



**Māori Incomes:  
Investigating Differences Between Iwi**

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## **Abstract**

This paper investigates several factors that may be important for improving Māori outcomes, and the extent to which their importance varies by iwi. Specifically, it examines the extent to which controlling for differences in characteristics of the European population and the populations of various iwi can account for the differences in income distribution between the groups. It finds that qualification levels are important—they account for an average of approximately 29% of the difference between iwi and European incomes. The differing age distributions and the proportions of the population with different work and labour force statuses also account for much of the difference. Residence in different types of urban or rural area appears less relevant, as does residence in different regional council areas. The sizes of the influences of the different factors vary considerably by iwi and sometimes by gender. This suggests that policies aimed at improving Māori incomes may be more cost-effective if they target specific iwi.

### **JEL classification**

J15—Economics of Minorities and Races, D31—Personal Income, Wealth, and Their Distributions.

### **Keywords**

Income distribution, Māori income, iwi, decomposition.



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# 1 Introduction

This paper conducts a preliminary investigation into factors that may be important for improving the incomes of Māori. It examines candidate covariates using data that are currently available and marks them for further work, which will be done when we obtain unit record data. The factors we consider are highest qualification, work and labour force status, urban or rural residence, and regional council area. Additionally, age is examined as an explanation for some of the difference in outcomes between Māori and Europeans in New Zealand.

Studies that compare the socioeconomic outcomes of Māori with those of other ethnic groups generally pay little attention to the differences within the Māori population, between iwi.<sup>1</sup> The iwi was traditionally the largest socio-political organisation in Māori society, and was generally a territorial entity. Today, iwi is very important to the identity of many Māori, and socioeconomic outcomes differ significantly between iwi. Consequently, it is important that we examine differences within the Māori population, not just between Māori and other ethnic groups. One paper that examines the importance of iwi for Māori outcomes is Vaithianathan (1995), although its focus and approach are quite different to those used here.

This paper focuses on the differences in income that exist between iwi. Specifically, it examines the extent to which the factors that are most important in improving Māori socioeconomic outcomes vary between iwi. This analysis is performed by looking at how the differences between the income distributions of an iwi and of a benchmark population change when we account for differences in one of the underlying characteristics listed previously. We perform these adjustments for a small number of the larger iwi, and compare the results. Informal checks are used to verify that the iwi studied are not unusual among the Māori population as a whole in terms of the aspects of interest.

Because of limitations on the data available, this paper is primarily descriptive. Rather than give a comprehensive and detailed analysis of its subject,

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<sup>1</sup> See, for example, Te Puni Kōkiri (1998) and Te Puni Kōkiri (2000).

it aims to give a summary of the relevant data, and to highlight areas that appear to be worth pursuing in greater depth. Much of this further research will become possible when we have access to unit record data from the New Zealand Census of Population and Dwellings.

Section 2 of this paper gives a brief overview of the data used. Section 3 examines the features of iwi income data. Section 4 looks at the extent to which poor Māori outcomes may be attributable to age demographic, qualification levels, work and labour force statuses, rural and urban residence, and regional council area. Section 5 considers what all this tells us about how to improve Māori incomes. Section 6 draws some conclusions.

## **2 Data**

The data used in this project come from the New Zealand Census of Population and Dwellings for the years 1991, 1996 and 2001. We have relied on data available from the Statistics New Zealand website [[www.stats.govt.nz](http://www.stats.govt.nz)], which provides data at the aggregate level only, decomposed along up to four dimensions.

The definition of Māori used in this paper is any person who specifies Māori as either their only ethnicity or one of their ethnicities. Similarly, everyone who stated European as their ethnicity or one of their ethnicities was counted in the European group. Clearly, all individuals who stated both Māori and European as their ethnicities were counted in both groups. Although this blurred boundary between ethnicities is less than ideal in that it lessens statistical differences between the groups, the boundary in reality is no clearer. Papers such as Chapple (2000) and Chapple and Rea (1998) emphasise the evolving nature of the Māori ethnic group and its lack of a clear-cut boundary. These papers also discuss the differences between the outcomes of sole- and mixed-Māori individuals. It is well-known that such differences are considerable. Faced with the choice of using sole Māori or all Māori, we choose to use all Māori, which gives us a larger population and is less likely to be biased towards the older generation.

The variable of central interest in this paper is income. The income question in the Census had slightly different income brackets in the three Census

years of interest. For graphing purposes, these data are aggregated slightly to the following per annum income brackets: zero income or loss, \$1 to \$5,000, \$5,001 to \$10,000, \$10,001 to \$15,000, \$15,001 to \$20,000, \$20,001 to \$25,000, \$25,001 to \$30,000, \$30,001 to \$40,000, \$40,001 to \$50,000, \$50,001 to \$70,000, and \$70,001 or greater.<sup>2</sup> For the purposes of adjustment by the various characteristics, the categories “zero income” and “loss” are separated, “\$70,000 or greater” is disaggregated into “\$70,000 to \$100,000” and “\$100,001 or greater”, and the category “not stated” is also used. Income data refer to the usually resident population aged 15 years or older. For some analyses, incomes of the working age population would have been preferable, but we are limited for this paper to the available published data.

Outcomes in the Māori population are examined separately in this paper according to the iwi of the respondent. Census respondents are included in every iwi with which they claim an affiliation, thus many individuals are counted for two or more iwi.

However, there is a discrepancy between census years in the manner in which iwi is determined. In all three census years, respondents who replied “yes” when asked if they had any Māori ancestors were asked to name the iwi (one or several) to which they were affiliated. The 1996 and 2001 Censuses asked this question in comparable manners, suggesting the respondent enter up to six and up to five iwi respectively. The 1991 Census, however, asked for one “main iwi” and up to two “other iwi”. The concept of “main iwi” is a European rather than a Māori idea. It has been suggested, therefore, that some Māori were unsure which iwi to call their “main” one, and opted for a “don’t know” response.<sup>3</sup> The extent of the bias this may have created when compared with the later censuses is uncertain.

A rough idea of the extent of double counting of individuals by including each in several iwi can be gained by a comparison of the total number of iwi responses to the number of respondents.

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<sup>2</sup> The last category, \$70,001 or greater, is not in fact illustrated in the graphs because it adds little information.

<sup>3</sup> Vaithianathan (1995).

Table 1 shows that, in the 2001 Census, the ratio of iwi responses to Māori who answered the iwi question was approximately 1.5 to 1. Thus Māori who specified at least one iwi specified one and a half iwi on average. This ratio is smaller in 1991 and 1996, and is similar in those two years.

To place these values in context, it is useful to look at the iwi classification system. Statistics New Zealand's Statistical Standard for Iwi 2000<sup>4</sup> defines iwi as follows:

The iwi today is the focal economic and political unit of the traditional Māori descent and kinship based hierarchy of:

- Waka (founding canoe)
- Iwi (tribe)
- Hapu (sub-tribe)
- Whanau (family).

In deciding whether to classify a tribal group of Māori as an iwi, Statistics New Zealand considers a number of factors, including the group's historical or genealogical tradition, and whether it has a history of operating as a separate, recognised iwi in a business or resource management capacity. Neither population size nor linguistic differentiation is an important determinant.<sup>5</sup>

Because of the vast number of iwi and the small size of many of them, this paper investigates results only for a selection of the larger iwi. The iwi for which data were examined are the 13 iwi that each contained 10,000 or more members according to the 2001 Census. Two of these are in fact groupings of iwi. The first of these is Te Atiawa, which includes Te Atiawa (Taranaki), Te Atiawa (Te Whanganui a Tara / Wellington), Te Atiawa ki Whakarongotai, Te Atiawa (Te Waipounamu / South Island) and Te Atiawa, region unspecified.

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<sup>4</sup> Statistics New Zealand (2000).

<sup>5</sup> Statistics New Zealand (2000).

The second is Ngāti Kahungunu, which includes Ngāti Kahungunu ki Te Wairoa, Ngāti Kahungunu ki Heretaunga, Ngāti Kahungunu ki Wairarapa, Ngāti Kahungunu region unspecified, Ngāti Kahungunu ki Whanganui a Orotu, Ngāti Kahungunu ki Tamatea, and Ngāti Kahungunu ki Tamakinui a Rua.

The groupings of iwi used for the 1991 analysis differ very slightly from these groupings because of data availability limitations. In the 1991 census, the iwi Te Atiawa ki Whakarongotai is not one of the possible iwi, and thus does not appear in the Te Atiawa iwi grouping. Additionally, a few of the small iwi placed in the Ngāti Kahungunu grouping in 1996 and 2001 were not separate categories in 1991, and thus were caught in the group *Other (Ngāti Kahungunu)*.

The other iwi for which data were examined are Ngāpuhi, Ngāti Porou (east coast only), Ngāi Tahu / Kāi Tahu, Waikato, Ngāti Tūwharetoa, Tūhoe, Ngāti Maniapoto, Ngāti Awa, Ngāti Whātua, Te Rarawa and Ngāti Raukawa (Horowhenua / Manawatū). Table 2 shows the populations of these iwi in the years of interest, and that of the overall Māori population. It is relevant to note that the iwi examined vary greatly in size. In 2001, there was nearly a tenfold difference in population between the smallest of the iwi examined, Ngāti Raukawa (Horowhenua / Manawatū), and the largest iwi, Ngāpuhi. However, this table must be interpreted with care, because many individuals are counted for more than one iwi.

This paper begins by examining income distributions by iwi, and the extent of the differences between iwi. It then looks at the income distributions of subsets of the population with certain characteristics, and the effect of the distribution across these characteristics of iwi members on iwi income distributions. The characteristics considered are age distribution, distribution of highest qualifications, proportion in each work and labour force status group, residence in types of rural or urban area, and residence in regional council area. These factors were chosen for several reasons. First, it was thought that they might have important influences on the income distributions of the iwi. Second, data that were broken down appropriately by income for Europeans or All New Zealanders were available. Iwi income distributions are available only for each iwi population but not broken down by the factors of interest.

Income data broken down by age category is available for 2001. The age categories provided are each five years wide, from 0–4 years up to 80–84 years. The exception is the highest category, which is 85 years and older.

Income is also adjusted using a breakdown by highest qualification. The categories of qualification used are *no qualification, fifth form qualification, sixth form qualification, higher school qualification, other NZ secondary school qualification, overseas secondary school qualification, basic vocational qualification, skilled vocational qualification, intermediate vocational qualification, advanced vocational qualification, bachelor degree, higher degree* and *not elsewhere included*. Because of the recategorisation of a number of courses after 1991, the post-school categories in 1991 are not precisely comparable to these categories in later years.

The next variable of interest is work and labour force status. The categories are *full-time employed, part-time employed, unemployed* and *not in the labour force*. A person is classified as employed if he or she is in the working age population and usually works for one hour or more per week either:

- for pay or profit in the context of an employee / employer relationship or self-employment
- in work that contributed directly to the operation of a farm, business or professional practice owned or operated by a relative.

A *full-time employed* person usually works for 30 or more hours per week; a *part-time employed* person usually works for fewer than 30 hours per week. A person in the working age population is *unemployed* if, in the week leading up to the census, he or she was without a paid job, was available for work and either:

- had actively<sup>6</sup> sought work in the four weeks leading up to census night
- had a new job to start within four weeks.

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<sup>6</sup> Only looking at job advertisements in the newspaper is not considered to be active seeking of work.



Everyone who is neither employed nor unemployed is considered to be *not in the labour force*.

People living in New Zealand were also categorised by the type of area in which they lived. The categories are *main urban area*, *secondary urban area*, *minor urban area*, *rural centre*, *other rural* and *other*.

The final variable used was regional council area. The 16 regional council areas in New Zealand are the *Northland region*, *Auckland region*, *Waikato region*, *Bay of Plenty region*, *Gisborne region*, *Hawke's Bay region*, *Taranaki region*, *Manawatū-Wanganui region*, *Wellington region*, *Tasman region*, *Nelson region*, *Marlborough region*, *West Coast region*, *Canterbury region*, *Otago region* and *Southland region*.

### **3 Iwi income distributions**

This section examines the income distributions of the large iwi selected for analysis, the Māori population as a whole and the European population. Its purpose is to provide an overview of the raw data, and to examine differences in income distributions between iwi.

As Figure 1 shows, there is a moderate amount of variation in income distributions among iwi. For comparison, the distributions for European males and European females respectively are shown on these graphs. Compared with the spread between iwi, European females appear to be barely an outlier. The difference between iwi males and European males, however, is more significant.

This type of graph will be used frequently in this paper, so it is worth taking time to understand it. The top panel, males, shows the male income distributions for all Māori and for Europeans, and also the maximum and minimum proportion in each income bracket over the large iwi. For each of these lines, the height over each income bracket \$5,000 wide represents the proportion of the population that has an income within that bracket. For instance, for Europeans, approximately 5.9% of the population has an annual income between \$0 and \$5,000. In some income brackets, such as \$30,000 to \$40,000, data was not available for the individual \$5,000 brackets. To be consistent with the other

cases, the height of the line between \$30,000 and \$35,000 represents half of the proportion of the population with incomes between \$30,000 and \$40,000.

Examining median incomes<sup>7</sup> is one further way to look at variation in income distributions between iwi. Table 3 summarises median real income data for the large iwi, Māori and Europeans. The values are in real 2001 dollars. This table shows that the spread in median incomes by iwi is much greater for males than for females. For example, in 2001, the largest median iwi male income was 43% larger than the smallest, while the equivalent female difference was only 18%. The difference between Māori and European median incomes is also greater for males. In 2001, the ratio of European male median income to Māori male median income was 1.44 to 1, while this ratio for females was much lower at 1.14 to 1. This greater similarity of female incomes has been noted before in such papers as Maani (2000).

It is also interesting that, while the median real incomes of European males and females grew at similar average rates over the 10-year period, Māori male incomes grew considerably faster than Māori female incomes, and also faster than European male incomes. In the five years between 1991 and 1996, Māori male incomes grew over four times as fast as European male incomes. However, a considerable proportion of this growth can be attributed to a very poor preceding five years for Māori males. Consequently, much of this growth merely caught Māori male incomes up to where they would have been had the preceding years been more moderate. Regardless of its cause, this growth was not spread evenly over iwi. Over the 10-year period, the fastest growing male iwi incomes increased seven times as fast as the slowest growing male iwi incomes.

Table 3 and Table 4 suggest that, while the males of some iwi improved their incomes considerably over the decade to 2001, both in absolute terms and relative to Europeans, the male incomes in other iwi are still growing more slowly than those of Europeans. The difference between Māori and European female incomes is less, but it is only decreasing for a selection of iwi. While it is true that

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<sup>7</sup> In some cases, median incomes were provided by Statistics New Zealand. Elsewhere, they were derived using linear interpolation within the appropriate income bracket.

many of the faster-growing iwi began with lower incomes, this is not a strict relationship. Some of the iwi whose incomes grew very rapidly began near the top of the iwi distribution.

## **4 Income distribution adjustments**

Section 4 considers the effect on income distribution of various characteristics of iwi members. For ease of presentation, it would be preferable to adjust all iwi distributions to the same benchmark population composition. Ideally, the characteristics occurring in iwi populations would be reweighted in frequency so that their distributions resembled those in a yardstick population, such as the pooled Māori population, or the population of New Zealand Europeans. Unfortunately, the readily available data do not provide a sufficiently detailed disaggregation of the iwi income distribution by characteristics. Consequently, in this section, raw iwi income distributions are compared with adjusted European and adjusted overall New Zealand income distributions.

We first compare the raw iwi income distribution with the raw European income distribution, noting the different proportions of the two populations in each income bracket. We then adjust the European population composition to match that of the relevant iwi, and compare the different income distributions.

We are trying to detect characteristics of the European and Māori populations that differ in ways that we would expect to lead to different income distributions. Differences in population composition can lead to large differences in income distributions if the differences in composition are large, and if incomes vary greatly by characteristics. If differences in composition are small, income distributions are likely to be small unless incomes vary greatly across characteristics.

In comparing the income distribution of the European population with that of a particular iwi, we adjust the European income distribution. We generate a counterfactual of what the European income distribution would have been if the European population had had the same composition as the iwi under consideration. The counterfactual is derived as:

$$\frac{\tilde{N}_i^{Eur}}{N_{\bullet\bullet}^{Eur}} = \sum_{j=1}^J \left( \frac{N_{ij}^{Eur}}{N_{\bullet j}^{Eur}} \right) \left( \frac{N_{\bullet j}^{Iwi}}{N_{\bullet\bullet}^{Iwi}} \right)$$

where i=income band; j=subgroups (e.g. age bracket).

Income distribution adjustment of the European population is performed for a variable such as age as follows. The raw income distributions (in terms of numbers of people) for each age category in the European population are first listed. The number of people in each income bracket for each age category is divided by the proportion of the European population in that age category, and multiplied by the proportion of the iwi population in that age category. These hypothetical numbers of people in each income bracket for each age group are then aggregated over all age groups. The resulting adjusted income distribution is recalculated in terms of proportions of the population. This adjusted income distribution then shows what the European income distribution would look like if the European age distribution were the same as that of the iwi under examination.

Although this method of adjustment gives a useful preliminary idea of the importance of various population characteristics for iwi income distributions, it is limited in an important way. Income distributions are influenced by many population characteristics, yet this method only allows for adjustment by one characteristic at a time. If there exists some correlation between characteristics in the population, as is highly likely, then this method may be misleading as to the importance of these characteristics. However, breakdowns of the populations over a larger number of dimensions would be required to analyse the effect of more than one characteristic at a time.

Because of limitations in the data that are readily available, all of the income distributions considered in this section correspond to the population aged 15 years and older. This has a number of implications for adjusting the income distribution with respect to the various characteristics. It can reasonably be expected that the inclusion of the retirement-aged population will dampen some of the differences between the Māori and European populations. For instance, most people aged 65 and over, both Māori and European, are retired. Furthermore, a much higher proportion of the European population than of the Māori population falls into the 65 and over age bracket. Consequently, inclusion of these people

may decrease or otherwise distort the differences between work and labour force participation rates of Māori and Europeans.

Any relationships that exist between income levels and qualifications in the working age population are likely to break down for those people of retirement age. Thus patterns of income distribution for various qualifications are likely to vary less between qualification levels when they are determined using data that include people of retirement age. This will likely make the effects of controlling for qualification levels less distinct. Arguments that including people aged 65 and over may reduce the clarity of the effects of controlling for certain characteristics can be applied to some extent to all of the characteristics considered.

Section 4.1 considers an adjustment by age, Section 4.2 by highest qualification, Section 4.3 by work and labour force status, Section 4.4 by urban or rural residence and Section 4.5 by regional council area. The data used for all of these income distributions are from the 2001 Census.

## **4.1 Age**

Life-cycle and experience considerations mean we would expect income distribution to vary considerably by age. Education causes many people to not enter the labour force until their early twenties or even later; many people, especially women, withdraw from the labour force or work reduced hours while caring for children; at the older end of the working age population, early retirement begins attrition of the labour force. Experience acquired is generally greater for older age groups. This translates into greater human capital and thus into higher wages.

If this theory is correct in its prediction that income distributions vary significantly by age, we would expect that the income distributions of two populations with different age profiles might differ considerably. The Māori and European populations are two such groups. Specifically, the Māori population is, on average, considerably younger than the New Zealand European population.

Figure 2 shows the extent of the difference in age distributions within the adult populations of Māori and Europeans in 2001. There are larger

proportions of the Māori population in the younger age brackets, and smaller proportions in the older age brackets. Almost 15% of adult Māori fall into the 15 to 19 age group, compared with approximately 8½% of Europeans. At the other end of the distribution, nearly 3½% of adult Europeans are aged 80 to 84, but less than half a percent of adult Māori fall into this age bracket. The magnitude of these differences suggests that adjusting the income distributions for age could have a considerable effect, provided that there are differences in income distributions between age groups.

Within the Māori population, between iwi, there is some variation in age distribution. However, it is not great when compared with the difference between the Māori population as a whole and the European population. Table 5 shows the differences in age between iwi. The median ages presented here are for the working age population, 15 to 64 years old. The spread of median and mean ages would be greater for the entire population. None of the iwi studied has either a mean or median age that is as large as that of Europeans; the youngest of the large iwi has a median age seven years younger than the median European age. Furthermore, the median European age is more than four standard deviations above the mean of the median ages for the large iwi. Gender differences in age distribution were negligible for the groups considered.

The iwi that have been selected for examination are, on average, very slightly younger than the overall Māori population. The small magnitude of the difference suggests that the iwi chosen are fairly indicative of Māori overall in terms of age distribution. Consequently, we are able to make some tentative inferences about the overall Māori population regarding income effects of age on the basis of examining these iwi.

Besides the differences in age distributions of the iwi and Europeans, another factor that determines the extent of the effect of age adjustment on incomes is the difference in the income distributions of different age groups. Figure 3 and Figure 4. give two perspectives on the relationship between age and income. Figure 3 illustrates, separately for males and females, the income distributions of two different age groups over all New Zealanders. The

distributions for all the different age groups are tabulated in Appendix A, Table A1. Figure 4 shows the evolution of median and quartile incomes by age.

As expected, many young people have zero or very low incomes, and very few have high incomes. For males, average incomes appear to rise until somewhere in middle age, at which point factors such as early retirement begin to have an effect and average incomes begin to fall. Female average incomes are also low at very old and young ages, but are double-peaked over the life cycle, with a decrease during the main childbearing and child-raising years. Because the data displayed show income distributions for all age groups at one point in time, rather than following one age cohort through their lives, it is not possible to tell a precise story about how incomes change over the life cycle of any particular cohort. However, it is possible to determine that the data are roughly consistent with the life cycle changes that we would expect to see.

Age adjustment of the European male and female income distributions were then performed for each large iwi. Because iwi data were not readily available broken down by income and age group, and iwi income distributions were only available for the age group 15 years and older, the income distributions relate to those 15 years and older. This is unfortunate, because it captures age groups that are mostly in retirement rather than just capturing the working age population. However, the comparison of adjusted income still gives an indication about the desired result. The age brackets used for the adjustment are five-yearly intervals except for the oldest group: the first group is 15 to 19 years old, and the oldest is 85 years and over. The data used are from the 2001 Census.

Figure 5 and Figure 6 illustrate for one iwi, Tūhoe, the effect of age adjustment on comparisons with European income distributions. Tūhoe is one of the iwi for which age adjustment should have the greatest effect, because it is the youngest of the iwi examined. It has a median age of 31.1 years, compared with the median of 38.2 for all New Zealanders.

The top panels for each of Tūhoe males and Tūhoe females show the actual income distributions of the iwi against the income distributions, raw and

age adjusted, of the comparable European groups.<sup>8</sup> The lower panels present this same information in terms of the differences between the proportion of Tūhoe and of Europeans in each income bracket.

Because Tūhoe has a larger proportion of young people, the European adjustment means that an increased weight is placed on the incomes of young Europeans. These people tend to have lower incomes, and thus the graph for adjusted Europeans shows a higher proportion of people earning low incomes.

The top panel for males shows that the Tūhoe male income distribution is severely skewed right. It peaks in the \$5,000 to \$10,000 bracket, with nearly 17% falling into this range. Although there is a slight rise in numbers between \$15,000 and \$30,000, brackets above \$10,000 generally contain progressively fewer members. The raw European distribution is more clearly double-peaked, with the second peak at \$25,000 to \$30,000. The first peak shifts from the \$10,000 to \$15,000 bracket to the \$0 to \$5,000 bracket with age adjustment.

The Tūhoe female income distribution shows a similar skew to the male distribution, but peaks in the \$10,000 to \$15,000 bracket. The raw European female distribution is similar, except that it is lower below the \$20,000 mark and higher above it. Age adjustment of European females shifts the peak to the \$0 to \$5,000 bracket.

The raw difference in male income distributions shows that each of the sub-\$30,000 income bands has a higher proportion of the Tūhoe male population than of the European male population. For instance, 5% more of the Tūhoe population are in the \$0 to \$5,000 band. Some of this difference is because the Tūhoe population has a higher proportion of young people, who, as shown in Figure 3, tend to have low incomes. The "adjusted" difference has controlled for the difference in age structures. Tūhoe still have a higher proportion of males in the low-income bracket, beyond what can be accounted for by age differences alone.

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<sup>8</sup> Responses that income was either zero or less than zero were grouped and assumed spread evenly on the interval from -\$10,000 to \$0. However, a vast majority of these responses were in fact zero income.



The pre-adjustment differences for females are similar to those for males, except that the crossover point where there ceases to be a higher proportion of Tūhoe than of Europeans is lower, at \$20,000. Age adjustment explains or more than explains almost all of the greater Tūhoe proportions below \$5,000. However, the number of Tūhoe between \$5,000 and \$20,000 is much greater than can be explained by age, and the number above \$20,000 is fewer than can be explained by age.

One quantitative measure of the effect of age adjustment on the difference between iwi and European income distributions is the dissimilarity index. This index gives the percentage of one population that would have to change income bracket for the two populations to have identical distributions. It gives a simple quantitative measure of the difference between two distributions. However, such a crude measure clearly has severe limitations. For instance, a dissimilarity index does not give any information about where in the income distribution the differences lie, and thus it has nothing to say about the relative means or medians of the distributions. It may be that a dissimilarity index rises when some adjustment is carried out, where in fact the adjustment lessens the gap between some average measure of income. While bearing these caveats in mind, we can still glean some useful summary information from dissimilarity indices.

Table 6 presents dissimilarity indices for the large iwi relative to the raw and age-adjusted European income distributions. These indices were calculated using the following income brackets: loss, \$0, \$1 to \$5,000, \$5,001 to \$10,000, \$10,001 to \$15,000, \$15,001 to \$20,000, \$20,001 to \$25,000, \$25,001 to \$30,000, \$30,001 to \$40,000, \$40,001 to \$50,000, \$50,001 to \$70,000, \$70,001 to \$100,000, and \$100,000 and over.

If a change in dissimilarity index of 10% or more is considered a significant change, then, for most of the large iwi, age adjustment has a barely significant effect on the difference between iwi male and European male income distributions. For females, most of the changes appear very significant, but are positive. Thus it appears from the dissimilarity indices that controlling for age greatly increases the difference between iwi female and European female income distributions. However, this is one circumstance in which dissimilarity indices are

somewhat misleading. The graph for Ngāti Raukawa (Horowhenua / Manawatū) females, Figure 7, illustrates this point. This figure shows that age adjustment of European females significantly increases the proportion with incomes below \$5,000, and significantly decreases the number with incomes between \$5,000 and \$20,000. The effect is almost certainly a fall in mean income. Ngāti Raukawa female mean and median incomes in 2001 were slightly below those of Europeans. It is therefore possible that age adjustment brought the European mean down close to or even below the Ngāti Raukawa mean. However, the dissimilarity index does not distinguish this situation from a situation where the adjustment increased European mean and median incomes, increasing the European lead over Ngāti Raukawa. The positive changes in dissimilarity indices for females should therefore be interpreted with care.

Table 7 further demonstrates the need for caution in interpreting any single descriptive statistic on the effect of adjusting income for a population characteristic. This table shows the effect on the median incomes of European females when age distribution is adjusted to match those of various iwi. In contrast to the dissimilarity indices, which suggest age adjustment increases the iwi-European differences in income distribution for all iwi, the median income measures suggest a decrease in the difference in the majority of cases. It is likely that an examination of changes in mean incomes would present a different verdict again.

The effect of controlling for age is similar in some aspects for males and females in all the iwi examined. In each case, age differences explain a significant number of iwi members with incomes under \$5,000, and suggest that the iwi are significantly over-represented in the \$5,000 to \$20,000 range. Controlling for age has little effect on relative iwi proportions with incomes over \$20,000 for most iwi. The magnitude of raw differences in proportions in the various income brackets varies considerably across iwi, as does the magnitude of the effect of age adjustment. Dissimilarity indices suggest that age adjustment has a barely significant effect for the males of most iwi, and an insignificant effect for some. However, they also indicate that controlling for age increases differences between iwi and European incomes for females, which is unlikely to be true in a

meaningful sense. Overall, allowing for the different age demographics of Māori and non-Māori populations makes iwi populations appear less over-represented in incomes below \$5,000, but more over-represented in incomes from \$5,000 to \$20,000. The predominant difference between iwi and European incomes appears not to be accounted for by age differences.

## 4.2 Highest qualification

It is a well-known fact that the formal qualifications possessed by a person greatly affect the jobs he or she is likely to be offered, and thus affect his or her expected income. This section investigates the extent to which variations in qualifications between European and iwi groups account for the differences in income distribution observed between these groups.

Table 8 summarises the highest qualifications of the large iwi, all Māori and the European population in 2001. The qualification categories are fairly aggregated and they all, particularly *vocational qualification*, encompass a range of levels of qualification. It is clear from this table that qualification levels of Māori males and females differ considerably, with females generally more educated, and thus the two genders should be considered separately in analysis.

The proportion in each iwi with no qualifications varies greatly, ranging from 29.4% to 41.7% for large-iwi males. The proportion with other levels of qualification varies less between iwi in percentage point terms, but the differences are still large. For example, the percentage of males with degrees varies from 3.4% to 7.6% between iwi; the percentage of females varies from 4.4% to 8.4%. These differences suggest that low qualification levels are a much greater issue in some iwi than in others.

When compared with Europeans of the same gender, none of the iwi examined has as low a proportion of members with no qualifications. Similarly, for both genders, no iwi has as high a proportion with degrees as do Europeans. European males also have higher proportion with school and vocational qualifications than do any of the iwi examined. European female proportions with school and vocational qualifications are at the high end of the iwi range.

Table 8 suggests that the large iwi studied are slightly more qualified than the iwi that are not studied: the large iwi have lower average proportions with no qualifications, and higher average proportions with all the other qualification types. However, the differences are generally not large, so analysis on the large iwi will have a fairly high degree of applicability to the unexamined iwi.

Qualification levels of the iwi studied generally increased over the period 1991 to 2001. As noted in Section 2, the classification of some qualifications changed over this period, turning some post-school qualifications into degrees. Although the exact effect of this change is difficult to measure, it is likely that a similar pattern of qualification changes would be seen in its absence.

Figure 8 illustrates the changes for males and females in large iwi over this period. For males, the proportion with no qualifications fell significantly, the proportions with school qualifications and degrees rose, and vocational qualifications were fairly static. For females, vocational qualifications also rose. It appears from this figure that the proportions of females with degrees in the various iwi are diverging. In 1991, the proportions were spread very little, whereas by 2001 the range ran from 4.4% to 8.4%. This may mean that females in iwi with very low proportions of people with degrees face greater barriers to achieving this level of education. If this is true, in the absence of intervention, the disparity between iwi may increase over time.

The size of the effect on income of improving Māori qualification levels is partially dependent on the effect of qualifications on an individual's expected income. This is illustrated in Figure 9 for several disaggregated qualification categories. The full set of income distributions for different qualification levels is tabulated in Appendix A. The difference that qualifications make for income distribution is indicated by the vertical spread of the different qualification lines. Note, however, that only a subset of the possible qualification categories is graphed here, thus the spread is likely to be greater than the figure suggests. It is evident that, as expected, qualifications have a significant effect on income. For example, the proportion of males with no qualifications only who earn between \$1 and \$5,000 is over 7%, whereas it is only about 1.5% for males with skilled vocational qualifications. This suggests that qualification levels may

be able to explain a significant proportion of the differences between iwi and European income distributions. Figure 10 shows the effect of controlling for qualifications on two iwi groups. The qualification adjustment used here was carried out with the full breakdown of qualifications given in Section 2.

The graphs displayed relate to Waikato males and Tūhoe females. Both of these groups have relatively low qualifications, both relative to Europeans and relative to other iwi. For both of these iwi groups, controlling for qualifications goes some distance towards explaining the large number of iwi members in low income brackets, and also partially explains the low number of iwi members in very high income brackets. For instance, for both Waikato males and Tūhoe females, controlling for qualifications explains in the region of half the difference between iwi and European numbers in the \$50,000 to \$70,000 bracket.

The reason for this is that these iwi have lower proportions of members with high qualification levels, and higher proportions with low or no qualifications, relative to Europeans. Thus, in adjustment, more weight is placed on Europeans with low qualification levels, and less on those with high qualification levels.

The pattern was similar over the iwi examined. In all cases, controlling for qualifications reduces the Māori lead in very low income brackets, and reduces the European lead in very high income brackets. However, the magnitudes of the effects and the changes in the mid-income range vary significantly by iwi and by gender.

Table 9 presents the effects on iwi-European dissimilarity indices of controlling for qualifications. For all the iwi examined and for both genders, the changes in dissimilarity index with quality adjustment are negative and significant. The magnitudes of the changes range from 18% to 37%. Although they must be interpreted with caution, these dissimilarity indices suggest that differences in qualification are an important explanatory factor in the differences between Māori and European income distributions.

In general, it appears that controlling for qualification levels significantly decreases the difference in income distributions of iwi compared

with Europeans. Specifically, Māori have qualification distributions that help to account for their over-representation in very low income brackets and their under-representation in high income brackets.

### **4.3 Work and labour force status**

Work and labour force status relates to whether a person is in the labour force and, if he or she is, whether he or she is employed full-time, employed part-time, or unemployed. In some cases, a person may choose the category in which to be. Specifically, he or she may choose not to work or actively look for work, and thus to be not in the labour force. Alternatively, a person who is able to find employment may choose to work either part- or full-time.

However, the factors that determine the work and labour force status of a person are frequently much more complex. The possibilities for some people may be limited by family situation (marital status or the presence of dependent children), cultural expectations, participation in training or other such factors. The ability of others to move into the employed categories may be limited merely by their capabilities to find work.

In the face of all these complexities, we do not attempt to prescribe a work and labour force status composition for the Māori population that is most "desirable" in any sense of the word. Instead, we are interested only in examining the contribution of these compositions to iwi income differences.

Table 10 shows work and labour force rate summaries for Europeans, Māori and the large iwi in 2001. Specifically, it looks at full-time employment and part-time employment as percentages of the working age population, unemployment as a proportion of the labour force, and the number not in the labour force as a proportion of the working age population. There is a considerable amount of variation between the iwi examined. For example, male unemployment rates vary from 9.4% to 20.4%, and female rates vary from 10.7% to 23.0%.

In general, Māori and European males are more different than are Māori and European females. However, neither gender has any iwi with an

unemployment rate as low as the comparable European unemployment rate. Additionally, none of the iwi examined has a male full-time employment rate that is as high as the European rate. This table suggests that labour force participation rates are similar for Māori and Europeans, with Māori rates perhaps slightly higher. However, it must be remembered that these statistics do not control for age composition in any way, and thus European participation rates may appear lower than they should because of the high proportion of people of retirement age included in the population under consideration.

The unweighted averages of work and labour force status rates over the large iwi examined do differ slightly from those for the Māori population as a whole. For instance, large iwi unemployment rates are, on average, higher. However, the magnitudes of the differences do not appear great when compared with the variation between large iwi. Consequently, results in this section for the large iwi are likely to have reasonable applicability to the Māori population as a whole.

The work and labour force status rates of Māori show some patterns of change between 1991 and 2001 that are common across most iwi. For both genders, there was a strong movement into the labour force and into work, both part- and full-time, though this was larger for males. Female unemployment rates also rose for most iwi, while male unemployment rates remained fairly static. These changes are illustrated in Figure 11. As would be expected, income distributions differ greatly by work and labour force status.

Figure 12 illustrates some of these differences for all New Zealand males and females. It shows that, for both males and females, there is a great distinction between those in full-time employment and the unemployed. This is hardly surprising, but it does suggest that work and labour force status may be very important for iwi incomes. Full income distributions for the different work and labour force statuses are tabulated in Appendix A. They suggest that there exist significant differences between the income distributions of all the different statuses, particularly at very low income levels.

Figure 13 illustrates for Tūhoe males and females the extent to which differences between iwi income distributions and European distributions can be explained by different work and labour force status compositions. It is clear that, for this iwi, differing work and labour force status proportions account for a significant proportion of the difference between Māori and European income distributions. The adjustment places greater weight on the incomes of Europeans who are unemployed, and less on those in full-time work, thus reducing the proportion with high incomes, and increasing the proportion with low incomes. This figure suggests that work and labour force status proportions cause Tūhoe to be over-represented in income brackets below \$10,000 and under-represented in brackets above \$30,000. The effect is more pronounced in males, but is present for both genders.

However, Tūhoe is an extreme case in that it has exceptionally high unemployment, low labour force participation and a low full-time employment rate. When the effect of work and labour force adjustment was examined for Ngāi Tahu females, for example, the changes were negligible. Although the effects of the adjustment were directionally similar to Tūhoe's in the low and high income brackets for most iwi, the magnitude of the effects ranged from very large to negligible.

The effect of controlling for work and labour force statuses was then examined using dissimilarity indices for the income distributions relative to European distributions before and after work and labour force status adjustment. The indices and changes to them caused by the adjustment are presented in Table 11. For most iwi males and females, work and labour force status adjustment decreases the dissimilarity index significantly. In the cases of Ngāi Tahu females and Te Atiawa females, however, the changes are insignificant. Conversely, some of the changes are very large. Dissimilarity indices indicate that nearly half of the difference between Ngāti Awa male and European male income distributions can be attributed to differences in work and labour force status rates. The average falls in dissimilarity index over iwi, however, are more modest, at 25% for females and 29 for males.



The analysis suggests that work and labour force status rates account for a significant proportion of the difference between iwi and European income distribution for most, but not all, large iwi. Particularly, they explain much of the over-representation at incomes below \$10,000, and under-representation at incomes above \$30,000. The explanatory power of work and labour force status for mid-range incomes varies in magnitude and direction by iwi.

#### **4.4 Rural or urban residence**

The type of area in which a person lives both affects and is affected by his or her income. Employment opportunities for people with different skills vary greatly by residence, as do housing prices and other costs of living. Major urban areas are generally relatively expensive places to live, but they also frequently offer many opportunities for work to people of all skill levels. Minor urban areas and rural centres tend to be much cheaper places to live, but also to have limited job opportunities. It is likely that many low-income people choose to live in cheap areas, thus limiting their job prospects. The costs of moving to an area with better job opportunities can also be a considerable barrier to many less well-off people. These factors suggest that there may be significant differences in income distribution between different types of rural and urban areas, and consequently that urban / rural distribution may be able to explain some aspects of iwi income distributions.

Examination of numbers living in rural and urban residence reveals that the patterns are very similar for males and females. Reasons for this are obvious. Consequently, the first part of this section looks at residence patterns for the total population, rather than dividing it by gender.

Previous sections have put Māori data into perspective by providing comparisons with European figures. However, European figures were not available for urban and rural residence, so the comparison is instead made with the total population of New Zealand, a large proportion of which is European.

Table 12 shows iwi residence divided into the categories *major urban*, *other urban*, *rural centre* and *other rural*. For Māori, All New Zealanders, and all the iwi examined, the largest proportion resides in major urban areas. None of the

iwi examined has a major urban population proportion as large as that of All New Zealanders. The All New Zealander values for the other three region types fall within the range of iwi values, although they tend to be near the low end of the range. On average, Māori are a little less urbanised than the average New Zealander. However, this difference is much greater for some iwi.

There is considerable variation in urbanisation between large iwi. For instance, the percentage in major urban areas ranges from 47.8% to 69.5%, and the percentage in other rural areas ranges from 9.3% to 19.8%. In terms of urban and rural location, the iwi examined appear fairly representative of Māori on average.

There was a gradual trend of Māori urbanisation between the 1991 and 2001 censuses. Figure 14 illustrates the movement of iwi to major urban areas over the decade. The speed of this change varies by iwi from almost no change to a net 14% of the iwi moving into a major urban area.

Some Māori migration to major urban areas was probably caused by lifestyle considerations. However, a large proportion was likely related to job prospects, which encompass both the likelihood of finding work and the expected wages when a job is found. Figure 15 illustrates income distributions for males and females in main urban areas and in rural centres. The full tabulations of income distribution for all the types of urban and rural area can be found in Appendix A, Table A4. Major urban areas offer males a fairly high probability of high wages, but also a high probability of very low income. Incomes between \$70,001 and \$100,000 are most likely to be achieved by males who live in major urban areas; incomes above \$100,001 are most likely to be achieved by males in other rural areas. For females, major urban areas and other rural areas offer preferable income distributions to those offered by secondary and minor urban areas or rural centres. Incomes above \$70,000 are most frequently achieved by females in other rural areas.

Urban / rural location was then controlled for in the All New Zealander income distribution relative to the iwi income distributions. On average, the effects of this adjustment differed considerably by iwi. Figure 16 illustrates the

effect of the adjustment for Ngāti Whātua males and for Ngāti Awa females. It is clear that controlling for urban / rural residence has virtually no effect on the relative Ngāti Whātua male income distribution. However, Ngāti Awa female relative incomes were significantly altered. This is because the adjustment considerably down-weights All New Zealander incomes in main urban areas, and up-weights those in areas such as secondary and minor urban areas. All New Zealander incomes in these latter areas average considerably lower than in main urban areas, thus the adjustment increases the weighting of All New Zealanders in low income brackets. More specifically, for Ngāti Awa females urban / rural residence appears to account for a significant amount of the over-representation of Ngāti Awa in the \$5,000 to \$20,000 bracket, and also for some of the under-representation in the \$30,000 plus bracket. Ngāti Awa females were an extreme case, though, and most female groups showed considerably smaller effects.

Dissimilarity indices relative to the appropriate All New Zealander income distributions put the two illustrated iwi into perspective. These indices and the effect on them of adjusting for urban / rural residence are shown in Table 13. Relative to the size of the decreases in dissimilarity index for other male iwi groups, the decrease for Ngāti Whātua was small, but not unusually so. Only one iwi, Ngāti Raukawa, had a male group showing a significant decrease in dissimilarity index. Even this decrease was only barely significant. However, a number of female iwi groups showed significant falls in index, although Ngāti Awa's was the largest, at 36%. Of the thirteen female iwi groups, six showed decreases that exceeded the 10% significance threshold.

The graphs of the female iwi groups with significant decreases all showed certain patterns in common. In each case, urban / rural residence accounted for some of the over-representation of Māori in the \$5,000 to \$20,000 range, and some of the under-representation above \$25,000 or \$30,000.

It appears that urban / rural residence accounts for an insignificant amount of the difference between iwi male and All New Zealand male income distributions for almost all of the iwi examined. Urban / rural residence adjustment also had insignificant effects for about half of the female iwi groups

examined. However, for the females of the other iwi, residence in various types of urban and rural area appears to account for a portion of the over-representation of Māori in the \$5,000 to \$20,000 bracket as well as some of the under-representation at incomes over \$30,000.

#### **4.5 Regional council area**

Because iwi have traditional areas to which many of their members feel strong attachment, some iwi may find themselves concentrated in regions of the country with poor economic growth and limited job opportunities. It would be useful to identify any effect on iwi incomes that may occur as a consequence of their remaining in traditional areas. This section does not explicitly distinguish between traditional iwi areas and other areas where particular iwi are highly concentrated, but in many cases these will be one and the same.

Table 14 shows how the population of New Zealand is spread across the regional council areas. It is evident from this table that the populations of individual iwi tend to be quite differently distributed from each other and from the overall population. Many iwi appear to have one or two regions in which they are highly concentrated relative to all New Zealanders, just as we would expect to see if many Māori tend to remain in their traditional iwi areas. Māori overall are also more concentrated in the North Island than is the overall population.

The average of the distributions of the iwi that were examined is not dissimilar to the distribution of the overall Māori population. Consequently, conclusions drawn for the large iwi should generally apply to the Māori population as a whole. However, it must be remembered that individual smaller iwi may be even more highly concentrated in their areas of origin, and thus adjusting income for region may have greater effects on some unexamined iwi.

These large differences in distribution between iwi suggest that, if average incomes vary significantly by region, iwi incomes could be significantly limited by the regions in which the iwi members live. Figure 17 illustrates the extent of income distribution differences among regional council areas. Table A5 in Appendix A contains the same information, but with the regions labelled. There is some spread over areas, but not as much as between, for instance, different

work and labour force statuses. The Auckland region is a somewhat unusual case, with relatively high proportions of its population in very high or very low income brackets, and relatively low proportions in intermediate brackets.

Regional council adjustment of the income distribution of all New Zealanders was carried out to make it comparable to those of each large iwi. Figure 18 shows the effects of this adjustment for Ngāti Awa males, Ngāti Awa females and Ngāti Whātua females. Ngāti Awa has a particularly high concentration in the Bay of Plenty Region, with 46% of its members living there in 2001 compared with 6.4% of all New Zealanders; nearly 73% of Ngāti Whātua are located in the Northland and Auckland regions, compared with 34.5% of all New Zealanders. This 73% consists of over 50% in the Auckland region, and over 22% in the Northland region.

The three graphs in Figure 18 illustrate a range of the effects seen for the iwi examined. Ngāti Awa males show slight decreases in the differences between the iwi and All New Zealander income distributions, but these do not appear significant. Ngāti Awa females show a modest decrease in the income difference with regional council area adjustment.

Ngāti Whātua, however, shows significant increases in the difference in income distribution when the adjustment for regional council is made. Specifically, adjustment for region decreases the iwi over-representation at zero and negative incomes, increases over-representation in the income bracket \$0 to \$30,000, and increases under-representation in incomes above \$30,000. This pattern is suggestive of an “Auckland effect”. Auckland has a relatively high proportion of people earning both zero and negative incomes, and also high incomes. If Ngāti Whātua is concentrated in the Auckland region, but receives less than its share of the high incomes in this region, controlling for regional council area might have the type of effect observed.

The income dissimilarity indices displayed in Table 15 illustrate the wide range of effects of controlling for regional council area. As with urban / rural residence, the effects of this adjustment differ significantly by gender. For males, three iwi saw significant decreases in dissimilarity index, but only Ngāi Tahu’s effect was more

than barely significant. Of the iwi examined, Ngāi Tahu has by far the greatest concentration of members in the South Island, primarily in Canterbury. The other male iwi groups saw insignificant increases or decreases in their dissimilarity indices.

For females, on the other hand, six of the thirteen iwi saw significant decreases, two saw significant increases, and the others saw insignificant changes. The female iwi group with the greatest decrease in dissimilarity index, 31%, was Ngāi Tahu. The two that saw increases were Ngāti Whātua, discussed above, and Ngāpuhi. Like Ngāti Whātua, Ngāpuhi is over-represented in Northland and Auckland, with 41% in Auckland and nearly 21% in Northland. It may be that Ngāpuhi females also exhibit something of an “Auckland effect”. However, the different unadjusted relative income distribution of Te Rarawa, which has 46.3% in Auckland and 32.2% in Northland, prevents the same effect showing through as significant for its females.

The effect of regional council area adjustment ranges from a moderate increase in the difference between iwi and All New Zealander income distributions to a moderate decrease in the difference, depending on gender and the iwi. It appears that, for females at least, concentration in Auckland and perhaps Northland are positively correlated with similarity to the All New Zealander income distribution. For both males and females, concentration in the South Island may be negatively correlated with similarity to All New Zealanders. One other pattern that emerges is that female incomes tend to be more affected by regional council area than do male incomes.

It should be noted, however, that this study is very limited. It considers geographic distribution only at the regional council level, and thus misses any effects that may be evident only at lower levels of geographic aggregation.

## **5 Implications for improving Māori incomes**

Section 4 of this paper found that controlling for any of the factors considered significantly affected the income distributions of at least some iwi gender groups. The effects of some of the characteristics were more widespread

across iwi than were those of others. This section makes a few observations on what this means in terms of improving Māori incomes.

The effects on income distribution of controlling for age and for qualifications were significant for males and females of all iwi. Although the dissimilarity indices indicated that controlling for age made female Māori income distributions less like European female income distributions, examination of the graphs suggests that in fact the differences in income distribution between the ethnicities were decreased by this adjustment. Work and labour force status adjustment also significantly decreased differences for almost all iwi gender groups. However, the results for urban / rural residence and regional council were more mixed. For the latter, differences actually increased significantly for some iwi. These effects suggest that there is potential to improve Māori outcomes by influencing these characteristics, but that this potential is highly dependent on iwi in some cases. It is difficult to determine for certain from the analysis conducted whether the differences in the effects between iwi are caused by different distributions of the characteristics across iwi, or by different income profiles for people with the same characteristics. However, it may be worth considering policies targeted at specific iwi if these are feasible and likely to be cost efficient.

It is important to remember that correlation only, not causality, has been established between characteristics of iwi and their income distributions. What this implies, of course, is that there is no guarantee that a Māori who gained, for example, a degree as a result of policy intervention would then face an income probability distribution the same as that of other Māori already with degrees. However, there is no certain way to establish what would occur in this counterfactual, thus we use the correlation as a guide to expected causality.

This paper has identified some characteristics that, were they to change, would likely improve Māori incomes. However, it does not deal with a number of issues pertinent to the design of policy aimed at addressing the Māori income issue. It does not consider either the cost or effectiveness of potential policies, and thus can say nothing about the type of policies likely to be most cost effective. Furthermore, it avoids the complex ethical issues related to designing any policy that is intended to improve the outcomes of a specified ethnic group.

The analysis suggests that, if policy were able to affect the qualifications, distributions among work and labour force statuses, urban / rural residence or regional council areas of Māori, it could potentially significantly improve Māori incomes. However, designing an effective policy to influence these characteristics is not so simple. It is likely that the big sources of income differences will remain for some time because they are difficult or costly to alter.

## **6 Conclusion**

This paper investigates several factors that may be important for improving Māori incomes, and the extent to which their importance varies by iwi. In many cases, the proportion of the population with various characteristics varies greatly by iwi. In some of these cases, this variation is even greater than the variation between the Māori population as a whole and the European population.

The factors examined were chosen because individuals falling into different categories might be expected to face incomes drawn from different probability distributions. For each iwi and each characteristic, such as the distribution of highest qualifications, the European (or All New Zealander) income distribution was adjusted so that the incidence of the characteristic in the European population matched that in the iwi. The effect of this adjustment on the difference between the iwi and European income distributions was taken as an indication of the extent to which the iwi characteristic affected their incomes.

The results, a summary of which is presented in Table 16, suggest that there may be potential to considerably improve Māori incomes by improving their qualification levels. This holds true for males and females in all of the iwi examined. Qualifications appear to be able to account for an average of approximately 29% of the difference between iwi and European incomes. Work and labour force status proportions appear, on average, to be able to account for slightly less of the difference than do qualifications. However, the effect of work and labour force status is more variable across iwi. The effect of urban or rural residence is less, particularly for iwi males. For the males of most iwi and the females of some, its effects are insignificant. The effects of regional council are even less decisive. By gender and iwi, the impact of accounting for regional



council ranges from a considerable decrease in the difference between iwi and All New Zealander incomes to a considerable increase in it. Although not really amenable to policy intervention, age also appears to account for some of the difference between Māori and European incomes for most iwi. There is some evidence that certain policies might be more cost effective if they were directed specifically at a subset of iwi for which they were likely to have the greatest effect.

The analysis in this paper is primarily descriptive, limited by data considerations. Further analysis, conducted on less-aggregated data, would be required in order to delve beyond the simple univariate income adjustments performed here.

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# Figures

**Figure 1: Variation in income distributions among iwi, 2001**

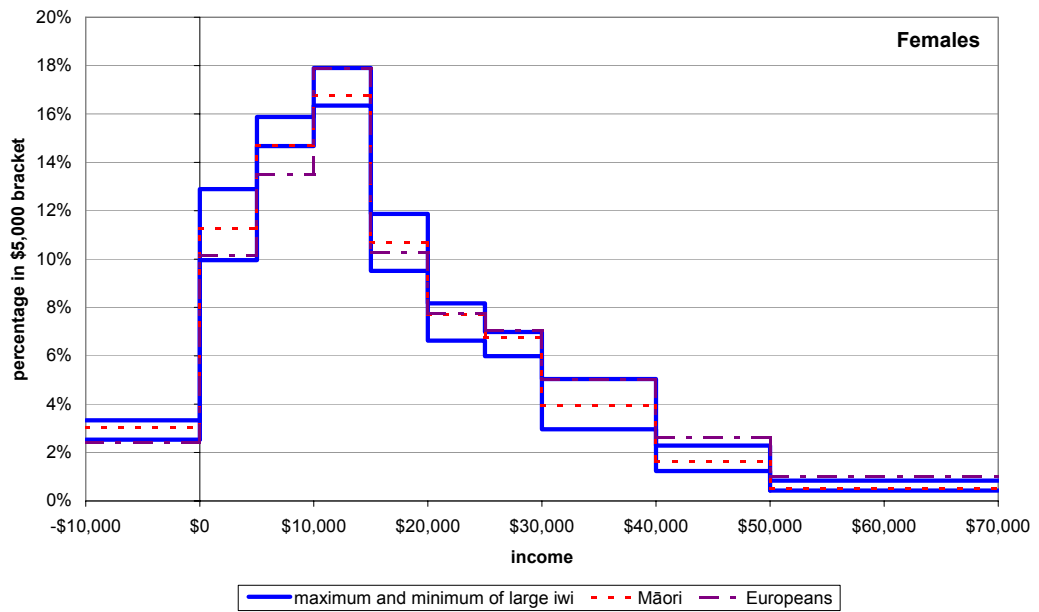
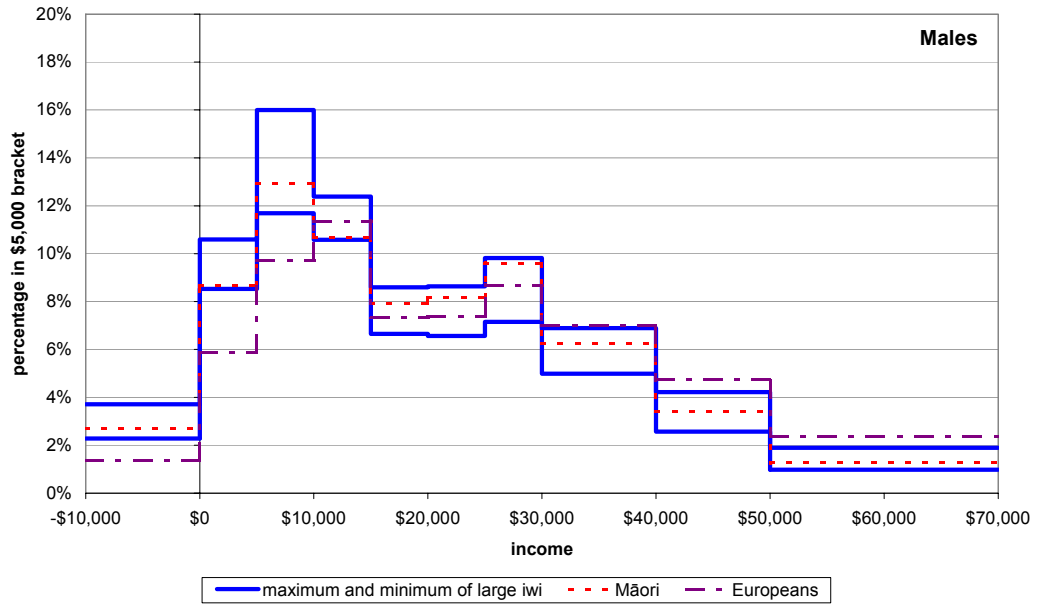
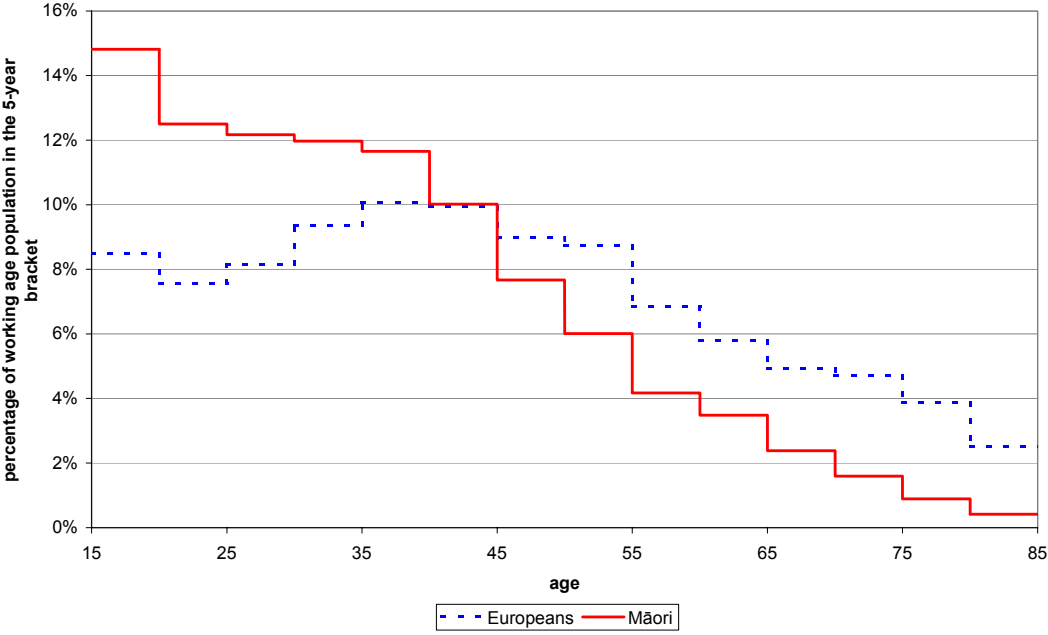
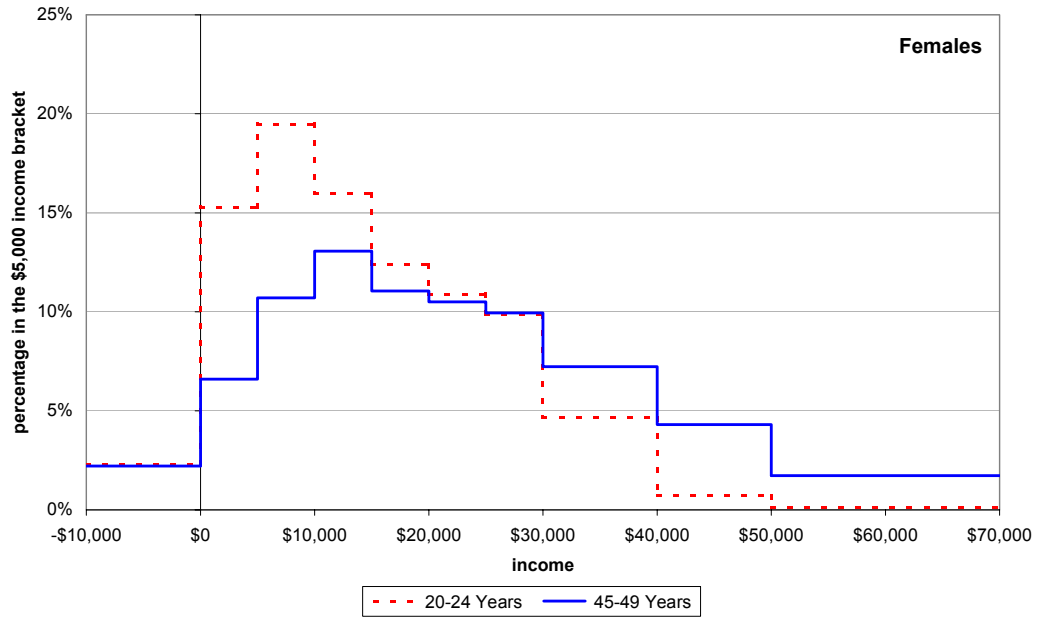
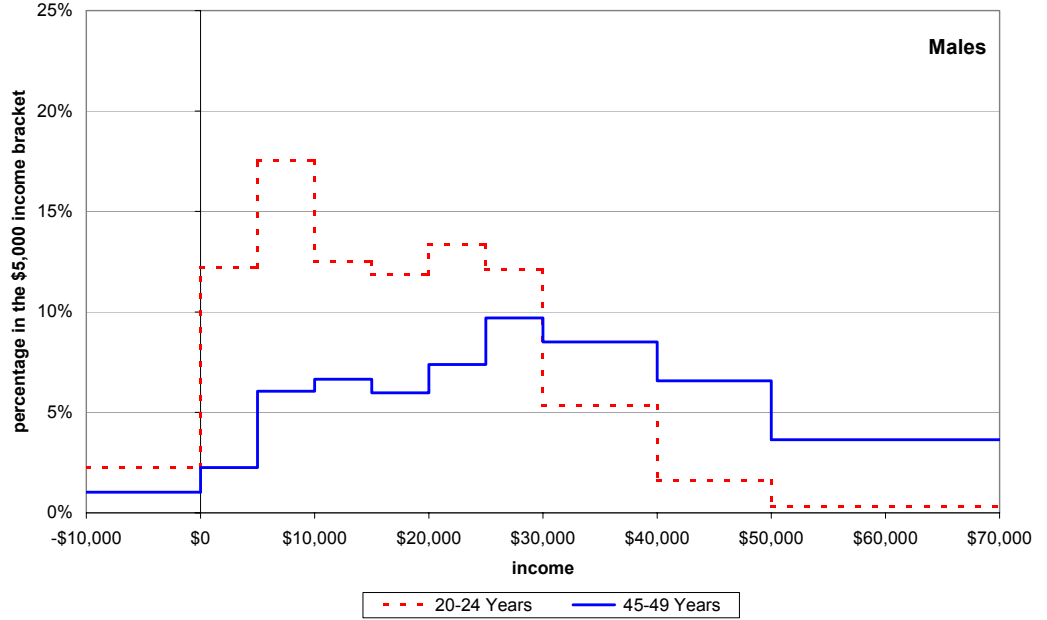


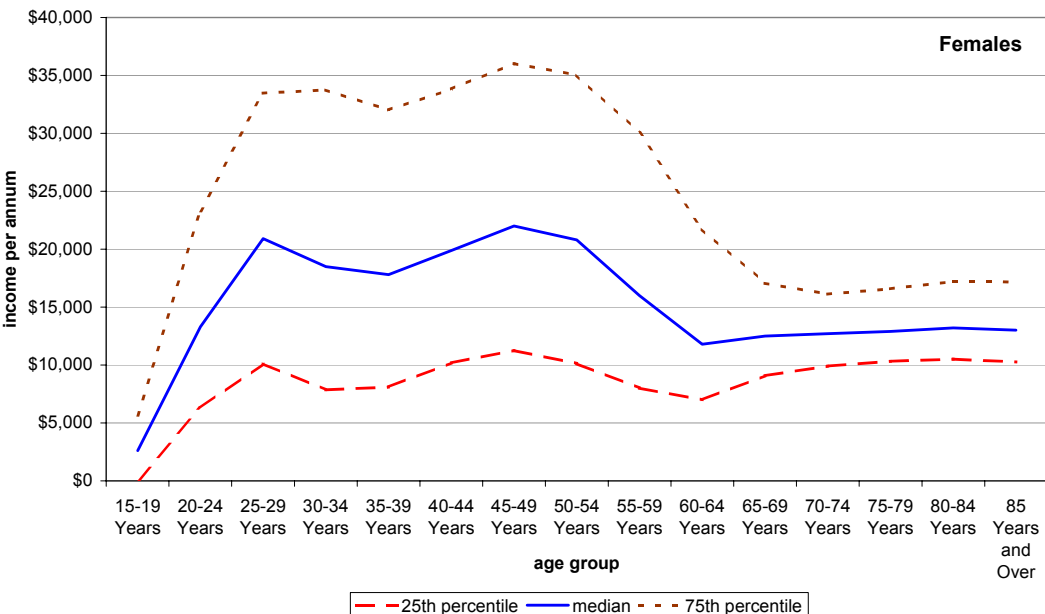
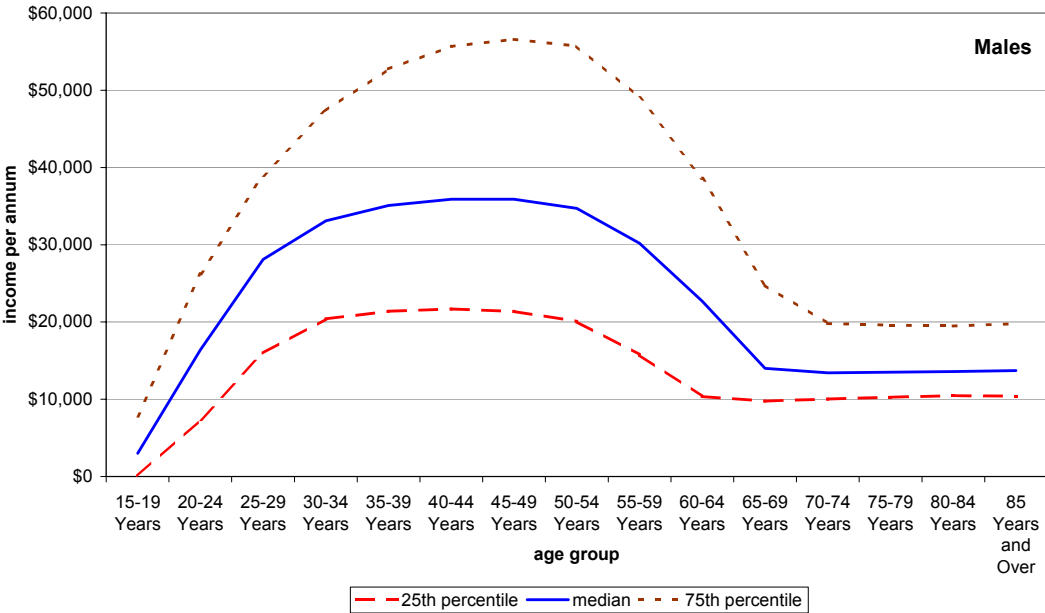
Figure 2: Māori and European age distributions, 2001



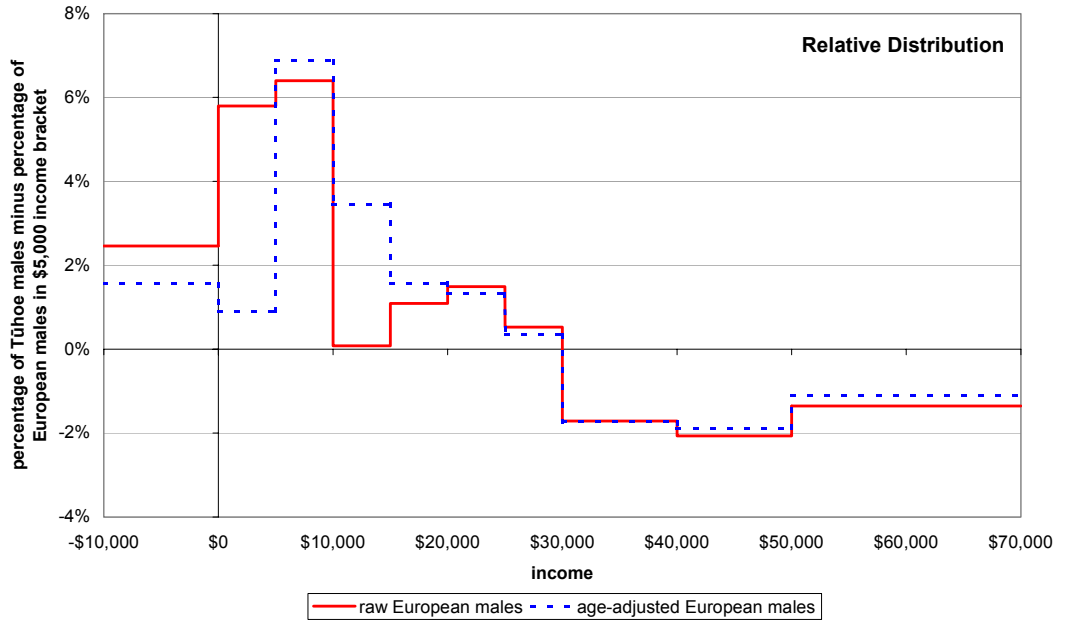
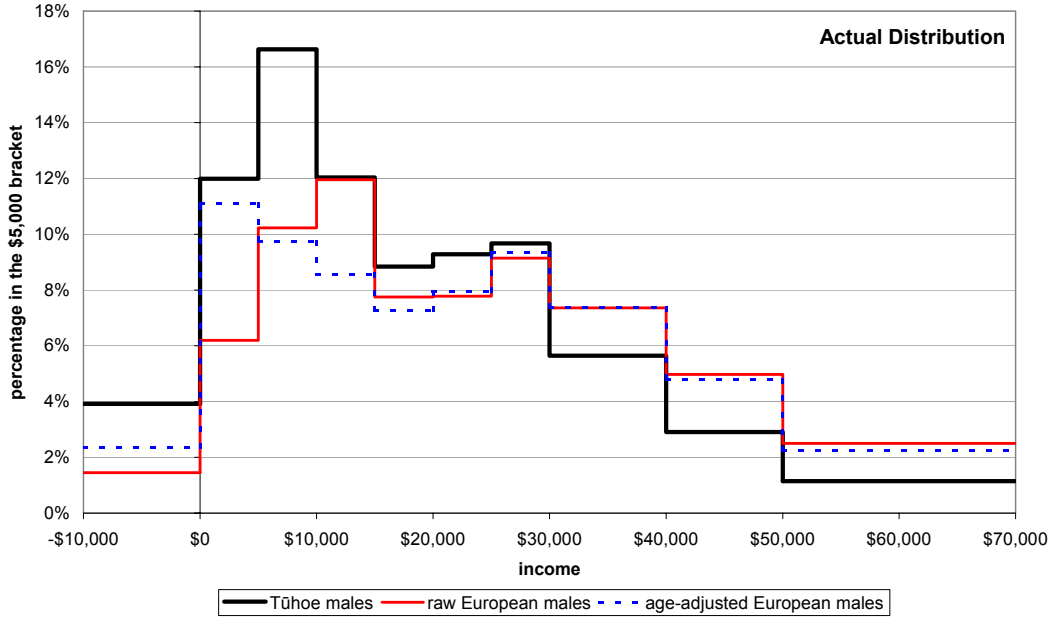
**Figure 3: Age- and gender-specific income distributions, 2001**



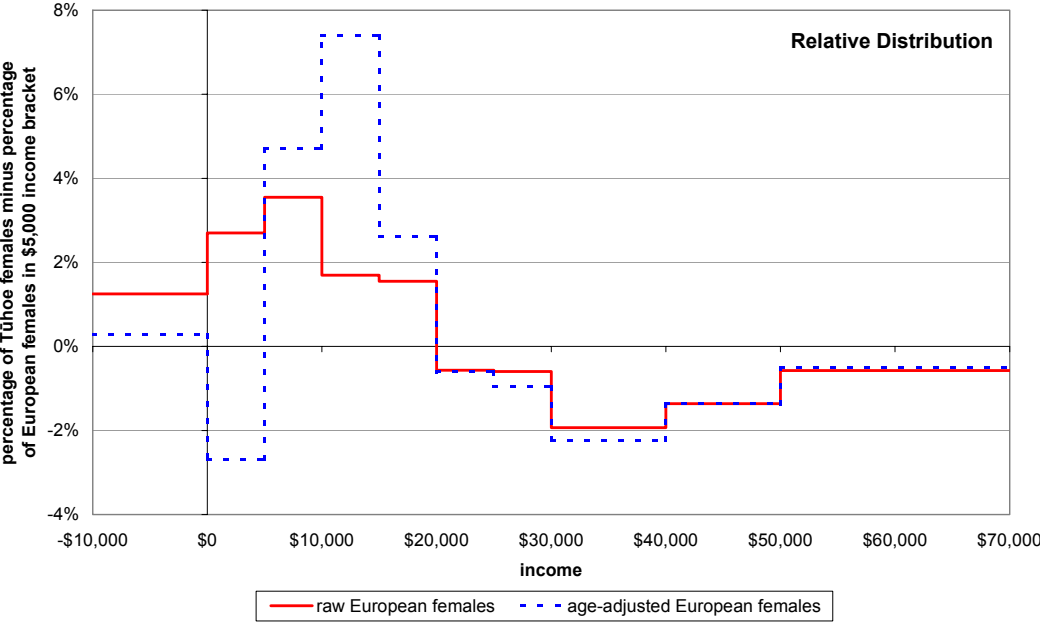
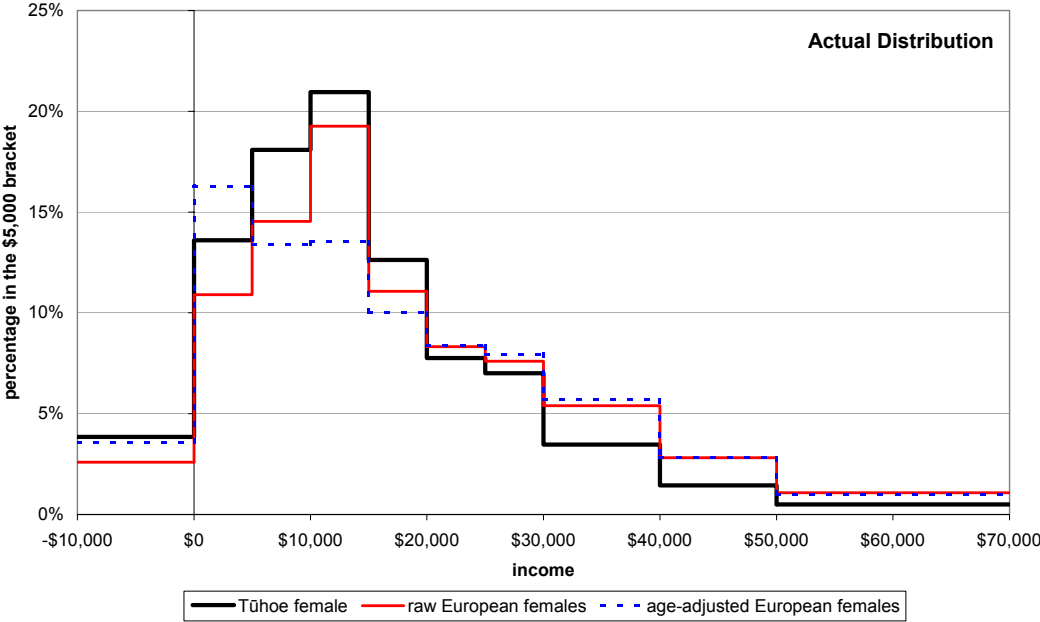
**Figure 4: Income by age, 2001**



**Figure 5: Age adjustment: Tūhoe male income distributions**

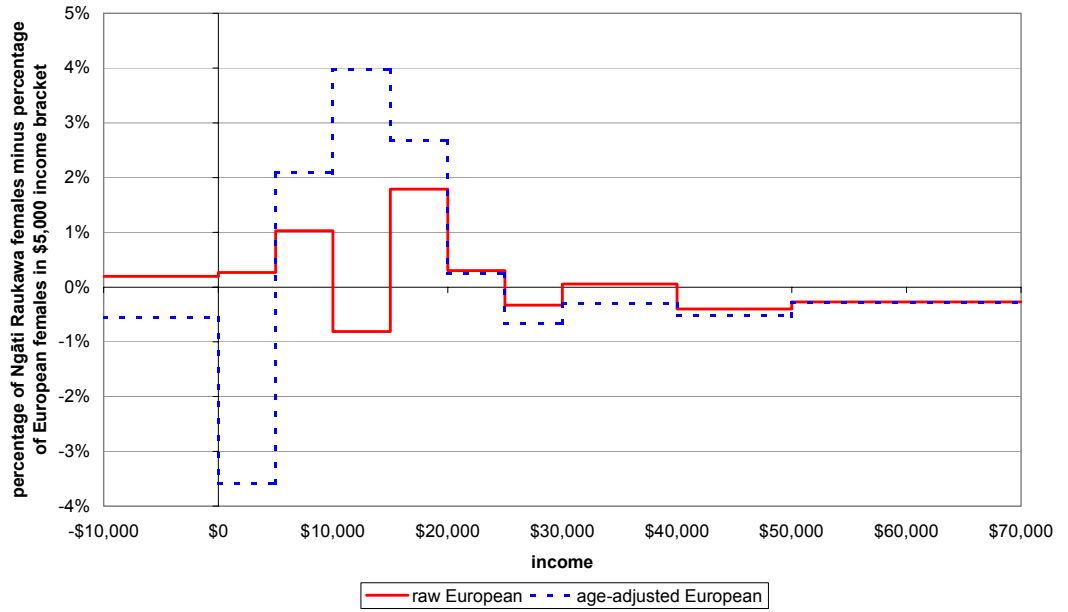


**Figure 6: Age adjustment: Tūhoe female income distributions**

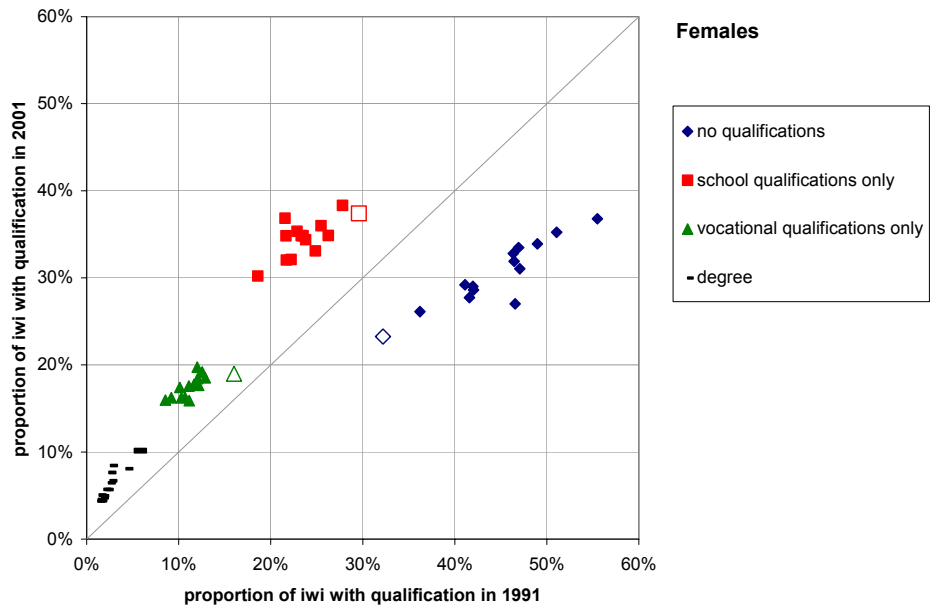
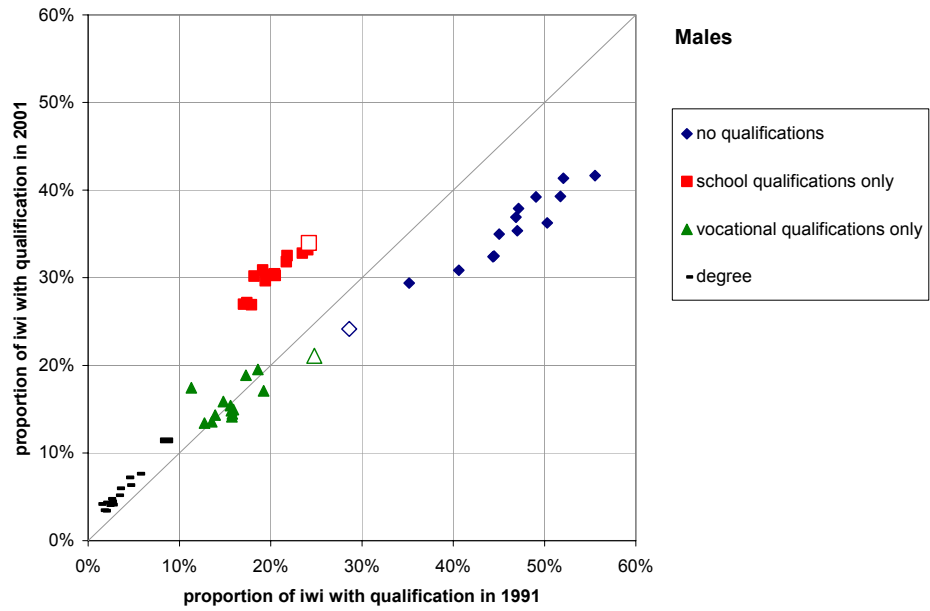




**Figure 7: Age adjustment: Ngāti Raukawa female relative income distribution**

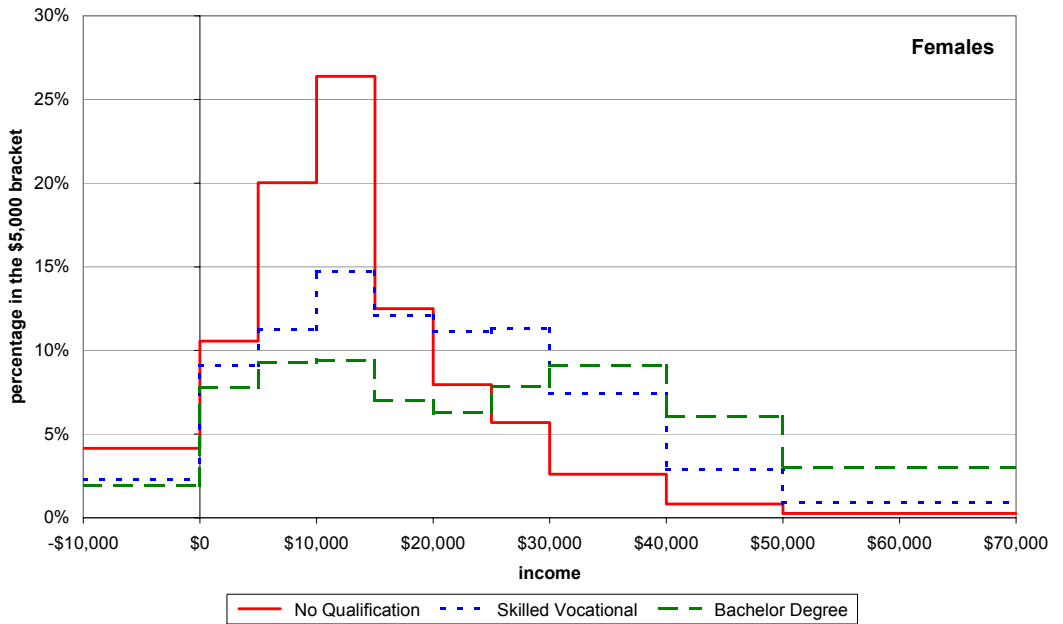
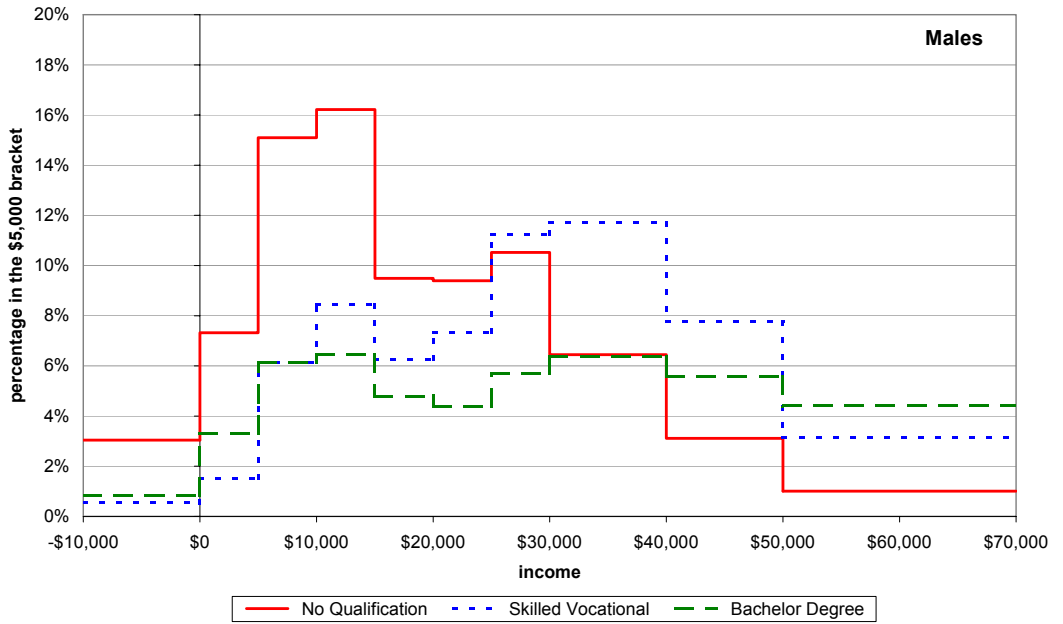


**Figure 8: Changes in highest qualifications, 1991–2001**

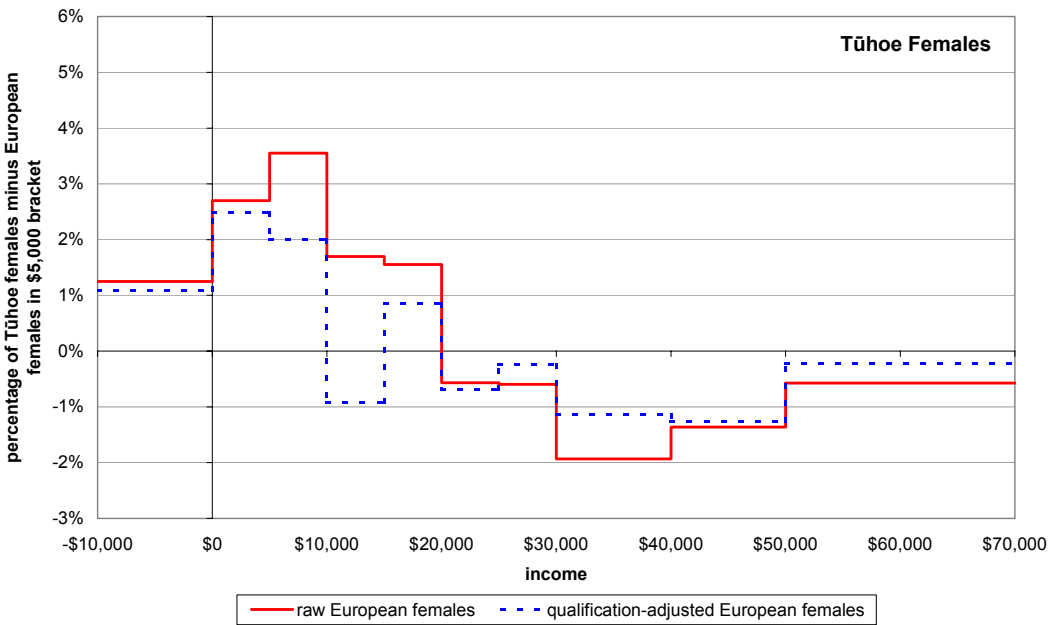
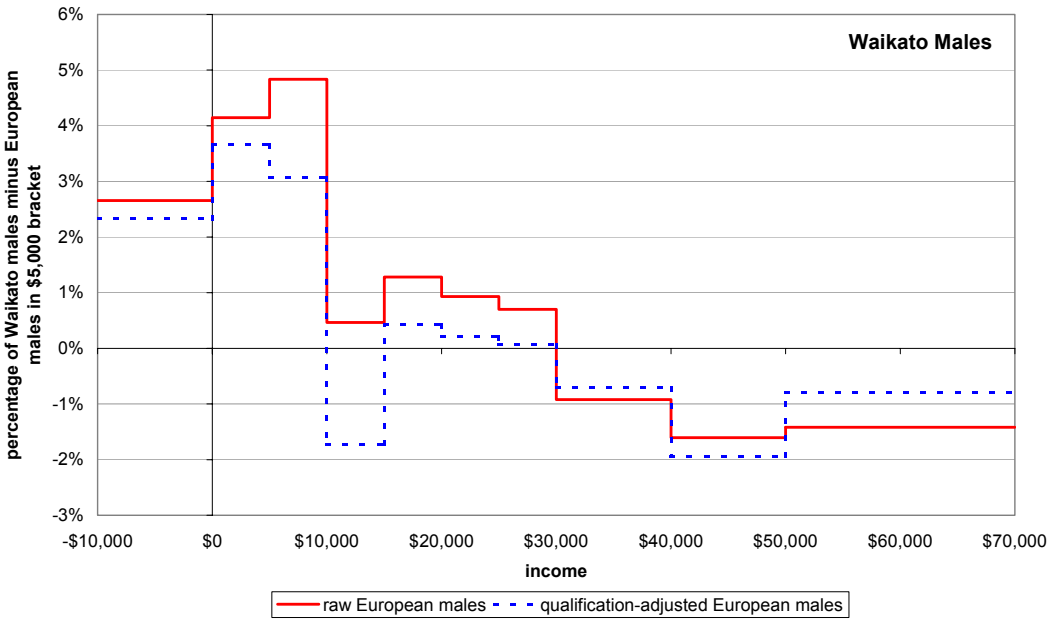


Note: The larger, empty shapes represent the European population.

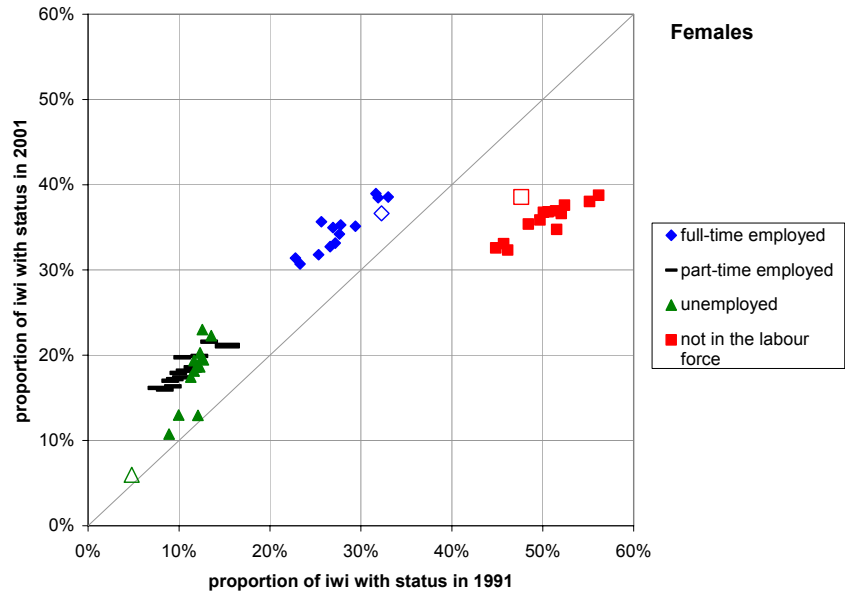
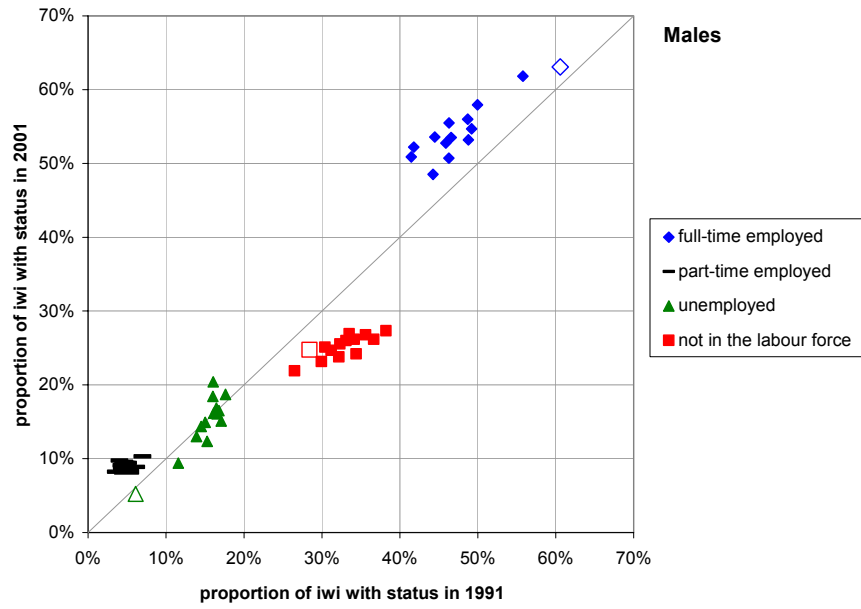
**Figure 9: Income distributions by highest qualification, 2001**



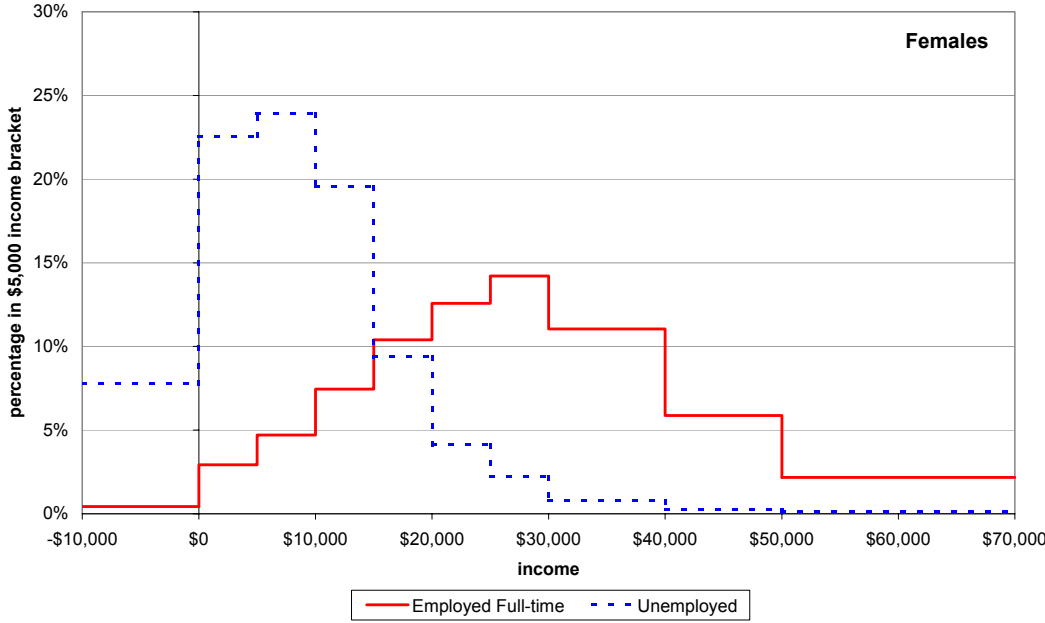
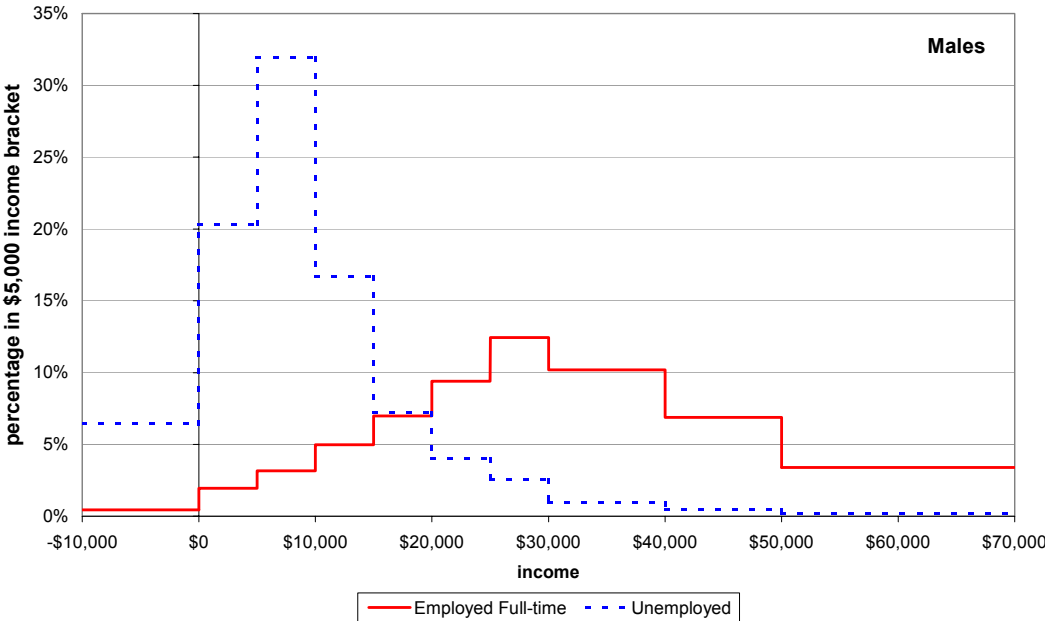
**Figure 10: Qualification adjustment: Waikato male and Tūhoe female relative income distributions**



**Figure 11: Changes in work and labour force status, 1991–2001**



**Figure 12: Income distributions by work and labour force status, 2001**



**Figure 13: Adjustment for labour force status: Tūhoe relative income distributions**

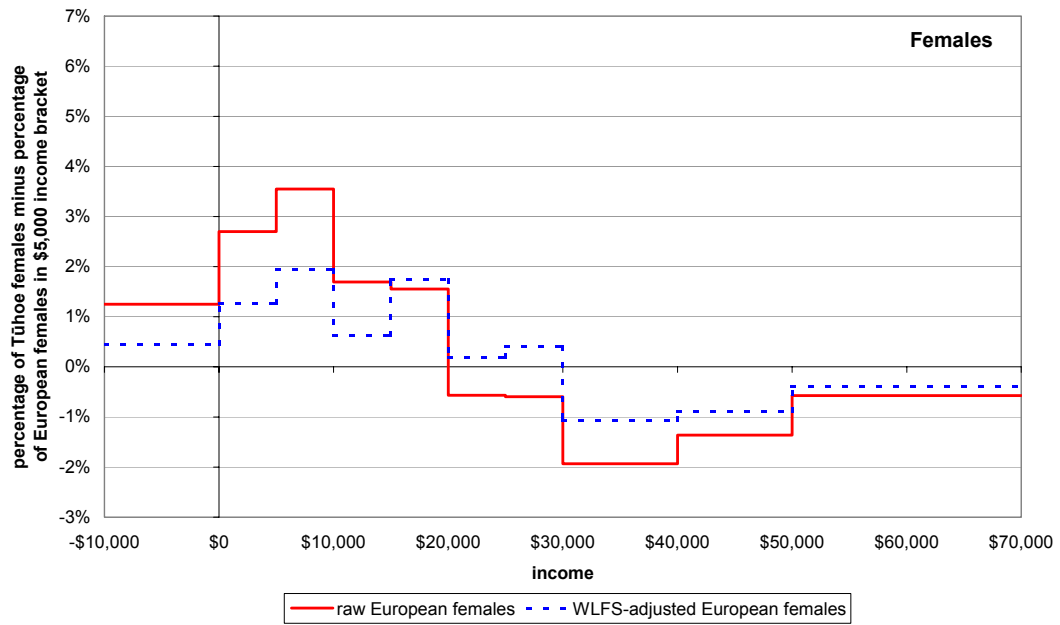
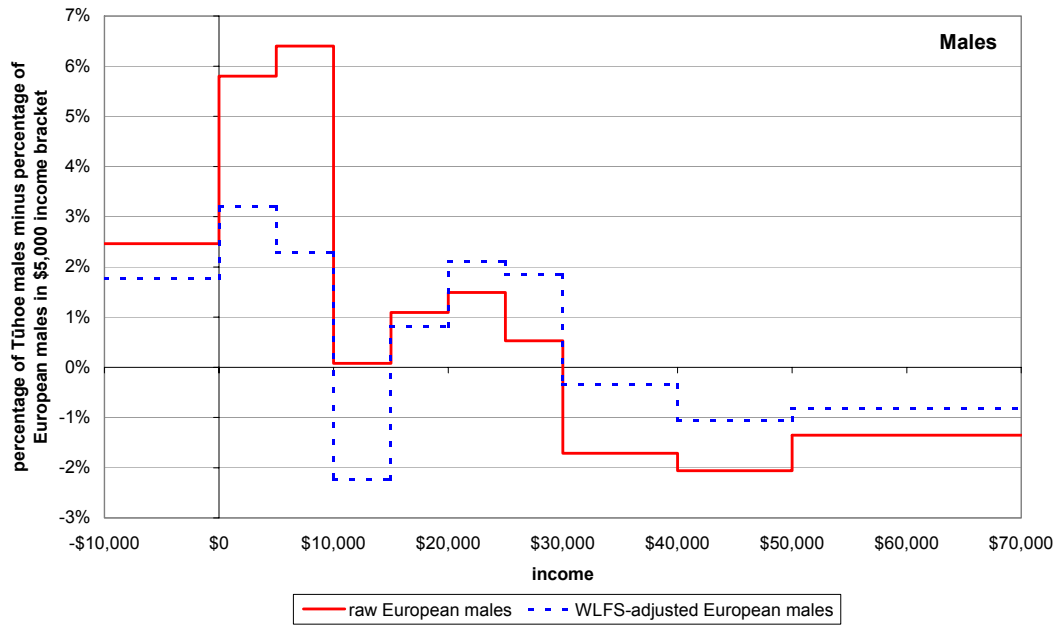
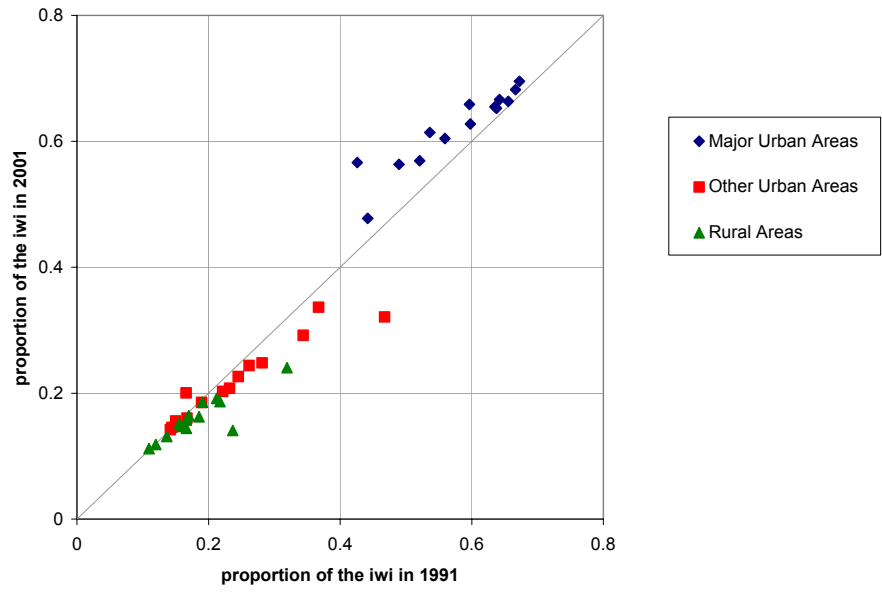
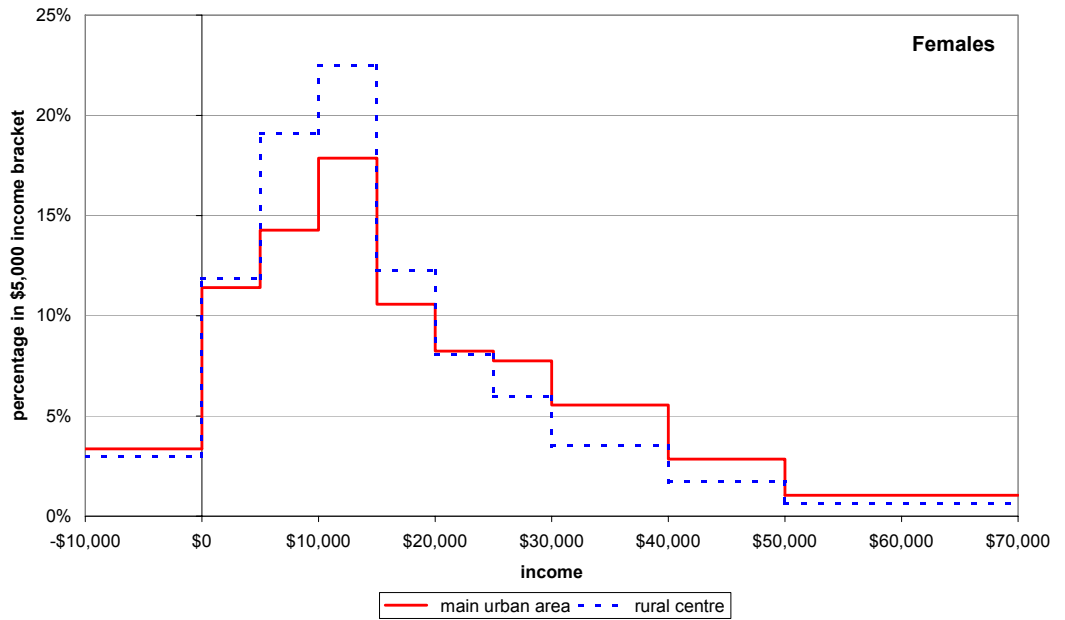
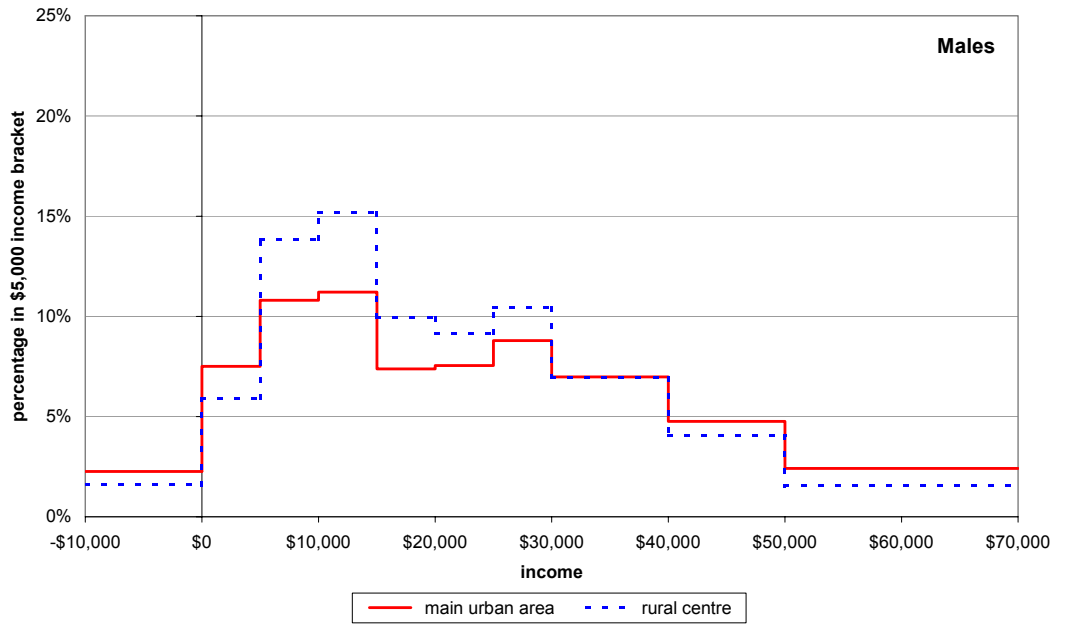


Figure 14: Changes in urban / rural residence, 1991–2001

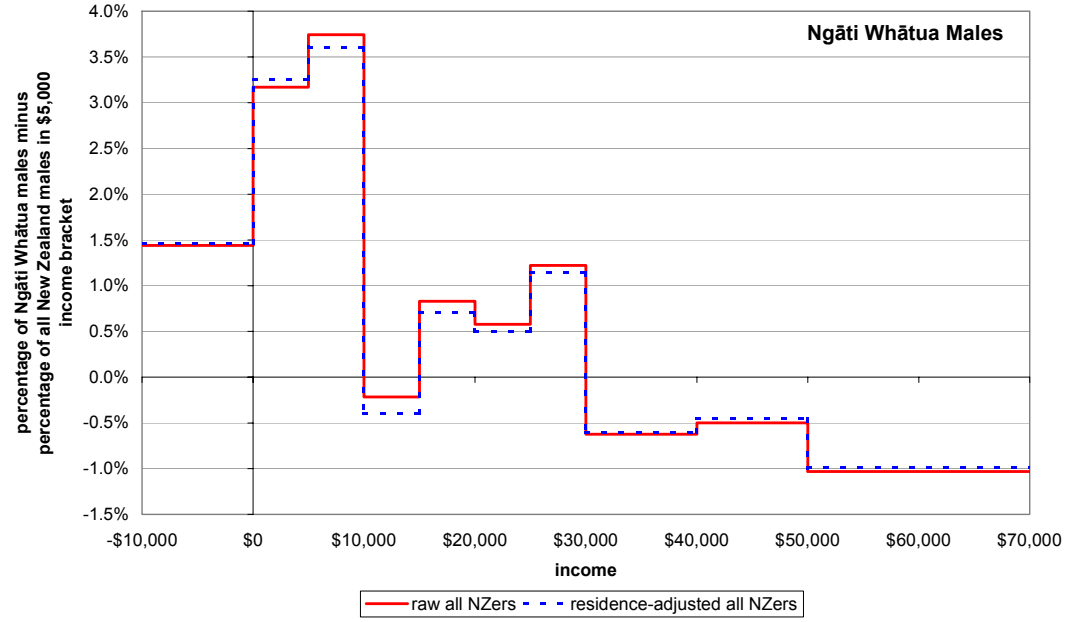
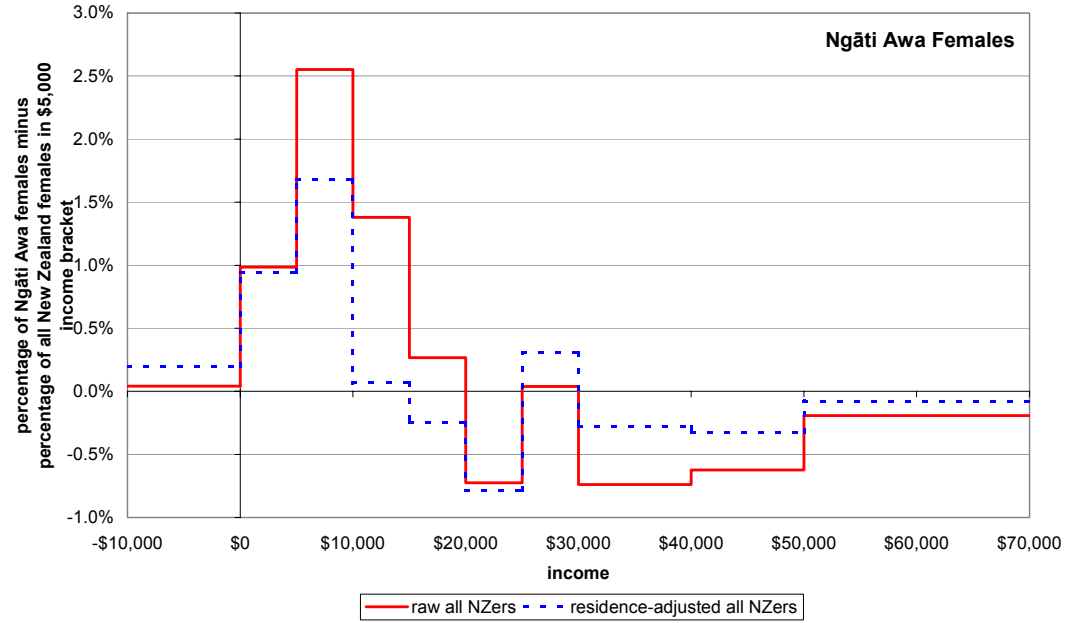




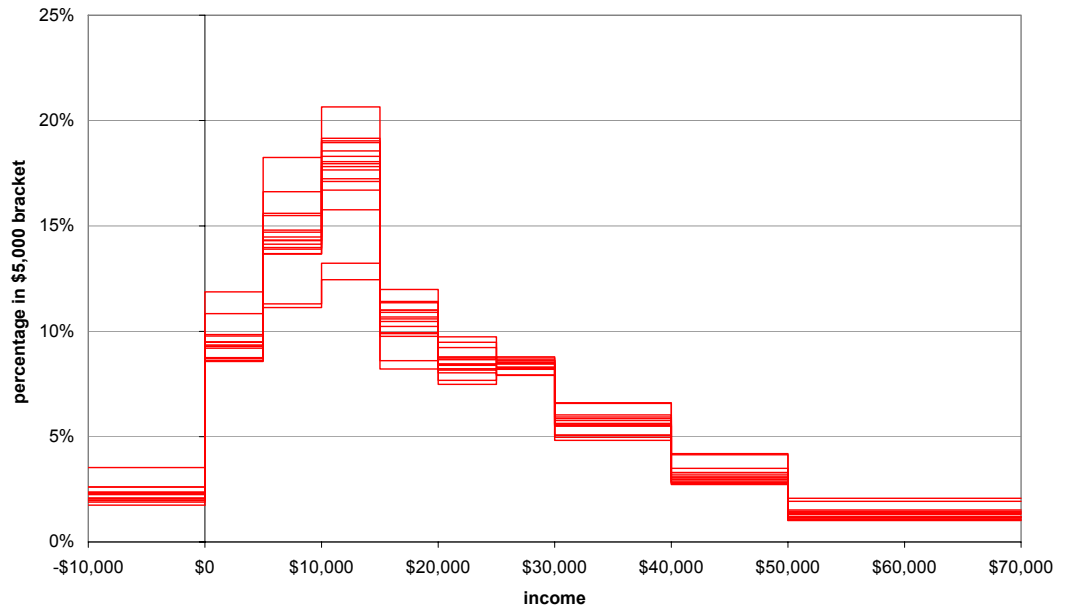
**Figure 15: Income distributions by urban / rural location, 2001**



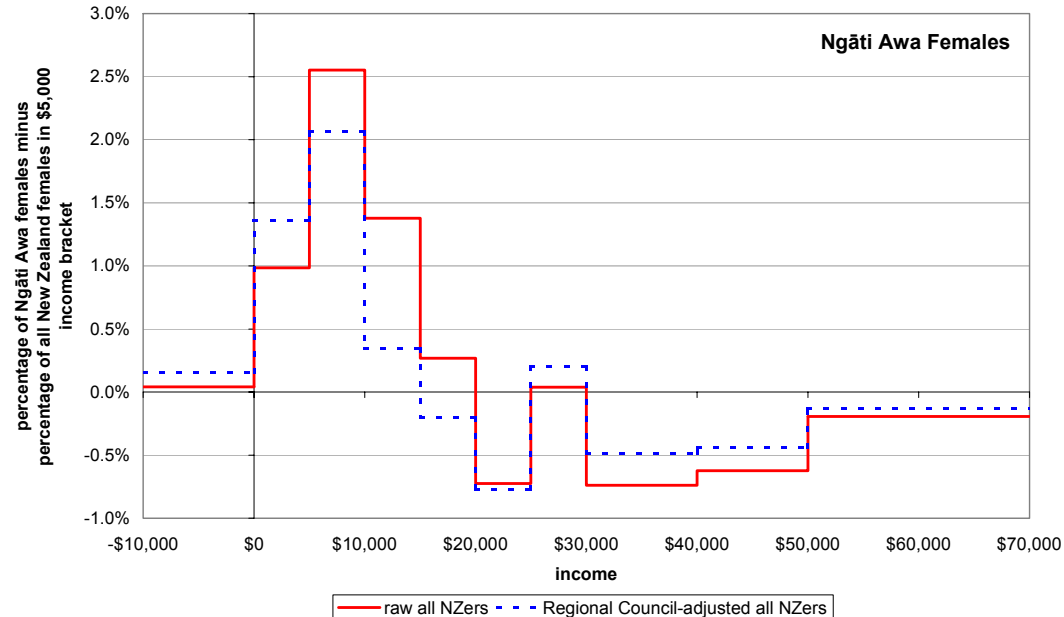
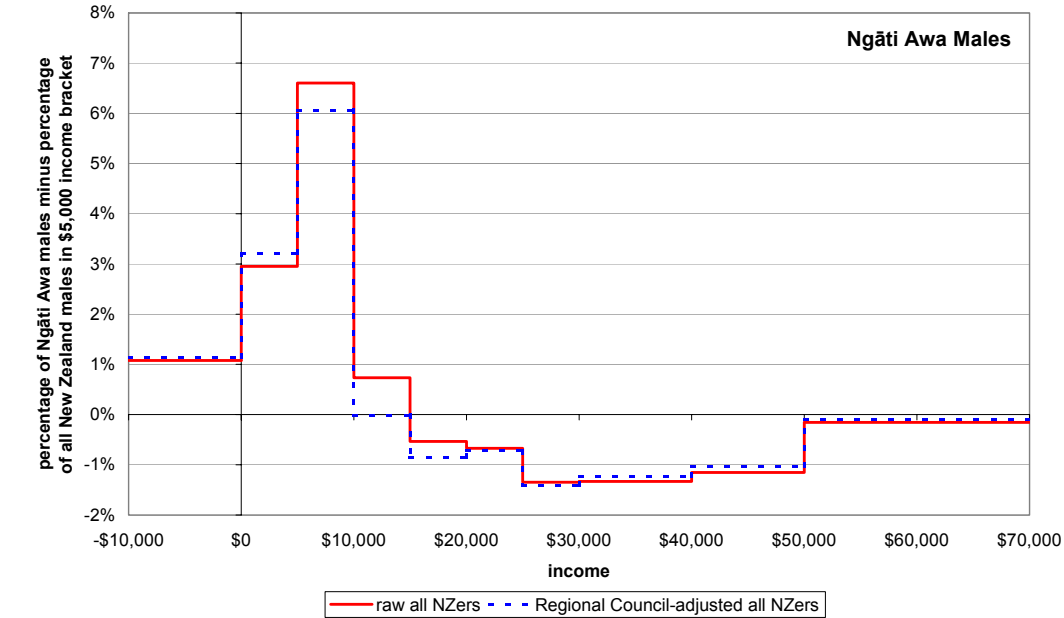
**Figure 16: Adjustment for urban / rural residence: Ngāti Awa female and Ngāti Whātua male relative income distributions**

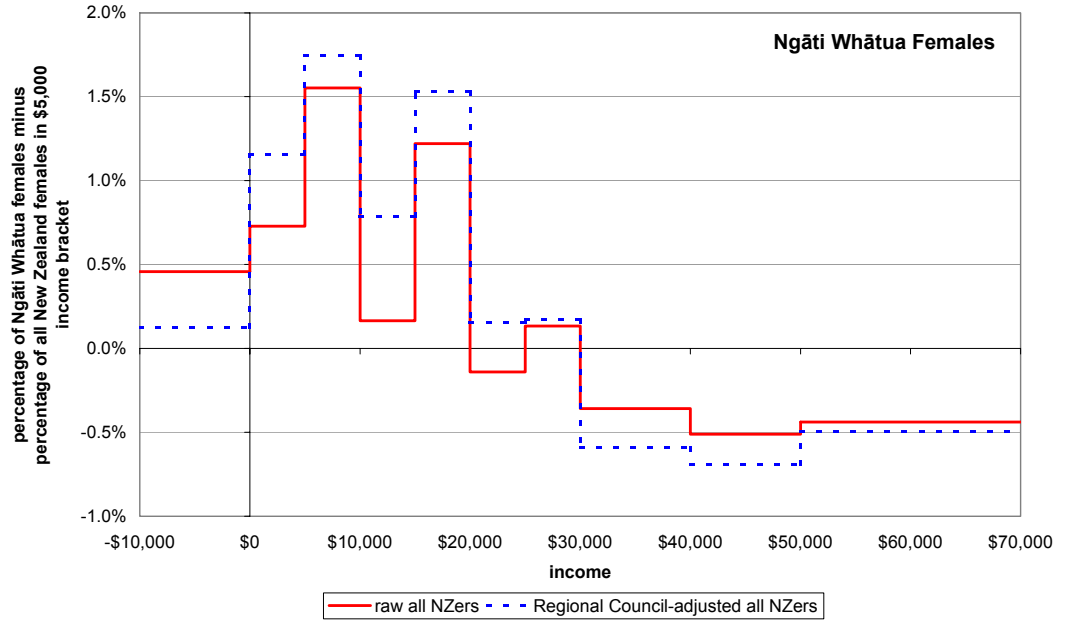


**Figure 17: Income distributions by regional council location, 2001**



**Figure 18: Adjustment for regional council location: Ngāti Awa male, Ngāti Awa female and Ngāti Whātua female relative income distributions**





## Tables

**Table 1: Extent of multiple responses to census questions on iwi affiliation**

	1991	1996	2001
Sum of responses in each iwi (1)	501,354	572,271	686,541
Iwi unidentified (2)	153,477	167,718	162,936
Respondents who gave at least one iwi	365,160	426,231	454,479
Total number of people of Māori descent	511,278	579,714	604,110
Ratio of sum of responses to iwi respondents	1.37	1.34	1.51

(1) “Sum of responses in each iwi” includes “area unspecified” iwi.

(2) “Iwi unidentified” includes “Hapu name common to more than one iwi”, “Do not know the name of iwi”, and “Not specified / not applicable / unidentifiable”.

**Table 2: Large iwi populations**

Iwi	1991 Population	1996 Population	2001 Population
<b>All Māori</b>	511,278 (100%)	579,714 (100%)	604,110 (100%)
<b>Large iwi:</b>			
Ngāpuhi	92,973 (25.2%)	95,451 (22.4%)	102,981 (21.7%)
Ngāti Porou (east coast only)	48,525 (13.2%)	54,219 (12.7%)	61,701 (13.6%)
Ngāti Kahungunu	43,614 (11.8%)	45,261 (10.6%)	51,552 (11.3%)
Ngāi Tahu / Kāi Tahu	20,304 (5.5%)	29,136 (6.8%)	39,180 (8.6%)
Waikato	22,227 (6.0%)	23,808 (5.6%)	35,781 (7.9%)
Ngāti Tūwharetoa	24,066 (6.5%)	28,995 (6.5%)	29,301 (6.4%)
Tūhoe	24,522 (6.7%)	25,917 (6.1%)	29,259 (6.4%)
Ngāti Maniapoto	21,936 (6.0%)	23,733 (5.6%)	27,168 (6.0%)
Te Atiawa	11,271 (3.1%)	13,167 (3.1%)	17,445 (3.8%)
Ngāti Awa	9,795 (2.7%)	11,304 (2.7%)	13,044 (2.9%)
Ngāti Whātua	9,360 (2.5%)	9,810 (2.3%)	12,105 (2.7%)
Te Rarawa	5,919 (1.6%)	8,133 (1.9%)	11,526 (2.5%)
Ngāti Raukawa (Horowhenua/ Manawatū)	1,014 (0.3%)	5,136 (1.2%)	11,088 (2.4%)

**Table 3: Median real incomes summary (2001 dollars)**

		1991	1996	2001	% change: 1991 to 1996	% change: 1996 to 2001	% change: 1991 to 2001
Male	European	\$24,321	\$25,397	\$26,700	4%	5%	10%
	Māori	\$15,432	\$18,244	\$18,600	18%	2%	21%
	<b>Large iwi:</b>						
	minimum	\$13,249	\$14,307	\$15,900	-1%	0%	5%
	maximum	\$20,199	\$21,782	\$22,700	18%	16%	36%
	unweighted mean	\$15,918	\$17,193	\$18,585	8%	8%	17%
	standard deviation	\$1,824	\$1,985	\$1,716	6%	5%	9%
Female	European	\$13,750	\$14,073	\$15,100	2%	7%	10%
	Māori	\$11,939	\$12,372	\$13,200	4%	7%	11%
	<b>Large iwi:</b>						
	minimum	\$11,599	\$11,325	\$12,500	-4%	-1%	6%
	maximum	\$12,905	\$14,134	\$14,800	13%	12%	18%
	unweighted mean	\$12,101	\$12,489	\$13,546	3%	9%	12%
	standard deviation	\$399	\$777	\$629	5%	4%	4%

**Table 4: Median real incomes of large iwi (2001 dollars)**

	<b>Iwi (sorted by 2001 size)</b>	<b>1991 Median Income</b>	<b>2001 Median Income</b>	<b>% Change</b>
<b>Male</b>	Ngāpuhi	\$15,814	\$18,600	18%
	Ngāti Porou (east coast only)	\$16,348	\$18,300	12%
	Ngāti Kahungunu	\$15,923	\$18,400	16%
	Ngāi Tahu / Kāi Tahu	\$20,199	\$22,700	12%
	Waikato	\$13,629	\$17,200	26%
	Ngāti Tūwharetoa	\$17,009	\$17,900	5%
	Tūhoe	\$14,520	\$15,900	10%
	Ngāti Maniapoto	\$15,732	\$18,000	14%
	Te Atiawa	\$18,092	\$20,600	14%
	Ngāti Awa	\$15,845	\$17,300	9%
	Ngāti Whātua	\$14,880	\$18,600	25%
	Te Rarawa	\$13,249	\$18,000	36%
	Ngāti Raukawa (Horowhenua/ Manawatū)	\$15,700	\$20,100	28%
<b>Female</b>	Ngāpuhi	\$12,349	\$13,600	10%
	Ngāti Porou (east coast only)	\$12,422	\$13,500	9%
	Ngāti Kahungunu	\$11,963	\$13,400	12%
	Ngāi Tahu / Kāi Tahu	\$12,459	\$14,000	12%
	Waikato	\$11,599	\$13,100	13%
	Ngāti Tūwharetoa	\$11,778	\$13,100	11%
	Tūhoe	\$11,790	\$12,500	6%
	Ngāti Maniapoto	\$12,059	\$12,900	7%
	Te Atiawa	\$12,905	\$14,500	12%
	Ngāti Awa	\$11,945	\$13,300	11%
	Ngāti Whātua	\$11,638	\$13,600	17%
	Te Rarawa	\$11,858	\$13,800	16%
	Ngāti Raukawa (Horowhenua/ Manawatū)	\$12,546	\$14,800	18%



**Table 5: Average ages, 2001**

	median age (15-64)	mean age (15-64)
European	38.2	37.9
Māori	33.2	34.1
<b>Large iwi summary:</b>		
unweighted mean	33.0	33.8
standard deviation	1.2	0.8
<b>Large iwi:</b>		
Ngāpuhi	32.2	33.3
Ngāti Porou (east coast only)	31.9	33.0
Ngāti Kahungunu	32.6	33.6
Ngāi Tahu / Kāi Tahu	34.4	34.8
Waikato	32.3	33.4
Ngāti Tūwharetoa	32.1	33.1
Tūhoe	31.1	32.4
Ngāti Maniapoto	33.0	33.9
Te Atiawa	34.2	34.8
Ngāti Awa	33.3	34.1
Ngāti Whātua	32.9	33.7
Te Rarawa	35.1	35.1
Ngāti Raukawa (Horowhenua/ Manawatū)	34.5	34.7

**Table 6: Age adjustment and income dissimilarity indices**

Iwi	Male Income Dissimilarity Indices			Female Income Dissimilarity Indices		
	Raw European	Age-Adjusted European	% change	Raw European	Age-Adjusted European	% change
Ngāpuhi	16.0	14.2	-11%	7.3	10.4	44%
Ngāti Porou (east coast only)	16.9	14.7	-13%	7.2	10.5	46%
Ngāti Kahungunu	16.5	14.7	-11%	7.6	11.0	44%
Ngāi Tahu / Kāi Tahu	8.1	6.9	-15%	5.7	6.5	14%
Waikato	17.7	15.8	-11%	9.8	13.1	34%
Ngāti Tūwharetoa	16.1	14.0	-13%	9.0	11.9	32%
Tūhoe	20.3	17.6	-13%	12.0	15.3	27%
Ngāti Maniapoto	16.8	15.7	-7%	9.6	12.8	33%
Te Atiawa	11.0	10.0	-10%	4.7	7.5	62%
Ngāti Awa	15.4	13.8	-11%	7.1	11.1	58%
Ngāti Whātua	16.0	14.3	-11%	6.8	10.4	53%
Te Rarawa	14.2	13.4	-5%	5.1	9.2	82%
Ngāti Raukawa (Horowhenua/ Manawatū)	13.1	12.7	-2%	3.9	9.0	132%

**Table 7: The effect of age adjustment on European female median incomes**

	<b>lwi median</b>	<b>European median</b>	<b>change in European median</b>	<b>% change in difference between medians</b>
<b>Unadjusted</b>	\$15,100			
<b>Adjusted to:</b>				
Ngāpuhi	\$13,600	\$15,080	-\$20	-1%
Ngāti Porou (east coast only)	\$13,500	\$14,857	-\$243	-15%
Ngāti Kahungunu	\$13,400	\$14,913	-\$187	-11%
Ngāi Tahu	\$14,000	\$14,997	-\$103	-9%
Waikato	\$13,100	\$14,971	-\$129	-6%
Ngāti Tūwharetoa	\$13,100	\$14,758	-\$342	-17%
Tūhoe	\$12,500	\$14,880	-\$220	-8%
Ngāti Maniapoto	\$12,900	\$15,061	-\$39	-2%
Te Atiawa	\$14,500	\$15,159	\$59	10%
Ngāti Awa	\$13,300	\$15,441	\$341	19%
Ngāti Whātua	\$13,600	\$14,884	-\$216	-14%
Te Rarawa	\$13,800	\$15,345	\$245	19%
Ngāti Raukawa (Horowhenua/ Manawatū)	\$14,800	\$15,297	\$197	66%

**Table 8: Highest qualifications, 2001**

<b>Males</b>				
	<b>No Qualifications</b>	<b>School Qualifications Only</b>	<b>Vocational Qualifications</b>	<b>Degree</b>
European	24.2%	34.0%	21.1%	11.4%
Māori	38.0%	29.9%	14.5%	4.1%
<b>Large iwi summary:</b>				
unweighted mean	36.0%	30.3%	15.7%	5.0%
standard deviation	3.9%	2.1%	2.0%	1.4%
<b>Large iwi:</b>				
Ngāpuhi	39.2%	29.7%	14.1%	3.4%
Ngāti Porou (east coast only)	35.0%	31.8%	15.4%	4.5%
Ngāti Kahungunu	36.3%	30.2%	15.0%	5.2%
Ngāi Tahu / Kāi Tahu	29.4%	33.2%	19.5%	7.6%
Waikato	41.7%	27.0%	13.4%	4.2%
Ngāti Tūwharetoa	36.9%	30.4%	14.8%	4.1%
Tūhoe	39.3%	27.2%	14.3%	3.5%
Ngāti Maniapoto	41.4%	26.9%	13.6%	4.0%
Te Atiawa	30.9%	32.5%	18.9%	7.2%
Ngāti Awa	32.5%	30.9%	17.1%	6.0%
Ngāti Whātua	37.9%	30.2%	14.5%	4.3%
Te Rarawa	35.4%	30.4%	15.9%	4.8%
Ngāti Raukawa (Horowhenua/ Manawatū)	32.4%	32.8%	17.4%	6.3%

<b>Females</b>				
	<b>No Qualifications</b>	<b>School Qualifications Only</b>	<b>Vocational Qualifications</b>	<b>Degree</b>
European	23.3%	37.4%	19.0%	10.2%
Māori	33.8%	33.9%	15.5%	5.0%
<b>Large iwi summary:</b>				
unweighted mean	31.0%	34.4%	17.4%	5.9%
standard deviation	3.3%	2.2%	1.3%	1.4%
<b>Large iwi:</b>				
Ngāpuhi	33.5%	34.4%	16.3%	4.5%
Ngāti Porou (east coast only)	29.0%	36.0%	17.7%	5.7%
Ngāti Kahungunu	31.0%	34.8%	17.4%	5.7%
Ngāi Tahu / Kāi Tahu	26.1%	38.3%	18.5%	8.1%
Waikato	36.8%	30.2%	16.0%	5.1%
Ngāti Tūwharetoa	32.8%	34.8%	15.9%	4.7%
Tūhoe	33.9%	32.1%	16.2%	4.4%
Ngāti Maniapoto	35.2%	32.0%	16.2%	5.0%
Te Atiawa	27.7%	34.9%	19.7%	7.7%
Ngāti Awa	29.2%	33.1%	19.2%	6.7%
Ngāti Whātua	31.9%	34.8%	17.6%	4.4%
Te Rarawa	28.6%	35.4%	17.8%	6.5%
Ngāti Raukawa (Horowhenua/ Manawatū)	27.0%	36.8%	18.4%	8.4%

**Table 9: Qualification adjustment and income dissimilarity indices**

Iwi	Male Income Dissimilarity Indices			Female Income Dissimilarity Indices		
	Raw European	Qualification-Adjusted European	% change	Raw European	Qualification-Adjusted European	% change
Ngāpuhi	16.0	11.1	-31%	7.3	4.8	-34%
Ngāti Porou (east coast only)	16.9	12.5	-26%	7.2	5.0	-31%
Ngāti Kahungunu	16.5	12.1	-27%	7.6	5.2	-31%
Ngāi Tahu / Kāi Tahu	8.1	5.8	-29%	5.7	4.3	-25%
Waikato	17.7	12.1	-32%	9.8	6.8	-31%
Ngāti Tūwharetoa	16.1	11.2	-30%	9.0	6.0	-33%
Tūhoe	20.3	15.1	-26%	12.0	7.5	-37%
Ngāti Maniapoto	16.8	10.7	-36%	9.6	6.3	-35%
Te Atiawa	11.0	8.6	-22%	4.7	3.3	-29%
Ngāti Awa	15.4	12.7	-18%	7.1	4.9	-31%
Ngāti Whātua	16.0	11.2	-30%	6.8	4.6	-32%
Te Rarawa	14.2	10.4	-26%	5.1	4.0	-20%
Ngāti Raukawa (Horowhenua/Manawatū)	13.1	8.9	-32%	3.9	3.2	-18%

**Table 10: Work and labour force status, 2001**

<b>Males</b>				
	<b>Full-Time Employed</b>	<b>Part-Time Employed</b>	<b>Unemployed</b>	<b>Not in the Labour Force</b>
European	63.1%	8.2%	5.2%	24.8%
Māori	56.5%	8.9%	13.7%	24.2%
<b>Large iwi summary:</b>				
unweighted mean	54.0%	9.2%	15.6%	25.2%
standard deviation	3.4%	0.5%	2.9%	1.6%
<b>Large iwi:</b>				
Ngāpuhi	53.5%	8.6%	16.5%	25.5%
Ngāti Porou (east coast only)	54.7%	9.4%	14.9%	24.7%
Ngāti Kahungunu	55.5%	9.4%	14.4%	24.2%
Ngāi Tahu / Kāi Tahu	61.8%	8.9%	9.4%	21.9%
<b>Waikato</b>				
Ngāti Tūwharetoa	53.2%	9.6%	16.2%	25.1%
Tūhoe	48.5%	9.7%	20.4%	26.8%
Ngāti Maniapoto	52.8%	9.3%	16.1%	26.0%
<b>Te Atiawa</b>				
Ngāti Awa	50.7%	8.8%	18.4%	26.9%
Ngāti Whātua	53.6%	9.2%	15.1%	26.2%
Te Rarawa	52.2%	8.2%	16.8%	27.3%
Ngāti Raukawa (Horowhenua/ Manawatū)	56.0%	10.3%	13.0%	23.8%

<b>Females</b>				
	<b>Full-Time Employed</b>	<b>Part-Time Employed</b>	<b>Unemployed</b>	<b>Not in the Labour Force</b>
European	36.6%	21.1%	6.0%	38.6%
Māori	34.7%	18.5%	16.4%	36.3%
<b>Large iwi</b>				
unweighted mean	34.7%	18.0%	18.0%	35.8%
standard deviation	2.7%	1.6%	3.7%	2.1%
<b>Large iwi:</b>				
Ngāpuhi	34.2%	17.2%	18.6%	36.8%
Ngāti Porou (east coast only)	35.1%	17.4%	18.7%	35.4%
Ngāti Kahungunu	35.7%	18.2%	17.4%	34.8%
Ngāi Tahu / Kāi Tahu	38.6%	21.6%	10.7%	32.6%
<b>Waikato</b>				
Ngāti Tūwharetoa	32.7%	18.2%	19.5%	36.8%
Tūhoe	30.7%	17.0%	23.0%	38.0%
Ngāti Maniapoto	31.8%	17.9%	20.3%	37.6%
<b>Te Atiawa</b>				
Ngāti Awa	33.2%	18.6%	19.4%	35.9%
Ngāti Whātua	35.0%	16.0%	19.8%	36.6%
Te Rarawa	35.3%	16.3%	18.1%	36.9%
Ngāti Raukawa (Horowhenua/ Manawatū)	38.5%	19.8%	13.0%	33.1%

**Table 11: Work and labour force status adjustment and income dissimilarity indices**

Iwi	Male Income Dissimilarity Indices			Female Income Dissimilarity Indices		
	Raw European	WLFS-Adjusted European	% change	Raw European	WLFS-Adjusted European	% change
Ngāpuhi	16.0	11.7	-27%	7.3	5.6	-23%
Ngāti Porou (east coast only)	16.9	12.9	-24%	7.2	5.4	-25%
Ngāti Kahungunu	16.5	12.7	-23%	7.6	6.2	-19%
Ngāi Tahu / Kāi Tahu	8.1	7.2	-12%	5.7	5.3	-7%
Waikato	17.7	12.2	-31%	9.8	6.8	-31%
Ngāti Tūwharetoa	16.1	11.5	-29%	9.0	6.3	-30%
Tūhoe	20.3	13.8	-32%	12.0	7.1	-41%
Ngāti Maniapoto	16.8	11.5	-31%	9.6	6.0	-38%
Te Atiawa	11.0	8.2	-26%	4.7	4.2	-9%
Ngāti Awa	15.4	8.1	-48%	7.1	3.9	-44%
Ngāti Whātua	16.0	11.7	-27%	6.8	5.1	-25%
Te Rarawa	14.2	10.1	-29%	5.1	3.7	-27%
Ngāti Raukawa (Horowhenua/Manawatū)	13.1	8.6	-34%	3.9	3.4	-12%

**Table 12: Urban / rural location, 2001**

	Major Urban Areas	Other Urban Areas	Rural Centres	Other Rural Areas
All New Zealanders	71.0%	14.7%	2.1%	12.1%
Māori	64.2%	19.6%	3.4%	12.8%
Large iwi summary:				
unweighted mean	61.8%	22.2%	3.5%	12.5%
standard deviation	6.1%	6.5%	1.3%	2.7%
Large iwi:				
Ngāpuhi	68.2%	16.0%	2.9%	12.9%
Ngāti Porou (east coast only)	69.5%	14.2%	4.7%	11.6%
Ngāti Kahungunu	65.9%	20.0%	3.0%	11.1%
Ngāi Tahu / Kāi Tahu	62.8%	20.8%	3.3%	13.1%
Waikato	66.6%	20.3%	2.7%	10.4%
Ngāti Tūwharetoa	56.4%	29.2%	2.8%	11.7%
Tūhoe	56.9%	24.4%	5.8%	12.9%
Ngāti Maniapoto	60.4%	24.8%	2.5%	12.3%
Te Atiawa	65.5%	22.6%	1.7%	10.1%
Ngāti Awa	47.8%	33.6%	5.7%	12.9%
Ngāti Whātua	65.2%	15.6%	4.2%	15.0%
Te Rarawa	61.4%	14.6%	4.2%	19.8%
Ngāti Raukawa (Horowhenua/Manawatū)	56.6%	32.1%	1.9%	9.3%

**Table 13: Urban / rural residence adjustment and income dissimilarity indices**

Iwi	Male Income Dissimilarity Indices			Female Income Dissimilarity Indices		
	Raw All NZers	Residence-Adjusted All NZers	% change	Raw All NZers	Residence-Adjusted All NZers	% change
Ngāpuhi	12.4	12.2	-2%	5.1	4.9	-4%
Ngāti Porou (east coast only)	13.5	13.2	-2%	5.3	5.0	-4%
Ngāti Kahungunu	13.0	12.6	-3%	6.1	5.4	-12%
Ngāi Tahu / Kāi Tahu	5.2	4.8	-8%	4.2	3.6	-13%
Waikato	14.2	13.7	-4%	8.0	7.3	-9%
Ngāti Tūwharetoa	12.7	11.5	-9%	7.3	5.7	-22%
Tūhoe	16.9	16.0	-5%	10.2	8.7	-15%
Ngāti Maniapoto	13.3	12.3	-8%	7.8	6.5	-17%
Te Aitāwa	7.7	7.4	-4%	3.4	3.1	-9%
Ngāti Awa	12.5	12.0	-4%	5.3	3.4	-36%
Ngāti Whātua	12.5	12.2	-2%	4.7	4.3	-8%
Te Rarawa	11.5	11.3	-2%	4.1	4.2	3%
Ngāti Raukawa (Horowhenua/Manawatū)	9.6	8.5	-12%	3.4	3.2	-5%

**Table 14: Regional council, 2001**

	Summary					
	All New Zealanders	All Māori	Large Iwi			
			minimum	maximum	unweighted mean	standard deviation
Northland Region	3.8%	7.4%	1.6%	32.2%	7.6%	10.3%
Auckland Region	30.7%	24.7%	10.7%	50.6%	24.0%	14.0%
Waikato Region	9.6%	13.5%	5.4%	35.4%	13.3%	10.6%
Bay of Plenty Region	6.4%	11.5%	4.0%	46.3%	12.2%	13.1%
Gisborne Region	1.2%	3.3%	0.5%	19.4%	3.1%	5.1%
Hawke's Bay Region	3.8%	5.8%	0.8%	29.9%	5.6%	7.7%
Taranaki Region	2.7%	2.9%	0.7%	19.2%	2.8%	5.0%
Manawatu-Wanganui Region	5.8%	7.4%	2.1%	32.8%	8.2%	8.2%
Wellington Region	11.2%	9.7%	3.7%	25.3%	11.3%	7.3%
Total North Island	75.1%	86.2%	43.6%	95.9%	88.0%	13.7%
Tasman Region	1.2%	0.6%	0.2%	1.3%	0.5%	0.4%
Nelson Region	1.1%	0.7%	0.3%	1.5%	0.6%	0.3%
Marlborough Region	1.1%	0.8%	0.2%	4.2%	0.9%	1.2%
West Coast Region	0.9%	0.5%	0.1%	2.3%	0.4%	0.6%
Canterbury Region	13.0%	6.7%	2.1%	28.2%	5.9%	6.8%
Otago Region	5.1%	2.3%	0.7%	9.7%	1.8%	2.4%
Southland Region	2.5%	2.1%	0.4%	10.2%	1.8%	2.6%
Total South Island	24.8%	13.8%	4.1%	56.1%	11.9%	13.6%

By Iwi

	Ngāpuhi	Ngāti Porou	Ngāti Kahungunu	Ngāi Tahu	Waikato	Ngāti Tūwharetoa	Tūhoe	Ngāti Maniapoto	Te Atiawa	Ngāti Awa	Ngāti Whātua	Te Rarawa	Ngāti Raukawa (Horowhenua/Manawatū)
Northland Region	20.7%	2.4%	2.0%	1.7%	3.6%	2.2%	2.3%	3.1%	1.9%	2.1%	22.3%	32.2%	1.6%
Auckland Region	41.0%	17.5%	11.5%	10.7%	33.2%	15.6%	17.0%	23.7%	13.3%	20.6%	50.6%	46.3%	11.5%
Waikato Region	10.1%	9.3%	8.5%	5.6%	34.8%	22.8%	9.8%	35.4%	7.1%	9.1%	7.1%	5.4%	8.5%
Bay of Plenty Region	6.4%	10.1%	6.6%	4.6%	7.1%	14.7%	34.8%	8.5%	5.1%	46.3%	4.0%	4.3%	5.6%
Gisborne Region	1.1%	19.4%	4.2%	1.4%	1.0%	1.5%	5.1%	0.9%	0.9%	1.7%	0.9%	0.5%	1.2%
Hawke's Bay Region	2.2%	7.8%	29.9%	3.1%	2.2%	6.8%	7.4%	2.7%	2.6%	2.3%	1.1%	0.8%	4.1%
Taranaki Region	1.2%	1.2%	1.2%	1.4%	1.6%	1.8%	0.9%	2.9%	19.2%	1.1%	0.8%	0.7%	2.0%
Manawatu-Wanganui Region	3.6%	6.0%	8.8%	5.3%	3.7%	15.2%	4.7%	8.6%	8.8%	3.0%	3.3%	2.1%	32.8%
Wellington Region	6.0%	16.2%	16.5%	9.7%	5.0%	10.6%	10.9%	7.1%	24.6%	7.4%	4.3%	3.7%	25.3%
Total North Island	92.5%	89.9%	89.1%	43.6%	92.1%	91.1%	92.9%	93.1%	83.5%	93.5%	94.4%	95.9%	92.5%
Tasman Region	0.4%	0.5%	0.4%	1.2%	0.4%	0.4%	0.2%	0.4%	1.3%	0.6%	0.3%	0.2%	0.3%
Nelson Region	0.4%	0.5%	0.6%	1.5%	0.5%	0.6%	0.4%	0.5%	1.1%	0.4%	0.4%	0.3%	0.6%
Marlborough Region	0.4%	0.5%	0.6%	3.0%	0.4%	0.6%	0.3%	0.4%	4.2%	0.4%	0.2%	0.2%	0.7%
West Coast Region	0.3%	0.3%	0.3%	2.3%	0.2%	0.3%	0.2%	0.2%	0.3%	0.2%	0.3%	0.1%	0.4%
Canterbury Region	3.7%	5.0%	5.2%	28.2%	4.0%	5.0%	3.7%	3.3%	6.1%	3.1%	2.8%	2.1%	4.1%
Otago Region	1.2%	1.6%	1.7%	9.7%	1.1%	1.1%	0.9%	1.0%	2.1%	1.1%	0.9%	0.7%	0.9%
Southland Region	1.0%	1.6%	2.0%	10.2%	1.3%	0.9%	1.4%	1.1%	1.1%	0.8%	0.6%	0.5%	0.4%
Total South Island	7.5%	10.1%	10.8%	56.1%	7.9%	8.8%	7.1%	6.9%	16.3%	6.5%	5.5%	4.1%	7.5%



**Table 15: Regional Council area adjustment and income dissimilarity indices**

Iwi	Male Income Dissimilarity Indices			Female Income Dissimilarity Indices		
	Raw All NZers	Region-Adjusted All NZers	% change	Raw All NZers	Region-Adjusted All NZers	% change
Ngāpuhi	12.4	11.8	-5%	5.1	5.7	11%
Ngāti Porou (east coast only)	13.5	11.9	-12%	5.3	4.5	-15%
Ngāti Kahungunu	13.0	11.8	-9%	6.1	4.6	-25%
Ngāi Tahu / Kāi Tahu	5.2	4.2	-18%	4.2	2.9	-31%
Waikato	14.2	14.4	1%	8.0	8.4	5%
Ngāti Tūwharetoa	12.7	11.4	-10%	7.3	6.0	-18%
Tūhoe	16.9	15.9	-6%	10.2	8.6	-15%
Ngāti Maniapoto	13.3	12.9	-3%	7.8	7.4	-5%
Te Aitāwa	7.7	8.1	5%	3.4	3.4	-1%
Ngāti Awa	12.5	11.6	-7%	5.3	4.4	-19%
Ngāti Whātua	12.5	12.2	-2%	4.7	5.8	23%
Te Rarawa	11.5	10.5	-8%	4.1	4.2	3%
Ngāti Raukawa (Horowhenua/Manawatū)	9.6	8.7	-10%	3.4	3.2	-7%

**Table 16: Average dissimilarity indices**

	Characteristic for adjustment	Comparison group	Average unadjusted dissimilarity index over large iwi	Average adjusted dissimilarity index over large iwi	Average change with adjustment
Male	Age Qualifications WLFS	European males	15.2	13.7	-10%
	Urban/Rural Region	All NZ males	11.9	10.9	-28%
				10.8	-29%
Female	Age Qualifications WLFS	European females	7.4	11.4	-5%
	Urban/Rural Region	All NZ females	5.8	11.2	-6%
				10.7	51%
				5.1	-30%
			5.3	-25%	
			5.0	-12%	
			5.3	-7%	

## Appendix A: Income Distributions by Characteristic

Table A1: Age group

		Income Distributions of All New Zealanders by Age, 2001												
	age	loss	zero income	\$1 - \$5,000	\$5,001 - \$10,000	\$10,001 - \$15,000	\$15,001 - \$20,000	\$20,001 - \$25,000	\$25,001 - \$30,000	\$30,001 - \$40,000	\$40,001 - \$50,000	\$50,001 - \$70,000	\$70,001 - \$100,000	\$100,001 or More
Males	15-19 years	1.0%	23.5%	43.0%	13.4%	7.0%	6.0%	3.5%	1.5%	0.6%	0.1%	0.1%	0.1%	0.2%
	20-24 years	0.8%	3.7%	12.2%	17.6%	12.5%	11.9%	13.4%	12.1%	10.7%	3.2%	1.3%	0.3%	0.3%
	25-34 years	0.7%	1.4%	3.5%	7.7%	7.4%	6.9%	8.9%	12.7%	21.2%	13.1%	10.0%	4.0%	2.5%
	35-44 years	0.8%	1.2%	2.3%	5.9%	6.6%	5.9%	7.2%	9.9%	18.4%	13.6%	14.5%	6.8%	6.7%
	45-54 years	1.0%	1.1%	2.3%	6.6%	6.8%	6.1%	7.4%	9.9%	16.6%	12.7%	14.4%	7.3%	7.8%
	55-64 years	0.9%	1.5%	3.3%	13.6%	10.5%	7.7%	8.4%	10.1%	14.5%	9.3%	10.1%	5.0%	5.0%
	65-74 years	0.3%	0.8%	1.6%	22.8%	33.4%	12.5%	7.5%	6.0%	6.5%	3.2%	2.8%	1.3%	1.4%
	75-84 years	0.1%	0.6%	2.1%	19.5%	39.4%	14.5%	7.9%	5.5%	5.2%	2.0%	1.8%	0.6%	0.6%
85+ years	0.2%	1.2%	4.1%	16.4%	38.6%	15.1%	7.8%	5.5%	5.6%	2.2%	1.8%	0.7%	0.7%	
Females	15-19 years	0.8%	24.0%	48.4%	13.6%	5.9%	4.0%	2.1%	0.8%	0.3%	0.1%	0.0%	0.0%	0.0%
	20-24 years	0.6%	4.1%	15.3%	19.5%	16.0%	12.4%	10.9%	9.9%	9.3%	1.5%	0.5%	0.1%	0.1%
	25-34 years	0.6%	6.2%	9.8%	10.8%	13.0%	10.4%	8.9%	9.7%	15.7%	7.9%	4.8%	1.5%	0.7%
	35-44 years	0.7%	5.7%	9.3%	11.2%	14.0%	11.7%	9.8%	8.8%	12.5%	7.0%	5.6%	2.0%	1.6%
	45-54 years	0.7%	3.9%	6.9%	11.7%	13.2%	10.8%	10.2%	9.8%	14.2%	8.3%	6.9%	1.9%	1.6%
	55-64 years	0.5%	4.4%	8.5%	23.6%	18.0%	9.7%	7.6%	7.0%	9.6%	4.9%	4.0%	1.2%	0.9%
	65-74 years	0.2%	1.0%	2.2%	24.3%	43.2%	13.1%	5.7%	3.7%	3.4%	1.4%	1.1%	0.4%	0.4%
	75-84 years	0.1%	0.9%	2.8%	17.4%	47.8%	16.2%	6.3%	3.4%	2.7%	0.9%	0.8%	0.4%	0.3%
85+ years	0.3%	1.7%	5.6%	15.1%	45.2%	16.6%	6.6%	3.7%	2.8%	0.9%	0.9%	0.3%	0.4%	

**Table A2: Highest qualification**

	Highest Qualification	Loss	Zero Income	\$1 - \$5,000	\$5,001 - \$10,000	\$10,001 - \$15,000	\$15,001 - \$20,000	\$20,001 - \$25,000	\$25,001 - \$30,000	\$30,001 - \$40,000	\$40,001 - \$50,000	\$50,001 - \$70,000	\$70,001 - \$100,000	\$100,001 or More
Males	No Qualification	0.9%	5.1%	7.3%	15.1%	16.2%	9.5%	9.4%	10.5%	12.9%	6.2%	4.0%	1.3%	1.4%
	Fifth Form	0.6%	4.6%	9.6%	8.6%	10.0%	8.3%	9.0%	10.9%	16.2%	9.5%	7.5%	2.8%	2.5%
	Sixth Form	0.6%	3.6%	10.7%	8.3%	9.1%	7.7%	8.3%	9.5%	14.7%	10.0%	9.4%	4.2%	3.8%
	Higher School Qual	0.8%	4.1%	18.9%	16.2%	10.2%	6.5%	6.5%	6.9%	10.1%	6.5%	6.5%	3.4%	3.6%
	Other NZ Secondary School Qual	2.4%	5.7%	8.8%	16.6%	17.8%	10.3%	8.8%	7.9%	10.6%	4.8%	3.3%	1.2%	1.8%
	Overseas Secondary School Qual	1.3%	6.0%	6.5%	14.6%	14.9%	9.1%	8.4%	8.6%	11.6%	7.2%	6.3%	3.0%	2.6%
	Basic Vocational	0.6%	1.5%	5.6%	10.7%	10.9%	8.9%	9.4%	10.6%	15.9%	10.9%	9.3%	3.5%	2.3%
	Skilled Vocational	0.5%	0.6%	1.5%	6.2%	8.5%	6.3%	7.4%	11.3%	23.4%	15.6%	12.6%	3.9%	2.4%
	Intermediate Vocational	0.4%	0.9%	3.2%	7.0%	7.7%	6.6%	7.1%	9.0%	18.8%	15.6%	15.7%	5.2%	2.8%
	Advanced Vocational	0.6%	0.9%	2.4%	5.9%	7.5%	6.2%	6.5%	7.5%	14.2%	14.5%	18.6%	8.7%	6.5%
Bachelor Degree	0.5%	1.1%	3.3%	6.2%	6.5%	4.8%	4.4%	5.7%	12.8%	11.2%	17.6%	11.8%	14.1%	
Higher Degree	0.5%	0.9%	2.4%	4.6%	5.1%	4.1%	3.7%	4.3%	9.7%	10.6%	21.3%	15.3%	17.5%	
Females	No Qualification	0.8%	7.5%	10.6%	20.0%	26.4%	12.5%	8.0%	5.7%	5.2%	1.6%	1.0%	0.4%	0.4%
	Fifth Form	0.5%	7.1%	13.4%	12.9%	16.6%	11.6%	9.3%	8.9%	11.4%	4.4%	2.4%	0.8%	0.8%
	Sixth Form	0.5%	6.1%	16.0%	11.3%	13.5%	10.4%	8.9%	9.0%	13.0%	5.7%	3.6%	1.1%	1.0%
	Higher School Qual	0.4%	5.1%	26.0%	18.9%	13.0%	8.1%	6.5%	6.4%	8.2%	3.5%	2.3%	0.8%	0.6%
	Other NZ Secondary School Qual	1.5%	8.5%	10.9%	21.5%	23.5%	12.1%	7.9%	5.6%	4.1%	1.5%	1.5%	0.9%	0.6%
	Overseas Secondary School Qual	1.1%	11.8%	11.3%	17.6%	19.0%	10.5%	7.6%	6.6%	7.8%	3.3%	2.0%	0.7%	0.6%
	Basic Vocational	0.4%	3.8%	10.8%	14.0%	17.6%	13.6%	10.8%	9.6%	11.3%	4.4%	2.5%	0.7%	0.5%
	Skilled Vocational	0.4%	4.2%	9.1%	11.3%	14.7%	12.1%	11.1%	11.3%	14.8%	5.8%	3.6%	1.0%	0.8%
	Intermediate Vocational	0.5%	3.3%	10.4%	13.5%	16.4%	13.9%	11.6%	10.8%	11.2%	4.5%	2.6%	0.8%	0.5%
	Advanced Vocational	0.3%	2.8%	6.5%	9.5%	13.6%	10.1%	9.0%	9.1%	16.1%	12.1%	7.8%	1.9%	1.2%
Bachelor Degree	0.3%	3.5%	7.8%	9.3%	9.4%	7.0%	6.3%	7.9%	18.2%	12.1%	12.0%	3.9%	2.3%	
Higher Degree	0.4%	2.9%	5.7%	7.1%	7.7%	6.2%	5.5%	6.4%	14.2%	13.2%	19.0%	7.1%	4.5%	

**Table A3: Work and labour force status**

	Work and Labour Force Status	Loss	Zero Income	\$1 - \$5,000	\$5,001 - \$10,000	\$10,001 - \$15,000	\$15,001 - \$20,000	\$20,001 - \$25,000	\$25,001 - \$30,000	\$30,001 - \$40,000	\$40,001 - \$50,000	\$50,001 - \$70,000	\$70,001 - \$100,000	\$100,001 or More
Male	Employed Full-time	0.6%	0.3%	2.0%	3.2%	5.0%	7.0%	9.4%	12.4%	20.4%	13.8%	13.6%	6.4%	6.0%
	Employed Part-time	0.9%	1.6%	27.0%	17.4%	16.9%	10.4%	6.9%	5.4%	5.5%	2.9%	2.5%	1.1%	1.4%
	Unemployed	1.6%	11.2%	20.3%	31.9%	16.7%	7.2%	4.0%	2.6%	2.0%	0.9%	0.7%	0.4%	0.4%
	Not in the Labour Force	0.9%	10.4%	10.7%	24.9%	26.5%	9.5%	5.4%	3.9%	3.7%	1.6%	1.3%	0.5%	0.6%
Female	Employed Full-time	0.4%	0.5%	2.9%	4.7%	7.4%	10.4%	12.6%	14.2%	22.1%	11.7%	8.7%	2.6%	1.8%
	Employed Part-time	0.5%	1.3%	22.2%	19.4%	20.1%	13.4%	8.1%	5.3%	4.9%	1.9%	1.6%	0.6%	0.6%
	Unemployed	1.2%	14.3%	22.5%	23.9%	19.5%	9.4%	4.1%	2.2%	1.6%	0.6%	0.4%	0.1%	0.1%
	Not in the Labour Force	0.7%	13.0%	12.8%	22.0%	29.2%	10.5%	4.6%	2.7%	2.3%	0.9%	0.7%	0.3%	0.3%

**Table A4: Urban / rural residence**

	Area of Residence	Loss	Zero Income	\$1 - \$5,000	\$5,001 - \$10,000	\$10,001 - \$15,000	\$15,001 - \$20,000	\$20,001 - \$25,000	\$25,001 - \$30,000	\$30,001 - \$40,000	\$40,001 - \$50,000	\$50,001 - \$70,000	\$70,001 - \$100,000	\$100,001 or More
Males	main urban area	0.7%	3.8%	7.5%	10.8%	11.2%	7.4%	7.5%	8.8%	14.0%	9.5%	9.6%	4.7%	4.4%
	secondary urban area	0.5%	2.2%	6.3%	11.7%	14.0%	9.1%	8.9%	10.6%	15.6%	9.1%	7.5%	2.8%	1.9%
	minor urban area	0.6%	2.5%	6.1%	14.0%	16.1%	9.4%	8.9%	10.2%	14.1%	8.0%	6.4%	2.2%	1.5%
	rural centre	0.7%	2.5%	5.9%	13.8%	15.2%	10.0%	9.2%	10.4%	13.9%	8.1%	6.2%	2.2%	2.0%
	other rural	1.2%	2.8%	6.3%	10.2%	11.1%	8.9%	8.9%	10.5%	14.5%	8.5%	8.4%	3.9%	4.8%
Females	main urban area	0.5%	6.2%	11.4%	14.3%	17.9%	10.6%	8.2%	7.7%	11.1%	5.7%	4.2%	1.3%	0.9%
	secondary urban area	0.4%	4.8%	11.6%	17.4%	23.9%	13.1%	8.7%	6.7%	7.3%	3.1%	2.1%	0.5%	0.4%
	minor urban area	0.5%	4.8%	11.3%	18.9%	24.5%	12.8%	8.4%	6.6%	6.6%	2.8%	2.0%	0.5%	0.4%
	rural centre	0.6%	5.4%	11.9%	19.1%	22.5%	12.3%	8.1%	6.0%	7.0%	3.4%	2.5%	0.7%	0.6%
	other rural	0.9%	5.8%	12.0%	15.2%	16.3%	10.9%	8.3%	7.5%	9.6%	5.1%	4.5%	1.7%	2.1%

**Table A5: Regional council area**

	Region of Residence	Loss	Zero Income	\$1 - \$5,000	\$5,001 - \$10,000	\$10,001 - \$15,000	\$15,001 - \$20,000	\$20,001 - \$25,000	\$25,001 - \$30,000	\$30,001 - \$40,000	\$40,001 - \$50,000	\$50,001 - \$70,000	\$70,001 - \$100,000	\$100,001 or More
North Island	Northland Region	0.8%	4.4%	8.7%	16.6%	19.0%	10.9%	8.0%	7.9%	10.1%	5.5%	4.6%	1.7%	1.7%
	Auckland Region	0.8%	6.2%	9.3%	11.3%	12.5%	8.2%	7.5%	8.2%	13.2%	8.4%	7.7%	3.4%	3.2%
	Waikato Region	0.7%	4.5%	9.3%	13.7%	15.8%	9.9%	8.2%	8.5%	11.9%	7.0%	6.1%	2.3%	2.2%
	Bay of Plenty Region	0.7%	4.0%	8.7%	14.7%	18.1%	10.6%	8.4%	8.3%	11.1%	6.2%	5.5%	2.1%	1.7%
	Gisborne Region	0.7%	3.9%	10.8%	15.6%	18.3%	11.4%	8.4%	8.5%	9.9%	5.4%	4.1%	1.4%	1.4%
	Hawke's Bay Region	0.7%	3.8%	9.5%	14.3%	17.8%	11.0%	8.7%	8.8%	11.5%	6.0%	4.9%	1.6%	1.4%
	Taranaki Region	0.5%	4.3%	8.7%	14.1%	17.7%	10.2%	8.2%	8.3%	11.0%	6.4%	5.8%	2.5%	2.4%
	Manawatu-Wanganui Region	0.5%	4.0%	9.8%	14.8%	18.0%	10.7%	8.6%	8.6%	11.1%	6.0%	4.8%	1.6%	1.4%
	Wellington Region	0.5%	4.2%	8.7%	11.1%	13.2%	8.6%	7.7%	8.2%	13.1%	8.3%	8.3%	4.3%	3.8%
South Island	Tasman Region	0.8%	3.1%	9.8%	14.5%	19.2%	11.3%	9.2%	8.5%	10.2%	5.7%	4.5%	1.6%	1.6%
	Nelson Region	0.4%	3.3%	9.3%	13.7%	18.6%	11.0%	9.5%	8.3%	11.2%	6.2%	5.2%	1.8%	1.5%
	Marlborough Region	0.8%	2.7%	8.6%	14.3%	19.0%	12.0%	9.7%	8.7%	11.3%	5.7%	4.3%	1.5%	1.5%
	West Coast Region	0.6%	3.6%	8.6%	18.2%	20.6%	9.9%	8.2%	7.9%	9.6%	5.9%	4.2%	1.3%	1.4%
	Canterbury Region	0.6%	4.1%	9.5%	14.0%	16.7%	9.9%	8.7%	8.6%	12.0%	6.6%	5.4%	2.1%	1.7%
	Otago Region	0.5%	3.7%	11.9%	15.5%	17.1%	9.8%	8.5%	8.6%	11.0%	5.6%	4.7%	1.7%	1.6%
	Southland Region	0.4%	3.5%	9.2%	13.9%	17.2%	10.5%	8.8%	8.5%	11.7%	6.6%	5.7%	2.0%	2.0%

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