MINISTRY OF HEALTH
MANATŪ HAUORA

New Zealand Government

# Position Paper on Māori Health Analytics – Age standardisation

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# Purpose

Since 2006, the Ministry of Health (the Ministry) has age standardised to the 2001 Census Māori population in Māori health analytics, where Māori are the focus of the analytics and non-Māori are the comparator group.[1]

This paper explains why the Ministry uses this approach under the following sections:

- Background
- 2018 Census data
- Technical notes.

# Summary

The Ministry continues to use and advocate the use of the 2001 Census Māori population as the standard population in Māori health analytics. The main reasons for doing so are:

- results continue to be comparable with our previous work in this area and that of Māori academics and researchers we have worked with since 2006[2]
- the Ministry prefers to implement any changes to the standard population in consultation with its network of Māori academics and researchers.

# Background

For general reporting of health statistics, such as survey and administrative data that reports results for more than one ethnicity, the Ministry age standardises to the World Health Organization (WHO) standard population. However, when Māori are the focus of the analysis and non-Māori are the comparator group, the Ministry's approach is different.

Kaupapa Māori research acknowledges the right of Māori to good health and, therefore, advocates centralising Māori in a research setting. The use of the non-Māori group as a comparator for analysing Māori health data is favoured.

The non-Māori group is not a distinct ethnic group, but rather a group defined by the absence of individuals who identify as Māori. This population could also be conceptualised as Ngā Tāngata Tiriti, which includes all peoples not descended from Māori who are living in New Zealand by right of the Treaty of Waitangi.

1 For example in Tatau Kahukura: Māori Health Chart Book 2015 3rd edition, see **https://www.health.govt.nz/publication/tatau-kahukura-maori-health-chart-book-2015-3rd-edition**

2 The Ministry works closely with Māori academics and researchers such as Te Rōpū Rangahau Hauora a Eru Pōmare, University of Otago.

# What is age standardisation?

In this paper the direct method of age standardisation is used, which is the calculation of an overall standardised rate obtained by applying age-specific rates of a population to a standard population. Age-standardised rates are commonly expressed as a rate per 100,000, but can also be expressed as a rate per 100 (ie, a percentage), per 1000, or per 10,000.

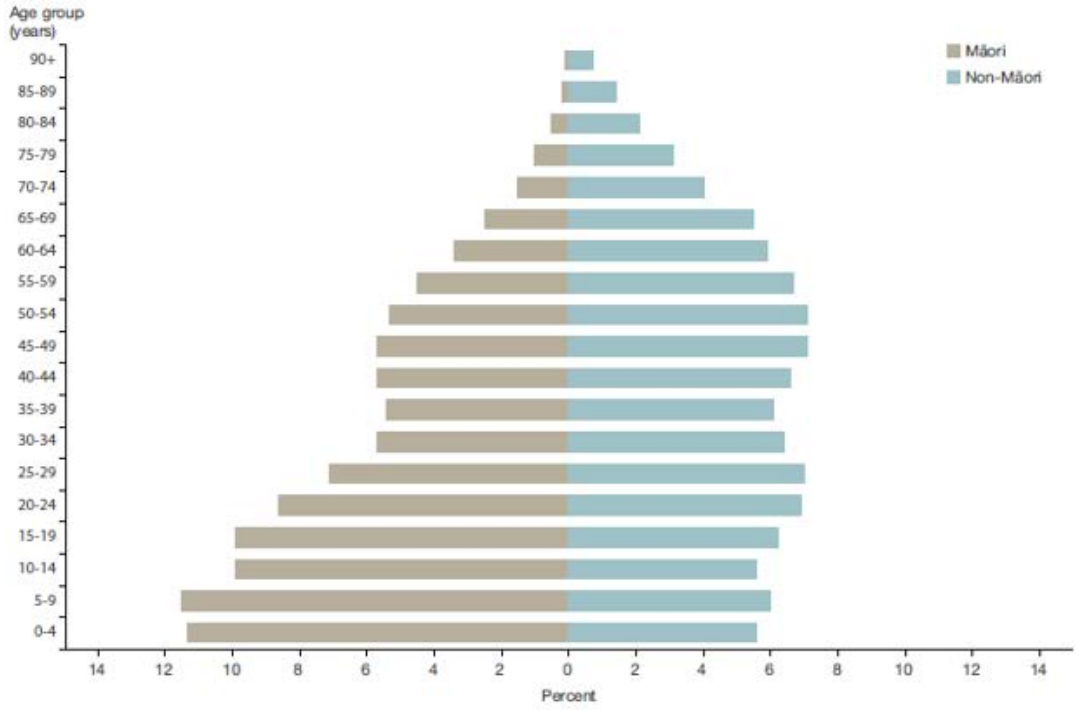
# Why age standardise?

Age-standardised rates can be used to compare health statistics between populations with different age structures, eg, Māori and non-Māori populations. Māori people on average are younger than non-Māori, which means these populations cannot be directly compared. Age-standardised rates should only be compared with other age-standardised rates that have been calculated using the same standard population.

# Māori and non-Māori age structures

According to 2015 population estimates, the Māori population remains much younger than the non-Māori population. For example, in 2015, more than 11 percent of Māori were aged 5–9 years compared to around 6 percent of non-Māori. This can be seen in the graph on the following page where the bars are much longer in the younger age groups for Māori, compared to non-Māori, and the opposite applies in the older age groups.

**Figure 1: New Zealand population, 2015, Māori and non-Māori, by age**




Source: Statistics New Zealand – Māori and non-Māori population by age, 2015

# Why did the Ministry begin age standardising to the 2001 Census Māori population in 2006 where Māori are the focus of the analytics?

The Ministry began age standardising to the 2001 Census Māori population in 2006 when it published Tatau Kahukura: Māori Health Chart Book 2006. Standardising to a Māori population provides rates that more closely approximate the crude Māori rates than could be provided by other standard populations eg, the WHO World Standard population, while allowing comparisons with the non-Māori population.

Prior to this, the Ministry consulted with its network of Māori academics and researchers, particularly with Te Rōpū Rangahau Hauora a Eru Pōmare – the Māori Health Research Centre of University of Otago, Wellington (Eru Pōmare), about which standard population to use. In consultation with Eru Pōmare, the Ministry chose to use the 2001 Census Māori population as the standard population so rates from both institutions would be comparable.

The 2001 Census Māori population was the latest available Census Māori population at the time.

# What standard population should be used?

Different population standards will produce different results. In general, the use of a standard population with a young age structure, for example the Māori population, will lead to low age-standardised mortality rates, while the use of a standard population with an old age structure will lead to high age-standardised mortality rates, due to the strong association between age and mortality. Likewise, rate ratios (RRs), will also be different depending on which standard population is used. (See *Technical notes*.)

Conversely, if a standard population is chosen with an age structure closely matching the focus group, age-standardised rates of the focus group will closely match the crude rates of the focus group.

In 2001, the WHO introduced the WHO World Standard Population. It expected this standard population to be used over the next 20 to 30 years. Information on age standardisation and the use of standard populations can be found in the WHO paper Age Standardization of Rates: A New WHO Standard,[3] which forms the basis of many claims in this report. The WHO paper states there is clearly no conceptual justification for choosing one standard population over another, hence the choice is arbitrary. It also adds that whichever standard population is chosen should ideally be maintained for a number of years, during which time the age structure of populations will change.[4]

[3] See: **http://www.who.int/healthinfo/paper31.pdf**

[4] Attempting to match a particular standard population to current population age structures is insufficient justification for choosing one standard population over another. Rather than selecting a standard population to match the current age-structure of some population(s), the standard population must be chosen to reflect the average age-structure of all populations to be compared over the period of use.

# Comparing age-standardised rates and rate ratios of different standard populations

When examining the Ministry's projects for 2017/18, it seemed timely to check if age standardising to the 2001 Māori population was still the best option for presenting Māori health analytics.

Firstly, the age structure of the Māori population has largely remained the same between 2001 and 2016, with a slight increase in the proportion of Māori in the later age groups. When tested, the slight increase in the proportion of Māori in the later age groups did not affect rate ratios (RRs).[5]

Secondly, the Ministry tested mortality data for Māori and non-Māori across a range of health conditions using different standard populations. Generally, age-standardised results for Māori produced lower age-standardised rates using a Māori standard population than those produced from SEGI[6] and WHO standard populations, and sometimes produced higher age-standardised RRs. These results are summarised in the table below and are available on request. These results are also in line with similar tests completed by Eru Pōmare.[7]

**Table 1: Comparison of age standardisation and rate ratio tests between Māori Census and estimated residential standard populations and SEGI and WHO standard populations**

| Test | Māori populations | SEGI and WHO |
|---|---|---|
| Age-standardisation rates | Generally lower | Generally higher |
| Rate ratios | Sometimes higher | Sometimes lower |

Lastly, one of the Ministry's 2017/18 projects is to provide data as an evidence base for a Treaty of Waitangi Tribunal claim (WAI2575), where Māori are the focus of the analytics. A decision to continue using the 2001 Census Māori population as the standard population allows work in this area by the Ministry and Eru Pōmare to be comparable and support this project.

[5] To see if the slight increase affects rate ratios (RRs) for these age groups, testing was undertaken using cancer mortality data which is correlated to the later age groups. Results showed that these RRs were almost identical no matter if a 2001 or 2016 Māori standard population was used – confirming the slight increase in the proportion of Māori in the later age groups did not affect RRs.

[6] The SEGI population was the standard population used by the WHO from the 1960s to the current WHO standard population, it was constructed by Dr Mitsuo Segi.

[7] See: Age Standardisation – An Indigenous Standard? Emerging Themes in Epidemiology.

After considering these results and the Ministry's current demand for Māori-centred analytics, the Ministry does not see a compelling reason to change the standard population, as any change to another standard population would produce conflicting results. In addition, the Ministry wishes to continue working with its network of Māori academics and researchers and seeks a joint change to a different standard population, rather than acting alone.

# Opportunity to review our approach: 2018 Census data

The 2018 Census data will present an opportunity to see if the Māori population's age structure has changed substantially between 2001 and 2017. If testing shows the Māori population's age structure has changed substantially, the Ministry will consult with its network of Māori academics and researchers and move to update the standard population.

Statistics New Zealand have reported there is a delay in the 2018 Census data because the response rate is lower than it has been in previous years. For Māori, there could be an even lower response rate, especially in areas that have historically had lower response rates.

Statistics New Zealand is currently working to understand what it means for data quality generally and for Māori data. Only when this is understood will the Ministry move to update the standard population to the 2018 Census data.

# Technical notes

## What are rate ratios?

Rate ratios (RRs) are often presented with confidence intervals (CIs) and can be age standardised. Age-standardised RRs are commonly used when studying differences in population groups' rates over time. In general, if the CI of a RR:

- includes 1, it suggests there is no difference between the population groups being compared
- is greater than 1, it suggests an increase of risk
- is less than 1, it suggests a reduced risk.

For example, if the age standardised RR comparing the rate of ischaemic heart disease in Māori with non-Māori is 1.06, with a confidence interval of 0.87-1.25, the CI includes 1 therefore there is a 95 percent chance there is no difference between Māori and non-Māori rates of ischaemic heart disease. We will report this as *rates for Māori are similar to those of non-Māori*.

With a rate ratio of 1.37 and a CI of 1.18-1.56, the range of the CI is greater than 1, therefore, there is an increase in the risk of ischaemic heart disease for Māori compared to non-Māori. We will report these findings as *rates for Māori are around 1.4 times as high as those for non-Māori*. Another way to say this is *there is a 95 percent chance the rate for Māori is between 1.18 and 1.56 times as high as the rate for non-Māori*.

When the range of the CI is less than 1, we will report these findings using the same terms. However, because the risk is less than 1, it suggests reduced risk.

## What are confidence intervals?

A confidence interval (CI) gives an indication of uncertainty around a single value, such as an age-standardised rate. CIs are calculated with a stated probability; normally 95 percent, which means the CI has a 95 percent probability of enclosing the true value.

The CI is influenced by the sample size of the group. As the sample size becomes smaller, the CI becomes wider, and there is less certainty about the rate.