

Chapter 1: Introduction and Methods

Overview of the survey

The 2006/07 New Zealand Health Survey was carried out from October 2006 to November 2007, collecting information on over 17,000 New Zealanders (4921 children aged from birth to 14 years and 12,488 adults aged 15 years and over). The survey included 11,632 European/Other people, 5143 Māori, 1831 Pacific peoples and 2255 Asian people of all ages.

The New Zealand Health Survey measures self-reported physical and mental health status (including doctor-diagnosed health conditions), risk and protective behaviours for health outcomes, and the use of health care services, among the usually resident New Zealand population living in private dwellings.

A final response rate of 68% was achieved for the adult questionnaire and 71% for the child questionnaire, with good participation by Māori and Pacific peoples. All results have been weighted in order to be representative of New Zealand's estimated resident population living in permanent private dwellings at 31 June 2007.

This chapter answers the following questions:

- Why do a survey?
- What questions were asked?
- How were survey participants selected?
- Who agreed to take part?
- How does the survey represent the total population?
- What has been analysed and reported?
- What is the quality of these results?
- How can readers access more survey results?

Why do a survey?

The Ministry of Health repeats the New Zealand Health Survey at regular intervals to monitor changes in the health of the population. The 2006/07 New Zealand Health Survey is the fourth such survey. Previous New Zealand Health Surveys were conducted in 1992/93, 1996/97 and 2002/03.

The New Zealand Health Survey collects information that cannot be obtained more effectively or efficiently through other means, such as analyses of hospital administrative records, disease registries or epidemiological research. For most of the topics in this report the New Zealand Health Survey is the best source of information at a population level.

Objectives of the 2006/07 New Zealand Health Survey

The five objectives of the survey are to:

1. measure the health status of New Zealanders and the prevalence of selected health conditions

2. measure the prevalence of risk and protective factors associated with these health conditions
3. measure the use of health services, including barriers to accessing health services
4. examine differences between population groups (as defined by age, gender, ethnicity and socioeconomic position)
5. monitor trends in the health status, risk and protective factors and health service use of the population over time.

The New Zealand Health Survey is a key component of the New Zealand Health Monitor, an integrated programme of household surveys and cohort studies managed by Public Health Intelligence (PHI), which monitors the health of the New Zealand population (Ministry of Health 2005a). It is also an important element of the cross-sector Programme of Official Social Statistics led by Statistics New Zealand.¹

PHI, the epidemiology group of the Ministry of Health, developed the objectives and content of the 2006/07 New Zealand Health Survey, in consultation with stakeholders, an advisory group and an independent monitoring group. The data collection was carried out by a specialist survey company, National Research Bureau Ltd (NRB), which undertook the interviewing and prepared the data sets. PHI led the analysis and dissemination of the data.

What questions were asked?

The 2006/07 New Zealand Health Survey adult (15 years and over) and child (birth to 14 years) questionnaires are available online.² The questions asked to survey participants are also presented in the topic introductions throughout this report.

The content of the New Zealand Health Survey has remained the same over time, where possible, to allow for comparisons between surveys. However, some changes have been made between surveys to reflect current monitoring requirements and changes in definitions or health policy.

The main difference between the 2006/07 New Zealand Health Survey and previous Health Surveys is that this survey is the first to ask comprehensive questions on child health (the 1992/93 survey had a small number of questions regarding child health, and the 1996/97 survey included questions on child health service utilisation).

Child questionnaire

For the 2006/07 New Zealand Health Survey, the primary caregiver of each selected child participant, that is, the person with day-to-day responsibility for the care of the child, was invited to answer the child questionnaire. In over 90% of interviews, the primary caregiver was a biological parent (mostly the biological mother). For ease of reporting, primary caregivers are usually referred to as 'parents' throughout this report.

It is envisaged that future New Zealand Health Surveys will continue to include a comprehensive child health questionnaire, building on the content of the 2006/07 New Zealand Health Survey (Table 1.1).

1 *About Official Statistics*, www.statisphere.govt.nz/about-official-statistics/default.htm.

2 www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health

Table 1.1: Summarised content of the 2006/07 New Zealand Health Survey child questionnaire (answered by the primary caregiver for children aged from birth to 14 years)

Module	Topics	Details
Health status and development	Chronic conditions, general health in past 4 weeks (physical and emotional/behavioural), family cohesion, discipline	Prevalence of ever-diagnosed condition, age at diagnosis, treatment, CHQ-PF28 general health questionnaire
Health service utilisation	Primary health care provider use, general practitioners, nurses, oral health care professionals, medical specialists, prescriptions, other health care professionals, telephone health advice, hospital use	Use in past 12 months, frequency of contact, reasons for visit, unmet need and barriers to access
Health risk and protective factors	Breastfeeding, eating breakfast at home, fizzy drink and fast food intake, active transport to school, television watching, exposure to second-hand smoke	Prevalence of risk and protective factors
Socio-demographics	Gender, age, ethnicity, language, country of birth, early childhood care and education, shared parenting arrangements, primary caregiver's relationship to child, age, education, income support, labour status, and household characteristics	Standard questions and classifications
Anthropometry	Height and weight measurements (if 2 years and over) and waist circumference measurements (if 5 years and over)	Using standardised equipment and procedures

Adult questionnaire

The adult questionnaire content is similar to earlier New Zealand Health Survey questionnaires (Table 1.2). Key differences between the 2002/03 and 2006/07 adult questionnaires are:

- a more detailed primary health care section, covering accessibility, comprehensiveness of services, and continuity and co-ordination of care by primary health care providers, as well as experiences of primary health care
- an expanded oral health care section
- additional questions on mental health conditions
- new chronic pain questions
- revised tobacco questions (to align with the New Zealand Tobacco Use Survey)
- replacement of the 2002/03 problem gambling screen with an internationally comparable screen (the Canadian Problem Gambling Index)

- addition of the Economic Living Standards Index (ELSI-SF) and New Zealand Index of Socioeconomic Deprivation for Individuals (NZiDep)³
- removal of the World Health Organization Long Form (WHO-LF) health status questions
- more detailed collection of household and family composition information
- updated anthropometry (height, weight and waist circumference collection) protocols and equipment.

Table 1.2: Summarised content of the 2006/07 New Zealand Health Survey adult questionnaire (answered by adults aged 15 years and over)

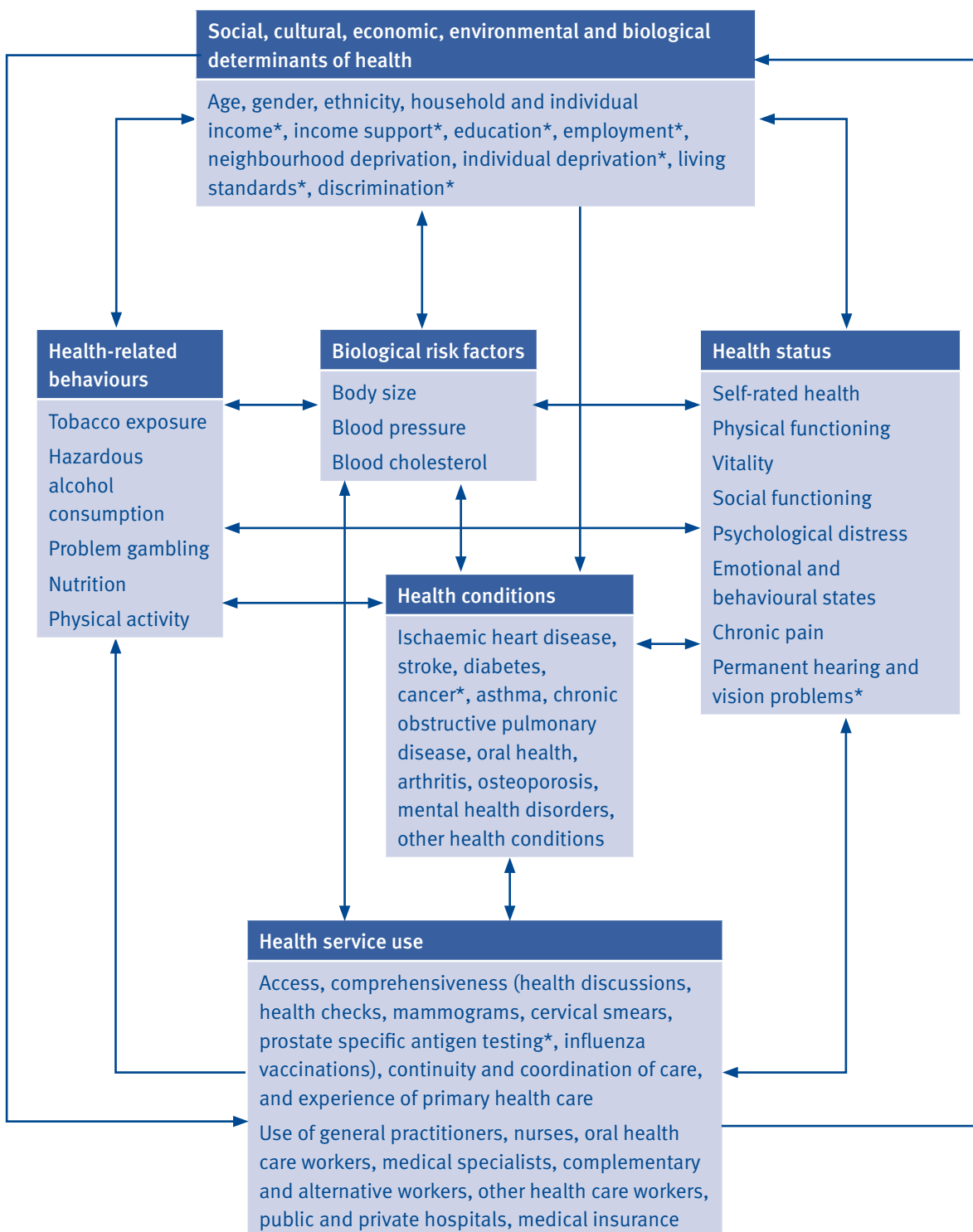
Module	Topics	Details
Chronic health conditions	Heart disease, stroke, diabetes, asthma, chronic obstructive pulmonary disease, arthritis, spinal disorders, osteoporosis, cancer, mental health conditions, other long-term conditions, chronic pain	Prevalence of ever-diagnosed condition, age at diagnosis, treatment
Health service utilisation	Primary health care provider use, general practitioners, nurses, oral health care professionals, medical specialists, prescriptions, complementary and alternative health professionals, other health care professionals, telephone health advice, hospital use	Use in previous 12 months, frequency of contact, reasons for visit, unmet need and barriers to access, measures of service for primary health care
Health risk and protective factors	High blood pressure, high blood cholesterol, mammograms, cervical smears, prostate specific antigen testing, physical activity, tobacco smoking, second-hand smoke exposure, vegetable and fruit intake, alcohol use and hazardous drinking, gambling participation and problem gambling	Prevalence of risk and protective factors
Health status	General health in past 4 weeks (physical and mental health), psychological distress	SF-36 Health Status Questionnaire and K10 Psychological Distress Scale
Socio-demographics	Gender, age, ethnicity, language, country of birth, education, income support, labour status, income, racial discrimination, medical insurance, household characteristics, living standards and deprivation characteristics	Standard questions and classifications
Anthropometry	Height, weight and waist circumference measurements	Using standardised equipment and procedures
Re-contact	Permission to re-contact within 2 years, contact details	

³ Analyses using ELSI and NZiDep have not been included in this report, however they are planned and will be published at a later date.

Overview of content

Figure 1.1 illustrates the relationships between the content of the questionnaires and the topics included in this report. Not all of the information collected in the 2006/07 New Zealand Health Survey was able to be presented in this report. Topics not included are signalled with an asterisk (*), and it is expected that the results and further analyses of these topics will be released at a later date.

Figure 1.1: Relationships between New Zealand Health Survey content areas



Key: * Not included in this report. See *How can readers access more survey results?* section later this chapter.

How were survey participants selected?

Overview of the sample design

Like earlier New Zealand Health Surveys, the 2006/07 New Zealand Health Survey used a multi-stage, stratified, probability proportionate to size (PPS) sample design, with increased sampling of some ethnic groups, primarily through a 'screened' sample. The sample design was developed by the Centre for Statistical and Survey Methodology, University of Wollongong, New South Wales, Australia.

Small geographic areas (meshblocks) were randomly chosen throughout New Zealand, with larger areas having a slightly increased chance of selection. These areas were randomly allocated to the four seasons of the year to minimise seasonality bias. Interviewers began at a random point in each area and selected every kth house as the 'core' sample households. In core households, one adult aged 15 years and over, and one child aged from birth to 14 years old, if any, were randomly selected for the survey. Interviewers then selected every jth house in each area as the 'screened' sample households, to boost Māori, Pacific and Asian sample sizes. In screened households, adults and children were only eligible if the participants identified with a Māori, Pacific or Asian ethnicity (determined using the Census ethnicity question and Statistics New Zealand Ethnicity Classification Level 4). There was no substitution of households or participants if the selected household or participant refused, was not contactable or was unavailable.

This sample design ensured that:

- robust national estimates for key health behaviours and outcomes could be produced
- all population groups of interest – in particular Māori, Pacific and Asian populations, and District Health Board (DHB) area populations – were included in sufficient numbers to enable estimates that are accurate for all groups
- interviewer travel costs were reduced because the sample was geographically clustered or 'clumped'.

A full methodology report for the 2006/07 New Zealand Health Survey is available online at <http://www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health>.

Data collection

Interviews were conducted from October 2006 to the end of November 2007. The 2006/07 New Zealand Health Survey interview team consisted of professional social research interviewers, employed by NRB.

The New Zealand Health Survey is voluntary, relying on the goodwill of participants, and consent is obtained without coercion or inducement. Adults and the primary caregivers of children selected for the survey were given an invitation letter from the Ministry of Health and an information brochure, available in 11 languages. If they agreed to take part, they were asked to sign a consent form. The consent form included a request for an interpreter, if required, and it was possible to match participants and interviewers by ethnicity and gender when requested.

Interviews were conducted in participants' homes, at a time to suit participants. Interviewers typed responses directly into a laptop computer, and show cards with predetermined response categories were used to assist the participant, where appropriate. The height, weight and

waist measurements were taken following protocols developed specifically for the New Zealand Health Monitor surveys, using professional weighing scales, a portable stadiometer, and a standard anthropometric measuring tape.

Adult interviews were approximately 60 minutes long and child interviews (with the primary caregiver) were approximately 40 minutes long.

The methodology report contains more information on data collection procedures (available from www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health).

Ethical approval

The New Zealand Health and Disability Multi-Region Ethics Committee granted approval for the 2006/07 New Zealand Health Survey (MEC/06/02/004), confirming that the study met the following ethical principals:

- validity of research
- minimisation of harm
- privacy and confidentiality
- informed consent
- cultural and social responsibility.

Who agreed to take part?

A total of 12,874 households from throughout New Zealand participated in the 2006/07 New Zealand Health Survey, resulting in interviews with 12,488 adults (aged 15 years and over) and the parent or caregiver of 4921 children (aged from birth to 14 years).

The adult sample included 3160 Māori, 1033 Pacific, 1513 Asian and 8593 European/Other adults⁴. The child sample included 1983 Māori, 798 Pacific, 742 Asian and 3039 European/Other children. Young people (aged 15–24 years) and men aged 25–64 years were proportionately less likely to participate in the New Zealand Survey, but sufficient numbers in these groups still took part to provide accurate results for the key findings presented in this report.

Appendix 2 contains the survey sample size and population counts for the groups referred to in this report.

For more information on the 2006/07 New Zealand Health Survey sample, please refer to the methodology report (www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health).

How does the survey represent the total population?

To ensure that no group is under- or over-represented in estimates from the survey, ‘weights’ were calculated for every survey participant. The weight can be thought of as the number of population members represented by a given survey participant.

⁴ Total response standard output for ethnic groups has been used, so these numbers will not add to the total sample size. See page 9 for more information on total response standard output.

Calibrated weighting

A method called ‘calibrated weighting’ (Deville and Sarndal 1992) was used for the 2006/07 New Zealand Health Survey. This results in:

- the weight being close to the inverse of the probability of selection of each participant
- the aggregated weights matching the known population counts for a range of sub-populations (eg, age-by-sex categories).

Calibrated weights were calculated using population counts from the 2006 Census, broken down by age, gender, DHB area and ethnic group. These variables were included in the calibration weighting because they are related to many health conditions and non-response, and are the output classifications for the survey. By using these variables in the calibration, if the sample differed from the population according to any of these categories, then the weights corrected for the discrepancy. For example, if young men are under-represented in the sample relative to the census counts (as was the case due to non-response), the weights for young male participants are increased so that this group is correctly represented in estimates.

Weights were used in all of the results presented in this report, so that estimates of population totals, averages and proportions can be said to be representative of the total resident population of New Zealand.

The online methodology report contains more information on weighting the 2006/07 New Zealand Health Survey sample.

What has been analysed and reported?

This report presents the key descriptive results from the 2006/07 New Zealand Health Survey: this includes data on topics that align with the Ministry of Health’s priority monitoring and policy areas, as stated in the New Zealand Health Strategy (Minister of Health 2000) and the Health Targets (Minister of Health 2007).

Data in this report have been presented for the total child and/or adult population, by gender and age group. Analyses by ethnic group, neighbourhood deprivation (NZDep2006), DHB area, and comparisons over time have also been reported, where possible. Important information about these analyses is discussed below.

Gender analyses

Gender is self-defined in the 2006/07 New Zealand Health Survey and therefore in a very small number of cases may not be the biological sex at birth of the participant.

Where statements regarding differences between genders are made in this report, the data have been age standardised to account for the different age structures of the male and female populations.⁵

Appendix 2 contains the survey sample size and population counts for boys and girls (0–14 years) and men and women (15 years and over).

⁵ For more information on age-standardisation see page 16.

Age group analyses

The participant's date of birth was used to ascribe the appropriate age group. In the small number of cases where this was not possible, age or 10-year age group was collected from the participant. There were no missing data on the dataset for age group.

For ease of reporting, children aged from birth to 14 years have been referred to as boys and girls, and adults aged 15 years and over have been referred to as men and women. The total child population refers to boys and girls aged from birth to 14 years, unless otherwise stated, and the total adult population refers to men and women aged 15 years and over, unless otherwise stated.

In most instances, child data have been presented by five-year age group (0–4, 5–9, 10–14 years) and adult data have been presented by 10-year age group. For some topics these age groups were not appropriate, so different age groups have been used in analyses and stated specifically in the text.

Age group analyses have been presented throughout this report in graphs using unadjusted data, by gender.

Appendix 2 contains the survey sample sizes and population counts of each age group.

Ethnic group analyses

Ethnicity is a self-defined concept. Participants in the 2006/07 New Zealand Health Survey were able to report affiliation with multiple ethnicities, using the Statistics New Zealand standard ethnicity question and Level 4 response categories.⁶ Only three adult participants (0.02%) and one parent of a child participant (0.02%) refused the ethnicity question.

For this report, participants' ethnicity (Statistics New Zealand Level 4) was output to the following ethnic groups: European/Other, Māori, Pacific, and Asian.⁷ The 'Other' ethnic group (comprising mainly Middle-Eastern, Latin-American and African ethnicities) has been combined with 'European' to avoid small number problems. The small number of participants who reported 'New Zealander' as their ethnicity (0.9% of adults and 0.7% of children) or refused the ethnicity question (noted above) have been included in the European/Other group.

Participants were counted in each of the four output ethnic groups, and so the sum of the ethnic group populations exceeds the total New Zealand population. This is referred to as 'total response standard output' by Statistics New Zealand. Total response standard output is the most appropriate way to represent valid multiple ethnic group data in the restricted space of this report (Callister et al 2007a). A total of 1578 adult participants (12.7% of adults) and 1390 child participants (28.3% of children) have been assigned to more than one of the four ethnic groups in this report, based on their self-reported multiple ethnicities.

In this report unadjusted prevalences by ethnic group for some indicators have been presented to show the burden on different population groups, and include estimates of the number of people affected in each group.

Age standardised rate ratios (SRR) have also been presented after the unadjusted rate to compare each ethnic group with the total New Zealand population by gender (the reference group). For example, Pacific men are compared to men in the total population. The reference

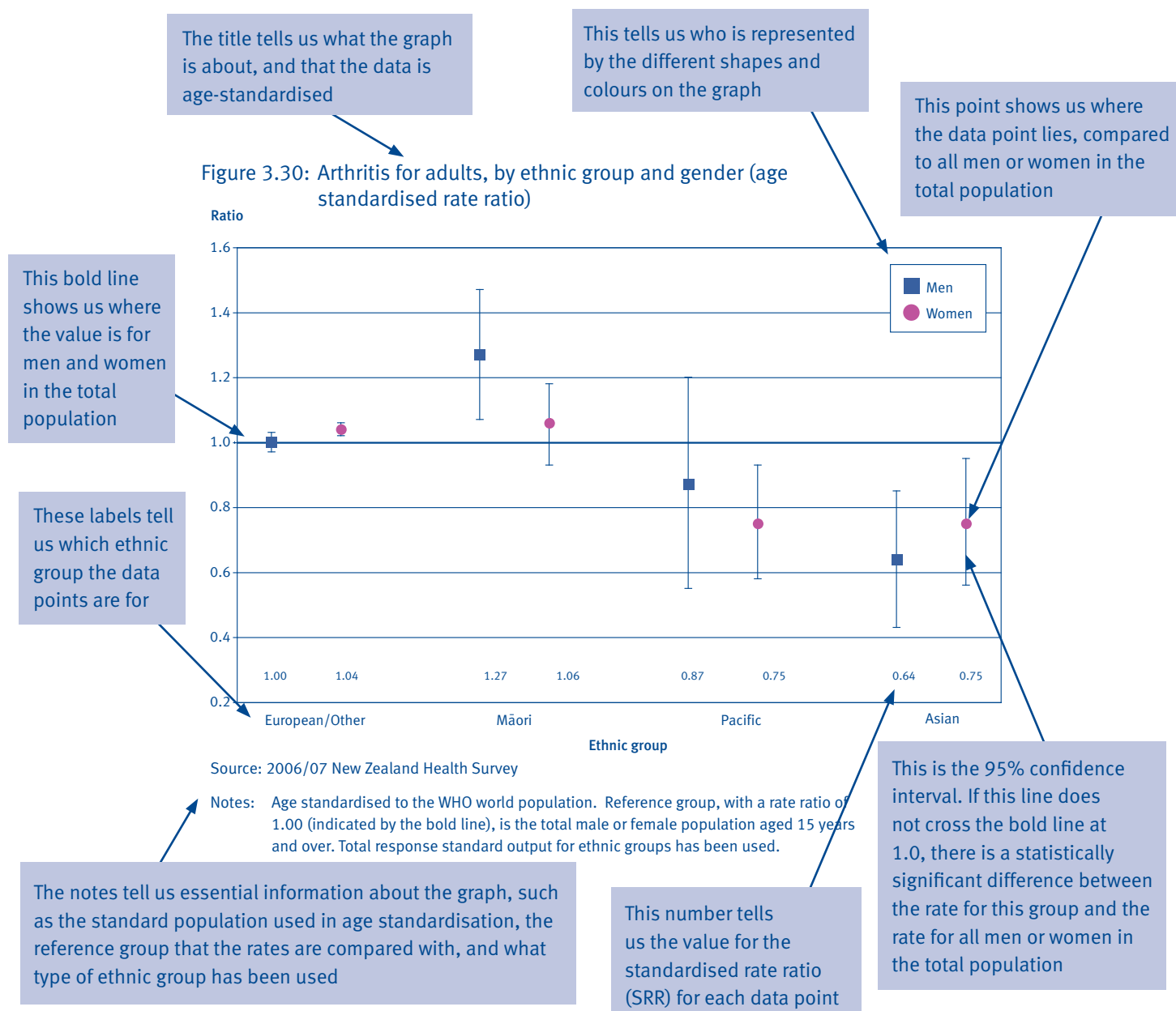
⁶ The methodology report contains more information on collection of ethnicity data in the New Zealand Health Survey (www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health).

⁷ More information on the ethnicities included in the output ethnic groups can be found at www.stats.govt.nz/statistical-methods/classifications-and-related-statistical-standards/ethnicity/default.htm.

group does not represent ‘the best health outcome group’, but provides an indication of the current level in New Zealand for comparison.

Ethnic groups should not be compared with each other (eg, comparing Māori and Pacific data) using either the unadjusted rates or the standardised rate ratios. Instead, comparisons should be made with the reference population as explained in Figure 1.2.

Figure 1.2: How to interpret rate ratio graphs in this report



Ethnic group analyses with an independent comparison group (ie, Māori/non-Māori, Pacific/non-Pacific and Asian/non-Asian) are available in the online data tables⁸ and will be published in upcoming ethnic-specific publications from the Ministry of Health, such as the next *Tatau Kahukura: Māori Health Chart Book*. Readers should note that variation also occurs within the four aggregated ethnic groups presented in this report. The issue of variation within ethnic groups is explored in Pacific and Asian health publications by the Ministry of Health (Ministry of Health 2006a; Ministry of Health and Ministry of Pacific Island Affairs 2004).

8 www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health - see Appendix 5.

Appendix 2 contains the survey sample sizes and population counts of each ethnic group.

Neighbourhood deprivation analyses

Data in this report have been presented by quintile of the 2006 version of the New Zealand Index of Deprivation (NZDep2006) as a proxy measure of socioeconomic position. NZDep2006 is an area-based index of deprivation that measures the level of socioeconomic deprivation for each neighbourhood (meshblock) according to a combination of the following 2006 Census variables: income, benefit receipt, transport (access to car), household crowding, home ownership, employment status, qualifications, support (sole-parent families), and access to a telephone (Salmond et al 2007).

The predecessors of NZDep2006 (NZDep91, NZDep96 and NZDep2001) have been validated. This means that the index accurately describes levels of deprivation in small areas and is highly correlated with key health outcomes and behaviours, such as mortality and smoking (Crampton et al 2004). The 3rd edition of the Atlas of Socioeconomic Deprivation in New Zealand will be published by the Ministry of Health in June 2008.

All analyses using NZDep2006 in this report have been adjusted for the differing age distributions within NZDep2006 quintile populations (page 16 has an explanation of age standardisation).

Appendix 2 contains the survey sample sizes and population counts of each NZDep2006 quintile group.

Other measures of socioeconomic position collected in the 2006/07 New Zealand Health Survey include: household income, individual income, education qualifications, employment status, income support (benefit receipt), individual-level deprivation (NZiDep), and economic standard of living (ELSI). Analyses using these other measures of socioeconomic position have not been included in this report, but analyses are planned and will be published at a later date.

District Health Board analyses

There are 21 DHBs in New Zealand, responsible for providing, or funding the provision of, health and disability services in their district. Key data from the 2006/07 New Zealand Health Survey, that is, data on topics aligned with the New Zealand Health Strategy, (Minister of Health 2000) and the Health Targets (Minister of Health 2007) have been presented in this report at the DHB level, where possible.

Appendix 2 contains the sample size and population counts for each DHB area and Appendix 3 contains a map of DHB areas.

Direct survey results from the 2006/07 New Zealand Health Survey were possible only for the larger DHBs (Waitemata, Auckland, Counties Manukau, Waikato and Canterbury). The remaining DHBs have been grouped according to population age and socio-demographic structure or shared service provision, to produce robust direct survey estimates with minimal sample error:

- Northland, Lakes, Hawke's Bay, Tairāwhiti and Whanganui
- Bay of Plenty, Taranaki and MidCentral
- Wairarapa, Hutt Valley and Capital and Coast
- Nelson Marlborough, West Coast, South Canterbury, Otago and Southland.

DHB-level analyses in this report are presented in table format. Table 1.3 provides a list of topics in this report that contain DHB-level estimates. Readers should look for + (higher) and – (lower) symbols in the data tables, which represent a statistically significant difference between DHB and national rates. DHB areas that do not have a symbol next to their rate are not statistically different from the national rate.

DHB analyses for this report have used a different method to that used to produce DHB-level data from the 2002/03 New Zealand Health Survey. However, comparisons between the 2002/03 and 2006/07 data are presented at PHIONline (an interactive geographic mapping website, www.phionline.moh.govt.nz), where the 2002/03 estimates have been updated using a comparable method. Adult data for the estimates in Table 1.3 have been presented on PHIONline for all DHBs using small area estimation techniques. Estimates for child data were not possible due to the small number of children sampled from each DHB in the survey. Small area estimation methodology and its application to New Zealand Health survey data are described in detail in the methodology report.

Table 1.3: Regional / DHB area data presented in this report

Topic	Indicator	Age group
Health behaviours and risk factors		
Infant feeding	Ever breastfed	0–14
Fizzy drink intake	Three or more fizzy drinks in the previous 7 days	2–14
Fast food intake	Fast food eaten 3 or more times in the previous 7 days	2–14
Television watching	Usually watched 2 or more hours of television per day	5–14
Tobacco exposure	Second-hand smoke exposure in children and non-smokers in their home	0–14, 15+
	Current smokers	15+
Alcohol use	Hazardous drinking	15+
Vegetable and fruit intake	Adequate vegetable intake	15+
	Adequate fruit intake	15+
Physical activity	Regular physical activity	15+
	Sedentary behaviour	15+
Body size	Obesity	2–14, 15+
Health conditions		
Blood pressure	Medicated high blood pressure	15+
Cholesterol	Medicated high blood cholesterol	15+
Ischaemic heart disease	Ever diagnosed with ischaemic heart disease (angina or heart attack)	15+
Stroke	Ever diagnosed with stroke	15+
Diabetes	Ever diagnosed with diabetes	15+
Asthma	Medicated asthma	2–14, 15+
Oral health	Never had a filling	2–14
	One or more teeth removed due to decay, abscess, infection or gum disease	2–14, 15+
Health status		
General health	Parent-rated or self-rated health as excellent or very good	0–14, 15+
Psychological distress	High or very high probability of having an anxiety or depressive disorder (K-10 score of 12 or more)	15+
Health service use		
Primary health care provider and general practitioner use (in previous 12 months)	Has a primary health care provider	0–14, 15+
	Saw a general practitioner	0–14, 15+
	Last visit to general practitioner was free	0–14, 15+
	Unmet need for a general practitioner visit	0–14, 15+
Oral health services	Visited an oral health care worker in previous 12 months	2–14, 15+
	Never seen an oral health care worker	2–14, 15+
	Unmet need for oral health care services in previous 12 months	2–14, 15+
Emergency department use	Emergency department use in the previous 12 months	0–14, 15+

Time trend analyses

Where possible, key findings from the 2006/07 New Zealand Health Survey have been compared with earlier New Zealand Health Survey data (1996/97 and 2002/03), as well as the 1997 National Nutrition Survey and the 2002 National Children's Nutrition Survey, where appropriate. The 1992/93 New Zealand Health Survey has not been included in the time trend analyses as it was a telephone survey and had a smaller sample size making it difficult to compare with more recent New Zealand Health Surveys.

To ensure as much comparability as possible with the 2006/07 New Zealand Health Survey data, all earlier data sets have been reanalysed and only identical questions or measurements have been analysed and presented. The methodology report (available at www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health) contains information on the comparability of the survey data presented in the time trends, and Appendix 2 has the sample sizes for each survey used in the time trend analyses.

Statistical tests for difference have been used to assess changes in prevalence rates between surveys (ie, 95% confidence intervals and t-tests), and data are presented by gender for the total population where appropriate.

As a population group, Māori have the poorest health outcomes and highest mortality rate of any ethnic group in New Zealand (Blakely et al 2007; Robson and Harris 2007). It is therefore important to monitor progress towards addressing these disparities, and as a result, time trend data for the Māori population by gender have also been presented where possible.

Although European/Other, Pacific and Asian people also have poor outcomes for some indicators in this report, comparisons with earlier survey data for these ethnic groups have not been presented in the limited space available. Time trends for these ethnic groups may be explored in other publications.

The results presented in this report may be different from those in earlier publications due to:

- age standardisation of the data rather than presenting unadjusted rates
- total response standard output for ethnic groups being used in analyses rather than prioritised ethnic groups (where participants with multiple ethnicities are only counted once rather than in each reported ethnic group)
- differing age groups used in analyses
- changes in the definition of some variables (eg, a change in the BMI cut-off points for Māori and Pacific adults).

Direct comparisons with other data that are not included in the time trend analyses in this report need to be treated with caution due to differences in statistical methods used in the collection and analysis of data.

Table 1.4 provides a summary of the time trend topics and the survey data used in this report.

Table 1.4: Time series data presented in this report

Topic	Indicator	1996/97	2002/03	2006/07	Age group
Health behaviours and risk factors					
Tobacco use	Daily smoking	•	•	•	15+
Alcohol use	Hazardous drinking	•	•	•	15+
Vegetable and fruit intake	Adequate vegetable intake	• ¹	•	•	15+
	Adequate fruit intake	• ¹	•	•	15+
Physical activity	Regular physical activity		•	•	15+
	Sedentary behaviour		•	•	15+
Body size	Obesity and mean BMI		• ²	•	2–14
	Obesity and mean BMI	• ¹	•	•	15+
Health conditions					
Blood pressure	Medicated high blood pressure		•	•	15+
Cholesterol	Medicated high blood cholesterol		•	•	15+
Stroke	Ever diagnosed with stroke		•	•	15+
Diabetes	Ever diagnosed with diabetes	•	•	•	15+
Asthma	Medicated asthma		•	•	15–44
Oral health	Never had a filling		• ²	•	5–14
	One or more teeth removed due to decay, abscess, infection or gum disease		• ²	•	5–14
Arthritis	Ever diagnosed with arthritis		•	•	15+
Osteoporosis	Ever diagnosed with osteoporosis		•	•	15+
Health status					
General health	Self-rated health excellent or very good	•	•	•	15+
SF-36	SF-36 health scores	•	•	•	15+
Health service utilisation					
General practitioner use (in previous 12 months)	Saw a general practitioner (GP)	•		•	0–14
	Saw a GP	•	•	•	15+
	Median number of visits to a GP		•	•	15+
	Last visit to GP was free	•		•	0–14
	Last visit to GP was free	•	•	•	15+
	Unmet need for a GP	•		•	0–14
	Unmet need for a GP	•	•	•	15+
Prescriptions (in previous 12 months)	Uncollected prescriptions due to cost	•		•	0–14
	Uncollected prescriptions due to cost		•	•	15+
Primary health care nurse use	Saw a primary health care nurse in previous 12 months		•	•	15+

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Topic	Indicator	1996/97	2002/03	2006/07	Age group
Health service utilisation					
Public hospital use (in previous 12 months)	Emergency department use	•		•	0–14
	Emergency department use	•	•	•	15+
	Use of other public hospital services	•		•	0–14
	Use of other public hospital services	•	•	•	15+
Private hospital use (in previous 12 months)	Use of private hospital services	•		•	0–14
	Use of private hospital services	•	•	•	15+
Medical insurance	Medical insurance coverage		•	•	15+

1 Data sourced from 1997 National Nutrition Survey

2 Data sourced from 2002 Children’s Nutrition Survey

Age standardisation

Unadjusted rates have been presented in this report for estimates of the prevalence in the total population and by age group. However, age is an important determinant of health, so populations with different age structures, (such as men and women, due to women having a longer life expectancy) will have different rates due to these age differences.

For this report, age standardisation was performed by the direct method using the World Health Organization (WHO) world population age distribution (Ahmad et al 2000). This statistical method of standardising for age has been used in analyses by gender, ethnic group and neighbourhood deprivation (NZDep2006), and for comparisons between the different health surveys. Results for children in this report have been age standardised to the under 15-year-old population, and results for adults have been age standardised to the 15-year-old and over population.

What is the quality of these results?

As a signatory to the Protocols of Official Statistics (Statistics New Zealand 1998), best-practice survey techniques have been employed throughout the 2006/07 New Zealand Health Survey. Many steps have been taken to ensure the data collected are as high quality and robust as possible, including the establishment of an advisory group and an independent monitoring group to direct questionnaire content and analyses of the survey. External peer-review of the sample design and this report has contributed to maintaining the high quality of the survey.

However, readers should be aware that errors can come about due to sampling (selection of only some people in a population) and for other reasons (referred to as non-sample errors). The minimising and quantifying of sampling errors and the prevention of non-sampling errors is discussed below.

Sample error and small sample numbers

Sample error results from selecting a small number of people (a sample) in the population to represent the entire population, and is influenced by the complex design of the survey (that is, that some people have a higher chance of selection than others). Consequently, results presented in this report may differ from the 'true' value that would have been produced if the questionnaire had been given to everyone in the population.

Ninety-five percent confidence intervals are used to represent the sample error for estimates. A 95% confidence interval means that there is a 95% chance that the true value of the estimate (if we were to ask the whole population) lies between the lower and upper confidence interval values. Ninety-five percent confidence intervals are presented in this report in brackets after estimates in the text, and as error bars in graphs.

Differences between estimates are said to be statistically significant when the confidence intervals for each rate do not overlap. Sometimes, even when there are overlapping confidence intervals the difference between the groups can be statistically significant, and so in this report any differences between two variables where the confidence intervals overlap were tested using a t-test. The significance of a t-test is represented by the p-value. If a p-value is below 0.05, then we are 95% confident the difference between the two estimates is statistically significant. In this report, t-test results appear in brackets after the analyses, rounded to two decimal places (p-value < 0.05).

Unless otherwise stated, all differences noted in the text in this report are statistically significant.

Small sample numbers can affect both the reliability and the confidentiality of results. Problems with reliability occur when the sample becomes too small to adequately represent the population from which it has been drawn. Problems with confidentiality can occur when it becomes possible to identify an individual, usually someone in a sub-group of the population within a small geographical area.

In order to ensure that the survey data presented are reliable and that the confidentiality of the participants is protected, data have only been presented when there are at least 30 people in the denominator (the population group being analysed). Care has been taken to ensure that no participant can be identified in the results.

Non-sample error

Non-sample errors arise primarily from coverage problems, measurement inaccuracies, non-response, or processing errors (explained in Table 1.5). Non-sample errors are extremely difficult to measure and therefore the effect of them on the quality of survey data is uncertain. Consequently, non-sample errors are prevented in surveys, where possible.

Table 1.5 summarises the steps taken to prevent or minimise non-sample error in the 2006/07 New Zealand Health Survey.

Table 1.5: Summary of actions taken to prevent non-sample error

Survey area	Type of error	Actions taken to prevent error
Coverage	Omissions, erroneous inclusions, duplications, misclassification of units in the survey frame	Statistics New Zealand’s geographical frame of census meshblocks was used to randomly select areas for interviewing (only excluding meshblocks with a very small number of households, and off-shore islands).
		Comprehensive training of interviewers was given regarding household inclusion / exclusion criteria.
		Supervisor checking was done of all enumeration and household selection.
		A random method (Kish Grid) was used to select participants.
		Standard procedures were used to screen for ethnicity, using Statistics New Zealand ethnicity classification.
		No exclusion criteria based on age, literacy, cognitive functioning or poor health were used – the primary caregiver acted as a proxy participant, where necessary.
Measurement	Difference between the recorded response to a question and the ‘true’ value	Interviewers were trained for consistency in approach, technique and recording of answers.
		Validated questions, standard definitions and accepted classifications were used where possible in the questionnaires.
		Cognitive testing of new questions was carried out.
		Concepts in questions were clearly defined.
		Professional language assistance was provided when requested (including sign language).
		Direct measurement of height, weight and waist circumference using standard protocols and procedures, including calibration of scales at mid-point of data collection, was done.
		A limited recall period was used where possible.
		Data were collected across the four seasons to control for seasonality effects (eg, for physical activity).
Supervisors re-contacted a proportion of the interview participants to check the interview occurred and to check key data collected.		
Non-response	Item non-response (participant refuses or doesn’t know answer)	Interviewer training was given on establishing rapport and sustaining interest throughout the survey.
		Computer programming, including skip patterns so that participants only answer questions relevant to them.
		Item non-response was monitored.
		Interview length was kept as short as possible to reduce participant burden.
		Show cards were used where appropriate to assist the participant and prompt an appropriate response.
		Supervisors telephoned back participants to check unclear or illogical answers.

Survey area	Type of error	Actions taken to prevent error
Non-response	Complete non-response (when all or almost all answers are missing, lost data, etc)	Up to nine call-backs to households were made to make contact.
		There was flexibility with interview day and time to suit the participant and their household.
		Child care was provided where necessary for the interview to occur.
		An invitation letter from the Ministry was sent to householders and colourful brochures in 11 different languages were used to assist the interviewer to secure household participation.
		Participants were given the option to request another interviewer (for any reason) using an 0800 phone number.
		Overlap control was carried out with other Ministry of Health surveys in the field at the same time to avoid approaching the same households.
		Follow-up was done of non-responders where possible.
		Non-response was analysed and accounted for where possible in the weighting (calibration).
Processing	Responses are changed during data handling after collection and prior to reporting. These could be during coding, data movement, editing or analysis.	High-quality software was used in data collection, transfer, editing and analysis.
		A dress rehearsal was done to test operational processes.
		Closed-response categories were used where possible, avoiding text answers, which require additional coding.
		A coding manual was used for 'other' responses.
		Range and logic edit checks of data were performed throughout data collection, by both NRB and PHI.
		No imputation for non-response was performed.
		Double-coding of descriptive analyses output was done to check for error.

The methodology report contains more information on questionnaire development, interviewer training and operational processes (www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health).

Response rates

The main measure used to assess the overall quality of a survey is the final weighted response rate. The response rate is a measure of how many people who were invited to take part in the survey actually participated. A high response rate means that we can be more confident that the survey results are representative of the New Zealand population.

The overall response rates for the 2006/07 New Zealand Health Survey were 68% for adults and 71% for children. Table 1.6 presents the weighted response rates by ethnic group. These rates are comparable to other face-to-face household-based population surveys conducted in New Zealand, and are similar to earlier New Zealand Health Surveys and other national health surveys in like countries.

Table 1.6: Final weighted response rates for 2006/07 New Zealand Health Survey

Ethnic group	Child response rate (0-14 years)	Adult response rate (15+ years)
European/ Other	75.0	67.8
Māori	74.9	67.5
Pacific	74.9	70.2
Asian	74.0	79.6
New Zealand total	71.2	67.9

Note: The total response rate for children is lower than the ethnic group response rates due to there being a large number of screened households in the survey for which the ethnicity of children was not recorded. The eligibility of some children was therefore unknown and these cases could not be directly used in the ethnic group response rate calculations, whereas they were able to be used in the overall response rate calculation. See methodology report for more information.

The methodology report contains a detailed explanation of the response rate calculations (www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health).

Key points for interpreting results

The 2006/07 New Zealand Health Survey is a sample survey at one point in time and can be used to examine *associations* between health states, individual health risk and protective behaviours, and socio-demographic characteristics. However, associations do not necessarily imply *causality*. For example, if the survey finds that a particular condition is more common in people living in deprived areas, an *association* has been identified. This does not mean the condition is *caused* by living in a deprived area. Associations between current health states and current behaviour or current socio-demographic characteristics, need to be interpreted with caution, as current health states may reflect past, rather than present, behaviour or childhood circumstances.

The survey only included the usually resident population who live in private dwellings, that is, approximately 94% of the usually resident population. People living in institutions (hospitals, IHC⁹ and rest homes, prisons, boarding schools), the homeless, short-term visitors and tourists were not included, many of whom may have a particular health condition and may be accessing New Zealand health services.

Many of the survey results are based on the assumption that participants can accurately recall previous events (such as a diagnosis by a doctor, or how many times they did a particular activity in a given period) and that they have a sufficient level of health literacy. Questions and additional definitions of technical terms provided to participants during the interview are included in the topic introductions throughout this report.

Comparisons with other data sources (Census, health system administrative and other survey data) which are not presented in this report should be approached with caution, as there are many issues regarding comparability.

9 Supported living homes for the intellectually disabled.

How can readers access more survey results?

The Ministry of Health hopes this report stimulates interest in the health of New Zealanders and generates more research, both through additional use of Health Survey data and by informing future research direction and priorities.

There are several ways to access further data from the 2006/07 New Zealand Health Survey: through online data tables, further publications, confidential unit record files (CURFs), PHIONline maps, or by contacting PHI.

Online data tables

To see the data for all analyses presented in this report and extra descriptive results, please go to www.moh.govt.nz/moh.nsf/indexmh/portrait-of-health where you can access the data tables online in Excel format. Appendices 5 and 6 contain more information on the data tables available online.

Further publications

Look for further publications from PHI that use the 2006/07 New Zealand Health Survey data, which will be available on PHI's website (www.moh.govt.nz/phi/publications).

New Zealand Health Survey CURF data access

The analyses presented in this report are only a small proportion of those that could be undertaken, and in many ways pose more questions than they answer. PHI encourages researchers to use New Zealand Health Survey data sets to explore topics of interest. The 2006/07 New Zealand Health Survey Adult and Child CURFs, with accompanying documentation and user guides, will be available from September 2008.

Researchers may apply to access the CURFs from PHI. CURFs have had all identifying information about individuals removed, and have been modified to protect individual information. Approval is subject to certain criteria, terms and conditions and the researcher's organisation must sign a microdata access agreement with PHI.

Refer to PHI's Microdata Data Access Protocol online for more information and to download the application form (www.moh.govt.nz/phi/dataaccess).

PHIONline website

PHIONline (www.phionline.moh.govt.nz) is a geographic visualisation tool with linked tables, graphs and maps, which gives a multidimensional view of data. DHB-level estimates for adult data presented in this report are accessible on PHIONline, allowing users to visually compare DHB data. Due to the small number of children in the survey sample for some DHBs, child estimates have not been included on PHIONline.

PHIONline uses Adobe Flash player version 8 or above. Flash is a standard PC multimedia application, and is already embedded in most commonly used internet web browsers for free. If you have trouble accessing PHIONline, please contact PHI.

How to contact Public Health Intelligence

Public Health Intelligence
Health and Disability Systems Strategy Directorate
Ministry of Health
PO Box 5013
Wellington, New Zealand

Tel: +64 (4) 816 2000, Fax: +64 (4) 816 2340

Email: phi@moh.govt.nz or to contact staff directly firstname_lastname@moh.govt.nz