

A Comparison of Selected Findings from the 1996/97 and 2002/03 New Zealand Health Surveys

**Public Health Intelligence
Occasional Bulletin No. 33**

Authors

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Citation: Ministry of Health. 2006. *A Comparison of Selected Findings from the 1996/97 and 2002/03 New Zealand Health Surveys*.
Wellington: Ministry of Health.

Published in September 2006 by the
Ministry of Health
PO Box 5013, Wellington, New Zealand

ISBN 0-478-30049-2 (Book)
ISBN 0-478-30050-6 (Internet)
HP 4298

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



MANATŪ HAUORA

Foreword

Public Health Intelligence (PHI), the epidemiology group of the Ministry of Health, monitors the health of the New Zealand population. An integral component of our work is managing the New Zealand Health Monitor (NZHM), a co-ordinated cycle of population-based health-related surveys designed to address two basic questions: 'how healthy are we as a nation?' and 'how healthy is the health system?' The New Zealand Health Surveys (NZHS) are the cornerstone of the NZHM and provide insight into these two central questions. There have been three national health surveys conducted in New Zealand: the 1992/93 Household Health Survey, the 1996/97 NZHS, and the 2002/03 NZHS. The next NZHS is scheduled for 2006/07.

A Comparison of Selected Findings from the 1996/97 and 2002/03 New Zealand Health Surveys compares data from the 1996/97 and 2002/03 NZHS. We were unable to include the 1992/93 Household Health Survey in the comparison as the data set was unavailable. The 1996/97 and 2002/03 NZHS involved approximately 8000 and 13,000 face-to-face interviews respectively, with randomly selected New Zealanders conducted over a 12- to 15-month period.

The purpose of the report is to provide information on changes in the prevalence of selected risk and protective factors, diabetes, use of health services and self-reported health status over the six-year period between the two surveys. The report therefore provides valuable evidence to assess progress towards achieving the key objectives of the New Zealand Health Strategy. Inclusion of the 2006/07 NZHS in future comparison reports will provide further information on trends in the health status of New Zealanders, and whether the Ministry of Health's societal and systemic outcomes of better health, reduced inequalities and equity and access are being addressed.

We welcome any feedback on the content, relevance and direction of this report and how its findings might be translated into policy and improved health for New Zealanders. Please direct any comments to Public Health Intelligence, Ministry of Health, PO Box 5013, Wellington.



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Acknowledgements

The author gratefully acknowledges the Public Health Intelligence team members who reviewed and commented on the draft document. The participants of both surveys who freely gave their time to take part in the surveys are also gratefully acknowledged.

The report was peer reviewed by: Professor Alistair Woodward, University of Auckland; and Jon Foley, Ministry of Health.

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Executive Summary

This is a summary of the findings of this report. Any changes described below are statistically significant changes.

Males

From 1996/97 to 2002/03 among New Zealand males aged 15 years and over there was:

- no change in the prevalence of diagnosed diabetes
- no change in the proportion consuming three or more servings of vegetables per day
- an increase in the proportion consuming two or more servings of fruit per day (from 35 to 43%)
- no change in the prevalence of overweight (excludes obese)
- an increase in the prevalence of obesity (from 14 to 19%)
- no change in the proportion who were current smokers
- no change in the proportion who had visited a general practitioner in the previous 12 months
- an increase in the proportion who had been admitted as an inpatient to a public hospital in the previous 12 months (from 27 to 35%)
- an increase in the proportion who had been admitted for day treatment in a public hospital in the previous 12 months (from 10 to 15%)
- a decrease in the proportion who attended an accident and emergency department at a public hospital in the previous 12 months (from 53 to 41%).

Females

From 1996/97 to 2002/03 among New Zealand females aged 15 years and over there was:

- no change in the prevalence of diagnosed diabetes
- no change in the proportion consuming three or more servings of vegetables per day
- an increase in the proportion consuming two or more servings of fruit per day (from 55 to 64%)
- no change in the prevalence of overweight (excludes obese)
- no change in the prevalence of obesity
- no change in the proportion who were current smokers
- no change in the proportion who had visited a general practitioner in the previous 12 months

- an increase in the proportion who had been admitted as an inpatient to a public hospital in the previous 12 months (from 34 to 43%)
- an increase in the proportion who had used a private accident and emergency department in the previous year (from 12 to 15%).

Māori

From 1996/97 to 2002/03 among New Zealand Māori aged 15 years and over there was:

- no change in the prevalence of diagnosed diabetes
- an increase in the proportion consuming three or more servings of vegetables per day (from 58 to 66%)
- no change in the proportion consuming two or more servings of fruit per day
- no change in the prevalence of overweight (excludes obese)
- no change in the prevalence of obesity
- no change in the proportion who were current smokers
- no change in the proportion who had visited a general practitioner in the previous 12 months
- a decrease in the proportion who attended an accident and emergency department in a public hospital in the previous 12 months (from 46 to 31%).

Non-Māori

From 1996/97 to 2002/03 among New Zealand non-Māori aged 15 years and over there was:

- no change in the prevalence of diagnosed diabetes
- no change in the proportion consuming three or more servings of vegetables per day
- an increase in the proportion consuming two or more servings of fruit per day (from 46 to 55%)
- no change in the prevalence of overweight (excludes obese)
- an increase in the prevalence of obesity (from 15 to 19%)
- a decrease in the prevalence of current smoking (from 23 to 21%)
- an increase in the proportion who had visited a general practitioner in the previous 12 months (from 79 to 81%)
- an increase in the proportion who had been admitted as an inpatient to a public hospital in the previous 12 months (from 29 to 38%)
- an increase in the proportion who had been admitted for day treatment in a public hospital in the previous 12 months (from 11 to 15%)
- a decrease in the proportion who attended an accident and emergency department in a public hospital in the previous 12 months (from 41 to 36%).

Introduction

This report contains a comparison of selected findings from the 1996/97 and 2002/03 New Zealand Health Surveys. Changes in the prevalence of selected risk and protective factors, diabetes, use of health services and self-reported health status are examined and reported on. The report is purely descriptive and no attempt has been made to explain any trends seen. However, it is hoped that the report will stimulate further analysis by interested groups.

There have been three national health surveys conducted in New Zealand since 1992: the 1992/93 Household Health Survey, the 1996/97 New Zealand Health Survey (NZHS), and the 2002/03 NZHS. The 1992/93 survey involved telephone interviews with 7065 adults; the 1996/97 NZHS involved face-to-face interviews with 7862 adults; and the 2002/03 NZHS involved face-to-face interviews with 12,529 adults.

The data set from the 1992/93 survey was not available, so only results between the 1996/97 and 2002/03 NZHS are compared. Only identical questions from the latter two surveys were analysed and presented because not all questions were comparable (eg, due to different wording).

A comparison between the 1996/97 and 2002/03 NZHS feeds into the objectives of the New Zealand Health Monitor (NZHM), which was developed in 2002 and updated in 2005 (Ministry of Health 2005). The NZHM is an integrated programme of surveys and cohort studies with the objective to routinely and regularly collect, analyse, interpret and disseminate information (collected through population-based surveys and cohort studies) relating to two central questions:

- How healthy are we?
- How healthy is the health system?

A comparison of the 1996/97 and 2002/03 NZHS allows us to track changes in the health of New Zealanders over the six-year time period between surveys and aims to provide an insight into any changes in these two central questions of the NZHM. When interpreting findings it is important to take into consideration that the gap between surveys is too short to pick up some changes in the prevalence of risk factors or diseases. For example, for overweight and obese, when comparisons are made over two decades (as opposed to only six years), there has been an increasing trend in prevalence, as reported in *Tracking the Obesity Epidemic* (Ministry of Health 2004b).

Data were analysed for the total population 15 years and over, and by sex and ethnic group (Māori and non-Māori).

Methods

1996/97 New Zealand Health Survey

The target population for the 1996/97 NZHS was defined as the total usually resident, civilian population of New Zealand of all ages, residing in permanent private households.

A working group of Ministry of Health and Regional Health Authority representatives developed the 1996/97 NZHS questionnaire. Statistics New Zealand designed the sampling methodology, pre-tested the questionnaire, interviewed respondents, processed the data and provided a final data set with documentation to the Ministry of Health.

A stratified cluster sampling process was undertaken by Statistics New Zealand to select a sample from the target population. The sampling frame was area-based using primary sampling units (PSUs).

In order to obtain more reliable estimates for Māori and Pacific peoples, these groups were oversampled. Each of the 1752 selected PSUs contained a panel of households which had recently taken part in the Household Labour Force Survey. A subset of these households which were known to contain Māori or Pacific people was added to the 1996/97 NZHS sample. The final sample was made up of 7862 adults: 3258 males and 4604 females, including 1321 Māori, 645 Pacific and 5896 European/Other (6541 non-Māori) (prioritised counts).

The Central region was also oversampled to obtain reliable estimates at a sub-national level for this region.

The sample consisted of 11,921 eligible households. One eligible adult was randomly selected from each selected household. The adult response rate was 74% and represents the proportion of eligible households visited during the survey period which provided an adult respondent. To maximise the response rate, a total of four to six calls were made at each sampled dwelling before accepting that dwelling as a non-contact dwelling. Data were collected from October 1996 to October 1997 using face-to-face interviewing.

The 1996/97 NZHS sample population was used to recruit participants for the 1997 National Nutrition Survey (NNS). A total of 4636 adults participated in the 1997 NNS, including an over-sample of Māori (n = 704) and Pacific people (n = 307). Data for the 1997 NNS were collected over the 12-month period from December 1996 to November 1997. The 1997 NNS achieved a response rate of 50 percent taking into account the response rate of the 1996/97 NZHS on which the 1997 NNS was 'piggybacked'. In this comparison report, '1996/97' results for vegetable and fruit intake, overweight and obesity were obtained from the 1997 NNS.

Originally, the 1996/97 data were age-standardised to the New Zealand population as at March 1997 (see page 6 for the definition of age standardisation). To allow comparison with the 2002/03 NZHS, the data were reweighted to use the World Health Organization world population for age standardisation. This is the same age standardisation as performed for the 2002/03 NZHS.

Full details on the methodology of the 1996/97 NZHS can be found in *Taking the Pulse: The 1996/97 New Zealand Health Survey* (Ministry of Health 1999) and for the 1997 NNS in *NZ Food: NZ People: Key results of the 1997 National Nutrition Survey* (Russell et al 1999).

2002/03 New Zealand Health Survey

The target population for the 2002/03 NZHS was the usually resident New Zealand adult population, 15 years and over, living in permanent private dwellings. An area-based frame using meshblocks as primary sampling units was used as a sample frame. The survey used a complex sample design involving stratification and clustering to provide high-quality estimates for minimal cost and acceptable respondent burden.

Ministry of Health staff developed the 2002/03 questionnaire based on the 1996/97 NZHS questionnaire. Statistics New Zealand tested the 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 data set with documentation to the Ministry of Health.

Population characteristics from the 2001 Census were used in the sample design and sample selection. A stratified sample design was used, and the strata were defined according to the ethnicity variable defined by Question 11 in the Individual Form in the 2001 Census. To obtain more reliable estimates for Māori, Pacific and Asian peoples, these ethnic groups were oversampled. Due to a change in the survey objectives shortly after the field work started, the survey had two sample designs. The initial sample design consisted of four strata (Māori, Asian, Pacific peoples and Other) and the second design consisted of two strata (Māori and Other). For the latter design, in addition to the two strata, there were three ethnic over-samples within the Other stratum (Māori, Pacific peoples and Asian). A total of 12,929 people responded to the survey, including 4369 Māori, 910 Pacific people and 1173 Asian people (prioritised counts).

Data were collected from September 2002 to January 2004 using face-to-face interviewing. The total response rate for the survey was 72%, meaning that 72% of eligible people approached for the main survey completed a questionnaire. To maximise the response rate, up to 10 calls were made at each sampled dwelling before accepting that dwelling as a non-contact dwelling.

The survey was conducted on a sample of respondents, so 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.

The 2002/03 NZHS was benchmarked to the 2001 Census population. 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 life-cycle age groups (15–24, 25–44, 45–64, 65+)
- by sex, by NZDep2001 deciles.

Full details on the methodology of the 2002/03 NZHS can be found in *A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey* (Ministry of Health 2004a).

Comparability of the two surveys

The 1996/97 NZHS and 2002/03 NZHS were similar in that they had the same target population, included face-to-face interviews and had similar response rates. The analyses in this report are restricted to questions that were comparable in both surveys. Nevertheless, some caution is required in comparing the results, as other factors (such as question order) can influence responses to an unknown extent.

Differences in survey design, as outlined in the survey methodology section, may also influence the comparability of results. Data collection for the two surveys was undertaken by different organisations – Statistics New Zealand carried out the 1996/97 NZHS and NRB carried out the 2002/03 NZHS. Different practices between the two organisations may have introduced some unknown bias into the results. To control for non-response, Statistics New Zealand allowed for four to six call-backs before accepting that dwelling as a non-contact dwelling, whereas NRB allowed up to 10 call-backs. Item non-response was higher in 1996/97 compared to 2002/03.

The 1996/97 survey was balanced for seasonality whereas the 2002/03 survey was not (ie, the 1996/97 survey interviews were spread evenly across the year whereas the 2002/03 interviews were not). This may have some impact on the comparisons, particularly for measures which are influenced by seasonality such as fruit and vegetable consumption. However, analysis to determine the impact of seasonality showed little evidence of any effect.

A key objective of the 2002/03 NZHS was to improve the quality of ethnic estimates, with Māori, Pacific and Asian peoples oversampled to provide more reliable results. As a result, there are four times as many Māori in the 2002/03 NZHS compared to the 1996/97 NZHS. In the 1996/97 NZHS, some variables for Māori have a small sample size; in these cases the reliability of results may be affected and will be reflected by wide confidence intervals. This has to be taken into account when comparing trends for Māori between the two surveys. It was not possible to examine trends for Pacific and Asian people across the two surveys due to the small numbers of these ethnic groups in the 1996/97 NZHS.

To improve comparability between the two surveys, replicate survey weights were created for the 1996/97 NZHS in order to calculate variances using the same methodology for both surveys.

In addition, the 1996/97 NZHS, although benchmarked to the general population, was not benchmarked to ethnicity (meaning that the final weighted proportions of Māori in the survey sample were not in line with the proportion of Māori within the general population). In comparison, the 2002/03 NZHS was benchmarked to age, sex, ethnicity and NZDep2001, as mentioned previously.

To assess the impact of not benchmarking to ethnicity in the 1996/97 survey, we looked at the representation of the main ethnic groups in the weighted results from the 1996/97 survey and compared this to the 1996 Census. While there are some differences (Māori are under-represented by about 1.8%, Pacific over-represented by 0.7% and the 'Other' ethnic category over-represented by 1%), adjusting the 1996/97 survey weights to reflect these small differences does not make a significant impact on the overall results we have presented. As a result, we have not re-benchmarked the 1996/97 weights.

Comparison between the 1996/97 and 2002/03 AUDIT and SF-36 results must be interpreted with caution because the administration of the standard AUDIT and SF-36 forms were different between the two surveys. In 1996/97 the AUDIT and SF-36 instruments were self-administered, whereas in 2002/03 they were interviewer administered. Although both instruments are suitable for self-administration or administration by a trained interviewer in person or by telephone (Babor et al 2001; Ware et al 1993), it is unknown what effect this might have had on the responses within the two surveys.

Data reliability

Ninety-five percent confidence intervals are used in this report to represent sampling error for a point estimate. Ninety-five percent confidence intervals are presented as error bars in graphs, and in brackets after estimates in the text and in the summary tables at the end of the report. If the 95% confidence intervals of two proportions do not overlap, it means that there is a statistically significant difference between the proportions.

However, sometimes a difference is significant even when the confidence intervals slightly overlap. The t-test is an additional statistical test that can be used to determine whether the difference between two proportions is significant. The significance of a t-test is represented by the *p-value*, which is a statement of probability. If the p-value is 0.05 or less the difference between the proportions is statistically significant. In this report, the confidence intervals are used to represent whether the difference in prevalence for a particular variable between the 1996/97 and 2002/03 NZHS is significant. Where confidence intervals slightly overlap, the p-value will be used to determine further any statistical significance. Although calculated for all analyses, p-values are only presented in the report where the confidence intervals overlap but the difference in proportions is significant (ie, the p-value is less than or equal to 0.05).

Analysis

Comparisons between the two surveys were made for the total population 15 years and over, and by sex and ethnicity (Māori and non-Māori).

The classification of ethnic group was based on respondents indicating with which ethnic group or groups they identified. If Māori was one of the groups reported, the respondent was prioritised as 'Māori'. All other groups were classified as 'non-Māori' for the purposes of this report.

Age is an important determinant of health status and health risks. Therefore, when making comparisons between population sub-groups (eg, between the 1996/97 and 2002/03 populations, and 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 sub-groups. Age-standardisation was performed by the direct method using the World Health Organization world population (World Health Organization 2000) as the standard population for both surveys.

It is important to note that age-standardised estimates have no meaning on their own because they do not represent the true prevalence of a variable in a particular population sub-group (as represented by crude estimates). Age-standardised estimates are only meaningful when compared with other age-standardised estimates. Because the focus of this report is on a comparison of selected findings from the 1996/97 and 2002/03 NZHS, only age-standardised results are presented. For crude prevalences for each population of interest, please refer to *Taking the Pulse: The 1996/97 New Zealand Health Survey* (Ministry of Health 1999) and *A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey* (Ministry of Health 2004a).

Chronic Disease

Diabetes

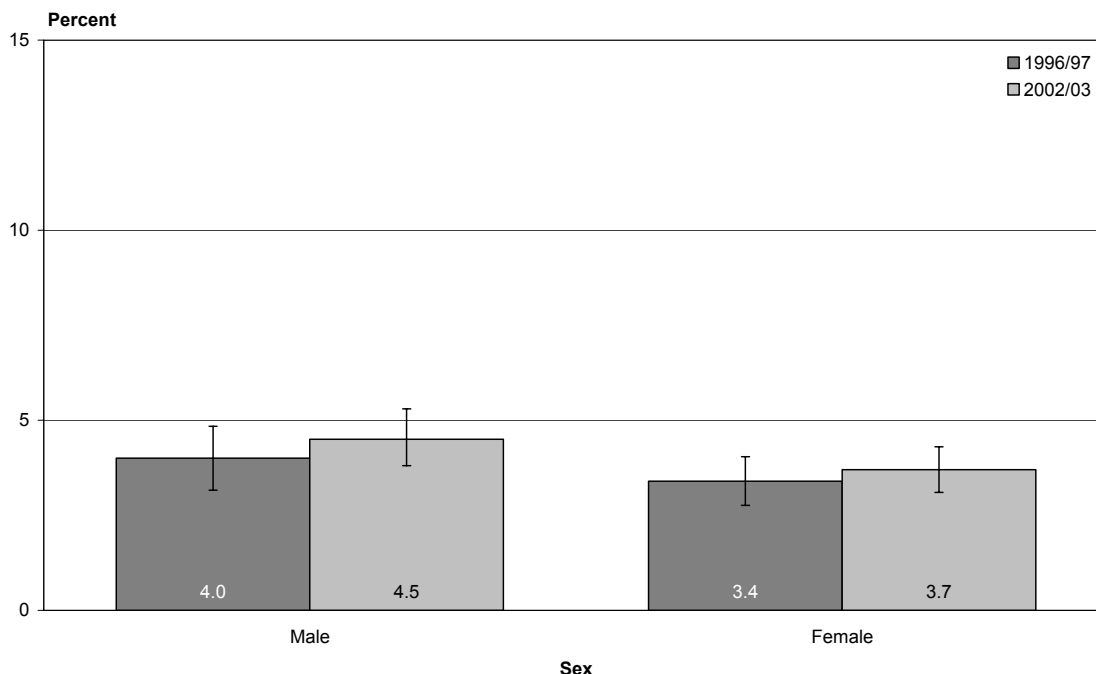
Diabetes is an important cause of morbidity and mortality in New Zealand. The presence of diabetes can lead to cardiovascular disease, blindness, kidney disease, and vascular insufficiency of the legs, which may lead to nerve damage in, or amputation of, lower limbs. There are two main types of diabetes:

- type 1 diabetes, which usually develops in childhood and is caused by the destruction of insulin-producing cells, resulting in insulin deficiency
- type 2 diabetes, which usually develops in adulthood and is associated with insulin resistance leading to a relative insulin deficit. The major risk factors for type 2 diabetes are obesity and physical inactivity. Type 2 diabetes accounts for most (85–90%) of diabetes cases in New Zealand.

Respondents in both health surveys were asked if a doctor had ever diagnosed them with diabetes (other than during pregnancy).

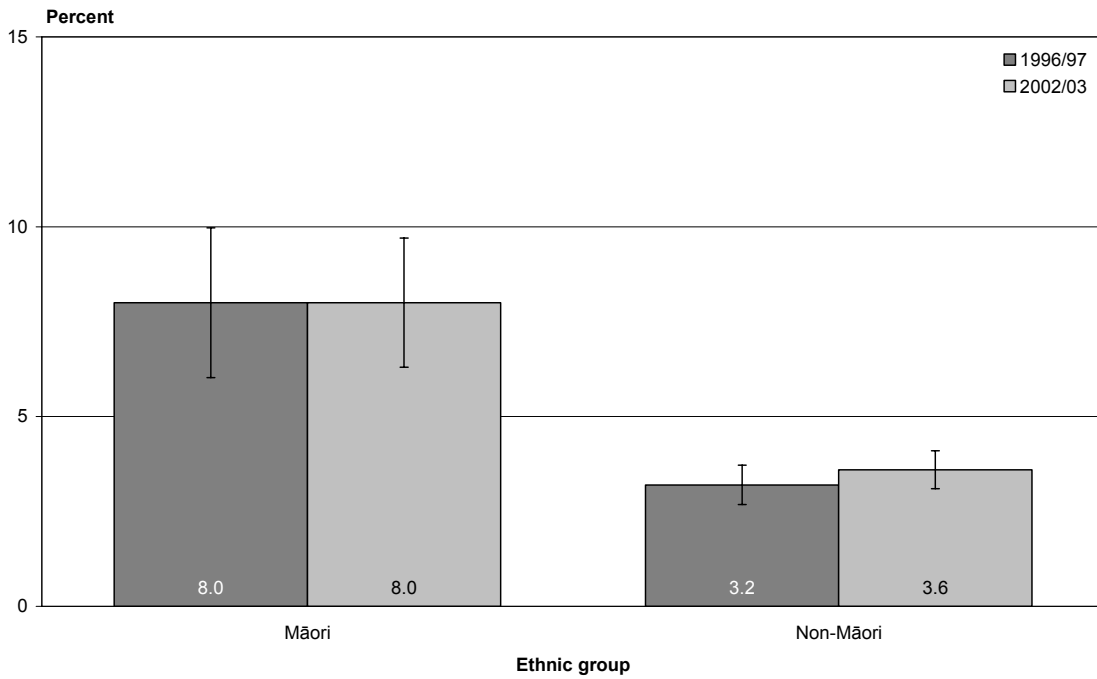
In 1996/97, the prevalence of doctor-diagnosed diabetes among New Zealand adults aged 15 years and over was 3.7% (3.2–4.2). In 2002/03, the prevalence was 4.1% (3.6–4.6). The change in prevalence found between the two surveys for the total population was not statistically significant.

Figure 1: Diabetes in adults, by sex, 1996/97 and 2002/03 (age-standardised percent)



There were no significant changes in the prevalence of diabetes in either males or females between 1996/97 and 2002/03 (Figure 1).

Figure 2: Diabetes in adults, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)



There were no significant changes in the prevalence of diabetes for either Māori or non-Māori from 1996/97 to 2002/03 (Figure 2). In both 1996/97 and 2002/03, Māori had a significantly higher prevalence of diabetes than non-Māori.

Risk and Protective Factors

Vegetable and fruit intake

Vegetables and fruit 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.

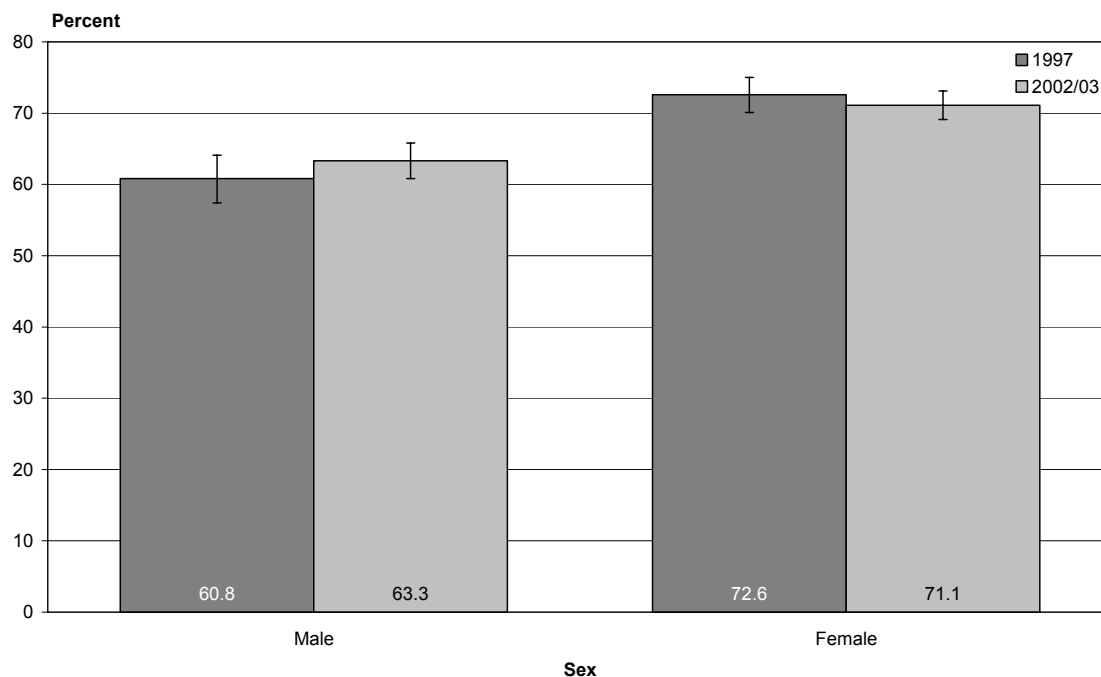
Vegetable and fruit intake was measured by asking participants in the 1997 NNS and the 2002/03 NZHS how many servings of vegetables and how many servings of fruit they eat each day on average. Participants were provided with information on serving size and the range and type of vegetables and fruit to include.

Adequate vegetable intake

Adequate vegetable intake is defined as consuming at least three servings of vegetables per day.

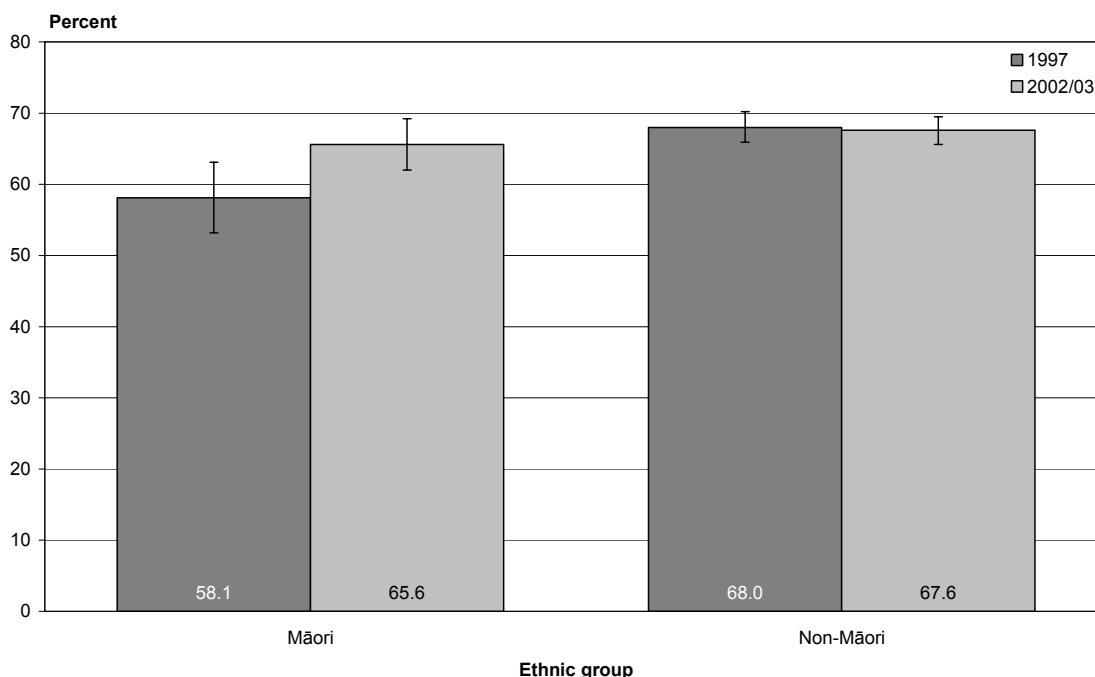
There was no change in the prevalence of adequate vegetable consumption among New Zealand adults from 1997 (66.9%; 64.9–68.9) to 2002/03 (67.3%; 65.6–69.1).

Figure 3: Vegetable intake (three or more servings per day) in adults, by sex, 1997 and 2002/03 (age-standardised percent)



There were no significant changes in the consumption of three or more servings of vegetables in males and females from 1997 to 2002/03 (Figure 3). The prevalence of adequate vegetable intake was significantly higher in females compared to males in both surveys.

Figure 4: Vegetable intake (three or more servings per day) in adults, by ethnic group, 1997 and 2002/03 (age-standardised percent)



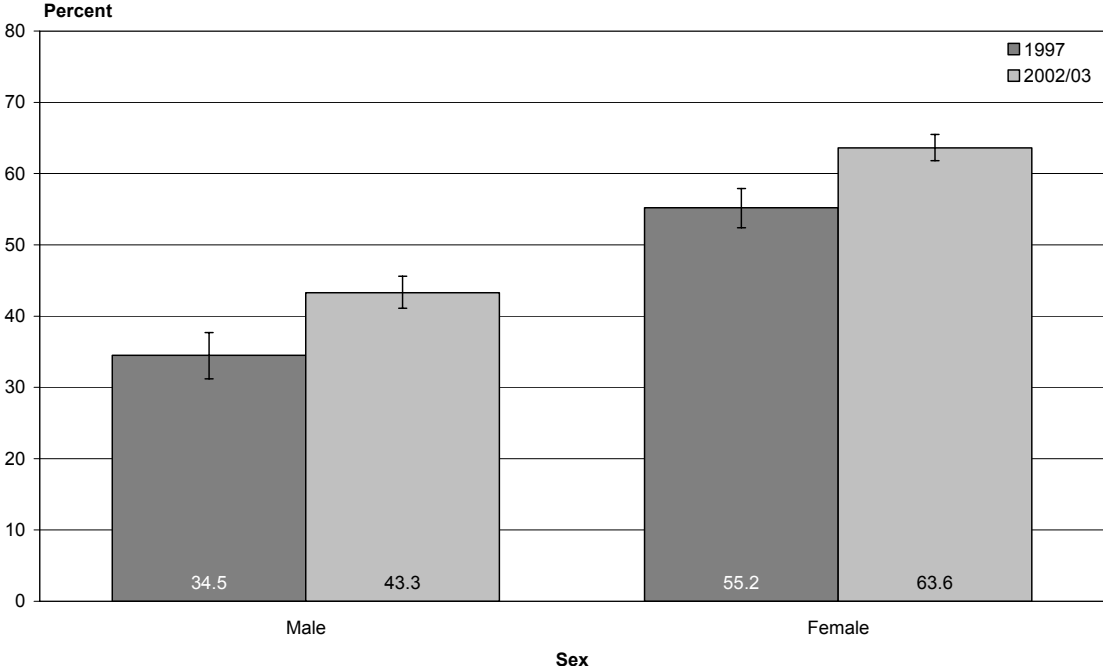
The prevalence of adequate vegetable intake increased significantly among Māori from 1997 to 2002/03 (p -value = 0.02) to a level similar to non-Māori (Figure 4). There was no significant change in the prevalence of adequate vegetable intake from 1997 to 2002/03 among non-Māori.

Adequate fruit intake

Adequate fruit intake is defined as consuming at least two servings of fruit per day.

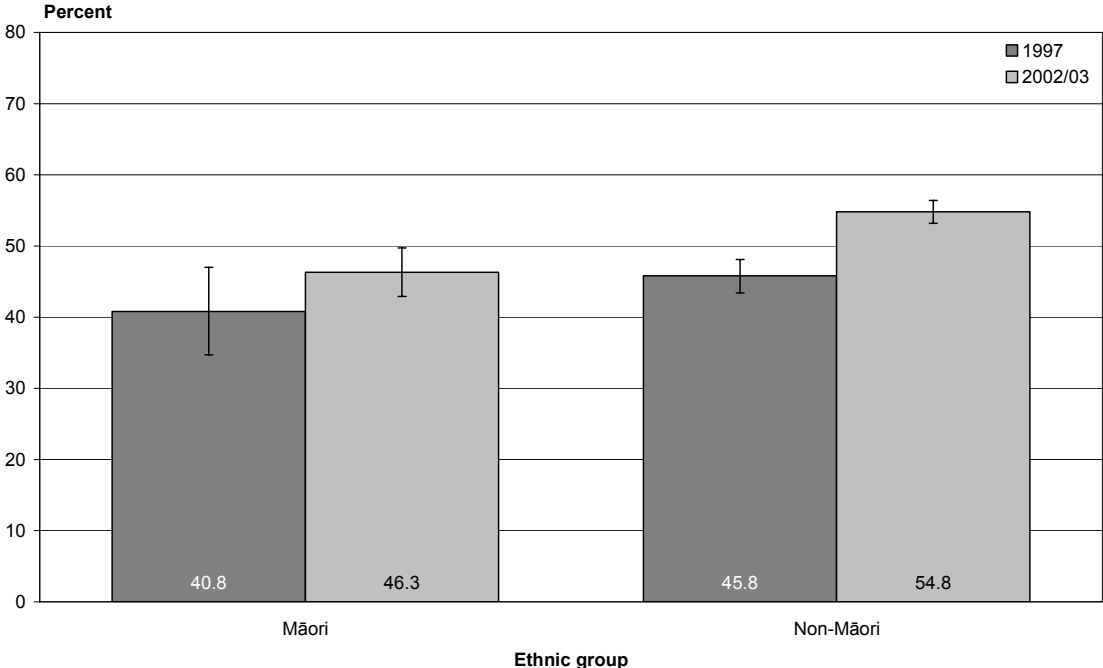
There was a statistically significant increase in adequate fruit intake among New Zealand adults from 1997 (45.2%; 43.1–47.4) to 2002/03 (53.9%; 52.4–55.3).

Figure 5: Fruit intake (two or more servings per day) in adults, by sex, 1997 and 2002/03 (age-standardised percent)



There was a statistically significant increase in adequate fruit intake among both males and females from 1997 to 2002/03 (Figure 5). The prevalence of adequate fruit intake continued to be significantly higher in females in 2002/03 compared to males.

Figure 6: Fruit intake (two or more servings per day) in adults, by ethnic group, 1997 and 2002/03 (age-standardised percent)



There was a statistically significant increase in adequate fruit intake among non-Māori from 1997 to 2002/03 (Figure 6). There was no significant change in the prevalence of adequate fruit intake among Māori between the two surveys. In 2002/03, non-Māori continued to have a significantly higher prevalence of adequate fruit intake compared to Māori.

Body weight

Overweight and obesity are important risk factors for several diseases, including type 2 diabetes, ischaemic heart disease, ischaemic stroke and several common cancers. Body mass index (BMI) is a measure of weight adjusted for height and is used to classify overweight and obesity. BMI is calculated by dividing weight in kilograms by height in metres squared (kg/m^2). Both the 1997 NNS and the 2002/03 NZHS included measurements of height and weight using standardised equipment and techniques. Adults were classified as overweight or obese according to their BMI (Table 1). Higher BMI cut-offs have been used to classify Māori and Pacific peoples as overweight and obese to account for differences in muscle mass (Swinburn 1998).

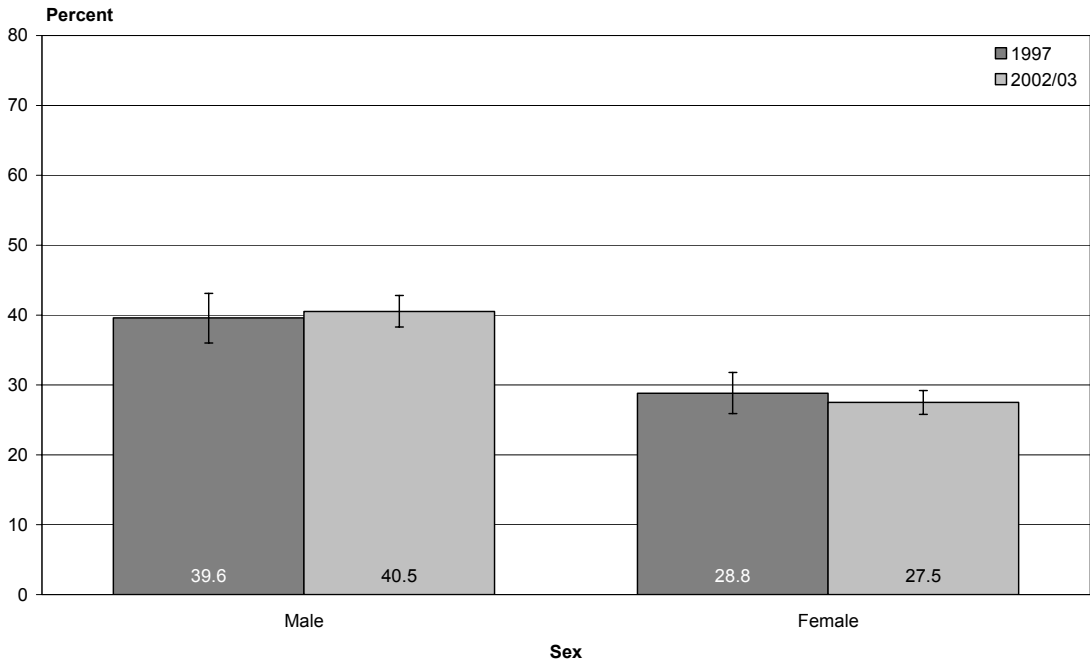
Table 1: Classifications of overweight and obesity according to BMI (kg/m^2)

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

Overweight

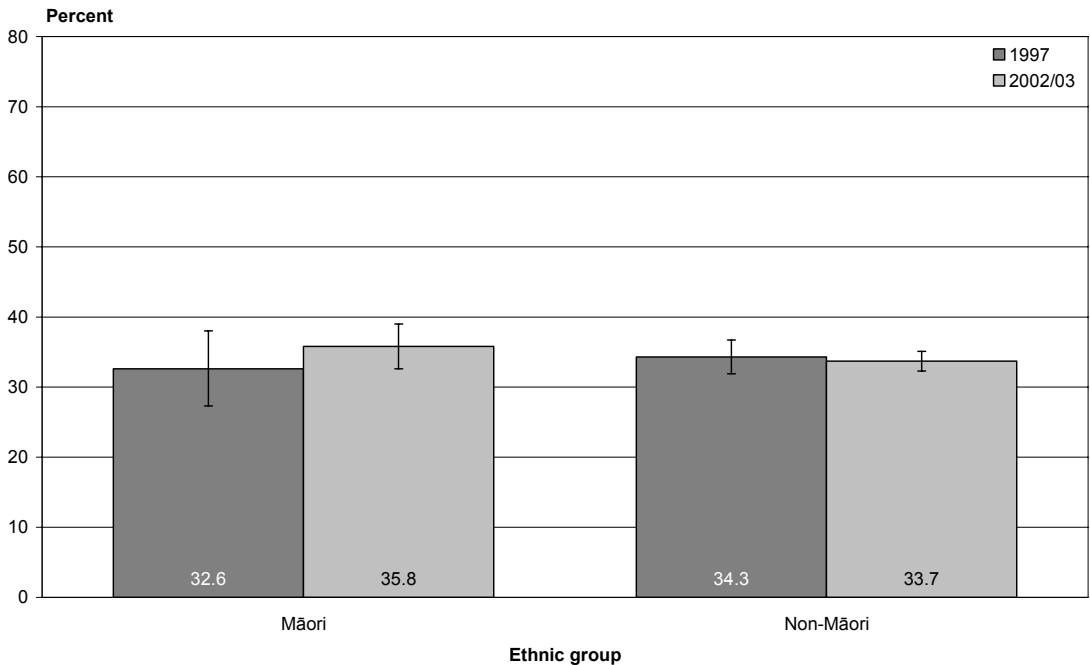
There was no change in the prevalence of overweight (excludes obese) among New Zealand adults from 1997 (34.1%; 31.8–36.4) to 2002/03 (34.0%; 32.6–35.3).

Figure 7: Overweight in adults, by sex, 1997 and 2002/03 (age-standardised percent)



There were no significant changes in the prevalence of overweight in males and females from 1997 to 2002/03 (Figure 7). Both surveys found a significantly higher prevalence of overweight among males than females.

Figure 8: Overweight in adults, by ethnic group, 1997 and 2002/03 (age-standardised percent)

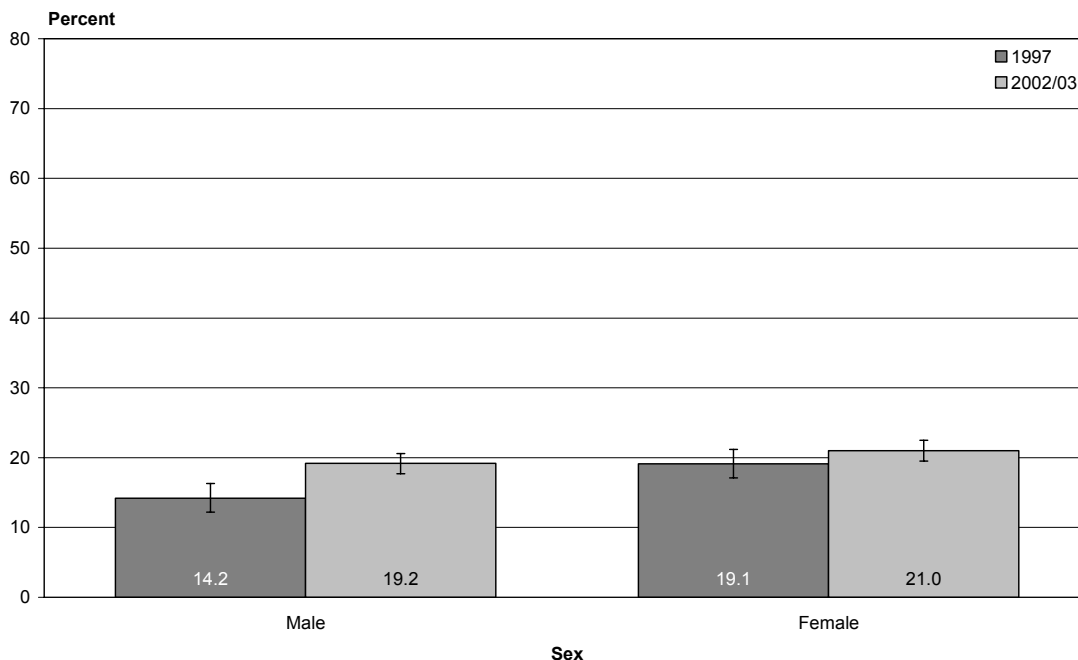


There were no significant changes in the prevalence of overweight in Māori and non-Māori from 1997 to 2002/03 (Figure 8). Similar levels of overweight continue to exist for both ethnic groups over the two survey periods.

Obesity

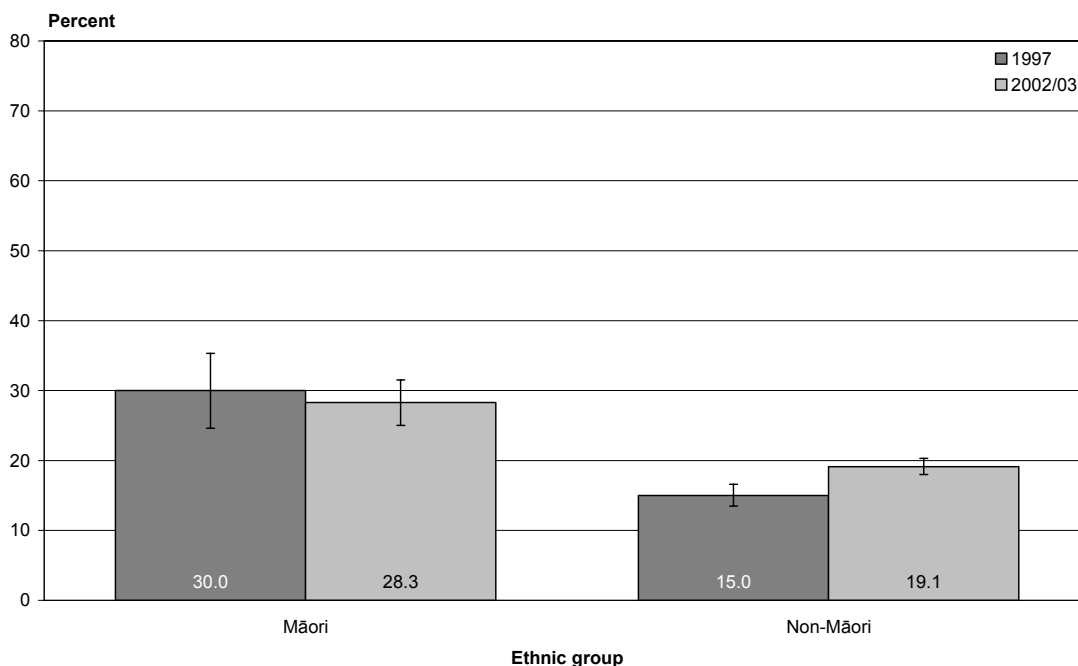
Overall there was a statistically significant increase in the prevalence of obesity among New Zealand adults from 1997 (16.7%; 15.2–18.2) to 2002/03 (20.1%; 19.0–21.2).

Figure 9: Obesity in adults, by sex, 1997 and 2002/03 (age-standardised percent)



There was a statistically significant increase in the prevalence of obesity among males from 1997 to 2002/03 (Figure 9). In 1997, females had a significantly higher prevalence of obesity compared to males, but in 2002/03 this difference was no longer significant.

Figure 10: Obesity in adults, by ethnic group, 1997 and 2002/03 (age-standardised percent)



From 1997 to 2002/03, non-Māori experienced a significant increase in the prevalence of obesity (Figure 10). However, Māori had a higher prevalence of obesity in both survey periods compared to non-Māori.

Alcohol

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.

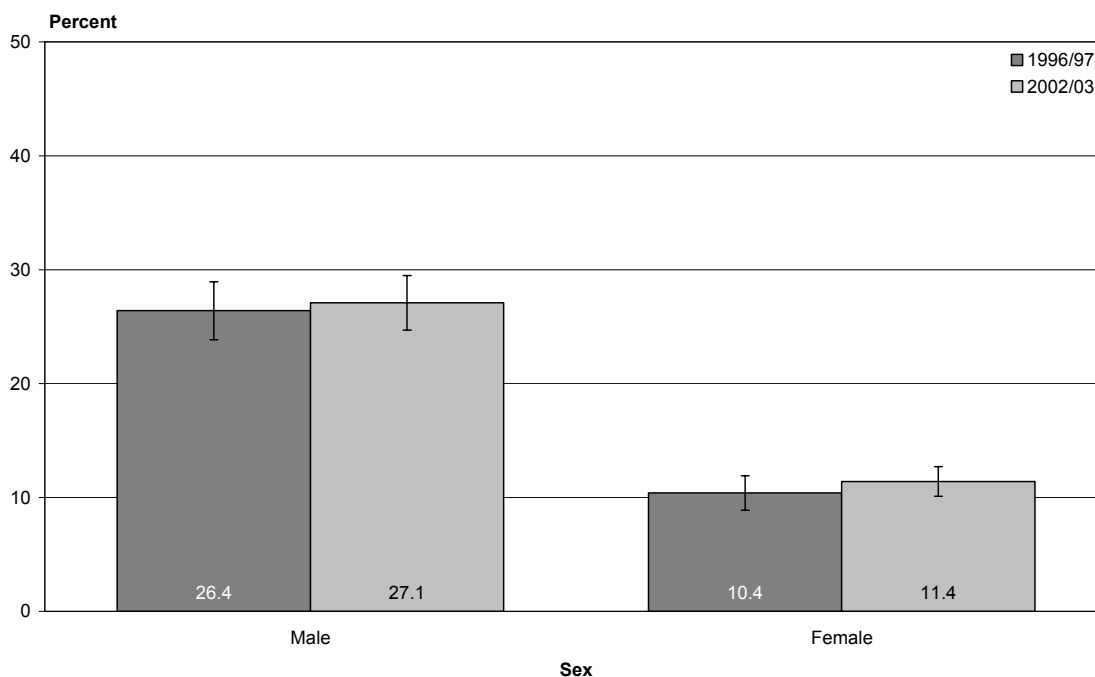
Prevalence of hazardous drinking

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 2001; 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 8 or more.

In the 1996/97 NZHS, the AUDIT questionnaire was self-administered whereas in the 2002/03 the instrument was interviewer-administered. Although both modes of administration have been validated (Babor et al 2001), the results presented below need to be interpreted with caution.

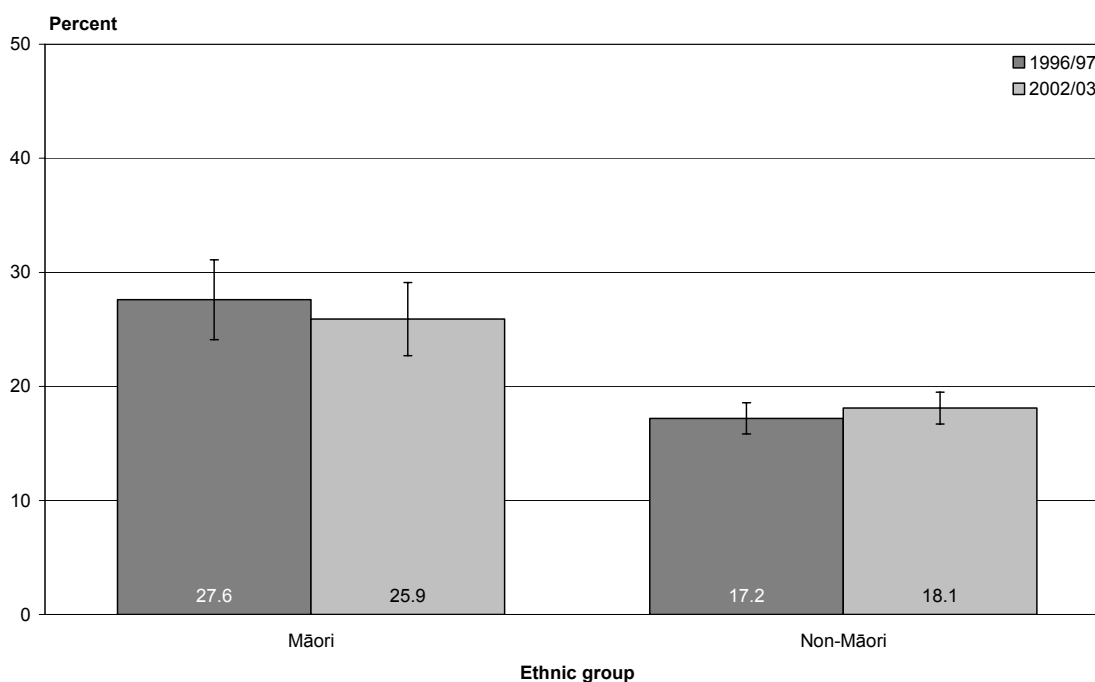
There was no significant change in the prevalence of potentially hazardous drinking patterns among New Zealand adults from 1996/97 (18.2%; 16.9–19.5) to 2002/03 (18.9%; 17.6–20.3).

Figure 11: Potentially hazardous drinking pattern in adults, by sex, 1996/97 and 2002/03 (age-standardised percent)



There was no significant change in the prevalence of potentially hazardous drinking patterns in either males or females from 1996/97 to 2002/03 (Figure 11). In both survey periods, males had a significantly higher prevalence of hazardous drinking patterns than females.

Figure 12: Potentially hazardous drinking pattern in adults, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)



There was no significant change in the prevalence of potentially hazardous drinking patterns in either Māori or non-Māori from 1996/97 to 2002/03 (Figure 12). In both surveys, Māori had a significantly higher proportion of hazardous drinking patterns than non-Māori.

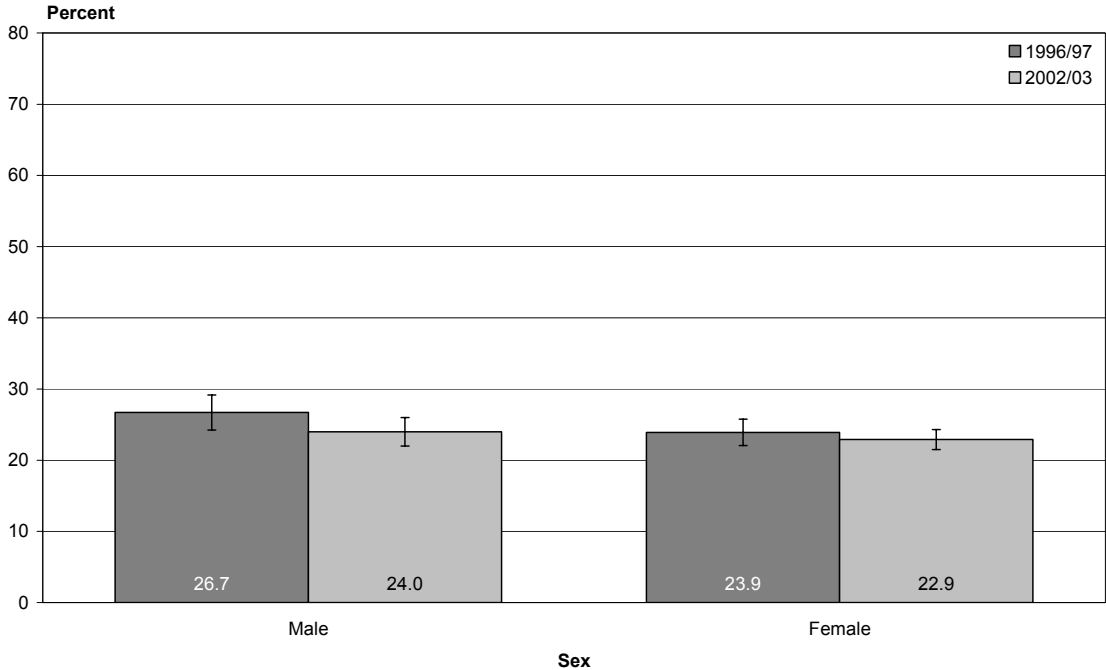
Tobacco smoking

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. Current smoking is defined as smoking one or more cigarettes per day (excludes cigars).

There was no significant change in the prevalence of current smokers among New Zealand adults from 1996/97 (25.2%; 23.7–26.8) to 2002/03 (23.4%; 22.2–24.7).

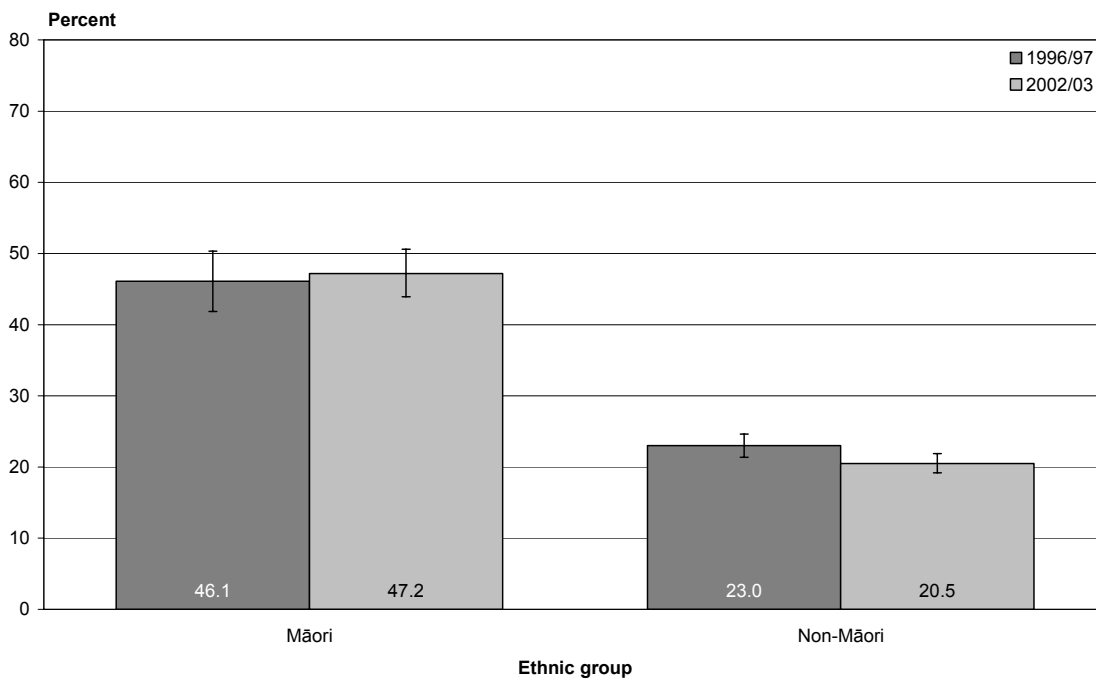
Current smoking

Figure 13: Current smoking in adults, by sex, 1996/97 and 2002/03 (age-standardised percent)



There was no significant change in the prevalence of current smoking in either males or females from 1996/97 to 2002/03 (Figure 13).

Figure 14: Current smoking in adults, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)



The prevalence of current smoking in non-Māori significantly decreased from 1996/97 to 2002/03 (p-value = 0.02) (Figure 14). There was no change in the prevalence of current smoking in Māori between the two surveys, with the prevalence in this ethnic group continuing to be significantly higher than in non-Māori.

Health Service Utilisation

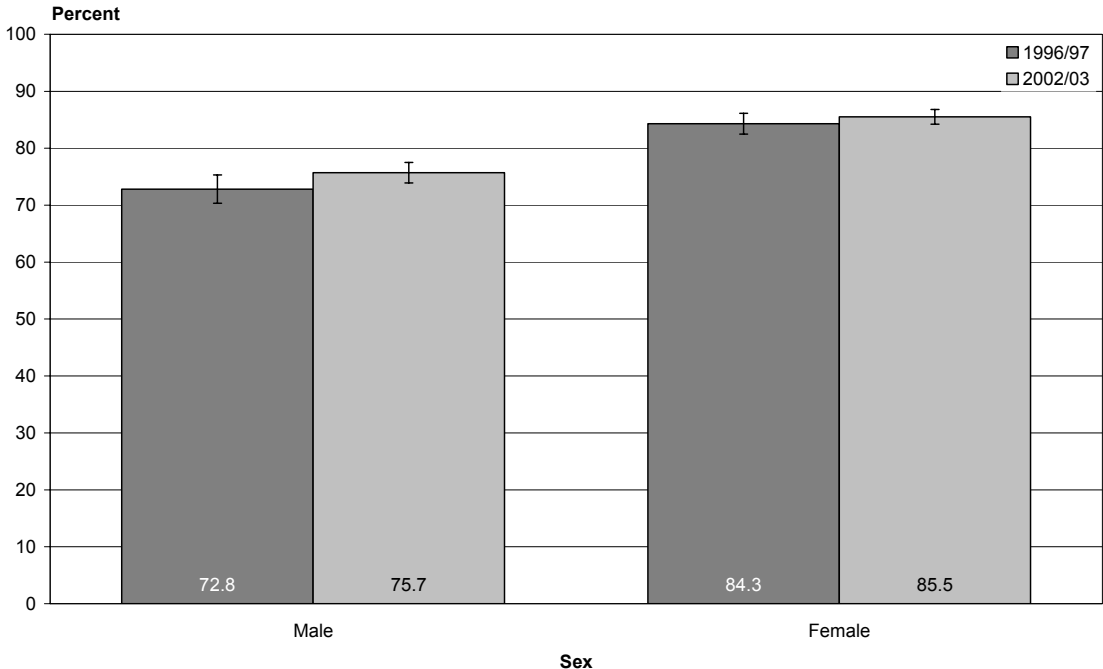
General practitioners

Participants in both health surveys were asked whether they had seen a general practitioner in the previous 12 months.

Use of general practitioner services

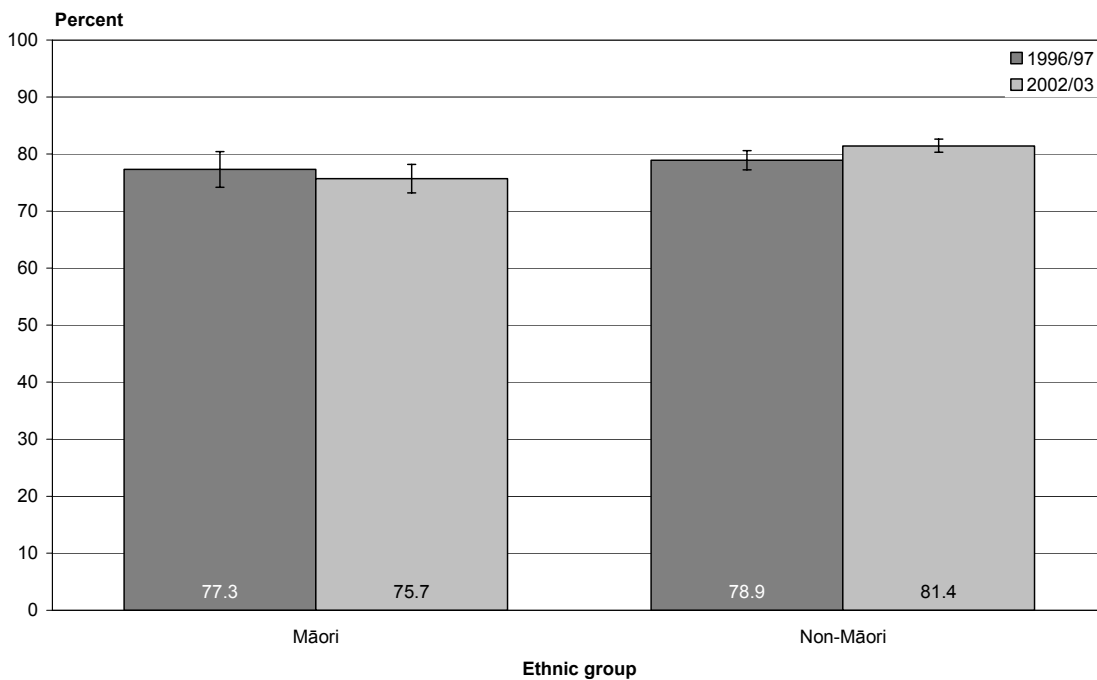
In 1996/97, 78.7% (77.2–80.3) of New Zealand adults aged 15 years and over had seen a general practitioner in the previous 12 months. In 2002/03, 80.8% (79.7–81.9) had seen a general practitioner in the previous 12 months. This small increase was statistically significant (p-value = 0.03).

Figure 15: Seen a general practitioner in the last 12 months, by sex, 1996/97 and 2002/03 (age-standardised percent)



There was no significant change in the prevalence of males and females who had seen a general practitioner in the last 12 months from 1996/97 to 2002/03 (Figure 15). However, in both surveys, significantly more females had seen a general practitioner in the last 12 months compared to males.

Figure 16: Seen a general practitioner in the last 12 months, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)



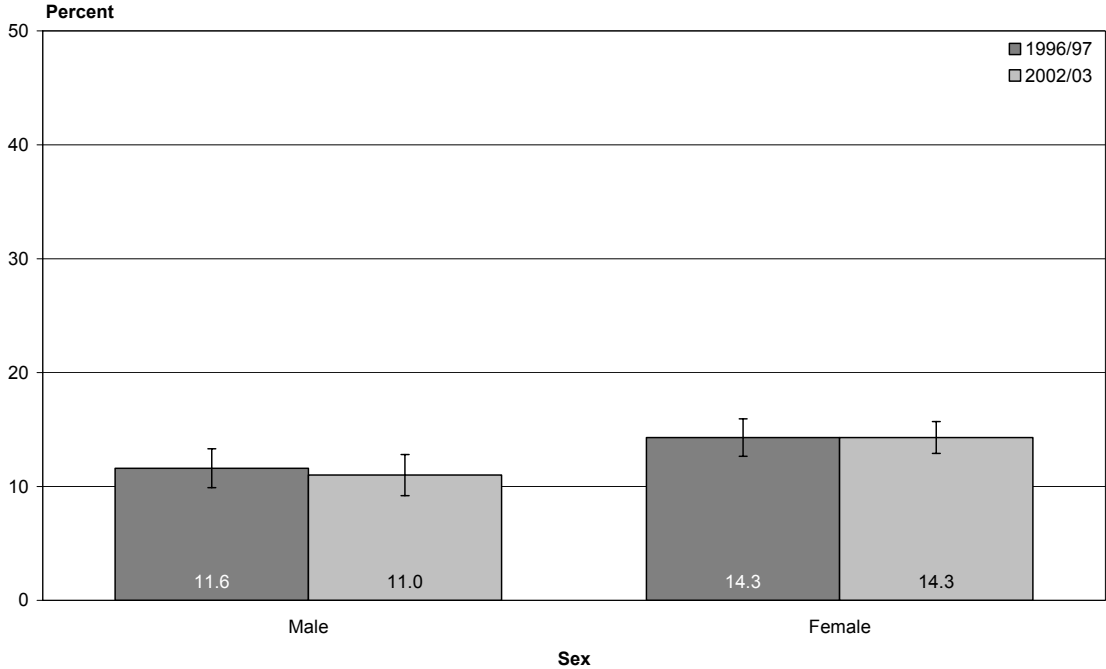
From 1996/97 to 2002/03 there was a small but significant increase in the prevalence of non-Māori who had seen a general practitioner in the last 12 months (Figure 16). There was no change in the prevalence among Māori.

In 1996/97, there was no significant difference between Māori and non-Māori in the prevalence of seeing a general practitioner in the previous year. However, in 2002/03, a significantly greater proportion of non-Māori had seen a general practitioner in the previous year compared to Māori.

Unmet need for general practitioner

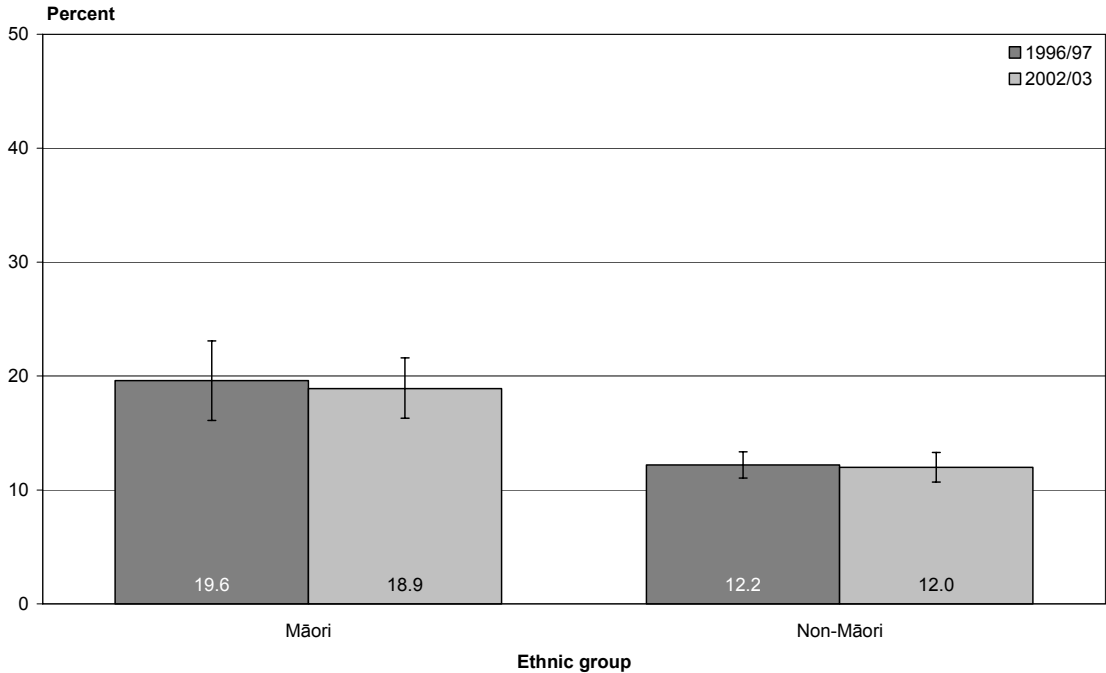
There was no significant change in the proportion of New Zealand adults who reported they had needed to see a doctor in the last 12 months but didn't get to see one, from 1996/97 (13.0%; 11.8–14.1) to 2002/03 (12.7%; 11.5–13.9).

Figure 17: Unmet need for general practitioner in the last 12 months, by sex, 1996/97 and 2002/03 (age-standardised percent)



There were no significant changes for either males or females in reporting unmet need from 1996/97 to 2002/03 (Figure 17). However, in 2002/03, females were significantly more likely to report unmet need than males.

Figure 18: Unmet need for general practitioner in the last 12 months, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)



There were no significant changes for either Māori or non-Māori in reporting unmet need from 1996/97 to 2002/03 (Figure 18). In both survey periods, Māori were significantly more likely to report unmet need compared to non-Māori.

Table 2: Reason for unmet need for general practitioner in the last 12 months, by sex and ethnic group, 1996/97 and 2002/03 (age-standardised percent)

Reason	Total		Male		Female		Māori		Non-Māori	
	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03
Cost too much	46.3 (41.4–51.2)	49.3 (44.6–54.1)	42.0 (33.9–50.1)	46.3 (38.2–54.3)	49.6 (43.0–56.2)	51.5 (46.2–56.9)	49.3 (39.4–59.2)	56.8 (47.8–65.7)	45.8 (40.2–51.3)	47.9 (42.6–53.2)
Didn't want to make fuss / couldn't be bothered	26.9 (22.2–31.6)	25.9 (21.7–30.1)	30.5 (23.0–38.1)	27.4 (21.1–33.7)	24.1 (18.1–30.1)	24.8 (20.4–29.2)	22.0 (15.4–28.6)	24.5 (17.6–31.4)	27.8 (22.3–33.2)	26.1 (21.2–31.1)
No suitable appointment	18.8 (13.9–23.7)	22.4 (18.7–26.2)	22.0 (13.0–31.0)	16.8 (11.1–22.5)	16.4 (11.2–21.6)	24.6 (20.0–29.1)*	17.5 (6.9–28.2)	19.8 (14.3–25.4)	19.0 (13.7–24.4)	21.6 (17.4–25.8)
Couldn't spare time	16.5 (12.7–20.2)	18.6 (15.2–22.0)	19.9 (13.8–25.9)	25.6 (18.7–32.5)	13.9 (8.9–18.9)	13.6 (10.4–16.8)	17.7 (10.1–25.4)	11.8 (7.3–16.2)	16.3 (12.1–20.5)	19.9 (16.0–23.9)
Lack of transport	6.2 (4.1–8.2)	5.2 (3.2–7.1)	5.0 (1.9–8.1)	3.5 (1.2–5.8)	7.1 (4.4–9.8)	6.4 (4.0–8.7)	12.9 (6.5–19.4)	13.1 (7.2–18.9)	5.0 (3.0–7.0)	3.6 (2.1–5.2)
Couldn't get in touch with doctor	5.3 (3.2–7.3)	4.1 (2.7–5.6)	4.8 (1.8–7.7)	3.4 (1.0–5.7)	5.6 (2.9–8.3)	4.7 (3.0–6.4)	5.7 (1.9–9.6)	5.4 (1.1–9.7)	5.2 (2.9–7.4)	3.9 (2.3–5.4)

* p-value ≤ 0.05, a statistically significant difference.

Table 2 shows the reasons given for unmet need. The most common reason in both 1996/97 and 2002/03 was cost. 'Didn't want to make a fuss / couldn't be bothered', 'no suitable appointment' and 'couldn't spare the time' were also common reasons reported in both surveys. The only statistically significant change from 1996/97 to 2002/03 in the reason given for unmet need was in an increase in females reporting 'no suitable appointment' as the reason for unmet need.

Hospitals

Public hospitals

Overall, from 1996/97 to 2002/03 there was a significant decrease in the prevalence of New Zealand adults aged 15 years and over who had used a service at, or been admitted to, a public hospital in the last 12 months, from 26.2% (24.8–27.7) to 22.1% (20.9–23.3).

Table 3 shows the type of public hospital service used by males and females. Although overall, public hospital use decreased for both males and females, there was a significant increase in inpatient use for both males and females from 1996/97 to 2002/03. Admission for day treatment (an admission that is greater than three hours but not overnight) also increased for males between the two surveys. Accident and emergency use decreased significantly for males from 1996/97 to 2002/03.

Table 3: Type of public hospital service used, by sex, 1996/97 and 2002/03 (age-standardised percent)

	Male		Female	
	1996/97	2002/03	1996/97	2002/03
Inpatient	26.5 (21.7–31.3)	34.7 (30.8–38.5)*	34.0 (29.8–38.2)	43.1 (39.3–47.0)*
Outpatient	46.2 (41.1–51.3)	47.3 (42.8–51.8)	49.8 (45.9–53.6)	49.3 (45.7–53.0)
Day treatment	10.1 (7.3–13.0)	14.6 (11.2–18.1)*	12.4 (9.4–15.5)	15.6 (12.8–18.4)
Accident and emergency department	52.5 (47.5–57.4)	41.4 (36.5–46.3)*	32.6 (28.7–36.5)	31.0 (27.4–34.6)

* p-value \leq 0.05, a statistically significant difference.

Table 4 shows the type of public hospital service used by ethnic group in 1996/97 and 2002/03. For non-Māori, there was a significant increase in inpatient stays and day treatment. For both Māori and non-Māori there was a significant decrease in accident and emergency department use.

Table 4: Type of public hospital service used, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)

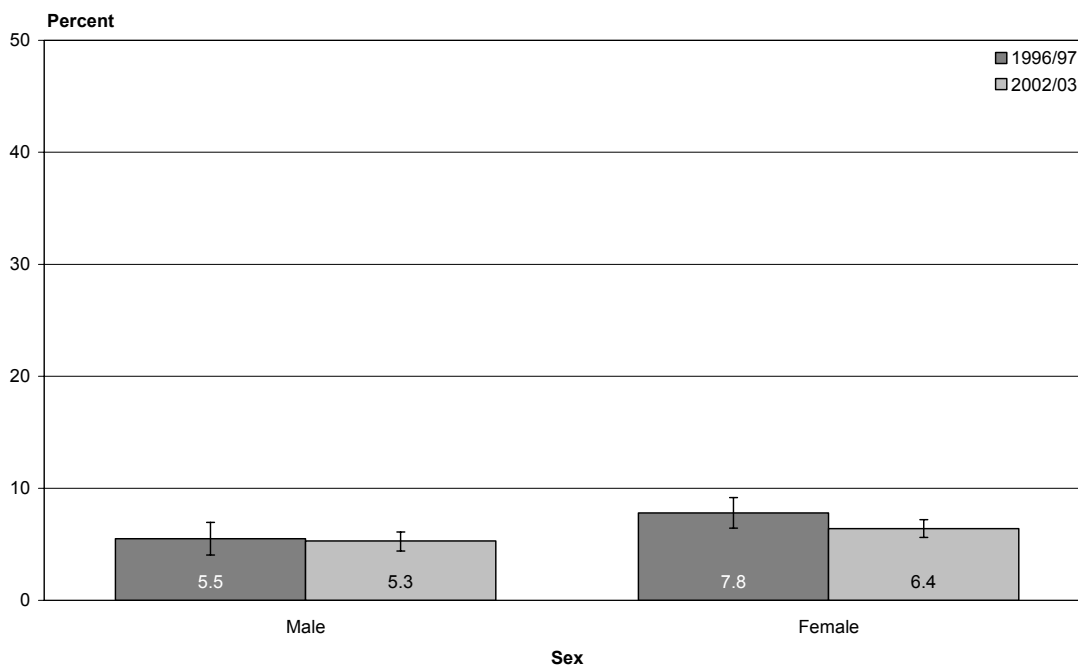
	Māori		Non-Māori	
	1996/97	2002/03	1996/97	2002/03
Inpatient	40.9 (32.2–49.6)	49.0 (42.9–55.0)	29.2 (25.9–32.5)	38.3 (35.4–41.3)*
Outpatient	39.7 (31.8–47.6)	48.6 (40.2–57.0)	49.2 (45.8–52.6)	48.5 (45.2–51.8)
Day treatment	12.1 (7.7–16.5)	14.9 (11.1–18.8)	11.3 (9.1–13.4)	15.2 (12.9–17.6)*
Accident and emergency department	45.7 (38.5–52.9)	31.3 (25.8–36.8)*	41.2 (37.7–44.8)	35.8 (32.6–39.1)*

* p-value \leq 0.05, a statistically significant difference.

Private hospitals

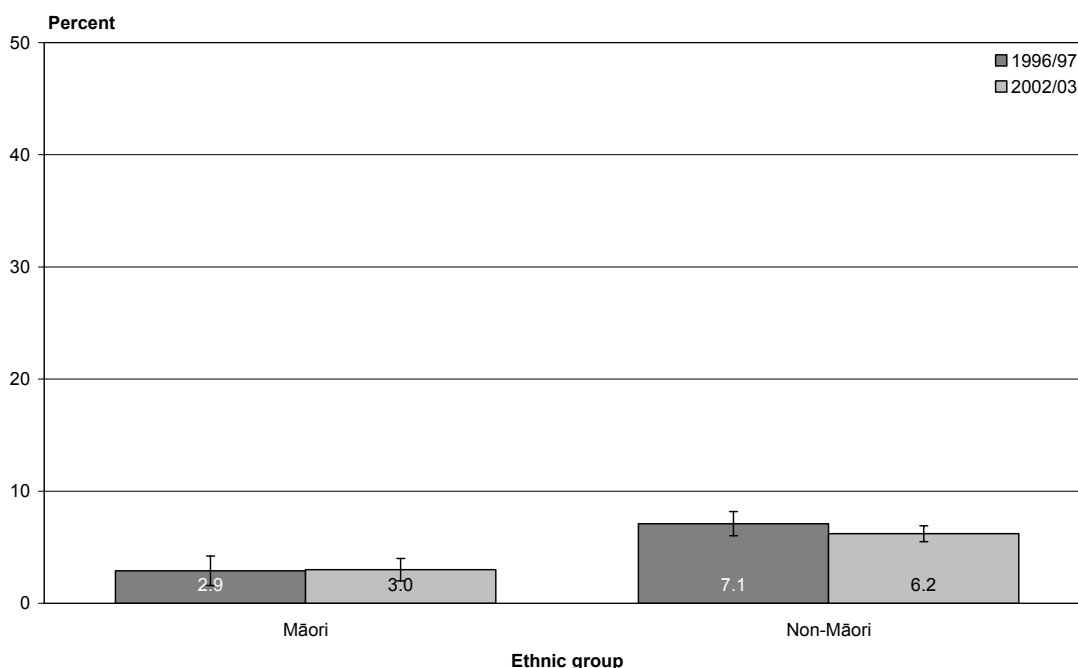
There were no significant changes in private hospital use among New Zealand adults from 1996/97 (6.7%; 5.7–7.6) to 2002/03 (5.9%; 5.3–6.5).

Figure 19: Private hospital use in the last 12 months, by sex, 1996/97 and 2002/03 (age-standardised percent)



There were no significant changes in private hospital use in either males or females from 1996/97 to 2002/03 (Figure 19).

Figure 20: Private hospital use in the last 12 months, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)

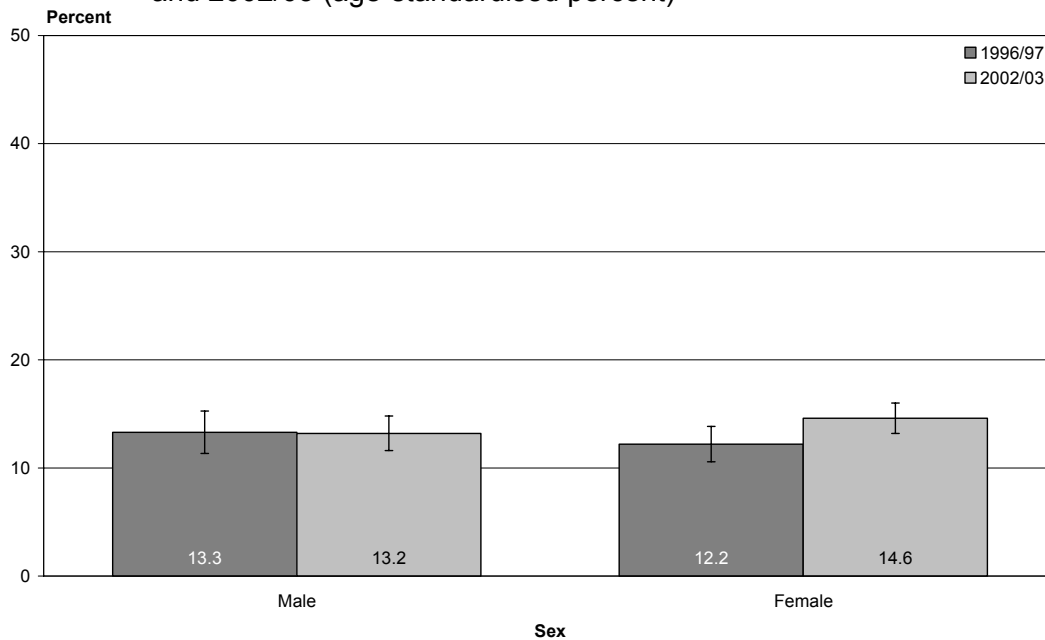


There were no significant changes in private hospital use in either Māori or non-Māori from 1996/97 to 2002/03 (Figure 20). However, Māori had a significantly lower prevalence of private hospital use than non-Māori in both surveys.

Private accident and emergency clinics

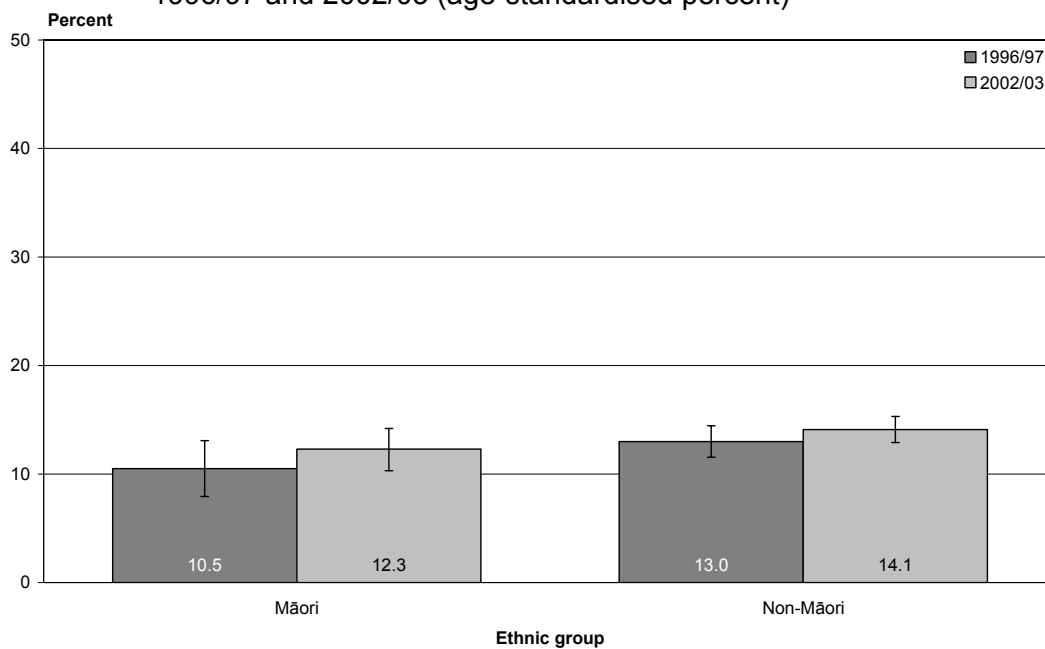
There were no significant changes in private accident and emergency clinic use among New Zealand adults from 1996/97 (12.7%; 11.4–14.1) to 2002/03 (13.9%; 12.8–15.0).

Figure 21: Private accident and emergency clinic use in the last 12 months, by sex, 1996/97 and 2002/03 (age-standardised percent)



There was a significant increase in private accident and emergency clinic use in females from 1996/97 to 2002/03 (p-value = 0.03) (Figure 21).

Figure 22: Private accident and emergency clinic use in the last 12 months, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)



There were no significant changes in private accident and emergency clinic use in either Māori or non-Māori from 1996/97 to 2002/03 (Figure 22).

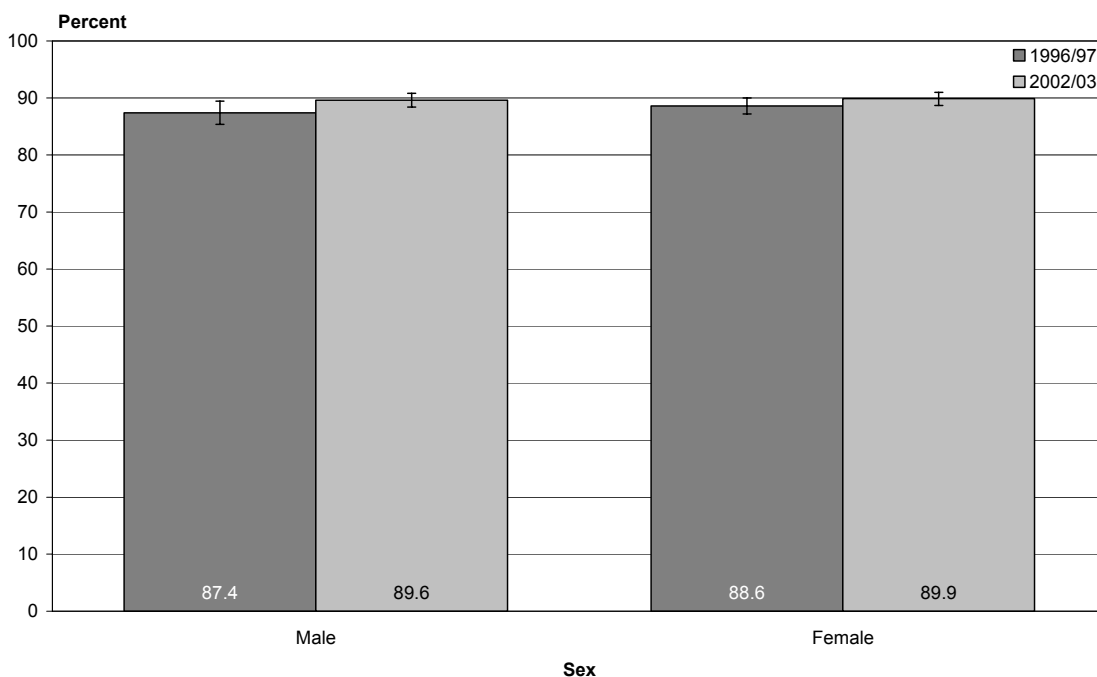
Self-reported Health Status

Self-rated health

In both 1996/97 and 2002/03, survey respondents were asked to rate their health as generally excellent, very good, good, fair or poor.

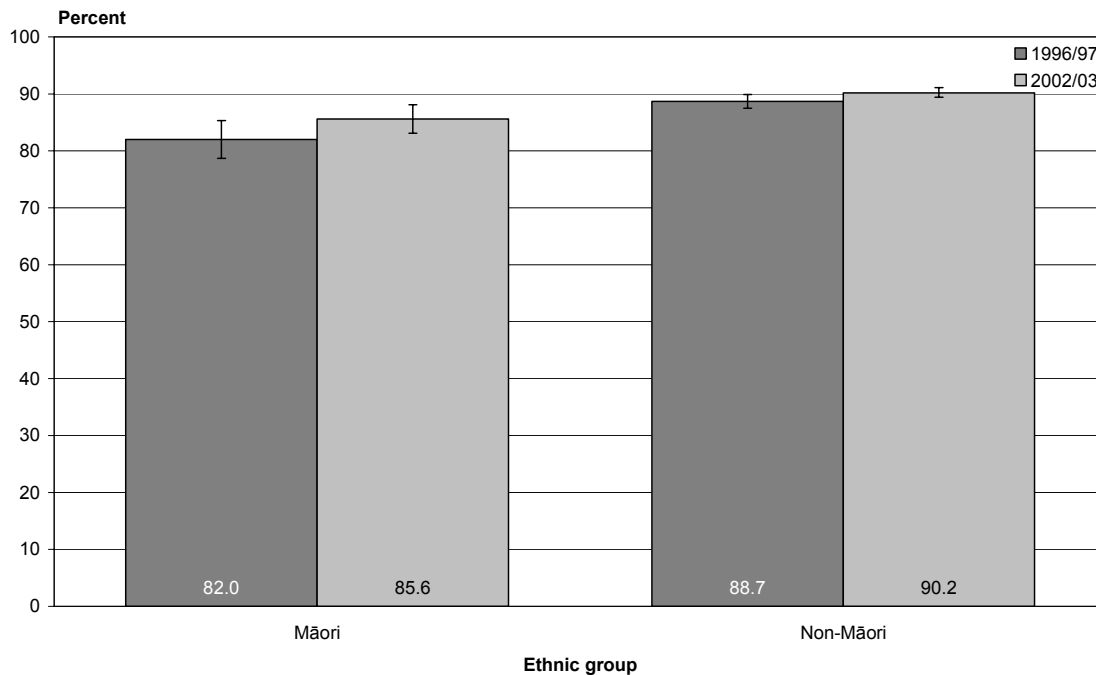
From 1996/97 (88.0%; 86.8–89.2) to 2002/03 (89.7%; 88.9–90.5) there was a small but significant increase in the proportion of adults who thought their health good, very good or excellent (p-value = 0.02).

Figure 23: Self-rated health good or better, by sex, 1996/97 and 2002/03 (age-standardised percent)



From 1996/97 to 2002/03, there were no significant changes in the proportions of either males or females reporting their health as good, very good or excellent (Figure 23).

Figure 24: Self-rated health good or better, by ethnic group, 1996/97 and 2002/03 (age-standardised percent)



There was a small but significant increase in the proportion of non-Māori reporting their health as good or better from 1996/97 to 2002/03 (p-value = 0.04) (Figure 24). There was no significant change among Māori.

During both surveys, non-Māori were significantly more likely to report their health as good, very good, or excellent compared to Māori.

SF-36

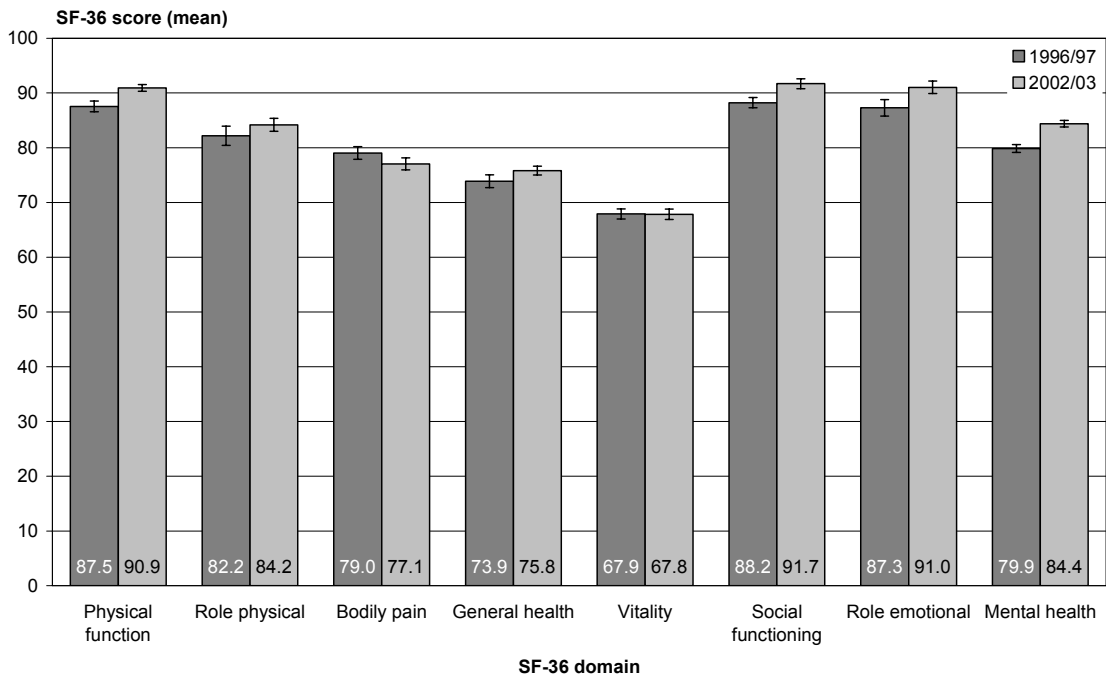
The SF-36 is a standard questionnaire derived from a larger set of questions used in the US Medical Outcomes Study in the mid-1980s (Ware and Sherbourne 1992). The SF-36 has become one of the most widely used questionnaires for measuring self-reported physical and mental health status. The SF-36 questionnaire consists of 36 questions (items) measuring physical and mental health status in relation to eight health scales. The Australian and New Zealand version of the SF-36 questionnaire (version 1) was used in both health surveys 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.

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 each scale, 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.

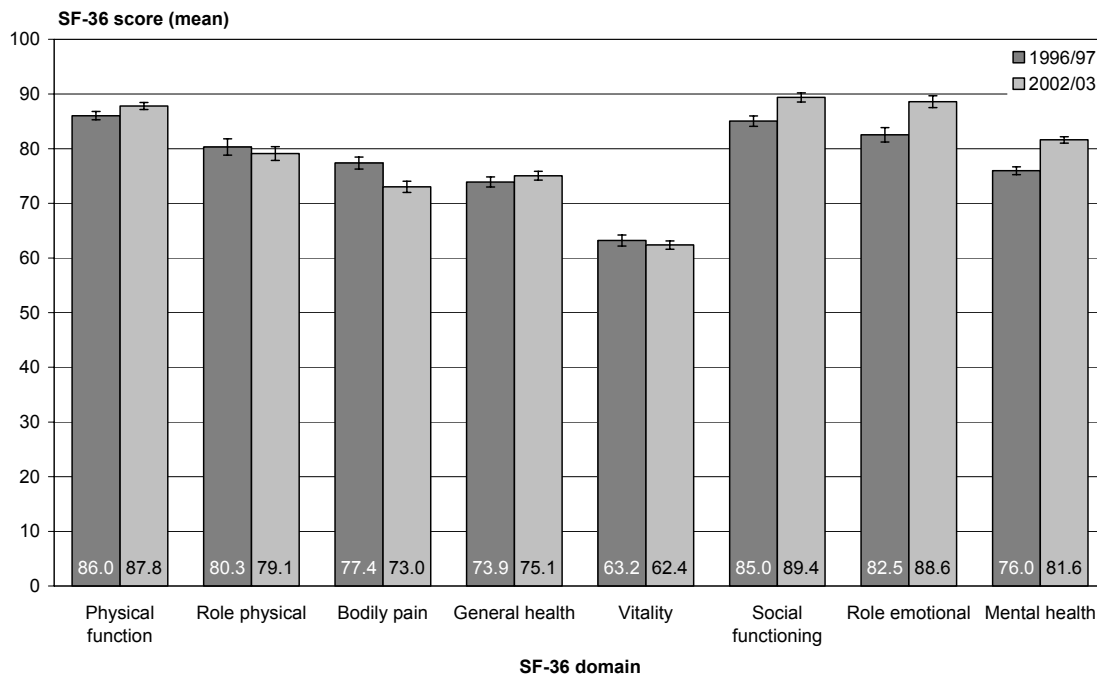
The 1996/97 SF-36 instrument was a self-administered paper and pen questionnaire whereas the 2002/03 instrument was interviewer-administered. Although the SF-36 questionnaire is validated for both types of administration, the results presented below need to be interpreted with caution, keeping in mind the different modes of administration.

Figure 25: Mean SF-36 scores, males, 1996/97 and 2002/03 (age-standardised mean)



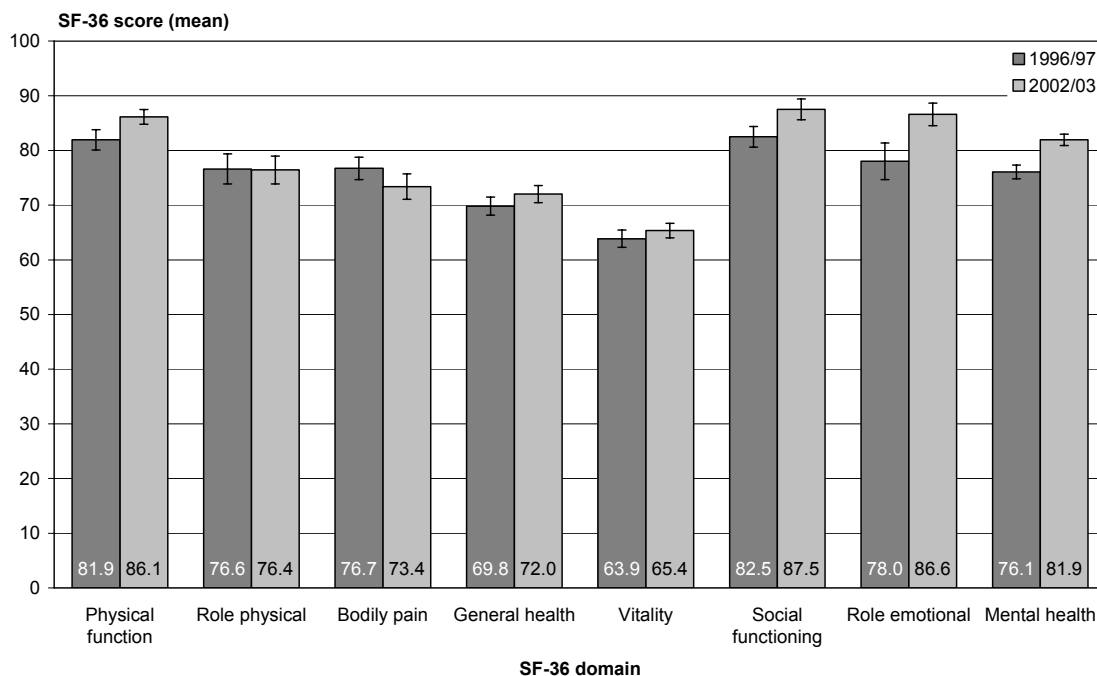
Among males there were significant increases in the SF-36 mean scores for physical function, general health (p-value = 0.01), social functioning, role emotional, and mental health from 1996/97 to 2002/03 (Figure 25). There was a significant decrease in the mean score for bodily pain (p-value = 0.01).

Figure 26: Mean SF-36 scores, females, 1996/97 and 2002/03 (age-standardised mean)



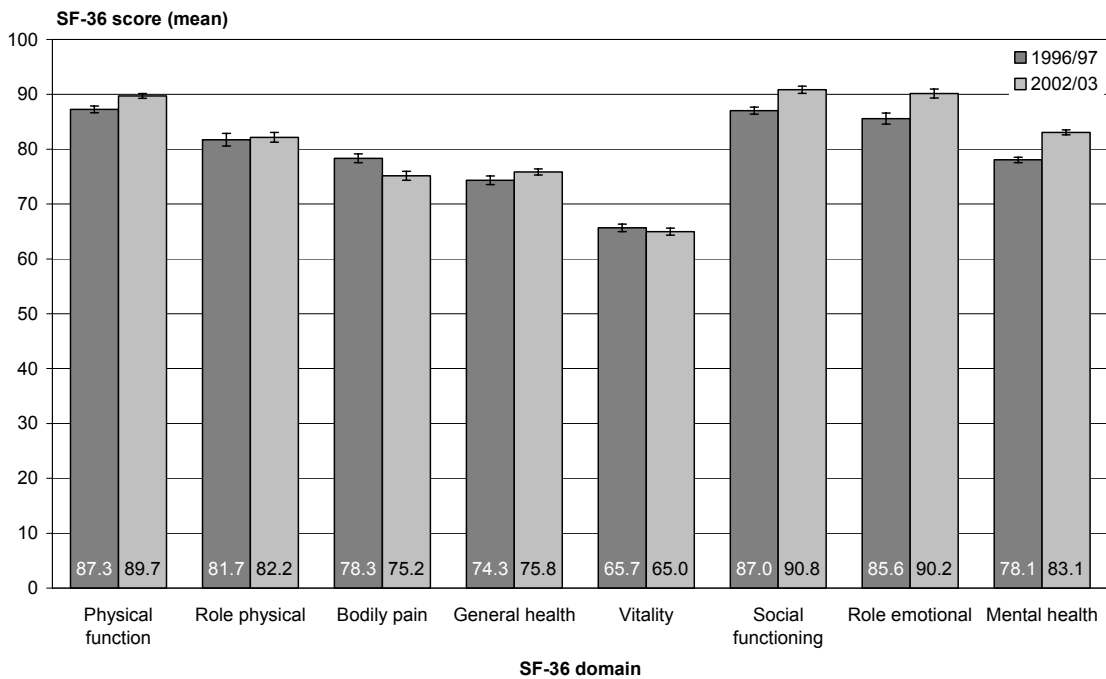
Among females there were significant increases in mean SF-36 scores for physical function, social functioning, role emotional and mental health (Figure 26). There was a significant decrease in the mean score for bodily pain.

Figure 27: Mean SF-36 scores, Māori, 1996/97 and 2002/03 (age-standardised mean)



Among Māori, there were significant increases in mean SF-36 scores for physical function, social functioning, role emotional and mental health (Figure 27). There was a significant decrease in the mean score for bodily pain (p -value = 0.03).

Figure 28: Mean SF-36 scores, non-Māori, 1996/97 and 2002/03 (age-standardised mean)



For non-Māori there were significant increases in mean SF-36 scores for physical function, general health, social functioning, role emotional and mental health (Figure 28). There was a significant decrease in the mean score for bodily pain.

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Appendix: Summary Tables

Chronic disease

Table A1: Prevalence of diabetes, by sex and ethnic group, 1996/97 and 2002/03 (age-standardised percent)

Total		Male		Female		Māori		Non-Māori	
1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03
3.7 (3.2–4.2)	4.1 (3.6–4.6)	4.0 (3.2–4.8)	4.5 (3.8–5.3)	3.4 (2.7–4.0)	3.7 (3.1–4.3)	8.0 (6.0–10.0)	8.0 (6.3–9.7)	3.2 (2.7–3.7)	3.6 (3.1–4.1)

Risk and protective factors

Table A2: Prevalence of risk and protective factors, by sex and ethnic group, 1996/97* and 2002/03 (age-standardised percent)

	Total		Male		Female		Māori		Non-Māori	
	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03
Adequate vegetable intake	66.9 (64.9–68.9)	67.3 (65.6–69.1)	60.8 (57.4–64.1)	63.3 (60.8–65.8)	72.6 (70.1–75.0)	71.1 (69.1–73.1)	58.1 (53.2–63.1)	65.6 (62.0–69.2)**	68.0 (65.9–70.2)	67.6 (65.6–69.5)
Adequate fruit intake	45.2 (43.1–47.4)	53.9 (52.4–55.3)**	34.5 (31.2–37.7)	43.3 (41.1–45.6)**	55.2 (52.4–57.9)	63.6 (61.8–65.5)**	40.8 (34.7–47.0)	46.3 (42.9–49.7)	45.8 (43.4–48.1)	54.8 (53.2–56.4)**
Adequate vegetable and fruit intake	34.6 (32.5–36.7)	40.5 (39.0–42.0)**	24.3 (21.4–27.1)	31.0 (28.8–33.2)**	44.1 (41.2–47.1)	49.3 (47.2–51.3)**	26.6 (21.7–31.4)	34.7 (31.4–38.1)**	35.6 (33.3–37.9)	41.2 (39.5–42.9)**
Overweight	34.1 (31.8–36.4)	34.0 (32.6–35.3)	39.6 (36.0–43.1)	40.5 (38.3–42.8)	28.8 (25.9–31.8)	27.5 (25.8–29.2)	32.6 (27.3–38.0)	35.8 (32.6–39.0)	34.3 (31.9–36.7)	33.7 (32.3–35.1)
Obese	16.7 (15.2–18.2)	20.1 (19.0–21.2)**	14.2 (12.2–16.3)	19.2 (17.7–20.6)**	19.1 (17.1–21.2)	21.0 (19.5–22.5)	30.0 (24.6–35.3)	28.3 (25.0–31.5)	15.0 (13.5–16.6)	19.1 (18.0–20.3)**
Overweight or obese	50.9 (48.5–53.2)	54.0 (52.5–55.6)**	53.8 (50.5–57.1)	59.7 (57.5–61.9)**	48.0 (44.7–51.3)	48.5 (46.4–50.5)	62.6 (57.4–67.8)	64.1 (60.9–67.2)	49.3 (46.8–51.9)	52.9 (51.2–54.5)**
Hazardous drinking	18.2 (16.9–19.5)	18.9 (17.6–20.3)	26.4 (23.9–29.0)	27.1 (24.7–29.5)	10.4 (8.9–11.9)	11.4 (10.1–12.7)	27.6 (24.1–31.1)	25.9 (22.7–29.1)	17.2 (15.8–18.6)	18.1 (16.7–19.5)
Current smoking	25.2 (23.7–26.8)	23.4 (22.2–24.7)	26.7 (24.2–29.2)	24.0 (22.0–26.0)	23.9 (22.0–25.7)	22.9 (21.5–24.3)	46.1 (41.8–50.3)	47.2 (43.9–50.6)	23.0 (21.3–24.6)	20.5 (19.2–21.9)**

* Prevalence for vegetable and fruit intake, overweight and obese were obtained from the 1997 National Nutrition Survey.

** p-value ≤ 0.05, a statistically significant change between the two surveys.

Health service utilisation

Table A3: Utilisation of selected health services in the last year, by sex and ethnic group, 1996/97 and 2002/03 (age-standardised percent)

	Total		Male		Female		Māori		Non-Māori	
	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03
General practitioner	78.7 (77.2–80.3)	80.8 (79.7–81.9)*	72.8 (70.3–75.3)	75.7 (73.9–77.5)	84.3 (82.5–86.1)	85.5 (84.2–86.8)	77.3 (74.1–80.4)	75.7 (73.2–78.2)	78.9 (77.2–80.6)	81.4 (80.3–82.6)*
Unmet need for general practitioner	13.0 (11.8–14.1)	12.7 (11.5–13.9)	11.6 (9.9–13.3)	11.0 (9.2–12.8)	14.3 (12.6–15.9)	14.3 (12.9–15.7)	19.6 (16.1–23.1)	18.9 (16.3–21.6)	12.2 (11.1–13.4)	12.0 (10.7–13.3)
Public hospital	26.2 (24.8–27.7)	22.1 (20.9–23.3)*	24.8 (22.6–27.0)	19.1 (17.4–20.8)*	27.6 (25.7–29.5)	24.9 (23.2–26.6)*	29.2 (25.5–32.8)	24.4 (21.3–27.5)	25.9 (24.4–27.5)	21.8 (20.6–23.1)*
Public hospital – inpatient	30.5 (27.1–33.9)	39.6 (37.0–42.3)*	26.5 (21.7–31.3)	34.7 (30.8–38.5)*	34.0 (29.8–38.2)	43.1 (39.3–47.0)*	40.9 (32.2–49.6)	49.0 (42.9–55.0)	29.2 (25.9–32.5)	38.3 (35.4–41.3)*
Public hospital – outpatient	48.1 (45.0–51.2)	48.5 (45.4–51.6)	46.2 (41.1–51.3)	47.3 (42.8–51.8)	49.8 (45.9–53.6)	49.3 (45.7–53.0)	39.7 (31.8–47.6)	48.6 (40.2–57.0)	49.2 (45.8–52.6)	48.5 (45.2–51.8)
Public hospital – day treatment	11.4 (9.3–13.4)	15.2 (13.1–17.3)*	10.1 (7.3–13.0)	14.6 (11.2–18.1)*	12.4 (9.4–15.5)	15.6 (12.8–18.4)	12.1 (7.7–16.5)	14.9 (11.1–18.8)	11.3 (9.1–13.4)	15.2 (12.9–17.6)*
Public hospital – accident and emergency	41.7 (38.6–44.9)	35.3 (32.3–38.3)*	52.5 (47.5–57.4)	41.4 (36.5–46.3)*	32.6 (28.7–36.5)	31.0 (27.4–34.6)	45.7 (38.5–52.9)	31.3 (25.8–36.8)*	41.2 (37.7–44.8)	35.8 (32.6–39.1)*
Private hospital	6.7 (5.7–7.6)	5.9 (5.3–6.5)	5.5 (4.0–6.9)	5.3 (4.4–6.1)	7.8 (6.4–9.2)	6.4 (5.6–7.2)	2.9 (1.6–4.2)	3.0 (2.0–4.0)	7.1 (6.0–8.1)	6.2 (5.5–6.9)
Private accident and emergency clinic	12.7 (11.4–14.1)	13.9 (12.8–15.0)	13.3 (11.3–15.2)	13.2 (11.6–14.8)	12.2 (10.6–13.9)	14.6 (13.2–16.0)*	10.5 (7.9–13.1)	12.3 (10.3–14.2)	13.0 (11.5–14.4)	14.1 (12.9–15.3)

* p-value ≤ 0.05, a statistically significant change between the two surveys.

Health status

Table A4: Self-rated health, by sex and ethnic group, 1996/97 and 2002/03 (age-standardised percent)

	Total		Male		Female		Māori		Non-Māori	
	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03
General health good or better	88.0 (86.8–89.2)	89.7 (88.9–90.5)*	87.4 (85.4–89.4)	89.6 (88.4–90.8)	88.6 (87.2–90.0)	89.9 (88.7–91.0)	82.0 (78.7–85.3)	85.6 (83.1–88.1)	88.7 (87.5–89.9)	90.2 (89.4–91.1)*

* p-value ≤ 0.05, a statistically significant change between the two surveys.

Table A5: SF-36 scores, 1996/97 and 2002/03 (age-standardised mean)

	Physical function		Role physical		Bodily pain		General health		Vitality		Social functioning		Role emotional		Mental health	
	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03	1996/97	2002/03
Male	87.5 (86.6–88.5)	90.9 (90.3–91.5)*	82.2 (80.4–84.0)	84.2 (83.0–85.4)	79.0 (77.9–80.2)	77.1 (76.0–78.2)*	73.9 (72.7–75.1)	75.8 (75.0–76.7)*	67.9 (67.0–68.8)	67.8 (66.9–68.8)	88.2 (87.3–89.2)	91.7 (90.8–92.6)*	87.3 (85.8–88.8)	91.0 (89.9–92.2)*	79.9 (79.2–80.6)	84.4 (83.8–85.0)*
Female	86.0 (85.3–86.8)	87.8 (87.2–88.5)*	80.3 (78.8–81.8)	79.1 (77.8–80.4)	77.4 (76.3–78.5)	73.0 (72.0–74.0)*	73.9 (73.0–74.8)	75.1 (74.2–75.9)	63.2 (62.2–64.2)	62.4 (61.6–63.1)	85.0 (84.1–86.0)	89.4 (88.5–90.2)*	82.5 (81.2–83.8)	88.6 (87.5–89.7)*	76.0 (75.2–76.7)	81.6 (81.0–82.2)*
Māori	81.9 (80.1–83.8)	86.1 (84.8–87.5)*	76.6 (73.9–79.4)	76.4 (73.9–79.0)	76.7 (74.7–78.8)	73.4 (71.1–75.7)*	69.8 (68.2–71.5)	72.0 (70.4–73.6)	63.9 (62.3–65.4)	65.4 (64.0–66.7)	82.5 (80.6–84.4)	87.5 (85.6–89.4)*	78.0 (74.7–81.4)	86.6 (84.5–88.7)*	76.1 (74.8–77.3)	81.9 (80.9–83.0)*
Non-Māori	87.3 (86.7–87.9)	89.7 (89.3–90.1)*	81.7 (80.6–82.9)	82.2 (81.3–83.1)	78.3 (77.5–79.1)	75.2 (74.4–76.0)*	74.3 (73.6–75.1)	75.8 (75.3–76.4)*	65.7 (65.0–66.4)	65.0 (64.3–65.6)	87.0 (86.4–87.7)	90.8 (90.2–91.5)*	85.6 (84.6–86.6)	90.2 (89.3–91.0)*	78.1 (77.6–78.5)	83.1 (82.6–83.5)*
Total	86.8 (86.2–87.3)	89.3 (88.9–89.7)*	81.2 (80.1–82.3)	81.6 (80.7–82.4)	78.2 (77.4–78.9)	75.0 (74.2–75.7)*	73.9 (73.2–74.6)	75.4 (74.9–76.0)*	65.5 (64.8–66.2)	65.0 (64.4–65.6)	86.6 (86.0–87.2)	90.5 (89.9–91.1)*	84.9 (83.9–85.8)	89.8 (89.0–90.5)*	77.9 (77.4–78.3)	83.0 (82.5–83.4)*

* p-value ≤ 0.05, a statistically significant change between the two surveys.