Presenting Ethnicity

Comparing prioritised and total response ethnicity in descriptive analyses of New Zealand Health Monitor surveys

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Views expressed in this report are solely those of the authors and do not necessarily reflect the opinions of the peer reviewers or the Ministry of Health.

Contents

Executive Summary vi

1 Introduction 1
Background 1
Overview of this report 3

2 Data and Methods 4
2002/03 New Zealand Health Survey 4
Ethnicity 4
Health outcomes 6
Statistical methods 7
Analyses 9
Definitions 11

3 Investigating Differences between Prioritised and Total Response Rates 14
Absolute differences 14
Relative differences 17

4 Presenting Ethnicity Results 23
Example of how to present results for prioritised ethnic groups 23
Example of how to present results for total response ethnic groups 24
Notes for presenting total response ethnic groups 25

5 Discussion 27
Key results 27
Discussion 27
Recommendations for best practice 29
Conclusion 30

References 32

Appendix A 33

List of Tables

Table 1: Number of ethnic groups that respondents in the 2002/03 New Zealand Health Survey identified with 5

Table 2: Number of respondents in the 2002/03 New Zealand Health Survey, by prioritised ethnic groups and total response ethnic groups 6

Table 3: Selected health outcomes used in this study, from the 2002/03 New Zealand Health Survey 6

Table 4: Example of template for standardised total response ethnic group dataset 9

Table 5: Prevalence of key health indicators in the 2002/03 New Zealand Health Survey, comparing prioritised Pacific with total response Pacific, age-standardised percent 15

Table 6: Prevalence of key health indicators in the 2002/03 New Zealand Health Survey, comparing prioritised Asian with total response Asian, age-standardised percent 16

Table 7: Prevalence of key health indicators in the 2002/03 New Zealand Health Survey, comparing prioritised European/Other (non-Māori/Pacific/Asian) with total response European/Other, age-standardised percent 17

Table 8: Standardised rate ratios for the prevalence of key health indicators, for prioritised Māori versus prioritised European/Other, and for total response Māori versus total New Zealand population, 2002/03 19

Table 9: Standardised rate ratios for the prevalence of key health indicators, for prioritised Pacific versus prioritised European/Other, and for total response Pacific versus the total New Zealand population, 2002/03 20

Table 10: Standardised rate ratios for the prevalence of key health indicators, for prioritised Asian versus prioritised European/Other, and for total response Asian versus the total New Zealand population, 2002/03 21

Table 11: Standardised rate ratios for the prevalence of key health indicators, for total response European/Other versus the total New Zealand population, 2002/03 22

Table 12: Heart disease for adults, by ethnic group and gender, 2002/03 (unadjusted prevalence) 24

Table A1: Number of respondents in the 2002/03 New Zealand Health Survey, by single and combination ethnic groups 33

List of Figures

Figure 1: Example of how to interpret standardised rate ratio graphs 13

Figure 2: Prevalence of heart disease, by ethnic group, percent (age-standardised), 2002/03 23

Figure 3: Heart disease for adults, by ethnic group and gender, 2002/03 (age-standardised rate ratio) 25

Executive Summary

Background

Statistics New Zealand reviewed the measurement of ethnicity in 2004, as a result of which they recommended that the practice of using prioritised ethnicity be discontinued for the standard output of ethnicity data in official statistics (Statistics New Zealand 2004). Current Ministry of Health (the Ministry) ethnicity data protocols still include prioritisation as a valid option for presenting ethnicity data (Ministry of Health 2004b).

Public Health Intelligence (PHI), the epidemiology group of the Ministry, is responsible for monitoring the health of New Zealanders, which includes managing the New Zealand Health Survey (NZHS). As part of this role, PHI publishes key survey results, which include results by ethnic group.

Recently, the presentation of key results from the 2006/07 NZHS provided a useful opportunity to consider how PHI could present total response ethnicity for the outputs of the 2006/07 survey and subsequent PHI New Zealand Health Monitor (NZHM) descriptive survey analyses.

The aims of this report are to:

- present the findings of a study investigating the impact of using total response ethnicity (compared to prioritised ethnicity) when analysing the 2002/03 NZHS
- discuss some of the methodological challenges in presenting results by total response ethnic groups
- make recommendations for best practice for PHI, for presenting key descriptive results from the NZHM surveys.

Methods

Rates were calculated for 10 selected health outcomes (including chronic disease, risk factors and health service utilisation variables) using 2002/03 NZHS data. These rates were calculated for the ethnic groups of Māori, Pacific, Asian and European/Other, first using prioritised ethnic groups and then using total response ethnic groups. Rates were calculated using survey weights to represent the total population and were age standardised to the World Health Organization (WHO) world population.

For each health indicator, the absolute rate differences between the age-standardised rates using prioritised ethnic groups and total response ethnic groups were calculated for each ethnic group.

Rate ratios were calculated for the relative differences between the rates (i) for the prioritised ethnic group compared with the rates for the comparison group of European/Other and (ii) for the total response ethnic group compared with the rate for the total New Zealand population. These rate ratios were then compared.

Results

This study found that there was very little difference in results when using prioritised or total response ethnic groups to analyse the 2002/03 NZHS.

When examining the absolute differences between the rates calculated using prioritised and total response ethnic groups, the rates were found to be very similar, particularly for Asian and European/Other. For Pacific, using total response ethnic groups resulted in significantly lower prevalence estimates for 2 of the 10 indicators (heart disease and diabetes) compared with when prioritised ethnic groups were used.

The analysis of the relative differences between rates also showed very few significant differences. In general, the rate ratio of the age-standardised rates between each prioritised ethnic group and the prioritised European/Other group was very similar to the rate ratio between each total response ethnic group and the total New Zealand population; the one exception being for the health indicator of diabetes.

Recommendations for the descriptive analyses of key results of New Zealand Health Monitor surveys

As a result of this study and recommendations by Statistics New Zealand, this report has made the following recommendations for PHI, for presenting ethnic data in key descriptive results from NZHM surveys. Researchers may also wish to implement these recommendations in their own analysis of NZHM surveys. These recommendations are intended as guidelines only, and should be interpreted and applied as appropriate:

- Consider the data, the sampling method and the purpose of the analysis before deciding on which method and comparison group to use.
- Use total response ethnic groups to present key results of NZHM surveys where possible. Using total response ethnic groups increases the sample sizes for Pacific and Asian ethnic groups as total numbers are used.
- Use the category of 'total European/Other' rather than the category of 'non-Māori non-Pacific non-Asian' when presenting total response ethnic groups. This allows the European/Other group to include all people who identified with these ethnic groups and means that a consistent approach is taken for presenting total response ethnic groups.
- Present crude rates in a table if readers require an indication of the unadjusted proportion of the different ethnic populations affected.
- Present standardised rate ratios (SRRs) for the comparison of the rates of each ethnic group with national New Zealand rates for males and females.
- Use the 'total New Zealand' population as the key reference group for SRRs, for publications with a total population focus (that is, for publications that do not focus on only one ethnic group).
- Use total response ethnicity for time-series comparisons of NZHM surveys when appropriate.
- The approach of 'ethnic group versus non-ethnic group' may be used for ethnic-specific analyses, such as in publications about specific ethnic groups.

- Regardless of the method used to present ethnicity, report clearly what analysis was carried out.

1 Introduction

Statistics New Zealand carried out a review of the measurement of ethnicity in 2004 (Statistics New Zealand 2004), as a result of which they recommended that the practice of using prioritised ethnicity be discontinued for the standard output of ethnicity data in official statistics. Current Ministry of Health (the Ministry) ethnicity data protocols still include prioritisation as a valid option for presenting ethnicity data (Ministry of Health 2004b). A review of ethnicity and data protocols for the health and disability sector is currently being carried out, following the Health Information Standards Organisation guidelines.

Public Health Intelligence (PHI), the epidemiology group of the Ministry, is responsible for monitoring the health of New Zealanders through the New Zealand Health Monitor (NZHM), a series of national surveys that includes the New Zealand Health Survey (NZHS). As part of this role, PHI publishes key survey results, which include results by ethnic group.

PHI reported results from the 2002/03 NZHS using prioritised ethnicity and, as a general rule, has used prioritised ethnicity for presenting most descriptive analyses in the past. Recently, the presentation of key results from the 2006/07 NZHS provided a useful opportunity to consider how PHI could present total response ethnicity for the outputs of the 2006/07 survey and subsequent PHI NZHM descriptive survey analyses.

This publication presents the findings of a study that examined the impact of using total response ethnicity rather than prioritised ethnicity when presenting key results from the 2002/03 NZHS. Using the results of this study and recommendations from Statistics New Zealand, this report provides further recommendations for the presentation of ethnicity data for future PHI publications of NZHM surveys. Researchers may also follow these recommendations if they wish.

Background

In New Zealand, the concepts of 'ethnicity' and 'ethnic groups' have been defined by the Statistical Standard for Ethnicity 2005 (Statistics New Zealand 2005a) as follows:

> Ethnicity is the ethnic group or groups that people identify with or feel they belong to. Ethnicity is a measure of cultural affiliation, as opposed to race, ancestry, nationality or citizenship. Ethnicity is self perceived and people can belong to more than one ethnic group.
>
> An ethnic group is made up of people who have some or all of the following characteristics:
>
> - a common proper name
> - one or more elements of common culture which need not be specified, but may include religion, customs, or language
> - a unique community of interests, feelings and actions
> - a shared sense of common origins or ancestry, and
> - a common geographic origin.

In the Census, ethnicity is self-defined, and people are able to identify with as many different ethnicities as they wish, which can result in people having multiple ethnicities. As a result, there are several options for presenting ethnicity data, which include using prioritised ethnic groups and total response ethnic groups.

Prioritised ethnic groups involve each person being allocated to a single ethnic group based on the ethnic groups they have identified with, which are, in order of priority: Māori, Pacific, Asian and European/Other (Ministry of Health 2004b). This means that if someone identifies as being Chinese and Māori, they are classified as Māori for the purpose of analysis.

Total response ethnic groups involve each person being allocated to all ethnic groups that they have identified with. This can result in overlapping groups, where some people can appear more than once (Ministry of Health 2004b). This means that if someone identifies as being Chinese and Māori, they are classified as both Asian and Māori for the purpose of analysis; in other words, they will appear in the rates for both the Māori population and the Asian population. Statistics New Zealand has recommended using total response ethnicity wherever possible (Statistics New Zealand 2005b).

Furthermore, Statistics New Zealand has recommended that the practice of using prioritised ethnicity be discontinued for the standard output of ethnicity data in official statistics (Statistics New Zealand 2004). There are several reasons for this recommendation. First, more people are identifying with multiple ethnicities. For example, in the 2001 Census, 9.0% of people identified with more than one ethnic group, and this increased to 10.4% in 2006 (Statistics New Zealand 2007). Therefore, it is considered that using prioritised ethnicity does not reflect the true reality of the ethnic make-up of the New Zealand population.

Using prioritised ethnic groups conceals some of the diversity and overlaps with ethnic groups and may possibly be seen as biasing data towards specific ethnic groups (Statistics New Zealand 2004). Additionally, ethnicity is self-defined, and a person will choose which ethnic group or groups that they identify with without being aware that prioritisation may mean they end up in a group that they would not consider their preferred ethnic group if asked to choose only one (Statistics New Zealand 2004).

PHI and the Ministry collect and/or disseminate a wide variety of datasets and analyses that include ethnicity data. These include survey data from NZHM surveys and administrative data from hospitalisation and mortality records. For administrative data, a review is currently being carried out to examine the standard practice of how ethnicity data is collected in the health sector.

For survey data collected as part of the NZHM, it is considered preferable that PHI be consistent with the Statistics New Zealand's recommended way for presenting ethnicity data, where feasible and appropriate. With an increase in the number of people reporting multiple ethnicities in the Census, there is also likely to be a higher percentage of 2006/07 NZHS respondents who identify with multiple ethnicities. Therefore, at the time that this study was carried out, it was timely to consider how total response ethnicity might be presented in the key results from the 2006/07 NZHS. This study was

carried out to assess the impact of using total response ethnicity when analysing the 2002/03 NZHS.

Overview of this report

The aims of this report were to:

- present the findings of a study investigating the impact of using total response ethnicity (compared to prioritised ethnicity) when analysing the 2002/03 NZHS
- discuss some of the methodological challenges in presenting results by total response ethnic groups
- make recommendations for best practice for PHI for presenting key descriptive results from the NZHM surveys.

It is hoped that this report will provide clarification for users of ethnicity data in NZHM surveys. In particular, this report provides background information about the decision to use total response ethnicity in the report *A Portrait of Health: Key results of the 2006/07 New Zealand Health Survey* (Ministry of Health 2008).

It should be noted that this study only focuses on the analysis of ethnicity data from NZHM surveys and not on ethnicity data from administrative data.

2 Data and Methods

2002/03 New Zealand Health Survey

This study analysed the 2002/03 NZHS. This was a national health survey, carried out between September 2002 and January 2004 (Ministry of Health 2004a). The survey involved face-to-face interviews (Computer Assisted Personal Interviews or CAPI) with 12,929 respondents aged 15 years and over. The survey involved increased sampling among Māori, Pacific and Asian peoples.

The 2002/03 NZHS covered questions about a wide variety of topics, including chronic disease, risk and protective factors, self-rated health, the use of health services and sociodemographic questions.

For more details about the survey methodology, please refer to the publication, *A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey* (Ministry of Health 2004a).

Ethnicity

In the 2002/03 NZHS, ethnicity was self-identified, and respondents were able to identify with all of the ethnicities that they felt they belonged to. The 2002/03 NZHS included the Statistic New Zealand's standard ethnicity question that was used in the 2001 Census, in order to maintain comparability with the Census.

The ethnicities were then grouped into the following ethnic groups:

- Māori
- Pacific peoples
- Asian people
- European/Other people.

The above ethnic groups are referred to as Level 0 ethnic groups. This classification has been defined by and is used by the Ministry (Ministry of Health 2004b). However, the Level 0 classification used in this report is not a current standard Statistics New Zealand classification and furthermore is not consistent with previous Statistics New Zealand classifications of Level 0.

Since the ethnicity question allows people to record more than one ethnicity, classifying people into ethnic groups may be done in a number of ways to take account of this complexity of multiple ethnicities. This study examined two main methods of presenting ethnicity data: using prioritised ethnic groups and total response ethnic groups.

Prioritised ethnic groups involve each person being allocated to a single ethnic group, based on the ethnicities they have identified with, in the prioritised order of Māori, Pacific, Asian and European/Other (Ministry of Health 2004b). For example, if someone identifies as being Chinese and Māori, under the prioritised ethnic group method, they are classified as Māori for the purpose of analysis. The way that the ethnicity data is

prioritised means that the group of prioritised European/Other effectively refers to non-Māori, non-Pacific, non-Asian people.

Total response ethnic groups involve each person being allocated to all ethnic groups that they have identified with. This can result in overlapping, where some people can appear in more than one group (Ministry of Health 2004b). For example, if someone identifies as being Chinese and Māori, under the total response ethnic group method, they are classified as both Asian and Māori for the purpose of analysis; in other words, they will appear in the rates for both the Māori population and the Asian population. The total European/Other group includes all people who identified with these ethnic groups.

It should be noted that regardless of which of the above methods is used, there is still a level of aggregation and/or prioritisation of ethnicity data. For example, Chinese respondents are included in the Asian group, and Samoan respondents are included in the Pacific group in both methods.

The method of single and combination ethnic groups (whereby multiple ethnic groups are given their own separate group) has not been examined in this study as the low numbers of respondents in many of the multiple ethnic groups would generally preclude robust and reliable analysis. However, the number of respondents in each single and combination ethnic group is presented in Appendix A, for interested readers.

Regardless of the method used to classify ethnic groups, careful statistical analysis should be carried out for any analysis of ethnic groups due to the complexity of ethnicity data.

Ethnicity in the 2002/03 New Zealand Health Survey

In the 2002/03 NZHS, almost 1 in 10 (9.5%, n = 1,234) of the 12,929 respondents reported multiple level 0 ethnicities (Table 1). Of these respondents who reported multiple ethnic groups, the majority reported having two level 0 ethnicities (n = 1190), although a small number of respondents reported having three (n = 40) or four (n = 4) ethnicities.

Table 1: Number of ethnic groups that respondents in the 2002/03 New Zealand Health Survey identified with

Number of Level 0 ethnic groups reported	Number of respondents	Percent (%)
0 (no response)	2	0.02
1	11,693	90.44
2	1,190	9.20
3	40	0.31
4	4	0.03
Total	12,929	100.0

Table 2 presents the numbers of respondents in each prioritised ethnic group and total response ethnic group in the 2002/03 NZHS. These results show that using total response ethnicity did not change the number of Māori respondents, as this ethnic group is the first ethnic group on the prioritisation list. However, all other ethnic groups were affected by prioritisation. Using total response ethnicity increased the number of respondents in the other three ethnic groups (Pacific, Asian and European/Other).

Table 2: Number of respondents in the 2002/03 New Zealand Health Survey, by prioritised ethnic groups and total response ethnic groups

Prioritised ethnic group	Prioritised count (%)	Total response ethnic group	Total response count (%)
Māori	4369 (33.8)	Māori	4369 (33.8)
Pacific	910 (7.0)	Pacific	998 (7.7)
Asian	1173 (9.1)	Asian	1218 (9.4)
European/Other	6477 (50.1)	European/Other	7624 (59.0)

A small number of respondents reported no ethnicity data (n = 2). These respondents were removed from the analysis of specific ethnic groups.

Health outcomes

The study examined the results of 10 selected health indicators from the 2002/03 NZHS to compare the rates for ethnic groups, using prioritised and total response ethnicity.

These health indicators included chronic diseases, risk and protective factors, and health service utilisation (Table 3). These health indicators were selected as illustrative examples for this study because they are key health indicators, representative of the main types of indicators collected in the NZHS and are current issues for the New Zealand population.

The definitions of these indicators are consistent with those used for the publication of the key survey results in *A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey* (Ministry of Health 2004a).

Table 3: Selected health outcomes used in this study, from the 2002/03 New Zealand Health Survey

Health outcome	Definition
Heart disease	Ever diagnosed with heart disease (ie, heart attack, angina, abnormal heart rhythm or heart failure)
Diabetes	Ever diagnosed with diabetes
High blood pressure	Ever been told by a doctor that they had high blood pressure
High blood cholesterol	Ever been told by a doctor that they had high cholesterol
Hazardous drinking	Scored 8 or more on the Alcohol Use Disorders Identification Test (AUDIT)
Adequate fruit intake	Ate two or more servings of fruit per day on average
Adequate vegetable intake	Ate three or more servings of vegetables per day on average

Regular physical activity	Had at least 30 minutes of physical activity per day on five or more days of the last week
Seen a GP in the last 12 months	Seen a general practitioner (GP) in the previous 12 months
Emergency department use in past 12 months	Visited a hospital emergency department in the past 12 months

Statistical methods

Survey weights

Survey weights were applied to all analyses in order to produce nationally representative estimates. For further information about the calculation of the survey weights, see *A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey* (Ministry of Health 2004a).

Age standardisation

Age standardisation was used to adjust for the differing age distributions of ethnic groups as age is an important determinant of health status and health risks. Therefore, when making comparisons between ethnic groups, the different age distributions of the ethnic groups must be taken into account. Age standardisation for these analyses was performed by the direct method, using the World Health Organization (WHO) world population as the standard population (Ahmad et al 2000).

95 percent confidence intervals

Ninety-five percent confidence intervals (95% CI) were calculated for all age-standardised rates, rate differences and rate ratios presented in this report. A 95% confidence interval represents the variance around a rate and indicates that there is a 95% probability that the true value of the estimate lies within the interval between the lower confidence interval value and the upper confidence interval value. The confidence interval is influenced by the sample size of the group; when the sample size is small, the confidence interval becomes wider.

Calculating 95% confidence intervals

All 95% confidence intervals calculated in this study were calculated with the Delete-A-Group Jackknife replication method, using 100 replicate groups (Kott 1998). This method was selected because it produces accurate and consistent variance estimates and is easy to apply.

The Delete-A-Group Jackknife method is used to estimate the variance of survey methods by first dividing the sample into G (in this case, 100) random groups. G subsamples are produced by deleting one group at a time from the full sample. Each subsample is then reweighted to the population, based on the same weighting estimation methodology as for the full sample. For each estimate (for example, rate), another G replicate estimate is calculated, using the G replicate weights. The variance of the full sample statistic is then estimated, using the variability among the G replicate estimates.

For more details on this method, see *A Portrait of Health: Key results of the 2002/03 New Zealand Health Survey* (Ministry of Health 2004a).

Comparing groups that are not independent

In this study of the 2002/03 NZHS, specific methods were used for analysing rate differences and rate ratios and their 95% confidence intervals to account for having ethnic groups that were not mutually exclusive.

It is difficult to compare groups that are not independent, that is, groups that include some people from other groups (for example, comparing total Māori with the total New Zealand population). In these situations, when the distance between two confidence intervals is reasonably large, the results are significantly different. However, when the two confidence intervals overlap, there may still be a statistically significant difference.

These comparisons can be done by calculating the difference between two rates or by using ratios. However, when calculating the confidence intervals for these, the co-variance between the two groups needs to be taken into account. The Delete-A-Group Jackknife method can be used to do this as this technique gives a good approximation for the variance between groups by summing up all the differences between two groups within a replicate sample. This process is straightforward when considering rates, however, for mean and median differences, it is more complex but can be done using a method outlined by Kish (1965).

When comparing data by ethnic group, it is also important to standardise for the different age structures within the different ethnic groups. For the NZHM surveys, the confidence intervals for age-standardised rates are calculated using the Delete-A-Group Jackknife method with 100 standardised replicate weights, which have been calculated for the whole dataset. However, when using total response ethnic groups, it is preferable to create age-standardised weights for each ethnic group separately, to account for people with multiple ethnicities. In this case, there should be 100 standardised replicate weights for each total response ethnic group that the data are analysed by.

The comparison method used in this study saw the creation of a dataset where every respondent was represented at least twice, once as part of the total New Zealand population and once for each of the ethnic groups that they identified with. Each respondent then had different standardised replicate weights for each of their ethnic groups, and for the total New Zealand population. This resulted in a dataset that has many more records than the number of respondents.

Table 4 presents an example of a dataset created using this method. In this example, respondent A (who identified with two ethnic groups) has three records in the dataset, one for the total New Zealand population (Total NZ), one for Māori and one for Asian. Standardised weights and replicate weights would be created for each of these records, and this dataset would then be used for all analyses.

Table 4: Example of template for standardised total response ethnic group dataset

Respondent	Total response ethnicity	Final standardised weight	Standardised replicate weight 1	Standardised replicate weight 2	Standardised replicate weight ... G
A	Total NZ				
A	Māori				
A	Asian				
B	Total NZ				
B	Pacific				

Analyses

Prevalence rates

Age-standardised rates were calculated for the selected health outcomes using 2002/03 NZHS data. These rates were calculated for the ethnic groups of Māori, Pacific, Asian and European/Other, first using prioritised ethnic groups and then using total response ethnic groups.

The following analyses investigated the impact of using total response ethnic groups as compared with prioritised ethnic groups, for these ethnic-specific rates of selected health outcomes.

Absolute differences in rates

The impact of using total response ethnicity was first assessed by examining the absolute differences between the age-standardised rates (that is, the 'rate differences'), calculated using prioritised and total response ethnic groups.

For each health indicator, the absolute rate differences between the age-standardised rates using prioritised ethnic groups and total response ethnic groups were calculated for each ethnic group.

The 95% confidence intervals for these rate differences were also calculated. If the confidence interval for the difference between the two estimates did not include 0, there was a statistically significant difference between the two estimates.

Relative differences in rates

A further analysis examined whether there were any relative differences in the rates when comparing each ethnic group with a comparison group, for prioritised and total response ethnic groups. This was carried out using rate ratios.

For each ethnic group, rate ratios were calculated for the relative differences between the rates for the prioritised ethnic group compared with the rates for the comparison group of European/Other. Rate ratios were then also calculated for the relative differences between the rates for the total response ethnic group compared with the

rates for the total New Zealand population (which included all respondents in the NZHS).

The rate ratios were calculated with 95% confidence intervals. If the confidence interval for the rate ratio did not include 1, the rate ratio was statistically significant.

These rate ratios were then compared to observe if there appeared to be any differences between the two rate ratios when using prioritised and total response ethnic groups.

Selecting a comparison group for rate ratios

When using rate ratios, there needed to be a consistent comparison group for the ethnic groups. Three possible comparison groups were considered for comparing the total response ethnic groups to:

1. a particular ethnic group or grouping of ethnicities (for example, total European/Other)
2. a non-overlapping residual group (for example, non-Māori, non-Pacific, non-Asian)
3. the total New Zealand population.

A *particular ethnic group or grouping of ethnicities* may still overlap with the other ethnic groups and may unduly indicate that that ethnic group has the 'ideal' or target level of health.

A *non-overlapping residual group* is not an ethnic group that people identify with and so should generally be avoided when analysing data for more than one ethnic group. However, it is appropriate for analysing specific differences between people who identify with a certain ethnicity and those who do not identify with that ethnicity (for example, Māori versus non-Māori) and may be used for analysing specific ethnic groups, for example, for publications such as the *Tatau Kahukura Māori Health Chart Book 2006* (Ministry of Health 2006b).

The *total New Zealand population* includes all ethnic groups, and is not seen as the 'ideal' but as an indication of the current level in New Zealand. This group is one that can easily be defined and people can relate to.

Based on these options, it was concluded that the total New Zealand population was the most appropriate for analyses that use the four ethnic groupings of Māori, Pacific, Asian and European/Other. It was concluded that the preferable way of clearly presenting ethnic group comparisons was to use standardised rate ratios (SRRs) of the age-standardised rate of a total response ethnic group (for example, Pacific) compared with the age-standardised rate of the total New Zealand population. The total New Zealand rate may be referred to as the national rate in a publication regarding New Zealand health information.

Definitions

Rates

The *rate* of a disease or indicator refers to the prevalence of this indicator within a defined population (for example, Māori) and a defined time period (for example, 2002/03).

Crude rates

A *crude rate* (or *unadjusted rate)* refers to a rate (see above) that has not been age standardised. A crude rate can be used to estimate the number of people affected in a population.

Age-standardised rates

Age-standardised rates are rates that have been adjusted to take account of differences in the age distribution between different groups (for example, different ethnic groups). The standard population used in this report is the WHO world population (Ahmad et al 2000).

Rate differences

Rate differences present the absolute difference between the size of the rate in one population group (for example, prioritised Pacific ethnicity group) and the rate of another (for example, total response Pacific ethnic group).

Standardised rate differences

A *standardised rate difference* is the rate difference of two age-standardised rates (for example, prioritised Pacific versus total response Pacific).

Rate ratios

Rate ratios present the relative difference between two rates. A *rate ratio* is the ratio of two rates (that is, Māori versus the total New Zealand population).

Standardised rate ratios

A *standardised rate ratio* (SRR) is the ratio of two age-standardised rates (for example, Māori versus the total New Zealand population).

Total New Zealand population

This refers to the total New Zealand population. In this analysis, this includes all respondents in the survey.

Prioritised ethnic groups

When using *prioritised ethnic groups*, each person is allocated to one ethnic group, based on the ethnic groups they identified with, in the prioritised order of: Māori, Pacific, Asian, European/Other.

Total response ethnic groups

When using *total response ethnic groups*, each person is allocated to all ethnic groups that they identified with (in this report, these ethnic groups are Māori, Pacific, Asian, European/Other).

Confidence intervals

Ninety-five percent confidence intervals are used in this report to represent the variance around a rate, a rate difference or a rate ratio. Ninety-five percent confidence intervals are presented in brackets after estimates in the text and as error bars in graphs.

A 95% confidence interval indicates that there is a 95% probability that the true value of the estimate lies within the interval between the lower confidence interval value and the upper confidence interval value.

Differences between rates are said to be statistically significant when the confidence intervals for each rate do not overlap or when a specific statistical test for the difference between two rates is performed.

A rate difference is said to be statistically significant when the confidence interval does not include the value 0.

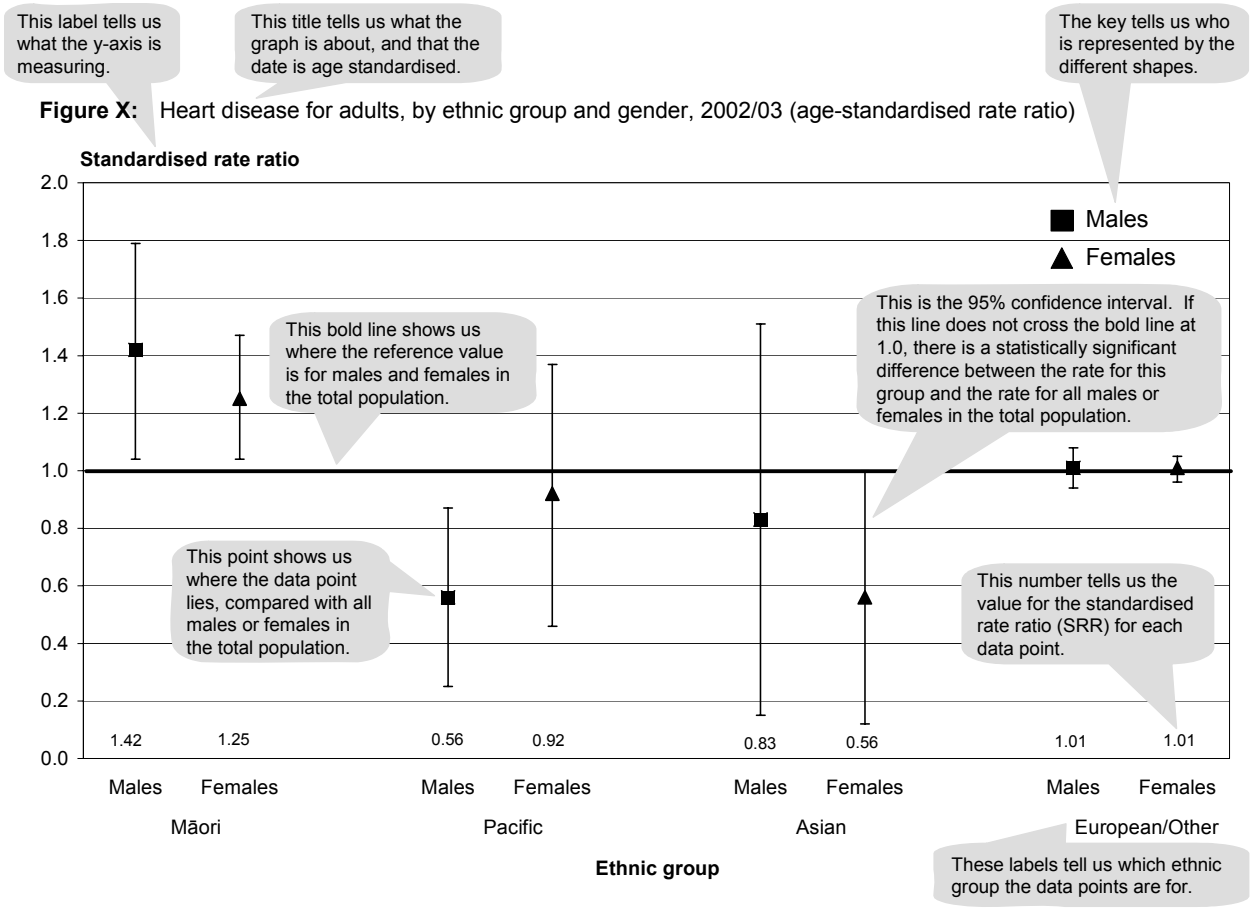
A rate ratio is said to indicate a statistically significant difference between the group of interest (for example, Asian) and the reference group (for example, the total New Zealand population) when the confidence interval does not include the value 1.

Terminology

Rate ratios can also be referred to as relative risk, risk ratio, prevalence ratio or incidence ratio (Webb et al 2005). Relative risk is a common term used to describe negative behaviours and health conditions in epidemiology. However, PHI presents positive behaviours as well as negative, and thus the word 'risk' is not always appropriate, as for example in the phrase 'the relative *risk* of having adequate vegetable intake is ...'. Previous PHI publications have used the term 'standardised rate ratio' (Blakely et al 2007; Ministry of Health 2006a).

For these reasons and to consistently use one term throughout a publication to reduce reader confusion, it is recommended that the term standardised rate ratio (SRR) be used.

Figure 1: Example of how to interpret standardised rate ratio graphs



Note: Age-standardised to the WHO world population. Reference group, with a rate ratio of 1.00 (indicated by the bold line) is the rate for the total male and female population aged 15 years and over. Total response standard output for ethnic groups has been used.

This note tells us essential information about the data, such as the standard population used in age standardisation, the reference group the rates are being compared with and what type of ethnic group has been used.

3 Investigating Differences between Prioritised and Total Response Rates

Absolute differences

Introduction

Using 2002/03 NZHS data, age-standardised rates were calculated for 10 selected health outcomes for the ethnic groups of: Māori, Pacific, Asian and European/Other, using both prioritised and total response ethnic groups.

To compare the absolute differences between these rates, the rate differences between the two estimates for each health outcome were calculated with 95% confidence intervals. If the confidence interval for the difference between the two estimates did not include 0, there was a statistically significant difference between the two estimates.

Tables 5–7 present these results, for each of the ethnic groups of: Pacific, Asian and European/Other. Each table shows the prevalence rates of the indicators using prioritised and total response ethnic groups, the differences between these rates, and whether or not each difference is significant.

The results for Māori have not been presented because the rates are the same for Māori using prioritised and total response ethnic groups. The ethnic group of Māori is first on the prioritisation list and is therefore not affected by prioritisation.

Pacific peoples

Overall, the only significant differences between the age-standardised rates for prioritised Pacific and total response Pacific were for the prevalence of heart disease and diabetes (Table 5). These indicated that using the total response Pacific ethnic group resulted in an age-standardised rate 0.6% lower for heart disease and 0.8% lower for diabetes.

Table 5: Prevalence of key health indicators in the 2002/03 New Zealand Health Survey, comparing prioritised Pacific with total response Pacific, age-standardised percent

Health indicator	Prevalence (95% CI)		Rate difference: total response–prioritised (95% CI)
	Prioritised Pacific	Total response Pacific	
Heart disease	7.0 (4.2–9.7)	6.4 (3.9–8.9)	-0.6 (-0.9–-0.2)#
Diabetes	10.1 (7.0–13.2)	9.3 (6.5–12.1)	-0.8 (-1.2–-0.4)#
High blood pressure	17.3 (13.5–21.1)	16.7 (13.0–20.3)	-0.6 (-1.5–0.3)
High blood cholesterol	10.3 (7.5–13.1)	9.8 (7.3–12.4)	-0.5 (-1.2–0.3)
Hazardous drinking	18.6 (13.7–23.5)	19.6 (15.2–24.1)	1.0 (-0.6–2.6)
Adequate fruit intake	55.6 (50.2–61.0)	55.0 (49.7–60.3)	-0.7 (-2.6–1.3)
Adequate vegetable intake	41.1 (35.1–47.0)	42.6 (37.2–47.9)	1.5 (-0.6–3.6)
Regular physical activity	47.7 (41.2–54.1)	48.8 (42.5–55.0)	1.1 (-0.9–3.1)
Seen a GP in past 12 months	79.6 (75.3–84.0)	80.3 (76.2–84.4)	0.6 (-0.4–1.7)
Emergency department use in past 12 months	4.9 (3.1–6.8)	5.4 (3.5–7.3)	0.5 (-0.4–1.3)

Notes: Age standardised to the WHO world population. # indicates that the rate difference is significant.

Asian peoples

The differences between the prioritised and total response Asian ethnic groups were very small (Table 6). The rate for adequate vegetable intake was slightly lower for the total response Asian ethnic group than for the prioritised Asian ethnic group, while this pattern was reversed for the health indicators of being regularly physically active and having seen a GP in the past 12 months.

Table 6: Prevalence of key health indicators in the 2002/03 New Zealand Health Survey, comparing prioritised Asian with total response Asian, age-standardised percent

Health indicator	Prevalence (95% CI)		Rate difference: total response– prioritised (95% CI)
	Prioritised Asian	Total response Asian	
Heart disease	6.2 (2.5–9.9)	6.2 (2.6–9.8)	-0.1 (-0.2–0.1)
Diabetes	8.4 (5.1–11.8)	8.3 (5.1–11.6)	-0.1 (-0.3–0.1)
High blood pressure	13.7 (10.2–17.3)	13.6 (10.2–17.1)	-0.1 (-0.4–0.2)
High blood cholesterol	12.8 (9.4–16.3)	12.7 (9.3–16.1)	-0.1 (-0.4–0.2)
Hazardous drinking	3.9 (1.9–5.9)	4.1 (2.1–6.0)	0.2 (-0.1–0.5)
Adequate fruit intake	57.3 (52.2–62.3)	57.3 (52.2–62.3)	0.0 (-0.5–0.5)
Adequate vegetable intake	46.4 (40.0–52.8)	46.0 (39.7–52.2)	-0.4 (-1.1–0.3)
Regular physical activity	38.5 (33.9–43.2)	39.0 (34.5–43.6)	0.5 (-0.2–1.2)
Seen a GP in past 12 months	69.2 (65.2–73.3)	69.6 (65.7–73.6)	0.4 (-0.1–0.9)
Emergency department use in past 12 months	2.0 (1.0–2.9)	1.9 (1.0–2.9)	-0.0 (-0.1–0.1)

Notes: Age-standardised to the WHO world population. # indicates the rate difference is significant.

European/Other

The differences in the rates calculated using prioritised European/Other and total response European/Other ethnic groups are presented in Table 7. These results show that prioritised European/Other had very similar results to the total European/Other group, with no significant differences between rates.

Table 7: Prevalence of key health indicators in the 2002/03 New Zealand Health Survey, comparing prioritised European/Other (non-Māori/Pacific/Asian) with total response European/Other, age-standardised percent

Health indicator	Prevalence (95% CI)		Rate difference: total response–prioritised (95% CI)
	Prioritised European/Other (non-MPA)	Total response European/Other	
Heart disease	8.9 (8.2–9.7)	9.1 (8.3–9.8)	0.1 (-0.1–0.4)
Diabetes	2.9 (2.4–3.4)	3.0 (2.5–3.4)	0.1 (-0.0–0.2)
High blood pressure	18.4 (17.4–19.4)	18.4 (17.5–19.3)	0.0 (-0.2–0.2)
High blood cholesterol	13.9 (13.1–14.7)	13.9 (13.1–14.6)	0.0 (-0.3–0.2)
Hazardous drinking	19.2 (17.6–20.7)	19.3 (17.8–20.8)	0.2 (-0.1–0.4)
Adequate fruit intake	54.6 (53.0–56.2)	54.4 (52.8–55.9)	-0.2 (-0.5–0.1)
Adequate vegetable intake	70.6 (68.6–72.7)	70.5 (68.6–72.5)	-0.1 (-0.4–0.2)
Regular physical activity	53.4 (51.7–55.2)	53.4 (51.8–55.1)	0.0 (-0.3–0.4)
Seen a GP in past 12 months	82.4 (81.2–83.7)	82.3 (81.1–83.4)	-0.2 (-0.4–0.0)
Emergency department use in past 12 months	8.4 (7.4–9.4)	8.5 (7.5–9.4)	0.0 (-0.1–0.2)

Notes: Age-standardised to the WHO world population. # indicates the rate difference is significant.

Relative differences

Introduction

For each ethnic group, rate ratios were calculated between the age-standardised rates for each health indicator, for (a) the prioritised ethnic group compared with prioritised European/Other, and (b) the total response ethnic group compared to the total New Zealand population. The rate ratios were calculated with 95% confidence intervals. If the confidence interval for the rate ratio did not include 1, the rate ratio was statistically significant.

These rate ratios were then compared to observe if there were differences when total response ethnic groups were used, as compared with when prioritised ethnic groups were used. Tables 8–11 present these results, for each of the ethnic groups of: Māori, Pacific, Asian and European/Other. Each table shows the rate ratio between the prioritised ethnic group and prioritised European/Other, and the rate ratio between the total response ethnic group and the total New Zealand population.

Māori

Table 8 shows that there were generally very similar SRRs between Māori and the prioritised European/Other, as between Māori and the national rate (the total New Zealand population), for the health outcomes listed.

One exception was for the health indicator of diabetes. When adjusting for age, Māori were 2.75 times (confidence interval: 2.08–3.42) more likely to have diabetes than prioritised European/Other. By comparison, when using total response ethnicity, this rate ratio decreased so that Māori were 1.94 times (CI: 1.59–2.30) more likely to have diabetes compared with the total New Zealand population.

There was a smaller difference in the rate ratios for the use of emergency departments in the past 12 months, between Māori and prioritised European/Other (SRR: 0.91, CI: 0.71–1.12) and between Māori and the total New Zealand population (SRR: 0.98, CI: 0.78–1.18).

While the rate ratio for adequate vegetable intake between Māori and prioritised European/Other was very similar to that between Māori and the total New Zealand population; only the former was statistically significant. For all other analyses, the rate ratios were either both statistically significant or both not statistically significant.

Table 8: Standardised rate ratios for the prevalence of key health indicators, for prioritised Māori versus prioritised European/Other, and for total response Māori versus total New Zealand population, 2002/03

Health indicator	Standardised rate ratio (95% CI)	
	Prioritised Māori versus prioritised European/Other	**Total response Māori versus total NZ population**
Heart disease	1.34 (1.10–1.59)#	1.33 (1.14–1.53)#
Diabetes	2.75 (2.08–3.42)#	1.94 (1.59–2.30)#
High blood pressure	1.29 (1.13–1.46)#	1.28 (1.14–1.41)#
High blood cholesterol	0.99 (0.83–1.16)	1.01 (0.86–1.16)
Hazardous drinking	1.35 (1.17–1.54)#	1.37 (1.21–1.53)#
Adequate fruit intake	0.85 (0.78–0.92)#	0.86 (0.80–0.92)#
Adequate vegetable intake	0.93 (0.87–0.99)#	0.97 (0.92–1.03)
Regular physical activity	1.03 (0.96–1.11)	1.05 (0.98–1.12)
Seen a GP in past 12 months	0.92 (0.88–0.95)#	0.94 (0.91–0.97)#
Emergency department use in past 12 months	0.91 (0.70–1.12)	0.98 (0.78–1.18)

Notes: Age standardised to the WHO world population. # indicates the rate ratio is significant.

Pacific peoples

Table 9 shows that the SRRs for prioritised Pacific versus prioritised European/Other were very similar to those for total response Pacific versus the total New Zealand population for the listed health outcomes. The most noticeable difference was that the rate ratio for diabetes was lower using total response ethnicity, as compared with the rate ratio using prioritised ethnicity.

Table 9: Standardised rate ratios for the prevalence of key health indicators, for prioritised Pacific versus prioritised European/Other, and for total response Pacific versus the total New Zealand population, 2002/03

Health indicator	Standardised rate ratio (95% CI)	
	Prioritised Pacific versus prioritised European/Other	**Total response Pacific versus total NZ**
Heart disease	0.78 (0.47–1.09)	0.73 (0.46–1.01)
Diabetes	3.47 (2.24–4.70)#	2.38 (1.68–3.08)#
High blood pressure	0.94 (0.73–1.15)	0.93 (0.72–1.14)
High blood cholesterol	0.74 (0.54–0.95)#	0.75 (0.55–0.95)#
Hazardous drinking	0.97 (0.72–1.23)	1.00 (0.78–1.23)
Adequate fruit intake	1.02 (0.92–1.12)	1.03 (0.93–1.12)
Adequate vegetable intake	0.58 (0.50–0.67)#	0.63 (0.56–0.71)#
Regular physical activity	0.89 (0.77–1.02)	0.92 (0.80–1.04)
Seen a GP in past 12 months	0.97 (0.91–1.02)	1.00 (0.95–1.05)
Emergency department use in past 12 months	0.59 (0.34–0.83)#	0.68 (0.43–0.92)#

Notes: Age standardised to the WHO world population. # indicates the rate ratio is significant.

Asian peoples

The only noticeable difference in the SRRs for Asian peoples was for the health indicator of diabetes (Table 10). For diabetes, the rate ratio was lower for total response Asian versus the total New Zealand population, compared with the rate ratio of prioritised Asian versus prioritised European/other. For the other health indicators, the rate ratios were very similar.

Table 10: Standardised rate ratios for the prevalence of key health indicators, for prioritised Asian versus prioritised European/Other, and for total response Asian versus the total New Zealand population, 2002/03

Health indicator	Standardised rate ratio (95% CI)	
	Prioritised Asian versus prioritised European/Other	Total response Asian versus total NZ
Heart disease	0.70 (0.28–1.12)	0.69 (0.30–1.08)
Diabetes	2.90 (1.69–4.11)#	2.05 (1.33–2.76)#
High blood pressure	0.75 (0.54–0.95)#	0.74 (0.55–0.93)#
High blood cholesterol	0.92 (0.68–1.17)	0.95 (0.71–1.18)
Hazardous drinking	0.20 (0.10–0.31)#	0.21 (0.11–0.32)#
Adequate fruit intake	1.05 (0.96–1.14)	1.06 (0.98–1.15)
Adequate vegetable intake	0.66 (0.56–0.75)#	0.69 (0.59–0.78)#
Regular physical activity	0.72 (0.63–0.81)#	0.75 (0.66–0.83)#
Seen a GP in past 12 months	0.84 (0.79–0.89)#	0.86 (0.82–0.91)#
Emergency department use in past 12 months	0.23 (0.12–0.35)#	0.25 (0.13–0.37)#

Notes: Age standardised to the WHO world population. # indicates the rate ratio is significant.

European/Other

From Table 11, it can be seen that total European/Other had a significantly lower rate of diabetes than the national rate (total New Zealand population) when adjusting for age.

In comparison, total European/Other had a slightly higher rate of use of emergency departments in the past 12 months and were slightly more likely to have adequate vegetable intake, compared with the total New Zealand population. Other rate ratios were either marginally statistically significant or not significant.

Table 11: Standardised rate ratios for the prevalence of key health indicators, for total response European/Other versus the total New Zealand population, 2002/03

Health indicator	Standardised rate ratio (95% CI)
	Total response European/other versus total NZ
Heart disease	1.01 (0.96–1.05)
Diabetes	0.72 (0.65–0.79)#
High blood pressure	0.98 (0.96–1.01)
High blood cholesterol	1.02 (0.99–1.04)
Hazardous drinking	1.02 (1.00–1.04)#
Adequate fruit intake	1.01 (1.00–1.02)
Adequate vegetable intake	1.05 (1.04–1.06)#
Regular physical activity	1.02 (1.01–1.03)#
Seen a GP in past 12 months	1.02 (1.01–1.02)#
Emergency department use in past 12 months	1.08 (1.05–1.11)#

Notes: Age standardised to the WHO world population. # indicates the rate ratio is significant.

4 Presenting Ethnicity Results

This section gives some examples of how ethnicity data may be presented for descriptive analyses of NZHM surveys.

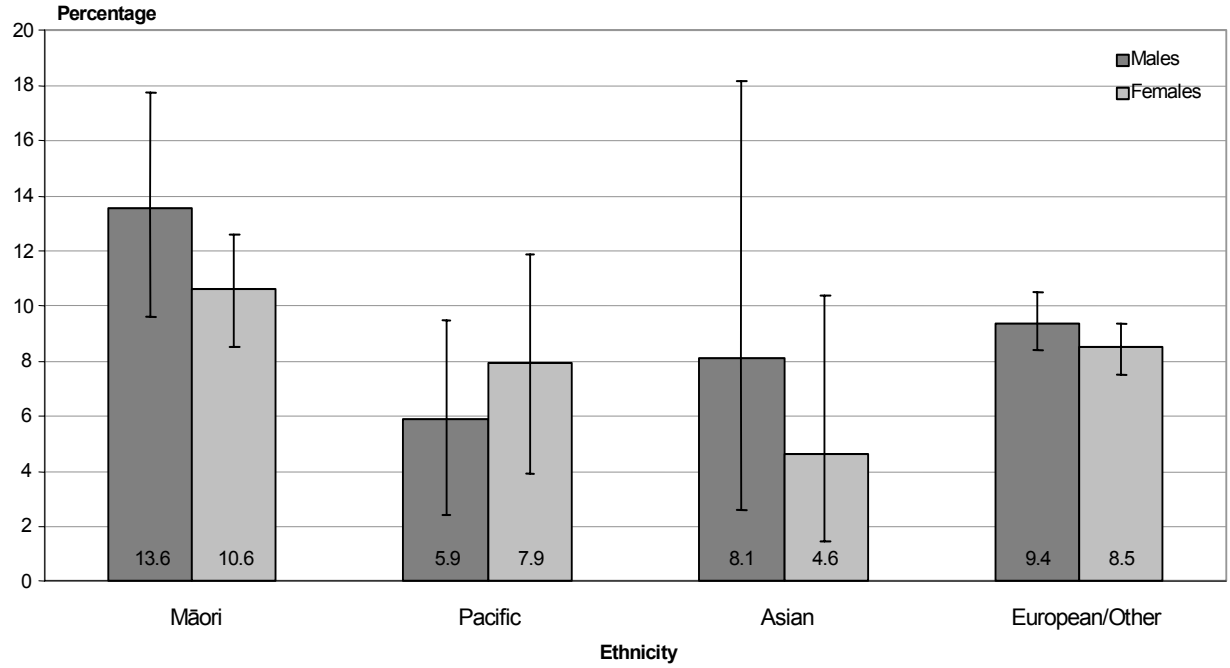
These examples present the prevalence of diagnosed heart disease using 2002/03 NZHS data.

The first example (Figure 2) shows how results for prioritised ethnic groups have often been presented in the past. The second example (Table 12 and Figure 3) shows one possible way of presenting descriptive survey results using total response ethnicity.

Example of how to present results for prioritised ethnic groups

Figure 2 shows that Māori males had a significantly higher prevalence of heart disease than Pacific males, when adjusting for age.

Figure 2: Prevalence of heart disease, by ethnic group, percent (age-standardised), 2002/03



Notes: Age standardised to WHO world population. Prioritised ethnic groups have been used.

Example of how to present results for total response ethnic groups

Table 12 presents an indication of the burden of heart disease in New Zealand's main ethnic population groups.

These results show that approximately 1 in 10 Māori adults had been diagnosed with heart disease.

Table 12: Heart disease for adults, by ethnic group and gender, 2002/03 (unadjusted prevalence)

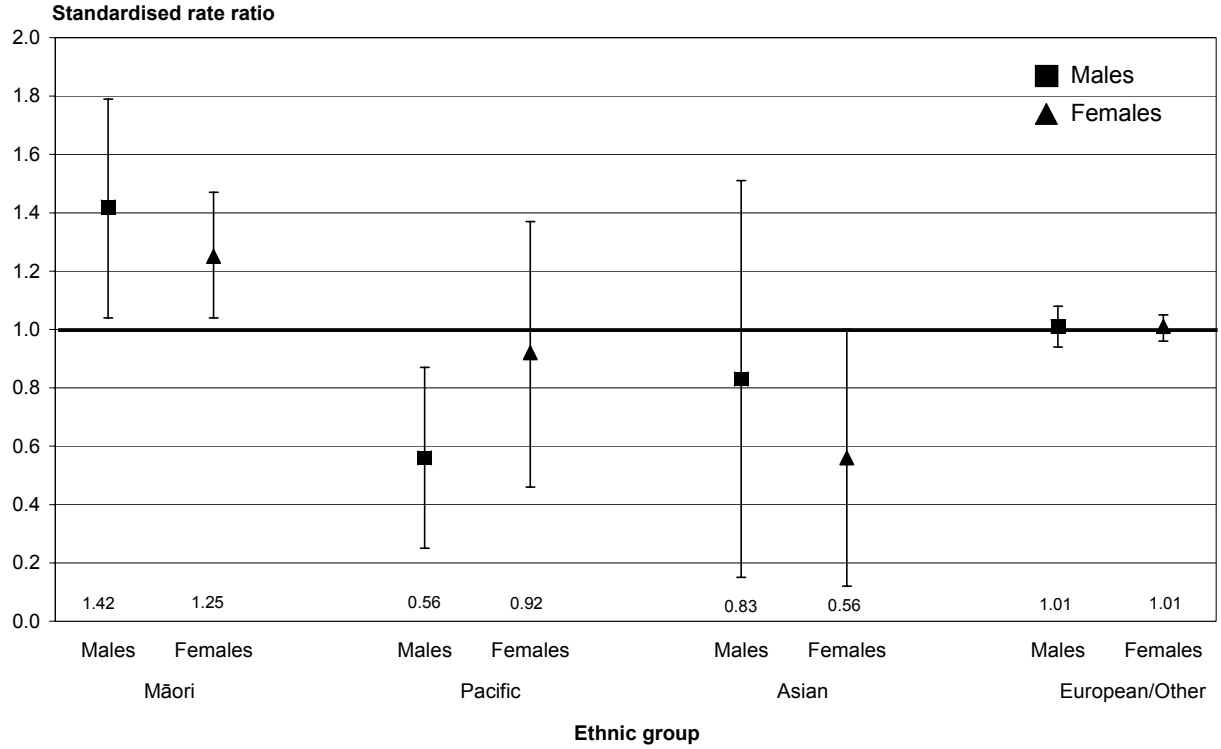
Ethnic group	Gender	Prevalence (95% CI)
Māori	Males	10.8 (7.1–14.4)
	Females	7.8 (6.3–9.4)
	Total	9.2 (7.5–10.9)
Pacific	Males	3.9 (1.6–6.2)
	Females	5.8 (2.7–8.9)
	Total	4.9 (2.9–6.8)
Asian	Males	4.9 (1.7–10.5)
	Females	2.6 (1.0–5.6)
	Total	3.6 (1.6–5.7)
European/Other	Males	11.7 (10.6–12.8)
	Females	10.7 (9.7–11.8)
	Total	11.2 (10.4–12.0)

Source: 2002/03 NZHS

Note: Total response standard output for ethnic groups have been used.

After adjusting for age, the results show that Māori men were 40% more likely to have heart disease than men in the total population (Figure 3), while Pacific men were significantly less likely to have heart disease (SRR: 0.56, 0.25–0.87). Compared with women in the total population, Māori women were also more likely to have heart disease.

Figure 3: Heart disease for adults, by ethnic group and gender, 2002/03 (age-standardised rate ratio)



Notes: Age standardised to the WHO world population. Reference group, with a rate ratio of 1.00 (indicated by the bold line) is the rate for the total male and female population aged 15 years and over. Total response standard output for ethnic groups has been used.

Notes for presenting total response ethnic groups

Notes about the table

The table in the example (Table 12) presents the crude (unadjusted) prevalence estimates by total response ethnic group and gender.

This table can be useful if readers require an indication of the unadjusted proportion of the different ethnic populations affected by the health indicator. In some cases, it may be useful and relevant to include another column presenting the population count estimates (and possibly the 95% confidence intervals).

Notes about the figure

The example figure (Figure 3) shows the SRRs, which give a comparison of the rates for each ethnic group (by gender) compared with the national rate for each gender.

These rate ratios are age-standardised to take into account the different age structures of the population groups.

Interpreting rate ratio graphs

The following are key points for how to interpret a rate ratio graph:

- A SRR greater than 1 (for example, Māori males) indicates that this group has a higher rate than the national rate for that gender.
- A SRR less than 1 (for example, Pacific males) indicates that this group has a lower rate than the national rate for that gender.
- If the 95% confidence interval does not cross the value 1 (for example, Māori males), then there is a significant difference between the rate for this group and the national rate for the gender.
- The information presented in the example should not be used to compare the rate of one ethnic group (for example, Māori males) with the rate of another ethnic group (for example, Pacific males).

Using rate ratio graphs in publications

In publications, using SRR graphs may be generally preferable to presenting the age-standardised rates themselves. The age-standardised rates are not a true representation of the number of people in the New Zealand population affected because the WHO world population is used for age standardisation. As a result, the age-standardised rates may possibly confuse readers if the crude rates are presented elsewhere.

When the rate ratios have been graphed, it is preferable to then comment on how each ethnic group compares to the comparison group. It is also recommended that publications presenting SRR graphs also include an example showing how to interpret these types of graphs (such as the example on page 13 in this publication).

In this example, results have been presented by ethnic group and gender. However, when a gender-specific analysis is not required, 'total New Zealand population' will refer to the total population (males and females combined).

5 Discussion

Key results

The results from this study show that the differences in prevalence estimates using prioritised and total response ethnic groups were generally not statistically significant.

When examining the absolute differences between the rates calculated using prioritised and total response ethnic groups, the rates were very similar, particularly for Asian and European/Other. For Pacific, using the total response ethnic groups resulted in significantly lower prevalence estimates for 2 of the 10 indicators (heart disease and diabetes) compared with when the prioritised ethnic groups were used. While using the total response Pacific ethnic group led to changes in the prevalence for other indicators of generally between 0.1–1.0%, none of these changes were significantly different from the prevalence using the prioritised Pacific ethnic group.

The analysis of the relative differences between rates also showed very few significant differences. In general, the rate ratio between each prioritised ethnic group and prioritised European/Other was very similar to the rate ratio between each total response ethnic group and the total New Zealand population. The most noticeable difference was for the health indicator of diabetes. In this analysis, the rate ratio decreased when using the total response ethnic group, for Māori, Pacific and Asian peoples compared with the rate ratios using prioritised ethnicity. However, the rate ratios were still significantly different from the comparison group in both the prioritised and total response ethnicity analyses.

Discussion

These results indicate that comparisons using total response ethnicity are similar to comparisons using prioritised ethnicity. Given the findings of this study, it was decided to present the results of the 2006/07 NZHS using total response ethnic groups, according to the example given in this report.

This way of presenting the results ensures that total response ethnicity is being used, as recommended by Statistics New Zealand. This allows respondents to be recorded for all ethnic groups that they identified with, not just one ethnic group determined through prioritisation. An added advantage of using total response ethnicity is that it increases the sample sizes for ethnic groups, and in particular Pacific and Asian peoples, leading to more statistical power in analyses.

Using a SRR graph to present ethnicity data also allows comparisons to be made between total response ethnic groups and the total New Zealand population, while adjusting for the different age structures of different population groups. It is recommended that if a publication includes these types of graphs, it should also include, for readers to refer to, an example of how to interpret such graphs.

Ethnic-specific comparisons

Comparisons between people who identify with an ethnic group (for example, Māori) and either (i) those who do not identify with this ethnic group (for example, non-Māori) or (ii) the total New Zealand population will not be affected by the change to total response ethnicity.

Presentation of ethnic-specific results using the above types of ethnic comparisons may be used in relevant analyses of NZHM surveys. Examples of these include ethnic-specific analyses, for example for publications such as *Tatau Kahukura Māori Health Chart Book 2006* (Ministry of Health 2006b).

Comparisons across time

When comparing results for ethnic groups for more than one survey, there are several key issues to consider.

The main issue with time-trend analyses is that results using prioritised ethnic groups should not be compared with results using total response ethnic groups. Rather, it is generally best to use total response ethnic groups for the comparison. This may involve re-analysing survey data so that the same consistent method of analysing ethnicity is used in both surveys. Another option is to compare specific ethnic groups (for example, Māori) over time, as these are not affected by the change from prioritised to total response ethnic groups.

The second issue when looking at time-trend analyses is that of whether there are sufficient sample sizes in the ethnic groups to allow reliable comparisons over time. Ideally, time-series comparisons of the NZHM surveys would be carried out for all ethnic groups using total response ethnicity. However, the sampled Asian and Pacific populations were generally small for the older surveys. This can lead to large confidence intervals for estimates, and therefore difficulty in detecting any changes over time. As a result, comparisons over time for some variables and some ethnic groups may not be useful or practical.

As a third point, when comparing NZHM surveys over time, there is the issue of the use of different benchmark populations to calculate survey weights. The benchmark population used for the 1996/97 and 2002/03 NZHSs was prioritised ethnicity. However, this was not truly representative of the population; for example, respondents who identified with both Māori and Pacific ethnicities were weighted in the Māori population (rather than both Māori and Pacific). Similarly, respondents in the total European/Other group who recorded other ethnicities were categorised into these other ethnic groups, resulting in a lower sample size in the prioritised count as compared with the total response count for European/Other.

While the 1996/97 and 2002/03 NZHSs were benchmarked to the prioritised ethnic population, the 2006/07 NZHS was benchmarked to the total ethnicity population. It is difficult to quantify how the use of two different benchmark populations would affect the results. However, it is thought that the effect of different ethnicity benchmark populations will be very small or will have no effect. Therefore, it is considered that the analysis of the survey should not be restricted to the grouping that was used in the survey weighting.

Recommendations for best practice

The following are recommendations for the presentation of key descriptive results of NZHM surveys. They are intended primarily for PHI, although other researchers may also wish to follow them. Furthermore, they are intended as guidelines only and should be interpreted and applied by PHI and researchers as appropriate.

- Consider the data, the sampling method and the purpose of the analysis before deciding on a method and comparison group to use.
- Use total response ethnic groups to present key results of NZHM surveys where possible. Using total response ethnic groups increases the sample sizes for Pacific and Asian ethnic groups as total numbers are used.
- Use the category of 'total European/Other' rather than the category of 'non-Māori non-Pacific non-Asian' when presenting total response ethnic groups. This allows the European/Other group to include all people who identified with these ethnic groups and means that a consistent approach is taken for presenting total response ethnic groups.
- Present crude rates in a table if readers require an indication of the unadjusted proportion of the different ethnic populations affected.
- Present standardised rate ratios (SRRs) for the comparison of the rates of each ethnic group with national New Zealand rates.
- Use the 'total New Zealand' population as the key reference group for SRRs, for publications with a total population focus (that is, for publications that do not focus on only one ethnic group).
- Use total response ethnicity for time-series comparisons of NZHM surveys when appropriate.
- The approach of 'ethnic group versus non-ethnic group' may be used for ethnic-specific analyses, such as in publications on specific ethnic groups.
- Regardless of the method used to present ethnicity, report clearly what analysis was carried out.

Limitations of this study

This report has only examined the use of total response ethnicity for the descriptive analysis of sample surveys in the NZHM. There are other issues that were not within the scope of this report, which could be investigated in more detail at a later date.

First, this report has not made any recommendations for the use of ethnicity data in more sophisticated analysis of survey data, such as regression analysis. In these types

of analyses, it may be more difficult to use total response ethnicity, and the analysis of ethnicity data may require a different approach.

Furthermore, this report does not address how to present ethnicity data from administrative data, such as hospitalisation data. These datasets often collect ethnicity data in a different way from how it is collected in the Census and in the NZHM surveys, and this can impact on how the data is presented. An example of how this has been done may be seen in *Tracking Disparity: Trends in ethnic and socioeconomic inequalities in mortality, 1981–2004* (Blakely et al 2007).

This report has not looked at using single and combination groups (for example, Māori only, Pacific only, Māori and Pacific, etc) because the number of respondents would be too small in many of these groups to allow robust analysis.

It has been previously noted that self-identification with multiple ethnic groups is higher amongst children and youth (see for example, Callister et al 2007). This may mean that the results from this study cannot be generalised to surveys for specific age groups, such as youth surveys. Furthermore, people may change affiliations over time and may increase or decrease their number of affiliations to ethnic groups.

It is also important to note that, regardless of whether prioritised or total response ethnic groups are used, the Pacific and Asian groups contain diverse ethnicities that have been aggregated for reporting purposes. Examining the diversity within these groups may be possible in some cases where sample sizes are sufficient, such as in the *Asian Health Chart Book 2006* (Ministry of Health 2006a).

Conclusion

One of the main aims of this study was to investigate the impact of using total response ethnic groups for the analysis of the 2002/03 NZHS. This followed from Statistics New Zealand's recommendations of no longer using prioritised ethnicity for standard output from official statistics (Statistics New Zealand 2004).

This study found that there was very little difference in results when using prioritised or total response ethnic groups to analyse the 2002/03 NZHS. In particular, there were generally no statistically significant differences (either absolute or relative differences) in the age-standardised prevalences of the selected health outcomes, using prioritised ethnic groups, as compared with total response ethnic groups.

These findings suggest that there is not likely to be a major impact of using total response ethnic groups to present the key descriptive findings of the NZHS. As a result of this study, it was decided to present the key findings from the 2006/07 NZHS using total response ethnic groups. In particular, it was decided that the presentation of ethnicity results should include the presentation of crude rates and numbers and SRR graphs to show differences in rates between ethnic groups and the total New Zealand population. To view this output, see *A Portrait of Health: Key results of the 2006/07 New Zealand Health Survey* (Ministry of Health 2008).

It should be noted that these results only apply to NZHM surveys. Ongoing work will need to investigate the feasibility and impact of presenting other types of health information (such as hospitalisation data) using total response ethnic groups.

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Appendix A

Table A1: Number of respondents in the 2002/03 New Zealand Health Survey, by single and combination ethnic groups

Single and combination ethnic groups	Prioritised ethnic group	Number of respondents	Unweighted percent (%)	Weighted percent (%)
European/Other only	European/Other	6475	50.08	78.74
Māori only	Māori	3241	25.07	6.77
Pacific only	Pacific	827	6.40	4.02
Asian only	Asian	1150	8.89	5.85
European/Other and Māori	Māori	1021	7.90	3.60
European/Other and Pacific	Pacific	65	0.50	0.27
European/Other and Asian	Asian	23	0.18	0.14
Māori and Pacific	Māori	58	0.45	0.35
Pacific and Asian	Pacific	14	0.11	0.10
Māori and Asian	Māori	9	0.07	0.02
European/Other, Māori and Pacific	Māori	22	0.17	0.10
European/Other, Māori and Asian	Māori	10	0.08	0.03
European/Other, Pacific and Asian	Pacific	4	0.03	0.01
Māori, Pacific and Asian	Māori	4	0.03	0.00
European/Other, Māori, Pacific and Asian	Māori	4	0.03	0.01
None	None	2	0.02	0.00

Notes: The unweighted percent presents the percentage of survey respondents who were in each ethnic group. The weighted percent presents the estimated percentage of the total population aged 15 years and over who were in each ethnic group. The percentage columns do not total to 100% exactly due to rounding.