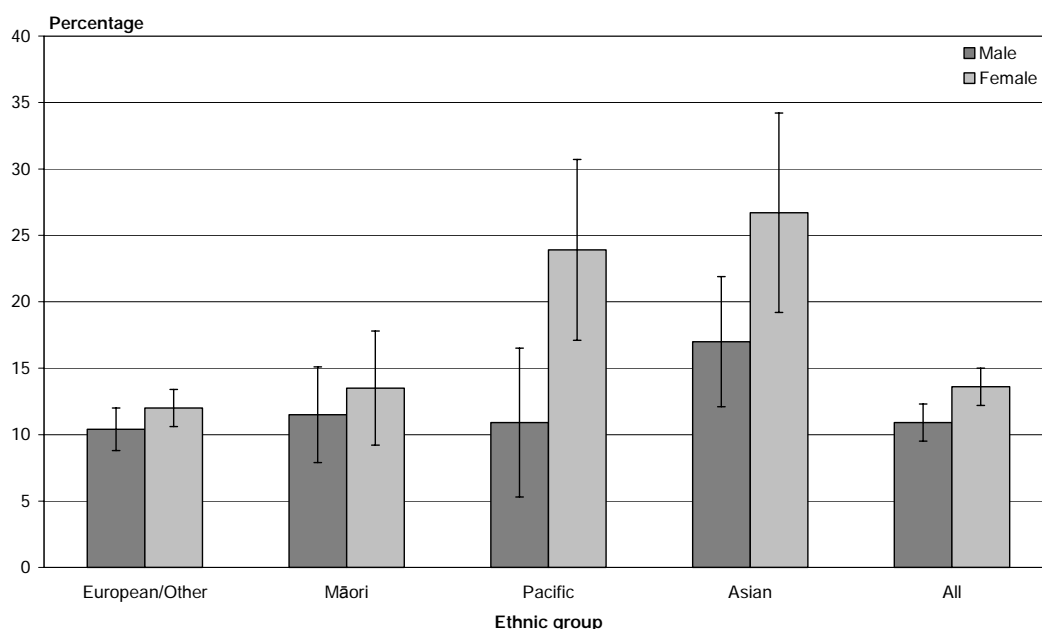
Prevalence of sedentary activity

Overall, one in eight adults (13.1%; 12.1–14.1) was sedentary (defined as less than 30 minutes of physical activity per week).

Females (13.6%; 12.2–15.1) were more likely than males (10.9%; 9.5–12.3) to be sedentary, although this difference was not significant.

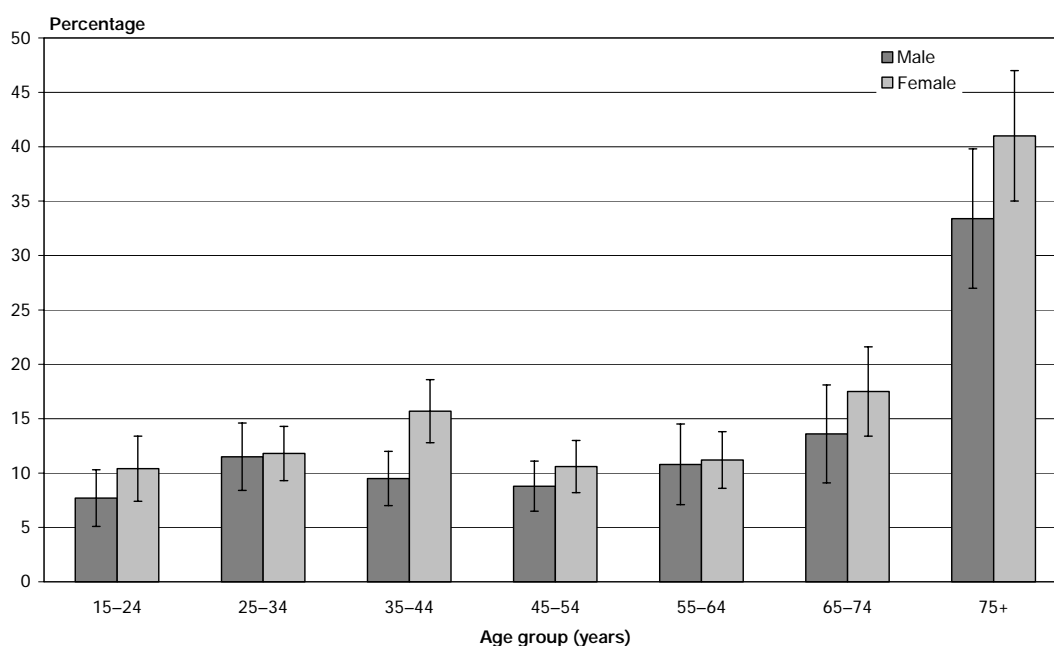
Asian males were significantly more likely to be sedentary than European/Other males (Figure 49). Asian females were significantly more likely to be sedentary than European/Other and Māori females, and Pacific females were significantly more likely to be sedentary than European/Other females.

Figure 49: Sedentary adults, by ethnic group and sex (age-standardised)



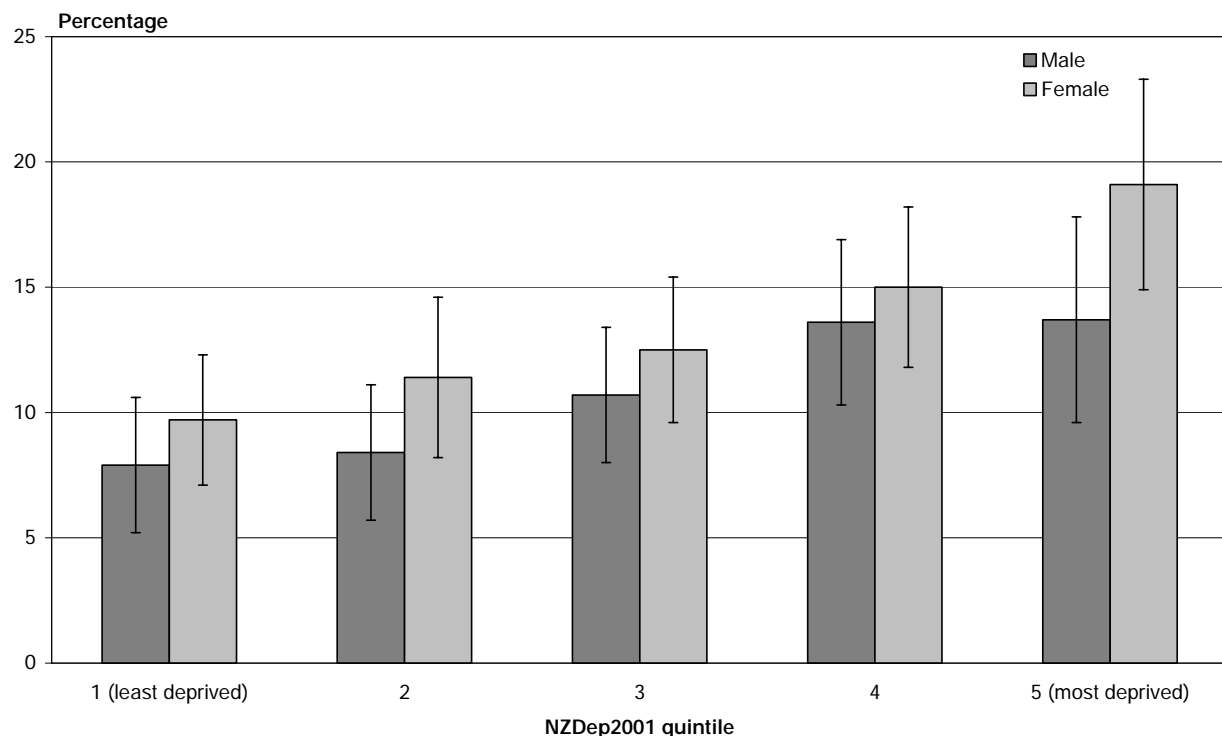
In both males and females, the proportion of adults who were sedentary was similar from age 15 to 74 years, then increased significantly in the 75+ years age group (Figure 50).

Figure 50: Sedentary adults, by age group and sex



In both males and females, the proportion of sedentary adults was about twice as high in NZDep2001 quintile 5 (most deprived) than in quintile 1 (least deprived), although this difference was not significant for males (Figure 51).

Figure 51: Sedentary adults, by NZDep2001 quintile and sex (age-standardised)



Body weight

Introduction

Overweight and obesity are important risk factors for several diseases, including type 2 diabetes, ischaemic heart disease, ischaemic stroke and several common cancers. The impact of overweight and obesity on these diseases operates, at least in part, through its effects on insulin resistance, blood glucose, blood lipids and blood pressure. Independently of overweight and obesity, fluctuations in body weight as a result of dieting and weight gain during adulthood have also been shown to increase the risk of certain diseases.

This section of the survey included measurements of height, weight and waist circumference using standardised equipment and techniques. Participants were also asked whether they had gained more than 10 kg since age 18 years (adult weight gain) and whether they had ever lost more than 10 kg through dieting and then put it on again (weight cycling).

Body mass index (BMI) was calculated by dividing weight in kilograms by height in metres squared (kg/m^2). Adults were classified as overweight or obese according to their BMI (Table 10). Higher BMI cutoffs were used to classify Māori and Pacific peoples as overweight and obese to account for differences in muscle mass (Swinburn 1998).

Table 10: Classifications of overweight and obesity according to BMI (kg/m^2)

Classification	European, Asian and Other	Māori and Pacific
Overweight	25.0–29.9	26.0–31.9
Obese	≥ 30.0	≥ 32.0
Overweight or obese	≥ 25.0	≥ 26.0

Lower BMI cutoffs have been suggested for adults of Asian origin (23 and 25 for overweight and obesity respectively) (WHO 2000). However, these proposed cutoffs have not been widely accepted, so have not been used in this report. As a result, by using the standard BMI cutoffs we may have underestimated the prevalence of overweight and obesity in Asian peoples.

Adults were classified as having abdominal obesity if their waist circumference was 102 cm or more for males and 88 cm or more for females.

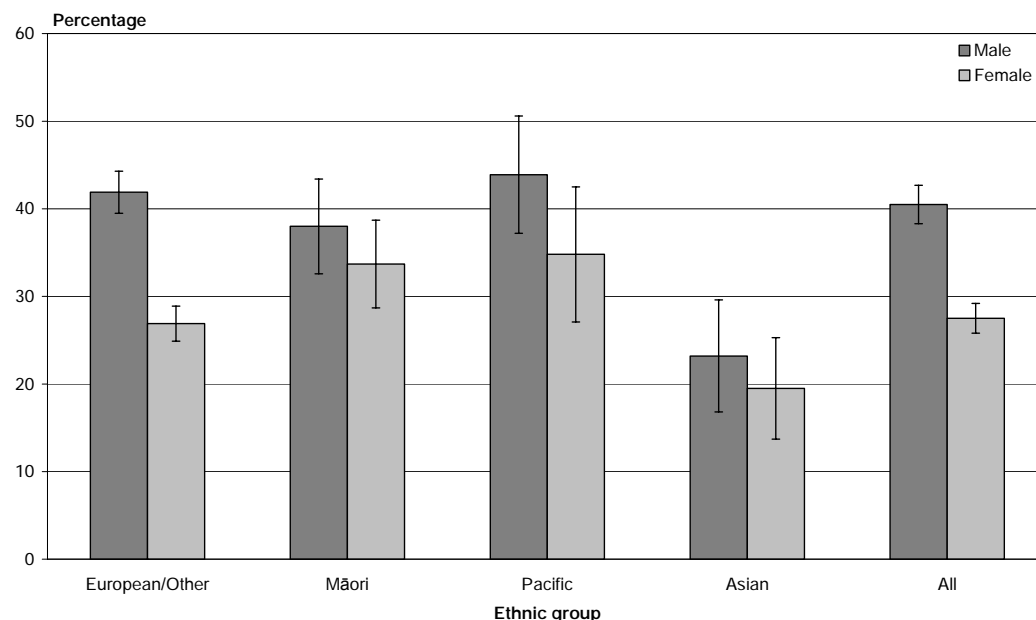
Prevalence of overweight

Overall, one in three adults (35.2%; 34.0–36.4) was overweight (excludes obese).

Males (40.5%; 38.3–42.8) were significantly more likely than females (27.5%; 25.8–29.2) to be overweight.

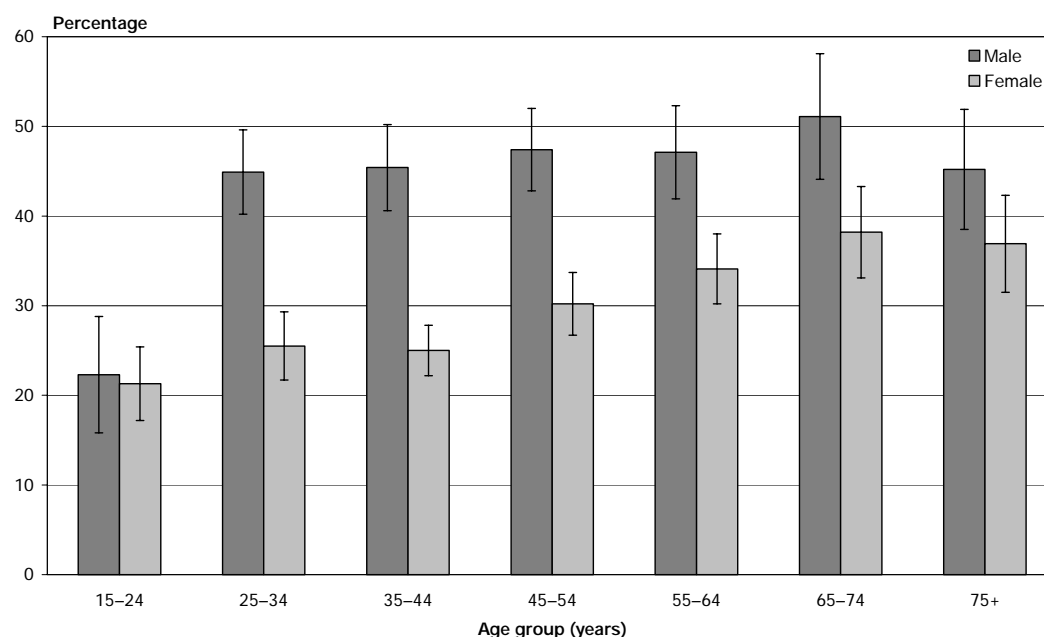
Asian males were significantly less likely to be overweight than European/Other, Māori and Pacific males (Figure 52). Asian females were significantly less likely to be overweight than Māori and Pacific females. Note: the threshold for overweight may have been set too high for the Asian ethnic group, so underestimating the prevalence of overweight in this group.

Figure 52: Overweight in adults, by ethnic group and sex (age-standardised)



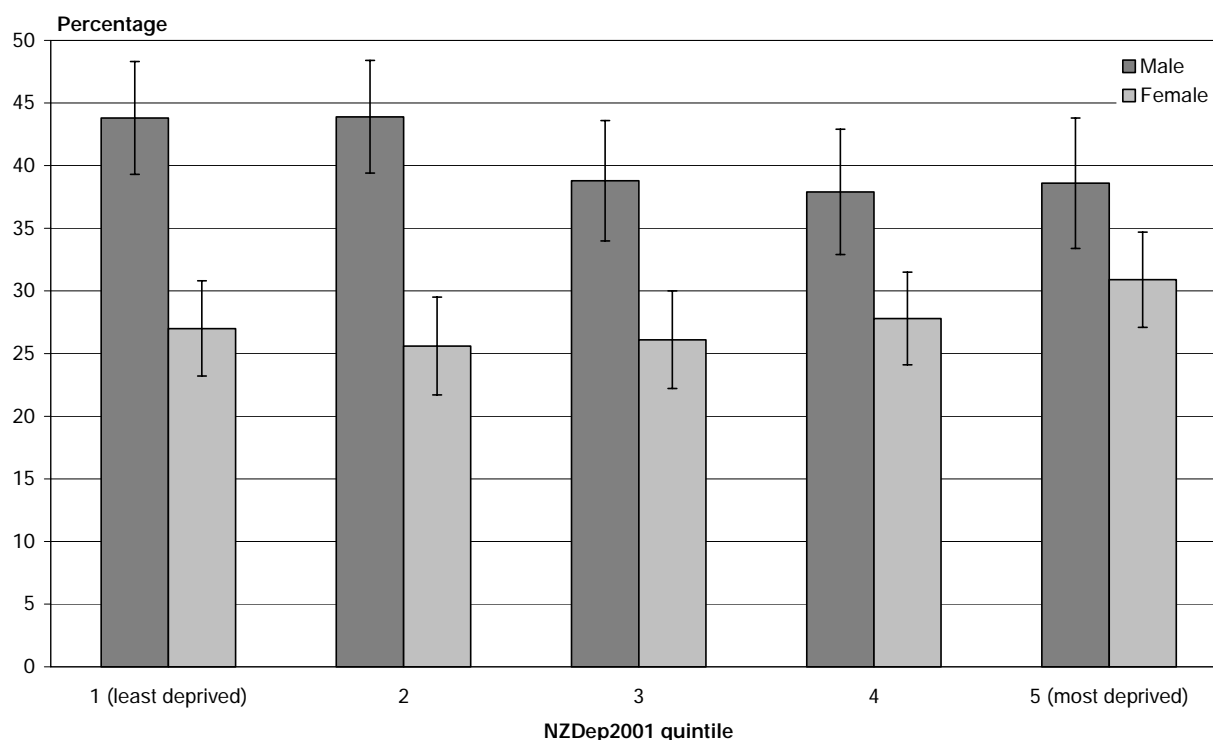
In males, the prevalence of overweight increased significantly from the 15–24 to 25–34 years age group, then remained relatively stable (Figure 53). In females, the prevalence of overweight increased with age until age 65–74 years and then declined slightly in the oldest age group.

Figure 53: Overweight in adults, by age group and sex



In both males and females, there was no significant difference in the prevalence of overweight between NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived) (Figure 54).

Figure 54: Overweight in adults, by NZDep2001 quintile and sex (age-standardised)



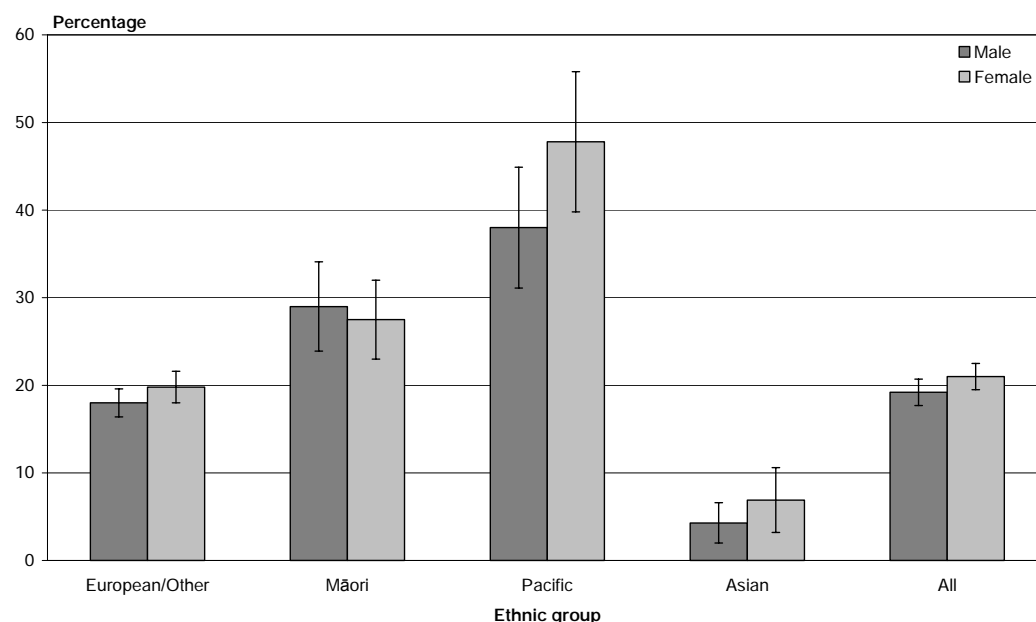
Prevalence of obesity

Overall, one in five adults (20.9%; 19.9–22.0) was obese.

There was no significant difference in the proportion of males (19.2%; 17.7–20.6) and females (21.0%; 19.5–22.5) who were obese.

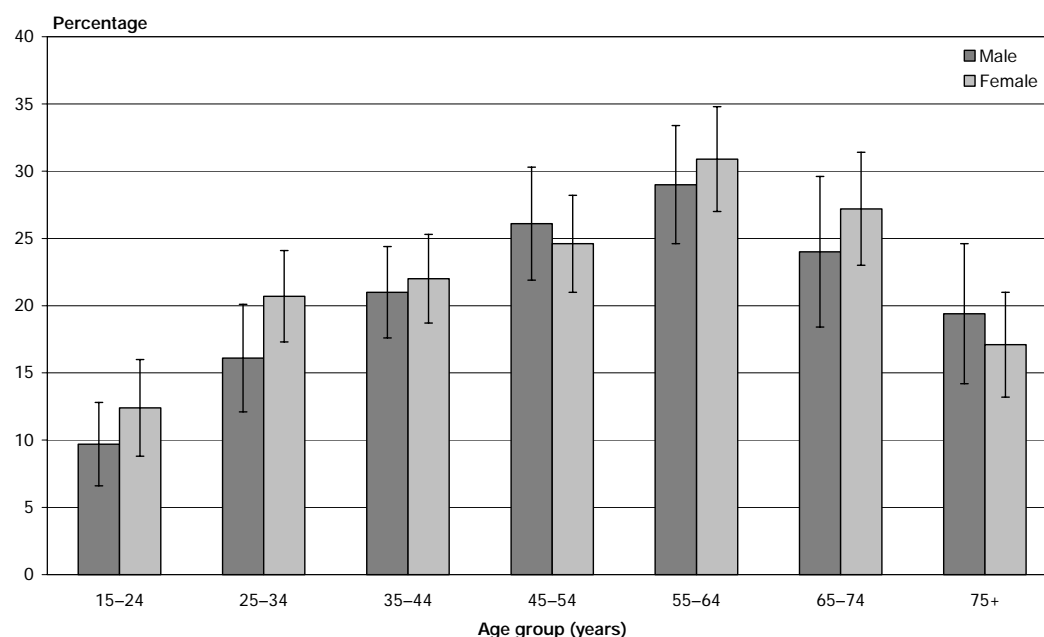
In both males and females, the prevalence of obesity was highest in the Pacific ethnic group, followed by Māori, European/Other and Asian ethnic groups (Figure 55). Differences between ethnic groups in the prevalence of obesity were significant, except between Māori and Pacific males. Note: the threshold for obesity may have been set too high for the Asian ethnic group, so underestimating the prevalence of obesity in this group.

Figure 55: Obesity in adults, by ethnic group and sex (age-standardised)



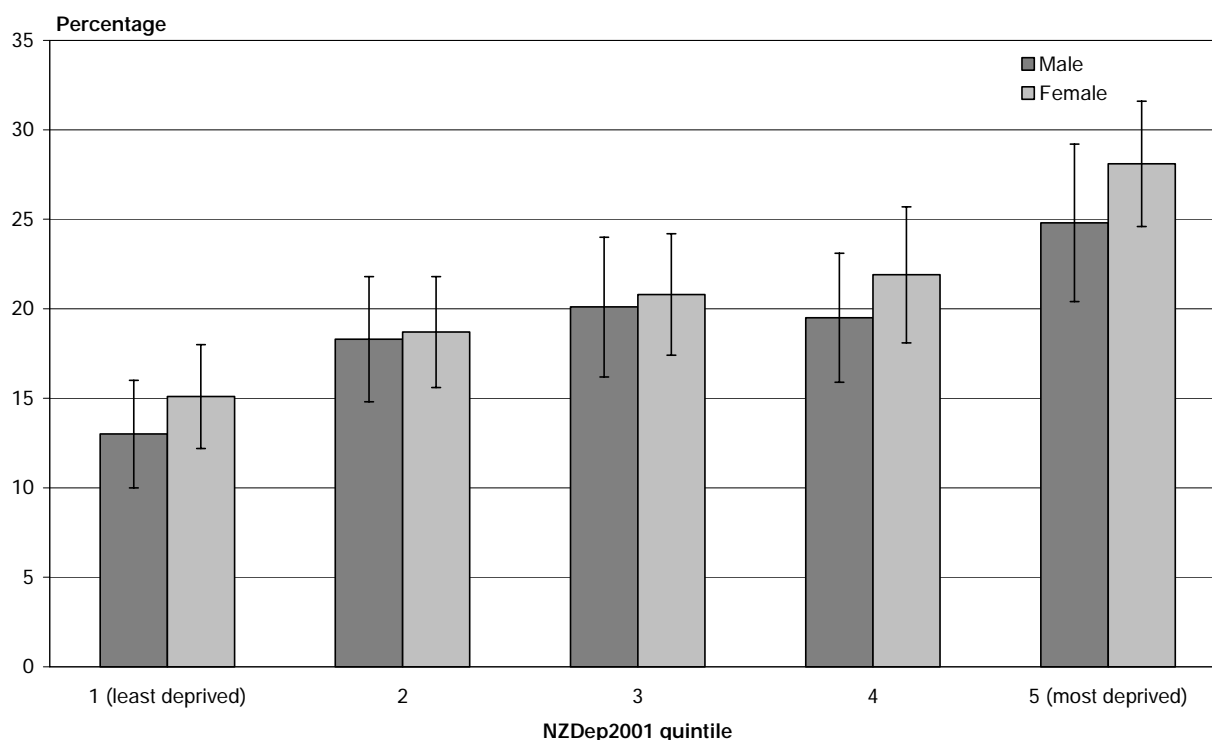
In both males and females, the prevalence of obesity increased with age until age 55–64 years, and then declined slightly in the two oldest age groups (Figure 56).

Figure 56: Obesity in adults, by age group and sex



In both males and females, the prevalence of obesity was significantly higher in NZDep2001 quintile 5 (most deprived) than quintile 1 (least deprived) (Figure 57).

Figure 57: Obesity in adults, by NZDep2001 quintile and sex (age-standardised)



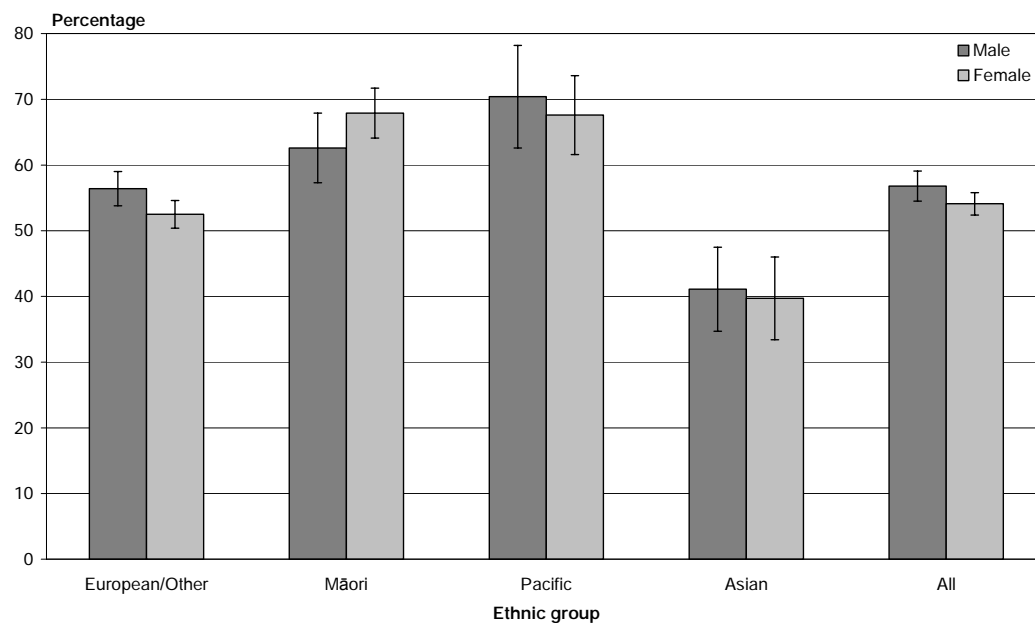
Prevalence of adult weight gain

Overall, just over half of adults (56.9%; 55.6–58.3) had gained 10 kg or more since age 18 years.

There was no significant difference in the prevalence of adult weight gain between males (56.8%; 54.4–59.1) and females (54.1%; 52.4–55.8).

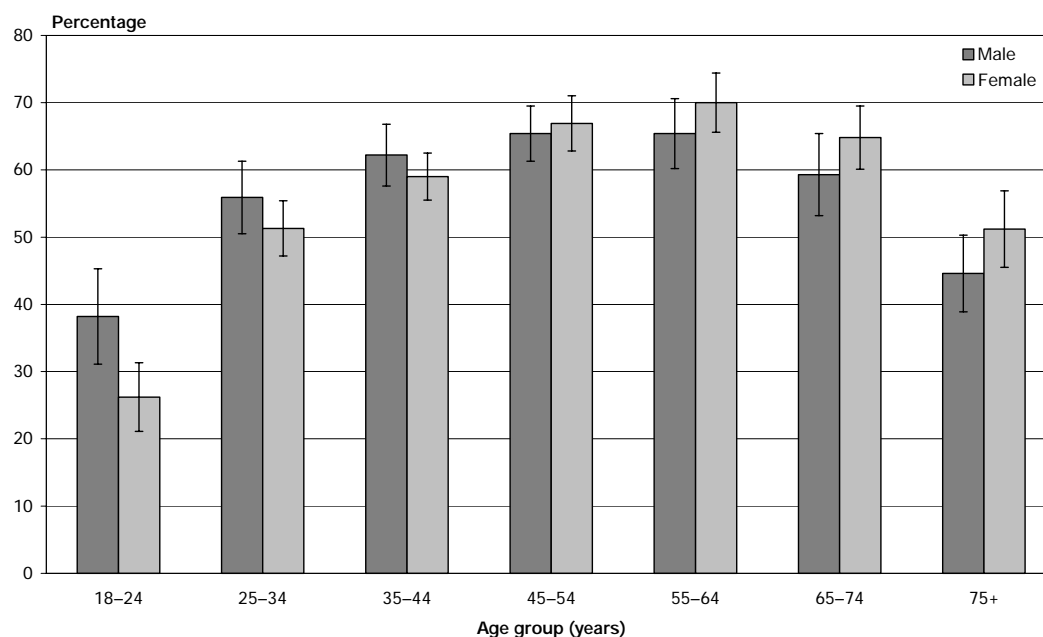
In both males and females, the prevalence of adult weight gain was highest in Pacific and Māori ethnic groups, intermediate in the European/Other ethnic group and lowest in the Asian ethnic group (Figure 58). Differences between ethnic groups were significant, except between the Māori and Pacific ethnic groups and between European/Other and Māori males.

Figure 58: Adult weight gain, by ethnic group and sex (age-standardised)



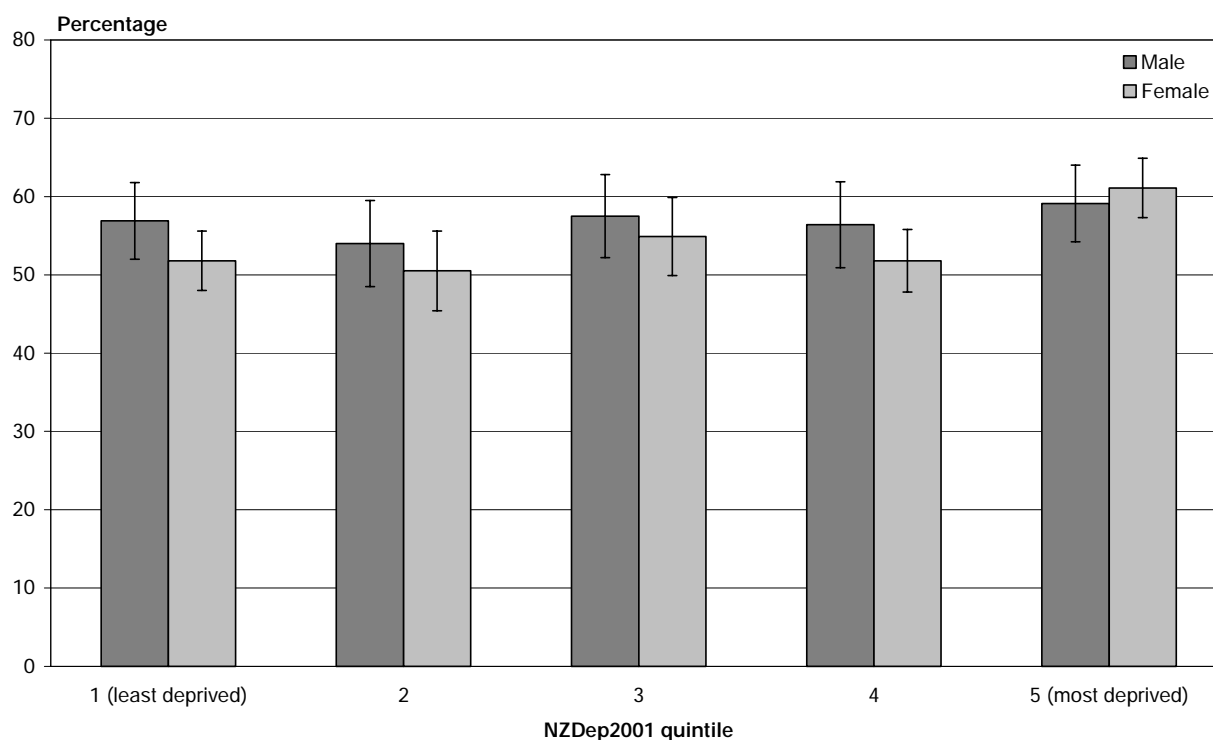
In both males and females, the prevalence of adult weight gain increased with age until the 55–64 years age groups, and then declined in the two oldest age groups (Figure 59).

Figure 59: Adult weight gain, by age group and sex



In males, there was no significant difference in the prevalence of adult weight gain in NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived) (Figure 60). In females, prevalence of adult weight gain was significantly higher in those living in NZDep2001 quintile 5 (most deprived) than in quintile 1 (least deprived).

Figure 60: Adult weight gain, by NZDep2001 quintile and sex (age-standardised)



Alcohol

Introduction

Alcohol is the most commonly used recreational drug in New Zealand. Alcohol causes a range of adverse effects on health, including cirrhosis of the liver, pancreatitis, endocrine disorders, cardiomyopathy, gastritis, high blood pressure, haemorrhagic stroke, and cancers of the mouth, pharynx, larynx, oesophagus, breast and liver. High levels of alcohol use are also associated with alcohol dependence and abuse, and alcohol during pregnancy can lead to birth defects in infants, including foetal alcohol syndrome. In older people, moderate alcohol consumption can protect against ischaemic heart disease, ischaemic stroke, vascular dementia and type 2 diabetes.

In this survey, participants were asked questions about their alcohol consumption using the Alcohol Use Disorders Identification Test (AUDIT). The AUDIT is a 10-item questionnaire covering alcohol consumption, alcohol-related problems and abnormal drinking behaviour. It was developed by the World Health Organization as a screening tool for health professionals to identify people at risk of developing alcohol problems (Babor et al 1992, Saunders et al 1993). Each question is scored from zero to four, so the questionnaire has a maximum score of 40. Hazardous drinking is defined as an established pattern of drinking that carries a high risk of

future damage to physical or mental health, but has not yet resulted in significant adverse effects. Hazardous drinking is most commonly identified from an AUDIT score of eight or more.

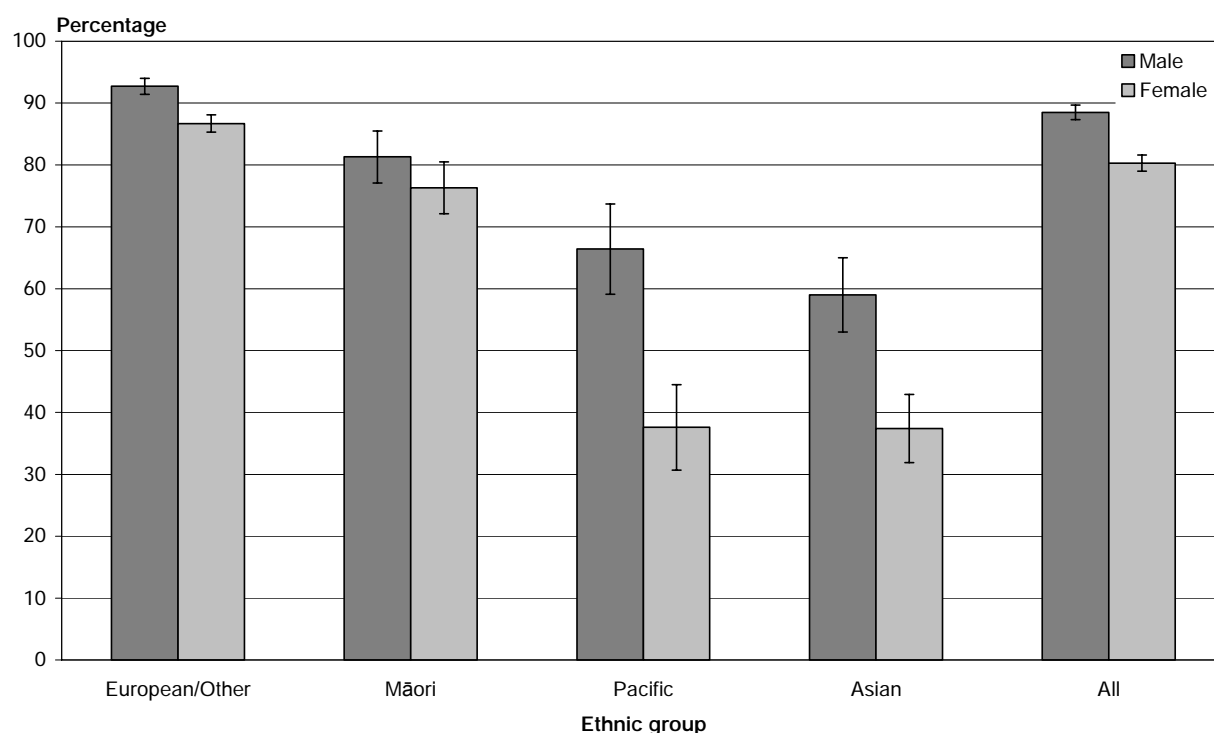
Prevalence of past year alcohol use

Overall, eight out of 10 adults (83.5%; 82.7–84.4) reported having had a drink containing alcohol in the last year.

The prevalence of past year alcohol use was significantly higher in males (88.5%; 87.3–89.6) than in females (80.3%; 79.0–81.6).

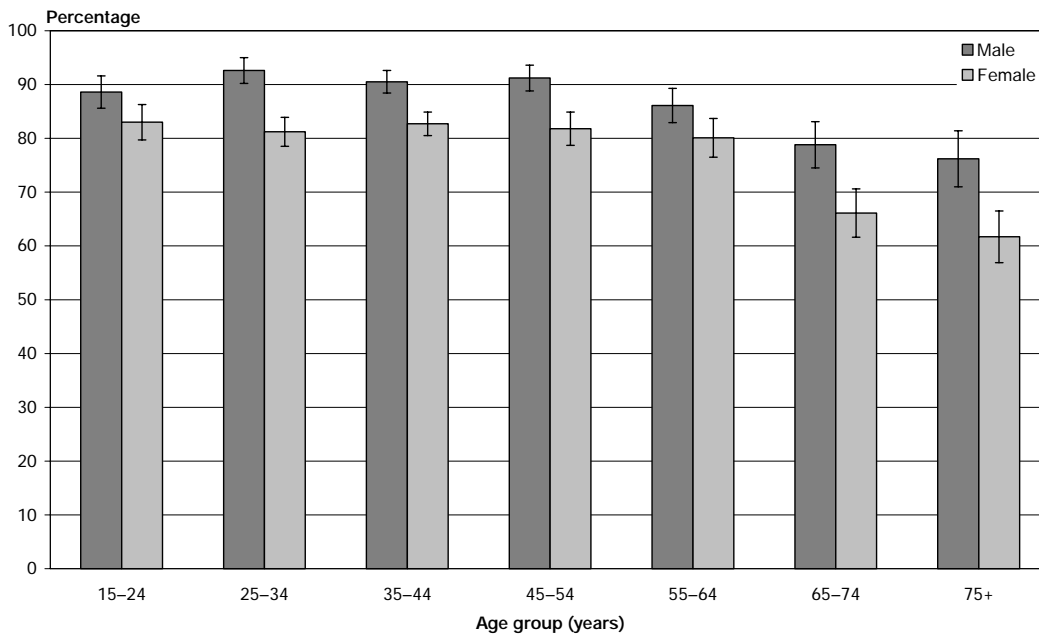
In both males and females, the prevalence of past year alcohol use was highest in the European/Other ethnic group, followed by Māori, Pacific and Asian ethnic groups (Figure 61). Differences between ethnic groups were significant, except between the Pacific and Asian ethnic groups.

Figure 61: Past year alcohol use in adults, by ethnic group and sex (age-standardised)



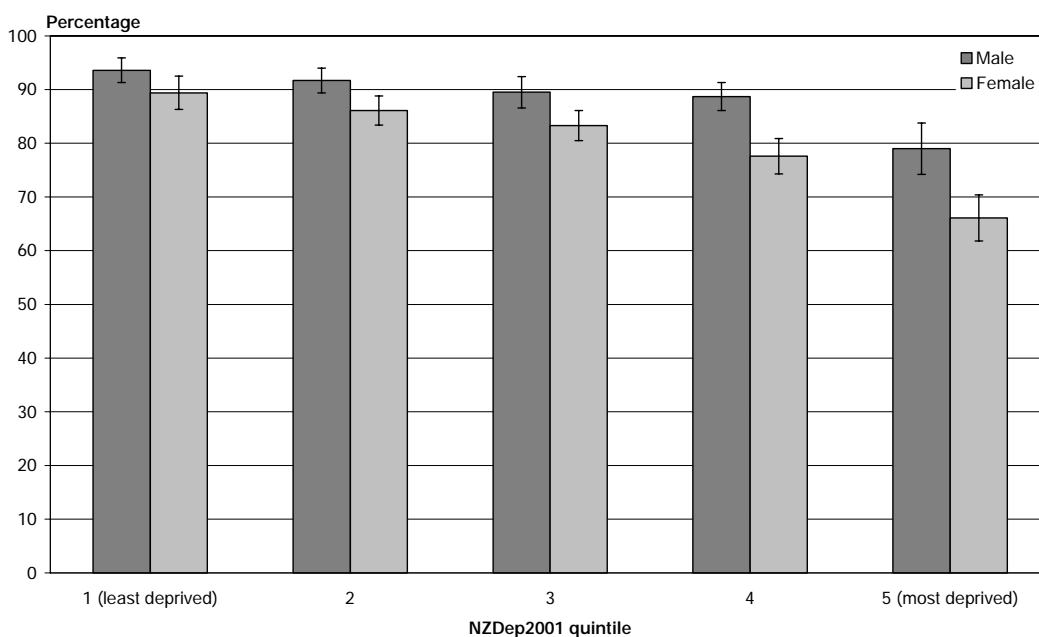
In both males and females, the prevalence of past year alcohol use was relatively stable until age 45–54 years, after which it declined slightly in males and more substantially in females (Figure 62).

Figure 62: Past year alcohol use in adults, by age group and sex



In both males and females, the prevalence of past year alcohol use was significantly higher in NZDep2001 quintile 1 (least deprived) than in quintile 5 (most deprived) (Figure 63).

Figure 63: Past year alcohol use in adults, by NZDep2001 quintile and sex (age-standardised)



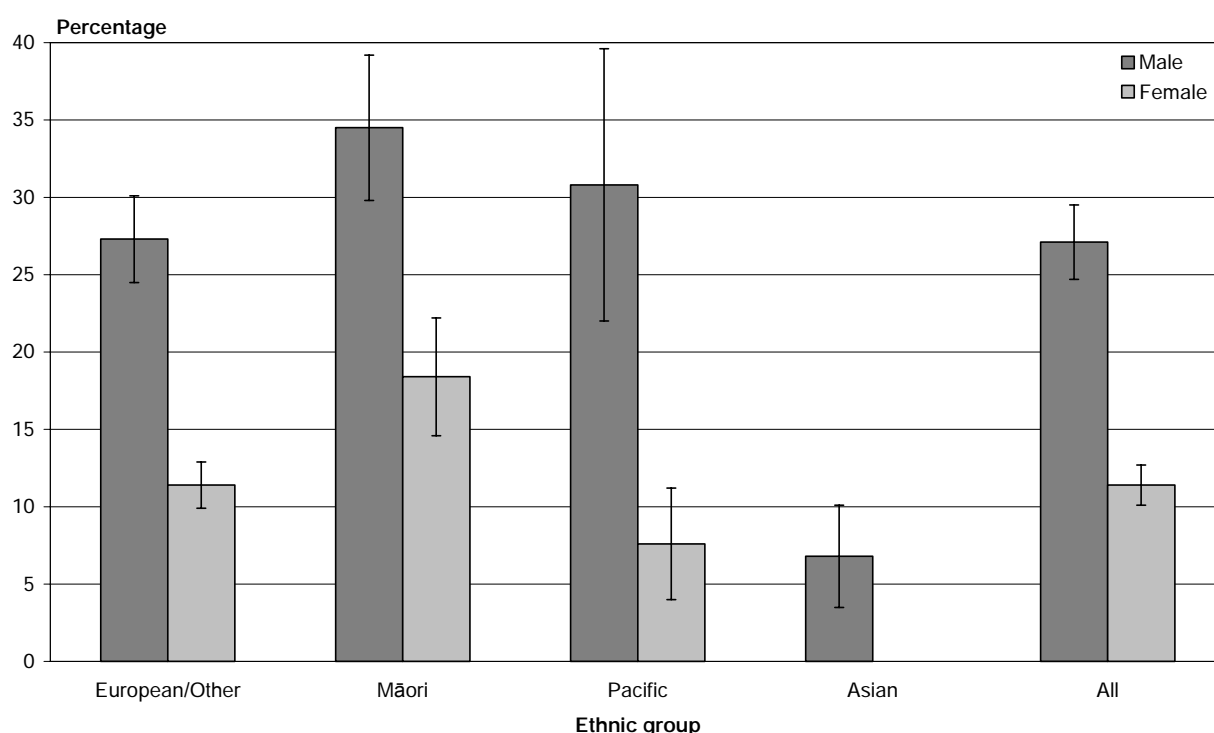
Prevalence of hazardous drinking

One in six adult drinkers (17.2%; 16.1–18.3) had a potentially hazardous drinking pattern, as indicated by an AUDIT score of eight or more.

Male drinkers (27.1%; 24.7–29.5) were significantly more likely than female drinkers (11.4%; 10.1–12.7) to have a potentially hazardous drinking pattern.

Māori, Pacific and European/Other males were significantly more likely to have a potentially hazardous drinking pattern than Asian males (Figure 64). Māori females were significantly more likely to have a potentially hazardous drinking pattern than females from all other ethnic groups.

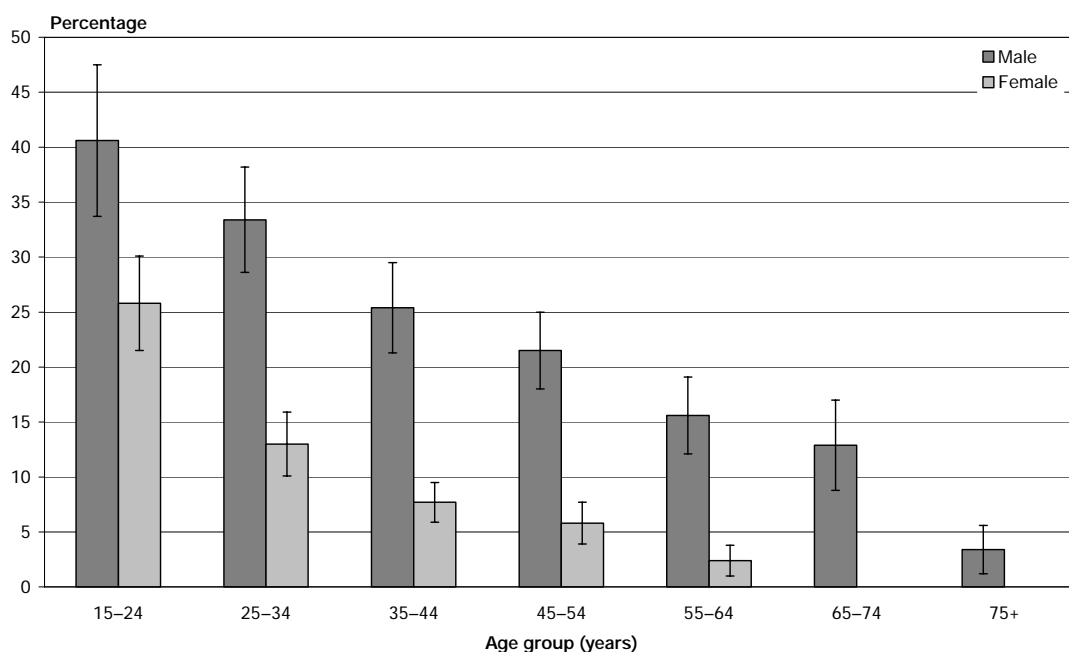
Figure 64: Potentially hazardous drinking pattern in adults, by ethnic group and sex (age-standardised)



Note: Data are not shown for Asian females due to low numbers.

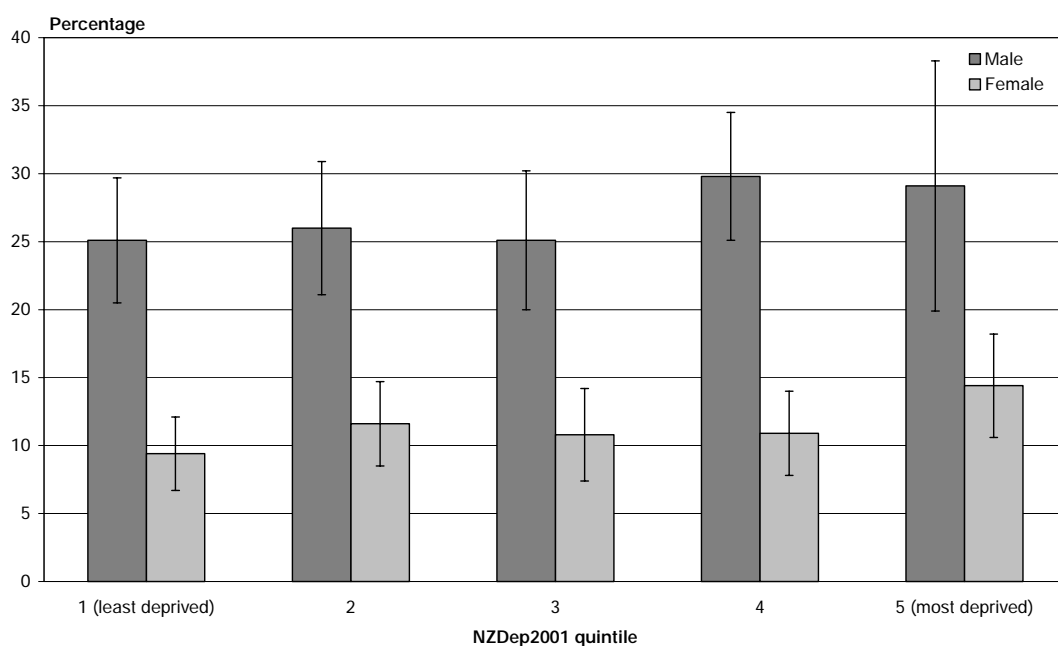
In both males and females, the proportion of adult drinkers with a potentially hazardous drinking pattern was highest in the 15–24 years age group, and then decreased with age (Figure 65).

Figure 65: Potentially hazardous drinking pattern in adults, by age group and sex



In both males and females, the proportion of adult drinkers with a potentially hazardous drinking pattern was slightly higher in NZDep2001 quintile 5 (most deprived) than in quintile 1 (least deprived), although these differences were not significant (Figure 66).

Figure 66: Potentially hazardous drinking pattern in adults, by NZDep2001 quintile and sex (age-standardised)



Tobacco smoking

Introduction

Tobacco smoking has long been known to be a major cause of death and ill health. Smoking is a risk factor for cancers of the lung, mouth, pharynx, oesophagus, larynx, pancreas and kidney. Smoking also increases the risk of heart disease, stroke and chronic respiratory diseases.

In this survey, participants are asked questions about their smoking habits, including the frequency and quantity of tobacco smoking, and whether they were exposed to tobacco smoke in the home.

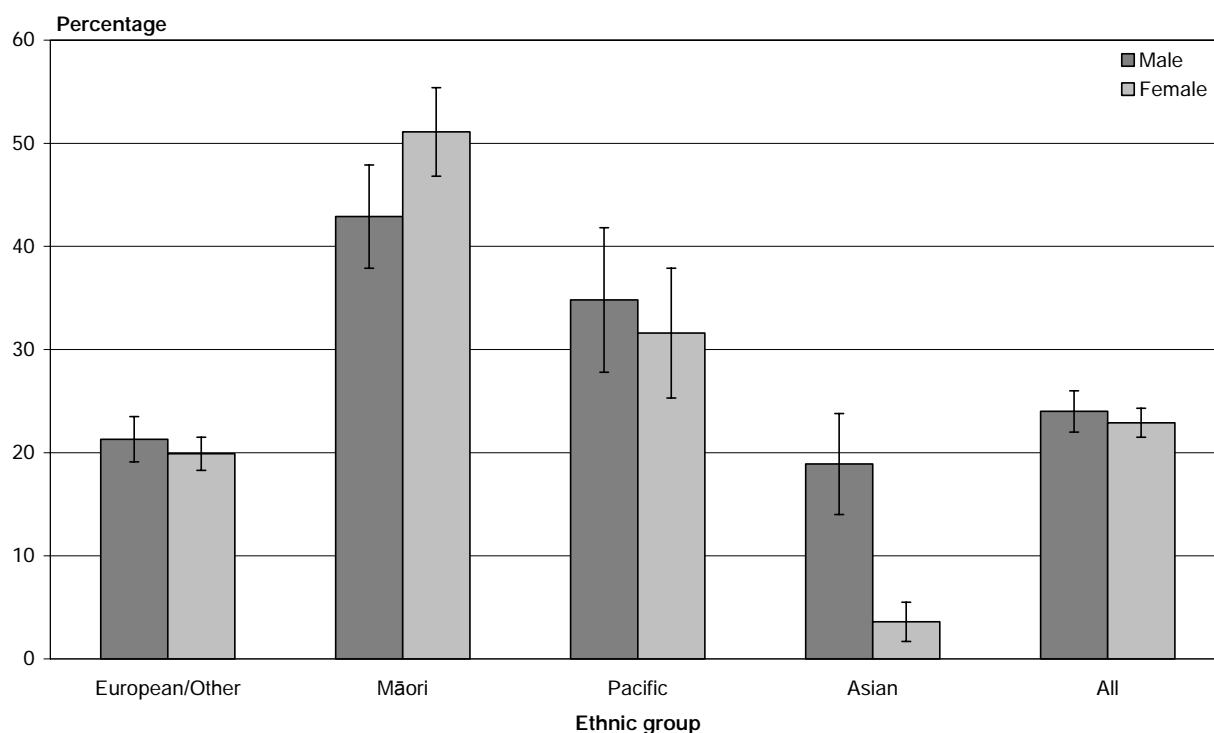
Prevalence of current smoking

Overall, one in four adults (22.9%; 21.8–24.0) reported smoking one or more tobacco cigarettes a day (excludes cigars).

There was no significant difference in the proportion of males (24.0%; 22.0–26.0) and females (22.9%; 21.5–24.3) who were current smokers.

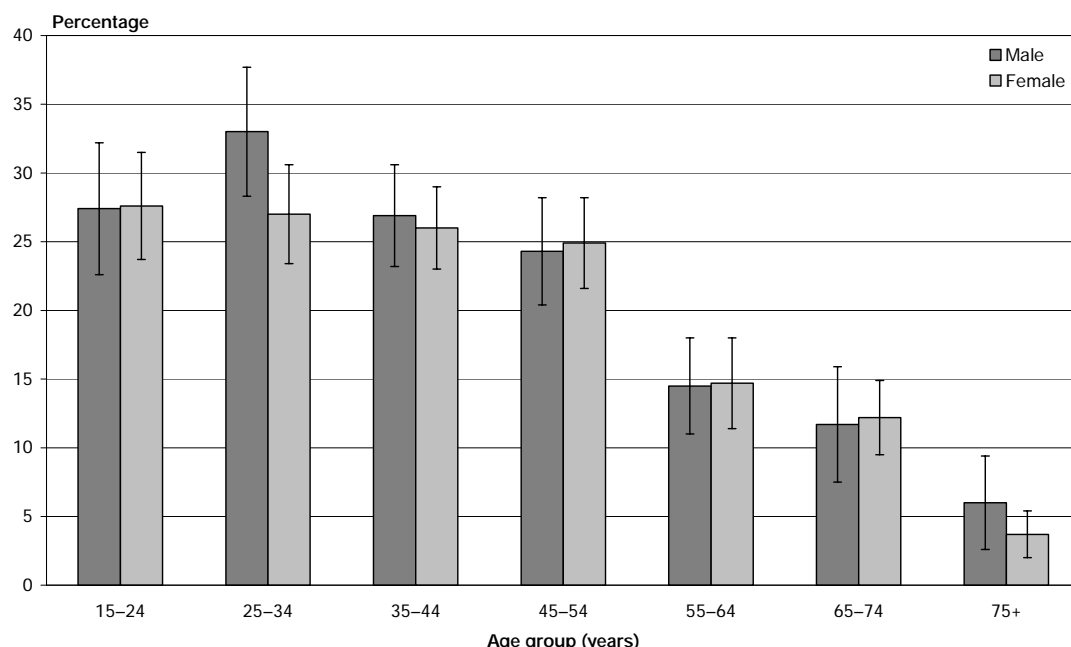
In both males and females, Māori were most likely to be current smokers, followed by Pacific, European/Other and Asian ethnic groups (Figure 67). Differences between ethnic groups were significant, except between European/Other and Asian males, and between Māori and Pacific males.

Figure 67: Current smoking, by ethnic group and sex (age-standardised)



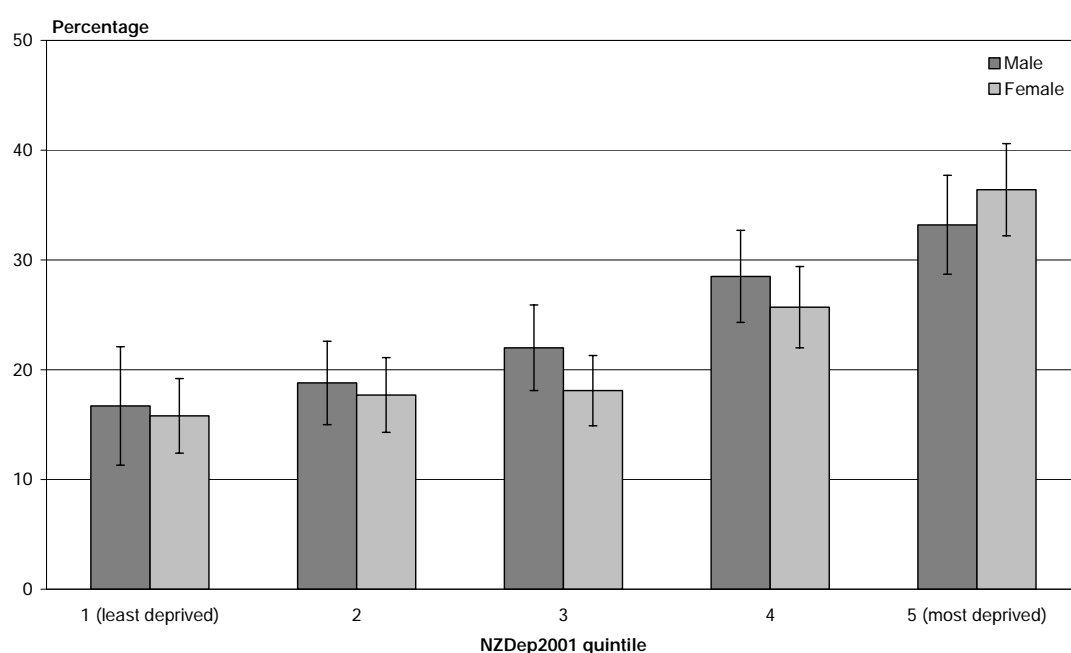
In males, the prevalence of current smoking peaked in the 25–34 years age group, and then declined with age (Figure 68). In females, the prevalence of current smoking was similar from age 15 to 54 years, and then declined in the three oldest age groups.

Figure 68: Current smoking, by age group and sex



In both males and females, the prevalence of smoking was significantly higher in NZDep2001 quintile 5 (most deprived) than in quintile 1 (least deprived) (Figure 69).

Figure 69: Current smoking, by NZDep2001 quintile and sex (age-standardised)



Prevalence of passive smoking

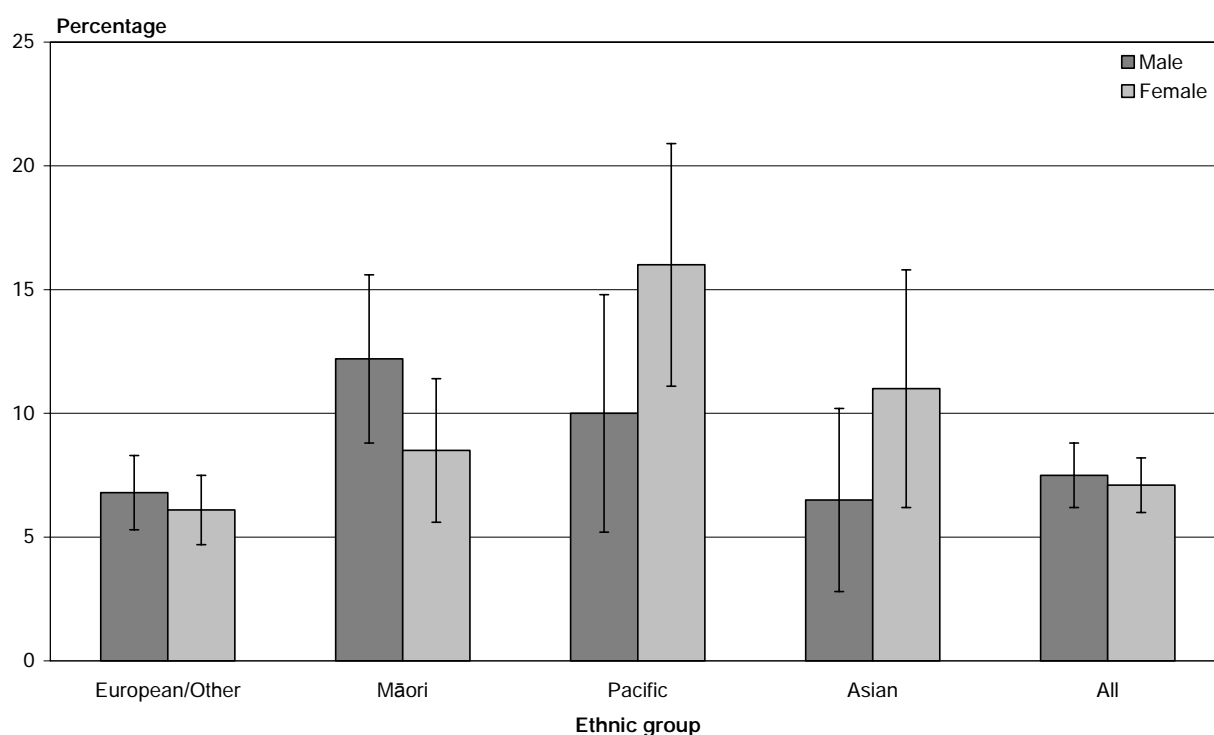
Passive smoking refers to the exposure of non-smokers (includes ex-smokers) to cigarette smoke in the home, car, workplace, and recreational or other settings. Here we consider only the home environment.

Overall, one in 15 adult non-smokers (6.7%; 6.1–7.4) was exposed to cigarette smoke inside their home.

There was no significant difference in the proportion of male non-smokers (7.5%; 6.2–8.7) and female non-smokers (7.1%; 6.0–8.2) who were exposed to cigarette smoke inside their home.

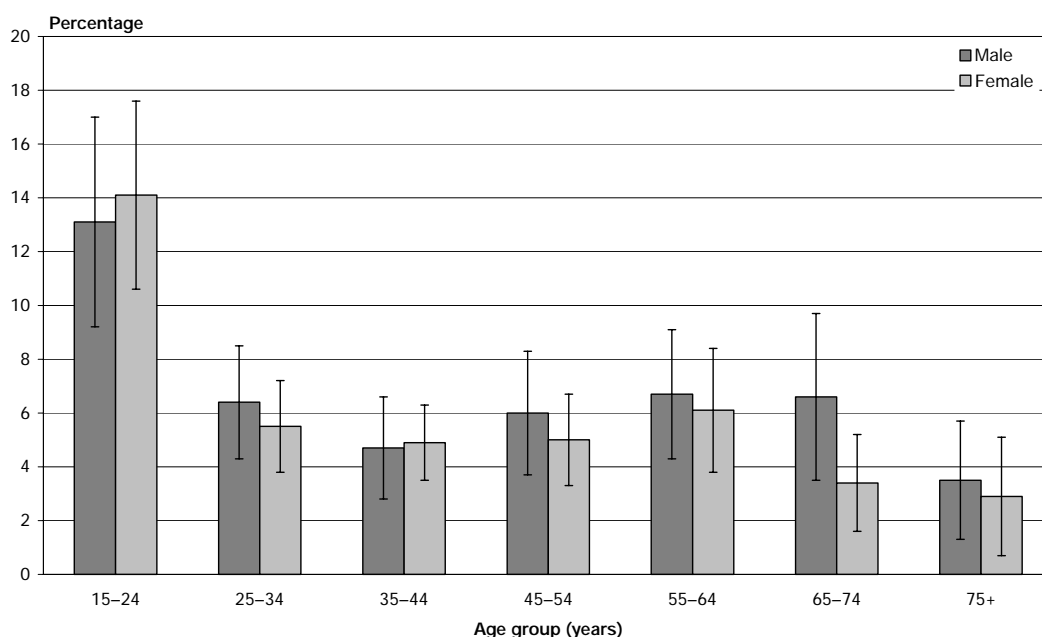
In males, Māori non-smokers were significantly more likely than European/Other non-smokers to be exposed to cigarette smoke inside their home (Figure 70). In females, Pacific non-smokers were significantly more likely to be exposed to cigarette smoke inside their home than European/Other non-smokers.

Figure 70: Passive smoking in adult non-smokers, by ethnic group and sex (age-standardised)



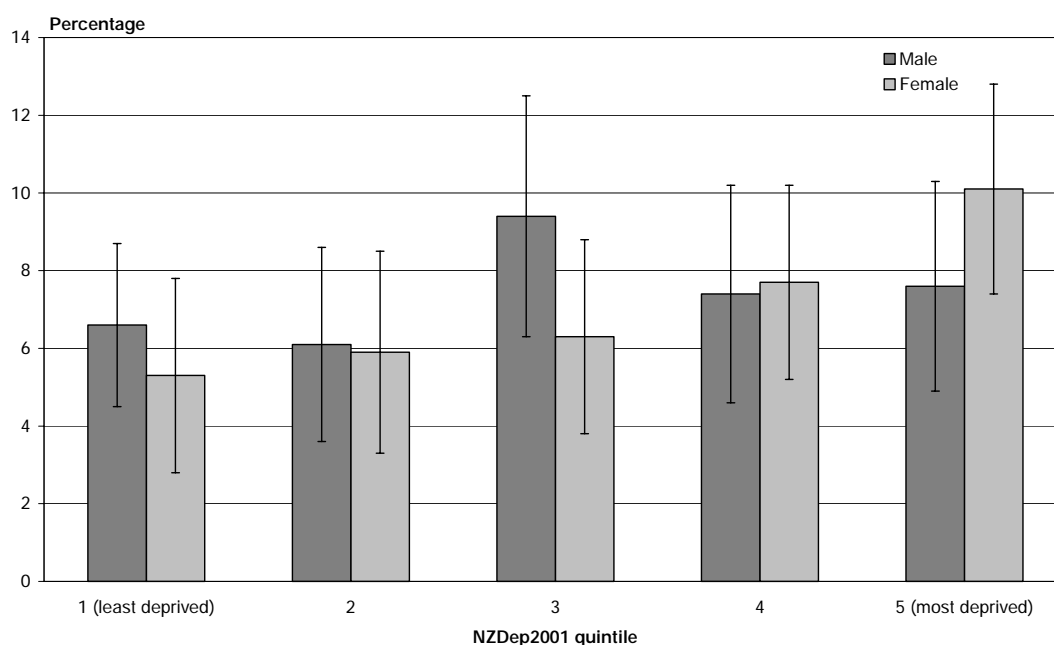
In both males and females, non-smokers aged 15–24 years were significantly more likely to be exposed to cigarette smoke inside the home than older adults (Figure 71).

Figure 71: Passive smoking in adult non-smokers, by age group and sex



In both males and females, non-smokers living in NZDep2001 quintile 5 (most deprived) were more likely to be exposed to cigarette smoke inside their home than non-smokers living in NZDep2001 quintile 1 (least deprived), although these differences were not significant (Figure 72).

Figure 72: Passive smoking in adult non-smokers, by NZDep2001 quintile and sex (age-standardised)



Marijuana smoking

Introduction

Marijuana use has adverse effects on the respiratory and cardiovascular systems and increases the risk of major psychological problems. Marijuana use is also associated with increased use of other substances.

In this survey, participants were asked whether they had ever smoked marijuana and if they had, how often they smoked marijuana.

Prevalence of marijuana smoking

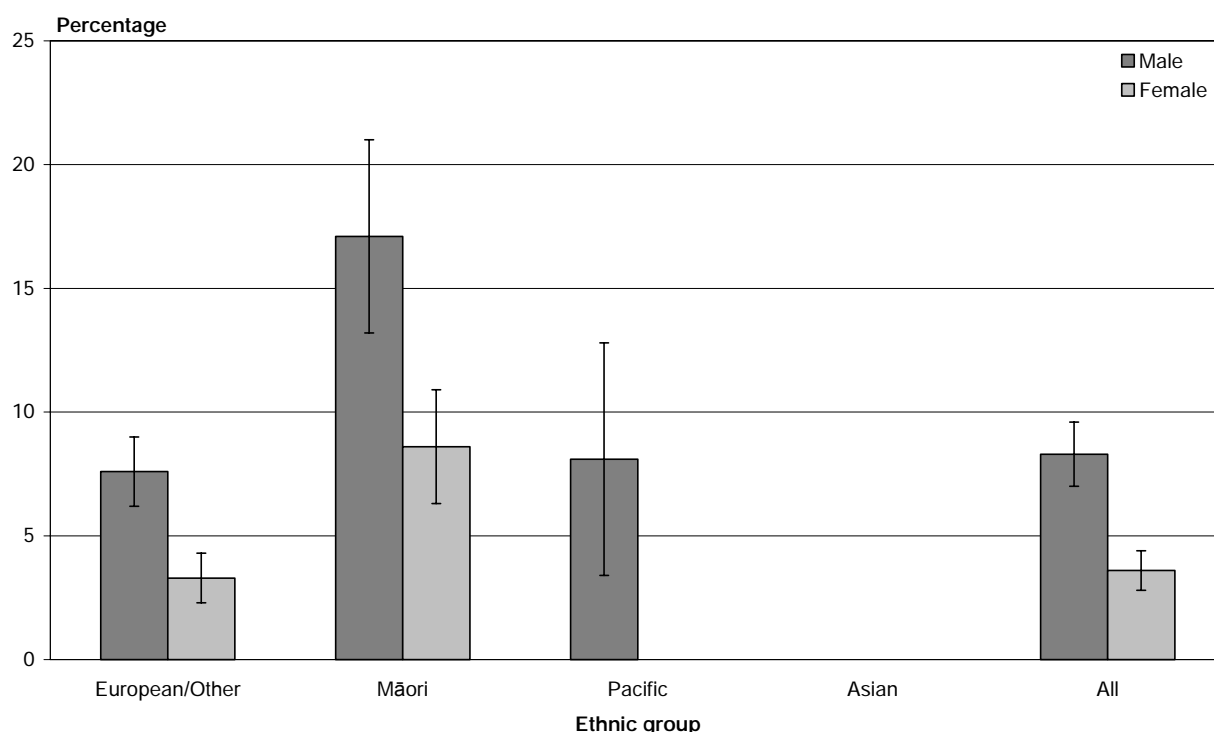
Overall, one in seven adults (14.2%; 13.2–15.1) had smoked marijuana in the last year and one in 19 adults (5.3%; 4.6–5.9) smoked marijuana regularly (ie, daily, weekly or fortnightly).

Males (8.3%; 6.9–9.6) were significantly more likely than females (3.6%; 2.8–4.4) to smoke marijuana regularly.

The following results are for regular marijuana smoking.

In both males and females, Māori were significantly more likely than other ethnic groups to smoke marijuana regularly (Figure 73).

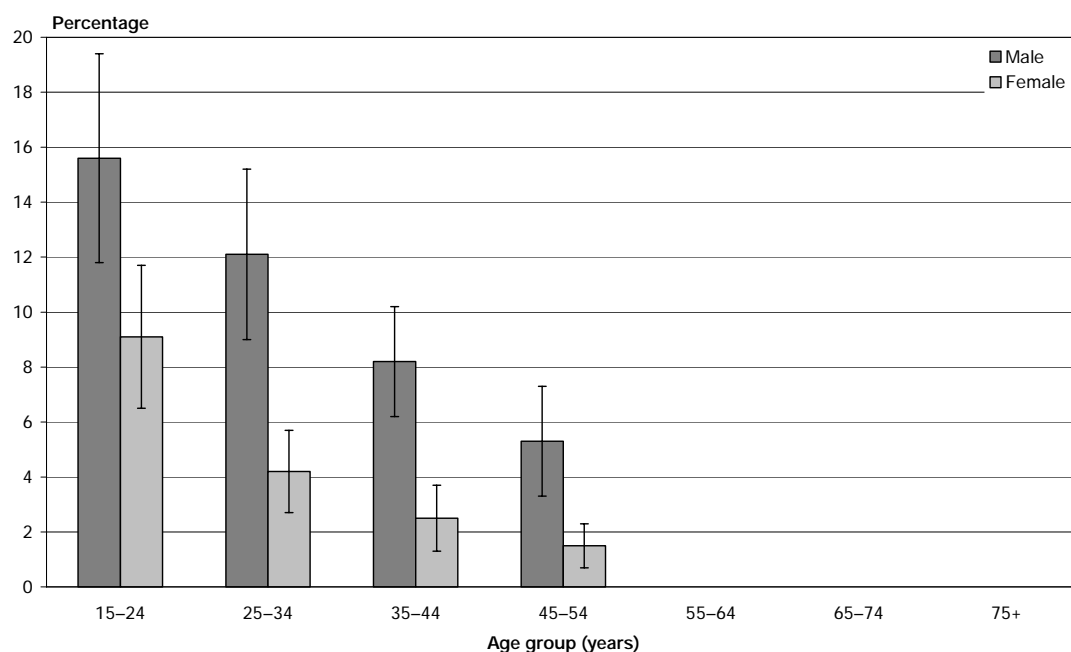
Figure 73: Regular marijuana smoking in adults, by ethnic group and sex (age-standardised)



Note: Data are not shown for Pacific females and Asian males and females due to low numbers.

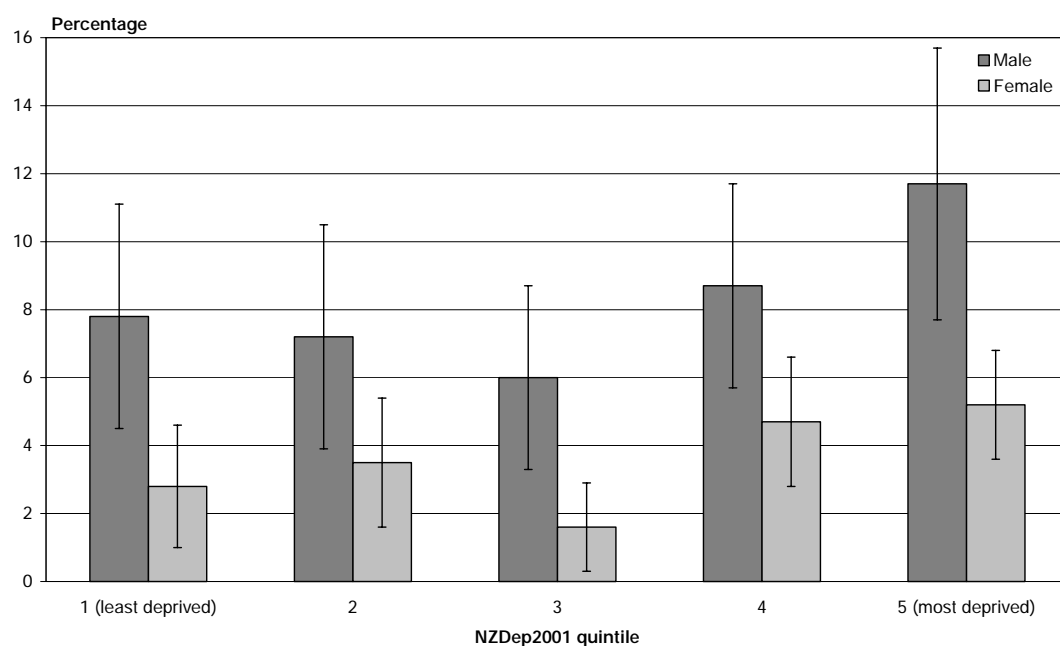
In both males and females, adults aged 15–24 years were most likely to smoke marijuana regularly (Figure 74).

Figure 74: Regular marijuana smoking in adults, by age group and sex



In both males and females, there was no significant difference in the proportion of adults who regularly smoke marijuana between NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived) (Figure 75).

Figure 75: Regular marijuana smoking in adults, by NZDep2001 quintile and sex (age-standardised)



Summary tables

Table 11 (male) and Table 12 (female) summarise the crude prevalence of selected risk and protective factors by ethnic group. Use these crude estimates if you want to know the actual burden experienced by the population of interest, but do not use them to compare one population subgroup (sex or ethnicity) with another.

Table 11: Prevalence (percent) of risk and protective factors, by ethnic group, males (crude)

	European/ Other	Māori	Pacific	Asian	All
Identified high blood pressure	20.9 (19.4–22.4)	20.2 (16.4–24.0)	11.6 (6.9–16.2)	11.1 (7.3–14.8)	19.9 (18.7–21.0)
Identified high cholesterol	17.6 (16.2–19.0)	12.9 (9.5–16.2)	7.7 (4.1–11.4)	11.7 (7.7–15.8)	16.3 (15.2–17.5)
Adequate vegetable intake	67.8 (65.2–70.5)	61.6 (56.4–66.7)	42.0 (33.2–50.9)	41.1 (33.5–48.8)	64.5 (62.4–66.7)
Adequate fruit intake	44.4 (42.1–46.8)	36.1 (30.7–41.5)	52.3 (44.4–60.2)	48.6 (42.6–54.6)	44.1 (42.1–46.2)
Physically active	78.3 (76.4–80.3)	80.5 (76.1–84.8)	76.9 (69.9–84.0)	68.7 (63.0–74.3)	77.9 (76.3–79.6)
Regularly physically active	56.5 (54.1–58.9)	61.2 (56.3–66.1)	53.9 (45.3–62.5)	44.0 (37.0–51.0)	56.2 (54.3–58.2)
Sedentary	11.2 (9.6–12.8)	11.4 (7.8–15.0)	9.4 (4.8–13.9)	15.5 (11.3–19.8)	11.4 (10.0–12.7)
Overweight	44.1 (42.0–46.2)	36.9 (31.8–41.9)	44.0 (36.8–51.2)	23.0 (16.8–29.3)	42.1 (40.1–44.1)
Obese	19.4 (17.9–21.0)	27.2 (22.3–32.1)	35.8 (28.8–42.9)	4.5 (2.0–7.0)	20.1 (18.7–21.5)
Overweight or obese	63.5 (61.4–65.7)	64.1 (59.2–69.0)	79.8 (73.0–86.6)	27.5 (21.0–34.1)	62.2 (60.3–64.1)
Abdominal obesity	27.7 (25.6–29.9)	35.6 (30.7–40.5)	45.7 (37.5–53.9)	5.8 (3.3–8.4)	28.1 (26.3–29.8)
Adult weight gain	57.7 (55.3–60.1)	61.6 (56.2–67.0)	69.9 (61.9–77.9)	41.4 (34.9–47.8)	57.7 (55.5–59.9)
Weight cycling	8.1 (6.8–9.3)	15.8 (11.4–20.2)	18.9 (13.2–24.5)	5.9 (2.3–9.4)	9.2 (8.1–10.3)
Hazardous drinking pattern in drinkers	24.6 (22.3–26.9)	38.0 (32.7–43.2)	32.5 (23.9–41.1)	7.5 (3.7–11.3)	25.4 (23.4–27.4)
Current smoker	20.2 (18.2–22.1)	46.1 (40.6–51.5)	38.5 (31.8–45.2)	20.2 (15.2–25.2)	23.7 (21.9–25.5)
Passive smoking	6.2 (4.9–7.4)	12.2 (8.6–15.7)	10.1 (5.4–14.8)	7.1 (3.4–10.7)	7.0 (5.9–8.2)
Marijuana use last 12 months	16.8 (15.2–18.3)	37.7 (32.6–42.8)	16.1 (9.1–23.1)	5.2 (2.0–8.3)	18.3 (16.8–19.7)
Regular marijuana use	6.3 (5.2–7.5)	19.9 (15.2–24.5)	9.7 (4.0–15.4)	–	7.7 (6.5–8.8)

Notes

1. When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

2. See main results for definitions of each risk and protective factor.

Table 12: Prevalence (percent) of risk and protective factors, by ethnic group, females (crude)

	European/ Other	Māori	Pacific	Asian	All
Identified high blood pressure	23.7 (22.3–25.1)	18.5 (15.7–21.3)	14.1 (10.1–18.0)	8.7 (5.1–12.3)	21.8 (20.5–23.0)
Identified high cholesterol	16.3 (15.2–17.5)	8.8 (7.1–10.4)	8.4 (5.4–11.3)	8.9 (4.9–12.9)	14.7 (13.7–15.7)
Adequate vegetable intake	76.8 (75.0–78.7)	66.6 (62.1–71.1)	39.3 (32.2–46.4)	49.1 (41.6–56.6)	72.3 (70.6–74.0)
Adequate fruit intake	66.1 (64.3–68.0)	54.4 (50.2–58.6)	56.7 (50.3–63.2)	64.1 (57.8–70.4)	64.3 (62.6–66.0)
Physically active	70.6 (68.5–72.8)	72.0 (67.0–77.0)	62.9 (55.6–70.2)	50.9 (44.1–57.8)	69.2 (67.3–71.1)
Regularly physically active	49.1 (47.0–51.2)	53.0 (48.5–57.6)	45.7 (37.5–53.9)	32.4 (26.1–38.7)	48.4 (46.4–50.4)
Sedentary	13.5 (12.1–14.9)	12.9 (8.6–17.3)	22.5 (15.8–29.1)	26.9 (20.4–33.4)	14.7 (13.3–16.1)
Overweight	28.5 (26.6–30.4)	31.7 (27.0–36.3)	36.2 (28.2–44.2)	17.5 (12.9–22.1)	28.4 (26.9–30.0)
Obese	21.0 (19.3–22.7)	26.8 (22.5–31.1)	47.2 (39.1–55.2)	5.7 (3.0–8.4)	21.7 (20.3–23.2)
Overweight or obese	49.5 (47.5–51.6)	58.5 (54.0–63.0)	83.4 (78.1–88.6)	23.2 (18.0–28.4)	50.2 (48.4–51.9)
Abdominal obesity	34.1 (32.3–35.9)	52.3 (47.8–56.8)	76.0 (68.3–83.6)	16.0 (11.3–20.8)	36.6 (34.9–38.3)
Adult weight gain	55.6 (53.6–57.6)	66.7 (62.8–70.5)	66.6 (60.6–72.7)	38.9 (33.4–44.5)	56.3 (54.7–57.9)
Weight cycling	18.2 (16.8–19.7)	25.1 (21.9–28.2)	29.1 (23.1–35.1)	5.5 (3.0–8.0)	18.7 (17.5–19.9)
Hazardous drinking pattern in drinkers	8.8 (7.7–9.9)	20.6 (16.3–24.8)	8.7 (4.6–12.8)	–	9.7 (8.6–10.7)
Current smoker	18.6 (17.2–20.0)	53.2 (48.5–57.8)	32.6 (26.4–38.9)	3.9 (1.8–6.0)	22.2 (20.9–23.4)
Passive smoking	5.2 (4.2–6.2)	8.4 (5.7–11.2)	16.3 (11.6–21.1)	11.3 (6.7–15.9)	6.4 (5.6–7.3)
Marijuana use last 12 months	9.2 (8.0–10.5)	25.8 (21.6–30.0)	6.3 (3.1–9.4)	–	10.4 (9.3–11.5)
Regular marijuana use	2.4 (1.7–3.1)	10.0 (7.3–12.7)	–	–	3.1 (2.5–3.7)

Notes

1. When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.
2. See main results for definitions of each risk and protective factor.

Table 13 (male) and Table 14 (female) summarise the age-standardised prevalence of selected risk and protective factors by ethnic group. Note that age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup (sex or ethnicity) with another.

Table 13: Prevalence (percent) of risk and protective factors in adult males, by ethnic group (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Identified high blood pressure	17.6 (16.2–19.0)	23.7 (19.6–27.8)	16.2 (11.0–21.4)	14.4 (9.5–19.4)	18.0 (16.9–19.1)
Identified high cholesterol	14.6 (13.4–15.8)	15.9 (12.0–19.7)	9.5 (4.8–14.1)	13.4 (9.0–17.9)	14.5 (13.4–15.5)
Adequate vegetable intake	65.9 (62.7–69.0)	63.4 (58.3–68.5)	42.9 (35.0–50.8)	42.6 (34.4–50.8)	63.3 (60.8–65.8)
Adequate fruit intake	43.3 (40.6–45.9)	36.8 (31.2–42.5)	53.5 (46.1–61.0)	48.5 (41.3–55.7)	43.3 (41.1–45.6)
Physically active	79.2 (77.1–81.3)	79.7 (75.4–84.0)	74.8 (66.9–82.7)	67.8 (61.9–73.7)	78.4 (76.6–80.2)
Regularly physically active	57.5 (54.7–60.2)	59.7 (54.7–64.8)	51.7 (43.6–59.8)	44.3 (37.8–50.9)	56.7 (54.5–58.9)
Sedentary	10.4 (8.8–12.0)	11.5 (7.9–15.0)	10.9 (5.4–16.5)	17.0 (12.1–21.9)	10.9 (9.5–12.3)
Overweight	41.9 (39.5–44.4)	38.0 (32.7–43.4)	43.9 (37.2–50.6)	23.2 (16.8–29.6)	40.5 (38.3–42.8)
Obese	18.0 (16.3–19.6)	29.0 (23.9–34.1)	38.0 (31.1–44.8)	4.3 (2.0–6.6)	19.2 (17.7–20.6)
Overweight or obese	59.9 (57.4–62.4)	67.0 (62.3–71.7)	81.8 (75.8–87.8)	27.5 (20.9–34.2)	59.7 (57.5–61.9)
Abdominal obesity	24.6 (22.7–26.6)	38.6 (33.6–43.7)	52.2 (44.8–59.6)	6.4 (3.5–9.4)	26.2 (24.5–27.9)
Adult weight gain	56.4 (53.7–59.0)	62.6 (57.3–68.0)	70.4 (62.6–78.2)	41.1 (34.8–47.5)	56.8 (54.4–59.1)
Weight cycling	7.8 (6.5–9.1)	17.0 (12.5–21.5)	22.2 (15.3–29.1)	6.5 (2.4–10.6)	9.3 (8.1–10.4)
Hazardous drinking pattern	27.3 (24.5–30.2)	34.5 (29.8–39.2)	30.8 (22.1–39.6)	6.8 (3.5–10.1)	27.1 (24.7–29.5)
Current smoker	21.3 (19.1–23.5)	42.9 (37.8–47.9)	34.8 (27.8–41.8)	18.9 (14.0–23.7)	24.0 (22.0–26.0)
Passive smoking	6.8 (5.3–8.2)	12.2 (8.8–15.6)	10.0 (5.2–14.9)	6.5 (2.9–10.2)	7.5 (6.2–8.7)
Marijuana use last 12 months	20.2 (18.2–22.3)	32.9 (28.5–37.3)	13.4 (7.7–19.2)	4.3 (1.8–6.9)	20.4 (18.6–22.2)
Regular marijuana use	7.6 (6.1–9.0)	17.1 (13.2–21.0)	8.1 (3.4–12.9)	–	8.3 (6.9–9.6)

Notes

1. When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.
2. See main results for definitions of each risk and protective factor.

Table 14: Prevalence (percent) of risk and protective factors in adult females, by ethnic group (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Identified high blood pressure	19.2 (17.7–20.6)	23.9 (20.6–27.3)	18.2 (13.0–23.4)	13.1 (7.5–18.8)	19.3 (18.0–20.5)
Identified high cholesterol	13.2 (12.2–14.2)	12.0 (9.7–14.3)	11.1 (6.9–15.2)	12.3 (6.7–18.0)	12.9 (12.0–13.8)
Adequate vegetable intake	75.1 (72.9–77.3)	67.6 (63.0–72.2)	39.4 (32.2–46.7)	49.6 (41.4–57.7)	71.1 (69.1–73.1)
Adequate fruit intake	65.2 (63.1–67.3)	54.6 (50.3–58.8)	57.5 (50.8–64.2)	64.7 (57.5–71.8)	63.6 (61.8–65.5)
Physically active	71.7 (69.4–74.0)	70.7 (65.7–75.7)	61.2 (53.5–68.8)	52.2 (44.2–60.2)	69.9 (67.9–71.9)
Regularly physically active	49.6 (47.4–51.9)	51.2 (46.9–55.6)	44.0 (35.9–52.1)	33.6 (26.3–40.8)	48.6 (46.5–50.6)
Sedentary	12.0 (10.6–13.5)	13.5 (9.2–17.8)	23.9 (17.1–30.6)	26.7 (19.3–34.2)	13.6 (12.2–15.1)
Overweight	26.9 (24.9–28.9)	33.7 (28.7–38.6)	34.8 (27.1–42.6)	19.5 (13.7–25.3)	27.5 (25.8–29.2)
Obese	19.8 (18.0–21.6)	27.5 (23.0–32.1)	47.8 (39.8–55.9)	6.9 (3.2–10.6)	21.0 (19.5–22.5)
Overweight or obese	46.7 (44.3–49.1)	61.2 (56.9–65.5)	82.6 (76.6–88.6)	26.4 (19.7–33.1)	48.5 (46.4–50.5)
Abdominal obesity	30.8 (28.8–32.8)	54.4 (50.0–58.8)	76.6 (68.6–84.6)	19.6 (13.4–25.9)	34.6 (32.7–36.4)
Adult weight gain	52.5 (50.4–54.6)	67.9 (64.1–71.8)	67.6 (61.6–73.7)	39.7 (33.4–46.1)	54.1 (52.4–55.8)
Weight cycling	17.5 (16.0–19.0)	25.7 (22.4–29.0)	28.7 (23.0–34.5)	6.5 (2.7–10.3)	18.2 (17.0–19.5)
Hazardous drinking pattern	11.4 (10.0–12.9)	18.4 (14.6–22.2)	7.6 (4.0–11.3)	–	11.4 (10.1–12.7)
Current smoker	19.9 (18.3–21.6)	51.1 (46.8–55.3)	31.6 (25.3–37.8)	3.6 (1.7–5.6)	22.9 (21.5–24.3)
Passive smoking	6.1 (4.8–7.5)	8.5 (5.6–11.4)	16.0 (11.1–21.0)	11.0 (6.2–15.7)	7.1 (6.0–8.2)
Marijuana use last 12 months	12.4 (10.7–14.1)	22.5 (18.8–26.2)	5.3 (2.6–8.0)	–	12.5 (11.1–13.9)
Regular marijuana use	3.3 (2.3–4.3)	8.6 (6.3–11.0)	–	–	3.6 (2.8–4.4)

Notes

1. When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.
2. See the main results for definitions of each risk and protective factor.

References

Babor TF, de la Fuente JR, Saunders J, et al. 1992. *AUDIT. The Alcohol Use Disorder Identification Test. Guidelines for Primary Care*. Geneva: World Health Organization.

Hillary Commission. 2001. *Active Communities*. Wellington: Hillary Commission for Sport, Fitness and Leisure.

Ministry of Health. 2003. *Food and Nutrition Guidelines for Health Adults: a background paper*. Wellington: Ministry of Health.

Saunders JB, Aasland OG, Babor TF, et al. 1993. Development of the Alcohol Use Disorders Screening Test (AUDIT). WHO collaborative project on early detection of persons with harmful alcohol consumption. II. *Addiction* 88: 791–804.

Swinburn B. 1998. Using the body mass index: weigh then weigh up. *New Zealand Medical Journal* 111: 377–9.

WHO. International Association for the Study of Obesity. 2000. *The Asia-Pacific perspective: Redefining obesity and its treatment*. World Health Organization.

Chapter 4: Health Service Utilisation

Introduction

This section covers a wide range of health care providers, with a particular focus on primary health care providers. Primary health care providers are a person's first point of contact with the health system and include general practitioner services, Māori and Pacific health care providers, practice nurses, pharmacists, complementary and alternative health care providers, and a range of other providers (eg, dentists and physiotherapists). In addition to primary health care providers, this section also includes medical specialists and hospital use.

In this survey, the use of health services was determined by asking adults if they had seen certain health care providers or workers in the last 12 months. If they had, they were asked additional questions such as the number of times they had visited, the reasons for their last visit, why they had selected a particular type of provider, their satisfaction with the consultation and reasons for any dissatisfaction, and whether they felt they needed to see a health practitioner for some reason but did not (unmet health need) and the reasons for this.

Key results are presented by sex and ethnicity. The following ethnic groups are used: European/Other, Māori, Pacific and Asian. Selected results are also presented by sex and 10-year age group, and by sex and NZDep2001 quintile. Additional results are included in datacubes.

Ninety-five percent confidence intervals are presented for all descriptive results after the estimate in the text or summary tables at the end of the chapter, or as error bars in graphs (except where otherwise noted). When a difference between population subgroups is referred to as significant, it means the difference is statistically significant at the 95 percent confidence level (ie, the 95 percent confidence intervals do not overlap).

All results presented by sex, ethnicity and NZDep2001 in the body of this report have been age-standardised by the direct method using the WHO World Population as the standard population. This is to allow comparisons between population subgroups without differences in the age distribution of the comparison populations influencing results. However, age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup with another.

If you want to know the actual use of health services by the population of interest, use the crude (unadjusted) estimates shown in the summary tables at the end of this chapter or in the datacubes.

Results

Key points

- Nine out of 10 adults have a health practitioner or service they usually first go to see when they are feeling unwell or are injured.
- Asian peoples were significantly less likely than European/Other, Māori and Pacific ethnic groups to have a usual health practitioner.
- One in seven Māori adults had visited a Māori health provider in the last 12 months.
- One in 11 Pacific adults had visited a Pacific health provider in the last 12 months.
- Eight out of 10 adults had visited a general practitioner (GP) in the last 12 months.
- The most common reasons for visiting a GP were a short-term condition, routine check-up or a chronic condition or disability.
- Seven out of 10 adults were given a prescription by their GP on their last visit.
- The most common cost of a GP visit was \$31–40.
- The average number of visits to a GP in the last 12 months was four.
- One in eight adults needed to see a GP in the last 12 months, but did not see one.
- The most common reasons for not seeing a GP when needed were high cost and inconvenience.
- Three out of 10 adults had seen a medical specialist in the last 12 months.
- Four out of 10 adults had seen a practice nurse in the last 12 months.
- Seven out of 10 adults had received a prescription for themselves in the last 12 months.
- One in six adults who received a prescription did not collect one or more of their prescription items from the chemist.
- One in four adults had seen a complementary or alternative health care worker in the last 12 months.
- The most common types of complementary or alternative health care workers were massage therapists, chiropractors and osteopaths.
- Four out of 10 adults had seen a dentist or dental therapist in the last 12 months.
- One in five adults had seen an optician or optometrist in the last 12 months.
- One in seven adults had seen a physiotherapist in the last 12 months.
- One in five adults had used a service at, or been admitted to, a public hospital in the last 12 months.
- One in 16 adults had used a service at, or been admitted to, a private hospital in the last 12 months.

General

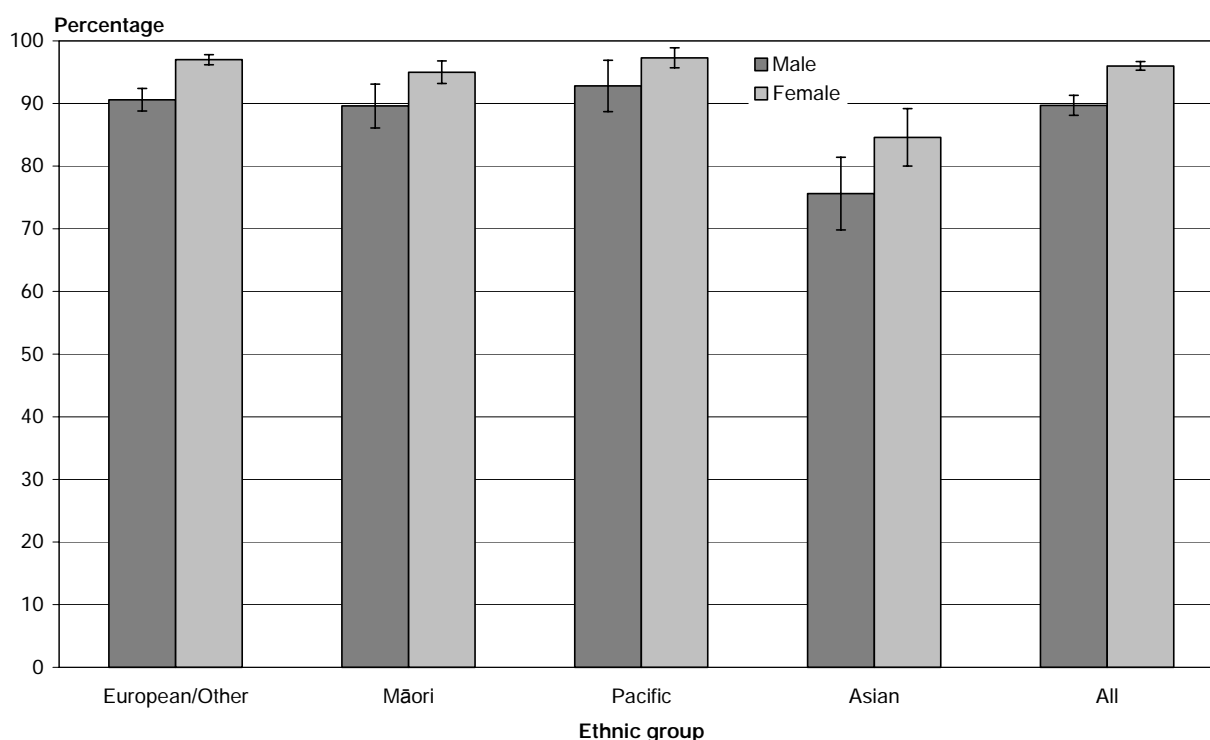
Usual health practitioner

Participants were asked whether they have a health practitioner or service that they usually first go to see when they are feeling unwell or injured, and what sort of practitioner this was.

Overall, nine out of 10 adults (93.5%; 92.7–94.2) reported they had a usual health practitioner. Females (96.0%; 95.3–96.8) were significantly more likely than males (89.7%; 88.1–91.4) to have a usual health practitioner.

In both males and females, Pacific, European/Other and Māori ethnic groups were significantly more likely to have a usual health practitioner than Asian peoples (Figure 76).

Figure 76: Have usual health practitioner, by ethnic group and sex (age-standardised)



Among adults who had a usual health practitioner, almost all (97.1%; 96.6–97.6) had a general practitioner (GP) as their usual health practitioner. Males (97.2%; 96.4–98.0) and females (96.6%; 95.8–97.3) were equally likely to have a GP as their usual health practitioner.

Males from European/Other (97.2%; 96.3–98.1), Māori (97.0%; 94.9–99.0), Pacific (98.6%; 97.0–100.0) and Asian (96.0%; 93.1–98.8) ethnic groups were similarly likely to have a GP as their usual health practitioner. Māori females (93.9%; 91.3–96.5) were less likely to have a GP as their usual health practitioner than European/Other (96.7%; 95.8–97.6), Pacific (98.6%; 97.4–99.8) and Asian (98.0%; 96.5–99.5) females.

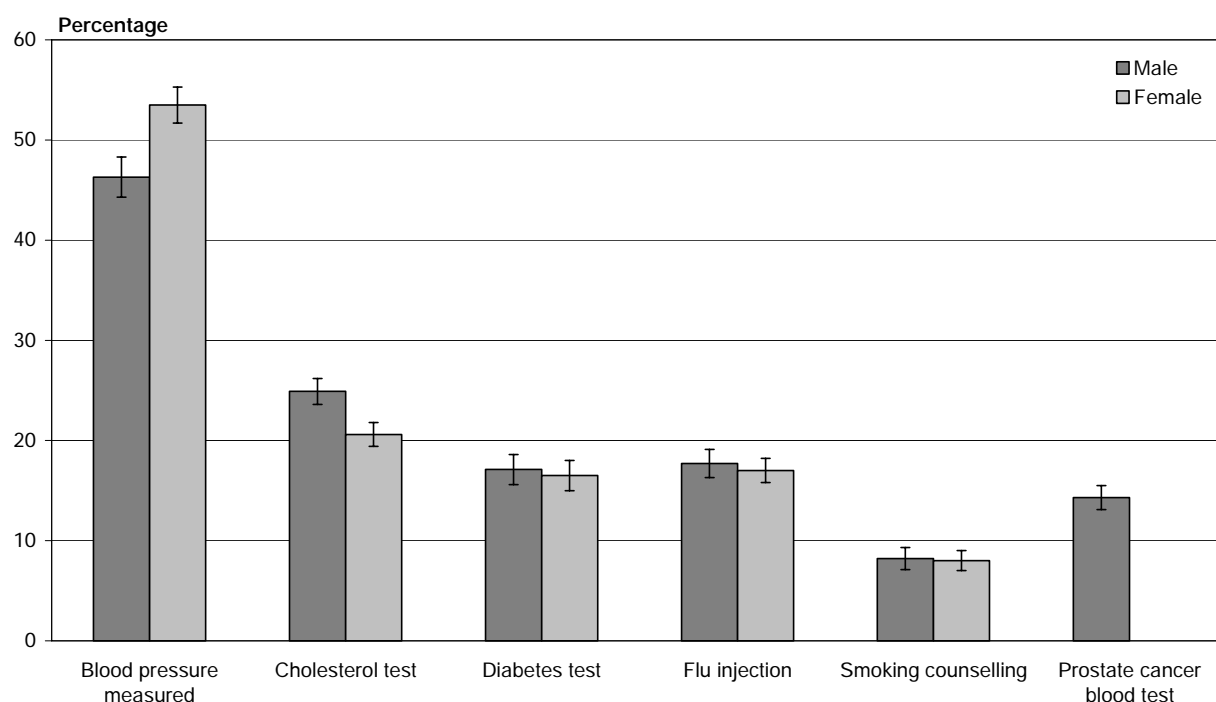
Health checks

Overall, in the last 12 months:

- one in two adults (52.0%; 50.7–53.3) had their blood pressure measured
- one in four adults (25.1%; 24.2–26.0) had their cholesterol tested
- one in six adults (17.8%; 16.7–18.9) had a diabetes test
- one in five adults (19.8%; 18.8–20.8) had a flu injection and six out of 10 adults aged 65 years and over (60.5%; 57.8–63.2) had a flu injection
- one in seven males (14.3%; 13.1–15.5) had a blood test for prostate cancer and over one-third of males aged 65 years and over (37.9%; 33.6–42.2) had a blood test for prostate cancer
- one in 13 adults (7.9%; 7.3–8.5) had been counselled about smoking.

Females were significantly more likely than males to have had their blood pressure measured, whereas males were significantly more likely to have had their cholesterol tested (Figure 77). There was no significant difference in the proportion of males and females who had had a diabetes test or flu injection or been counselled about smoking.

Figure 77: Health checks in the last 12 months, by sex (age-standardised)



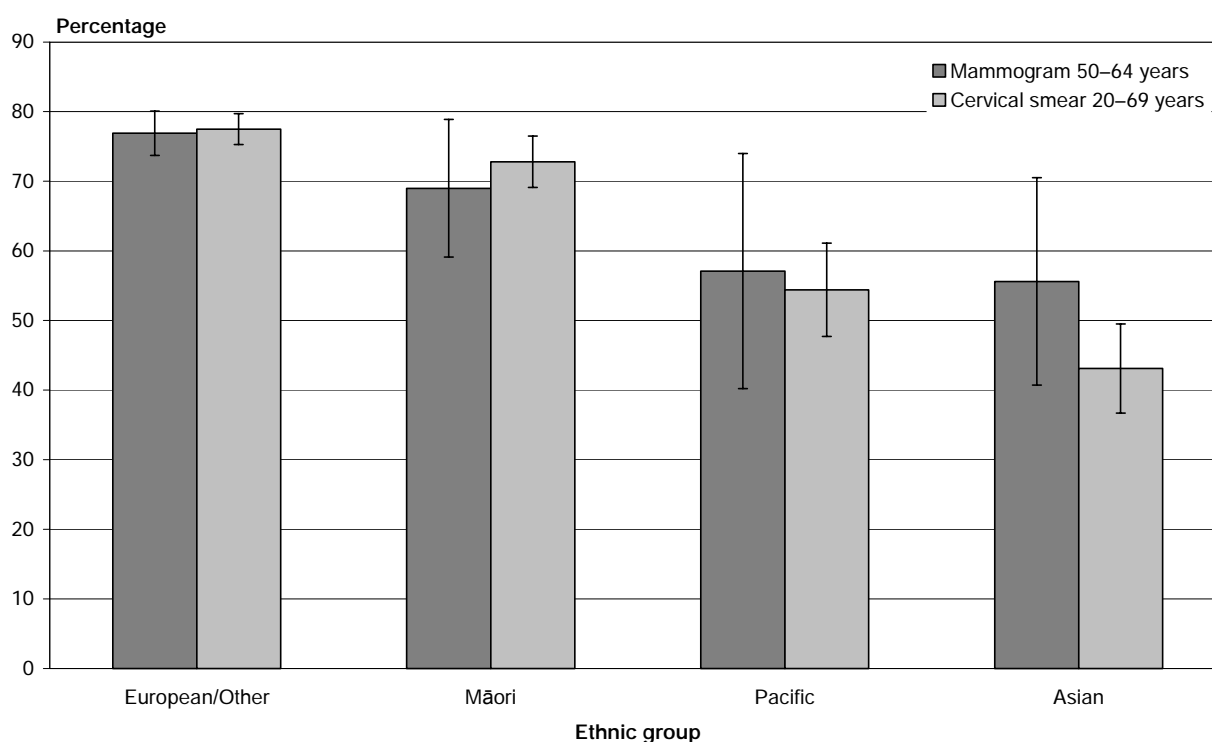
Mammograms and cervical smears (females)

BreastScreen Aotearoa provides a free mammogram (breast x-ray) every two years to all females aged 50–64 years to help check for early breast cancer. The National Cervical Screening Programme recommends that all women who have ever been sexually active have regular (every three years) cervical smear tests from the time they turn 20 until they turn 70 years old.

Overall, three out of four females (74.4%; 71.6–77.1) aged 50–64 years reported having a mammogram in the last three years. European/Other females were most likely to have had a mammogram in the last three years, followed by Māori, Pacific and Asian females, although the only significant difference was between European/Other and Asian females (Figure 78).

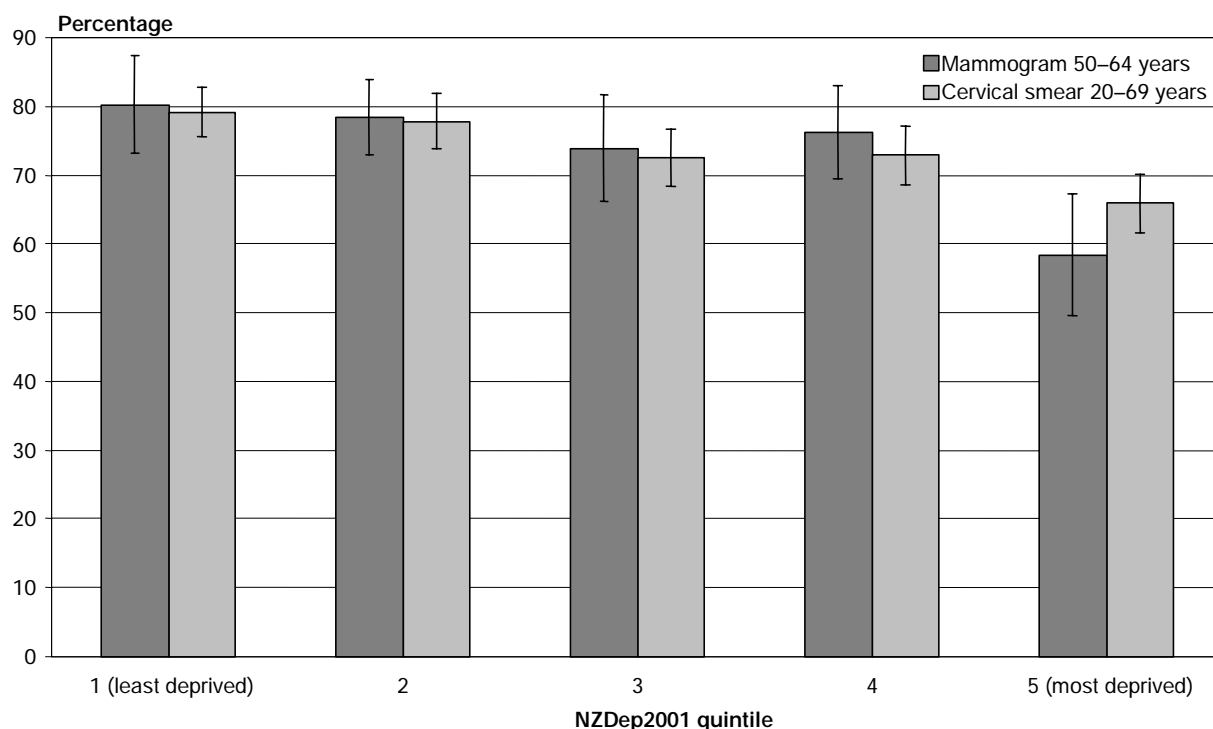
Overall, three out of four females (74.0%; 72.5–75.5) aged 20–69 years who had not had a hysterectomy reported having a cervical smear in the last three years. European/Other and Māori females were significantly more likely than Pacific and Asian females to have had a cervical smear in the last three years (Figure 78).

Figure 78: Mammogram or cervical smear in the last three years, by ethnic group (age-standardised)



Eligible females living in NZDep2001 quintile 1 (least deprived) were significantly more likely than eligible females living in quintile 5 (most deprived) to have had a mammogram or cervical smear in the last three years (Figure 79).

Figure 79: Mammogram or cervical smear in the last three years, by NZDep2001 quintile (age-standardised)



Access

Overall, one in 17 adults (5.9%; 5.3–6.5) had found it hard to find out who to go to, or what help they could get, for a health problem or disability in the last 12 months.

Females (7.9%; 6.9–8.9) were significantly more likely than males (4.4%; 3.5–5.4) to find it hard to find out who to go to, or what help they could get, for a health problem or disability.

Māori health providers

A Māori health provider is an organisation (ie, not an individual) that delivers health services mainly for Māori and is managed by Māori. An individual health care worker from the organisation is usually of Māori ethnicity, but this is not a requirement. Individual health care workers who may be Māori but are working for general practices or hospitals are not classed as Māori health providers.

The following results are restricted to Māori adults as it was not possible to provide reliable estimates for other ethnic groups due to the small number of non-Māori adults using these services.

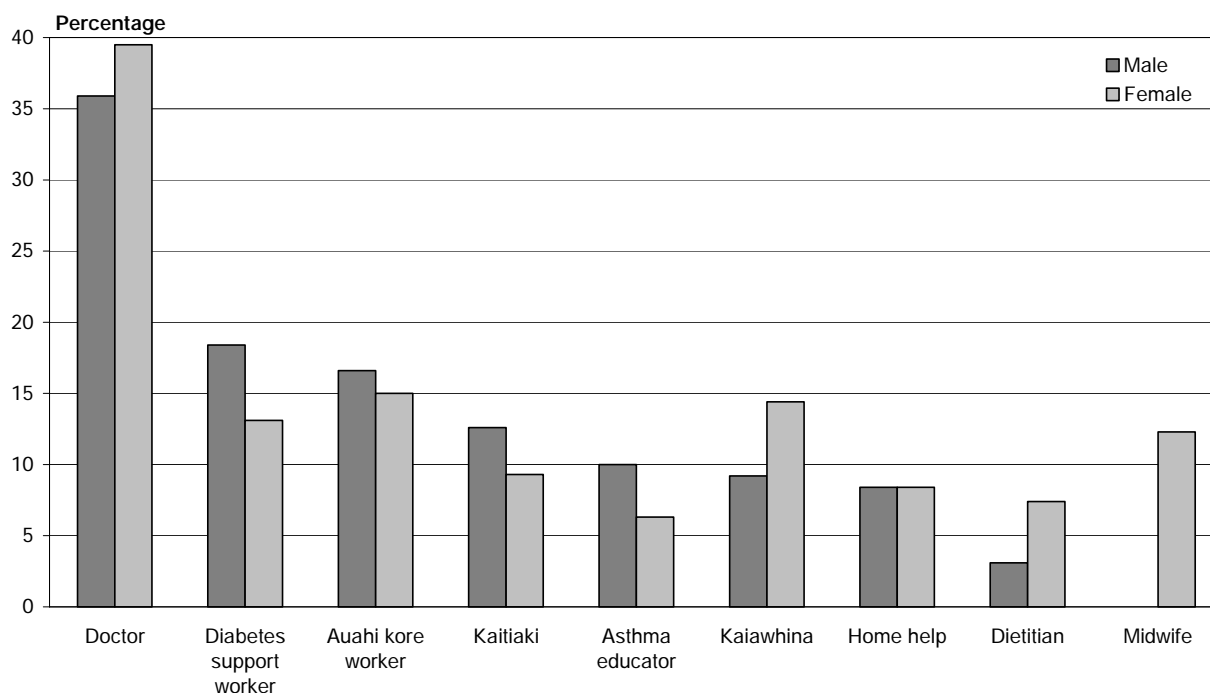
Use of Māori health provider services

Overall, one in seven Māori adults (13.7%; 11.3–16.0) had seen a health care worker from a Māori health provider in the last 12 months.

Māori females (16.3%; 12.9–19.8) were more likely than Māori males (12.3%; 8.9–15.6) to visit a Māori health provider, although this difference was not significant.

Doctors were the most common type of health care worker seen at a Māori health provider (Figure 80).

Figure 80: Type of health care worker seen at Māori health provider, by Māori adults, by sex (age-standardised)

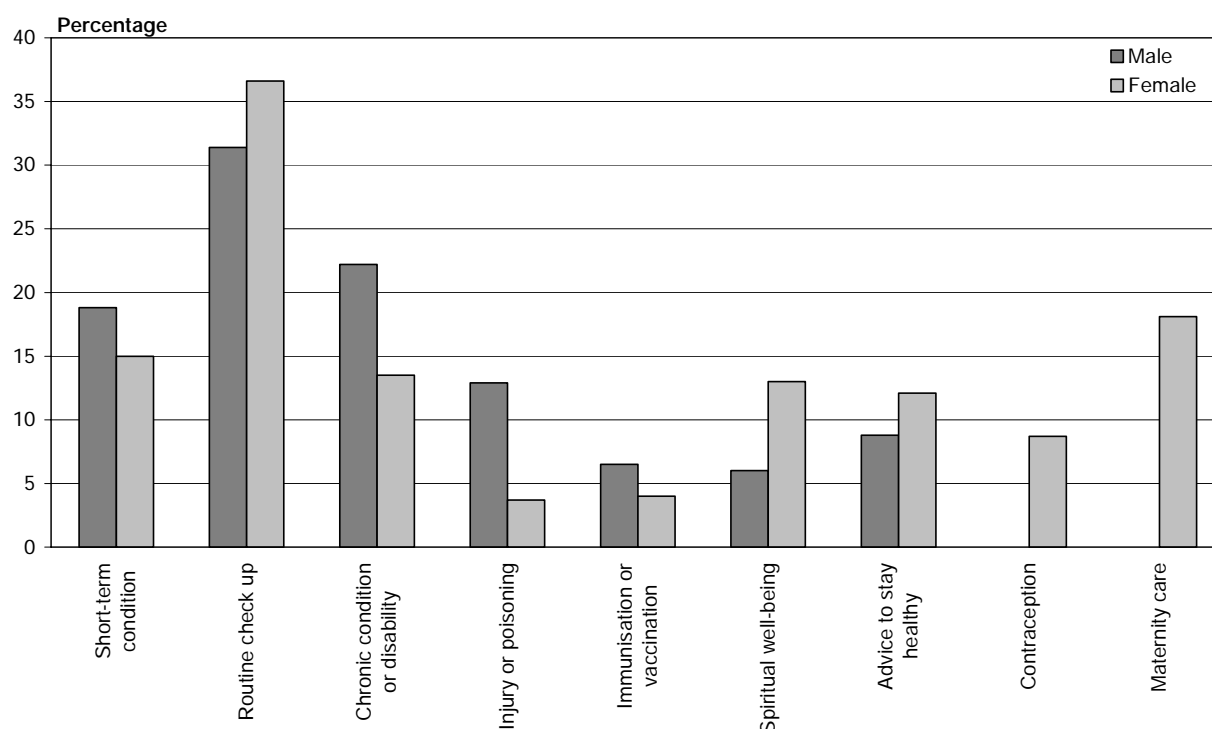


Note: Error bars are not shown because the 95 percent confidence intervals were wide and often included zero.

Reasons for visiting Māori health provider

A routine check-up was the most common reason Māori males and females gave for visiting a Māori health provider (Figure 81).

Figure 81: Reasons for last visit to Māori health provider, by Māori adults, by sex (age-standardised)



Note: Error bars are not shown because the 95 percent confidence intervals were wide and often included zero.

Reasons for choosing Māori health provider

Overall, the main reasons given by Māori adults for choosing a Māori health provider were:

- “I feel more comfortable talking to someone who understands my culture” (34.5%; 25.9–43.1)
- “it was cheaper than going to another provider” (27.3%; 21.2–33.4)
- “I was referred to them by a friend or relative” (25.9%; 19.3–32.5)
- “they are interested in the impact that my health and its treatments has on my whānau or family” (25.5%; 17.5–33.4)
- “I find they are willing to spend more time discussing my health” (18.3%; 12.6–24.1)
- “they were the closest provider” (14.9%; 10.0–19.7)
- “they offer specialist services that I need” (11.6%; 7.2–16.1)
- “I was referred to them by my doctor” (10.0%; 5.8–14.1).

Satisfaction with Māori health provider

Among Māori adults who had seen a Māori health provider about their health in the last 12 months, almost all were very satisfied (55.3%; 46.9–63.6) or satisfied (36.9%; 31.8–47.3) with the consultation.

The most common reason for any dissatisfaction with a Māori health provider was that the doctor did not spend enough time or was not thorough enough.

Unmet need for Māori health provider

Overall, one in 17 Māori adults (5.9%; 4.3–7.6) said they had wanted or needed to see a Māori health provider in the last 12 months, but were not able to.

Māori females (8.2%; 5.3–11.2) were significantly more likely than Māori males (3.2%; 1.6–4.7) to report an unmet need for a Māori health provider.

The most common reasons given by Māori adults for not being able to see a Māori health provider when needed were:

- “couldn’t get an appointment soon enough or at a suitable time or it was after hours” (33.3%; 18.5–48.1)
- “had no transport to get there” (31.5%; 16.5–46.6)
- “I couldn’t spare the time” (11.5%; 4.1–18.8)
- “didn’t want to make a fuss or couldn’t be bothered” (18.7%; 3.0–34.4)
- “couldn’t get in touch with the provider” (15.8%; 6.8–24.9)
- “costs too much” (12.2%; 3.2–21.2).

Pacific health providers

A Pacific health provider is an organisation (ie, not an individual) that delivers health services mainly for Pacific peoples and is managed by Pacific peoples. An individual health care worker is usually of Pacific ethnicity, but this is not a requirement. Individual health care workers who may be of Pacific ethnicity, but who are working for general practices or hospitals are not classed as Pacific health providers.

The following results are restricted to Pacific adults as it was not possible to provide reliable estimates for other ethnic groups due to the small number of non-Pacific adults using these services.

Use of Pacific health provider services

Overall, one in 11 Pacific adults (9.4%; 5.8–13.0) had seen a health care worker at a Pacific health provider in the last 12 months.

Pacific males (9.0%; 3.5–14.5) and females (10.4%; 6.6–14.2) were similarly likely to have seen a health care worker at a Pacific health provider in the last 12 months.

Among Pacific adults visiting a Pacific health provider, the most common types of health care worker seen were:

- doctors (60.8%; 36.4–85.2)
- nurses (17.2%; 5.1–29.2)
- health promoters (10.7%; 0.0–23.0).

Reasons for visiting Pacific health provider

The most common reasons Pacific adults gave for seeing a health care worker at a Pacific health provider were:

- a routine check-up or health advice (51.1%; 35.6–66.6)
- a short-term illness or temporary condition (27.4%; 7.7–47.1)
- a disability, long-term illness or chronic condition (15.4%; 4.7–26.0).

Reasons for choosing Pacific health provider

The main reasons given by Pacific adults for choosing a Pacific health provider were:

- “I feel more comfortable talking to someone who understands my culture” (74.4%; 57.9–90.9)
- “it was cheaper than going to another provider” (37.7%; 18.2–57.3)
- “I find they are willing to spend more time discussing my health” (31.8%; 15.0–48.5)
- “they are interested in the impact that my health and its treatments has on my aiga or family” (25.9%; 15.5–36.3)
- “they were the closest provider” (14.6%; 2.7–26.5)
- “I was referred to them by a friend or relative” (11.9%; 2.7–21.1).

Satisfaction with Pacific health provider

Overall, almost all Pacific adults who saw a Pacific health provider about their health were very satisfied (43.6%; 25.8–61.3) or satisfied (55.5%; 37.8–73.3) with the consultation.

Of the few Pacific adults dissatisfied or very dissatisfied with the consultation, the reasons given were:

- “costs too much”
- “didn’t like doctor or couldn’t talk to doctor or doctor wouldn’t listen”.

Unmet need for Pacific health provider

Overall, one in 32 Pacific adults (3.1%; 1.3–4.9) said they had wanted or needed to see a Pacific health provider in the last 12 months, but were not able to.

There was no difference in the proportion of Pacific males (3.2%; 0.0–6.7) and females (3.3%; 0.9–5.7) that reported an unmet need for a Pacific health provider.

Among the few Pacific adults who reported an unmet need for a Pacific health provider, the most common reasons given were:

- “couldn’t get in touch with the provider”
- “none in my area”
- “couldn’t get an appointment soon enough or at a suitable time or it was after hours”
- “had no transport to get there”.

General practitioners

Most GPs or family doctors work in clinics based in the community. GPs provide a range of primary health care services, as well as referring patients to medical specialists and hospitals.

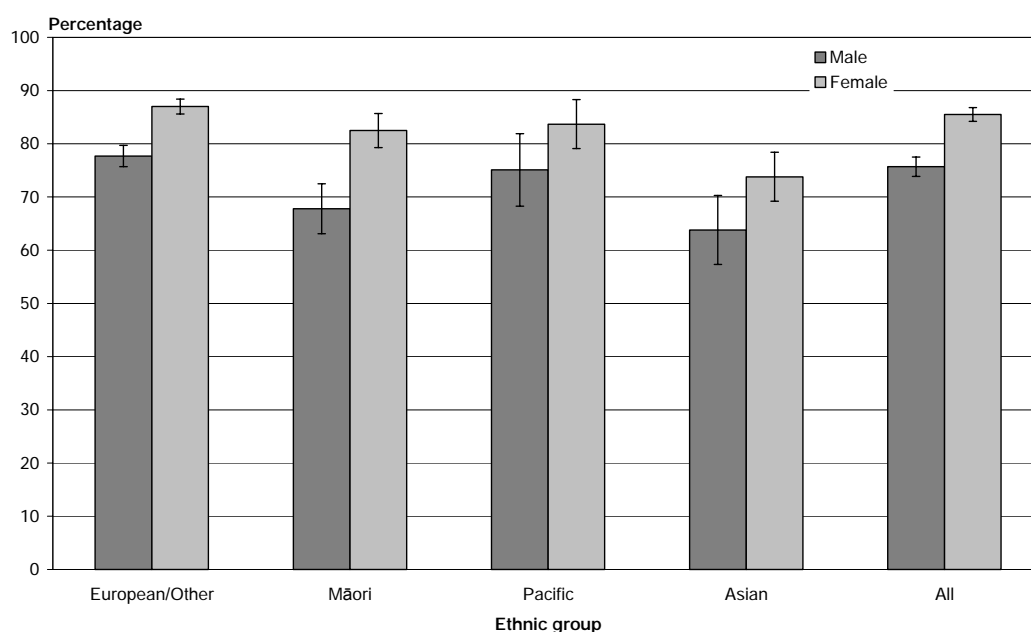
Use of general practitioner services

Overall, eight out of 10 adults (80.8%; 79.8–81.8) had visited a GP in the last 12 months. Almost all GPs or family doctors (96.1%; 95.4–96.8) who were visited were based at a mainstream practice.

Females (85.5%; 84.2–86.8) were significantly more likely than males (75.7%; 73.9–77.5) to have visited a GP in the last 12 months.

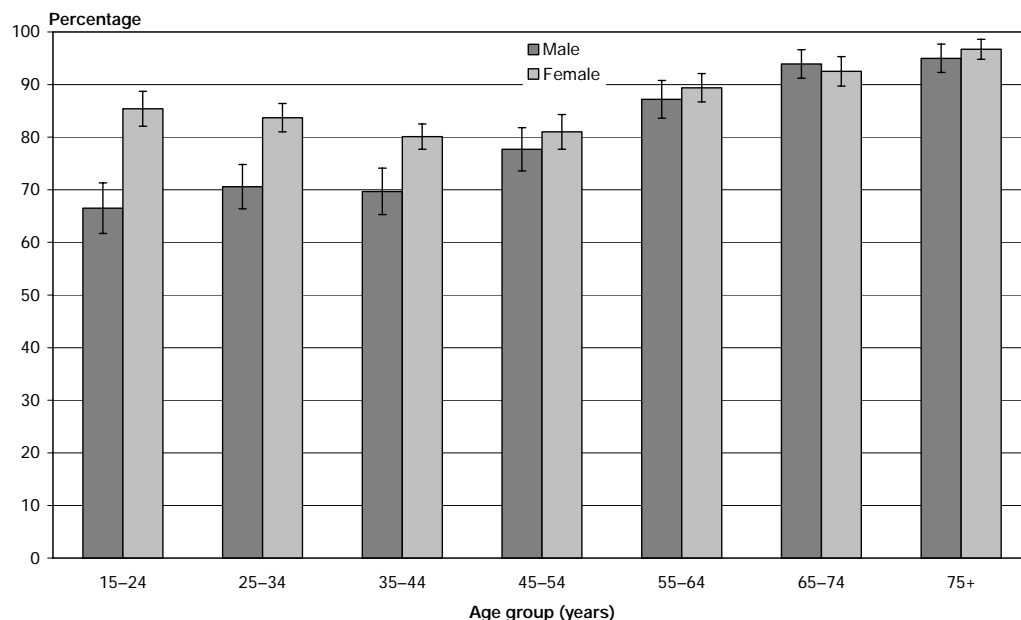
European/Other males were significantly more likely to have visited a GP in the last 12 months than Māori and Asian males (Figure 82). Asian females were significantly less likely to have visited a GP than females from other ethnic groups.

Figure 82: Seen a general practitioner in the last 12 months, by ethnic group and sex (age-standardised)



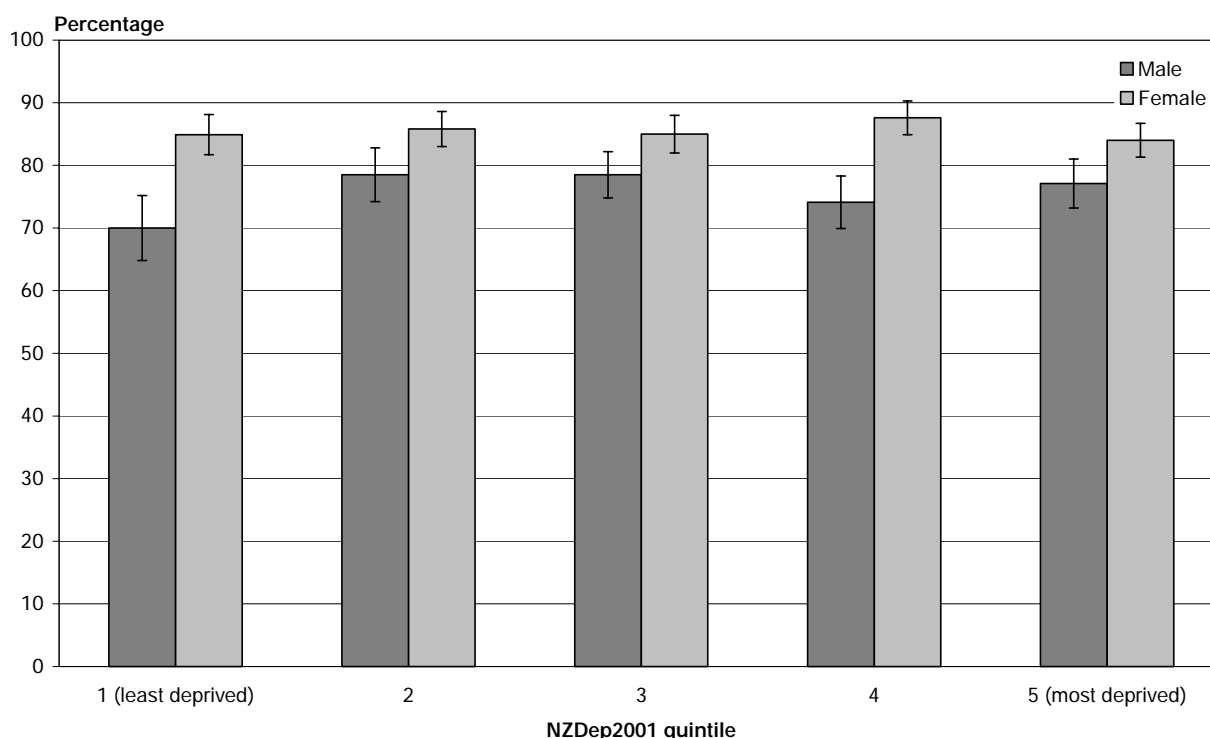
In both males and females, adults aged 65 years and over were significantly more likely than adults aged 15–24 years to have seen a GP in the last 12 months (Figure 83). Up to age 44 years, females were significantly more likely than males to have seen a GP in the last 12 months.

Figure 83: Seen a general practitioner in the last 12 months, by age group and sex



In both males and females, there was no significant difference in the use of GP services between NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived) (Figure 84).

Figure 84: Seen a general practitioner in the last 12 months, by NZDep2001 quintile and sex (age-standardised)



Number of visits

Overall, the mean number of GP visits among adults who had seen a GP in the last 12 months was four visits (3.8–4.1).

The mean number of visits to a GP was significantly higher in females (4.3 visits; 4.1–4.5) than in males (3.5 visits; 3.3–3.8).

In males, the mean number of GP visits was highest in Māori (4.2 visits; 3.7–4.8), followed by Pacific (4.1 visits; 3.3–5.0), Asian (3.8 visits; 2.4–5.2) and European/Other (3.4 visits; 3.2–3.6) ethnic groups. In females, the mean number of GP visits was highest in Māori (5.3 visits; 4.4–6.2), followed by Pacific (4.8 visits; 4.1–5.6), European/Other (4.2 visits; 4.0–4.4) and Asian (3.5 visits; 3.0–4.1) ethnic groups.

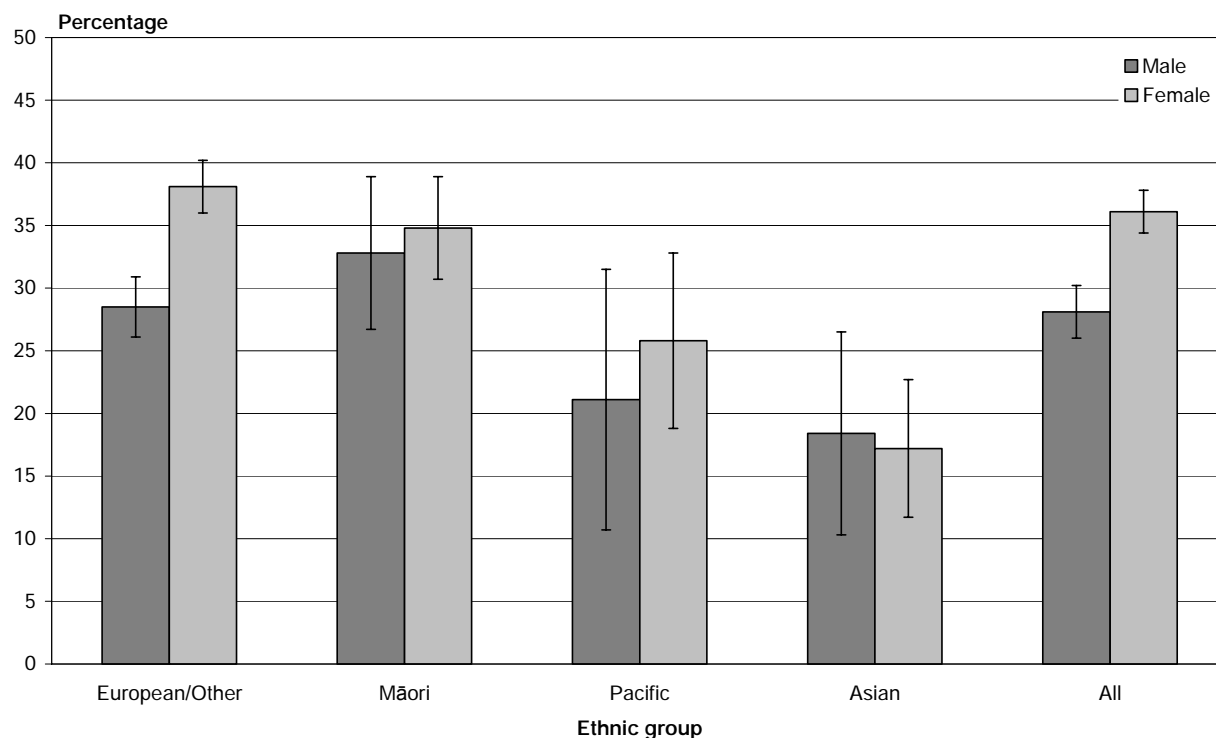
Seen more than one general practitioner

Overall, three out of 10 adults (31.4%; 30.1–32.7) who had seen a GP in the last 12 months reported seeing more than one GP.

Females (36.1%; 34.4–37.8) were significantly more likely than males (28.1%; 26.0–30.3) to have seen more than one GP in the last 12 months.

Māori males were most likely to have seen more than one GP in the last 12 months, followed by European/Other, Pacific and Asian males, although these differences were not significant (Figure 85). European/Other and Māori females were significantly more likely than Pacific and Asian females to have seen more than one GP.

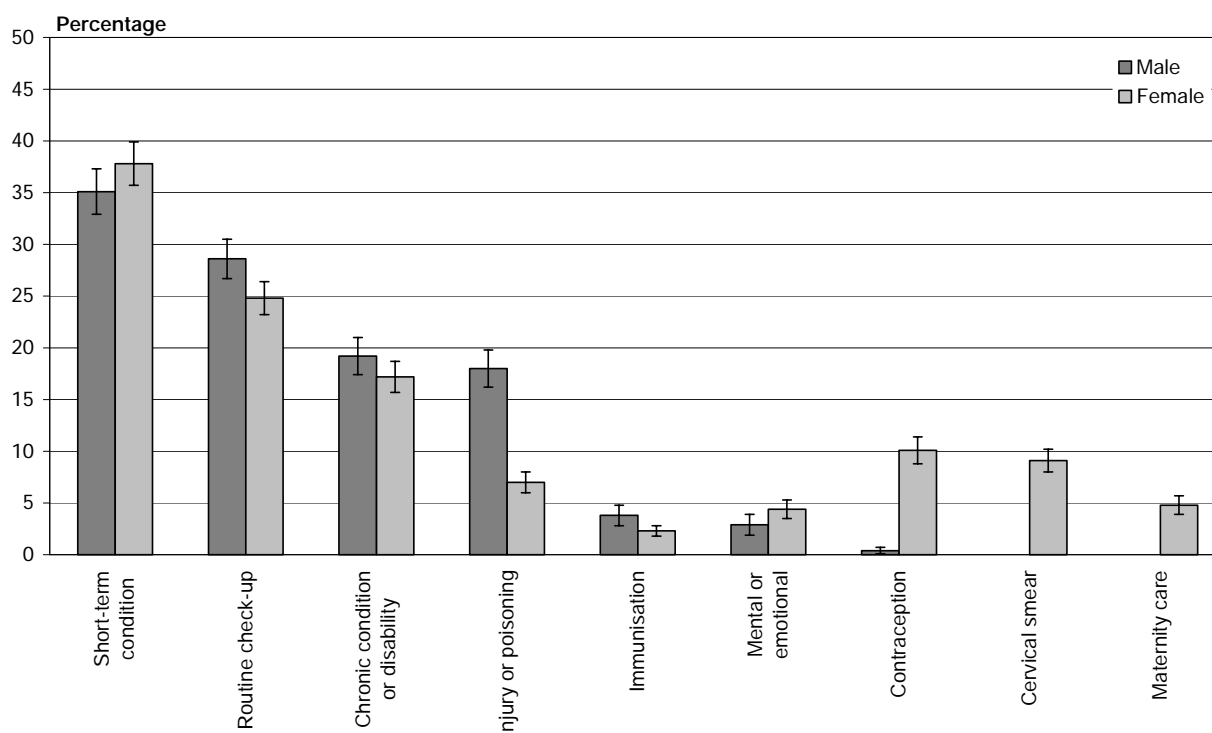
Figure 85: Seen more than one general practitioner in the last 12 months, by ethnic group and sex (age-standardised)



Reasons for visiting general practitioner

Overall, the most common reasons for seeing a GP were a short-term illness or temporary condition, a routine check-up or health advice, a chronic condition or disability, or an injury or poisoning (Figure 86).

Figure 86: Reasons for last visit to general practitioner, by sex (age-standardised)

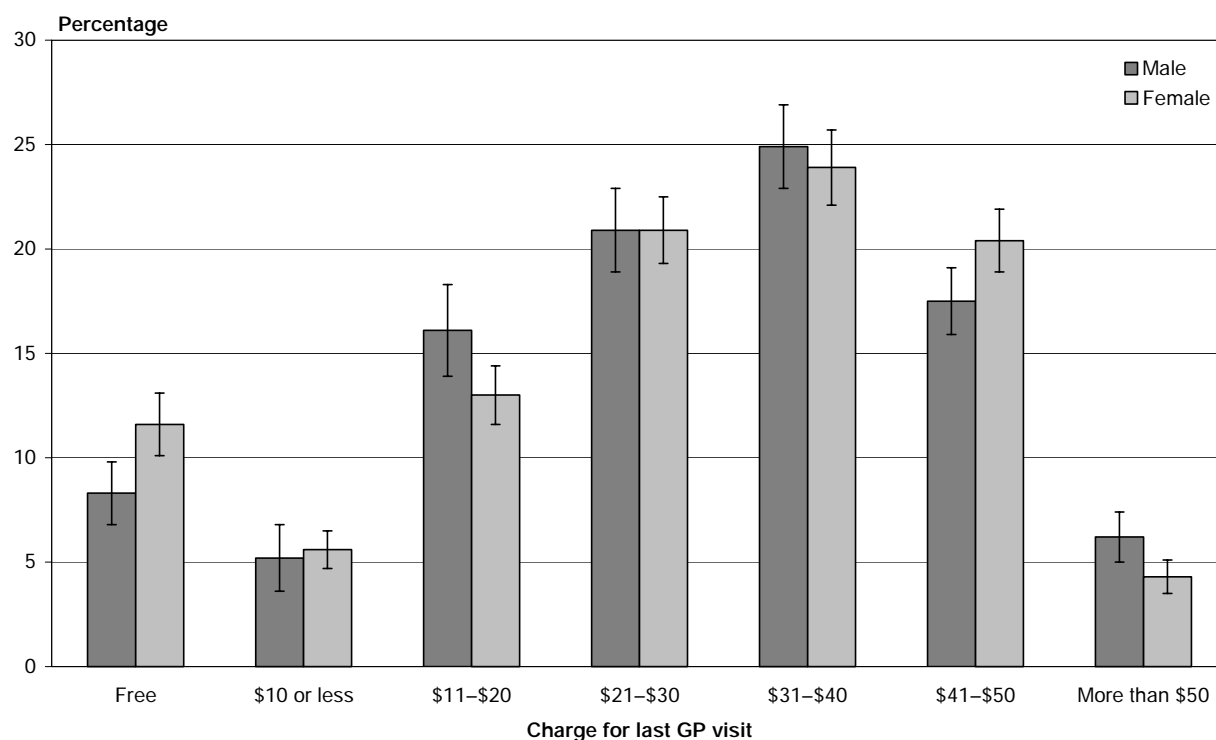


Cost of visiting general practitioner

Overall, the most common charge for the last GP visit was \$31–40. One in 10 adults (9.3%; 8.3–10.3) was not charged for their last GP visit, while one in 20 adults (5.0%; 4.4–5.7) was charged more than \$50.

Females were significantly more likely than males to not be charged for their last GP visit, while males were significantly more likely than females to be charged \$50 or more (Figure 87).

Figure 87: Cost of last visit to general practitioner, by sex (age-standardised)



Overall, one in 11 adults (9.4%; 8.6–10.2) had their last GP visit paid by the Accident Compensation Corporation (ACC). Males (13.6%; 11.8–15.4) were significantly more likely than females (6.3%; 5.4–7.3) to have had their last GP visit paid by the ACC.

Obtaining a prescription from general practitioner

Overall, a GP wrote a prescription for seven out of 10 adults (69.2%; 67.8–70.5) on their last visit.

Females (70.9%; 69.2–72.6) were significantly more likely than males (66.5%; 64.0–68.9) to have received a prescription from the doctor on their last visit.

Satisfaction with general practitioner services

Overall, almost all adults said they have been very satisfied (48.4%; 46.9–49.9) or satisfied (44.8%; 43.2–46.3) with their last GP visit.

When adults who were dissatisfied with their last GP visit were asked why, the most common reasons were:

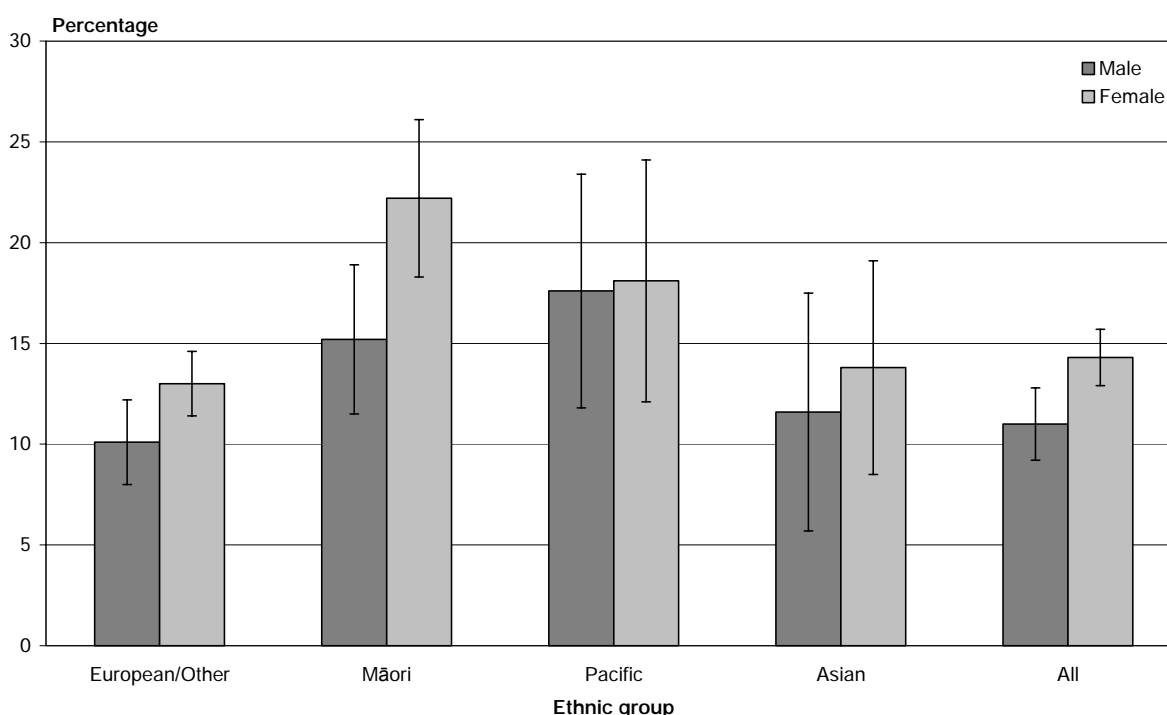
- “costs too much” (40.2%; 34.7–45.6)
- “doctor did not spend enough time or wasn’t thorough enough” (40.0%; 34.6–45.3)
- “doctor gave wrong treatment or didn’t give any treatment or only prescribed drugs” (22.5%; 17.4–27.5)
- “didn’t like doctor’s manner or couldn’t talk to doctor or doctor wouldn’t listen” (21.0%; 16.8–25.2).

Unmet need for general practitioner

Overall, one in eight adults (12.0%; 11.0–13.0) said they needed to see a GP in the last 12 months, but did not see one. Females (14.3%; 12.9–15.7) were significantly more likely than males (11.0%; 9.2–12.8) to report an unmet need for a GP.

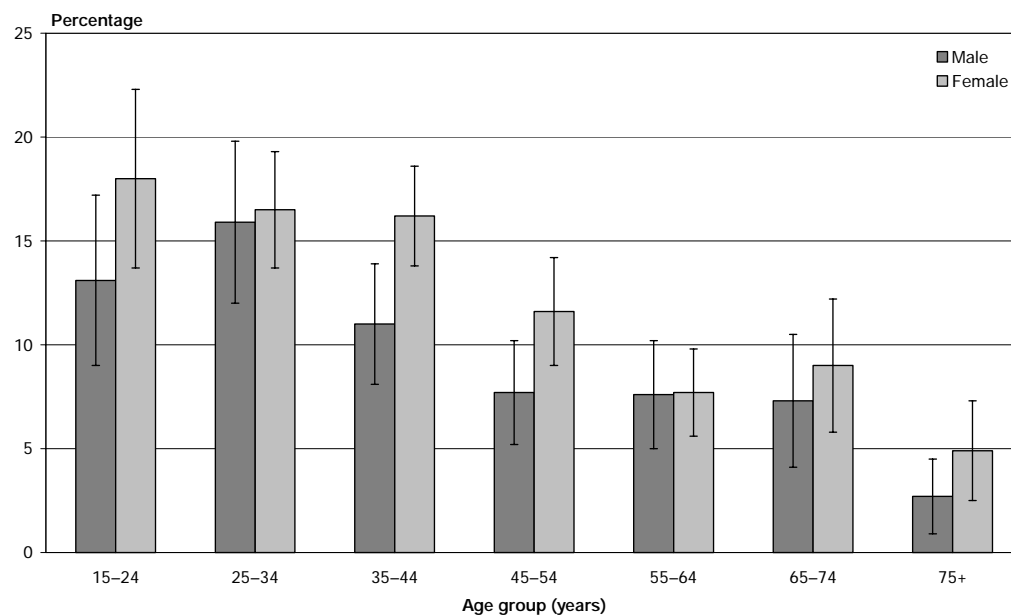
Pacific males were most likely to report an unmet need for a GP, followed by Māori, Asian and European/Other males, although these differences were not significant (Figure 88). Māori females were significantly more likely than European/Other females to report an unmet need for a GP.

Figure 88: Unmet need for general practitioner in last 12 months, by ethnic group and sex (age-standardised)



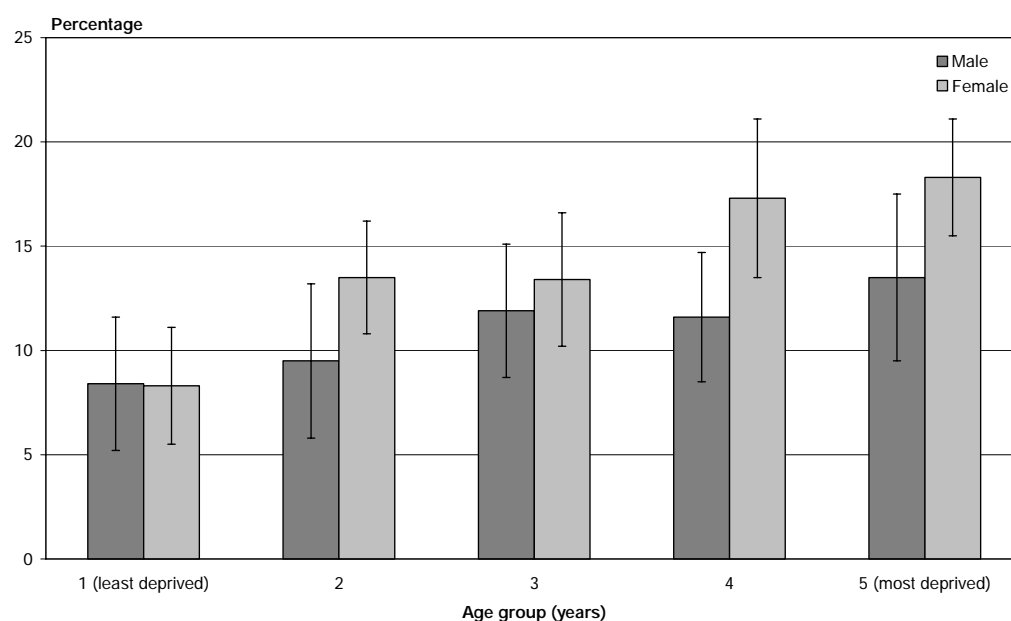
In both males and females, the proportion reporting an unmet need for a GP tended to decrease with age (Figure 89).

Figure 89: Unmet need for general practitioner in last 12 months, by age group and sex



In males, adults living in NZDep2001 quintile 5 (most deprived) were more likely than adults living in NZDep2001 quintile 1 (least deprived) to report an unmet need for a GP, although this difference was not significant (Figure 90). Females living in NZDep2001 quintile 5 (most deprived) were significantly more likely than females living in NZDep2001 quintile 1 (least deprived) to report an unmet need for a GP.

Figure 90: Unmet need for general practitioner in last 12 months, by NZDep2001 quintile and sex (age-standardised)



When asked why they had not seen a GP when they needed to, the most common reasons were:

- “costs too much” (48.5%; 44.2–52.7)
- “didn’t want to make a fuss or couldn’t be bothered” (26.1%; 22.3–30.0)
- “couldn’t get an appointment soon enough or at suitable time or it was after hours” (21.6%; 18.2–24.9)
- “couldn’t spare the time” (18.8%; 15.8–21.8).

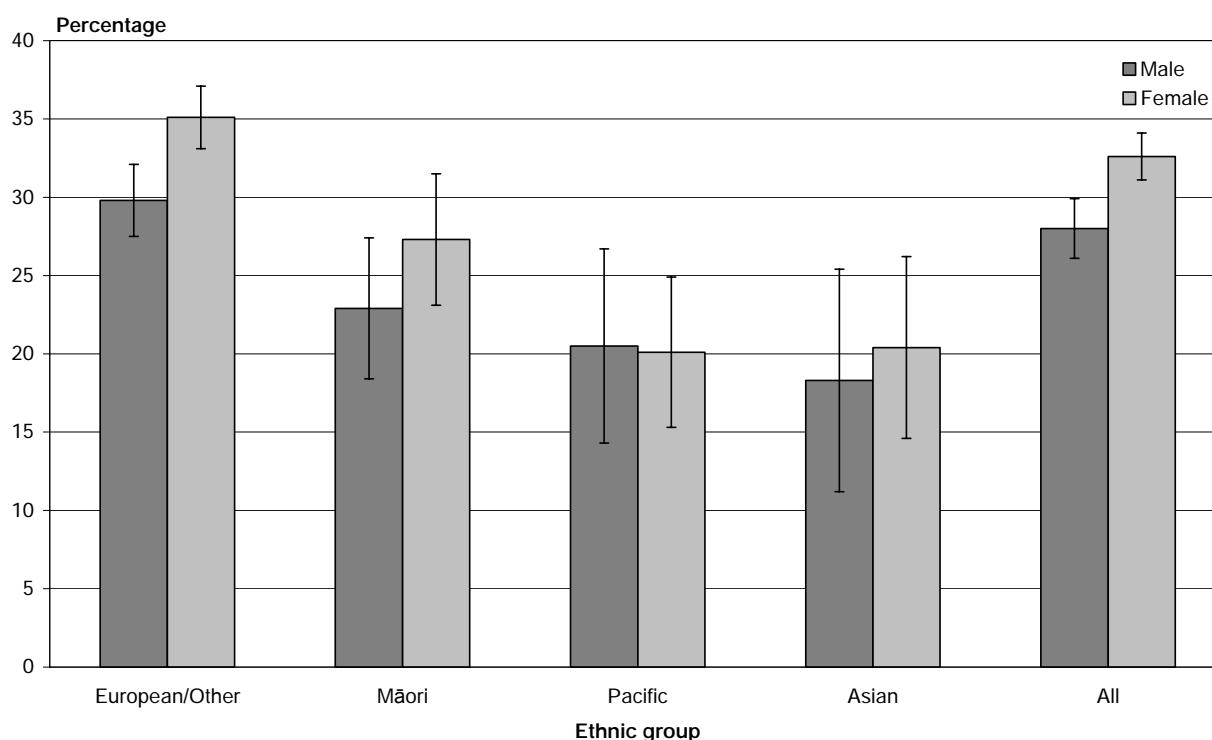
Medical specialists

Overall, three out of 10 adults (31.5%; 30.5–32.6) had seen a medical specialist in the last 12 months.

Females (32.6%; 31.1–34.2) were significantly more likely than males (28.0%; 26.1–29.9) to have seen a medical specialist in the last 12 months.

In both males and females, European/Other were significantly more likely to have seen a medical specialist in the last 12 months than all other ethnic groups (Figure 91).

Figure 91: Seen medical specialist in the last 12 months, by ethnic group and sex (age-standardised)



Overall, the mean number of visits to medical specialists in the last 12 months was three visits (2.8–3.1). There was no significant difference in the mean number of visits to medical specialists between males (2.9 visits; 2.6–3.2) and females (3.1 visits; 2.8–3.4).

Overall, medical specialists were most likely to be seen in a specialist's private rooms or clinic (45.0%; 42.6–47.4) or at a public hospital outpatient department (39.8%; 37.2–42.3).

Nurses

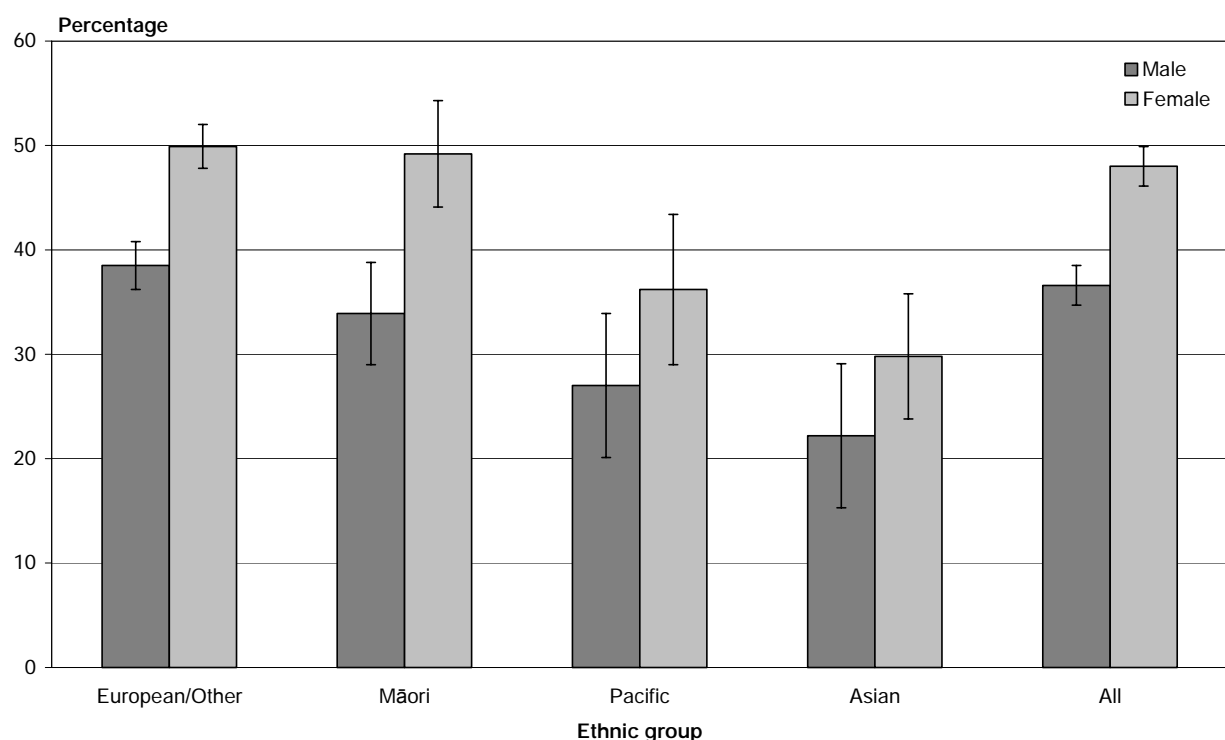
This includes nurses seen at a GP's practice or who had visited at home, but excludes midwives and nurses seen in a hospital.

All nurses

Overall, four out of 10 adults (43.4%; 42.1–44.8) saw a nurse about their health in the last 12 months. Females (48.0%; 46.1–49.9) were significantly more likely than males (36.6%; 34.6–38.5) to have seen a nurse in the last 12 months.

European/Other males were significantly more likely than Pacific and Asian males to have seen a nurse in the last 12 months (Figure 92). European/Other and Māori females were significantly more likely than Pacific and Asian females to have seen a nurse in the last 12 months.

Figure 92: Seen nurse in the last 12 months, by ethnic group and sex (age-standardised)



Practice nurse as part of general practitioner consultation

Overall, about one in four adults (27.4%; 26.2–28.5) had seen a practice nurse alone as part of a consultation with the GP in the last 12 months. Females (29.5%; 27.9–31.1) were significantly more likely than males (23.8%; 22.1–25.5) to have seen a practice nurse as part of a GP consultation.

The overall mean number of visits to a nurse in the last 12 months as part of a GP consultation was 2.7 visits (2.5–2.9). There was no significant difference in the mean number of nurse visits between males (2.6 visits; 2.3–3.0) and females (2.7 visits; 2.4–3.1).

The most common reasons given for seeing a practice nurse as part of a GP consultation were:

- blood test (38.2%; 35.7–40.7)
- immunisation or vaccination (18.9%; 17.0–20.7)
- cervical smear (females, 13.0%; 11.1–14.9)
- bandaging (11.6%; 9.9–13.3)
- health advice (8.6%; 7.2–9.9).

Practice nurse without seeing general practitioner

Overall, one in six adults (16.4%; 15.3–17.4) had seen a nurse in the last 12 months without seeing a GP at the same time. Females (18.8%; 17.4–20.2) were significantly more likely than males (12.0%; 10.7–13.3) to have seen a nurse without seeing a GP.

Overall, the mean number of visits to a nurse in the last 12 months without seeing a GP was 2.8 visits (2.6–3.1). There was no significant difference in the mean number of nurse visits between males (2.9 visits; 2.5–3.3) and females (2.6 visits; 2.4–2.9).

The most common reasons given for seeing a nurse without seeing a GP at the same time were:

- immunisation or vaccination (24.9%; 22.3–27.5)
- blood test (18.6%; 16.4–20.9)
- cervical smear (females, 16.9%; 14.2–19.6)
- health advice (10.0%; 8.0–12.1)
- bandaging (9.6%; 7.9–11.3).

Other nurses

Overall, one in nine adults (11.2%; 10.1–12.2) had seen another type of nurse (ie, not a practice nurse, midwife or nurse in hospital) in the last 12 months. Females (12.8%; 11.5–14.2) were significantly more likely than males (9.4%; 8.0–10.8) to have seen other types of nurse.

Among adults who had seen other nurses, the common types of nurse were:

- plunket nurse (females 22.5%; 18.6–26.3)
- district nurse (16.5%; 13.8–19.2)
- occupational health nurse (15.4%; 12.8–18.1)
- dental nurse or therapist (9.9%; 7.2–12.6)
- public health nurse (8.2%; 6.1–10.3)
- diabetes nurse (7.3%; 5.4–9.1).

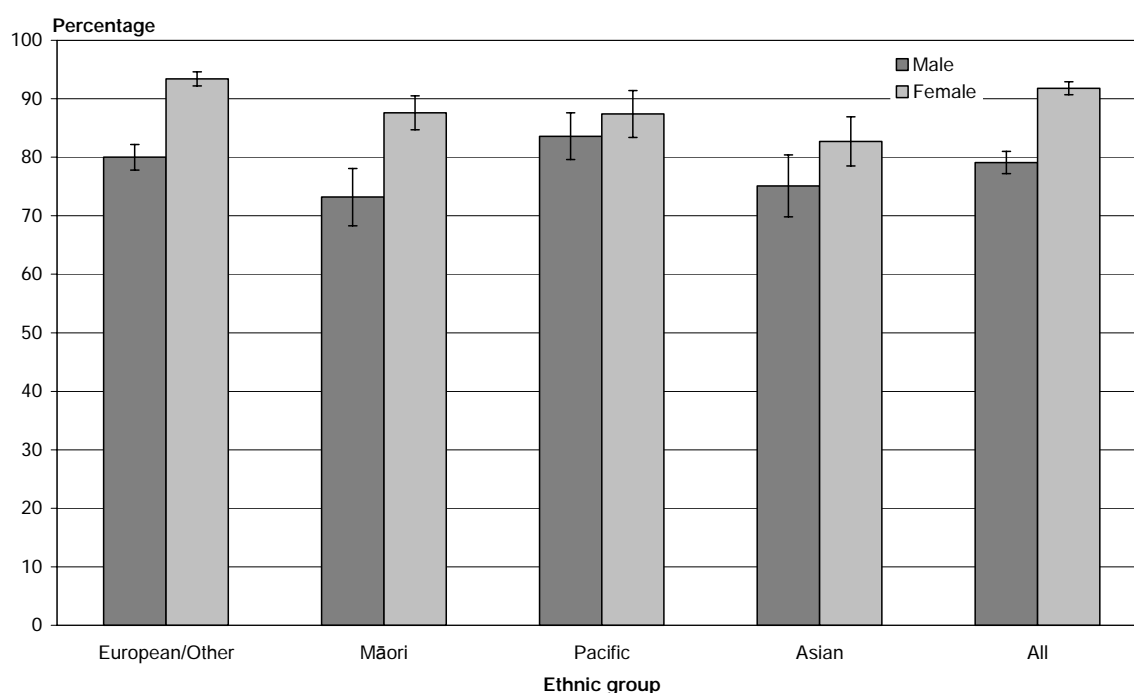
Pharmacists

Most adults (86.2%; 85.2–87.1) had been to a pharmacy or chemist for a health product or health information or advice in the last 12 months.

Females (91.8%; 90.8–92.9) were significantly more likely than males (79.1%; 77.2–81.1) to have been to a pharmacy or chemist in the last 12 months.

Māori males were significantly less likely than Pacific males to have been to a pharmacy or chemist in the last 12 months (Figure 93). European/Other females were significantly more likely than females from other ethnic groups to have been to a pharmacy in the last 12 months.

Figure 93: Seen pharmacist or chemist in the last 12 months, by ethnic group and sex (age-standardised)



Among adults who had visited a pharmacy or chemist in the last 12 months, the overall mean number of visits was 6.7 visits (6.5–6.9). The mean number of visits to a pharmacy or chemist was significantly higher in females (7.7 visits; 7.4–8.0) than in males (5.3 visits; 5.0–5.5).

The most common reasons for visiting a pharmacy or chemist were:

- collected a prescription for themselves (76.9%; 75.6–78.2)
- purchased a non-prescription medicine (excluding medicines that had to be signed for) (41.9%; 40.5–43.3)
- collected a prescription for someone else (41.1%; 39.8–42.4)
- got advice on non-prescription medicines (22.6%; 21.3–23.8)
- purchased vitamin or herbal supplements (19.9%; 18.9–21.0).

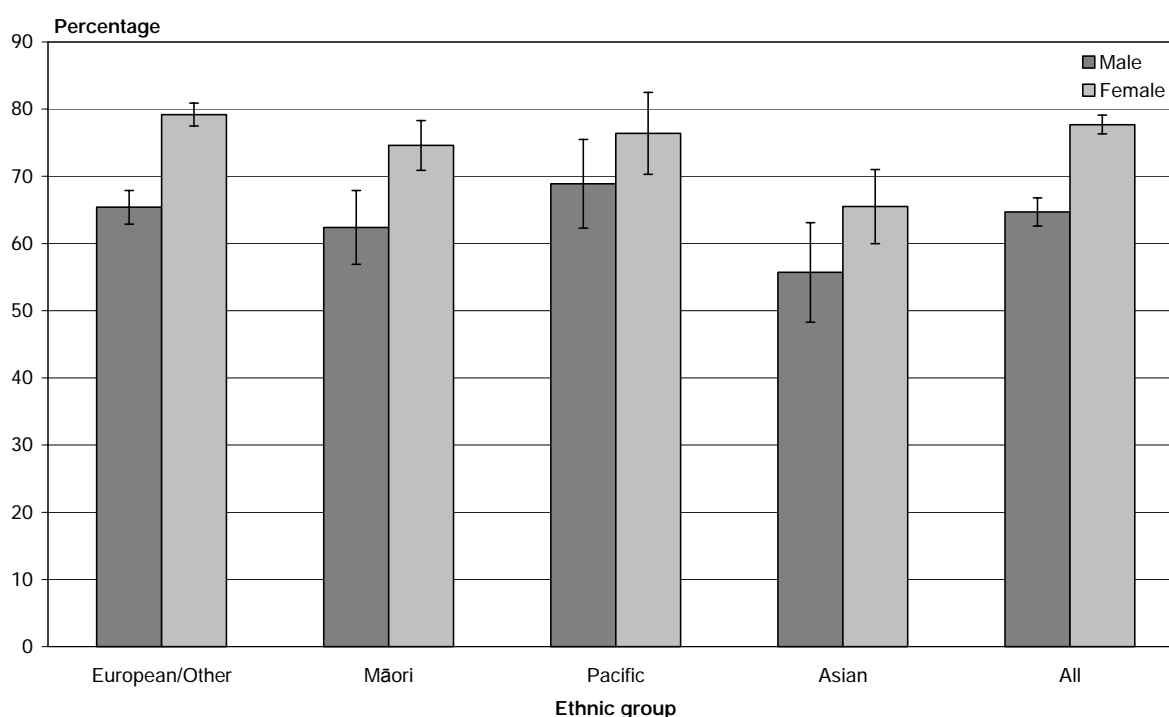
Prescriptions

Overall, seven out of 10 adults (71.8%; 70.6–73.0) said they had received a prescription for themselves in the last 12 months.

Females (77.7%; 76.3–79.2) were significantly more likely than males (64.7%; 62.6–66.8) to have received a prescription in the last 12 months.

In males, there were no significant differences between ethnic groups in the proportion receiving a prescription in the last 12 months (Figure 94). Asian females were significantly less likely than European/Other and Pacific females to have received a prescription in the last 12 months.

Figure 94: Prescription item in the last 12 months, by ethnic group and sex (age-standardised)



Among adults who had a prescription in the last 12 months, 48.1% (46.7–49.4) had one to four items, 15.9% (14.8–17.0) had five to nine items, and 36.1% (34.8–37.4) had 10 or more items.

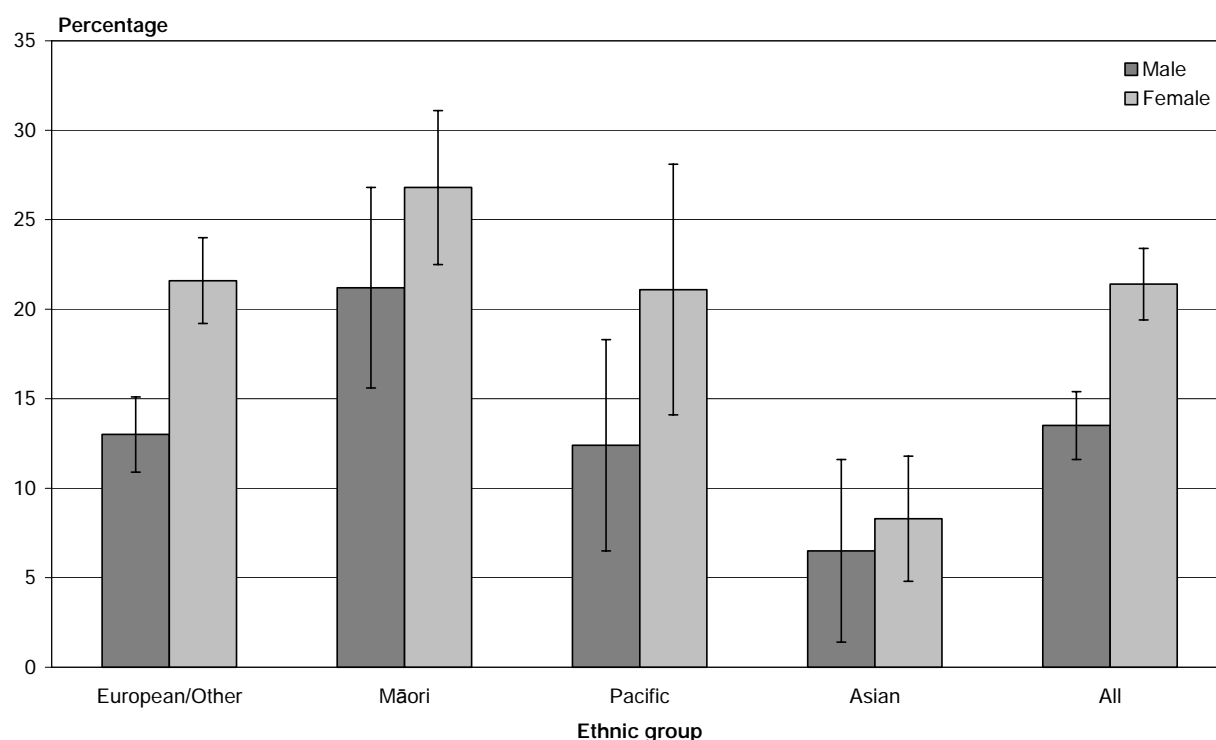
Uncollected prescriptions

Among adults who had received a prescription for themselves in the last 12 months, 17.2% (15.9–18.5) did not collect one or more of the items from the chemist or pharmacy.

Females (21.4%; 19.4–23.5) were significantly more likely than males (13.5%; 11.6–15.4) to have not collected a prescription item.

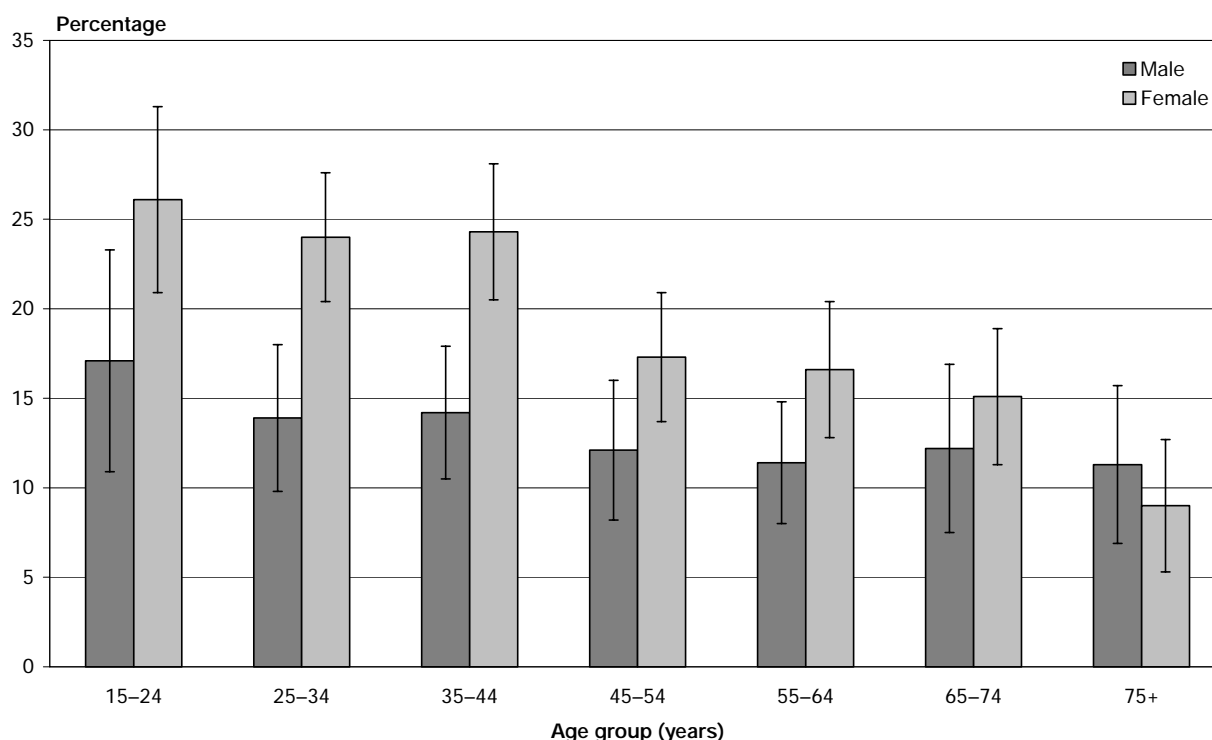
Māori males were significantly more likely than European/Other and Asian males to not collect one or more of their prescription items in the last 12 months (Figure 95). European/Other, Māori and Pacific females were significantly more likely than Asian females not to collect a prescription item.

Figure 95: Uncollected prescription in the last 12 months, by ethnic group and sex (age-standardised)



The proportion of males and females who did not collect one or more of their prescription items in the last 12 months declined with age, particularly in females (Figure 96).

Figure 96: Uncollected prescription in the last 12 months, by age group and sex

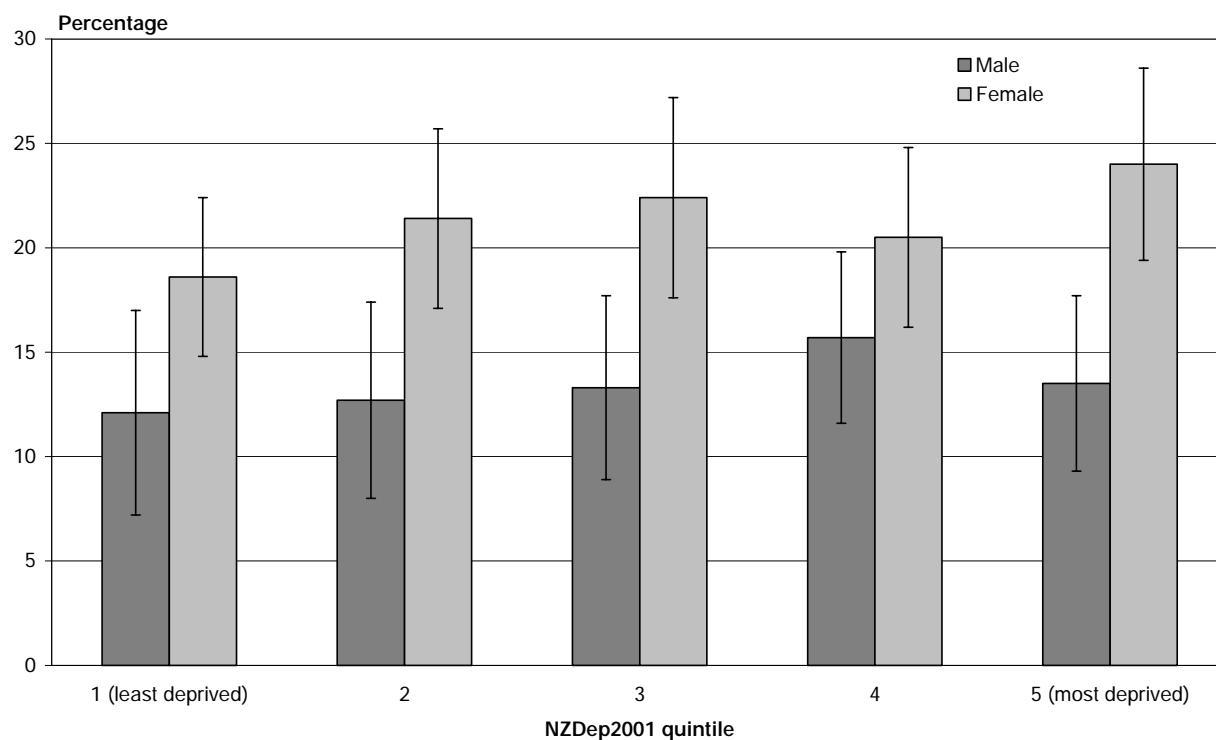


Overall, the most common reasons for not collecting a prescription item were:

- “costs too much” (26.9%; 23.8–29.9)
- “will pick up medication if needed or prescription written just in case” (21.1%; 17.7–24.4)
- “can only pick up one month’s prescription at a time” (16.4%; 13.2–19.6)
- “condition got better by itself” (16.1%; 13.0–19.2)
- “don’t like taking drugs” (11.0%; 8.6–13.5).

The proportion of males and females who did not collect one or more of their prescription items in the last 12 months did not vary significantly across NZDep2001 quintiles (Figure 97).

Figure 97: Uncollected prescription in the last 12 months, by NZDep2001 quintile and sex (age-standardised)



Complementary and alternative medicine providers

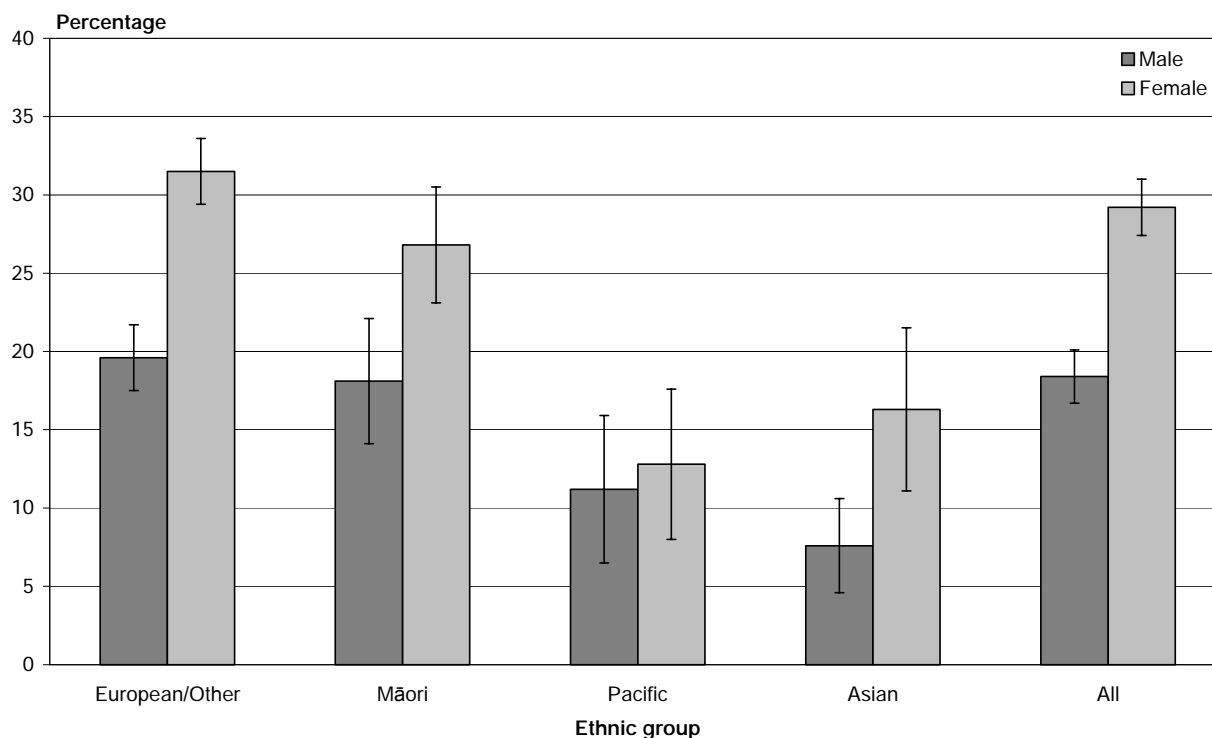
Complementary and alternative medicine (CAM) health care providers include providers not generally considered part of the mainstream health system.

Overall, one in four adults (23.4%; 22.4–24.5) had seen a CAM health care provider in the last 12 months.

Females (29.2%; 27.4–30.9) were significantly more likely than males (18.4%; 16.6–20.1) to have seen a CAM health care provider in the last 12 months.

In both males and females, European/Other and Māori ethnic groups were more likely than Pacific and Asian ethnic groups to have seen a CAM health care provider in the last 12 months (Figure 98).

Figure 98: Seen a complementary and alternative health care provider in the last 12 months, by ethnic group and sex (age-standardised)



Among all adults, the most common types of CAM health care provider visited were:

- massage therapists (9.1%; 8.3–9.9)
- chiropractors (6.1%; 5.6–6.7)
- osteopaths (4.9%; 4.3–5.5)
- homeopaths or naturopaths (4.5%; 3.9–5.0).

Overall, the most common reasons for seeing a CAM health care provider were:

- a disability, long-term illness or chronic condition (32.5%; 30.3–34.8)
- a short-term illness or temporary condition (28.3%; 26.1–30.6)
- an injury or poisoning (23.9%; 21.5–26.3).

The most common reasons given for choosing to see a CAM health care provider were:

- “I find they are able to provide help with conditions that other health care providers are unable to treat” (50.7%; 47.9–53.5)
- “I was referred by a friend or relative” (29.2%; 26.7–31.7)
- “they offer specialist services” (12.5%; 10.7–14.4)
- “I was referred to them by my doctor” (12.0%; 10.3–13.6).

Almost all adults who had seen a CAM health care provider were very satisfied (61.8%; 59.4–64.2) or satisfied (33.6%; 31.4–35.9) with the consultation.

One in three adults (33.4%; 30.6–36.1) who had seen a CAM health care provider had seen a GP about the same condition.

Other providers

Overall, six out of 10 adults (60.9%; 59.6–62.1) had seen other types of health care providers in the past 12 months. Among adults who had seen other types of health care providers, the most common types seen were dentists or dental therapists, opticians or optometrists, and physiotherapists.

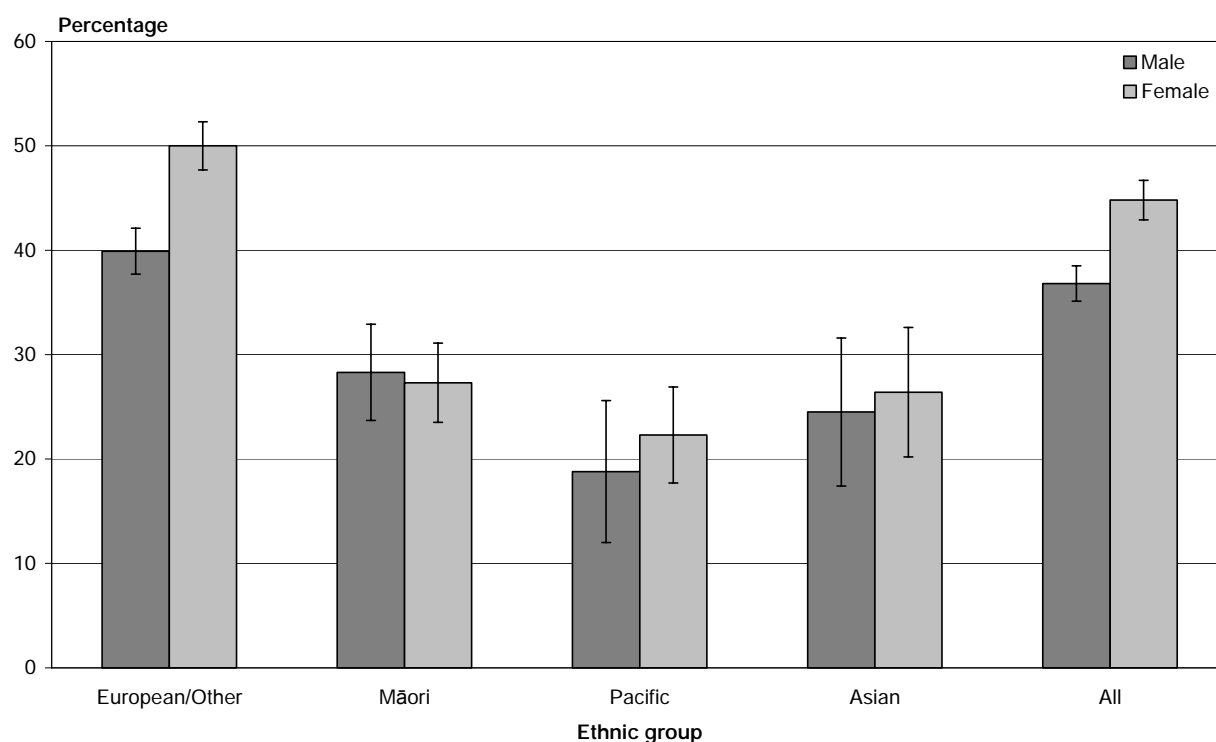
Dentists and dental therapists

Overall, four out of ten adults (40.4%; 39.1–41.7) had seen a dentist or dental therapist in the last 12 months.

Females (44.8%; 42.9–46.6) were significantly more likely than males (36.8%; 35.1–38.6) to have seen a dentist or dental therapist in the last 12 months.

In both males and females, European/Other were significantly more likely to have seen a dentist or dental therapist in the last 12 months than other ethnic groups (Figure 99).

Figure 99: Seen dentist or dental therapist in the last 12 months, by ethnic group and sex (age-standardised)



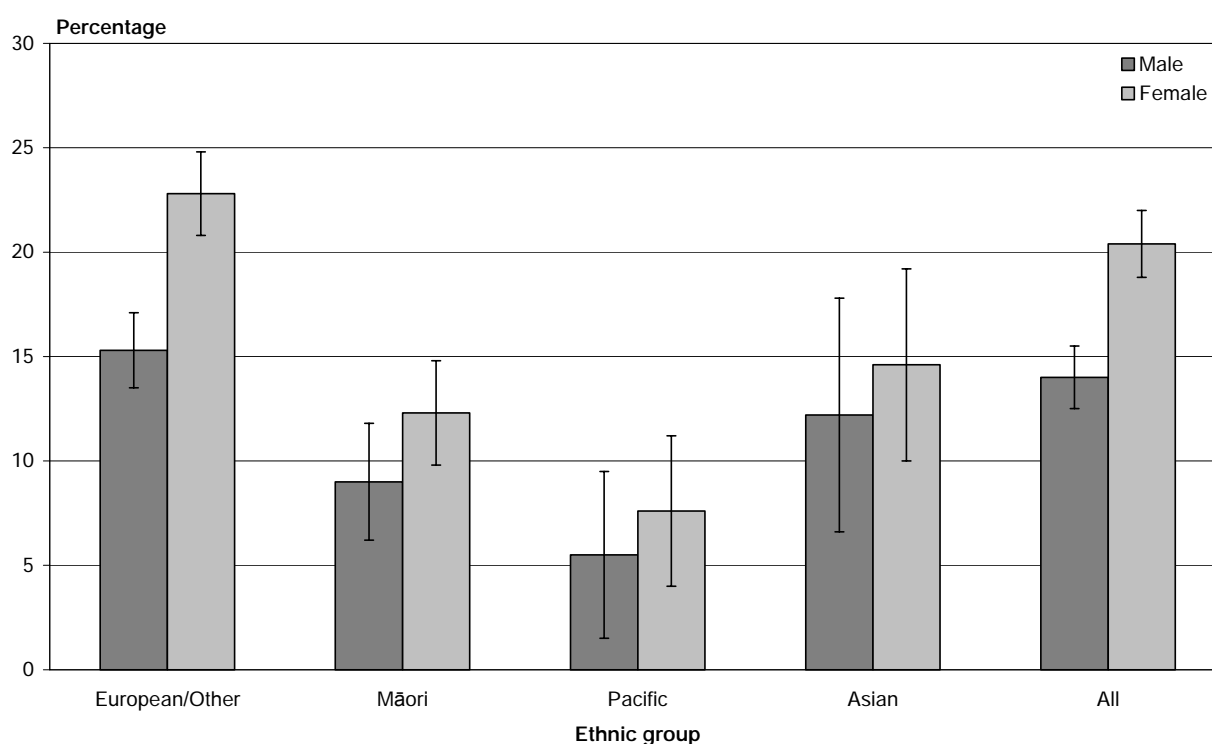
Opticians and optometrists

Overall, one in five adults (18.4%; 17.3–19.4) had seen an optician or optometrist in the last 12 months.

Females (20.4%; 18.8–22.0) were significantly more likely than males (14.0%; 12.5–15.6) to have seen an optician or optometrist in the last 12 months.

In both males and females, European/Other were significantly more likely to have seen an optician or optometrist in the last 12 months than Māori and Pacific ethnic groups (Figure 100).

Figure 100: Seen an optician or optometrist in the last 12 months, by ethnic group and sex (age-standardised)



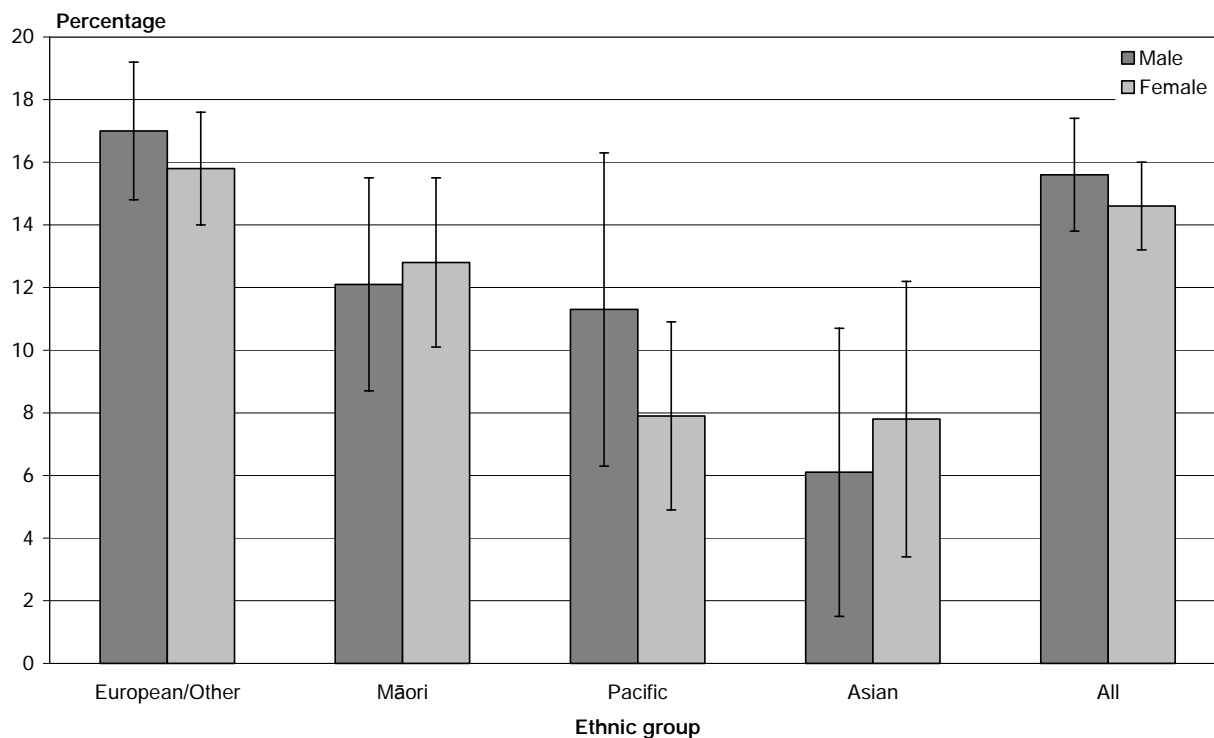
Physiotherapists

Overall, one in seven adults (14.8%; 13.9–15.6) had seen a physiotherapist in the last 12 months.

There was no significant difference in the proportion of males (15.6%; 13.9–17.4) and females (14.6%; 13.2–16.0) who had seen a physiotherapist in the last 12 months.

European/Other males and females were most likely to have seen a physiotherapist in the last 12 months, followed by Māori, Pacific and Asian males and females (Figure 101).

Figure 101: Seen a physiotherapist in the last 12 months, by ethnic group and sex (age-standardised)



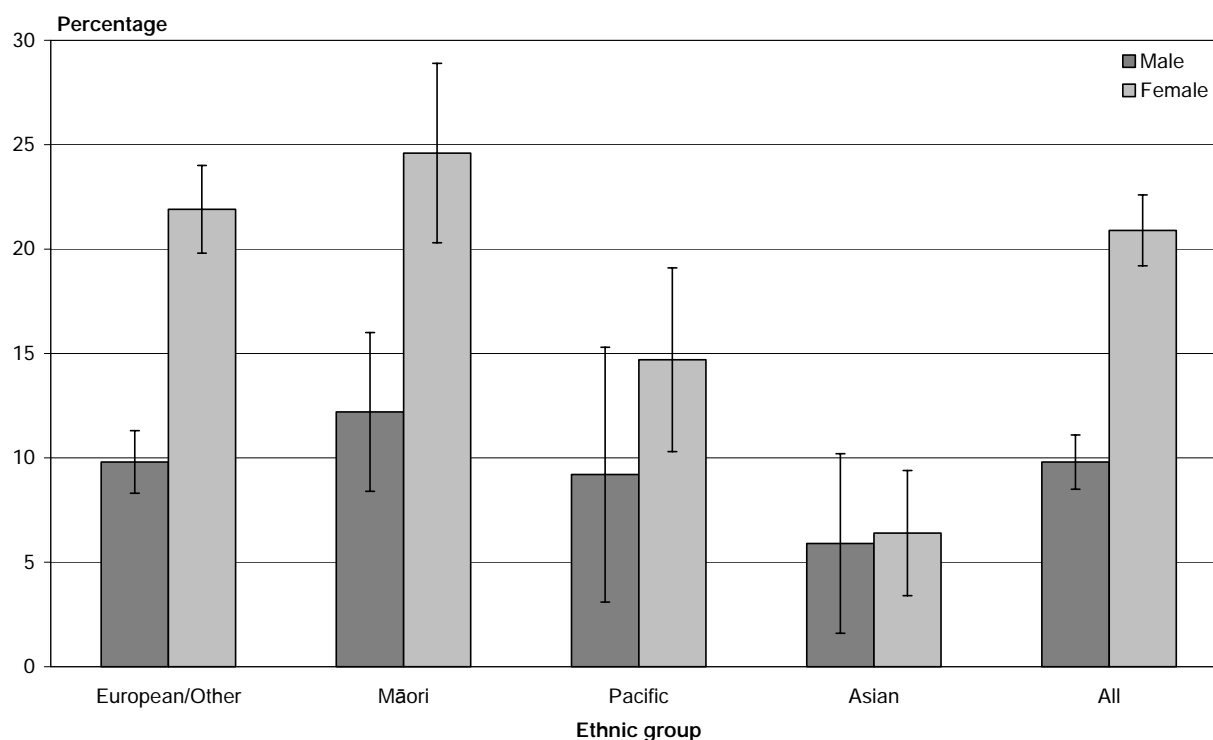
Telephone helplines

Overall, one in six adults (15.5%; 14.5–16.6) had used a telephone helpline in the last 12 months.

Females (20.9%; 19.3–22.6) were significantly more likely than males (9.8%; 8.5–11.14) to have used a telephone helpline.

In males, there were no significant differences between ethnic groups in the use of telephone helplines (Figure 102). European/Other and Māori females were significantly more likely than Pacific and Asian females to use telephone helplines.

Figure 102: Used telephone helpline in the 12 months, by ethnic group and sex (age-standardised)



Among adults who had used a telephone helpline, the most common services used were:

- GP's nurse (55.5%; 52.2–58.7)
- Quitline (13.4%; 11.1–15.7)
- after-hours medical centre (9.3%; 7.4–11.2)
- accident and emergency (8.2%; 6.3–10.1)
- Plunketline (7.9%; 6.4–9.5).

Overall, most adults using a telephone helpline were very satisfied (42.3%; 39.3–45.3) or satisfied (49.8%; 46.6–53.1) with the service.

Hospitals

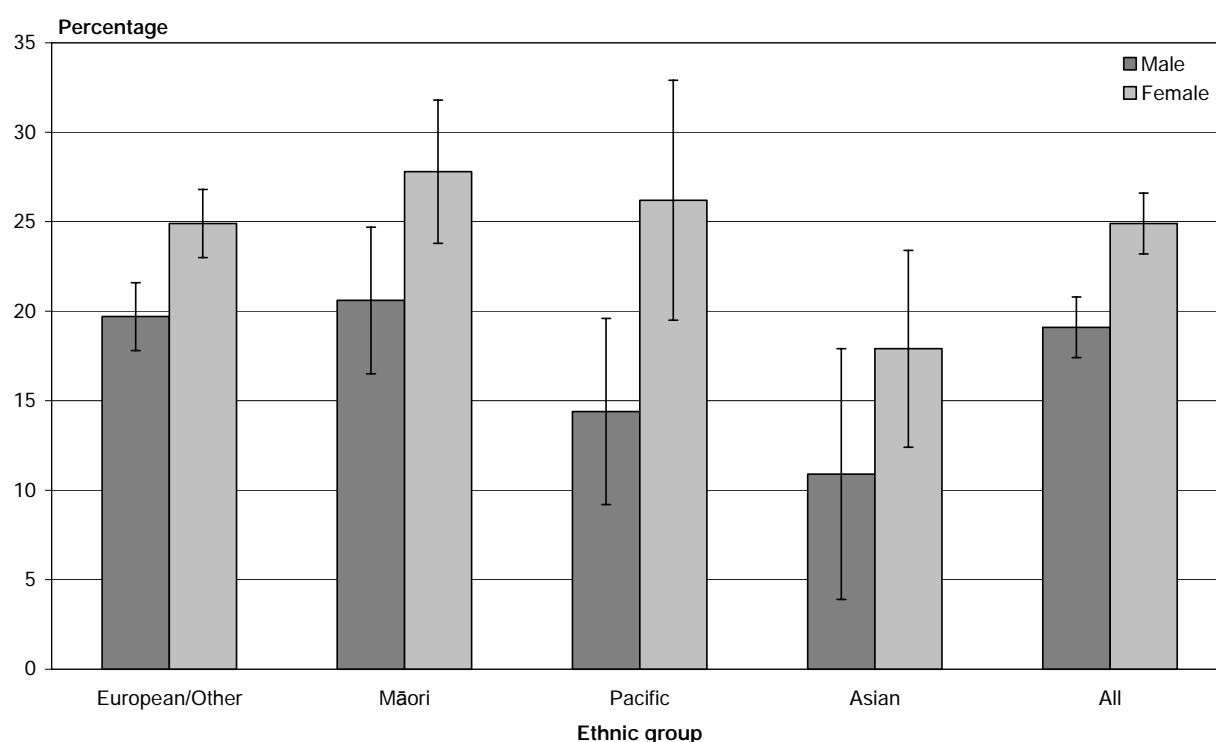
Public hospitals

Overall, one in five adults (22.2%; 21.1–23.3) had used a service at, or been admitted to, a public hospital as a patient in the past 12 months.

Females (24.9%; 23.2–26.6) were significantly more likely than males (19.1%; 17.4–20.8) to have used a service at, or been admitted to, a public hospital.

In males, the proportion that had used a service at, or been admitted to, a public hospital was highest in European/Other and Māori, intermediate in Pacific, and lowest in Asian ethnic groups (Figure 103). Māori, European/Other and Pacific females were more likely than Asian females to have been admitted to, or used a service at, a public hospital.

Figure 103: Public hospital use in the last 12 months, by ethnic group and sex (age-standardised)



Among adults who had used a service at, or been admitted to, a public hospital in the last 12 months, the most common types of service were:

- outpatient (49.8%; 47.0–52.6)
- inpatient (40.4%; 37.9–43.0)
- accident and emergency (32.8%; 30.3–35.4)
- day treatment (15.3%; 13.5–17.2).

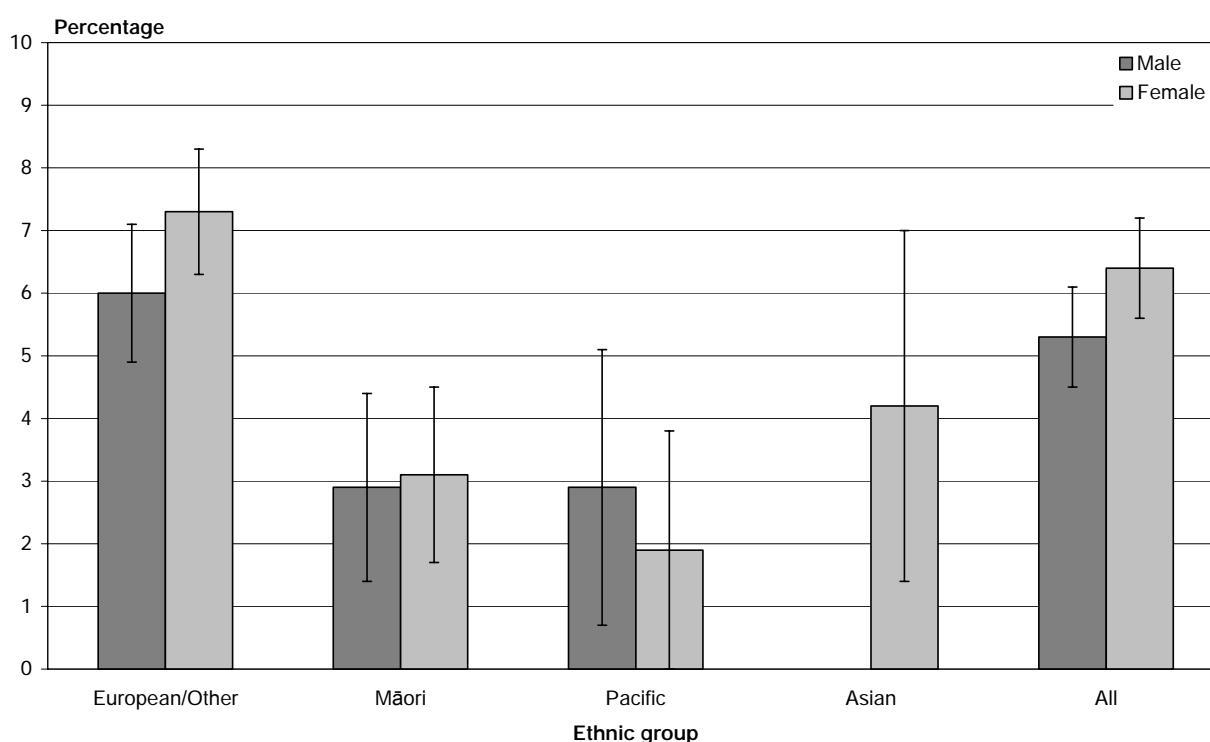
Private hospitals

Overall, one in 16 adults (6.1%; 5.5–6.6) had used a service at, or been admitted to, a private hospital as a patient in the past 12 months.

There was no significant difference in the proportion of males (5.3%; 4.4–6.1) and females (6.4%; 5.6–7.2) who had used a service at, or been admitted to, a private hospital.

In both males and females, the European/Other ethnic group was more likely than other ethnic groups to have been admitted to or used a service at a private hospital in the last 12 months (Figure 104).

Figure 104: Private hospital use in the last 12 months, by ethnic group and sex (age-standardised)



Among adults who had used a service at, or been admitted to, a private hospital in the last 12 months, 40.6% (35.5–45.6) were admitted for day treatment and 34.2% (28.8–39.6) were admitted as inpatients.

Private accident and emergency clinics

Overall, one in eight adults (13.1%; 12.2–14.1) had used a private accident and emergency clinic or doctor's after-hours clinic in the last 12 months.

There was no significant difference in the proportion of males (13.2%; 11.6–14.8) and females (14.6%; 13.2–16.0) using private accident and emergency clinics.

Summary tables

Table 15 (male) and Table 16 (female) summarise the crude utilisation (percent) of selected health services by ethnic group. Use these crude estimates if you want to know the actual use of health services by the population of interest, but do not use them to compare one population subgroup (sex or ethnicity) with another.

Table 15: Utilisation (percent) of selected health services and health checks in the last year, by ethnic group, males (crude)

	European/ Other	Māori	Pacific	Asian	All
Usual practitioner or provider	92.1 (90.7–93.5)	88.6 (84.8–92.3)	91.2 (86.1–96.4)	73.6 (67.5–79.6)	90.6 (89.3–92.0)
Māori health provider	0.7 (0.2–1.3)	10.9 (8.1–13.8)	–	–	1.8 (1.2–2.3)
Pacific health provider	–	–	9.1 (2.7–15.5)	–	0.4 (0.1–0.7)
GP or family doctor	79.1 (77.3–80.9)	64.9 (59.8–70.0)	70.9 (62.7–79.1)	60.9 (54.5–67.3)	76.2 (74.6–77.8)
Medical specialist	32.1 (30.1–34.1)	20.7 (16.8–24.6)	19.3 (12.9–25.7)	16.3 (10.9–21.7)	29.4 (27.7–31.1)
Nurse	40.7 (38.6–42.9)	31.5 (26.6–36.4)	26.5 (19.2–33.8)	20.2 (14.0–26.5)	38.0 (36.1–39.8)
Pharmacy or chemist	81.6 (79.7–83.5)	71.4 (66.3–76.5)	81.6 (77.1–86.0)	73.4 (68.1–78.7)	80.0 (78.4–81.7)
Prescriptions	67.6 (65.5–69.8)	59.9 (54.0–65.8)	63.6 (55.8–71.3)	52.3 (45.2–59.5)	65.8 (63.9–67.6)
Complementary and alternative	19.6 (17.8–21.5)	18.3 (14.2–22.4)	10.1 (6.0–14.2)	8.0 (4.7–11.2)	18.4 (16.8–20.0)
Dentist or dental therapist	40.0 (38.2–41.9)	28.7 (24.1–33.3)	19.4 (12.1–26.8)	23.5 (18.0–29.0)	37.0 (35.5–38.5)
Public hospital	20.6 (18.9–22.4)	18.9 (15.1–22.8)	13.4 (8.1–18.8)	9.7 (5.0–14.4)	19.5 (18.0–21.0)
Private hospital	6.3 (5.3–7.3)	2.8 (1.2–4.3)	3.0 (0.7–5.3)	–	5.5 (4.7–6.3)
Blood pressure test	51.2 (49.2–53.3)	38.9 (34.3–43.5)	46.7 (37.6–55.8)	36.8 (30.4–43.2)	48.9 (47.1–50.7)
Cholesterol test	29.3 (27.7–30.8)	17.8 (14.3–21.2)	17.3 (11.5–23.2)	27.3 (21.6–32.9)	27.4 (26.1–28.8)
Diabetes test	17.6 (16.2–19.1)	18.3 (14.5–22.0)	19.6 (13.3–25.9)	23.5 (18.1–28.9)	18.1 (16.6–19.6)
Flu injection	20.9 (19.3–22.6)	13.0 (9.6–16.4)	14.8 (8.1–21.5)	16.0 (10.6–21.3)	19.6 (18.1–21.0)
Flu injection (≥ 65 years)	61.1 (56.4–65.9)	64.2 (48.6–79.9)	44.2 (18.5–70.0)	55.2 (23.6–86.8)	60.4 (56.0–64.7)

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Table 16: Utilisation (percent) of selected health services and health checks in the last year, by ethnic group, females (crude)

	European/ Other	Māori	Pacific	Asian	All
Usual practitioner or provider	97.3 (96.7–97.9)	94.5 (92.4–96.6)	96.9 (95.0–98.7)	82.7 (77.5–88.0)	96.1 (95.4–96.8)
Māori health provider	0.7 (0.4–1.0)	16.1 (12.6–19.6)	3.2 (0.6–5.7)	–	2.5 (2.0–3.0)
Pacific health provider	–	0.9 (0.2–1.6)	9.6 (6.3–13.0)	–	0.6 (0.4–0.8)
GP or family doctor	87.0 (85.7–88.2)	81.6 (78.1–85.0)	81.8 (76.5–87.1)	71.1 (66.1–76.1)	85.1 (84.0–86.3)
Medical specialist	36.5 (34.7–38.3)	26.6 (22.2–31.0)	18.7 (14.2–23.2)	19.1 (14.5–23.7)	33.5 (32.1–34.9)
Nurse	50.8 (48.9–52.6)	49.0 (44.0–54.0)	35.5 (28.6–42.4)	28.0 (22.8–33.2)	48.5 (46.8–50.1)
Pharmacy or chemist	93.5 (92.4–94.6)	87.6 (84.7–90.5)	86.6 (82.3–90.8)	82.3 (78.5–86.0)	91.8 (90.8–92.8)
Prescriptions	79.3 (77.9–80.8)	73.0 (69.2–76.9)	74.1 (67.6–80.7)	62.4 (56.4–68.3)	77.3 (76.0–78.6)
Complementary and alternative	30.3 (28.6–32.1)	26.5 (22.8–30.2)	11.4 (7.3–15.5)	14.9 (10.6–19.1)	28.1 (26.6–29.6)
Dentist or dental therapist	48.4 (46.3–50.4)	28.2 (24.5–31.8)	23.1 (18.4–27.9)	25.8 (20.5–31.1)	43.6 (41.9–45.2)
Public hospital	24.7 (23.1–26.4)	27.9 (24.0–31.9)	26.0 (19.8–32.1)	17.5 (12.6–22.4)	24.7 (23.3–26.1)
Private hospital	7.6 (6.6–8.5)	3.1 (1.8–4.4)	1.9 (0.2–3.6)	4.3 (1.3–7.2)	6.6 (5.8–7.3)
Blood pressure test	56.7 (54.7–58.7)	49.0 (44.6–53.3)	56.7 (49.4–64.0)	40.4 (35.0–45.8)	54.8 (53.2–56.5)
Cholesterol test	24.1 (22.8–25.4)	15.2 (12.6–17.7)	25.4 (20.1–30.7)	20.8 (15.7–25.9)	23.0 (21.9–24.1)
Diabetes test	16.3 (14.9–17.8)	17.7 (14.5–20.8)	31.1 (24.1–38.2)	21.0 (16.1–25.9)	17.4 (16.1–18.8)
Flu injection	21.4 (20.0–22.8)	14.3 (11.7–17.0)	19.9 (14.9–25.0)	11.7 (8.0–15.5)	20.0 (18.8–21.2)
Flu injection (≥ 65 years)	61.2 (57.8–64.6)	49.3 (34.6–64.0)	60.1 (37.1–83.2)	36.7 (7.2–66.3)	60.2 (57.1–63.3)
Mammogram * (50–64 years)	76.9 (73.6–80.1)	68.0 (58.0–78.1)	56.5 (39.4–73.6)	51.4 (34.1–68.6)	74.4 (71.6–77.1)
Cervical smear * (20–69 years)	78.0 (76.1–80.0)	73.4 (69.6–77.2)	54.8 (48.2–61.3)	43.8 (37.7–49.9)	74.0 (72.5–75.5)

* Last three years.

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Table 17 (male) and Table 18 (female) summarise the age-standardised utilisation (percent) of selected health services by ethnic group. Note that age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup (sex or ethnicity) with another.

Table 17: Utilisation (percent) of selected health services and health checks in the last 12 months, by ethnic group, males (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Usual practitioner or provider	90.6 (88.8–92.4)	89.6 (86.1–93.2)	92.8 (88.8–96.9)	75.6 (69.7–81.4)	89.7 (88.1–91.4)
Māori health provider	0.8 (0.1–1.4)	12.3 (8.9–15.6)	–	–	2.0 (1.3–2.6)
Pacific health provider	–	–	9.0 (3.5–14.5)	–	0.5 (0.2–0.7)
General practitioner or family doctor	77.7 (75.6–79.7)	67.8 (63.1–72.5)	75.1 (68.3–81.9)	63.8 (57.3–70.3)	75.7 (73.9–77.5)
Medical specialist	29.8 (27.5–32.0)	22.9 (18.4–27.4)	20.5 (14.3–26.7)	18.3 (11.2–25.5)	28.0 (26.1–29.9)
Nurse	38.5 (36.2–40.8)	33.9 (29.0–38.8)	27.0 (20.1–34.0)	22.2 (15.4–29.1)	36.6 (46.1–49.9)
Pharmacy or chemist	80.0 (77.7–82.2)	73.2 (68.3–78.0)	83.6 (79.6–87.7)	75.1 (69.8–80.4)	79.1 (77.2–81.1)
Prescriptions	65.4 (62.9–67.9)	62.4 (56.9–68.0)	68.9 (62.2–75.5)	55.7 (48.3–63.1)	64.7 (62.6–66.8)
Complementary and alternative	19.6 (17.5–21.7)	18.1 (14.1–22.1)	11.2 (6.5–16.0)	7.6 (4.5–10.6)	18.4 (16.6–20.1)
Dentist or dental therapist	39.9 (37.7–42.0)	28.3 (23.8–32.9)	18.8 (12.0–25.5)	24.5 (17.4–31.5)	36.8 (35.1–38.6)
Optician or optometrist	15.3 (13.5–17.2)	9.0 (6.2–11.8)	5.5 (1.5–9.5)	12.2 (6.7–17.8)	14.0 (12.5–15.6)
Physiotherapist	17.0 (14.9–19.2)	12.1 (8.7–15.5)	11.3 (6.4–16.3)	6.1 (1.5–10.7)	15.6 (13.9–17.4)
Public hospital	19.7 (17.8–21.6)	20.6 (16.5–24.6)	14.4 (9.2–19.7)	10.9 (3.9–18.0)	19.1 (17.4–20.8)
Private hospital	6.0 (5.0–7.1)	2.9 (1.4–4.4)	2.9 (0.7–5.0)	–	5.3 (4.4–6.1)
Blood pressure test	46.7 (44.4–48.9)	43.8 (39.0–48.6)	51.7 (43.5–60.0)	41.4 (34.1–48.7)	46.3 (44.3–48.3)
Cholesterol test	25.1 (23.6–26.6)	21.9 (18.1–25.7)	20.3 (14.2–26.5)	31.6 (24.6–38.5)	24.9 (23.6–26.2)
Diabetes test	15.2 (13.7–16.7)	21.5 (17.3–25.6)	25.4 (17.8–33.1)	28.8 (22.1–35.5)	17.1 (15.6–18.6)
Flu injection	17.7 (16.2–19.3)	16.9 (13.2–20.5)	17.1 (10.1–24.0)	19.3 (12.6–25.9)	17.7 (16.3–19.1)
Flu injection (≥ 65 years)	61.1 (56.4–65.9)	64.2 (48.6–79.9)	44.2 (18.5–70.0)	55.2 (23.6–86.8)	60.4 (56.0–64.7)

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Table 18: Utilisation (percent) of selected health services and health checks in the last 12 months, by ethnic group, females (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Usual practitioner or provider	97.0 (96.3–97.8)	95.0 (93.2–96.8)	97.3 (95.7–98.9)	84.6 (80.0–89.2)	96.0 (95.3–96.8)
Māori health provider	0.7 (0.4–1.0)	16.3 (12.9–19.8)	2.8 (0.6–4.9)	–	2.5 (2.0–3.0)
Pacific health provider	–	0.8 (0.2–1.4)	10.4 (6.6–14.2)	–	0.6 (0.4–0.8)
General practitioner or family doctor	87.0 (85.5–88.4)	82.5 (79.3–85.8)	83.7 (79.1–88.3)	73.8 (69.2–78.5)	85.5 (84.2–86.8)
Medical specialist	35.1 (33.1–37.1)	27.3 (23.1–31.6)	20.1 (15.3–24.8)	20.4 (14.6–26.2)	32.6 (31.1–34.2)
Nurse	49.9 (47.9–52.0)	49.2 (44.1–54.3)	36.2 (29.0–43.4)	29.8 (23.8–35.8)	48.0 (46.1–49.9)
Pharmacy or chemist	93.4 (92.2–94.6)	87.6 (84.7–90.5)	87.4 (83.3–91.4)	82.7 (78.5–86.8)	91.8 (90.8–92.9)
Prescriptions	79.2 (77.5–80.9)	74.6 (71.0–78.3)	76.4 (70.3–82.5)	65.5 (60.0–71.0)	77.7 (76.3–79.2)
Complementary and alternative	31.5 (29.4–33.6)	26.8 (23.1–30.5)	12.8 (8.0–17.6)	16.3 (11.1–21.5)	29.2 (27.4–30.9)
Dentist or dental therapist	50.0 (47.7–52.3)	27.3 (23.5–31.1)	22.3 (17.6–26.9)	26.4 (20.2–32.5)	44.8 (42.9–46.6)
Optician or optometrist	22.8 (20.8–24.8)	12.3 (9.8–14.8)	7.6 (4.0–11.2)	14.6 (10.1–19.2)	20.4 (18.8–22.0)
Physiotherapist	15.8 (14.1–17.6)	12.8 (10.1–15.4)	7.9 (4.9–10.8)	7.8 (3.4–12.2)	14.6 (13.2–16.0)
Public hospital	24.9 (23.0–26.9)	27.8 (23.8–31.8)	26.2 (19.5–33.0)	17.9 (12.4–23.4)	24.9 (23.2–26.6)
Private hospital	7.3 (6.3–8.3)	3.1 (1.7–4.4)	1.9 (0.0–3.8)	4.2 (1.3–7.0)	6.4 (5.6–7.2)
Blood pressure test	54.0 (51.9–56.2)	51.8 (47.5–56.1)	60.1 (52.7–67.4)	44.9 (38.9–50.9)	53.5 (51.7–55.3)
Cholesterol test	20.1 (18.8–21.4)	19.0 (15.9–22.2)	28.3 (22.3–34.2)	24.8 (18.2–31.5)	20.6 (19.5–21.8)
Diabetes test	14.4 (12.8–16.0)	19.9 (16.4–23.4)	34.8 (27.2–42.3)	24.9 (18.5–31.2)	16.5 (15.0–18.1)
Flu injection	16.8 (15.5–18.1)	17.4 (14.3–20.5)	22.5 (17.0–28.0)	14.6 (9.3–19.9)	17.0 (15.8–18.1)
Flu injection (≥ 65 years)	61.2 (57.8–64.6)	49.3 (34.6–64.0)	60.1 (37.1–83.2)	36.7 (7.2–66.3)	58.3 (54.9–61.7)
Mammogram * (50–64 years)	76.9 (73.7–80.1)	69.0 (59.1–78.9)	57.1 (40.2–74.1)	55.6 (40.7–70.5)	74.4 (71.6–77.1)
Cervical smear * (20–69 years)	77.5 (75.2–79.7)	72.8 (69.1–76.5)	54.4 (47.7–61.1)	43.1 (36.6–49.5)	74.0 (72.5–75.5)

* Last three years.

Note: When ethnic groups were not represented in adequate numbers for reliable estimates results are suppressed and a dash (–) is shown in the table.

Chapter 5: Self-reported Health Status

Introduction

The SF-36 is a standard questionnaire derived from a larger set of questions used in the US Medical Outcomes Study in the mid-1980s (Ware and Sherbourne 1992). The SF-36 has become one of the most widely used questionnaires for measuring self-reported physical and mental health status. Self-reported health measures, based on an individual's perception of their health status and functioning, are an alternative to the more traditional objective measures of health, such as hospitalisation rates. Self-reported health measures introduce an element of subjectivity into health status measurement, which is useful for providing a more consumer-centred view of health, so placing more emphasis on quality of life or wellbeing.

The SF-36 questionnaire consists of 36 questions (items) measuring physical and mental health status in relation to eight health scales (Table 19). The Australian and New Zealand version of the SF-36 questionnaire (version 1) was used in this survey and differs only slightly from the original.

Responses to each of the SF-36 items are scored and summed across health scales according to a standardised protocol (Ware et al 1993). Scores are expressed on a 0–100 scale for each of the eight health scales, with higher scores representing better self-perceived health. Five of the scales (Physical Functioning, Role Physical, Bodily Pain, Social Functioning and Role Emotional) are unipolar, meaning they define health status in terms of the absence of limitation and the maximum score of 100 is achieved when no limitation is reported. The other scales (General Health, Vitality and Mental Health) are bipolar scales, covering both positive and negative health states and the maximum score on these scales indicates not just the absence of disability, but also the presence of a positive health state.

Interpretation of the SF-36 is based on the mean scores. The scales are independent of each other and scale scores cannot be compared. However, within one scale, population subgroup (ie, ethnicity, age or NZDep2001) means can be compared. The ordering of the scales used in this report is an international standard, with the order from left to right representing the extent to which each scale measures physical or mental health.

This chapter presents a summary of SF-36 results. Additional SF-36 results are available in datacubes. Ninety-five percent confidence intervals are presented for all results as error bars in graphs or after the estimate in the summary tables at the end of the chapter. When a difference between population subgroups is referred to as significant, it means the difference is statistically significant at the 95 percent confidence level (ie, the 95 percent confidence intervals do not overlap).

All results presented by sex, ethnicity and NZDep2001 in the body of this report have been age-standardised by the direct method using the WHO World Population as the standard population. This is to allow comparisons between population subgroups without differences in the age distribution of the comparison populations influencing results. However, age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup with another.

If you want to know the actual SF-36 score in the population of interest (eg, the mean Physical Functioning score in females), use the crude (unadjusted) rates shown in the summary tables at the end of this chapter or in the datacubes.

Table 19: Item groupings and abbreviated item content for the SF-36

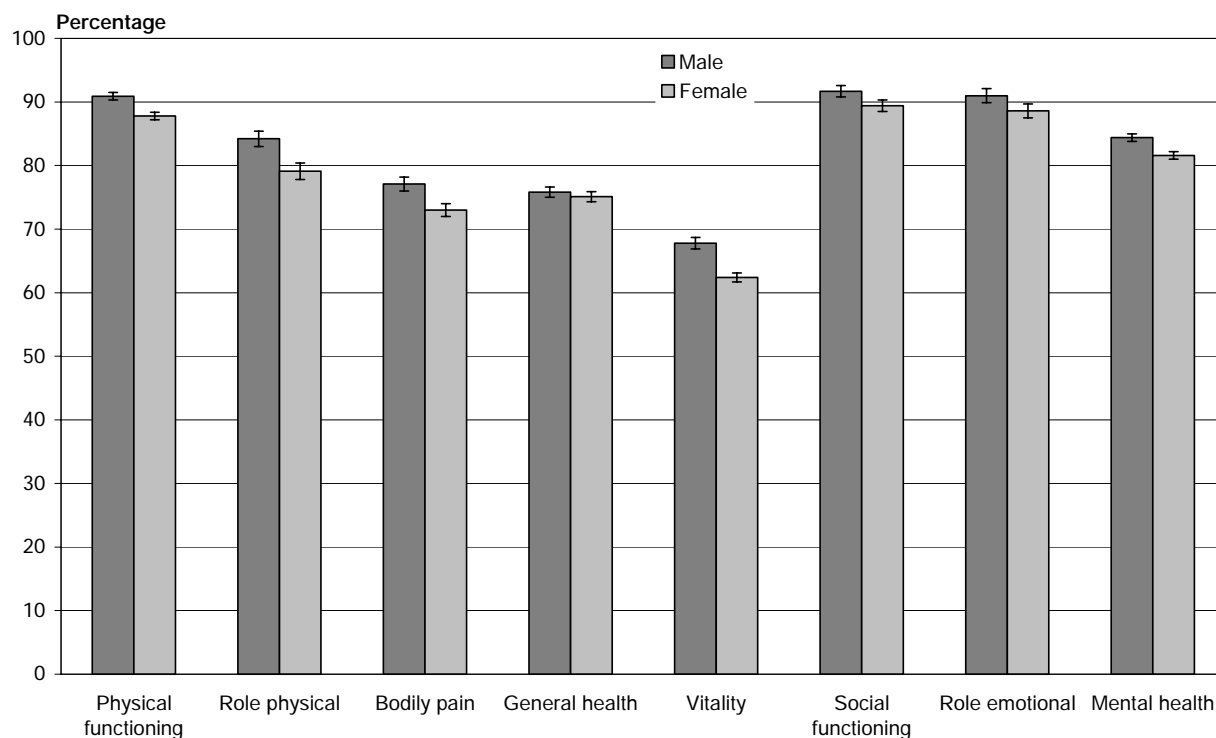
Health scale	Item	Abbreviated item content
Physical functioning (PF)	PF1	Vigorous activities, such as running, lifting heavy objects
	PF2	Moderate activities, such as vacuuming, bowling
	PF3	Lifting or carrying groceries
	PF4	Climbing several flights of stairs
	PF5	Climbing one flight of stairs
	PF6	Bending, kneeling, stooping
	PF7	Walking more than one kilometre
	PF8	Walking half a kilometre
	PF9	Walking 100 metres
	PF10	Bathing or dressing yourself
Role physical (RP)	RP1	Cut down the amount of time spent on work or other activities
	RP2	Accomplished less than would like
	RP3	Limited in the kind of work or other activities
	RP4	Difficulty performing work or other activities
Bodily pain (BP)	BP1	Intensity of bodily pain
	BP2	Extent pain interfered with normal work
General health (GH)	GH1	Is your health: excellent, very good, good, fair, poor
	GH2	I seem to get sick a little easier than other people
	GH3	I am as healthy as anybody I know
	GH4	I expect my health to get worse
	GH5	My health is excellent
Vitality (VT)	VT1	Feel full of life
	VT2	Have a lot of energy
	VT3	Feel worn out
	VT4	Feel tired
Social functioning (SF)	SF1	Extent health problems interfered with normal social activities
	SF2	Frequent health problems interfered with social activities
Role emotional (RE)	RE1	Cut down the amount of time spent on work or other activities
	RE2	Accomplished less than would like to
	RE3	Didn't do work or other activities as carefully as usual
Mental health (MH)	MH1	Been a very nervous person
	MH2	Felt so down in the dumps that nothing could cheer you up
	MH3	Felt calm and peaceful
	MH4	Felt down
	MH5	Been a happy person

Results

SF-36 scores by sex

Males scored significantly higher than females on all SF-36 scales, except general health (Figure 105). The differences were most pronounced for vitality, role physical and bodily pain. This may reflect a greater willingness on the part of females to acknowledge and report limitations rather than any real difference in levels of health.

Figure 105: Mean SF-36 scores, by sex (age-standardised)



SF-36 scores by ethnicity

The differences in SF-36 profiles between ethnic groups were similar for males and females (Figures 106 and 107) and most pronounced for scales associated with physical health (role physical, bodily pain and vitality).

The Asian ethnic group tended to rate its health higher than other ethnic groups on the scales more closely associated with physical health (physical functioning, role physical, bodily pain and vitality), although these differences were usually not significant.

The European/Other ethnic group generally rated its health higher than Māori on all scales except vitality. However, the differences were not always significant and not as large as might be expected based on results of more objective health status measures. The differences between the European/Other ethnic group and Māori were more often significant for females (physical functioning, role physical, general health, social functioning, and role emotional) than males (general health).

Pacific peoples tended to rate their health better than Māori, the same or higher than the European/Other ethnic group, but lower than Asian peoples. The only differences between Pacific peoples and Māori that were significant were role physical and role emotional in females. The only difference between Pacific peoples and European/Other that was significant was vitality in females.

Figure 106: Mean SF-36 scores, by ethnic group, males (age-standardised)

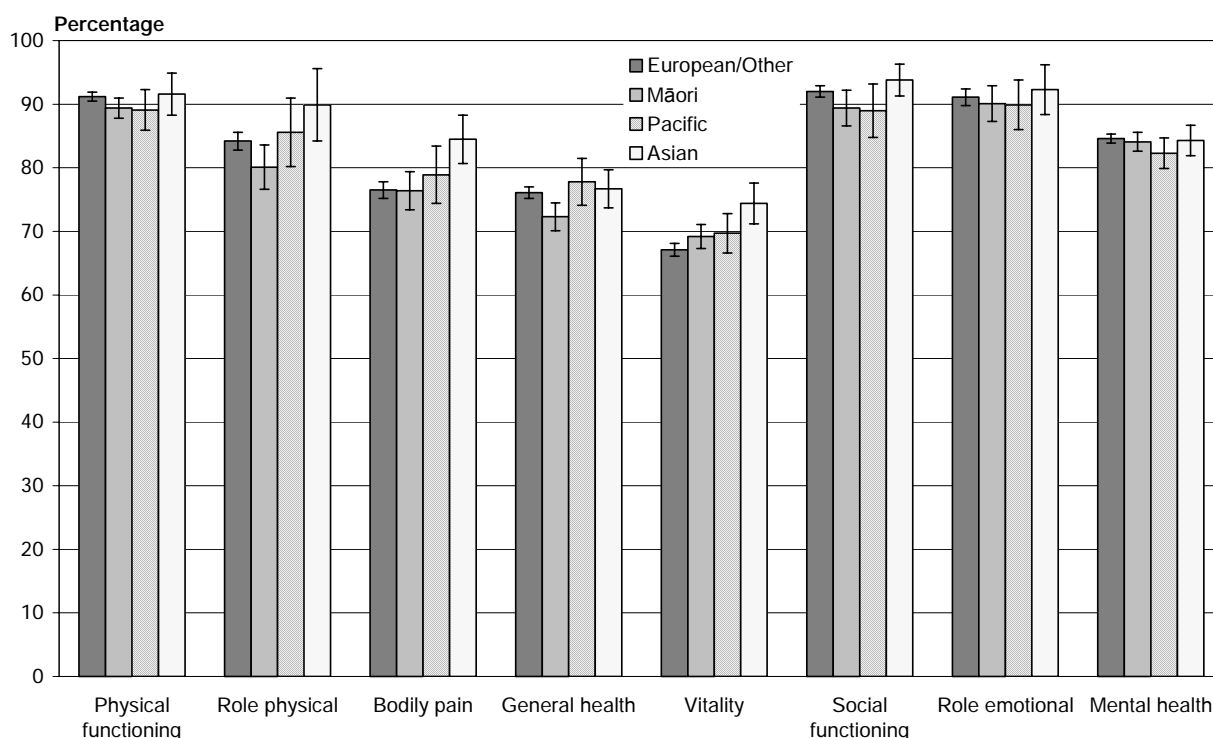
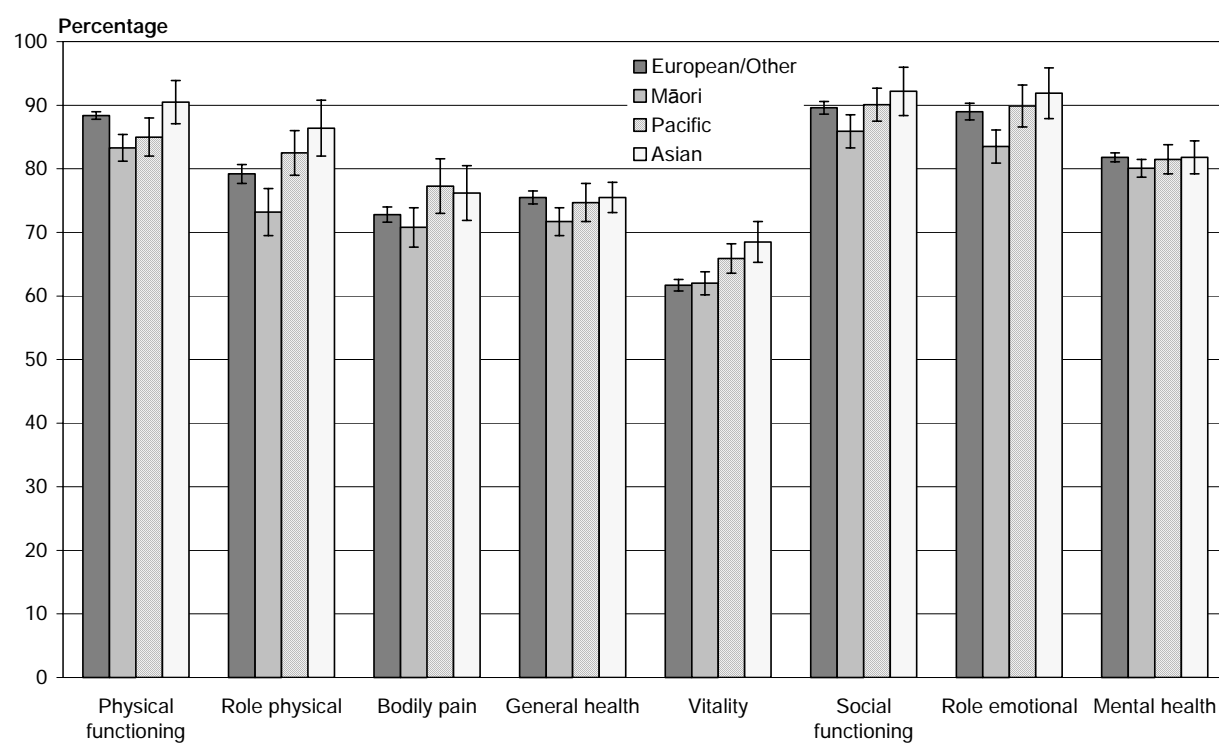


Figure 107: Mean SF-36 scores, by ethnic group, females (age-standardised)

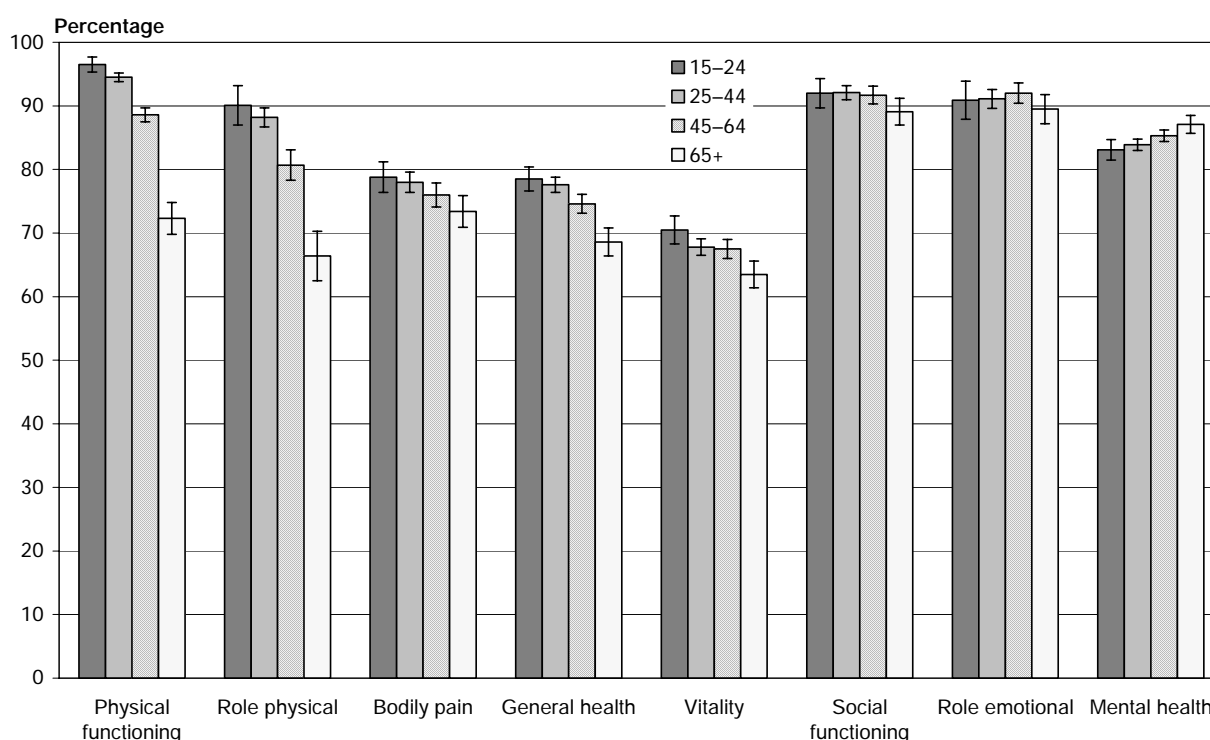


SF-36 scores by age

Mean SF-36 scores generally declined with age, particularly for the scales most closely associated with physical health (physical functioning and role physical). In contrast, SF-36 scores for scales associated with mental health were relatively stable across age groups, except mental health scores, which increased. The age-related patterns in mean SF-36 scores differed for males and females and are discussed separately below.

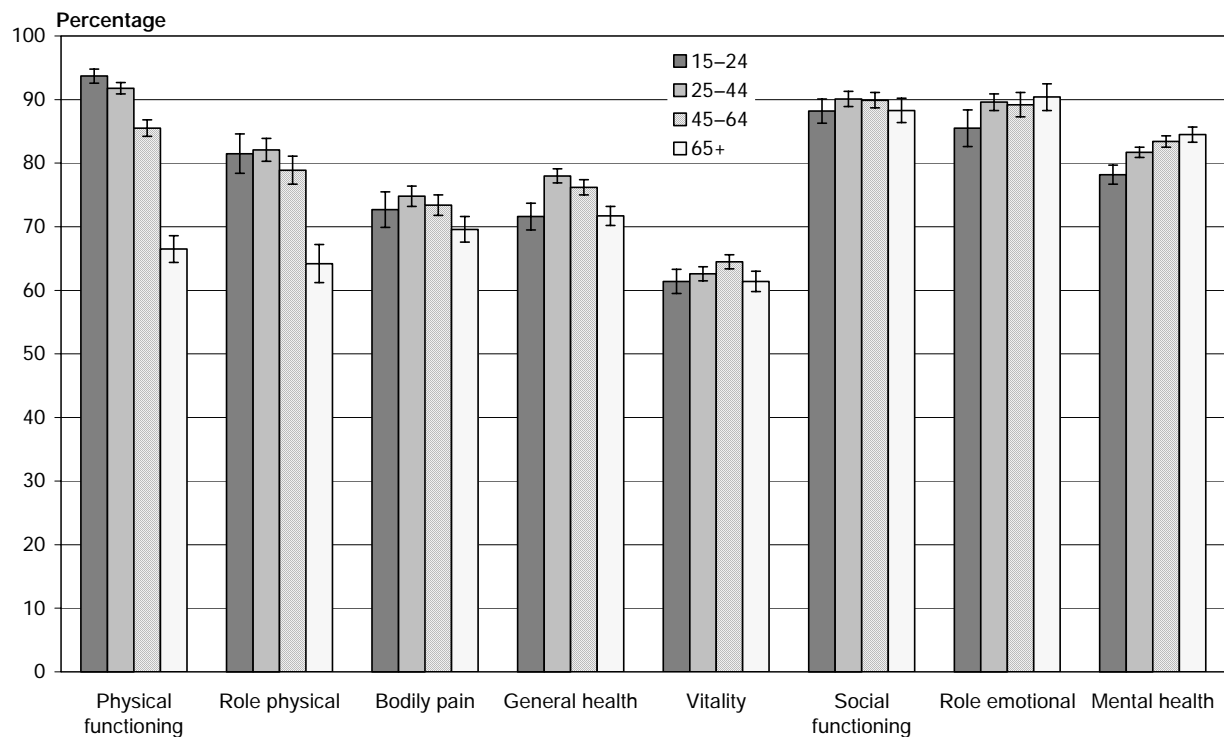
In males (Figure 108), mean SF-36 scores declined with age for all the physical health scales (physical functioning, role physical, bodily pain, general health and vitality), whereas mental health scores increased with age. Scores for other mental health-related scales (social functioning and role emotional) were similar in all age groups or declined only in the oldest age group. The differences in SF-36 scores between the youngest and oldest age groups were significant for all scales, except social functioning and role emotional.

Figure 108: Mean SF-36 scores, by age group, males



In females, mean SF-36 scores declined significantly with age for only two of the physical health scales (physical functioning and role physical) (Figure 109). Unlike males, scores in the other physical health scales (bodily pain, general health and vitality) were higher in the two middle age groups, with scores for the 15–24 years age group generally similar to the 65+ years age group. Scores for mental health-related scales showed a similar pattern to males, with mental health scores increasing with age and no real age-related pattern for social functioning and role emotional.

Figure 109: Mean SF-36 scores, by age group, females



SF-36 scores by deprivation

An increasing level of deprivation, as measured by NZDep2001, was associated with lower SF-36 scores for all scales (Figures 110 and 111). However, the difference between NZDep2001 quintile 1 (least deprived) and quintile 5 (most deprived) was not significant for bodily pain, vitality and role emotional in males, or role physical, bodily pain, vitality and social functioning in females.

Figure 110: Mean SF-36 scores, by NZDep2001 quintile, males (age-standardised)

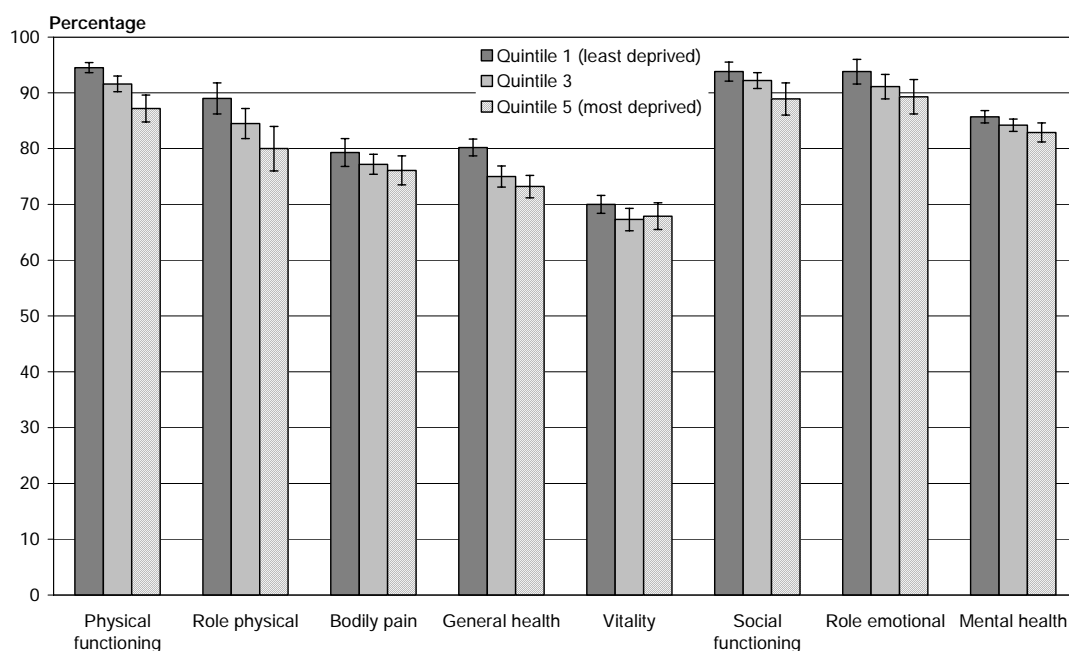
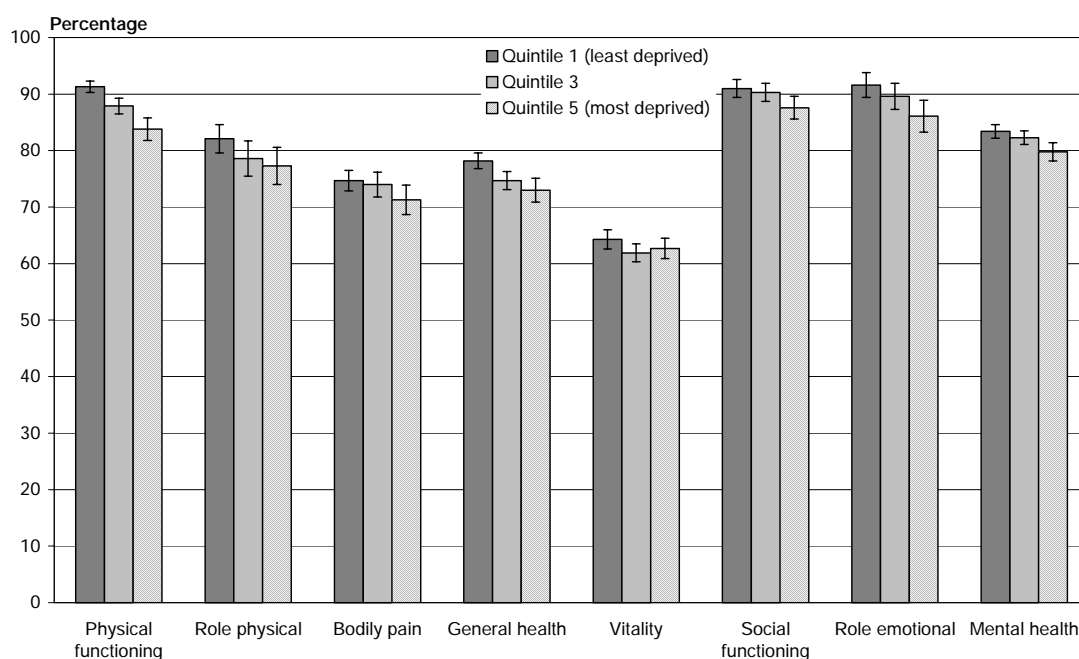


Figure 111: Mean SF-36 scores, by NZDep2001 quintile, females (age-standardised)



Summary tables

Table 20 (male) and Table 21 (female) summarise the crude mean SF-36 scores by ethnic group. Use these crude estimates if you want to know the actual mean SF-36 score in the population of interest, but do not use them to compare one population subgroup (sex or ethnicity) with another.

Table 20: Mean SF-36 scores, by ethnic group, males (crude)

	European/ Other	Māori	Pacific	Asian	All
Physical functioning	89.6 (88.8–90.3)	91.3 (89.8–92.7)	91.8 (88.9–94.7)	93.7 (91.0–96.3)	90.1 (89.5–90.7)
Role physical	82.6 (81.2–84.0)	82.6 (79.5–85.7)	88.3 (84.8–91.8)	91.1 (86.8–95.4)	83.3 (82.2–84.5)
Bodily pain	76.2 (74.9–77.5)	76.6 (73.7–79.5)	80.1 (75.4–84.7)	85.3 (81.6–88.9)	76.9 (75.8–78.0)
General health	75.5 (74.7–76.4)	73.2 (71.0–75.4)	80.1 (76.8–83.4)	78.1 (75.5–80.7)	75.6 (74.8–76.4)
Vitality	66.7 (65.8–67.7)	69.0 (67.1–70.9)	70.5 (67.0–74.0)	75.1 (72.3–78.0)	67.6 (66.8–68.5)
Social functioning	91.7 (90.9–92.6)	89.7 (87.2–92.2)	89.9 (85.8–94.0)	93.8 (91.4–96.1)	91.6 (90.7–92.4)
Role emotional	91.2 (90.1–92.3)	90.2 (87.4–92.9)	90.8 (87.4–94.1)	92.1 (88.2–96.0)	91.1 (90.1–92.1)
Mental health	84.9 (84.3–85.5)	83.6 (82.1–85.1)	82.6 (80.3–85.0)	84.1 (82.0–86.2)	84.6 (84.0–85.2)

Table 21: Mean SF-36 scores, by ethnic group, females (crude)

	European/ Other	Māori	Pacific	Asian	All
Physical functioning	86.0 (85.3–86.7)	85.2 (83.2–87.2)	86.8 (83.7–89.9)	92.8 (90.8–94.7)	86.4 (85.7–87.0)
Role physical	77.8 (76.4–79.1)	74.1 (70.4–77.8)	84.5 (81.2–87.8)	87.9 (84.2–91.5)	78.3 (77.1–79.5)
Bodily pain	72.9 (71.9–73.9)	71.1 (68.2–74.0)	78.4 (74.2–82.7)	77.7 (74.3–81.2)	73.2 (72.3–74.2)
General health	75.8 (74.9–76.6)	71.8 (69.6–74.0)	75.6 (72.6–78.6)	78.0 (75.7–80.2)	75.4 (74.7–76.2)
Vitality	62.1 (61.3–62.9)	61.9 (60.1–63.7)	66.4 (64.0–68.7)	69.6 (67.0–72.2)	62.8 (62.1–63.4)
Social functioning	89.6 (88.7–90.5)	85.8 (83.3–88.2)	90.2 (87.6–92.7)	93.1 (90.5–95.8)	89.4 (88.6–90.2)
Role emotional	89.4 (88.3–90.5)	83.2 (80.6–85.7)	90.3 (87.1–93.4)	92.8 (89.9–95.7)	89.0 (88.0–89.9)
Mental health	82.4 (81.8–83.0)	79.6 (78.2–80.9)	81.5 (79.6–83.5)	82.3 (80.4–84.3)	82.1 (81.5–82.6)

Table 22 (male) and Table 23 (female) summarise the age-standardised mean SF-36 scores by ethnic group. Note that age-standardised estimates have no meaning by themselves; they are meaningful only when compared with other age-standardised estimates. Therefore, only use these age-standardised estimates to compare one population subgroup (sex or ethnicity) with another.

Table 22: Mean SF-36 scores, by ethnic group, males (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Physical functioning	91.2 (90.5–91.8)	89.4 (87.8–91.0)	89.1 (85.9–92.3)	91.6 (88.3–94.9)	90.9 (90.3–91.5)
Role physical	84.2 (82.9–85.6)	80.1 (76.5–83.6)	85.6 (80.2–91.0)	89.9 (84.2–95.7)	84.2 (83.0–85.4)
Bodily pain	76.5 (75.2–77.8)	76.4 (73.4–79.4)	78.9 (74.4–83.4)	84.5 (80.7–88.3)	77.1 (76.0–78.1)
General health	76.1 (75.2–77.0)	72.3 (70.1–74.5)	77.8 (74.1–81.6)	76.7 (73.6–79.7)	75.8 (75.0–76.7)
Vitality	67.1 (66.0–68.1)	69.2 (67.2–71.1)	69.7 (66.6–72.9)	74.4 (71.3–77.6)	67.8 (66.9–68.7)
Social functioning	92.0 (91.1–92.9)	89.4 (86.5–92.2)	89.0 (84.8–93.2)	93.8 (91.3–96.2)	91.7 (90.8–92.6)
Role emotional	91.1 (89.9–92.4)	90.1 (87.3–92.9)	89.9 (85.9–93.8)	92.3 (88.4–96.1)	91.0 (89.9–92.2)
Mental health	84.6 (83.9–85.3)	84.1 (82.5–85.6)	82.3 (79.9–84.7)	84.3 (81.9–86.6)	84.4 (83.8–85.0)

Table 23: Mean SF-36 scores, by ethnic group, females (age-standardised)

	European/ Other	Māori	Pacific	Asian	All
Physical functioning	88.4 (87.8–89.0)	83.3 (81.2–85.4)	85.0 (82.0–87.9)	90.5 (87.1–93.9)	87.8 (87.2–88.5)
Role physical	79.2 (77.7–80.6)	73.2 (69.5–76.9)	82.5 (79.0–85.9)	86.4 (82.0–90.9)	79.1 (77.8–80.4)
Bodily pain	72.8 (71.7–74.0)	70.8 (67.7–73.8)	77.3 (73.1–81.6)	76.2 (71.9–80.5)	73.0 (72.0–74.0)
General health	75.5 (74.6–76.5)	71.7 (69.6–73.9)	74.7 (71.7–77.7)	75.5 (73.1–77.9)	75.1 (74.2–75.9)
Vitality	61.7 (60.8–62.7)	62.0 (60.2–63.8)	65.9 (63.5–68.2)	68.5 (65.2–71.7)	62.4 (61.6–63.1)
Social functioning	89.6 (88.6–90.6)	85.9 (83.3–88.4)	90.1 (87.4–92.7)	92.2 (88.4–96.0)	89.4 (88.5–90.2)
Role emotional	89.0 (87.7–90.3)	83.5 (81.0–86.1)	89.9 (86.7–93.2)	91.9 (87.9–95.9)	88.6 (87.5–89.7)
Mental health	81.8 (81.1–82.5)	80.1 (78.7–81.5)	81.5 (79.2–83.7)	81.8 (79.1–84.4)	81.6 (81.0–82.2)

References

Ware JE, Sherbourne CD. 1992. The MOS 36-item short-form health survey. I: Conceptual framework and item selection. *Medical Care* 30: 473–83.

Ware JE, Snow KK, Kosinski M, et al. 1993. *SF-36 Health Survey: Manual and interpretation guide*. Boston, MA: The Health Institute.