



ISSUES IN
MONITORING
MĀORI HEALTH
AND ETHNIC
DISPARITIES:
AN UPDATE

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Opinions expressed in this report are those of the authors only and do not necessarily reflect policy advice provided by the Ministry of Health, nor represent the views of the peer reviewers or the University of Otago.

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INTRODUCTION

Ethnicity data is essential to the measurement and monitoring of Māori health and disparities in health status, experiences, and outcomes over time in Aotearoa/New Zealand. In 2000, the paper *Counting for nothing* reviewed issues surrounding the quality of ethnicity data and its impact on measuring health disparities between Māori and non-Māori in the 1990s (Te Rōpū Rangahau Hauora a Eru Pōmare 2000). Similarly, the 2001 report *Monitoring ethnic inequalities* outlined challenges in relation to monitoring Māori health and disparities over time (Public Health Intelligence 2001). Many of these issues and challenges are ongoing.

This discussion paper is one in a series of topic-based discussion papers considering key current and future issues in ethnicity data, and the potential implications of these for the Māori health sector. Key issues include changes within the broader context of official ethnicity data policies and practices in Aotearoa/New Zealand; developments in approaches to collecting and analysing ethnicity data in the health sector; and the intersection of ethnicity with other concepts including nationality, 'race', ancestry and genes.

This paper will update a number of issues previously canvassed in relation to the monitoring of Māori health and ethnic inequalities in health over time. More specifically, it will include consideration of the impact of changes to the Statistics New Zealand statistical standard for ethnicity, particularly in terms of the definition of ethnicity, the census ethnicity question, the official classification system, and the standard outputs produced. It will also examine issues that arise in monitoring Māori health and ethnic inequalities as a result of changes to the quality and completeness of ethnicity data over time. Discussion regarding some methods that have been employed to improve Māori health estimates within the limitations of current datasets will also be presented.

For the purposes of this discussion, the focus will be on routinely collected data that is used to generate information about Māori health and inequalities and, in particular, official data sources and data that are used to calculate population rates. However, many of the issues discussed will have relevance for other forms of data collection and research, such as surveys, and longitudinal and cohort studies.

BACKGROUND

Previous work has identified challenges in the monitoring of Māori health and ethnic inequalities over time in Aotearoa/New Zealand. Changes to the collection of ethnicity data in the population census and other key datasets have had a significant impact on ethnic group denominator data (TRRHAEP 2000; PHI 2001). In addition to this, issues have been identified with numerator data, in terms of completeness of data, undercounting of Māori in datasets, and inconsistencies between numerator and denominator data collection approaches (TRRHAEP 2000; PHI 2001)¹

NUMERATORS AND DENOMINATORS

Numerators and denominators are important in calculating rates of health events and outcomes. The denominator is the population of interest (for example, the Maori ethnic group), while the numerator is the variable or outcome of interest (for example, the number of new cases of an illness or the number of admissions to hospital) at a particular time or for a particular time period (TRRHAEP 2000).

Population rates are calculated by dividing the numerator (the number of events in a specified time period) by the denominator (the population of interest for the corresponding time period).

There is strong rationale supporting the need to measure and monitor Māori health and ethnic disparities in health in Aotearoa/New Zealand over time. The ability to produce time trends is important

as it allows examination of how Māori health status and outcomes are changing, and whether disparities are increasing, remaining stable, or reducing.

Time trends also provide Māori with a depth and detail of information that is critical in the design, development, implementation, and evaluation of policies and interventions within Māori whānau, hapu, iwi and communities.

In addition, the ability to monitor the impact of government policies and practices on Māori health and ethnic disparities is vital. It is necessary to ensure the Crown meets its obligations under the Treaty of Waitangi and as signatories to various international conventions including, among others, the International Covenant on Economic, Social, and Cultural Rights and the Convention on the Elimination of all forms of Racial Discrimination. The United Nations, for example, requires states to submit reports periodically on measures that have been undertaken to realise rights protected under international conventions, and progress that has been made in this regard.

The importance of monitoring ethnic disparities over time has been reaffirmed by the Ministry of Health (Ministry of Health 2007). Realising improved Māori health and reducing inequalities are key objectives in various health and disability strategies. The ability to measure and monitor Māori health status, outcomes, and ethnic inequalities is integral to achieving these goals. Although the tracking of disparities is critical, the requirement to monitor health will be ongoing irrespective of whether disparities are eliminated. This includes fulfilling Crown obligations, but also as Māori communities have an ongoing interest and stake in

¹ These issues have been discussed in detail in the papers *Counting for nothing: understanding the issues in monitoring disparities in health* (TRRHAEP 2000) and *Monitoring ethnic inequalities in health* (PHI 2001).

quality data that allows for an enhanced and more comprehensive understanding of health issues of interest and concern.

The types of measurement and monitoring activities that are discussed in this paper reflect prevailing epidemiological and policy approaches to assessing Māori health and measuring ethnic disparities. It is recognised that these types of indicators are one way of measuring and monitoring Māori health, and that they have strengths and limitations. It is also acknowledged that the indicators and activities discussed in the paper are not the only way to measure Māori health nor are they necessarily the best or most appropriate way in all circumstances. However, they do contribute to more comprehensive and detailed information for Māori communities and add to a fuller understanding of health experiences for Māori in Aotearoa/New Zealand.

This discussion paper will focus principally on technical issues relating to official statistics. The Statistics Act 1975 defines official statistics as those collected by government agencies from statistical surveys and from administrative records and registers. The Act definition also includes “other forms and papers the statistical analyses of which are published regularly, or are planned to be published regularly, or could reasonably be published regularly” (Statistics Act 1975, s 3(24)(1) (a)). Within this category of official statistics, this paper has a particular interest in data that is used to calculate population rates, including data from the population census, and from birth and death registrations.

Many surveys and longitudinal studies administered outside of government agencies, (such as those undertaken by academic or other non-governmental institutions and/or by communities), also rely on the ability to monitor over time, and to have stability

in the way that ethnicity is measured in order that comparisons are able to be made across time periods. Although these studies do not necessarily fall within the criteria of official statistics, they are likely to be exposed to many of the same technical issues in relation to monitoring and measuring over time.

MEASURING & MONITORING HEALTH AND DISABILITY

This discussion paper is interested in technical issues related to the ways in which Māori health and ethnic disparities in health are able to be monitored over time.

WHAT IS MONITORING?

Monitoring has been defined by the Ministry of Health as involving:

... the regular and ongoing collection, analysis and reporting of information, and this term is considered to be synonymous with (but preferred to) ‘surveillance’. Monitoring is essentially descriptive, answering the ‘what?’ question. Insights are typically derived by comparing observed with expected or target levels of variables of interest, contrasts between population groups or geographic areas, or time trends (MOH 2005: 6).

Monitoring aims to identify changes and to assess the effect of various actions and interventions (Last 2001: 117).

A range of different types of monitoring activities are undertaken within the health and disability sector in Aotearoa/New Zealand, in addition to those in other agencies that inform the work of the sector. These

monitoring practices are central to a comprehensive understanding of the equity, effectiveness, and quality of the health system, and the planning and evaluation of policies and programmes within the sector. Information on health outcomes and ethnic disparities also provides important data on how well society is doing more broadly, in terms of achieving good health experiences and outcomes for all.

Types of health and disability monitoring activities currently undertaken in Aotearoa/New Zealand are described briefly below. The list is not exhaustive, but rather is designed to provide context to the discussion of technical issues that follows. While the focus of the paper is on official statistics, reference is also made to other relevant research activities and statistics in order to give an indication as to the scope and nature of current health and disability monitoring. Each of the monitoring activities varies in the extent to which they collect, analyse and report by data by ethnicity. They are discussed in more detail in Appendix One.

MONITORING USING ROUTINE

NATIONAL DATASETS

Various monitoring activities are undertaken in Aotearoa/New Zealand using routine datasets maintained by the Information Directorate of the Ministry of Health². Key datasets are the National Health Index (NHI); the National Minimum Dataset (NMDS), which includes hospital records and mortality data; the New Zealand Cancer Register (NZCR); the Maternal and Newborn Information System (MNIS); and, the Mental Health Information National Collection (MHINC). Reports are routinely published by the Ministry of Health, drawing on data from the national collections.

MONITORING OF NATIONAL HEALTH AND DISABILITY PROGRAMMES

Monitoring activities often form a part of publicly-funded national health and disability programmes. These include, for example, monitoring of the national breast and cervical screening programmes.

PUBLIC HEALTH SURVEILLANCE

The Institute of Environmental Science and Research (ESR) undertakes the surveillance of communicable and non-communicable diseases at a national level. Surveillance data on notifiable diseases is also produced regionally by local Public Health Units. Public health surveillance data is drawn from different sources, including laboratories and health clinics.

STATISTICS NEW ZEALAND

PRODUCED STATISTICS

Statistics New Zealand produces a range of health and disability related statistics. Some of these are generated from data gathered from external administrative sources (such as abortions, births and deaths, and injury), while others are collected through specific surveys and official collections administered by Statistics New Zealand, including the population census and the Disability Survey. Statistics New Zealand also collects some health information intermittently in the 5-yearly population census, namely questions on smoking and fertility. Statistics New Zealand undertakes several other surveys that include information on health or provide information on determinants of health, including regular surveys of economic, labour force and income status.

² In mid-2008, the New Zealand Health Information Service (NZHIS) and HealthPAC merged into the Ministry of Health's Information Directorate.

HEALTH AND DISABILITY INTELLIGENCE MONITORING ACTIVITIES

Health & Disability Intelligence (HDI), (formerly Public Health Intelligence), manage a programme of population surveys as part of the New Zealand Health Monitor (NZHM). The frequency of these surveys varies, as does the sample size (see Appendix Two for a more detailed description of these surveys). HDI is currently moving toward a single, integrated, continuous survey which will replace the existing separate periodic surveys. HDI also periodically produce monitoring reports on a range of health topics, including problem gambling, suicide, and tobacco, as well as chartbooks on the health status of population groups (e.g. *Tatau Kahukura*).

OTHER HEALTH AND DISABILITY-RELATED SURVEYS

In addition to the population surveys undertaken by HDI, surveys are administered by agencies outside the health sector. These include, for example, youth surveys undertaken by the University of Auckland (2001 and 2007); an annual smoking survey of Year 10 students undertaken by Action on Smoking and Health (ASH); and a five-yearly survey of participation in gambling (conducted by the Department of Internal Affairs).

LONGITUDINAL STUDIES, COHORT STUDIES, AND LINKAGE STUDIES

There are a number of longitudinal, cohort, and linkage studies that provide, or have the potential to provide, opportunities for monitoring health and inequalities in health over time. These include the Christchurch Health and Development Study; the Dunedin Multidisciplinary Health and Development Study; the recently launched 'Growing up in New Zealand' project; and Te Hoe Nuku Roa, a longitudinal study of Māori households.

The New Zealand Census-Mortality Study (NZCMS) is a cohort study that links census and mortality data to estimate ethnic and socioeconomic trends in mortality over time (Ajwani, Blakely, Robson, Tobias & Bonne 2003). HDI also routinely links the Primary Health Organisation (PHO) enrolment database (updated quarterly) to a range of numerator data (including hospital separations, laboratory tests and pharmaceutical prescriptions, among several others) using the encrypted NHI. This potentially allows the health of individuals (by ethnicity) to be tracked over their life course. Hence this data linkage system is called the "New Zealand Health Tracker".

As outlined briefly, there are a range of different activities that are undertaken in relation to monitoring health status, experiences, outcomes, and the quality and efficacy of health services and programmes in Aotearoa/New Zealand. These monitoring activities draw on a variety of data sources, including official statistics; data generated from within health services and programmes and data produced in other social sectors. However, regardless of the data source, issues of data quality, completeness and reliability, there are general concerns as to the ability to monitor health in a timely and efficient manner.

THE IMPACT OF CHANGING APPROACHES TO OFFICIAL ETHNICITY DATA

Many of the ongoing challenges in the monitoring of Māori health and ethnic inequalities over time in Aotearoa/New Zealand are related to broader issues with ethnicity data classification, collection, and output. This includes shifts in approaches to ethnicity data over time that have affected the way in which ethnicity data has been conceptualised and collected in the population censuses and other key data collections, such as birth and death registrations (TRRHAEP 2000; PHI 2001).

Changes to the collection of ethnicity data in the population census have had a significant impact on ethnic group denominator data and the ability to monitor Māori health and ethnic disparities. This was particularly so during the 1990s (TRRHAEP 2000; PHI 2001). Ethnicity data was historically collected in the population census in Aotearoa/New Zealand using a biological, descent based approach. In 1986, there was a shift towards conceptualising ethnicity as the group or groups that people felt they belonged to or affiliated with³. This move, while responding to important concerns about the continued use of a proportion of descent-based measure, produced a break in the time series (TRRHAEP 2000; PHI 2001).

Official practices and policies surrounding ethnicity data impact on other datasets from which denominator and numerator data are drawn, both those within the health and disability sector, and those in other sectors. For example, the current official statistical standard (Statistical Standard for Ethnicity 2005) produced by Statistics New Zealand is intended to be implemented across the whole of government and will, therefore, have an impact on data collections across the government sector.⁴

Official approaches to ethnicity can also contribute to the more general ethnicity data environment by influencing the ways people understand and respond to questions about ethnicity, or alternatively collect ethnicity data. This can in turn impact on the quality and consistency of the data. In discussing the changes to the 2000 Census in the United States, for example, Krieger notes that:

Change racial/ethnic categories in the US census, and you change denominators for rates of birth, disease, disability, and death. Change rates, and you change assessments of need, understandings of social inequalities in health, and claims for resources. Change racial/ethnic categories, and you change our view of ourselves in relation to what even the US federal government now recognizes, explicitly, as the “social-political construct” of race/ethnicity (2000: 1687).

In relation to the broader context of official ethnicity data, the following section will discuss current technical issues in measuring and monitoring Māori health and ethnic inequality, including:

- the impact of changes to the official definition of ethnicity;
- the impact of changes to the population census ethnicity question;
- the impact of changes to the official classification of ethnicity;
- the impact of changes to the methods for input and output of multiple ethnicities; and
- the impact of changes on choice of comparator group.

³ The history of official ethnicity data collection is outlined in more depth in the accompanying background paper entitled 'The politics and practice of counting: ethnicity in official statistics in Aotearoa/New Zealand' (Cormack 2009).

⁴ The Statistical Standard for Ethnicity 2005 outlines the rationale behind the official collection of ethnicity data in New Zealand, the current official definition of ethnicity, the standard classification of ethnicity and process for coding ethnicities, and recommendations for output of ethnicity data.

CHANGES TO THE OFFICIAL DEFINITION OF ETHNICITY

Statistics New Zealand is responsible for the definition of ethnicity in relation to official statistics in Aotearoa/New Zealand. The Statistics Act 1975 made it mandatory to collect statistics on the 'ethnic origin' of the population. However, during the 1970s and 1980s, there was no official definition of ethnicity and considerable variation existed in how ethnicity was collected by different sectors and agencies. The 1988 Review Committee on Ethnic Statistics recommended that Statistics New Zealand develop a standard ethnicity classification, with the aim of improving standardisation across official statistical collections (Department of Statistics 1988). The following definition, based on the work of Smith (1986), was adopted in the 1993 New Zealand Standard Classification of Ethnicity:

... a social group whose members have the following four characteristics:

- *share a sense of common origins;*
- *claim a common and distinctive history and destiny;*
- *possess one or more dimensions of collective cultural individuality;*
- *feel a sense of unique collective solidarity (Statistics New Zealand 1993).*

This definition was included in the subsequent 1996 Statistical Standard.

The official definition was reviewed as part of the Review of the Measurement of Ethnicity (RME) that occurred between 2000 and 2004. The following is the revised definition included in the current statistical standard for ethnicity:

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 affiliate with 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*
- *unique community of interests, feelings and actions*
- *a shared sense of common origins or ancestry, and*
- *a common geographic origin (Statistics New Zealand 2005).*

Although the official definition was revised in the 2005 Statistical Standard, the basic assumptions behind the definition have not changed; that is, the approach is still based on self-identification and cultural affiliation, and recognises the ability to identify with more than one ethnic group, as well as to change the group or groups that an individual identifies with over time. Within this context, it is unclear the extent to which the change to the official definition in the 2005 Standard might impact on the way ethnicity data is collected, recorded, or reported, in relation to both the population census, but also in other settings. The institution of a revised definition could potentially impact on ethnicity data by:

- influencing the way in which individuals understand and respond to ethnicity questions;
- influencing the way in which data collectors understand and approach the collection, input, and output of ethnicity data; or

- influencing more broadly the official approach to ethnicity data collection, e.g. encouraging changes to the classification or the question.

In reality, in relation to respondents, it is unlikely that individuals would routinely be referred to the official definition of ethnicity at the point of data collection, particularly in administrative data collection situations. Further, it is not clear the extent to which the public is aware of the definition more generally.

Similarly, it is difficult to judge the potential impacts of a change to the definition of ethnicity on the approach of individual data collectors, if the question itself has not changed. At a policy and procedural level, however, the change to the definition will affect training and support resources, and protocols and policies that include the previous definition. For example, the Ministry of Health *Ethnicity Data Protocols for the Health and Disability Sector* (2004), were produced prior to the release of the findings of the Statistics New Zealand *Review of the Measurement of Ethnicity* (June 2004), and contain the official definition from the 1996 Statistical Standard.

Finally, there is the potential for a change to the official definition to influence, more broadly, the way in which those responsible for related decisions conceptualise ethnicity going forward. This would include thinking about the official ethnicity classification system and the content and format of ethnicity data questions in the population census and other key data collections.

In summary, changes to the broader conceptualisation of ethnicity (and the assumptions underpinning these changes) are likely to have more impact on ethnicity data than the operational definition itself, although they are, of course, highly interrelated. There are, however, potentially some

practical implications resulting from the introduction of a revised definition in terms of updating policies, resources, and support materials for ethnicity data collection. There is also potential for the revised definition to influence the way in which ethnicity data is understood and approached by data collectors, respondents, and those using the data.

CHANGES TO THE CENSUS ETHNICITY QUESTION

The (in)stability of the ethnicity question employed in the population census has been noted as a significant challenge to the ability to compare and monitor outcomes by ethnicity over time. The census question used to collect information on ethnicity has changed with each consecutive census from 1976 until 2001, with the 2006 Census retaining the 2001 Census ethnicity question⁵. Statistics New Zealand has indicated that the question will remain the same for the 2011 Census.

The ethnicity census question is critically important as it provides the population denominator for calculating morbidity and mortality rates (TRRHAP 2000; PHI 2001). The impacts of changes to the census question over time have been well-documented (TRRHAP 2000; PHI 2001; Lang 2002).

From 1976 until 2001, the census ethnicity question changed with each consecutive census, impacting on the ability to monitor over time. For example, in 1996 there were changes to the format and wording of the census ethnicity question that prompted a greater-than-expected increase in the number of people identifying with more than one ethnic group. The number of Māori who identified with one or more other ethnicities in addition to Māori doubled, from 112,000

⁵ See Appendix Three for an outline of ethnicity questions used in previous population censuses.

in 1991 to 250,000 in 1996 (Statistics New Zealand 1999). This corresponded to 52% of the Māori ethnic population identifying with Māori ethnicity only (sole Maori) in 1996, compared to 74% in 1991. This had particular impacts on those who were using sole Māori (those who identified with Māori only in the census) populations in analysis. The number of those reporting Māori as their only ethnicity declined from 323,493 in 1991 to 273,438 in 1996, a 16% decrease (Lang 2002; PHI 2001).

The intercensal consistency study following the 1996 Census found that the inclusion of additional 'Other European' categories in the ethnicity question also led to both an increase in respondents identifying with those ethnic groups, as well as an increase of people reporting more ethnic groups (Statistics New Zealand 1999: 44). The 'sole Pacific' ethnic group decreased by 5%, and the sole New Zealand European grouping by 15% between 1991 and 1996 (PHI 2001). Overall, the proportion of the total population identifying with only one ethnic group decreased from 95% in 1991 to 85% in 1996. These shifts appeared to be primarily because of the changes to the question, rather than because of "demographic processes" (PHI 2001).

In 2001, the census ethnicity question reverted to that used in the 1991 Census (with a minor wording change). The use of a different question in 1996 meant that data from the 2001 Census could not be directly compared with the previous census, and so comparisons were only able to be made with the 1991 Census. Some of the phenomenon that had been evident in the 1996 Census (i.e., higher numbers of people identifying with 'Other European' categories, less

people identifying as 'New Zealand European or Pakeha', and an increase in multiple responses) were not as apparent in the 2001 Census (Statistics New Zealand 2005). In 2001, 9% of the population identified as belonging to more than one ethnic group, compared with 15% in 1996, and 5% in 1991.

Importantly, the re-establishing of a time-series occurred, as the 2006 Census retained the 2001 Census question for ethnicity. Approximately 10% of people overall identified with belonging to more than one group in 2006, compared with 9% in 2001 (Statistics New Zealand 2007a). For Māori, just over half (53%) identified Māori as their only ethnicity (Statistics New Zealand 2007b). There was a slightly higher number of non-responses to the ethnicity question in the 2006 Census (4.0%) compared to the 2001 Census (3.8%) (Statistics New Zealand 2008).

The stability of the census ethnicity question is also significant in relation to its usage in other data collections. A number of other datasets, including births and deaths registrations, align their ethnicity data collection with the approach taken in the population census, in order to make it comparable and to address issues of numerator-denominator bias. For example, the birth and death registration forms have been updated to include a slightly-modified version of the 2001 ethnicity question.

The health and disability sector has for some time recommended the use of the census question in ethnicity data collection. For example, in 1996 the collection of ethnicity data in hospitals was aligned to the 1996 ethnicity census question. The 2004 *Ethnicity data protocols for the health and disability sector* also require that data collected should use the census question:

The standard ethnicity question for the health and disability sector is the Statistics New Zealand 2001 Census ethnicity question (see Section 3.3). The format is to remain the same and the font size and dimensions must not be reduced (MOH 2004: 7).

Any change to the census ethnicity question, therefore, has far-reaching and significant impacts. At a technical level, it affects comparability over time and across datasets. This can particularly be an issue where datasets contain baseline data collected over extended periods of time, such as the NHI. In the absence of a date stamp associated with the ethnicity code, or some other way of establishing which question was used to collect the information, it is difficult to assess the comparability of ethnicity data. Question changes also make it difficult to estimate the extent to which changes in an individual's reporting of ethnicity reflects ethnic mobility, as opposed to reflecting variation in the data collection approach.

At a practical level, there are significant resource implications associated with the revision of the census ethnicity question, even where changes may be considered to be somewhat trivial, such as minor wording or format changes. For example, if data collections are to be aligned with the census, this would necessitate changes to data collection forms and/or software.

The experience of the 1990s provides a strong rationale for the need to be cautious about changes to the census ethnicity question, as well as the importance of maintaining a degree of stability over time. While the change to the question in 1996 was disruptive, it did provide important evidence of the impacts that changes to the format and wording of the ethnicity question can have, even in the absence of any substantive changes to the overall approach or conceptual basis. Any proposed changes to the

ethnicity question need to be considered extremely carefully in light of the potential for significant disruption to the time-series.

CHANGES TO THE STATISTICS NEW ZEALAND ETHNICITY CLASSIFICATION

In addition to the need to have a consistent and standardised ethnicity question in the population census to provide a denominator, there is also the need for some consistency over time in the standard classification of ethnicity. The official classification system, the delineation of ethnic groups, and the ways in which ethnic categories are aggregated into broader groups for output, are important in terms of disparities analyses, where those groups represent real or potential comparator groups.

In the current Statistical Standard for Ethnicity, released in 2005 and used in 2006 Census outputs, there were a number of changes made to the classification system that have the potential to impact on the ability to monitor trends over time, and to make comparisons with previous census periods.

The official classification system for ethnicity provides the framework for classifying and coding ethnic group responses into specific ethnic group categories. The current classification has four levels, from least detailed to most. It includes 239 ethnic groups at its most detailed level (Level Four). As the classification is hierarchical, ethnic groups are aggregated up into progressively broader ethnic groups "...according to geographical location or origin, or cultural similarities" (Statistics New Zealand 2005). The exception is Māori, which appears as a separate ethnic group code at each level of the classification.

The current Standard Classification of Ethnicity is a hierarchical classification with four levels (from least to most detailed). Level One represents the most aggregated codes (i.e. the least detailed level) and is used for output purposes, as opposed to data collection. Level One is a key level, as it is the level that is most commonly used in public policy for analysis and reporting (Statistics New Zealand 2007c: 9).

The first significant change introduced in the 2005 classification involves the Level One classifications. While the previous standard classification had five Level One classifications ('European', 'Māori', 'Pacific Island', 'Asian' and 'Other ethnic groups'), the current Level One classification now includes six categories (as well as one residual category), that is:

- European (1)
- Māori (2)
- Pacific Peoples (3)
- Asian (4)
- Middle Eastern/Latin American/African (5)
- Other Ethnicity (6)
- Not Elsewhere Included (9)

The main difference at this level is the splitting of the 'Other ethnic groups' code into two categories – namely, 'Middle Eastern/Latin American/African', and 'Other Ethnicity'.

Changes were also made at the other levels of the classification system. Level Two consisted of 25 codes in the previous classification, and now includes 27 codes (two further residual codes ('Don't Know' (94), and 'Refused to Answer' (95)) were added). Level Three now contains 42 codes (the code 'Other European NFD' (120) was removed and two additional residual codes added ('Don't Know' (944) and Refused to Answer (955)).

Level Four contains 239 codes in the 2005 Standard, compared with 231 in the previous classification. Some codes have been removed ('Other European NFD', 'Other Pacific Peoples NFD', 'Black'), while others have been added:

- 'Bosnian' (12516) and 'Zimbabwean' (12950) added under the broad European category. The 'South African' code was also split into 'South African NEC' (12948) and 'Afrikaner' (12949);
- 'Anglo Indian' (43117) added under the broad 'Asian category';
- 'Eritrean' (53120), 'Ethiopian' (53121), and 'Ghanaian' (53122) under the broad 'Middle Eastern/Latin American/African' category;
- 'South African Coloured' (61117) and 'New Zealander' (61118) under the broad 'Other' category.

In addition, there were some wording changes to some codes (e.g. 'New Zealand European/Pakeha' was changed to 'New Zealand European' at Levels Two, Three and Four).

In terms of monitoring, there are several issues related to the changes to the classification in the 2005 Standard, namely:

- general impacts on time-series;
- specific impacts arising from the introduction of the 'New Zealander' code; and
- impacts of changing requirements for the sector.

TIME-SERIES ANALYSES

The changes to the official classification of ethnicity outlined impact on comparability with ethnicity data collected in earlier time periods. This is primarily because of the separate categorisation of 'New Zealander' responses (discussed later), and the changes to Level One of the classification, namely the splitting of the 'Other' code into two codes

(‘Middle Eastern/Latin American/African’ and ‘Other Ethnicity’). Statistics New Zealand advises that comparisons should not be made directly between data produced in the 2006 Census and previous censuses because of this change (Statistics New Zealand 2005). They recommend that “... estimates of the resulting discontinuity in time series should be estimated either by back casting the new data in the time series or by dual coding and outputting two series at least once (Statistics New Zealand 2007c: 14).

Accordingly, Statistics New Zealand has produced time series using the 2005 classification for the 2006 Census data, as well as for the previous censuses (1991-2001) (Statistics New Zealand 2007c). In addition, ethnicity data from the 2006 Census has been produced using the 1996 ethnicity classification. These ethnic counts are available as grouped total responses⁶ at Level One of the classification.

Statistics New Zealand also recommends that where denominators are regrouped, numerators should also be regrouped to be consistent (Statistics New Zealand 2007c). The break in the time series as a result of changes to the standard classification, therefore, has practical impacts, in that additional time and resources are needed to regroup both numerator and denominator data so that it is comparable and estimates of the effect of the changes can be made. As there is likely to be a time-lag in full alignment of data collections with the new Standard, additional steps of back casting and/or producing two series will be required for some time.

THE INTRODUCTION OF A ‘NEW ZEALANDER’ CODE

The second change of significance introduced by the revised Standard was the introduction of a ‘New

Zealander’ code into the Classification. According to Statistics New Zealand, the introduction of the ‘New Zealander’ code was in response to:

... a growing number of people feel they do not fit into any of the current ethnic classification categories and want to identify and be counted as ‘New Zealanders’. This issue has increased antagonism among people who require an acceptable way of identifying themselves that is distinct from the traditional ethnic categories (Statistics New Zealand 2004: 14).

‘New Zealander’-type responses have been reported in the census at some level since the move to self-identified cultural affiliation made it possible for individuals to write in ‘Other’ ethnic groups in addition to the response categories provided. In the 1986 Census, 20,313 people wrote a ‘New Zealander’-type response to the ethnicity question (Statistics New Zealand 1993). In 1996, there were 58,614 ‘New Zealander’-type responses (Allan 2001). In 2001, there were 89,000 ‘New Zealander’-type responses, representing 2.4% of the total population (Statistics New Zealand 2007d).

Prior to the release of the 2005 Statistical Standard for Ethnicity, write-in ‘New Zealander’ responses were coded to the ‘New Zealand European’ category. In the 2005 Standard, ‘New Zealander’ was included in the classification at Level Four, within the broader ‘Other Ethnicity’ Level One category. As previously noted, the ‘Other’ category was split into two categories: ‘Middle Eastern/Latin American/African’ and ‘Other Ethnicity’. In addition to ‘New Zealander’, the other codes included in the ‘Other Ethnicity’ grouping are ‘Central American Indian’, ‘Inuit’, ‘North American Indian’, ‘South American Indian’, ‘Mauritian’, ‘Seychellois’, and ‘South African Coloured’.

⁶ Grouped total response refers to a method for coding multiple ethnicities. The ‘total’ response method counts each individual once in each ethnic group they identified with. ‘Total’ response is the method recommended by Statistics New Zealand as standard output for ethnic group statistics.

In the 2006 Census, 429,429 people recorded 'New Zealander'-type responses, representing 11.1% of the total population (Statistics New Zealand 2007d). There was a concurrent decrease in 'New Zealand European' responses, in part because of the change to coding 'New Zealander' separately as opposed to including these responses with the 'New Zealand European' count (Statistics New Zealand 2007c). Statistics New Zealand notes that research undertaken by them shows that over 90% of the increase in people identifying as 'New Zealander' in the 2006 Census was from those who had identified as 'New Zealand European' in the previous Census (Statistics New Zealand 2009). Other ethnic groups were also affected, however, with reductions to the Māori, Pacific and Asian ethnic groupings in the five years between the 2001 and 2006 Censuses (Statistics New Zealand 2009: 7).

Statistics New Zealand has recently released a discussion document regarding the 'New Zealander' issue, with a final report due in the last quarter of 2009. In relation to the official classification, the report proposes to move the 'New Zealander' category from Level Four within the broader 'Other Ethnicity' category, to Level Three within the 'European' category (Statistics New Zealand 2009).

The broader impact of the introduction of the 'New Zealander' classification is discussed more fully in an accompanying discussion paper⁷. At a technical level, however, the changing practices regarding the coding 'New Zealander'-type responses have a number of impacts, realised and potential.

COMPARABILITY OVER TIME

In previous censuses, 'New Zealander' responses have been coded in different ways. In the 1996 and 2001 Censuses, 'New Zealander' responses were coded to the 'New Zealand European' category, and output as such in the relevant census reports and publications.

Under the 2005 Standard, 'New Zealander' responses are coded to a separate category within the 'Other Ethnicity' grouping. Write-in responses of 'Pakeha' continue to be coded to 'New Zealand European'. In order to produce data that is comparable with earlier collections, Statistics New Zealand recommends combining 'European' and 'Other Ethnicity' at Level One to produce rates and ratios, and population estimates and projections, calling it the "European or Other Ethnicity (including New Zealander)" group, and making it explicit that 'New Zealander' is included:

For time series purposes, the counts of the new New Zealander category can be added to the counts of the New Zealand European category (except where people have given both New Zealander and NZ European responses). This will recreate a count for the New Zealand European category which will be comparable to those from previous data collections (Statistics New Zealand 2007c: 6).

In data using the 2006 Census ethnicity question, individuals with both a 'European' and 'Other Ethnicity' response should only be counted once in the 'European and Other Ethnicity' group. This may require customised data requests, depending on the output method the data has been drawn from (see later section), as total ethnic group counts will count each individual once in each group with which they identify. As a result it is not straightforward to classify those individuals who identified with both an 'Other Ethnicity' and a 'European' group response.

The recommendation to combine 'European' and 'Other Ethnicity (including New Zealander)' for both numerator and denominator data, and to back cast or produce two time series to enable comparisons with previous data requires additional time and resources. In addition, while those identifying as

⁷ Theoretical and practical issues relating to the 'New Zealander' category are discussed in the companion paper entitled 'Ethnicity, national identity, and New Zealanders' (Cormack & Robson 2009).

'New Zealander' are the majority of responses within the 'Other Ethnicity' category, there are a number of other ethnic groups included. Statistics New Zealand suggests that the inclusion of these other individuals with the 'European' grouping is an interim measure and that the overall impacts will be small because of the small numbers (Statistics New Zealand 2007c: 9–10).

In its discussion document on the 'New Zealander' issue, Statistics New Zealand has proposed that the ethnicity classification be revised again to move the 'New Zealander' category to Level 3 in the broader 'European' category (Statistics New Zealand 2009). This would mean a return to coding 'New Zealander' responses in a similar manner to Statistics New Zealand practice prior to the *2004 Review of the Measurement of Ethnicity*.

A further impact on the comparability of data over time results from changes in the practice of coding certain responses in the 2005 Standard. Responses such as 'New Zealand Chinese' were coded to one ethnic group under the 1996 Standard, but were coded as two responses under the 2005 Standard, i.e. 'New Zealander' and 'Chinese'. It is unclear what impact this change had on the data.

COMPARABILITY WITH OTHER DATASETS

In addition to the issues with comparability over time, there is a level of discordance between data sources in terms of the reporting of 'New Zealander'. Statistics New Zealand notes that "... there is currently a dissimilar pattern of New Zealander response evident across ethnic statistics sourced from other official surveys and administrative databases..." (Statistics New Zealand 2005: 4).

The reporting of 'New Zealander'-type responses in administrative datasets that are classifying these responses is 2% or less, compared with 11.1% in

the 2006 Census (Statistics New Zealand 2007c: 14). The 2006/07 New Zealand Health Survey also did not record as high a number of 'New Zealander' responses as the 2006 Census. According to Statistics New Zealand, this disagreement may result from a combination of the increased susceptibility of the Census to "external influences" (2007c: 14); variation in the progress of implementing the 2005 Standard across other data collections; and differences in the populations involved (Statistics New Zealand 2007c). It is probably a combination of these and other factors. However, the point of significance is that this dissimilarity impacts on comparability between datasets.

CHANGING SECTOR REQUIREMENTS

The Ethnicity Data Protocols for the Health and Disability Sector (Ministry of Health 2004) require the collection of ethnicity data to at least Level Two, although ideally data will be collected to Level Four. The ethnicity classification codeset to be used in the health and disability sector has recently been updated to align with the 2005 Statistics New Zealand Standard, as part of the 2009 National Collections Annual Maintenance Project (NCAMP). However, the health sector has been advised to continue coding 'New Zealander' responses to 'New Zealand European', as has been recommended practice under the *Ethnicity Data Protocols* (Ministry of Health 2004), pending a final decision on the revision of the 2005 Statistical Standard.

SUMMARY

It is recognised that the official classification of ethnicity will change over time with the introduction of more and different ethnic groups as the demographic profile of Aotearoa/New Zealand shifts. However, as with changes to the official definition, concept, and standard ethnicity question, changes to the classification need to be considered in light of the potential impacts on data.

CHANGES TO INPUT AND OUTPUT OF MULTIPLE ETHNICITIES

The ability for people to report multiple ethnic groups accompanied a change in the 1980s to a self-identified cultural affiliation approach to collecting ethnicity data. As a result, it became necessary to develop practices for the way in which multiple ethnic group affiliations were coded and outputted. The 2005 Statistical Standard for Ethnicity introduced changes to the practices surrounding the input and output of multiple ethnicities, namely:

- the discontinuation of prioritised response as a standard output;
- the use of total response or single/combination response as the standard outputs; and
- the use of randomisation as a method to reduce the number of multiple ethnic responses where necessary.

PRIORITISED, TOTAL, AND SINGLE/ COMBINATION RESPONSE

Prioritisation is a method that assigns people who identify with more than one ethnic group, (across the Level One categories but not within), to a single mutually exclusive category based on an established hierarchy. According to the 1993 Statistical Ethnicity, the practice was developed "... with the aim of giving priority to non-Pakeha/ European groups and special priority to Māori and Pacific Island groups" (Department of Statistics 1993: 26). The rationale was that the method:

- be consistent with Recommendation 4 of the report of the Review Committee on Ethnic Statistics;
- be consistent with the definition of Māori found in the Māori Affairs Amendment Act 1974 and the

Electoral Amendment Act 1980 ("a person of the Māori race of New Zealand, and includes any descendant of such a person");

- ensure that important but numerically small groups are not submerged in the dominant majority; and
- ensure that groups (such as Māori and Pacific Island groups) about whom policy decisions are commonly made, requiring information to inform those decisions, and which have in the past been shown statistically to be disadvantaged in some way, continue to be identified for monitoring purposes (Department of Statistics 1993: 26).

Prioritisation has been used for a number of years as a method for reducing responses and assigning individuals to a single mutually exclusive group in terms of both input and output of multiple ethnicities.

The 2004 Statistics New Zealand *Report of the Review of the Measurement of Ethnicity* proposed that prioritisation be discontinued. The subsequent Standard recommended 'Total Response' as the standard output (Statistics New Zealand 2005).

Total response counts each individual in each group for which they reported a response. Single/Combination Output was also included as an alternative output. Single/Combination output counts each individual only once in a single (e.g. Māori only, Asian only) or combination (e.g. Māori/ European, Pacific Peoples/Asian) group.

Outputs using the range of methods have been produced in recent census periods. In 1996, ethnic group data output from the Census was reported in two ways. Firstly, tables were produced based on prioritised ethnicity at Level Three, and these were the outputs that appeared in the main reports. Secondly, analysis was done based on "total responses to the fifty most frequently reported ethnic groups" (Statistics New Zealand 1997). In

2001, Statistics New Zealand's ethnic group report was produced using both total response and single/combination response to account for reporting of multiple ethnicities (Statistics New Zealand 2002). For the most recent Census (2006), the standard outputs have been produced using total response. This creates issues in making comparisons over time, in that the groups are not able to be compared with each other directly.

The Ethnicity Data Protocols provide a level of flexibility in terms of choice of method for the output of multiple ethnicities. The protocols recommend that the purpose and type of analysis being undertaken should guide the choice of the three methods currently in use, (prioritised, total, and single/combination), recognising that they all have strengths and limitations (MOH 2004).

The argument against the use of prioritisation appears to confuse the concept of self-identification in terms of the broad approach to ethnicity (i.e. individual's rights to identify their ethnicity based on which ethnic groups they affiliate with), and the mode of data collection (i.e. respondent's answering the question themselves) with the common, albeit not always desirable, process of aggregating and categorising groups for output and analysis. Ideally, it would be preferable for information on all groups to be available at the most detailed level. However, for a number of practical and analytical reasons, most outputs provided by Statistics New Zealand, and many other ethnic group analyses, are at Level One. At this level, ethnic groups (with the exception of Māori) have already been aggregated into broad categories. Following the same argument, these categories do not align with the concept of 'self-identification'. For example, a person who reports Indian in the Census is typically output as Asian in a standard output, which is not what they self-identified as.

There are identified limitations of the prioritisation method, including the undercounting of particular ethnic groupings. This particularly affects Pacific populations, and has a differential pattern by age (Statistics New Zealand 2006). However, prioritisation is a commonly used method for categorising ethnic groupings for the purposes of analysis and output in health data, and may be an appropriate option for particular types of analyses, as it has the benefit of all groups being mutually exclusive. Concerns of undercounting may apply less in the calculation of rates as the method of output, prioritisation or total ethnic group, is applied to both the numerator and denominator.

A study undertaken by PHI (now known as HDI) to investigate the impact of using total response as opposed to prioritised response for analysis of New Zealand Health Monitor (NZHM) surveys found that it made little difference to rates in terms of both absolute and relative differences (MOH 2008). They recommend that the choice of analysis should depend on the project being undertaken. The study, however, is only able to consider the impacts for certain types of data collection (i.e. survey as opposed to administrative datasets) and particular health measures.

The implications for monitoring inequalities include the additional work needed to enable comparisons with earlier time periods where prioritisation was used (i.e. back casting or producing dual series). Statistics New Zealand currently provides customised requests for prioritised ethnicity data. However, it is not clear if this will be provided into the future.

In addition, because of the widespread use of prioritisation for a number of years in the health sector, there is a danger that people will directly compare ethnic group data produced using total

counts (which are overlapping) with each other, as was done in the past with prioritised ethnic data. This is a particular issue in looking at differences between ethnic groups, as it will tend to minimise disparities.

INPUT RANDOMISATION

The 2005 Statistical Standard recommended a change to the method of inputting multiple ethnicities where the number of responses recorded by an individual is greater than the system can cater for. In the 2005 Census and some other current official surveys, up to six responses are now able to be recorded for an individual. This is a change from earlier censuses (prior to 2001), where only three responses were recorded. The revised Standard recommends that where: "... more responses are given than can be recorded per person, a random method for reducing the number of responses selects the ethnicities to be retained" (Statistics New Zealand: 2005).

The randomised method proposed is designed to retain Level One data where possible. In the case of reducing the number of codes to six, (where there are greater than six responses), responses are aggregated into Level One categories in order that the Level One data is retained, although some detail will be lost.

Randomisation raises more potential issues where multiple responses are being reduced to three, particularly where the responses include more than three Level One categories. It is conceivable that groups of particular policy interest e.g. Māori or Pacific Peoples could 'drop out' in the randomisation process and would as a result be unable to be identified. Additionally, individuals giving the same response at different data collection points could be randomised differently on different data sources.

A shift to randomisation raises further issues in terms of comparability over time, as the previous method for reducing the number of codes was based on prioritisation (using a set hierarchy). There is likely to be some time lag in fully implementing the new practice if and when data collections align with the 2005 Statistical Standard.

At a practical level, randomisation may not be a commonly used or understood practice for data collectors. There is a risk, therefore, that those inputting data do not apply either method and make a discretionary decision about which ethnicities to input. Prioritisation, given its limitations, means that when followed, it will enable the data to be consistently reduced across datasets and over time, and also ensure that the groups with the highest health need currently are always counted.

Although there is some evidence of low reporting of multiple ethnicities in administrative collections, relative to the population census, it is possible that this may increase as data collection practices and systems improve. In combination with the predicted general increase in reporting of multiple ethnicities, decisions about the inputting of multiple ethnicities may be more of an issue in the future.

IMPACTS OF RECENT CHANGES ON CHOICE OF COMPARATOR GROUP

One of the key types of analyses that are undertaken in disparities monitoring are comparisons between ethnic groups. In relation to monitoring Māori health, changes to official ethnicity data policies and practices impact on comparisons by influencing the composition and stability of comparator groups.

A number of the changes discussed earlier affect the comparator groups employed in disparities analyses, and are generally addressed through the recreation of comparator groups and through back casting or outputting two series. Comparisons between ethnic groups remain feasible, although somewhat less straightforward and more resource intensive.

Statistics New Zealand suggests that "...caution needs to be exercised in the use of the European and Other Ethnicity groupings" because of the changes to the classification (Statistics New Zealand 2007c: 9). In terms of monitoring Māori health and ethnic inequalities, the European grouping is potentially an attractive comparator group, as it has tended to be the broad ethnic grouping that demonstrates the most health advantage in Aotearoa/New Zealand. Its current and future usability as a comparator group in disparities analysis is further complicated by the move away from prioritisation of multiple ethnicities to total response.

Disparities analyses also sometimes use non-Māori as a reference or comparator group. There has been some opposition to this practice, with arguments relating primarily to the notion that individuals assigned to the non-Māori group were not asked if and/or did not answer that they were non-Māori (Callister, Didham & Kivi 2009).

In discussing the use of non-Māori as a comparator group, it is useful to make a distinction between data collection and practices for data analysis and output. The categories that individuals identify with in data collection and the categories that

are constructed for the purposes of analysis and output are inter-related, but different. In order to undertake analyses, individual responses are often aggregated into larger groups or given different labels than those used in data collection. For example, individuals who identify as Chinese in the population census are frequently aggregated into the broader Asian group for the purposes of analysis and output. Those individuals would not necessarily have chosen Asian as their ethnic group if it was an option in the question. However, for practical and theoretical reasons it is often preferable to construct categories specifically for the purposes of analysis, such as grouping people into age bands or education levels.

In terms of disparities analyses, the non-Māori category may often be used for analysis and output purposes where it most clearly meets the objective of the analysis, e.g. in monitoring Treaty obligations. In addition, the instability of the census ethnicity question and changes to the official classification over time mean that there are issues with the consistency of comparator groups other than non-Māori. Therefore, Māori/non-Māori analysis becomes a more attractive option, as it is not so impacted by changes to the classification. In monitoring health there will, however, need to be consideration of the changing composition of the groups that make up the non-Māori population over time.

It is acknowledged, and should be made clear in undertaking non-Māori in disparities analysis, that non-Māori is not an ethnic group *per se*, but rather a reference group or comparison group that includes a range of different ethnic groups.

METHODS TO IMPROVE ESTIMATES OF MĀORI HEALTH AND INEQUALITIES

As discussed, official datasets are an important source of information to calculate health measures. They allow for the calculation of population rates and ratios that measure aspects of Māori health status and inequalities in health. The issues discussed previously have focussed on ethnicity data in the population census, often used as the denominator in the calculation of rates. Official health sector collections such as hospital records, cancer registrations and mortality registrations are important sources of numerator data.

In the past, official health data has been shown to undercount Māori (TRRHAEP 2000). This has resulted in problems calculating rates, particularly if numerators and denominators are from different datasets with different quality, as is the case with official health data and census data. This in turn affects the accuracy of the rate because of numerator/denominator bias, as well as comparability across datasets e.g. comparing Māori/non-Māori disparities in cancer registration rates with disparities in cancer death rates. For Māori, undercounting in official health datasets, leads to an underestimation of rates. The effect on comparisons with non-Māori, as measured by rate ratios, can operate in any direction, depending on the variable of interest, to either inflate or minimise disparity. In addition, any changes in the quality of ethnicity on these datasets over time means that the magnitude of any biases can change making it particularly difficult to monitor health changes over time.

These concerns were previously raised in the publication *Counting for Nothing: understanding*

the issues in monitoring disparities in health in 2000 (TRRHAEP 2000). In addition to broader initiatives to improve ethnicity data collection in the health sector, various statistical methods have since been developed that try to address the issue of misclassification of ethnicity on health datasets and the resulting numerator/denominator bias, in order to improve estimates of Māori health and inequalities. These can be divided into two methods. Firstly, the reassignment of ethnicity on individual health records, and secondly, the development of adjusters that have been applied to “aggregate” or “group level” data. Both involve the linkage of records. This section describes some of these methods and also discusses strengths and weaknesses of these approaches.

INDIVIDUAL REASSIGNMENT OF ETHNICITY (EVER MĀORI METHOD)

EVER MĀORI METHOD

The ‘ever Māori’ method of ethnicity classification has been used to adjust for undercounting of Māori in health datasets in a number of studies examining Māori health and inequalities (Cormack, Robson, Purdie, Ratima & Brown 2005; Curtis, Wright & Wall 2005; Robson, Purdie & Cormack 2006; Ministry of Health 2006). The method assumes that Māori are generally undercounted in health datasets. Individuals are linked across multiple health datasets using unique identifiers (encrypted NHI number) and counted as Māori if they were ever recorded as Māori in any cancer registration, hospital admission or death registration, or on the NHI (usually over a specified period). For example, where a person

is identified as Māori in a mortality record, but not in a hospital discharge record, their hospital discharge record is reassigned as Māori. Remaining people are designated non-Māori.

WHAT IS THE NATIONAL HEALTH INDEX NUMBER?

The National Health Index (NHI) number is a number assigned to individuals so that they are able to be uniquely identified when using healthcare services in New Zealand. The NHI stores information on an individual's name, address, date of birth, sex, and ethnicity. Children born in New Zealand are assigned an NHI number at birth. It is estimated that approximately 98% of New Zealanders have an NHI (Ministry of Health 2009a).

The NHI system is maintained by the Information Directorate of the Ministry of Health (formerly known as NZHIS). The NHI system is maintained by the Information Directorate of the Ministry of Health (formerly known as NZHIS). Encrypted NHI data can be used to link health information across health data sets to produce statistics on health events and outcomes (NZHIS 2003).

This method appeared to produce reasonable Māori and non-Māori estimates in the above mentioned studies. For example, in *Unequal Impact* (Robson et al 2006), the 'ever Māori' method increased the number of cancer deaths classified as Māori during 1996–2001 by 6%, close to the 7% increase estimated for the 1996–1999 period by the New Zealand Census Mortality Study (Ajwani et al 2003). Cancer registrations were increased by approximately 17%. In *Tatau Kahukura* (Ministry of Health 2006), the 'ever Māori' method increased the number of total Māori deaths (2000–2002) by 6%, the number of cancer registrations (1999–2001) by 11%, and the number of public hospitalisations (2002–2004) by 5%.

With the use of the 'ever Maori' method in more recent years, there has been concern that it may be starting to overcount Māori. This seemed to occur when the method was explored prior to data analysis in the *Hauora IV* publication (covering the years 2000–2005) (Harris et al 2007). Potential reasons for this may have been the introduction of more "false positives"⁸ with the use of additional years of data to assign Māori ethnicity (i.e. 1996–2005), and improvement in the misclassification of Māori ethnicity in health data sets, as has been demonstrated in mortality data by the New Zealand Census Mortality Study for the 2001–2004 period (Fawcett, Atkinson & Blakely 2008). Updating of the New Zealand Census Mortality Study has shown for the period 2001–2004, no net undercount of Māori deaths on mortality records compared with matched census numbers, suggesting an improvement in ethnicity data quality in mortality data from 1996–1999 (Fawcett et al 2008).

As ethnicity data changes on health data sets, the effect of using the 'ever Māori' method will also change. The potential for false positives to impact on the Māori estimates increases as ethnicity data quality (hopefully) improves and with the use of more years of data linkage to estimate 'ever Māori' ethnicity. This makes this method difficult to use for more recent years and to calculate Māori health trends over time. However, variations on the 'ever Māori' method could be investigated for their potential to mitigate overcounting, such as restricting the number of years used to determine 'ever Māori' status, or using a threshold such as a required proportion of events recorded as Māori for an individual to be classified as Māori. There is also some error in the linkage of individuals across multiple datasets due to some people having multiple NHI numbers.

⁸ A false positive is when a person is recorded as Maori when they are not. The chance of this error occurring increases with the use of more years of data.

DEVELOPMENT OF ETHNICITY ADJUSTERS

Adjusters have also been developed to correct the number of Māori (or other ethnic groups) health records to account for misclassification of ethnicity. This is achieved by linking health datasets to datasets with better quality ethnicity to estimate the misclassification of ethnicity in the health datasets, and to calculate adjusters that can be applied to aggregate health data to adjust numbers accordingly. It is, therefore, reliant on the availability of a dataset with good quality and complete ethnicity data.

NEW ZEALAND CENSUS–MORTALITY STUDY

The New Zealand Census–Mortality Study (NZCMS) is a record linkage study of census and mortality records (Blakely et al 2007, Fawcett et al 2008). The NZCMS has probabilistically matched death records to census records for the 3 years following each census back to 1981. This creates 5 short term cohort studies that have covered the periods 1981–84, 1986–89, 1991–94, 1996–99 and 2001–04, enabling examination of the accuracy of ethnic mortality data, the quantification of misclassification of ethnicity on death records, the development of adjusters (termed ‘unlock ratios’) that can be applied to correct for any misclassification of ethnicity on mortality data, and the estimation of ethnic specific mortality rates that are free of numerator-denominator bias.

In terms of numerator-denominator bias and the misclassification of ethnicity, the NZCMS has shown that Māori and Pacific peoples were grossly undercounted, (and European/Other over counted), on mortality data relative to census data, until the mid 1990s. This improved over the 1996–99 period. In the most recent period (2001–04), negligible

differences between census and mortality counts were found for Māori and Pacific peoples using total and prioritised ethnicity classification. The quality of ethnicity data on mortality records has thus appeared to have improved over this time period for Māori and Pacific peoples.

In the most recent period (2001–04), the NZCMS showed no systematic differences in unlock ratios by sex, age or deprivation. However, there were differences by region, with total and prioritised Māori ratios higher in the South Island suggesting higher undercounting of Māori on mortality records in the south. This pattern was even more pronounced in earlier time periods (Ajwani et al 2003). Previous time periods also demonstrated differences in misclassification of ethnicity for Māori by cause of death, age and rurality (Ajwani et al 2003).

While undercounting of ethnicity has improved for Māori and Pacific peoples, the NZCMS still suggests some inconsistency in the recording of ethnicity on death compared with census records, with fewer 2001–04 deaths than expected with multiple ethnicities recorded for Māori and Pacific peoples.

The strengths of the NZCMS are that it has enabled the calculation of ethnic specific death rates that take into consideration the misclassification of ethnicity over time. This has been particularly useful for examining mortality rates over a long time period. Importantly, it has allowed for the monitoring of ethnic inequalities in mortality over a period of major social and economic reform in New Zealand, demonstrating the disproportionately negative impact of these changes on Māori in particular (Ministry of Health and University of Otago 2006).

There are barriers to, and limitations with, the development of adjusters such as those described in this section. Firstly, these are not simple statistical

analyses. They require specialist statistical expertise and are, therefore, relatively time and resource intensive to develop. They are also retrospective, with availability of adjusted ethnic specific mortality estimates dependent on availability of census data. There remains some level of error in the estimates of ethnicity misclassification due to incomplete linkage. Although the authors note methods were employed to minimise bias as a result of this (Fawcett et al 2008), standard errors are not routinely provided with the adjusters. This method was initially applied only to mortality data. A recent study, however, has similarly linked cancer registrations to census data to provide adjusters for cancer incidence statistics for the period 1981–2004 (Shaw, Atkinson & Blakely 2009).

While the NZCMS allows for correction of numerator/denominator bias following each census period, the adjusted numbers and rates are still subject to census ethnicity changes over time, which has the potential to impact on monitoring.

HAUORA: MĀORI STANDARDS OF HEALTH IV - A STUDY OF THE YEARS 2000-2005

Hauora: Māori Standards of Health IV (Hauora IV) is the fourth in a series of publications on Māori health status. It provides a comprehensive and detailed collection of key health indicators comparing Māori and non-Māori for the years 2000–2005. As such, *Hauora IV* monitors Crown performance in respect of Māori health rights (Robson & Harris 2007).

The Hauora series of books document patterns of Maori health and disparities in health status between Maori and non-Maori. The first volume of Hauora was published in 1980, and was written by Eru Pomare. It outlined mortality trends for Maori and non-Maori for the period from 1955 to 1975.

The second volume, *Hauora: Maori Standards of Health II*, was published in 1988. It included analysis of morbidity and mortality for Maori and non-Maori for the period 1970 to 1984, and was written by Gail de Boer and Eru Pomare.

The third volume, *Hauora: Maori Standards of Health III*, was published in 1995, and presented analysis on Maori health for the years 1970 to 1991. It was authored by Eru Pomare, Vera Keefe-Ormsby, Clint Ormsby, Neil Pearce, Papaarangi Reid, Bridget Robson and Naina Watene-Haydon.

The fourth and most recent volume of Hauora was published in 2007, and presents analysis of Maori health trends and disparities in health between Maori and non-Maori for the years 2000 to 2005. It was edited by Bridget Robson and Ricci Harris.

The customary chapters on mortality, public hospitalisations, cancer and mental health utilise data from official statistics to estimate Māori and non-Māori population rates and ratios. The NZCMS showed that, for the years 2001–2004, Māori were not under-enumerated in mortality records, therefore ethnicity on mortality records was used to analyse mortality data for Hauora IV. However, in hospital discharge data and cancer registration data, Māori were shown to be undercounted and adjusters were developed and applied to minimise the bias this created and allow for the more accurate calculation and comparability of population rates and ratios by ethnicity.

A record linkage study was also the method used to develop the adjusters used in Hauora IV (Harris, Purdie, Robson, Wright, Zhang, & Baker 2007).

Hospital discharge and cancer registration data were linked to datasets with more reliable ethnicity. These were death registrations (2000–2004) and Housing New Zealand Corporation (HNZC) tenant data (2003–2005). Among the linked records, the number of Māori hospitalisations (or cancer registrations), using ethnicity as recorded, were compared to the numbers using ethnicity on the linked dataset.

Adjusters were created for cancer register data and hospital discharge data by calculating a weighted average of the HNZC linkage and mortality linkage ratios on five-year age groups. For the calculation of population rates, smoothed adjusters were applied to the number of Māori hospitalisations and cancer registrations to correct for the undercount of Māori at each age group, giving an adjusted number of events. Non-Māori numbers were estimated as the difference between the total number of hospitalisations or cancer registrations and the adjusted Māori numbers. These data were then used as numerators in the calculation of population rates and ratios.

This process demonstrated an undercount of Māori hospitalisations and cancer registrations that varied by age, with a relatively low undercount across the younger age groups that increased in the older. The adjusters suggested that Māori hospital discharge numbers should be approximately 5–15% higher depending on age, and Māori cancer registrations 2–15% higher. This is less than that found in some earlier studies where 20–25% net undercounts of Māori in hospital records have been shown (Harris, Robson, Reid & Keefe 1997; Te Rōpū Rangahau Hauora a Eru Pōmare 1996). While the methods are not directly comparable, the improved undercounts suggest that the quality of ethnicity data may have improved.

The adjusters developed for Hauora IV minimise the undercount of Māori in hospital discharge and cancer register data sets therefore minimising numerator denominator bias in the calculation of population rates and ratios. As they are age-specific, they also allow for more accurate age-specific and age-standardised rates. However, in this instance they are used in a cross-sectional analysis. As was shown in the NZCMS, ethnicity misclassification can change over time; therefore, the adjusters developed for Hauora IV may not be applicable to other time periods, with the development of other adjusters likely to be needed for different time periods. In addition, these adjusters were developed at a national level. The NZCMS also showed that ethnicity data quality can vary by region as well as cause of death. The adjusters for Hauora IV do not allow for adjustment of data at this level.

SUMMARY

Ethnicity misclassification is a problem that has been identified for a number of years (Kilgour & Keefe 1992). For Māori, this has largely led to undercounting in health data sets. This leads to numerator/denominator bias when census population data is used as denominator data, and impacts on the calculation of rates and examination of inequalities in health between Māori and non-Māori.

Methods such as those described have been developed to minimize the misclassification of ethnicity and bias in order to provide better estimates of ethnic specific rates and ratios. However, these methods require expert skills. They are dataset specific and in order to monitor changes over time they require continual updating. They are therefore very resource intensive and time consuming, and not without error. Such resources may not be available to those wanting to

monitor and evaluate Māori health and inequalities, particularly at local community and provider levels. Importantly, these methods have been developed within specific separate pieces of research and are not systematically or routinely undertaken for official statistics.

Population adjusters are only able to be applied to group level data rather than individual data so they can not be used to improve ethnicity quality in longitudinal studies for example, (although the misclassification of ethnicity may not have as big an impact in these studies as the same misclassification occurs in the denominator). Where the reassignment of ethnicity at an individual level is undertaken, (as in the 'ever Māori' method), the impact of bias needs to be evaluated.

The development of adjusters in particular depends on the availability of good quality ethnicity data in other datasets and is also subject to changes in the measurement of ethnicity data on reference or gold standard datasets.

Undercounting has traditionally been highest among ethnic groups with the highest health need, making it more difficult to monitor these groups. The need for adjusters as a response to the absence of high quality ethnicity data also makes it more resource and time intensive to monitor these groups. That this resource burden should fall on those looking to provide information to address inequalities is in itself an inequality.

An important point to emphasis is that the development of adjusters is completely reliant on having good quality ethnicity data somewhere. That there are datasets with good quality ethnicity data and that there have been improvements in ethnicity in some areas (such as on mortality registrations) suggests that this is achievable. This means

the focus should always be first and foremost on improving the quality of ethnicity data in the health and disability sector, and on maintaining the integrity of ethnicity datasets. Adjusters should only ever be understood as a tool to mitigate data quality issues, rather than an answer to poor quality ethnicity data. Using adjusters as a tool is not an efficient use of resources and shifts the cost of poor quality data onto those researching Māori health/ethnic inequalities.

Finally, this section has described some of the methods that have been used to improve estimates of Māori health and inequalities. Other innovative ways to further improve estimates of Māori health and inequalities should also be explored. Examples include the potential use of alternative denominators within the health sector that may reduce numerator-denominator bias, and ways to improve NHI ethnicity data, such as linkage to the census as a gold standard data source.

CONCLUSION

Good quality ethnicity data to monitor Māori health and inequalities remains an ongoing goal. Improvements have been made in some datasets, such as mortality, but further effort is needed to reduce undercounting and misclassification of Māori ethnicity data across all datasets.

In terms of changes within the broader ethnicity data context, it is important that a focus remains on the purposes for which ethnicity data is being collected. These purposes, outlined by Statistics New Zealand, include providing for the monitoring of disparities between different population groups, as well as being able to understand what is happening for different populations over time in their own rights. Additionally, Statistics New Zealand, as a Crown agency, has obligations to take account of the Treaty of Waitangi implications of their work in this area, and to consider how decisions and policies may affect the Crown's ability to meet its obligations.

In addition, it is useful to consider the potential (and real) differential impact of changes to the ethnicity data environment, including changes to official standards for defining, collecting, classifying and outputting ethnicity data. Changes to the broader practices and policies surrounding ethnicity data may affect some types of analyses more than others. This appears to be the case with disparities analyses, which requires the ability to compare groups directly and to monitor outcomes over time. Some of the changes that have occurred as a result of the introduction of a new Statistical Standard potentially have a greater impact on disparities-type analyses than other analyses, such as the revisions to the official classification system, and the move away from the use of prioritisation as a method for

outputting multiple ethnicities. This could result in the need for increased resources (for example, time, money, and customised data requests) and expertise (conceptual and statistical) to achieve these types of analyses that are integral to the work of the health and disability sector, and many other sectors. There is also an opportunity cost, in the sense that money and time spent on undertaking these analyses could have been directed to interventions.

A number of the practical issues in relation to monitoring over time necessitate buy-in from those involved in the design and maintenance of data collection software and tools. It will be important to ensure that software developers and others with responsibility in this area are able to facilitate consistent data collection and that where changes are made, the implementation time can be reduced to achieve standardisation more quickly. In addition, time flags may be useful where ethnicity data is not recorded at every event, such as in primary care.

It is heartening that there appears to have been improvement in the completeness of ethnicity data in health datasets over the last two decades with a reduction in undercounting of Māori in hospitalisation and mortality datasets at least. However, this improvement is incomplete and inconsistent across datasets. That ethnicity data quality remains an issue after many years of advocating for improvement is a concern. High quality, accessible ethnicity data is fundamental to the Government's commitment to addressing Māori health needs and inequalities. Ongoing effort in the health sector is still required to achieve good quality

ethnicity data. It could be argued that a period of concerted effort with a shorter transition period may be less likely to disrupt time series. Challenges going forward include building on gains to improve and maintain ethnicity data quality and consistency over time, between numerator datasets and between numerators and the census. In addition, innovative ways to further improve estimates of Māori health and inequalities should be explored. It is encouraging that methods are being developed to improve Māori health estimates within current data limitations. However, these efforts would benefit from a collaborative, co-ordinated approach to avoid potential duplication of resources as well as to ensure comparability of findings.

Māori (and other ethnic groups) have the right to understand their own health status and the Crown has an obligation to monitor and address ethnic inequalities in health. Quality ethnicity data is fundamental to achieving this. It should be accessible at all levels, from communities to academics and policy makers.

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APPENDIX ONE: HEALTH MONITORING ACTIVITIES IN AOTEAROA/NEW ZEALAND

MONITORING USING ROUTINE NATIONAL DATASETS

Various monitoring activities are undertaken in Aotearoa/New Zealand using routinely collected datasets. Of particular relevance to health and disability, the Information Directorate of the Ministry of Health⁹ produces key reports on several health areas, drawing primarily on nationally-collected routine data sources. This includes annual reports on:

- Cancer: new registrations and deaths
- Mortality and demographic data
- Selected morbidity data for publicly funded hospitals
- Selected privately funded morbidity data
- Mental health: service use in New Zealand
- Report on maternity: maternal and newborn information
- Fetal and infant deaths.

In relation to Māori health and ethnic disparities, these reports all present information by ethnicity for some or all of the outcomes considered. As noted, ethnicity is usually drawn from routine datasets such as the National Health Index (NHI); the National Minimum Dataset (NMDS) (which includes hospital records and mortality data); the New Zealand Cancer Register (NZCR); the Maternal and Newborn Information System (MNIS); and the Mental Health Information National Collection (MHINC). Ethnicity data is not reported for the publications on privately funded morbidity data.

In addition, the Ministry of Health produce an annual report detailing the health workforce in Aotearoa/New Zealand, which also contains information on the ethnic makeup of the health workforce, based on ethnicity data collected via a voluntary health workforce questionnaire accompanying invoices for annual practising certificates (APC) (NZHIS 2007)¹⁰.

MONITORING OF NATIONAL HEALTH AND DISABILITY PROGRAMMES

A number of publicly-funded national health and disability programmes are undertaken in Aotearoa/New Zealand. Monitoring activities often form a part of these programmes. For example, the National Screening Unit (NSU) of the Ministry of Health (MOH) administers screening programmes for breast and cervical cancer, antenatal HIV, and newborn metabolic and hearing screening. Independent monitoring is undertaken for some of these programmes (including BreastScreen Aotearoa, the National Cervical Screening Programme, and antenatal HIV screening). The National Immunisation Register (NIR) collection contains information on immunisation enrolments and events that allows for the monitoring of immunisation programmes (NZHIS 2008). Data from the School Dental Service is also reported by ethnicity (MOH 2009).

PUBLIC HEALTH SURVEILLANCE

A range of public health surveillance activities are undertaken in Aotearoa/New Zealand. The Institute of Environmental Science and Research (ESR)

⁹ These reports were formerly produced by the New Zealand Health Information Service (NZHIS). In mid-2008, NZHIS and HealthPAC merged into the Ministry of Health's Information Directorate.
¹⁰ The workforce report produced by the Information Directorate (formerly NZHIS) only reports the ethnic makeup of each professional group. Further information on the characteristics of Maori in each professional group is provided on the website: <http://www.maorihealth.govt.nz/moh.nsf/indexma/workforce>

undertakes the surveillance of communicable and non-communicable diseases at a national level, including:

- Notifiable diseases
- Outbreak surveillance
- Sexually transmitted infections
- Chemical poisonings from the environment
- Hazardous substances injuries
- Influenza viruses
- Respiratory, enteric and herpes viruses.

Surveillance data on notifiable diseases is also produced regionally by local Public Health Units. Public health surveillance data is drawn from different sources, including laboratories and health clinics. Some indicators are reported by ethnicity; however, this is dependent on the source of the surveillance data.

STATISTICS NEW ZEALAND PRODUCED STATISTICS

Statistics New Zealand produces a range of health and disability related statistics that provide important data for monitoring health in Aotearoa/New Zealand. Some of these are generated from data gathered from external administrative sources, while others are collected through specific surveys and official collections administered by Statistics New Zealand, including the population census.

In relation specifically to health, Statistics New Zealand routinely produces statistics on:

- abortions (using data provided by the Abortion Supervisory Committee);
- births and deaths (produced quarterly from information provided by the Department of Internal Affairs),
- fertility (produced quarterly from information

- provided by the Department of Internal Affairs),
- life expectancy,
- alcohol and tobacco availability,
- injury (based on new Accident Compensation Corporation (ACC) claims),
- the financial status of District Health Boards (DHBs) (produced quarterly).

Statistics New Zealand also collects some health information in the 5-yearly population census. Questions on smoking status were included in the 1976, 1981, 1996, and 2006 Censuses. In addition, the 1996 and 2006 Censuses included a question for females 15 years and older asking about the 'number of children born alive'.

Disability information is produced from the Statistics New Zealand administered Disability Survey (discussed in the following section). Statistics New Zealand also undertake several other surveys that include some information on health or provide information on determinants of health, including the:

- Household Economic Survey (HES)
- Household Labour Force Survey (HLFS)
- New Zealand Income Survey
- Survey of Family, Income and Employment (SoFIE)
- General Social Survey (includes questions on health).

Statistics New Zealand is also planning to undertake a post-censal Māori Social Survey in 2012.

HEALTH AND DISABILITY INTELLIGENCE MONITORING ACTIVITIES

A number of surveys are undertaken periodically in Aotearoa/New Zealand, providing information on a range of health areas that is important in relation to

measurement and monitoring of Māori health and ethnic inequalities. Health & Disability Intelligence (HDI), (formerly Public Health Intelligence), manage a programme of population surveys as part of the New Zealand Health Monitor (NZHM). These include the:

- New Zealand Health Survey
- Te Rau Hinengaro – New Zealand Mental Health Survey
- New Zealand Adult Nutrition Survey
- New Zealand Child Nutrition Survey
- New Zealand Oral Health Survey
- New Zealand Tobacco Use Survey
- New Zealand Alcohol and Drug Use Survey.

The frequency of these surveys varies, as does the sample size (see Appendix 1 for a more detailed description of these surveys). HDI are currently moving toward a single, integrated, continuous survey which will replace the existing separate periodic surveys. The integrated New Zealand Health Survey is likely to go into the field in 2010 or 2011, and will interview approximately 1000 adults and 400 children each month. The survey will include a core taking approximately 20–30 minutes to complete, followed by rotating modules covering specific topics in more detail (e.g. mental health, nutrition, and substance use).

HDI also periodically produce monitoring reports on a range of health topics, including problem gambling, suicide, and tobacco, as well as chartbooks on the health status of population groups (e.g. Tatau Kahukura).

OTHER HEALTH AND DISABILITY-RELATED SURVEYS

In addition to the population surveys undertaken by HDI, surveys are administered by other agencies outside the health sector. These include, for example:

- post-censal Disability Survey conducted by Statistics New Zealand
- youth surveys undertaken by the University of Auckland (2001 and 2007)
- an annual smoking survey of Year 10 students undertaken by Action on Smoking and Health (ASH)
- a five-yearly survey of participation in gambling (conducted by the Department of Internal Affairs).

Longitudinal studies, cohort studies, and linkage studies

In addition to the official statistics produced from surveys and administrative records, there are a number of longitudinal, cohort, and linkage studies that provide useful information on Māori health and ethnic inequalities, and opportunities for monitoring over time. For example, the Christchurch Health and Development Study and the Dunedin Multidisciplinary Health and Development Study are birth cohort studies that have been running for a number of years. The Dunedin study is a cohort of 1000 babies born in 1972 and 1973, and the Christchurch study began in 1977 and includes 1200 participants. The Dunedin study has also expanded to include an 'offspring study'. Both studies include a focus on health behaviours, status, and outcomes.

The 'Growing up in New Zealand' project is a new longitudinal study that aims to follow a cohort of 7,800 children from the Auckland, Counties-Manukau and Waikato DHB regions. The project, launched in 2008, follows children from before their birth into adulthood, and includes a focus on child health and development.

Te Hoe Nuku Roa is a 25-year longitudinal study of Māori families begun in the mid-1990s. The study involves around 650 Māori families, and collects information on a range of indicators, including health. A longitudinal study is also being undertaken by Massey University looking at the relationships between health, work and retirement for people aged 55 to 70 years (<http://hwr.massey.ac.nz/study-info.htm>). Other longitudinal studies include the Pacific Islands Families Study, (First Two Years of Life & Transition to School), which follows a cohort of approximately 1400 Pacific children over their first six years of life, and the Youth Connectedness project, which involves three cohorts of youth (aged 10, 12 and 14 years) followed for three years.

The New Zealand Census-Mortality Study (NZCMS) is a cohort study undertaken jointly by researchers at the Wellington School of Medicine and Health Sciences and HDI at the Ministry of Health. The study involves the “anonymous and probabilistic linkage of census and mortality records” in order to provide better estimates of ethnic and socioeconomic trends in mortality (Ajwani, Blakely, Robson, Tobias, & Bonne 2003). The NZCMS has provided important information on ethnic and socioeconomic trends in mortality in the 1980s and 1990s (Ajwani, Blakely, Robson, Tobias, & Bonne 2003; Blakely, Fawcett, Atkinson, Tobias & Cheung 2005; Ministry of Health & University of Otago 2006), and more recently an update including the period 2001–04 (Blakely, Tobias, Atkinson, Yeh, & Huang 2007). According to the Ministry of Health, the NZCMS is “...the principal instrument by which the Ministry of Health monitors social inequalities in health and provides further understanding of the various determinants of health” (MOH 2007).

HDI also routinely links the PHO enrolment database (updated quarterly) to a range of numerator data, (including hospital separations,

laboratory tests and pharmaceutical prescriptions, as well as several others), using the encrypted NHI. This potentially allows the health of individuals (by ethnicity) to be tracked over their life course, (hence this data linkage system is called the “New Zealand Health Tracker”).

APPENDIX TWO: SUMMARY TABLE OF NZHM SURVEYS 2002–2012

Population Survey	Topic/data areas	Frame (target population)	Sample	Mode	Frequency
New Zealand Health Survey	Chronic diseases, biological and behavioural risk factors, reported health status, health service utilisation, sociodemographics.	All New Zealanders	Approximately 12,000 adults and approximately 5,000 children	Face to face, computer-assisted (CAPI) questionnaire plus anthropometric measurements in respondent's home.	Approximately every three years (2006/07, 2009/08 etc).
Te Rau Hinengaro - New Zealand Mental Health Survey	Prevalence, severity, impairment and treatment of major mental health disorders.	New Zealand adults (16 years+)	Approximately 13,000	Face-to-face CAPI questionnaire in respondent's home.	Approximately every 10 years (next planned for 2012)
New Zealand Adult Nutrition Survey	Food and nutrient intake, factors influencing dietary intake, nutritional status and nutrition-related health status.	New Zealand adults (15 years+)	Approximately 5000	24-hour dietary recall, questions on dietary patterns and nutrition related health, plus anthropometric measurements, in respondent's home. Blood and urine samples at laboratory collection point.	Approximately every 10 years (next 2008/09)
New Zealand Child Nutrition Survey	Food and nutrient intake, factors influencing dietary intake, nutritional status and nutrition-related health status.	New Zealand children (5 - 14 years)	Approximately 4000	24-hour dietary recall and a caregiver-administered questionnaire in home, and examination component at school.	Approximately every 10 years (next 2012)
New Zealand Oral Health Survey	Oral health status, beliefs, attitudes, knowledge and practices.	All New Zealanders	About 6000 adults and 2400 children.	Face-to-face interview in respondent's home and simple clinical dental examination in respondent's home or dentists clinic.	Last survey 1988, next starts Jan 2009
New Zealand Tobacco Use Survey	Tobacco use and the psychosocial correlates of smoking behaviours.	New Zealand adults (15 - 64 years)	Approximately 4000 to 6000	Face-to-face CAPI questionnaire in respondent's home.	Two out of every three years (2005, 2006, 2008, 2009 etc)
	Prevalence and consumption data available from the NZ Health Survey in third year.				
New Zealand Alcohol and Drug Use Survey	Alcohol and illicit drug use, and the behaviours associated with alcohol and drug use.	New Zealand adults (16 - 64 years)	Approximately 6000 to 8000	To be decided	Approximately every two years (2007, 2009, 2011 etc)

Source: Ministry of Health. 2005. The New Zealand Health Monitor: updated strategic plan. Wellington: Ministry of Health, p. 39

APPENDIX THREE: POPULATION CENSUS ETHNICITY QUESTIONS

A) 1981 CENSUS ETHNICITY QUESTION (NO LONGER IN USE)

ETHNIC ORIGIN

Either (a) If only one (full) origin, tick box which applies:

- | | |
|-----------------------------------|--------------------------|
| Full European or full Caucasian | <input type="checkbox"/> |
| Full New Zealand Maori | <input type="checkbox"/> |
| Full Samoan | <input type="checkbox"/> |
| Full Cook Island Maori | <input type="checkbox"/> |
| Full Chinese | <input type="checkbox"/> |
| Full Indian | <input type="checkbox"/> |
| Full Niuean | <input type="checkbox"/> |
| Full Tongan | <input type="checkbox"/> |
| Other full origin (specify) _____ | <input type="checkbox"/> |

Or (b) If of more than one origin, give particulars:

B) 1986 CENSUS ETHNICITY QUESTION (NO LONGER IN USE)

WHAT IS YOUR ETHNIC ORIGIN?

Tick the box or boxes which apply to you.

- | | |
|--|--------------------------|
| European | <input type="checkbox"/> |
| New Zealand Maori | <input type="checkbox"/> |
| Samoan | <input type="checkbox"/> |
| Cook Island Maori | <input type="checkbox"/> |
| Niuean | <input type="checkbox"/> |
| Tongan | <input type="checkbox"/> |
| Chinese | <input type="checkbox"/> |
| Indian | <input type="checkbox"/> |
| Other (such as Fijian, Tokelauan) please state _____ | <input type="checkbox"/> |

C) 1991 CENSUS ETHNICITY QUESTION (NO LONGER IN USE)

WHICH ETHNIC GROUP DO YOU BELONG TO?

Tick the box or boxes which apply to you.

- New Zealand European
- New Zealand Maori
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian •
- Other (such as Dutch, Japanese, Tokelauan) please state _____

Have you any New Zealand Maori ancestry?

- Yes
- No
- Don't know

D) 1996 CENSUS ETHNICITY QUESTION (NO LONGER IN USE)

Tick as many circles as you need to show which ethnic group(s) you belong to:

- New Zealand Maori
- New Zealand European or Pakeha
- Other European → Which of these groups?
- Samoan English
- Cook Island Maori Dutch
- Tongan Australian
- Niuean Scottish
- Chinese Irish
- Indian Other

Other (such as Fijian, Korean →)

 Print your ethnic group(s)

E) 2001 AND 2006 CENSUS ETHNICITY QUESTION (TO BE USED IN 2011 CENSUS)

11 Which ethnic group do you belong to?
Mark the space or spaces which apply to you.

- New Zealand European
- Maori
- Samoan
- Cook Island Maori
- Tongan
- Niuean
- Chinese
- Indian
- Other such as *DUTCH, JAPANESE, TOKELAUAN*. Please state:

