



**MINISTRY OF EDUCATION**

*Te Tāhuhu o te Mātauranga*

# **Outcomes of the New Zealand tertiary education system**

**A synthesis of the evidence**

## **Report**

Outcomes of the New Zealand tertiary education system - a synthesis of the evidence

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## **Executive summary**

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The New Zealand tertiary education system plays a pivotal role in enhancing the skills and knowledge of those who participate in post-compulsory study. In doing so, the tertiary education system improves the lifestyle of not only these students, but through them, the wider community and the economy. This report provides a synthesis of the evidence of the outcomes of the New Zealand tertiary education system. The report quotes a number of statistical studies completed over the last six years and also reproduces some previously published summaries of the evidence. Overall, the overwhelming weight of evidence points to there being significant and positive outcomes from the tertiary education system.

The funding invested in the New Zealand tertiary education system is substantial. In 2004/05, the government appropriated around \$3.3 billion to fund the tertiary education system. Adding the value of the tuition fees paid by domestic students (around \$545 million by students at tertiary education institutions in 2004) to this amount gives a sense of the size of the investment in tertiary education. Therefore, it is important that the outcomes of the tertiary education system are monitored and assessed to ensure that they are positive.

Enrolment data shows that New Zealand tertiary education organisations (TEOs) are producing an increasing number of graduates. Between 2000 and 2004, the number of domestic students completing a tertiary qualification at a New Zealand provider increased by 70 percent, from 68,800 to 116,600. A feature of this increase is the growth in completions of sub-degree qualifications. Between 2000 and 2004, the number of students completing this level of qualification increased by 122 percent. The growth in bachelors-level and postgraduate-level completions has been more muted, at 6.1 percent and 0.6 percent respectively.

More women are completing tertiary qualifications than men. In 2004, 60 percent of domestic completers of tertiary qualifications were women. Among domestic students, there has been a decrease in the proportion of completions by those of European ethnicity. In 2004, 61 percent of completers were European, compared with 71 percent in 2000. The proportion of completers who are Māori has risen from 15 percent in 2000 to 22 percent in 2004. Another trend is that domestic completers of tertiary qualifications are getting older. In 2000, 52 percent of tertiary completers were aged 25 and older. By 2004, this had increased to 66 percent.

Along with the number of domestic completions, the stock of human capital is also influenced by the migration of tertiary qualified people to New Zealand. The percentage of the usually resident population of working age who had a bachelors or higher qualification that were born and educated overseas increased from 14 percent in 1981 to 22 percent in 2001. This highlights the importance of this group in contributing to changes in the level of educational attainment in the New Zealand population.

The proportion of the New Zealand working-age population with tertiary qualifications is rising. In 2005, 50 percent of the New Zealand working-age population had a tertiary qualification, compared with 38 percent in 1991. The main

driver of this rise is an increase in the percentage of the population with a bachelors or higher qualification. In 1994, 7 percent of the working-age population held this level of qualification. By 2005, this had risen to 15 percent.

Although a higher proportion of men have tertiary qualifications than women, the gap in attainment levels is closing. In 1991, 44 percent of men and 32 percent of women had a tertiary qualification. In 2005, the figures were 53 percent and 46 percent respectively. At the bachelors or higher level, there is a higher proportion of women in the younger age groups than men with this level of qualification. Therefore, if this trend continues, it is likely that at some stage in the future a higher proportion of women will have a bachelors or higher qualification than men.

There is a wide disparity in the attainment of tertiary qualifications by ethnic group, especially higher qualifications. A significantly lower proportion of the Māori and Pasifika ethnic groups have a bachelors or higher qualification than Europeans. In 2005, 6 percent of Māori, 4 percent of Pasifika, and 14 percent of Europeans held this level of qualification.

The age of those with tertiary qualifications is rising as the effects of rising participation rates in the 1990s and 1970s are felt. In 2005, 57 percent of the working-age population with tertiary qualifications were aged 40 or over. This compares with 50 percent in 1998.

The field of study of the usually resident population aged 15 and over that hold tertiary qualifications is changing over time. At the bachelors or higher qualification level, an estimated 41 percent of tertiary graduates had qualifications in the field of 'society and culture' in 1981. By 2001, this had fallen to 29 percent. The largest increase was in the 'management and commerce' field of study. In 1981, 8 percent of tertiary graduates held qualifications in this field. By 2001, this had increased to 19 percent.

For those with non-degree tertiary qualifications, the largest field of study was 'engineering and related technologies'. In 1981, 28 percent of non-degree tertiary graduates had qualifications in this field of study. By 2001, this had fallen to 23 percent.

At an international level, New Zealand has a higher rate of attainment of tertiary qualifications than the Organisation for Economic Co-operation and Development (OECD) average. In 2003, 40 percent of the New Zealand population aged 25 to 64 had tertiary qualifications. This compares with an OECD average of 27 percent. Although a similar percentage of New Zealanders have a bachelors or higher degree, compared with the OECD average the percentage of New Zealanders with certificates and diplomas is significantly higher.

The employment prospects of New Zealanders are enhanced by having tertiary qualifications. In 2005, the unemployment rate of those with a bachelors or higher qualification was 2.2 percent and those with an 'other tertiary' qualification 2.5 percent. This compares with an unemployment rate of 4.2 percent for those with school qualifications and 6.4 percent for those with no qualifications. Also, during times of economic prosperity, the difference in unemployment rate between

qualification levels is reduced, but in an economic recession there is a substantial difference in unemployment rates. In other words, higher-level qualifications appear to be associated with greater sustainability of employment.

The disparity in the unemployment rate of ethnic groups in New Zealand is moderated by the attainment of higher qualifications. In 2005, the unemployment rate for those with no qualifications was 4.4 percent for Europeans, 12.1 percent for Māori, and 9.4 percent for Pasifika. However, for those with a bachelors degree or higher the unemployment rate for Europeans was 1.1 percent, Māori 1.7 percent and Pasifika 1.6 percent.

The unemployment rate of New Zealanders with a tertiary education is lower than the OECD average. In 2003, the unemployment rate of the New Zealand population aged 25 to 64 with a tertiary education was 3.5 percent, compared with an OECD average of 4.0 percent.

By attaining tertiary qualifications, there is a higher likelihood of engagement with the labour force. The labour force participation rate for those with tertiary qualifications is significantly higher than that for those with school or no qualifications. In 2005, the labour force participation rate for those with a bachelors or higher qualification was 84 percent, followed by those with 'other tertiary' qualifications with 76 percent, those with school qualifications with 64 percent and those with no qualifications 49 percent.

Overall, women have a lower level of labour force participation than men. However, the attainment of tertiary qualifications diminishes this gap significantly. In 2005, the participation rate of men with a bachelors or higher qualification was 87 percent and for women with this level of qualification it was 80 percent. This compares with a participation rate of 60 percent for men with no qualifications and 39 percent for women with no qualifications.

Attainment of tertiary qualifications results in higher incomes for New Zealanders. In 2005, the median weekly income was \$756 for those with a bachelors or higher qualification and \$560 for those with an 'other tertiary' qualification. This compares with a median weekly income of \$301 for those with school qualifications and \$293 for those with no qualifications.

The disparity between the median weekly incomes of men and women is declining for those with tertiary qualifications, but increasing for those with school or no qualifications. In 2005, the median weekly income of women with bachelors or higher qualifications was 69 percent that of men. This compares with 60 percent for 'other tertiary' qualifications, 61 percent for school qualifications, and 68 for no qualifications. The higher labour force participation rate of women with tertiary qualifications is a likely contributor to this trend.

The median weekly income of Māori with bachelors or higher qualifications is now higher than for the European ethnic group. In 2005, Māori with this level of qualification had a median weekly income of \$902. This compares with \$802 for Europeans. The median weekly income for the Pasifika ethnic group was \$690 and for the 'Other' ethnic group \$500.

The median weekly income for those with an ‘other tertiary’ qualification was not as widely distributed. In 2005, Europeans had a median weekly income of \$576, followed by Māori with \$550, Pasifika with \$510 and ‘Others’ with \$440.

An analysis of the impact of tertiary qualifications on the median hourly wage earned by people employed showed that there are significant gains associated with higher qualifications. In 2005, the median hourly wage for an employed person with a bachelors or higher qualification was \$22.35. This compares with a median hourly wage of \$17.50 for employed people with an ‘other tertiary’ qualification, \$14 for school qualifications and \$13 for an employed person with no qualifications.

The disparities in median weekly income exhibited by men and women were reduced when the median hourly wage was used as the measure of income. In 2005, the median weekly income of women with a bachelors or higher qualification was 69 percent of men with a similar qualification. However, the median hourly wage of women with a bachelors or higher qualification was 83 percent that of men. This illustrates the impact of the smaller number of hours worked per week on average by women on income relativities.

Europeans earned a higher median hourly wage than Māori and Pasifika ethnic groups at all levels of qualification. In 2005, Europeans with a bachelors or higher qualification earned a median hourly wage of \$23.49. This compares with \$21.58 for Māori and \$19.71 for Pasifika ethnic groups. This suggests that the higher median weekly income exhibited by Māori with a bachelors or higher qualification was a result of a greater number of hours worked per week.

There is evidence that the returns to income from higher tertiary qualifications is lower in New Zealand than in some other countries. OECD data shows that the premium<sup>1</sup> for a bachelors or higher qualification in New Zealand in 2003 was 50 percent, compared with someone with secondary school qualifications. The compares with a premium of 78 percent in the United Kingdom, 91 percent in the United States, and 42 percent in Australia (2001).

Analysis of the integrated dataset on Student Loan Scheme borrowers (IDS) shows that successful completion of a tertiary qualification results in higher median incomes. However, over time the premium on the successful completion of higher-level qualifications either stays the same or increases, while the premium on the successful completion of non-degree qualifications exhibits a decrease.

A study by Nair (2006) using the IDS found that borrowers with higher tertiary qualifications attained higher post-study income. Also, once controlling for other factors, borrowers who studied in the field of ‘health’ had the highest post-study income and ‘mixed field programmes’ the lowest. Nair also found that the industry of employment of the borrower influenced post-study income. Borrowers employed in the ‘electricity, gas and water supply’ industry had the highest post-study income,

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<sup>1</sup> The premium is calculated as the ratio of the income of those with a bachelors degree/income of those with secondary school qualifications.

while borrowers employed in ‘agriculture, forestry, fishing and hunting’ had the lowest.

Analytical studies of Census and Household Labour Force Survey (HLFS) data show positive returns to tertiary education. Studies by Maani (1999), Maani and Maloney (2004), and Penny (2005) all show that there are positive returns associated with higher qualifications. Similarly, a study by Scobie, Gibson and Tre (2005) estimated the value of human capital and found that the level of educational qualification was a major factor in determining an individual’s human capital. Those with higher qualifications had a significantly higher estimated human capital than those without these qualifications.

A study by Marē and Liang (2006) determined fields of study where there was a high degree of specialisation – a high proportion of people with a qualification similar to the field they worked in. Fields with high degrees of specialisation included ‘medicine’ and ‘nursing’. Fields with low degrees of specialisation included ‘business and management’ and ‘office studies’.

The study by Marē and Liang also found that tertiary graduates who worked in a field aligned with their tertiary qualification earned more than those who did not. In 2001, the median income of tertiary graduates aged 18 to 65 working ‘in-field’ was 11 percent higher than those working ‘out-of-field’. For tertiary graduates aged 18 to 30 the figure was 20 percent. However, there was wide variation in the returns to working ‘in-field’ across fields of study. In fields such as ‘medicine’ and ‘computer and information science’ there were significant positive returns from working ‘in-field’, while in areas such as ‘building’ and ‘automotive engineering’ there were negative returns from working ‘in-field’.

The tertiary education system contributes to the economic growth of New Zealand in many ways. Overseas studies suggest that education plays a key role in raising labour productivity and, through this, economic growth. In addition, the operational activities of tertiary education institutions (TEIs) direct substantial money flows into various areas of New Zealand. For example, a recent study by Walton (2006) estimated that the expenditure of the University of Auckland and its students added \$4.4 billion worth of output to the Auckland regional economy in 2005. Also, the income earned from international students studying in New Zealand is a billion dollar industry, and hence a vital source of foreign exchange.

Many analytical studies, both internationally and in New Zealand, show that higher levels of education are associated with better health and lifestyles. In addition, studies show an association between higher levels of education and a lower tendency to commit crime.

## **1 Introduction**

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The skills that students attain through the learning process improve their lifestyle and add to the human capital<sup>2</sup> stocks in New Zealand. In helping to develop and enhance those skills, the tertiary education system plays a pivotal role in the development of not just individual New Zealanders, but, through them, the economy and society in general.

This report draws from a variety of data sources and analytical reports to provide a synthesis of the evidence of the outcomes of the New Zealand tertiary education system. These outcomes range from the impact of tertiary qualifications on individual employment prospects and income to the effect on economic growth. In collating the currently available evidence, this report provides a useful overview of the outcomes of the tertiary education system.

The amount of money invested in running the tertiary education system in New Zealand is substantial. In 2004/05, around \$3.3 billion (GST exclusive) was appropriated by the government for the tertiary education system. Added to this is the amount paid by domestic students on tuition fees, around \$545 million (GST exclusive) at TEIs alone in 2004. With such substantial sums involved, it is important that the outcomes of this expenditure are monitored and assessed.

The report begins by outlining, in section 2, the scope of the analysis and the data sources used. That section also discusses the limitations and caveats that apply to the data and analytical studies used in the report.

The attainment of tertiary qualifications by the New Zealand working-age population is discussed in section 3. That section includes an analysis of the two influences on attainment levels: the number of New Zealanders who have completed a tertiary qualification at a New Zealand tertiary provider, and those in the working-age population who were born and educated overseas. The analysis of qualification completions at New Zealand tertiary providers includes an analysis of completions by level, gender, age, ethnic group, and field of study.

The stock of human capital in New Zealand, as measured by highest educational qualification, is also examined in section 3. This analysis disaggregates tertiary qualifications into 'bachelors or higher' and 'other tertiary', and examines the qualifications attainment of the working-age population by gender, ethnic group, and age group. Then, the attainment levels of the New Zealand working-age population are compared with international attainment levels, using Organisation for Economic Cooperation and Development (OECD) data.

Section 4 examines the impact of tertiary qualifications on the employment prospects of graduates from the tertiary education system. The focus of this analysis is primarily on the impact of tertiary qualifications on the unemployment rate and labour force participation rate of the New Zealand working-age population. This analysis disaggregates the data by gender, ethnic group, and age group, to gain a greater level

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<sup>2</sup> Human capital refers to the skills and knowledge of the individual. It can also include the health status of the person (Scobie, Gibson and Le, 2005).

of understanding of how tertiary qualifications impact on the employment prospects of these sub-populations. At the end of section 4, an international comparison of the impact of tertiary qualifications on employment prospects is made using OECD data.

The impact of tertiary qualifications on the income of New Zealanders is the subject of discussion in section 5. This section begins with an analysis of how tertiary qualifications impact on the distribution of income, using Census data. Then the weekly median income of the New Zealand working-age population is analysed by highest educational qualification. This analysis disaggregates the data by gender, ethnic group, and age group, to see how tertiary qualifications impact on these various sub-populations. A similar analysis is then undertaken of the median hourly wage from employment by highest qualification. An international comparison is then made of the returns to education in selected countries, using OECD data.

Section 5 also contains a summary of the findings from analytical reports on the income of New Zealanders who have studied at tertiary level and drawn down student loans. These studies use the integrated dataset on Student Loan Scheme borrowers (IDS).<sup>3</sup> This analysis examines the median incomes of borrowers to see how successful completion of a tertiary qualification impacts on the incomes of a variety of subgroups. In addition, findings on how the premium for successful completion changes over time are also presented. Then an analysis of the impact of educational factors such as qualification level and field of study, along with the impact of industry of employment, on post-study income, is presented.

This is followed by a summary of analytical studies of the returns to education in New Zealand. Those studies include important quantitative studies by Maani (1999) and Maani and Maloney (2004) on the impact of tertiary qualifications on income. In addition, the findings from a recent study by Scobie, Gibson and Tre (2005) on the impact of post-secondary education on the net worth of New Zealanders are presented. Finally, the findings from an analysis by Marē and Liang (2006) of the impact of working ‘in-field’ are presented. This study examines the premium on income earned by those people who studied and work in the same subject field, compared with those who did not. In addition, the authors examine the specialisation of employment in an industry – this is the degree to which tertiary graduates working in an industry were educated in this subject area.

In section 6, the gain in the likelihood of employment from higher educational qualifications is compared with the improvement in median weekly income. This analysis is repeated for selected ethnic groups and for selected years.

The role that education plays in promoting the growth of the New Zealand economy is discussed in section 7. The topics range from the scale and impact of the expenditure of tertiary education organisations (TEOs) in their local economies, to the results from quantitative studies of the impact of how an improvement in human capital can flow on to productivity and economic growth.

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<sup>3</sup> This dataset contains the educational and income records of New Zealanders who have drawn down student loans during the course of their tertiary study.

In section 8, the impact of tertiary qualifications on the general lifestyle of New Zealanders is examined. This section includes a summary of analyses into how education impacts on the health of individuals. This is followed by a summary of the latest findings on how the level of education impacts on the living standards of New Zealanders. Finally, a summary of the links between education and crime is presented, along with data on the education levels of the New Zealand prison inmate population.

## 2 Scope, data sources and limitations

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This report is a synthesis of the currently available information on the outcomes of tertiary education covering the period 1981 to 2005. As such, the report does not seek to present a multitude of new findings; but rather is a collation of recent analysis and research into a single reference to provide an overview of the outcomes of the New Zealand tertiary education system.<sup>4</sup>

The focus of this report is on the outcomes of the New Zealand tertiary education system, in particular employment and income-related outcomes. However, where appropriate, international data on tertiary education outcomes is presented to place the New Zealand performance into an international context.

There is a variety of sources of data for this report. Statistics New Zealand's Census of population and dwellings is a key source for income, unemployment, and qualifications attainment data, for the working-age population. However, with the most recent Census data available being from 2001, the data is becoming somewhat dated. This problem is alleviated to an extent by the use of annual data collected by Statistics New Zealand's *Household Labour Force Survey* (HLFS) and the associated *New Zealand Income Survey* (NZIS). These surveys provide data on the unemployment rates, median weekly incomes, and qualifications attainment of the working-age population on an annual basis. This data is available for the HLFS from 1991, and the NZIS from 1997.

A limitation of survey data such as the HLFS and NZIS is that it introduces sampling error. In the case of the analysis of some subgroups – such as the smaller ethnic groups - there can be a relatively large amount of sampling error, which reduces the level of confidence in the results. Therefore, the data from these surveys should be viewed with caution for these particular subgroups.

The integrated dataset of Student Loan Scheme borrowers (IDS) is used as a data source for the analysis of the impact of educational qualifications on income. This dataset is maintained by Statistics New Zealand and comprises the income, educational and demographic characteristics of all students who have drawn down a student loan. A drawback of using this dataset is that only about 60 percent of tertiary students who are eligible access a student loan. Therefore, any findings from analyses that use the IDS should be seen as not being representative of the entire tertiary student population.

The key source for the international comparisons is the OECD publication *Education at a Glance*. This is an annual publication that seeks to compare tertiary education outcomes across the OECD member countries. One problem with the OECD data concerns the definition of tertiary education. In many countries, tertiary education is only considered to cover degree-level and higher study. Therefore, the relatively large amount of sub-degree education that takes place at New Zealand tertiary providers is sometimes not fully captured in OECD statistics.

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<sup>4</sup> Extracts from previous Ministry of Education publications have been included in the text of this report.

In this report, tertiary qualifications are generally divided into two categories: 'bachelors or higher', and 'other tertiary'. 'Bachelors or higher' qualifications include postgraduate degrees, certificates or diplomas. 'Other tertiary' qualifications include university certificates or diplomas, teaching certificates or diplomas, nursing certificates or diplomas, New Zealand certificates or diplomas, technician's certificates, local polytechnic certificates or diplomas, and trade certificates or advanced trade certificates. Also note that 'School' qualifications referred to in this report include year 11, 12 and 13 qualifications and overseas school qualifications.

Finally, the measure of median weekly income used in section 5 excludes investment income. This is done for the purpose of providing a consistent series in the dataset over time.

### 3 The attainment of qualifications

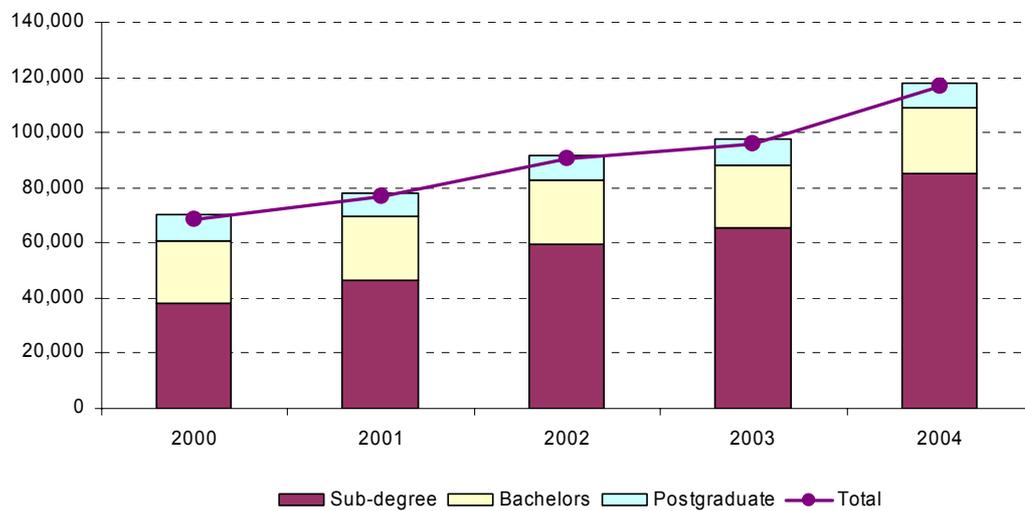
An increasing number and proportion of the New Zealand population hold tertiary-level qualifications. The reasons for this are two fold. Firstly, the number of New Zealanders attaining tertiary education qualifications from New Zealand TEOs has risen on the back of increased participation in the tertiary education sector. Secondly, there has been an increase in the number of people who were born and tertiary educated overseas and who are now resident in New Zealand.

In this section, an analysis of the trends in the completion of qualifications by domestic students at New Zealand tertiary providers is presented. This is followed by an analysis of trends in the proportion of the usually resident population who were born and educated overseas. Finally, the attainment of tertiary qualifications by the New Zealand working-age population is analysed over time and then compared with international benchmarks.

#### The completions of tertiary qualifications by New Zealanders

The significant growth in the number of people completing a tertiary qualification at a New Zealand tertiary provider is illustrated in Figure 1. Between 2000 and 2004, the number of domestic students completing a tertiary-level qualification rose by 70 percent, from 68,800 to 116,600. The rise in the number of completions has been most dramatic at the sub-degree level. Between 2000 and 2004, the number of sub-degree completions rose by 122 percent, from 38,400 to 85,200.

**Figure 1: Domestic students completing tertiary qualifications by level 2000-2004**



Note: Refer to technical note 1.

The remaining levels of qualifications showed more modest rates of increase. Between 2000 and 2004, the number of students completing bachelors degrees increased by 6.1 percent and postgraduate qualifications 0.6 percent.

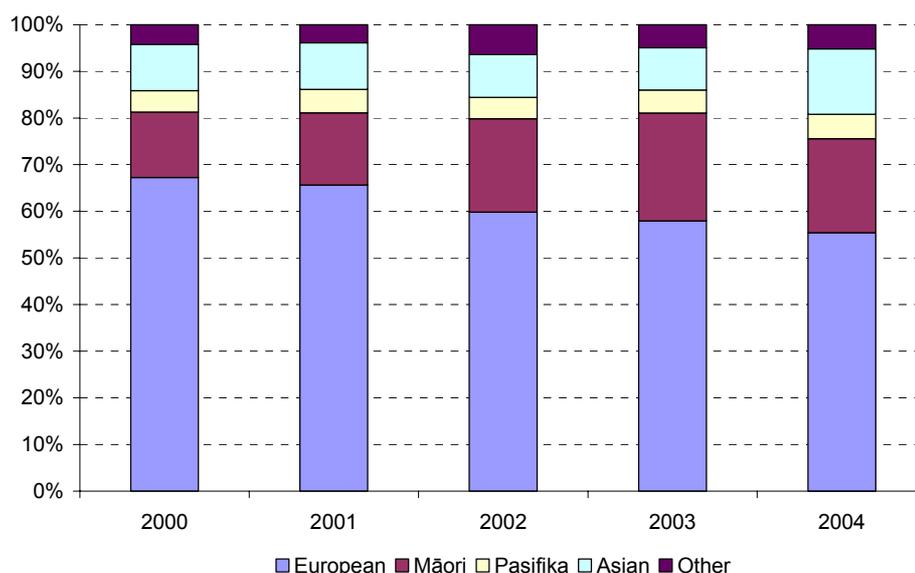
### Qualification completions by gender

The majority of New Zealanders who complete tertiary qualifications are women. Around 60 percent of completing students in each year are women, a figure that has remained relatively stable for the last six years.<sup>5</sup> The greater proportion of women graduates is a result of higher female participation in the tertiary sector<sup>6</sup> in combination with the greater likelihood of successful completion of tertiary qualifications by women (Scott and Smart, 2005).

### Qualification completions by ethnic group

A breakdown of completions by ethnic group shows a trend towards a higher proportion of Māori and Asians completing tertiary qualifications. In 2000, 15 percent of completers were Maori. By 2004, this had increased to 22 percent. The figures for students from the Asian ethnic group were 11 percent and 16 percent respectively. The percentage of students completing a tertiary qualification who identified themselves as European declined from 71 percent in 2000 to 61 percent in 2004. The percentage of completing students who were from the Pasifika ethnic group increased only slightly, from 4.8 percent in 2000 to 5.8 percent in 2004.

**Figure 2: Domestic students completing tertiary qualifications by ethnic group 2000-2004**

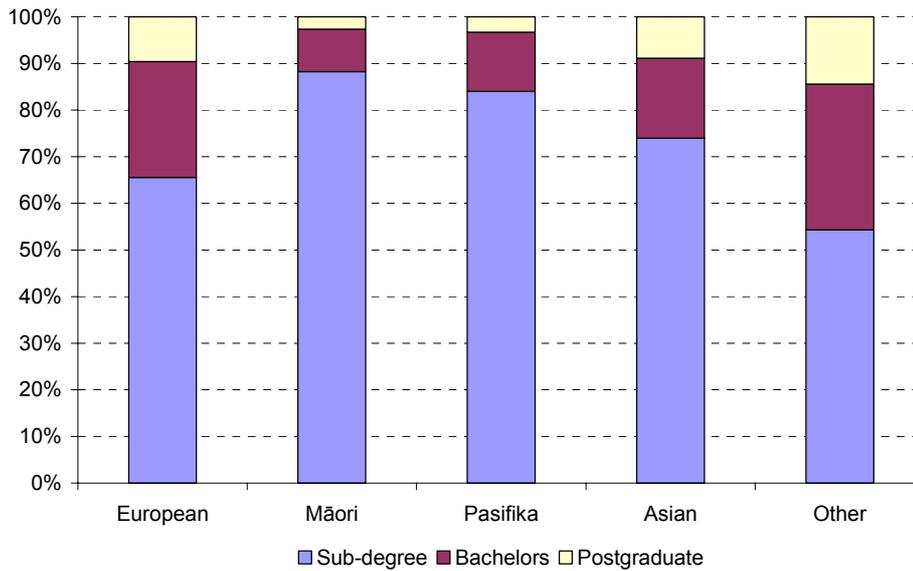


There is wide variation in the levels of qualifications completed by students from the various ethnic groups. In 2004, the vast majority (88 percent) of Māori completers studied at the sub-degree level, with few (2.7 percent) completing at the postgraduate level. The highest percentage of postgraduate completions was by students in the 'Other' ethnic group. In 2004, 14 percent of completers were from this ethnic group. Similarly, completers from the 'Other' ethnic group received the highest percentage of bachelors-level qualifications (31 percent).

<sup>5</sup> However, at the postgraduate level the proportion of female completions has increased from 53 percent in 1999 to 62 percent in 2004.

<sup>6</sup> In 2004, 57 percent of students enrolled in tertiary education were women.

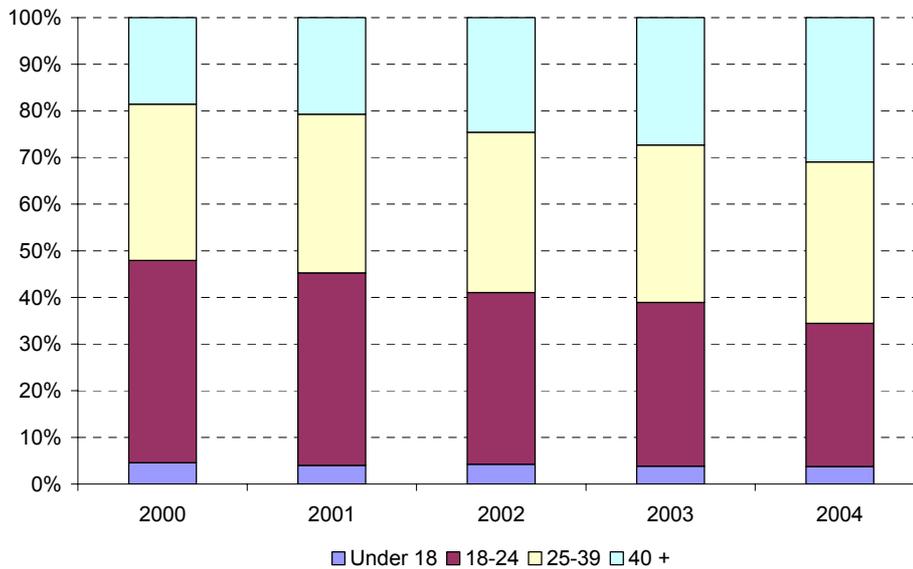
**Figure 3: Domestic students completing tertiary qualifications by ethnic group and level 2004**



**Qualification completions by age group**

The age at which New Zealanders complete tertiary qualifications is rising over time. In 2000, 52 percent of completers were aged 25 and over. By 2004, this had risen to 66 percent. This trend is most obvious at the sub-degree level, where the proportion of completers aged 40 and over has almost doubled from 20 percent in 2000 to 35 percent in 2004.

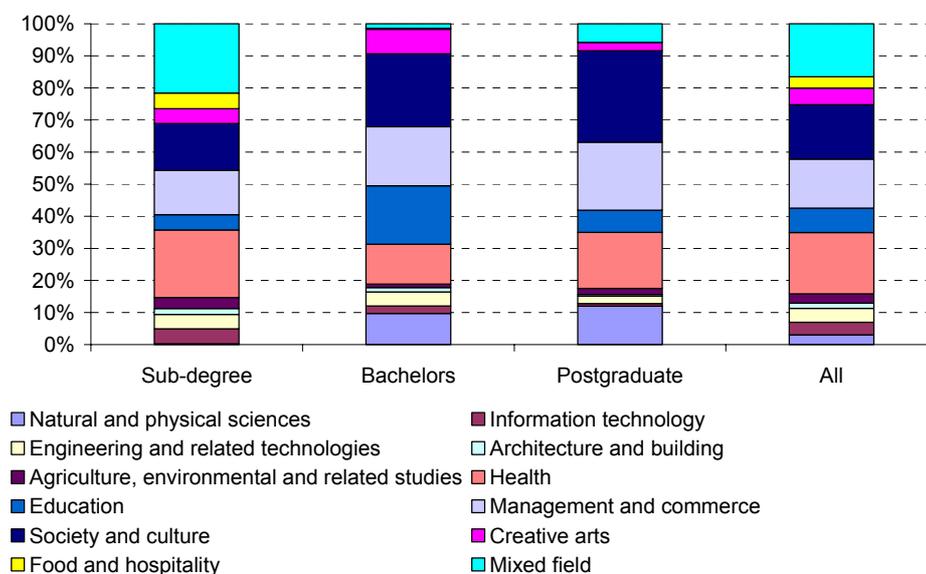
**Figure 4: Domestic students completing tertiary qualifications by age group 2000-2004**



### Qualification completions by field of study

In 2004, the most popular field of study<sup>7</sup> of those who completed a tertiary qualification was ‘health’. In 2004, 19 percent of completers studied in this field. The smallest field of study was ‘architecture and building’, with 1.7 percent of completers studying in this field.

**Figure 5: Domestic students completing tertiary qualifications by field of study and level 2004**



There are significant differences in the field of study of completers by level of qualification. At the sub-degree level, ‘health’ was the largest field of study, with 21 percent of completers in this subject area. ‘Natural and physical sciences’ was the smallest at 0.2 percent. The largest field of study of completers at the bachelors and postgraduate level was ‘society and culture’. Twenty-three percent of bachelors completers and 29 percent of postgraduate completers studied in this field respectively. The smallest field of study of completers at the bachelors level was ‘food and hospitality’ (0.2 percent), while the smallest field of study of postgraduate completers was ‘architecture and building’ (1.7 percent).<sup>8</sup>

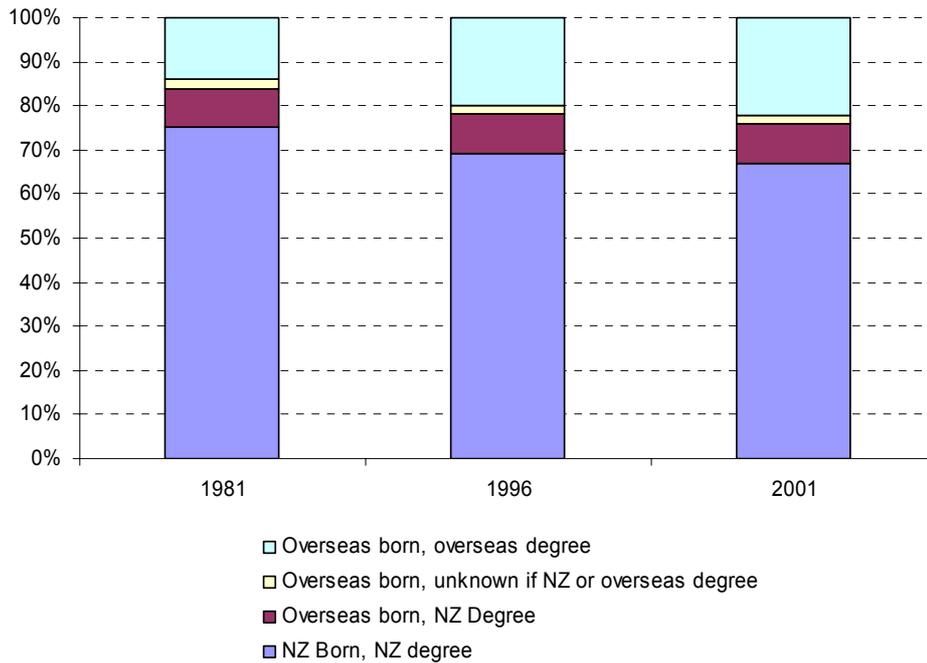
### Overseas born and educated New Zealand residents

The proportion of the New Zealand usually resident population who were born overseas and also obtained their tertiary qualifications overseas is increasing over time, especially at bachelors degree-level and above. A recent study (Newell and Perry, 2006) that analysed Census data estimated that 14 percent of the usually resident population with bachelors or higher qualifications were born and educated overseas in 1981. This proportion has risen over time, with 20 percent being born and educated overseas in 1996, and 22 percent in 2001.

<sup>7</sup> In this analysis, the New Zealand Standard Classification of Education (NZSCED) broad categories are used to denote the different fields of study.

<sup>8</sup> There were no students who completed postgraduate studies in the area of ‘food and hospitality’ in 2004.

**Figure 6: Birthplace and location of education of usually resident population aged 15 and over with bachelors or higher qualifications 1981, 1996 and 2001**



Source: Newell, J and M Perry (2006) *Trends in the Contribution of Tertiary Education to the Accumulation of New Zealand Human Capital: 1981 to 2001*

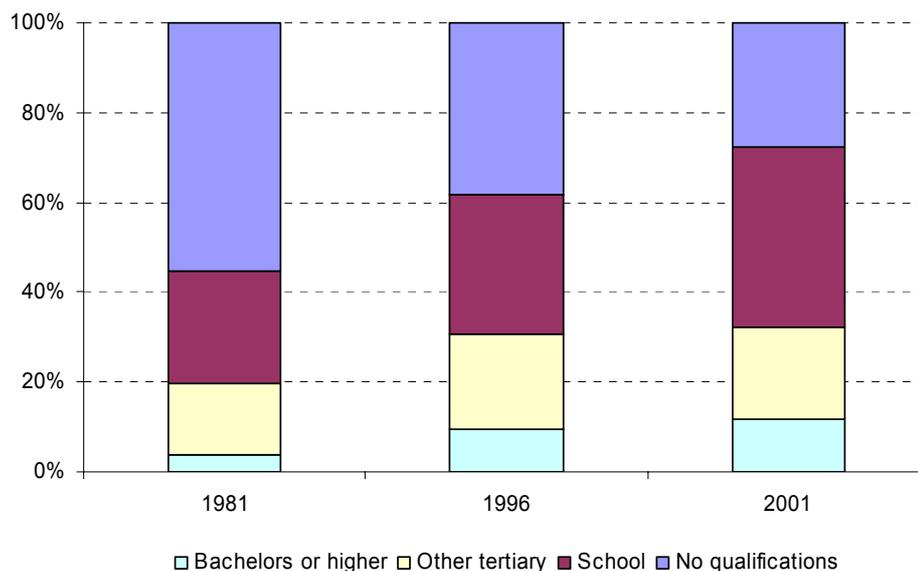
At the sub-degree tertiary level, the estimated proportion of the usually resident population born and educated overseas has remained relatively stable. In 2001, 12 percent of the usually resident population were estimated to be born and educated overseas, compared with 13 percent in 1981.

### Qualifications attainment of the New Zealand population

The growth in the number of people completing qualifications from New Zealand tertiary education providers and the rise in the number of overseas-born people with overseas qualifications resident in New Zealand are reflected in Census data of the New Zealand working-age population. The Census data shows that the proportion of the working-age population with a bachelors or higher degree increased from 3.8 percent in 1981 to 12 percent in 2001. The proportion of the population with an ‘other tertiary’ qualification increased from 16 percent in 1981 to 20 percent in 2001.<sup>9</sup>

<sup>9</sup>Due to issues with the coding of tertiary qualifications, it is not possible to compare counts of sub-degree qualifications in 1986 and 1991 with other years.

**Figure 7: Highest educational qualification of the New Zealand population aged 15 and over by level 1981, 1996, and 2001**

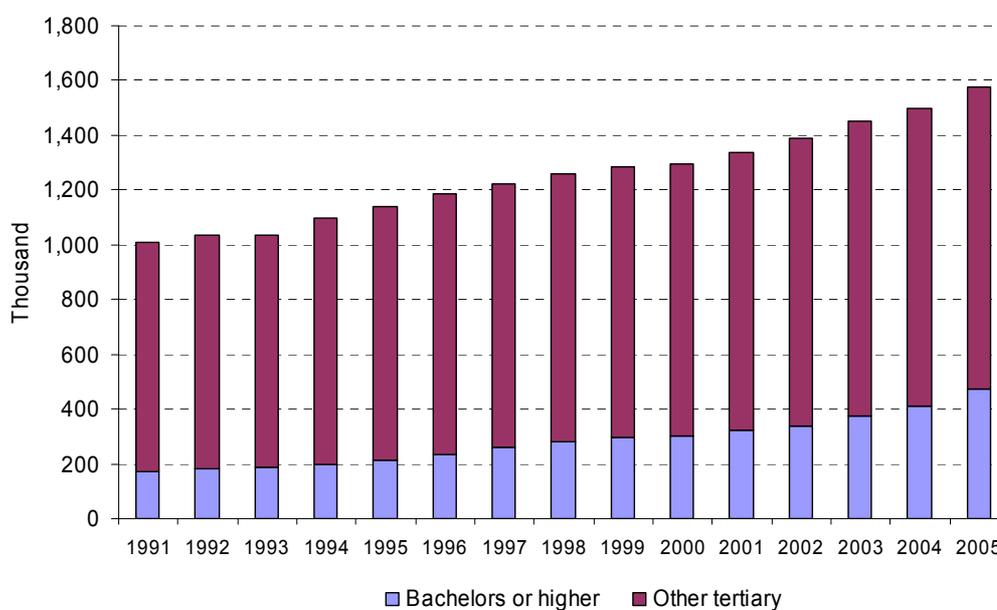


Note: Refer to technical notes 2, 3 and 4.

Source: Statistics New Zealand, *Census of Population and Dwellings*, Newell, J. and M Perry (2006) *Trends in the Contribution of Tertiary Education to the Accumulation of New Zealand Human Capital: 1981 to 2001*

Household Labour Force Survey (HLFS) data shows that there has been a steady rise in the number of people holding tertiary qualifications since 1994, especially at the degree level. Between 1994 and 2005, the number of people holding a bachelors or higher qualification increased by 142 percent, from 195,000 to 471,000.

**Figure 8: Highest tertiary-level qualification of population aged 15 and over 1991-2005**



Note: Refer to technical notes 2, 3, 4 and 5.

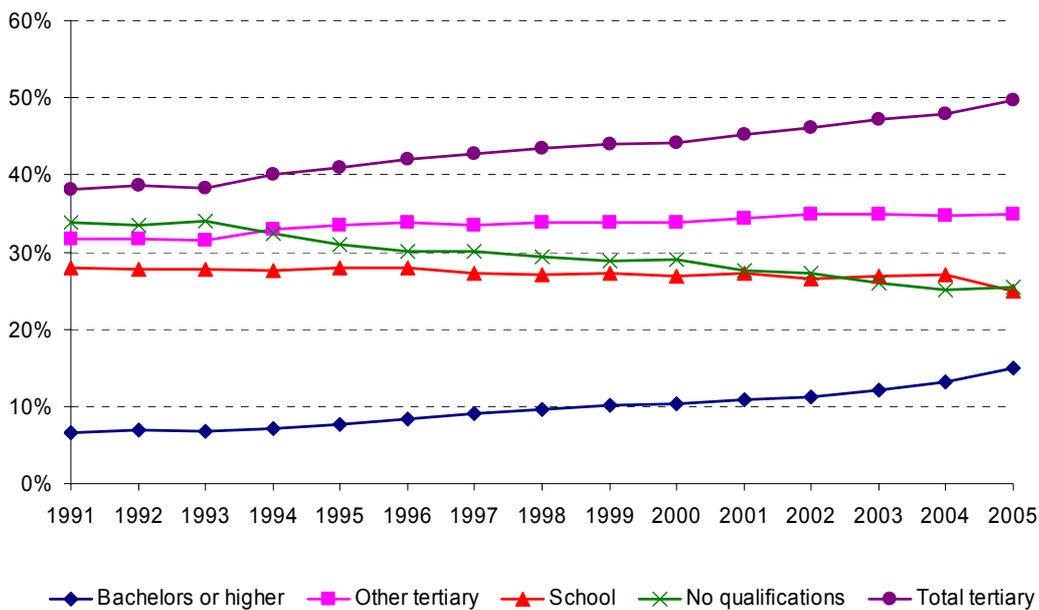
Source: Statistics New Zealand, *Household Labour Force Survey*

The increase in the number of people holding a tertiary qualification below bachelors level has been more modest. Between 1994 and 2005, the number of people holding these qualifications increased by 22 percent, from 903,000 to 1,104,000.

Between 1991 and 2005, the percentage of the working-age population with a tertiary qualification rose from 38 percent to 50 percent. This is mainly a result of a rise in the percentage of the working-age population with a bachelors or higher tertiary qualification. In 1994, 7 percent of the working-age population had attained bachelors or higher qualifications. By 2005, this had increased to 15 percent. The percentage of the working-age population with ‘other tertiary’ qualifications increased only slightly, from 33 percent in 1994 to 35 percent in 2005.<sup>10</sup>

It is interesting to note that the percentage of the working-age population with a school qualification as their highest qualification has remained relatively unchanged between 1991 and 2005 at around 27 percent, while the percentage of the population with no qualifications fell from 34 percent to 25 percent. Therefore, the fall in the percentage of the working-age population with no qualifications has been entirely driven by the rise in the share of people with tertiary qualifications.

**Figure 9: Percentage of the population aged 15 and over by highest qualification level 1991-2005**



Notes: Refer to technical notes 2, 3, 4 and 5.

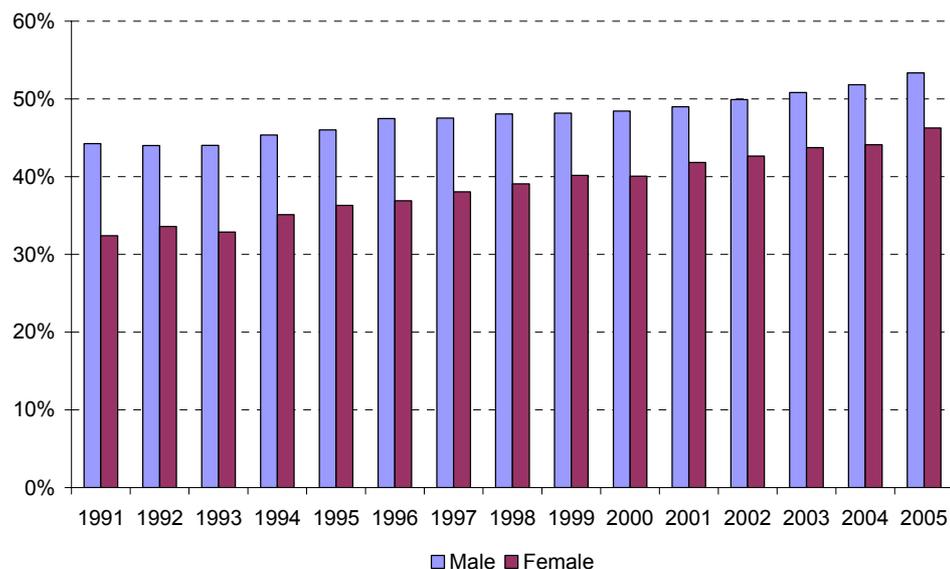
Source: Statistics New Zealand, *Household Labour Force Survey*

<sup>10</sup> The HLFS records a higher proportion of the working-age population with an ‘Other’ tertiary qualification than Census data. Differences in the way that this qualification is coded would explain some of the difference.

### Qualifications attainment by gender

Historically, men have had a higher level of tertiary qualification attainment than women in New Zealand. However, the gap in attainment between the genders is closing. In 1991, 44 percent of men had a tertiary-level qualification, compared with 32 percent of women. In 2005, 53 percent of men and 46 percent of women had attained a tertiary qualification. This represents a closing of the gap in attainment from 12 percentage points in 1991 to seven percentage points in 2005.

**Figure 10: Percentage of the New Zealand population aged 15 and over with a tertiary-level qualification by gender 1991-2005**



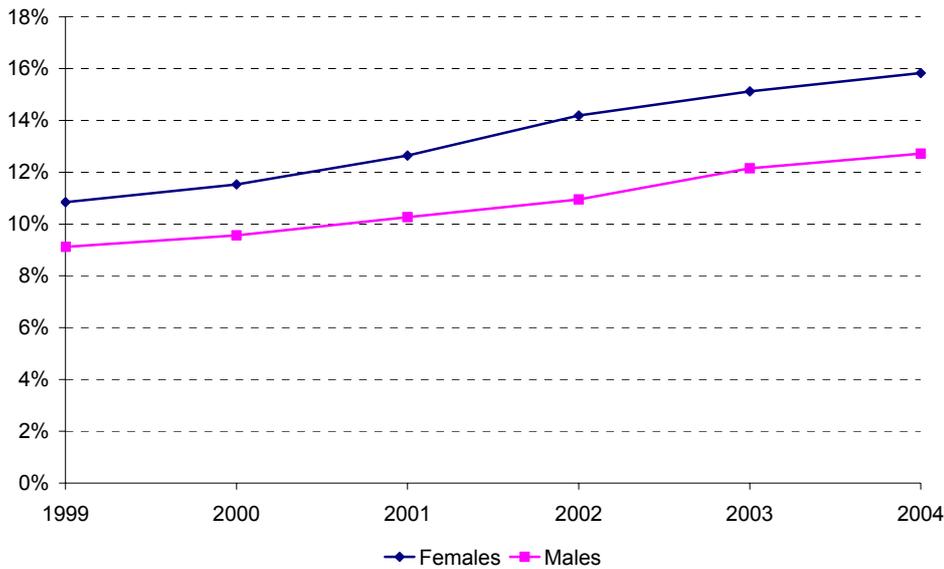
Note: Refer to technical note 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

Various factors are contributing to the closing of the gap in the attainment of tertiary qualifications by men and women. Firstly, women are participating in tertiary education at a much higher level than men. Figure 11 shows the participation rates for men and women in tertiary study. In 2004, 16 percent of the female working-age population participated in tertiary education, compared with 13 percent of men.

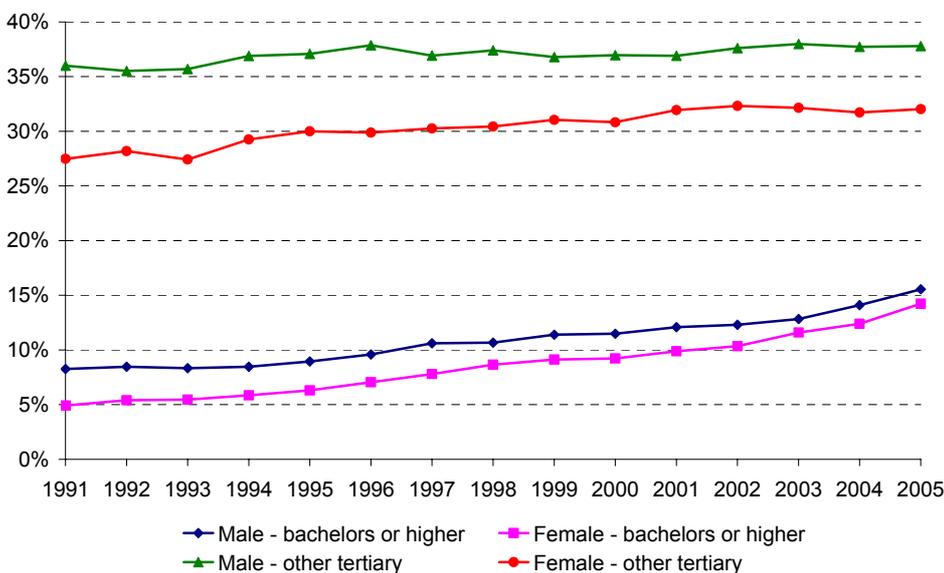
Secondly, the chances of completing a qualification are much greater for women than men. The seven-year completion rate for women who started a tertiary qualification in 1998 was 48 percent, compared with 37 percent for men (Ministry of Education, 2005b).

**Figure 11: Participation rate of the working-age population in tertiary education by gender 1999-2004**



The disparity between the attainment of men and women varies by the type of tertiary qualification. The gap in attainment is much smaller for bachelors or higher qualifications than for ‘other tertiary’ qualifications. In 2005, 16 percent of men had a bachelors or higher qualification, compared with 14 percent for women. The figures for ‘other tertiary’ qualifications were 38 percent and 32 percent respectively.

**Figure 12: Percentage of the New Zealand population aged 15 and over by tertiary qualification level and gender 1991-2005**



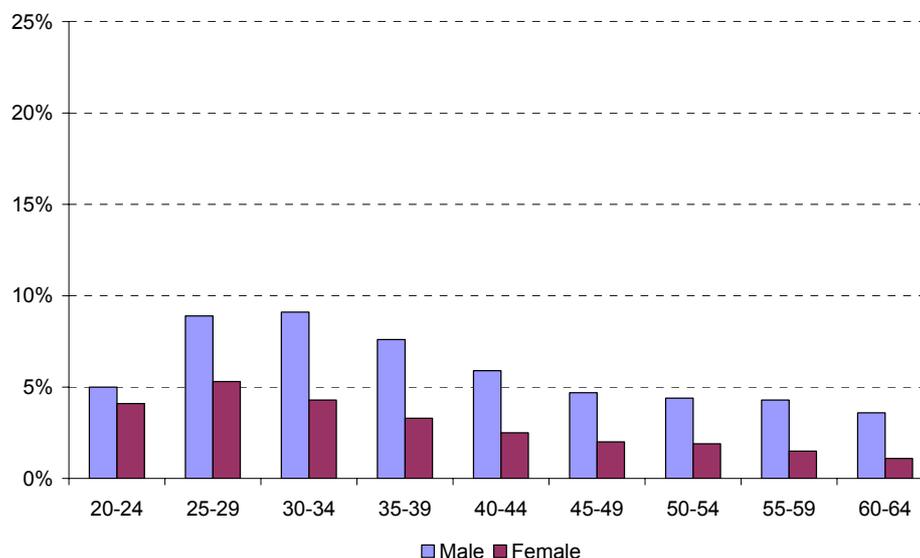
Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

The narrowing of the attainment gap between the genders over time is especially prevalent for those with a bachelors or higher degree. To illustrate the dynamics at work, Figures 13 and 14 show the attainment of bachelors or higher qualifications by

age group for men and women, in 1981 and 2001. In 1981, men had a higher level of attainment of degree-level qualifications in all age groups.

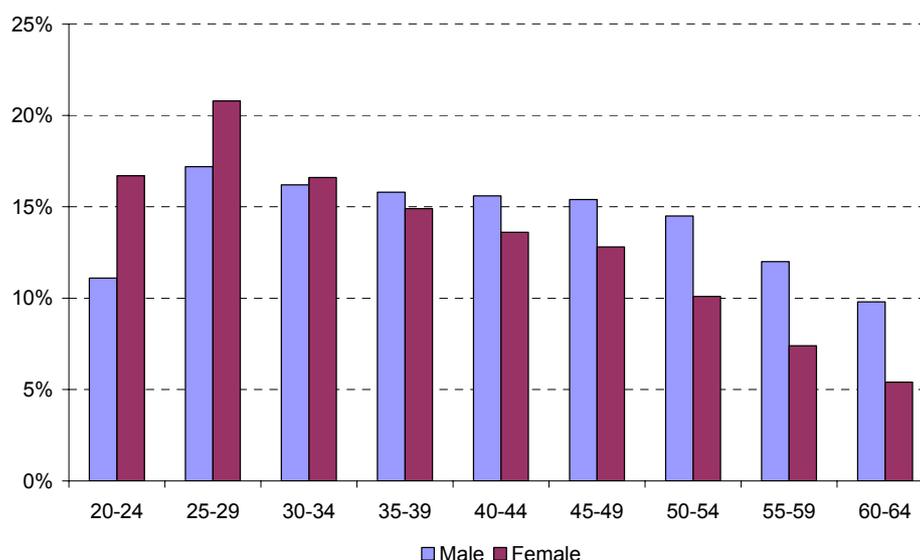
**Figure 13: Percentage of the usually resident population aged 15 and over with bachelors or higher qualifications by age group and gender 1981**



Source: Newell, J and M Perry (2006) *Trends in the Contribution of Tertiary Education to the Accumulation of New Zealand Human Capital: 1981 to 2001*

By 2001, the advantage that men had over women had decreased. In the younger age groups (from 20 to 34) a higher percentage of women than of men had degree-level qualifications. If this trend continues, then it is likely that in the future the attainment levels of women with bachelors or higher qualifications will exceed those of men.

**Figure 14: Percentage of the usually resident population aged 15 and over with bachelors or higher qualifications by age group and gender 2001**



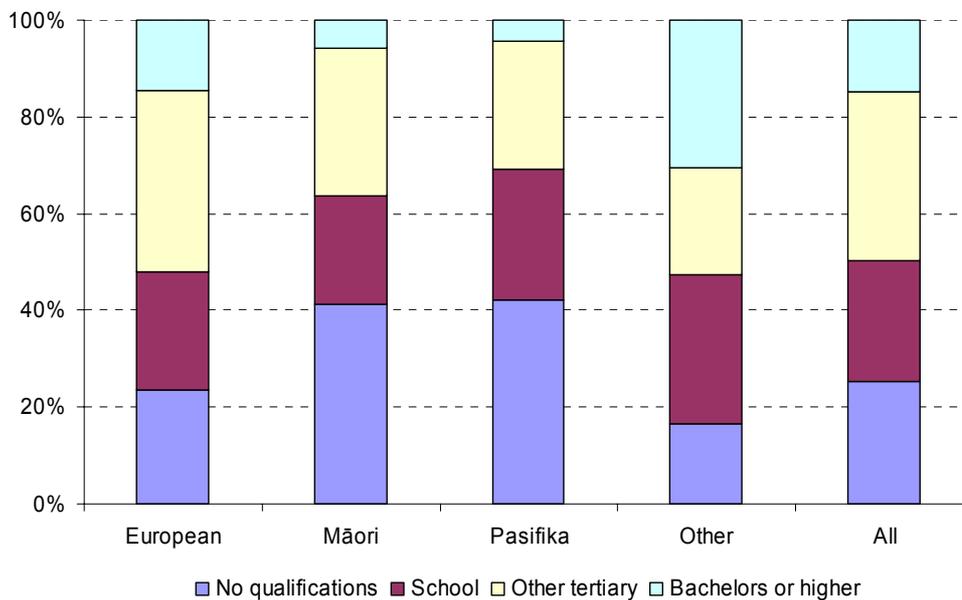
Source: Newell, J and M Perry (2006) *Trends in the Contribution of Tertiary Education to the Accumulation of New Zealand Human Capital: 1981 to 2001*

### Qualifications attainment by ethnic group

Significant variation exists in the attainment of tertiary qualifications by ethnic group in New Zealand. In 2005, the percentage of Europeans aged 15 and over with no qualifications was 24 percent. For Māori it was 41 percent, for Pasifika it was 42 percent, and 16 percent for the ‘Other’ ethnic group.

A similar disparity is present among those who have bachelors or higher qualifications. Fourteen percent of Europeans had attained a bachelors degree or higher. For Māori the percentage was significantly lower (6 percent), with those in the Pasifika ethnic group lower still (4 percent). Thirty-one percent of those in the ‘Other’ ethnic group had attained a bachelors or higher qualification.

**Figure 15: Percentage of the population aged 15 and over by highest educational qualification and ethnic group 2005**



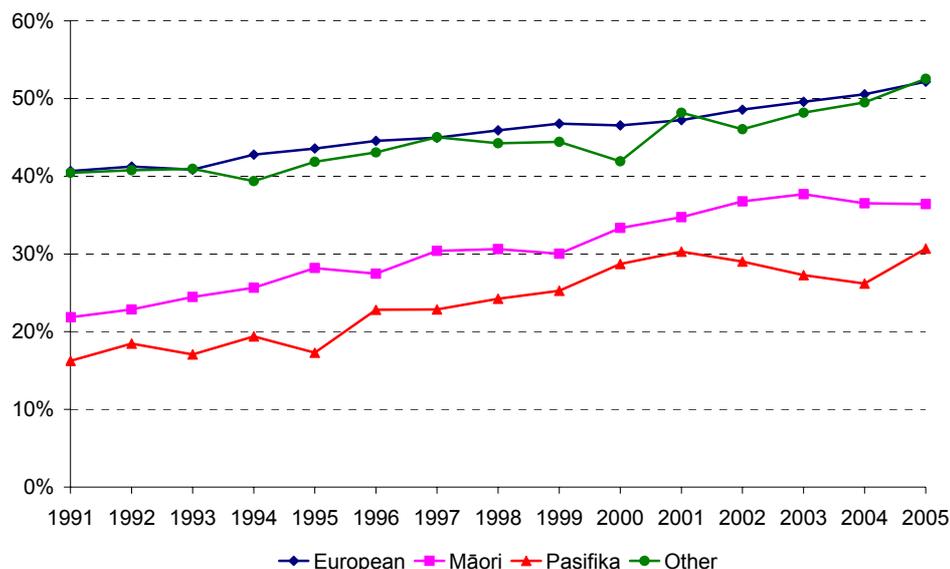
Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

Over time, the disparity between ethnic groups in attainment of tertiary qualifications has not closed at the bachelors or higher level, but has closed at the ‘other tertiary’ level. Firstly, Figure 16 shows the percentage of New Zealanders in each ethnic group that have attained a tertiary-level qualification between 1991 and 2005. In 1992, the gap in attainment between European and Māori was 19 percentage points. By 2001, the gap had closed to 12 percentage points, but widened to 16 percentage points in 2005.

However, as already noted in section 2, the sampling methodology used by Statistics New Zealand in collecting the data for the HLFS can result in the figures for the smaller ethnic groups (Māori and Pasifika) being less stable than for larger groups (Europeans). Caution therefore should be exercised in interpreting changes in the data for the smaller ethnic groups over time.

**Figure 16: Percentage of the New Zealand population aged 15 and over with a tertiary-level qualification by ethnic group 1991-2005**



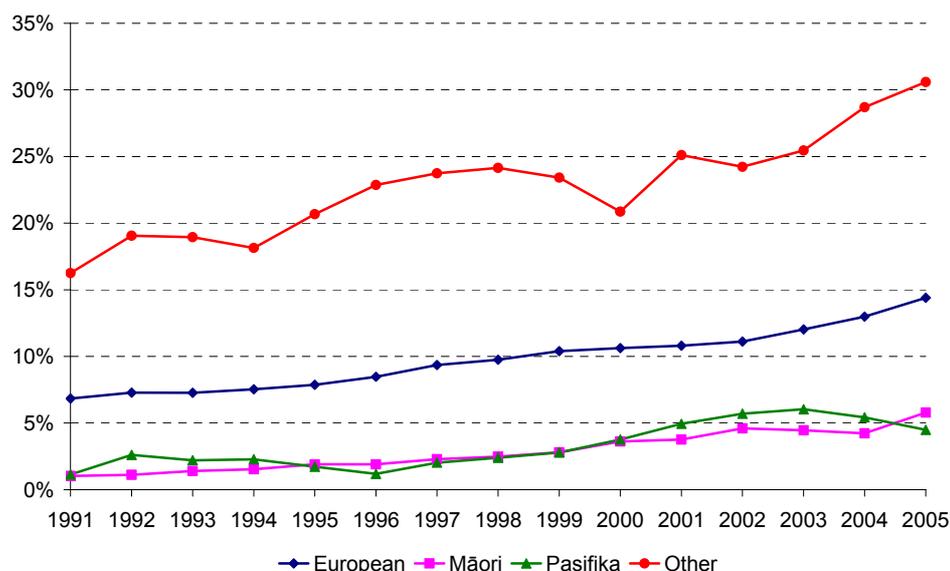
Note: Refer to technical notes 5 and 7.

Source: Statistics New Zealand, *Household Labour Force Survey*

At the bachelors or higher level, the ‘Other’ ethnic group has the highest percentage of the working-age population with this type of qualification. In 2005, 31 percent of people in this ethnic group had a bachelors or higher qualification.

The remaining ethnic groups had much lower levels of attainment at this level. In 2005, 14 percent of Europeans had a bachelors or higher degree, followed by Māori with 5.8 percent and Pasifika with 4.5 percent.

**Figure 17: Percentage of the New Zealand population aged 15 and over with a bachelors or higher qualification by ethnic group 1991-2005**



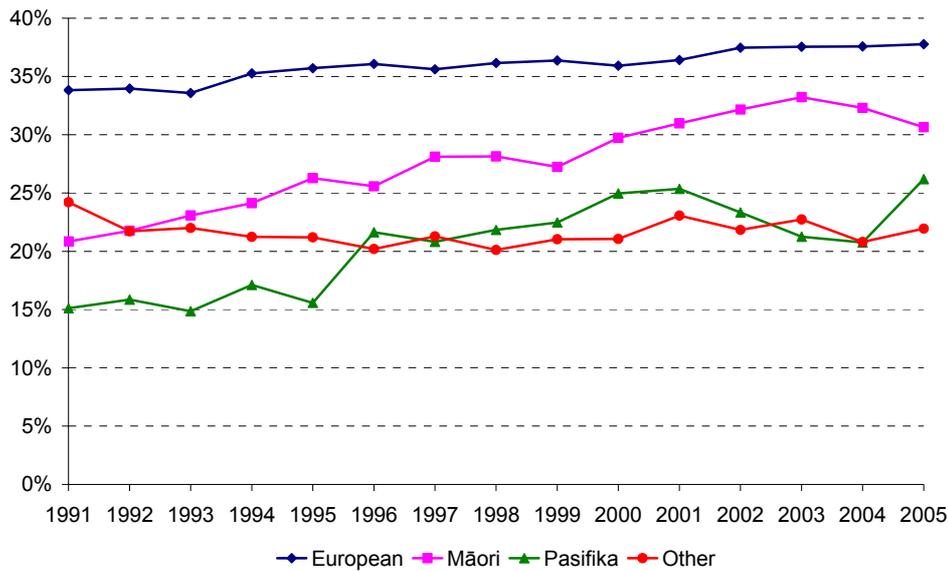
Note: Refer to technical notes 2, 5 and 7.

Source: Statistics New Zealand, *Household Labour Force Survey*

At the ‘other tertiary’ level, Europeans have the highest percentage of their working-age population with this level of qualification. In 2005, 38 percent of Europeans of working age had an ‘other tertiary’ qualification. They were followed by Māori with 31 percent, Pasifika with 26 percent and ‘Other’ with 22 percent.

An interesting feature of Figure 18 is the closing of the gap in attainment levels between the Māori and European ethnic groups between 1991 and 2003. The gap closed from 13 percentage points in 1991 to 4 percentage points in 2003. However, the gap has widened to seven percentage points in 2005.

**Figure 18: Percentage of the New Zealand population aged 15 and over with an ‘other tertiary’ qualification by ethnic group 1991-2005**



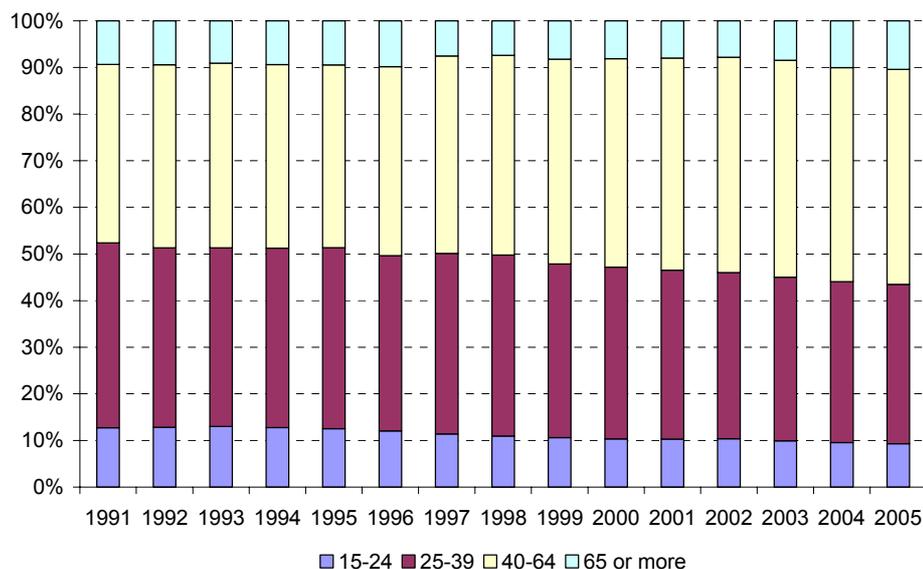
Note: Refer to technical notes 3, 5 and 7.

Source: Statistics New Zealand, *Household Labour Force Survey*

### **Qualifications attainment by age group**

A majority of the New Zealand working-age population with tertiary qualifications are aged 40 and over. In 2005, 57 percent of those with tertiary qualifications were in the 40 and over age group, compared with 50 percent in 1998. This trend is partly a reflection of the increasing number of completions in the older age groups during this time (see Figure 4).

**Figure 19: Percentage of the New Zealand population aged 15 and over holding tertiary-level qualifications by age group 1991-2005**

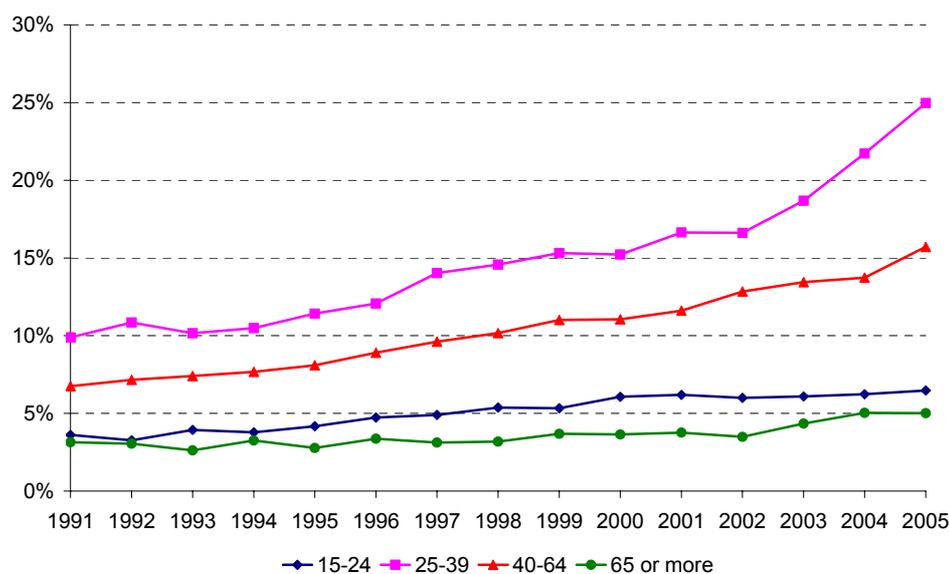


Note: Refer to technical note 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

At the bachelors or higher level, the greatest rise in the attainment of qualifications has been in the 25 to 39 and 40 to 64 age groups. For this latter age group, this is most likely the result of the ageing of the graduate population. In 1991, 9.9 percent of 25 to 39 year olds had a bachelors or higher degree. By 2005, this had increased to 25 percent. Similarly, in the 40 to 64 age group, the attainment of bachelors or higher degrees increased from 6.8 percent in 1991 to 16 percent in 2005.

**Figure 20: Percentage of the New Zealand population aged 15 and over holding bachelors or higher qualifications by age group 1991-2005**



Note: Refer to technical notes 2, 5 and 7.

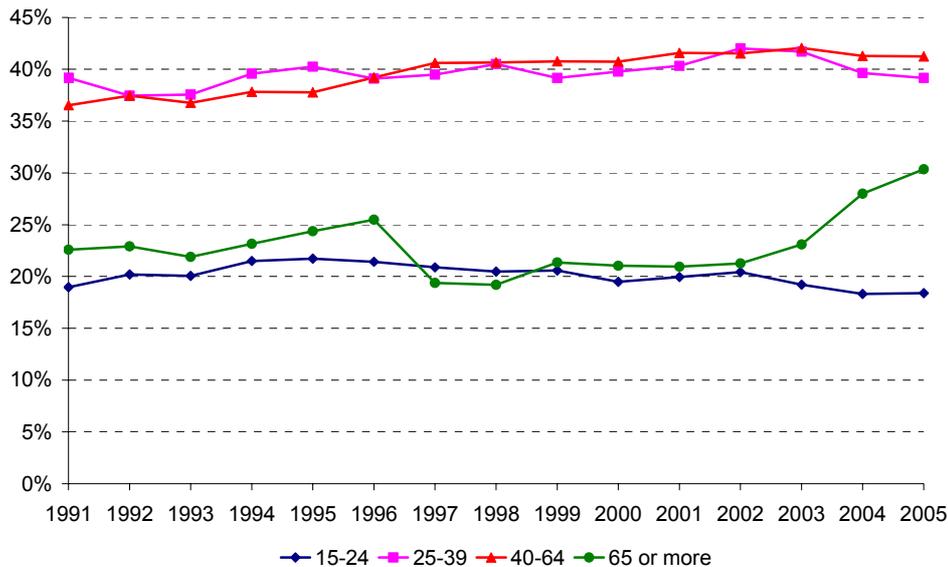
Source: Statistics New Zealand, *Household Labour Force Survey*

The growth in attainment in the remaining age groups was more muted. The percentage of 15 to 24 year olds with a bachelors or higher qualification increased

from 3.6 percent in 1991 to 6.5 percent in 2005. The figures for those aged 65 and older were 3.1 percent and 5.0 percent respectively.

For those with an ‘other tertiary’ qualification, the most significant trend has been the increase in the percentage of the population aged 65 and over with this level of qualification. This is related to the recent surge in completions of ‘other tertiary’ qualifications by this age group. In 2002, 21 percent of those aged 65 and over had attained ‘other tertiary’ qualifications. By 2005, this had increased to 30 percent.

**Figure 21: Percentage of the New Zealand population aged 15 and over holding ‘other tertiary’ qualifications by age group 1991-2005**



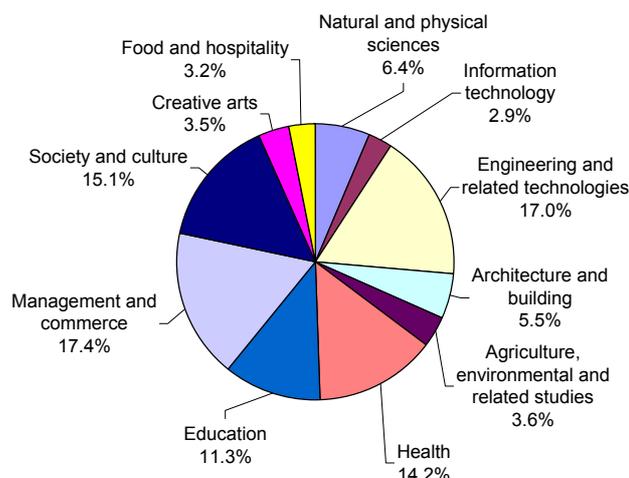
Note: Refer to technical notes 3, 5, and 7.

Source: Statistics New Zealand, *Household Labour Force Survey*

### **Qualifications attainment by field of study**

An analysis of Census data (Newell and Perry, 2006) identified the broad field of study of the tertiary qualifications held by the New Zealand working-age population in 1981, 1996 and 2001. The analysis showed that in 2001, the greatest proportion of tertiary graduates had studied in the area of ‘management and commerce’. Of the usually resident population aged 15 and over that identified a subject area in their tertiary qualification, 17.4 percent had studied in ‘management and commerce’. The next largest field of study was ‘engineering and related technologies’ with 17 percent, while the smallest field of study was ‘information technology’, with 2.9 percent.

**Figure 22: Field of study of the usually resident population aged 15 and over with tertiary education qualifications 2001**

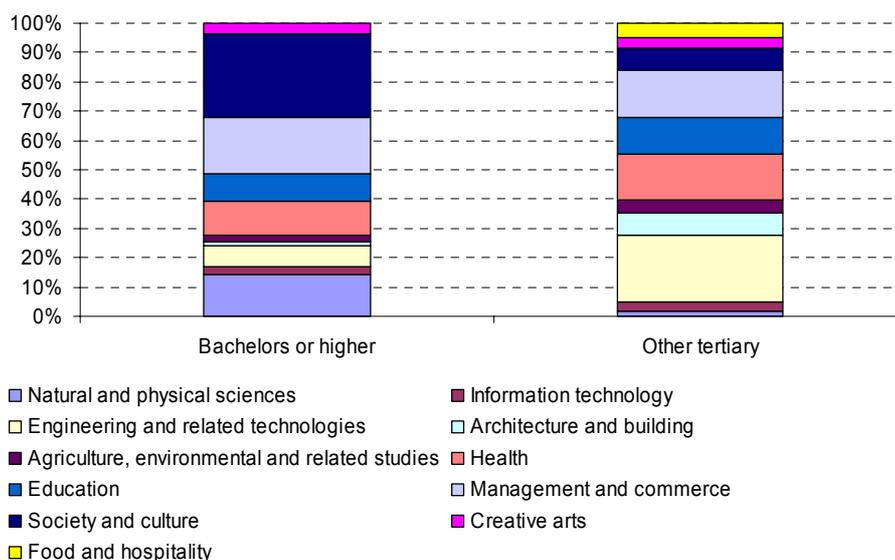


Source: Newell, J and M Perry (2006) *Trends in the Contribution of Tertiary Education to the Accumulation of New Zealand Human Capital: 1981 to 2001*

At the bachelors or higher level, the largest proportion of tertiary graduates studied in the field of society and culture (29 percent). The smallest field of study was food and hospitality with 0.03 percent.

For those with ‘other tertiary’ qualifications, the largest field of study was engineering and related technologies, a reflection of the vocational nature of non-degree qualifications. Twenty-three percent of graduates with ‘other tertiary’ qualifications studied in this field. The smallest field of study was natural and physical sciences (1.7 percent).

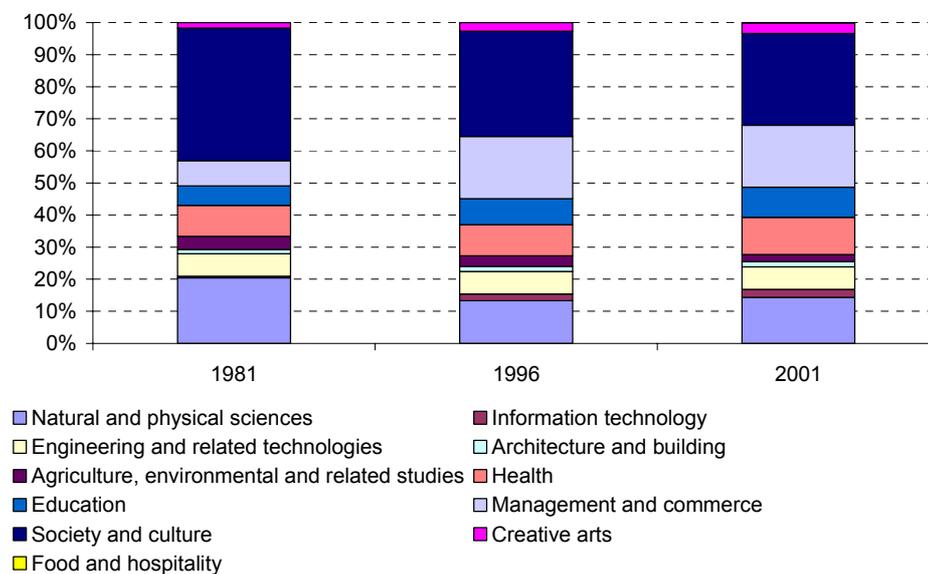
**Figure 23: Field of study of the usually resident population aged 15 and over with tertiary education qualifications by level 2001**



Source: Newell, J and M Perry (2006) *Trends in the Contribution of Tertiary Education to the Accumulation of New Zealand human capital: 1981 to 2001*

Over time, there has been a significant shift in the subject area studied by the New Zealand working-age population with tertiary qualifications, especially at bachelors or higher level. This is a result of a shift in the skills required in the economy (the increase in people with information technology qualifications between 1981 and 2001 for example), along with the changing tastes and preferences of tertiary students. In 1981, 41 percent of the working-age population with degree-level qualifications had studied in the area of society and culture. By 2001, this had fallen to 29 percent. This decrease was mirrored by a rise in the percentage of the population with qualifications in the field of management and commerce. In 1981, 8 percent of the working-age population had degree qualifications in the area of management and commerce; by 2001 this had increased to 19 percent.

**Figure 24: Field of study of the usually resident population aged 15 and over with bachelors or higher qualifications 1981, 1996 and 2001**



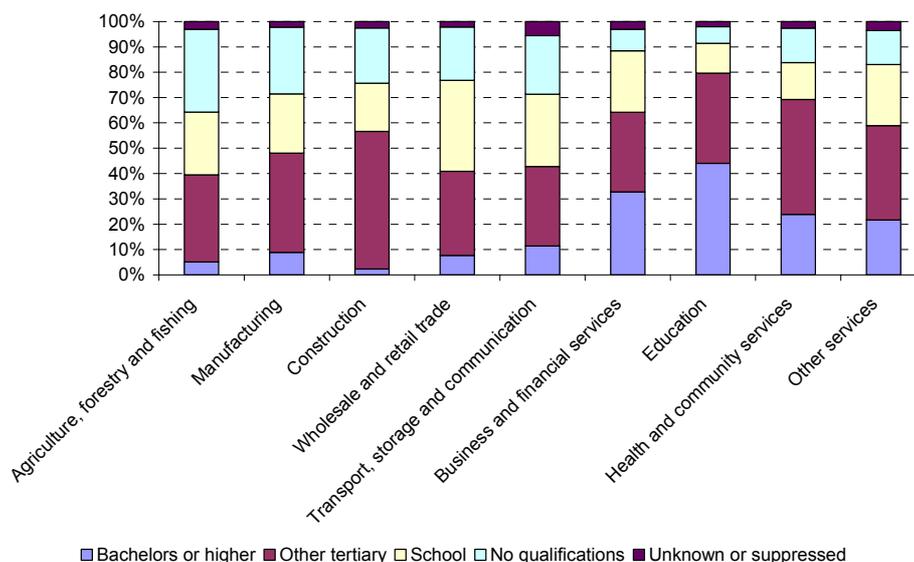
Source: Newell, J and M Perry (2006) *Trends in the Contribution of Tertiary Education to the Accumulation of New Zealand Human Capital: 1981 to 2001*

### **Qualifications attainment of those in employment by industry and occupation**

Figure 25 shows the highest educational qualification of people in employment by industry. In 2005, workers in the ‘education’ industry had the highest percentage of people with bachelors or higher qualifications. Forty-four percent of workers in the ‘education’ industry had this level of qualification. The industry with the smallest percentage of people with a bachelors or higher qualification was ‘construction’. Just 2.3 percent of workers in this industry had attained a bachelors or higher qualification.

However, the ‘construction’ industry had the highest percentage of people with an ‘other tertiary’ qualification. In 2005, 54 percent of workers in the ‘construction’ industry had attained ‘other tertiary’ qualifications. The industry with the smallest percentage of people with an ‘other tertiary’ qualification was ‘transport, storage and communication’. Thirty-one percent of workers in this industry had attained an ‘other tertiary’ qualification.

**Figure 25: Percentage of employed people by highest qualification and industry 2005**

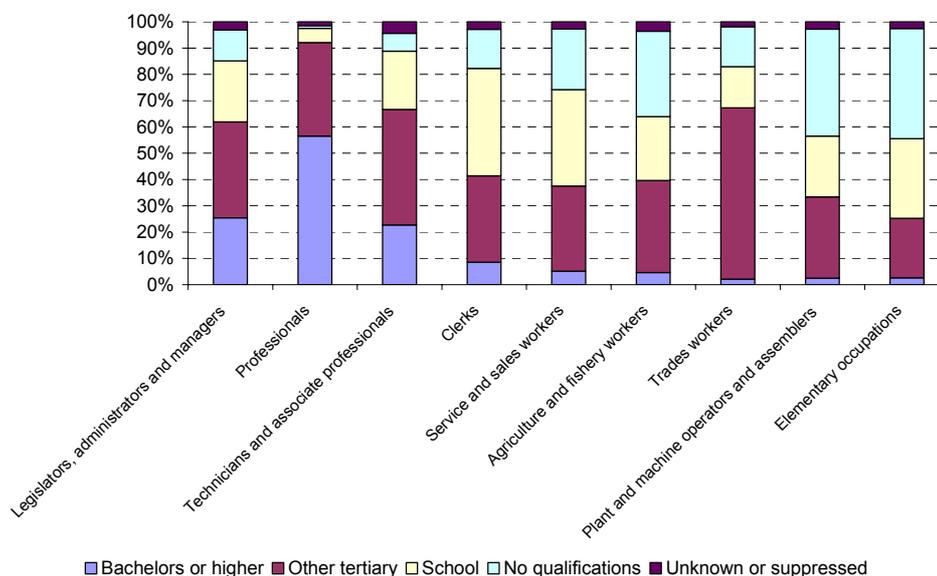


Notes: Refer to technical notes 2, 3, 4, and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

The highest qualification of employed people by occupation is shown in Figure 26. Not surprisingly, professional occupations had a high proportion of people with bachelors or higher qualifications, while there was a high proportion of people in more vocation-orientated occupations with ‘other tertiary’ qualifications.

**Figure 26: Percentage of employed people by highest qualification and occupation 2005**



Notes: Refer to technical notes 2, 3, 4, and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

Workers in the ‘professionals’ occupation had the highest percentage of people with bachelors or higher qualifications. In 2005, 57 percent of workers in the ‘professionals’ occupation had this level of qualification. The occupation with the lowest percentage of people with a bachelors or higher qualification was ‘trades

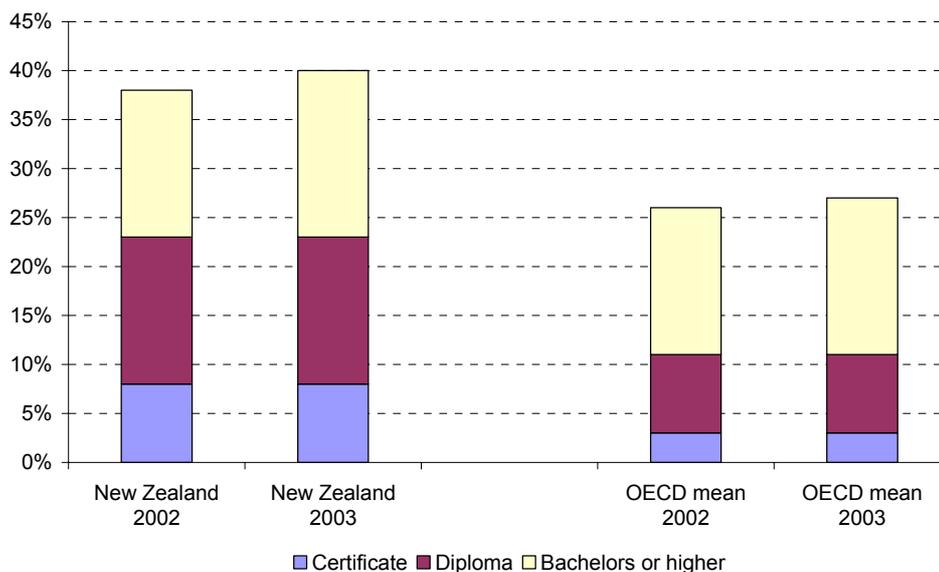
workers' with 2.1 percent. However, those people employed in the 'trades workers' occupation had the highest percentage of people with an 'other tertiary' qualification. In 2005, 65 percent of 'trades workers' had this level of qualification. This compares with 'elementary occupations' which had the lowest percentage (23 percent) of workers with an 'other tertiary' qualification.

### International comparisons<sup>11</sup>

Organisation for Economic Co-operation and Development (OECD) data shows that New Zealand compares favourably with the OECD average in terms of educational attainment. The OECD's publications *Education at a Glance: OECD Indicators 2004* and *2005* observed that, in 2003, 40 percent of the New Zealand population aged 25 to 64 years had achieved a tertiary-level qualification, compared with an OECD mean of 27 percent. In 2002, the figures were 38 percent and 26 percent respectively.

As can be seen in Figure 27, it is at the sub-degree level that New Zealand outperforms the OECD average, with the proportion of people holding a bachelors-level qualification or higher in 2003 (17 percent) being roughly the same as the OECD mean (16 percent).

**Figure 27: Distribution of the 25 to 64 year old population by highest level of tertiary qualification 2002 and 2003**

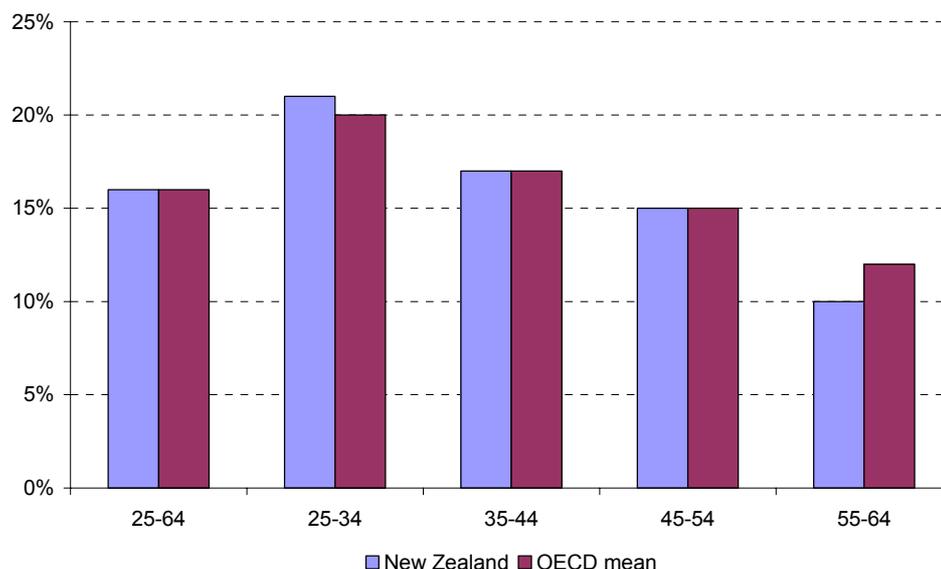


Source: OECD, *Education at a Glance: OECD Indicators 2004, 2005*

A pattern of increasing attainment over time is observed in the OECD data. Figure 28 shows that in the younger age bands, a significantly larger proportion of the population, both in New Zealand and in the OECD as a whole, holds tertiary qualifications at bachelors degree level or above.

<sup>11</sup> Some parts of this section have previously been published in Ministry of Education (2005) *Profile and Trends: New Zealand's Tertiary Education Sector 2004*, pp 165-166.

**Figure 28: Percentage of the population with bachelors qualifications or higher by age group 2003**

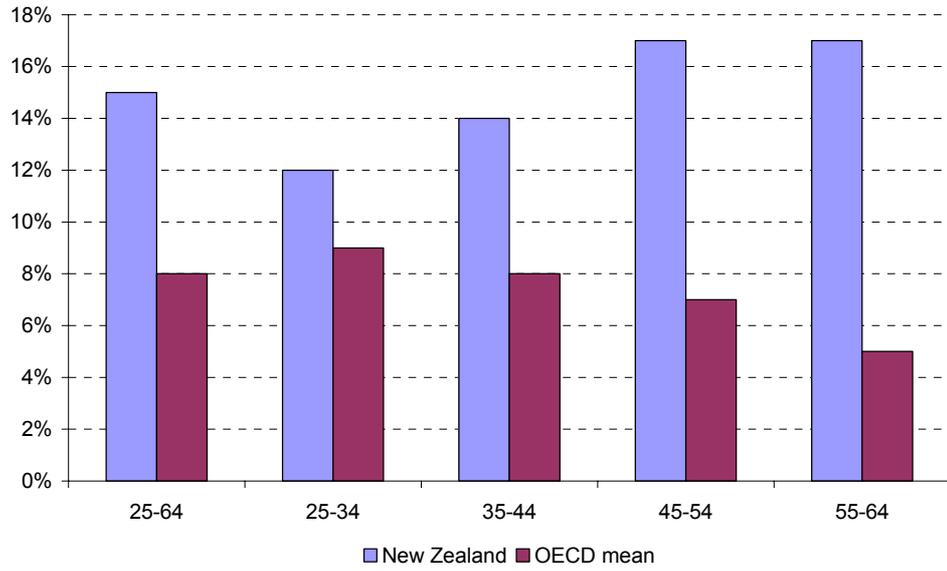


Source: OECD, *Education at a Glance: OECD Indicators 2005*

The proportion holding a bachelors degree or higher is especially high in the 25 to 34 age group, where 21 percent of the New Zealand population has a degree-level qualification. This compares with 17 percent in the 35 to 44 age group, 15 percent in the 45 to 54 age group, and 10 percent in the 55 to 64 age group. Overall, the proportion of the New Zealand population holding a degree-level qualification is similar to the OECD mean.

The proportion of New Zealanders who have completed diploma-level qualifications is higher than the OECD mean in every age group. However, whereas the proportion with a degree-level qualification is higher than the OECD mean in younger age groups, the proportion with diploma-level qualifications is lower in younger age groups, reflecting the shift towards enrolments in higher qualifications during the 1990s.

**Figure 29: Percentage of the population with diploma-level qualifications by age group 2003**



Source: OECD, *Education at a Glance: OECD Indicators 2005*

## 4 Labour market outcomes

The attainment of tertiary-level qualifications is associated with positive labour market outcomes such as a greater likelihood of gaining employment. In this section, the impact of tertiary qualifications on the unemployment rate and the labour force participation rate of the working-age population in New Zealand is explored. This is followed by an international comparison of unemployment rates by educational level over time.

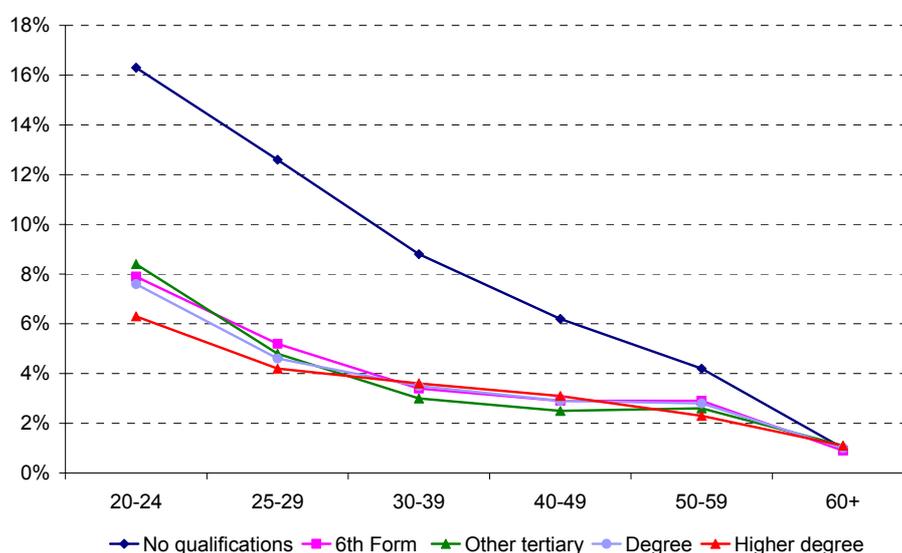
### Unemployment rates by level of qualification<sup>12</sup>

Data from the 2001 Census clearly shows that the attainment of a tertiary qualification results in a higher chance of employment. Figures 30 and 31 show the unemployment rates of the New Zealand resident population across various age bands, genders and education qualification levels.

Overall, people with no qualifications at all had an unemployment rate of 11 percent, those with school qualifications 7.0 percent, and those with higher degrees 3.6 percent. Female unemployment rates for those over the age of 25 were the same as, or higher than, those for males across all qualification levels.

When non-degree tertiary qualifications are examined in more detail, men with basic vocational qualifications were more likely to be unemployed than those with either a school qualification of at least year 12 level<sup>13</sup> or another non-degree qualification. This applies particularly to men aged 25 or above.

**Figure 30: Male unemployment rate by age group and qualification level 2001**

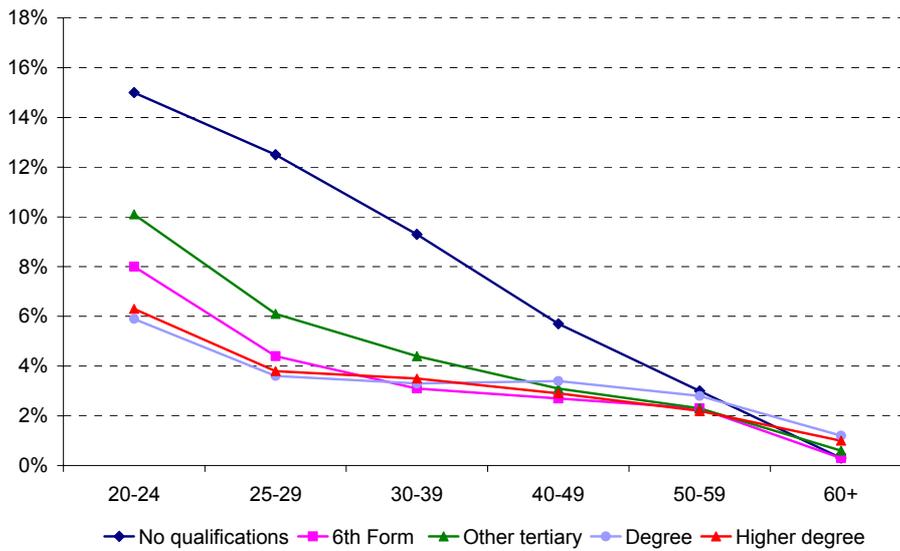


Source: Ministry of Education (2001), *What Can the Population Census Tell Us about Education? Data from the 2001 Census of Population and Dwellings*

<sup>12</sup> Part of this section was previously published in Ministry of Education (2004) *Profile and trends: New Zealand's Tertiary Education Sector 2003*, pp 91-92.

<sup>13</sup> The standard year 12 qualification at that time was Sixth Form Certificate, which was replaced by the National Certificate of Educational Achievement (NCEA) Level 2 in 2003.

**Figure 31: Female unemployment rate by age group and qualification level 2001**



Source: Ministry of Education (2001), *What Can the Population Census Tell Us about Education? Data from the 2001 Census of Population and Dwellings*

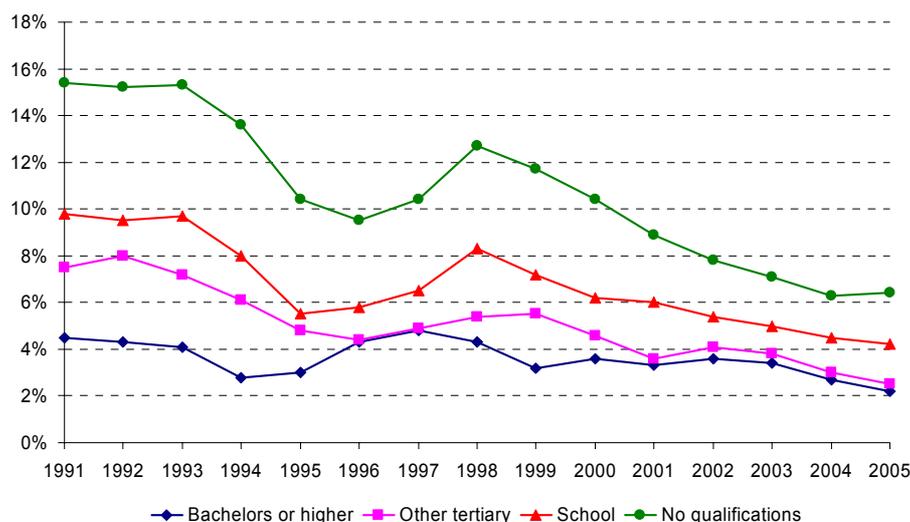
That pattern does not hold for women, and especially for younger women, where additional qualifications bring increases in the probability of being employed. While those with a tertiary qualification were a little more likely to be employed than those with a school qualification, the main difference is between women with a qualification and those without a formal qualification.

A similar high qualification/low unemployment relationship is exhibited by Household Labour Force Survey (HLFS) data (see Figure 32). In 2005, the unemployment rate for a person with a bachelors or higher qualification was 2.2 percent, compared with 2.5 percent for those with an 'other tertiary' qualification, 4.2 percent for those with a school qualification, and 6.4 for those with no qualifications.

It is noticeable that the unemployment rate of those with tertiary qualifications is less susceptible to large variation during the phases of the economic cycle. Between 1991 and 2005, the unemployment rate for those with a bachelors or higher qualification has varied between 4.8 percent and 2.2 percent. This compares with a range of between 15.4 percent and 6.3 percent for those with no qualifications.

As a result of this cyclical variation, the gap between those without qualifications and those with tertiary qualifications will fall during times of economic expansion and increase during times of economic recession. In 1991, during a time of economic recession, the gap in unemployment rates between those without qualifications and those with a bachelors or higher degree was 11 percentage points. In 2005, after a sustained period of economic expansion, this gap had decreased to just 4.2 percentage points.

**Figure 32: Unemployment rates of the population aged 15 and over by highest qualification 1991-2005**



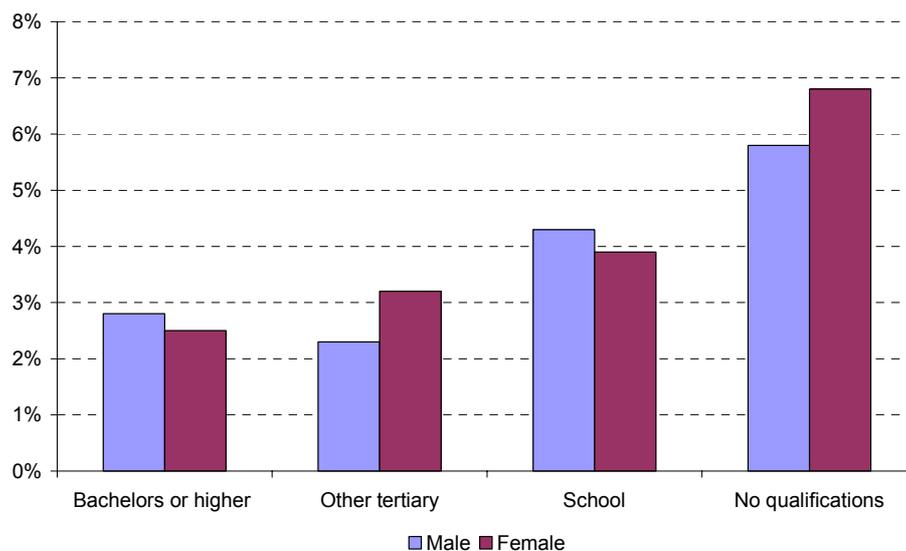
Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

**Unemployment rates by level of qualification and gender**

Figure 33 shows the unemployment rate of men and women at various levels of qualification in 2005. As can be observed, both genders exhibit lower unemployment rates for those with tertiary qualifications. One small point of difference between the genders in recent years<sup>14</sup> is that while men with ‘other tertiary’ qualifications have a lower unemployment rate (2.3 percent) than men with bachelors or higher qualifications (2.8 percent), the opposite is the case for women. Women with a bachelors or higher qualification have a lower unemployment rate (2.5 percent) than those with an ‘other tertiary’ qualification (3.2 percent).

**Figure 33: Unemployment rates of the population aged 15 and over by highest qualification and by gender 2005**



Note: Refer to technical notes 2, 3, 4 and 5.

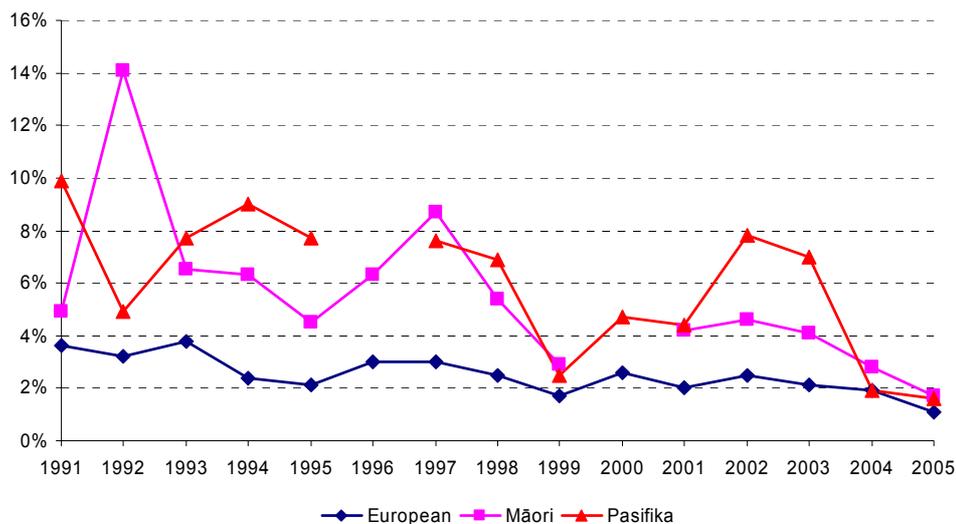
Source: Statistics New Zealand, *Household Labour Force Survey*

<sup>14</sup> This was also the case in 2003.

### Unemployment rates by level of qualification and ethnic group

For those with tertiary qualifications, the disparities in the unemployment rates of ethnic groups have diminished over time, especially for those with a bachelors or higher qualification. In 2005, the unemployment rate for those with a bachelors or higher qualification was 1.1 percent for Europeans, 1.7 percent for Māori and 1.6 percent for Pasifika. This compares with an unemployment rate in 1991 of 3.6 percent for Europeans, 4.9 percent for Māori and 10 percent for Pasifika.

**Figure 34: Unemployment rate of the population aged 15 and over with a bachelors or higher tertiary qualification by ethnic group 1991-2005**



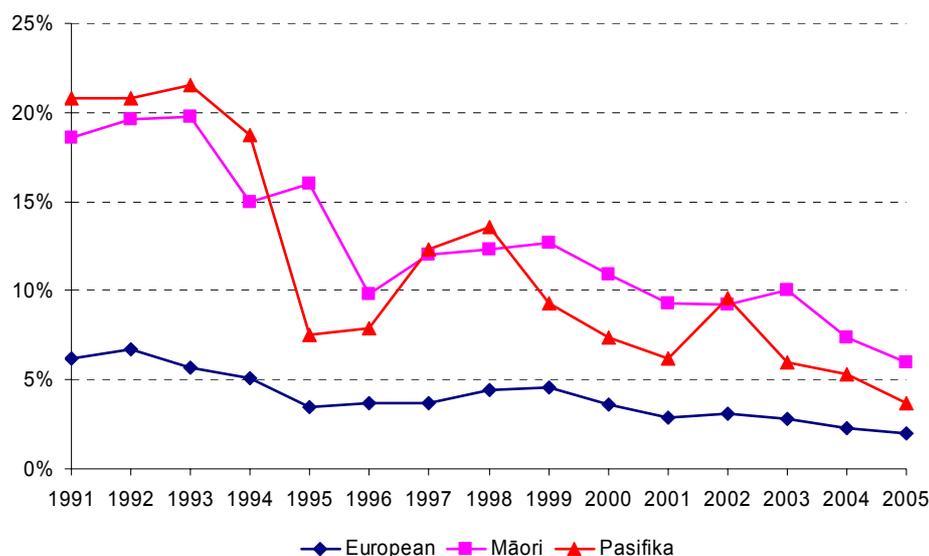
**Notes:**

1. Refer to technical notes 2, 5 and 7.
2. The breaks in the data for the Māori and Pasifika ethnic groups are the result of small sample sizes.

Source: Statistics New Zealand, *Household Labour Force Survey*

For those with an ‘other tertiary’ qualification, there are indications that the disparities in unemployment rates are also closing, if not to the same degree as for bachelors or higher qualifications. In 2005, Europeans with an ‘other tertiary’ qualification had an unemployment rate of 2.0 percent, followed by Pasifika with 3.7 percent, ‘Other’ with 4.3 percent and Māori with 6.0 percent. This compares with an unemployment rate in 1991 of 6.2 percent for Europeans, 19 percent for Māori and 21 percent for Pasifika.

**Figure 35: Unemployment rate of the population aged 15 and over with a non-degree tertiary qualification by ethnic group 1991-2005**

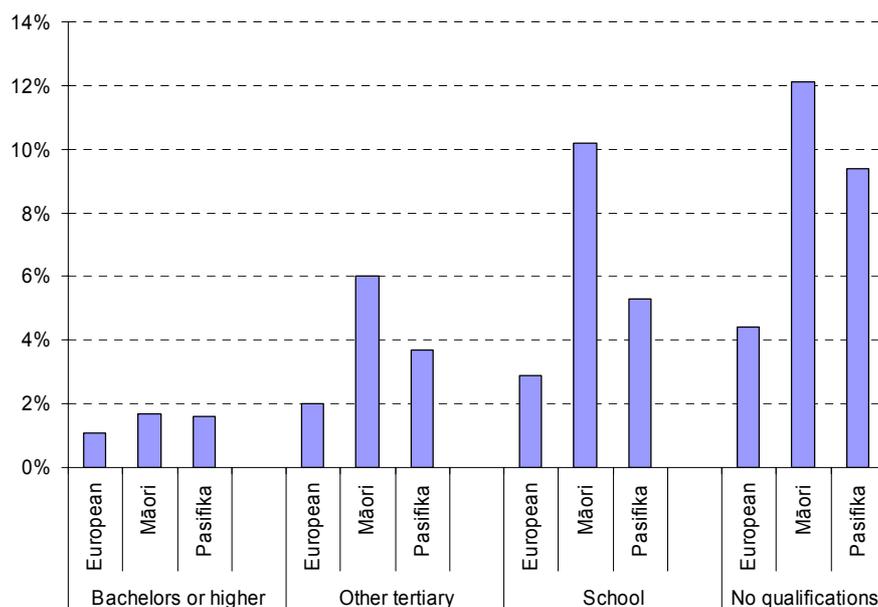


Note: Refer to technical notes 3, 5 and 7.

Source: Statistics New Zealand, *Household Labour Force Survey*

HLFS data shows that the disparity between the unemployment rate of Europeans and those of Māori and Pasifika is reduced by attaining tertiary qualifications. In 2005, the gap in the unemployment rate between Europeans (4.4 percent) and Māori (12.1 percent) with no qualifications was 7.7 percentage points. The gap between Europeans and Pasifika (9.4 percent) was 5.0 percentage points. However, for those with bachelors or higher degrees, the gap in the unemployment rate between Europeans (1.1 percent) and Māori (1.7 percent) was just 0.6 percentage points. The figure between Europeans and Pasifika (1.6 percent) was 0.5 percentage points.

**Figure 36: Unemployment rate of the population aged 15 and over by qualification level and ethnic group 2005**



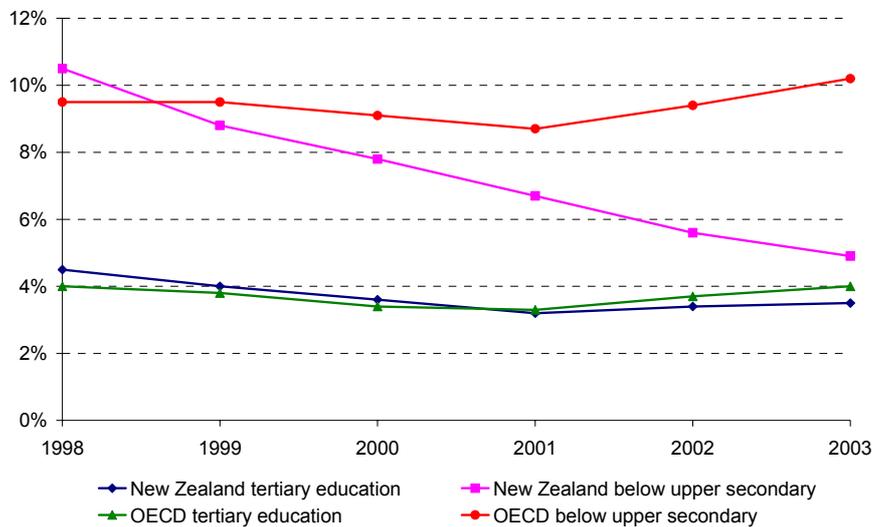
Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

### International comparisons<sup>15</sup>

An international comparison by the OECD of unemployment rates by educational qualifications shows that, since 2001, the unemployment rate for New Zealanders with a tertiary education has fallen below the OECD average. In 2003, the unemployment rate for people in New Zealand aged between 25 and 64 years with a tertiary education was 3.5 percent, compared with an unemployment rate of 4.9 percent for those with education below upper secondary level. The unemployment rate for those with a tertiary education has shown a gradual improvement relative to the OECD mean since 1998, with the rate falling below the OECD mean in 2001. Between 1998 and 2003, the gap between the OECD mean unemployment rates for people with a tertiary education and those with below upper secondary education has remained relatively constant at about six percentage points. However, in New Zealand this gap has narrowed from six percentage points in 1998 to 1.4 percentage points in 2003.

**Figure 37: Unemployment rate of the population aged 25 to 64 by highest qualification level 1998-2003**



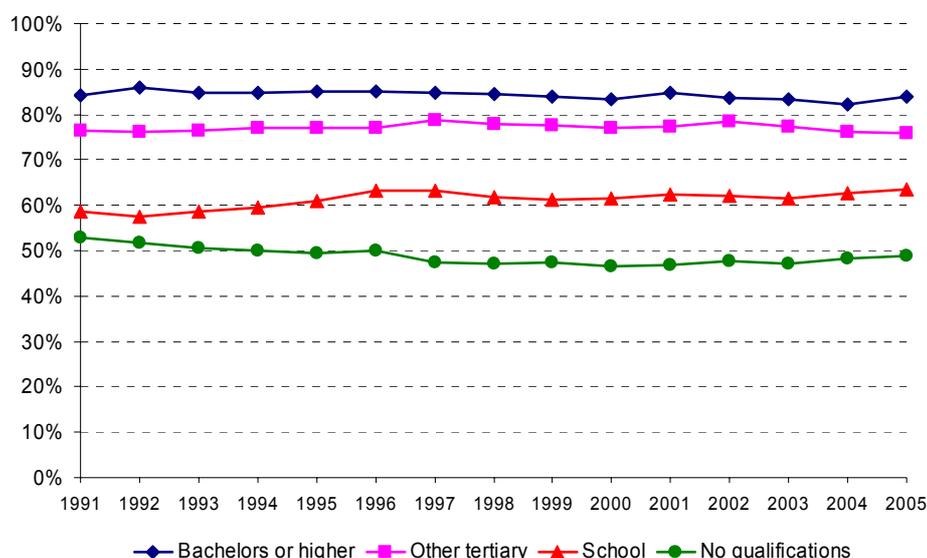
Source: OECD, *Education at a Glance: OECD Indicators 2005*

<sup>15</sup> This section was previously published in Ministry of Education (2005) *Profile and Trends: New Zealand's Tertiary Education Sector 2004*, pp 167-168.

### Labour force participation by level of qualification

As well as increasing the chances of employment, attaining tertiary qualifications increases the chance of labour force participation. Labour force participation rates measure the proportion of the working-age population that are engaged, or attempting to engage, with the labour market. The labour force is made up of those who are employed and unemployed. In 2005, the labour force participation rate was highest for those with a bachelors or higher degree (84 percent), followed by ‘other tertiary’ (76 percent), school qualifications (64 percent) and no qualifications (49 percent). As can be observed in Figure 38, these participation rates have remained relatively stable since 1996.

**Figure 38: Labour force participation rate of the population aged 15 and over by highest qualification 1991-2005**



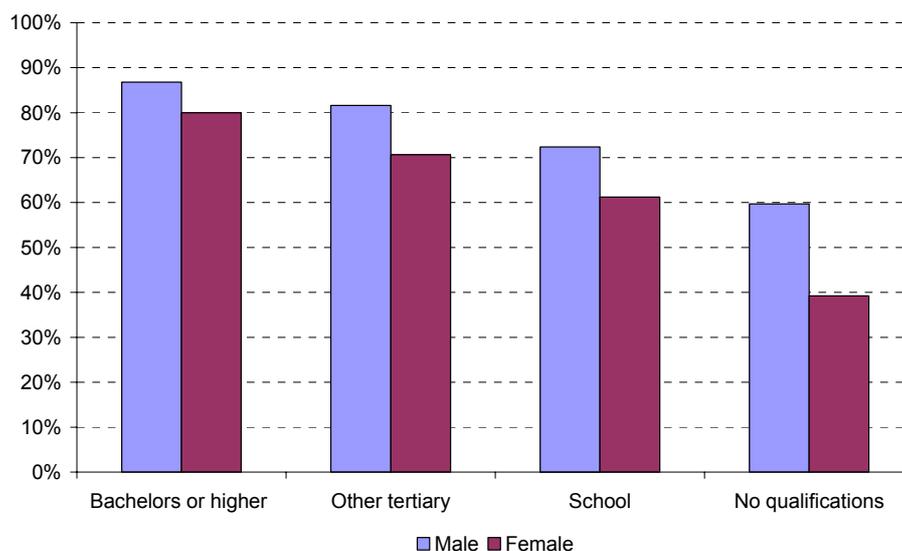
Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

### Labour force participation by level of qualification and gender

Figure 39 displays the labour force participation rates of men and women at various levels of highest qualification. From it we can observe that the labour force participation rate of men is higher than that of women at all levels of educational qualifications. However, the gap in the labour force participation rates between men and women decreases for those with tertiary qualifications. In other words, tertiary qualifications improve the access of women to the labour market. In 2005, men with a bachelors or higher qualification had a labour force participation rate of 87 percent. Women with the same level of qualification had a labour force participation rate of 80 percent, a gap of seven percentage points. This compares with a gap of 11 percentage points for those with an ‘other tertiary’ qualification. For those with school qualifications, the gap is also 11 percentage points, and for those with no qualifications the gap is 21 percentage points.

**Figure 39: Labour force participation rate of the population aged 15 and over by highest qualification and gender 2005**

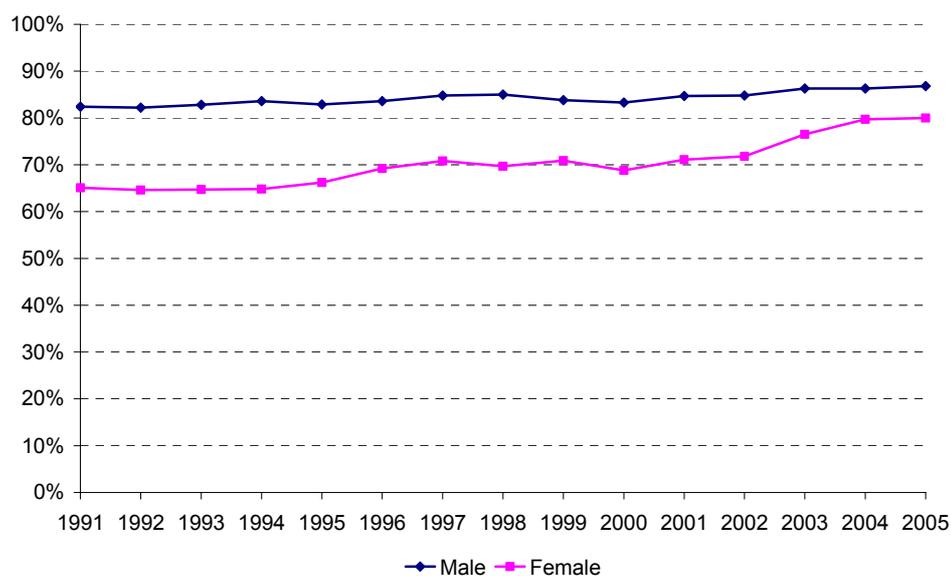


Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

Examining labour force participation rates over time shows a significant upward shift in the participation rate of women with a bachelors or higher qualification. Figure 40 shows the participation rates for men and women with this level of qualification between 1991 and 2005. A closing of the gap in the labour force participation rate is noticeable, especially between 2002 and 2004. In 2002, the gap in the labour force participation rates between men and women was 13 percentage points. By 2004, this had almost halved to just seven percentage points. For those with ‘other tertiary’ qualifications, the gap in labour force participation has closed only slightly over time. In 1991, the gap in the labour force participation rate of men and women was 12 percentage points, compared with 11 percentage points in 2005.

**Figure 40: Labour force participation rate of the population aged 15 and over with a bachelors or higher qualification by gender 1991-2005**



Note: Refer to technical notes 2 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

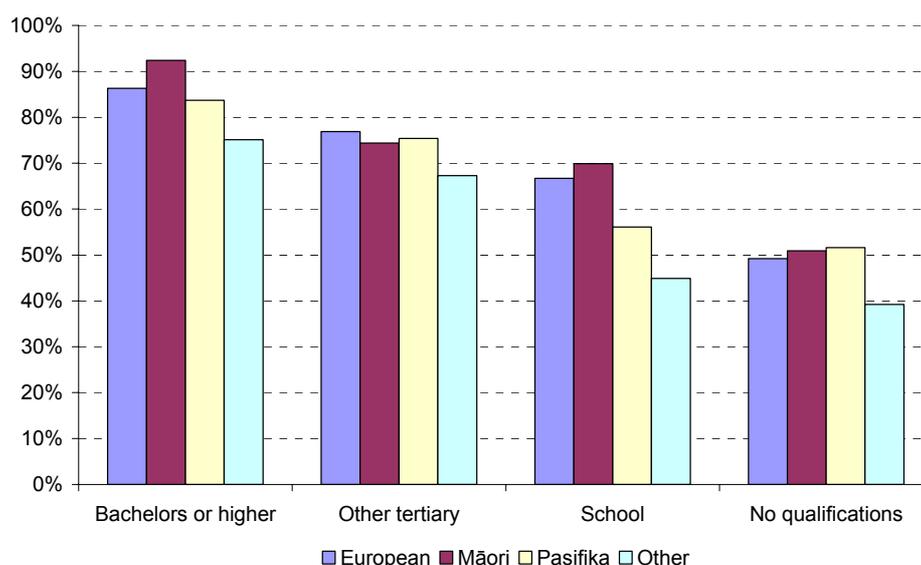
### Labour force participation by level of qualification and ethnic group

Figure 41 shows the labour force participation rates for 2005 by highest qualification and by ethnic group. It clearly shows that all ethnic groups exhibit higher participation rates for those who have attained tertiary qualifications. In addition, those in the European, Māori and Pasifika ethnic groups have generally similar labour force participation rates at most levels of highest qualification. Those in the ‘Other’ ethnic group had a notably lower labour force participation rate at all levels of highest qualification.

In 2005, of those with a bachelors or higher qualification Māori had the highest labour force participation rate, at 92 percent, followed by Europeans (86 percent) and Pasifika (84 percent). Those in the ‘Other’ ethnic group had the lowest participation rate, at 75 percent.

The labour force participation rates of those with ‘other tertiary’ qualifications were 77 percent for Europeans, 75 percent for Pasifika, 74 percent for Māori, and 67 percent for ‘Others’.

**Figure 41: Labour force participation rate of the population aged 15 and over by highest qualification and ethnic group 2005**



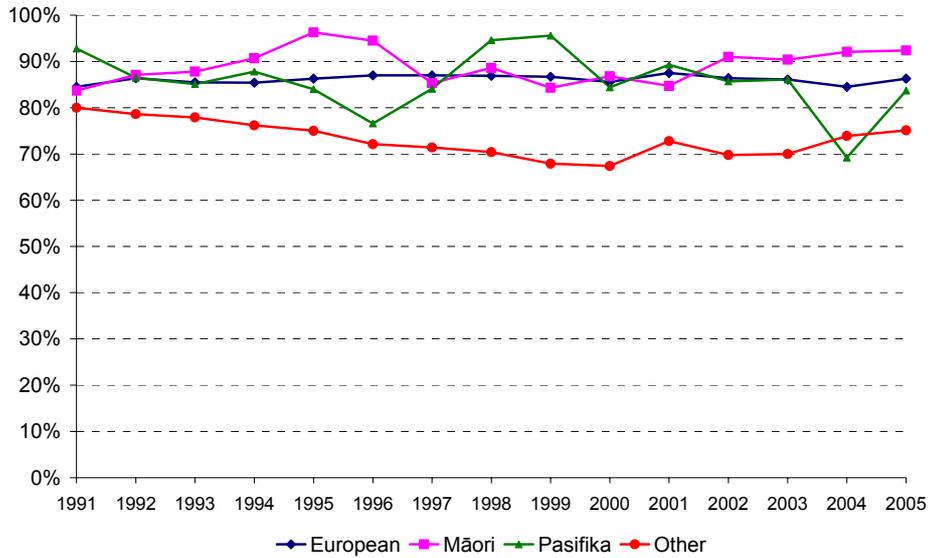
Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *Household Labour Force Survey*

Over time, the participation rates of those in the European, Māori or Pasifika ethnic groups with tertiary qualifications have been of relatively similar levels and has remained fairly stable, especially at the ‘other tertiary’ qualification level. At the bachelors or higher level of qualification, the labour force participation rate of Māori has risen above that of Europeans since 2001.

Figures 42 and 43 show the labour force participation rates of the various ethnic groups at the bachelors or higher level and ‘other tertiary’ level, respectively.

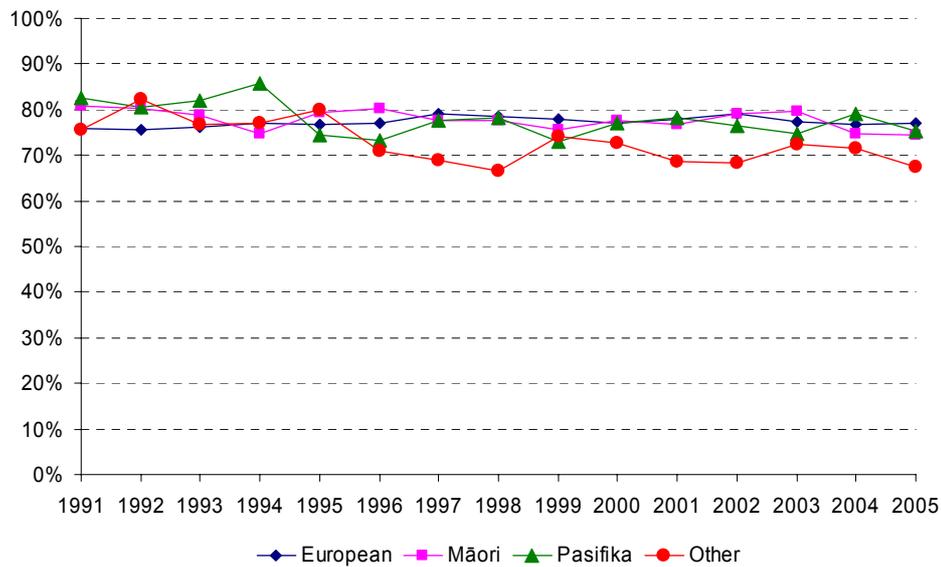
**Figure 42: Labour force participation rate of the population aged 15 and over with a bachelors or higher tertiary qualification by ethnic group 1991-2005**



Note: Refer to technical notes 2, 5 and 7.

Source: Statistics New Zealand, *Household Labour Force Survey*

**Figure 43: Labour force participation rate of the population aged 15 and over with an 'other tertiary' qualification by ethnic group 1991-2005**



Note: Refer to technical notes 3, 5 and 7.

Source: Statistics New Zealand, *Household Labour Force Survey*

## **5 The relationship between the level of qualifications and income**

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People who attain tertiary qualifications generally earn higher incomes than those people without tertiary qualifications. In fact, it is one of the expectations of tertiary graduates that their qualifications will earn them a premium over those who have not gained qualifications.

In this section, the distribution of income and the median weekly income of the New Zealand working-age population are analysed to examine the effect that tertiary qualifications have on income. Then, an international comparison of the returns to various levels of tertiary education is made using OECD data for selected countries.

Findings from studies analysing the integrated dataset on Student Loan Scheme borrowers (IDS) are also presented in this section. These examine the impact on income of the level of qualification, successful completion of study, field of study, and the industry of employment. This is followed by a summary of findings from analytical studies of the returns to education in New Zealand. Then a summary of an analysis of the impact of tertiary education on the net worth of New Zealanders is presented. Finally, the findings from a report that examines the link between field of study and industry of employment of young tertiary graduates is presented.

### **Distribution of income by level of qualification<sup>16</sup>**

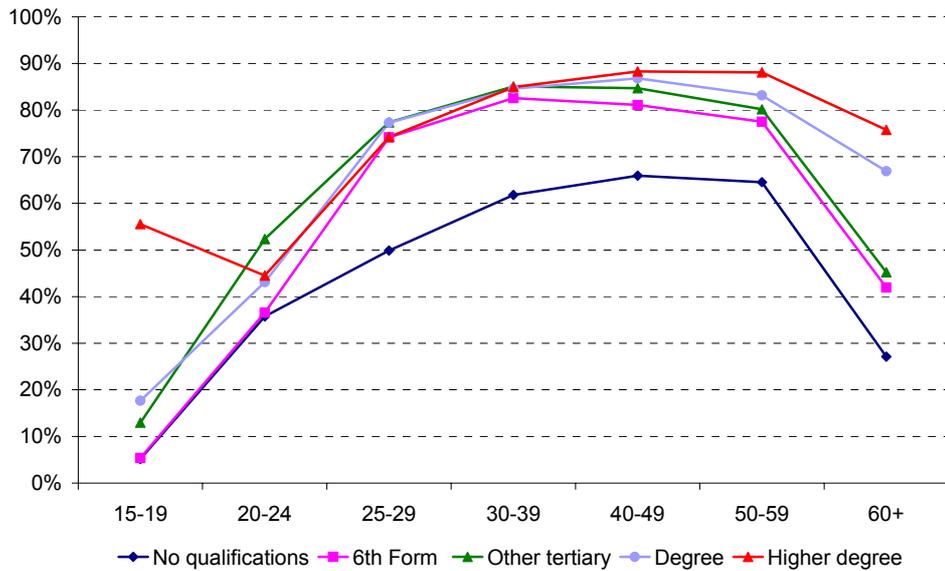
According to the 2001 Census, 8.2 percent of those without qualifications received an income of over \$40,000 in the year to March 2001, compared with 15 percent for those whose highest qualification was at school level. Those who took educational qualifications beyond school level were more likely to receive higher incomes: 34 percent of those with post-school qualifications received an income of over \$40,000. Men with post-school qualifications were more likely to receive higher incomes than women. Over two-fifths (45 percent) of men with post-school qualifications received an income of over \$40,000, compared with 23 percent of women.

Figures 44 to 47 show the percentages of men and women with different qualifications in different age bands receiving incomes of \$20,001 or more and \$50,001 or more. In each case, a high qualification/high income relationship is illustrated.

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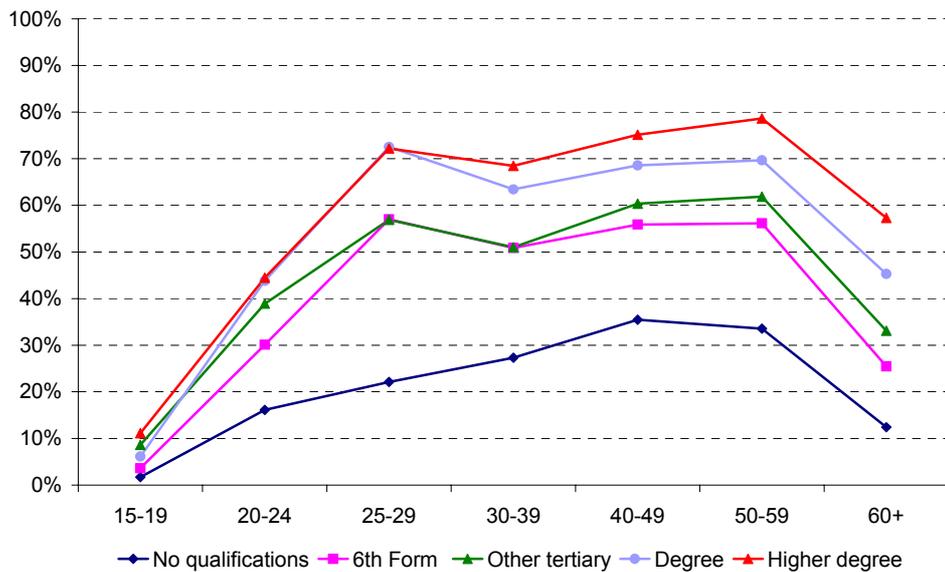
<sup>16</sup> This section was previously published in Ministry of Education (2004) *Profile and trends: New Zealand's Tertiary Education Sector 2003*, pp 93-94.

**Figure 44: Percentage of males aged 15 and over and earning \$20,001 or more by age group and qualification level 2001**



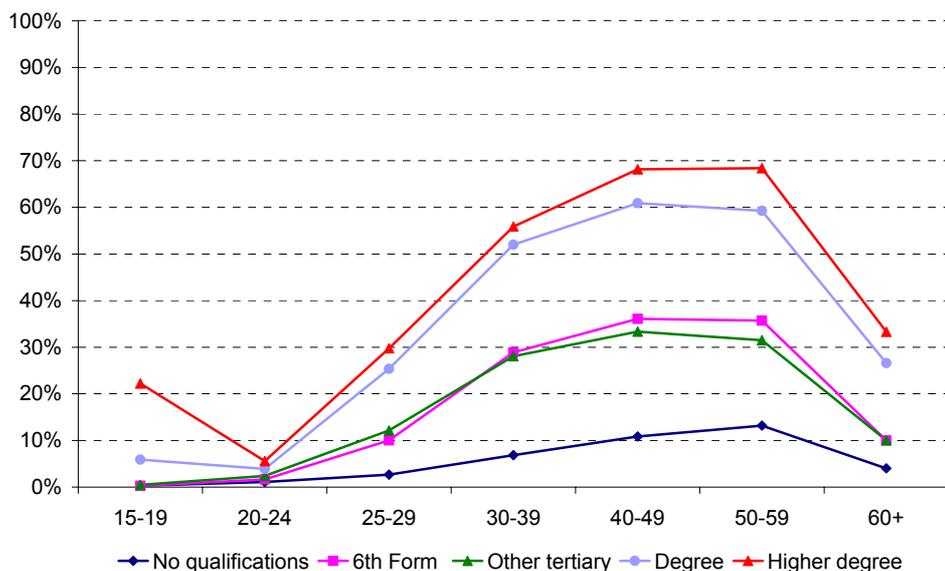
Source: Ministry of Education (2001) *What Can the Population Census Tell Us about Education? Data from the 2001 Census of Population and Dwellings*

**Figure 45: Percentage of females aged 15 and over and earning \$20,001 or more by age group and qualification level 2001**



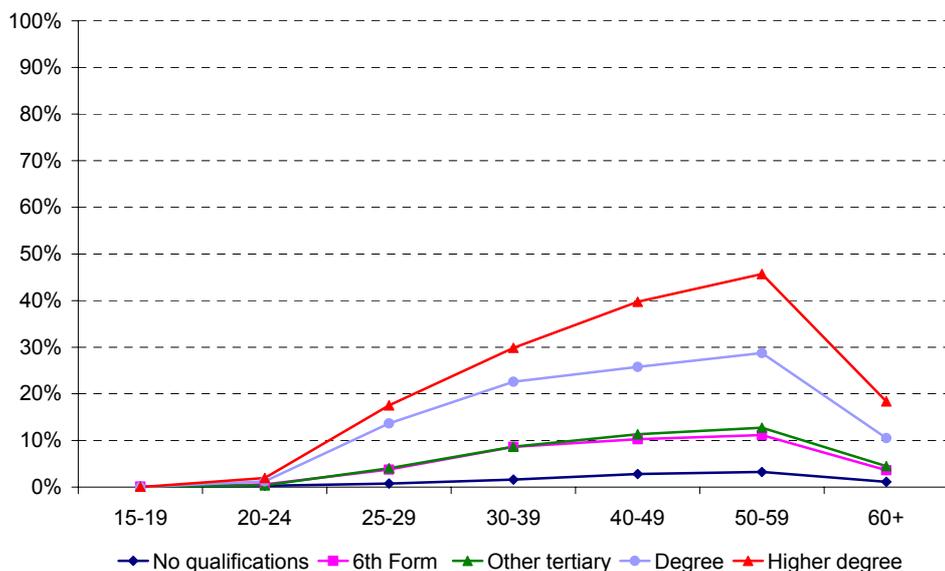
Source: Ministry of Education (2001) *What Can the Population Census Tell Us about Education? Data from the 2001 Census of Population and Dwellings*

**Figure 46: Percentage of males aged 15 and over and earning \$50,001 or more by age group and qualification level 2001**



Source: Ministry of Education (2001) *What Can the Population Census Tell Us about Education? Data from the 2001 Census of Population and Dwellings*

**Figure 47: Percentage of females aged 15 and over and earning \$50,001 or more by age group and qualification level 2001**



Source: Ministry of Education (2001) *What Can the Population Census Tell Us about Education? Data from the 2001 Census of Population and Dwellings*

The data shows that on average women earn lower incomes than males with similar levels of qualifications. The reasons for this include a greater degree of part-time employment for women, a higher representation of women in lower-income occupational groups, and the lower labour force participation rates exhibited by women. This latter point is particularly important as access to the labour market is a key factor in determining the level of income an individual will earn.

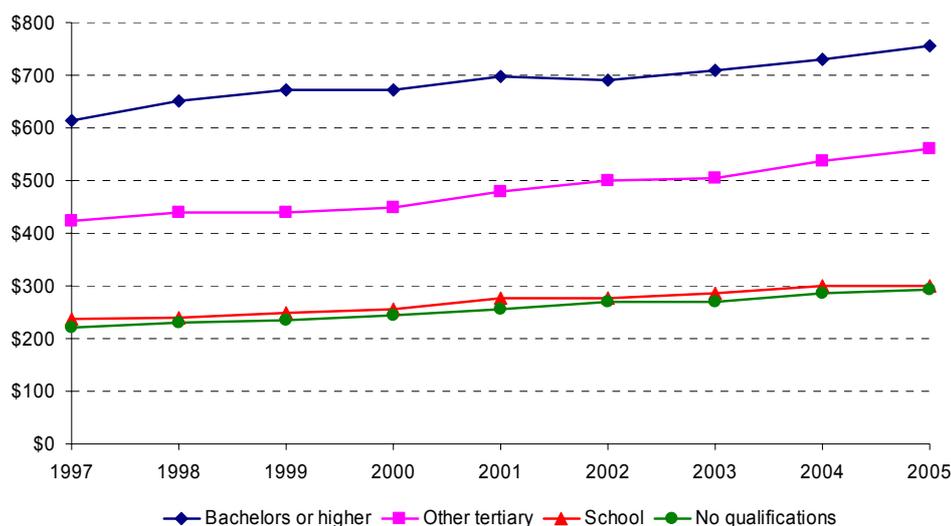
Where the inequalities in income between men and women are especially stark, such as for those with no qualifications, there exists a large gap in the labour force

participation rate between the genders. In 2001, when this Census data was collected, the labour force participation rate of women with no qualifications was 39 percent and for men with no qualifications it was 60 percent. This compares with a labour force participation rate of 85 percent for men and 71 percent for women with a bachelors or higher qualification where the inequality in income is much lower.<sup>17</sup>

### Median weekly income by level of qualification

Data from the New Zealand Income Survey (NZIS) shows that people with tertiary-level qualifications received significantly higher incomes than those without qualifications. Figure 48 shows the median weekly income from all sources (excluding investment income) for the population aged 15 and over, by highest educational qualification, between 1997 and 2005. The relationship between higher qualifications and higher income is clearly illustrated. Those with a highest qualification of a bachelors or higher degree received the highest weekly median income (\$756 in 2005), followed by ‘other tertiary’ (\$560). People with no qualifications received the lowest median weekly income (\$293).

**Figure 48: Median weekly income for the population aged 15 and over from all sources by highest qualification 1997-2005**



Note: Refer to technical notes 2, 3, 4, 5 and 6.

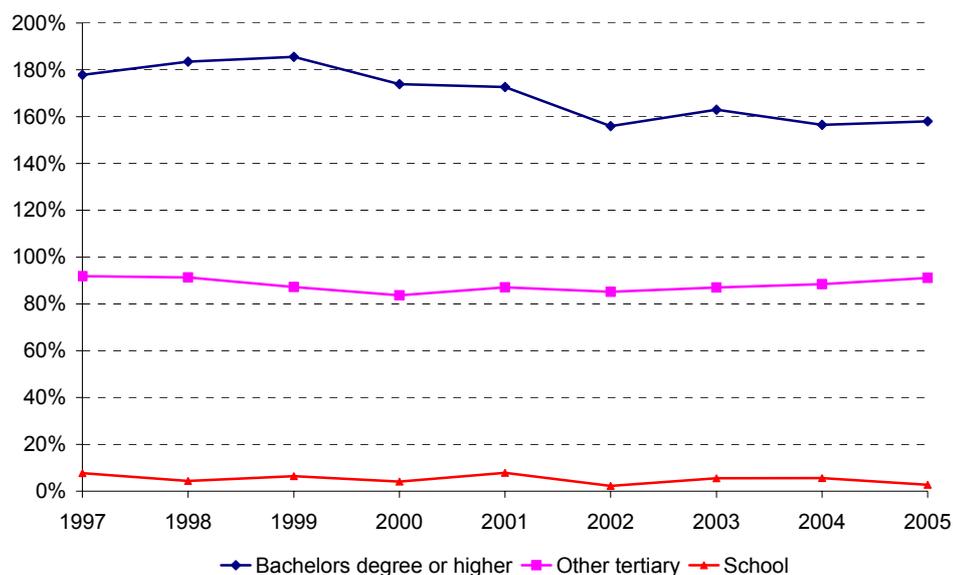
Source: Statistics New Zealand, *New Zealand Income Survey*

The margin paid to a holder of a bachelors or higher qualification over those with no qualifications has decreased from a high point of 186 percent in 1999 to 158 percent in 2005. The margin paid to the holder of an ‘other tertiary’ qualification over those with no qualifications has increased from a low of 84 percent in 2000 to 91 percent in 2005. These two trends have had the effect of closing the gap in median income between those with a bachelors or higher qualification and those with an ‘other tertiary’ qualification.

Figure 49 presents changes in the margin of median weekly income of various levels of highest qualification compared with someone with no qualifications.

<sup>17</sup> See section 4 for a more detailed breakdown of labour force participation by gender and level of educational qualification.

**Figure 49: Percentage gain in median weekly income for the population aged 15 and over by highest qualification compared with a person with no qualifications 1997-2005**



Note: Refer to technical notes 2, 3, 4, 5 and 6.

Source: Statistics New Zealand, *New Zealand Income Survey*

The large decrease in the unemployment rate of those with ‘other tertiary’ qualifications and those with no qualifications (see Figure 32) since 1998 is a likely factor in the faster growth rate in weekly median income experienced by these groups. This ‘tightening’ of the labour market would have led to faster wage growth and also more hours worked per week. This compares with the relative stability of the unemployment rate for those with bachelors or higher qualifications, possibly leading to lower upward pressure on wages and hours worked for this group.

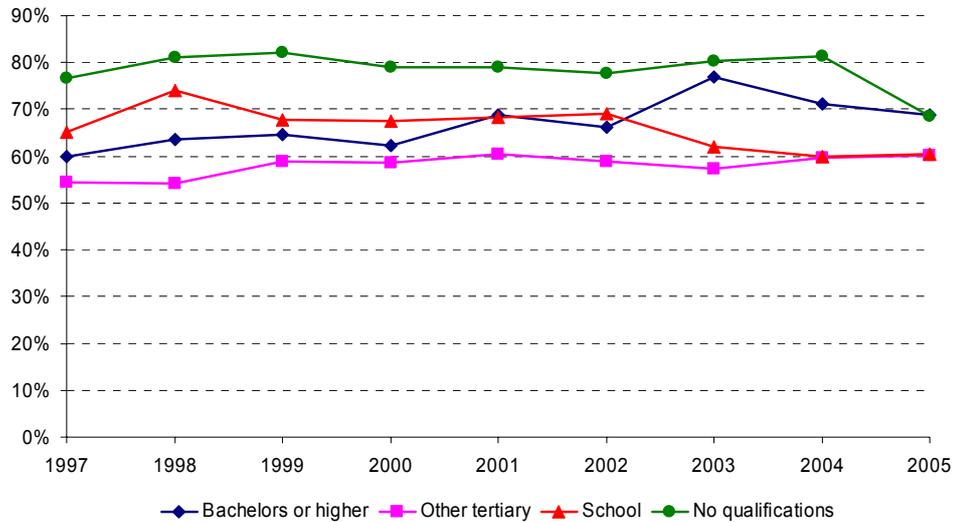
### **Median weekly income by level of qualification and gender**

The NZIS data displays similar results to the 2001 Census data in that women on average earn less than men. Figure 50 shows the female median weekly income as a percentage of the male median weekly income over time for various levels of qualification. In 2005, the median weekly income for females with a bachelors degree or higher was 69 percent. This compares with 60 percent for ‘other tertiary’ qualifications, 61 percent for school qualifications, and 68 percent for no qualifications.

The gap in the median weekly income earned by women and men with tertiary-level qualifications has been decreasing. In 1997, the female median weekly income was 60 percent that of men for those with a bachelors or higher qualification, compared with 69 percent in 2005.

A similar pattern was evident in those with an ‘other tertiary’ qualification. The female median weekly income as a percentage of male median weekly income rose from 55 percent in 1997 to 60 percent in 2005.

**Figure 50: Female median weekly income as a percentage of male median weekly income by highest qualification 1997-2005**



Note: Refer to technical notes 2, 3, 4, 5 and 6.

Source: Statistics New Zealand, *New Zealand Income Survey*

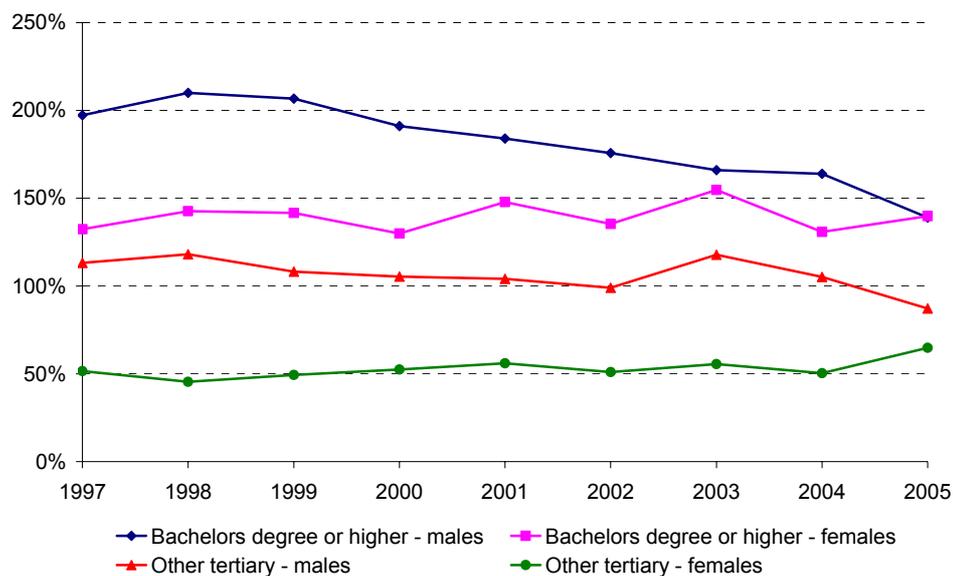
In contrast, the gap in the median weekly income between men and women has been increasing for those with school-level or no qualifications. In 1997, the female median weekly income was 65 percent that of males with school qualifications. By 2005, this figure had fallen to 61 percent. For those with no qualifications, the figures were 77 percent and 68 percent respectively.

When the weekly median income data is split by gender, it is apparent that the decrease in the premium for having a bachelors or higher qualification since 2000 - illustrated in Figure 49 - is due to a fall in the premium for males. Figure 51 shows, by gender, the margin for holding tertiary qualifications compared with those with no qualifications.

Among men, the percentage gain from holding a bachelors or higher qualification compared with someone with no qualifications decreased from 210 percent in 2000 to 139 percent in 2005. For women, the decrease in premium was much smaller. The premium for women on having a bachelors or higher qualification over someone with no qualifications fell from 143 percent in 2000 to 140 percent in 2005.

Although the premium on holding an ‘other tertiary’ qualification over someone with no qualifications fell from 118 percent to 87 percent for men from 2003, women experienced an increase in premium from 56 percent to 65 percent over the same period.

**Figure 51: Percentage gain in median weekly income for the population aged 15 and over by highest qualification compared with a person with no qualifications by gender 1997-2005**



Note: Refer to technical notes 2, 3, 4, 5 and 6.

Source: Statistics New Zealand, *New Zealand Income Survey*

### **Median weekly income by level of qualification and ethnic group**

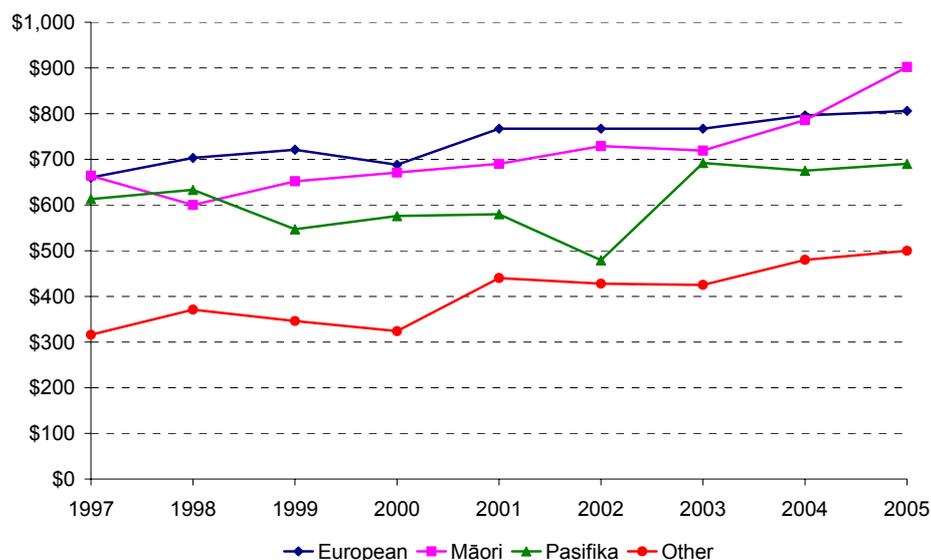
Figure 52 shows the median weekly income for the various ethnic groups who have a bachelors or higher qualification. In 2005, Māori had the highest median weekly income, at \$902. They were followed by Europeans with \$806 in median weekly income, Pasifika with \$690 and 'Other' with \$500.<sup>18</sup>

After trailing for most of the time period, the median weekly income of Māori surged ahead of the European median weekly income in 2005. This result is not surprising, given the decrease in unemployment rate and very high levels of labour force participation for Māori with a bachelors degree or higher in the last few years.<sup>19</sup>

<sup>18</sup> As noted previously, due to smaller sample sizes there is a larger sampling error associated with the Māori and Pasifika ethnic groups. Therefore, caution should be used in interpreting changes in the weekly median income for this group over time.

<sup>19</sup> It should be noted that the median does not give an indication of the distribution of income. Although Māori may have a higher median income than Europeans, they may have a larger proportion of their population with low incomes and few with high incomes.

**Figure 52: Median weekly income for the population aged 15 and over with a bachelors or higher degree by ethnic group 1997-2005**

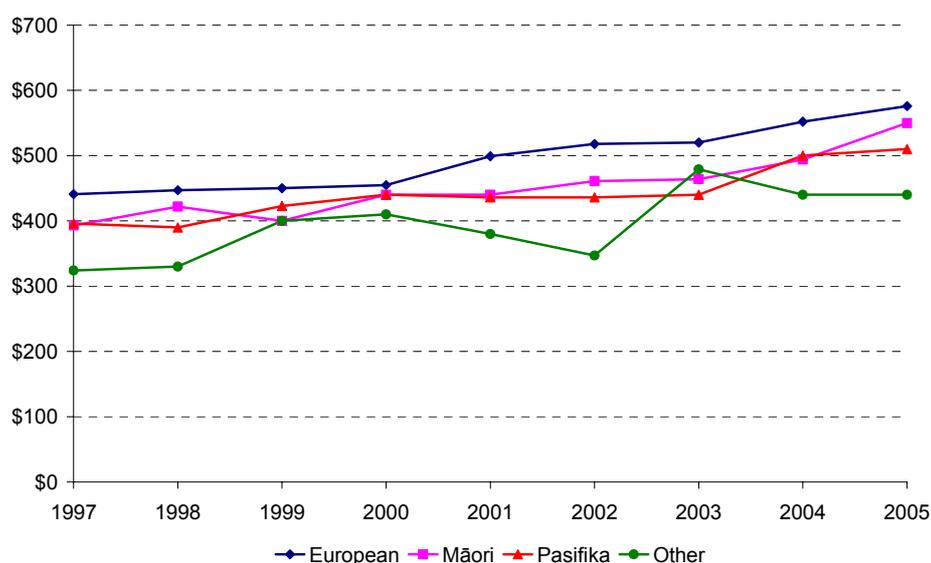


Note: Refer to technical notes 2, 5, 6 and 7.

Source: Statistics New Zealand, *New Zealand Income Survey*

Of those with an ‘other tertiary’ qualification, Europeans received the highest median weekly income, of \$576, in 2005. They were followed by Māori with \$550, Pasifika with \$510 and ‘Other’ with \$440. The surge in median weekly income experienced by Māori with a bachelors or higher degree was also experienced by Māori with a non-degree tertiary qualification. The growth in weekly median income for Māori of 19 percent between 2003 and 2005 compares with growth of 11 percent for Europeans.

**Figure 53: Median weekly income for the population aged 15 and over with an ‘other tertiary’ qualification by ethnic group 1997-2005**



Note: Refer to technical notes 3, 5, 6 and 7.

Source: Statistics New Zealand, *New Zealand Income Survey*

### Median weekly income by level of qualification and age group

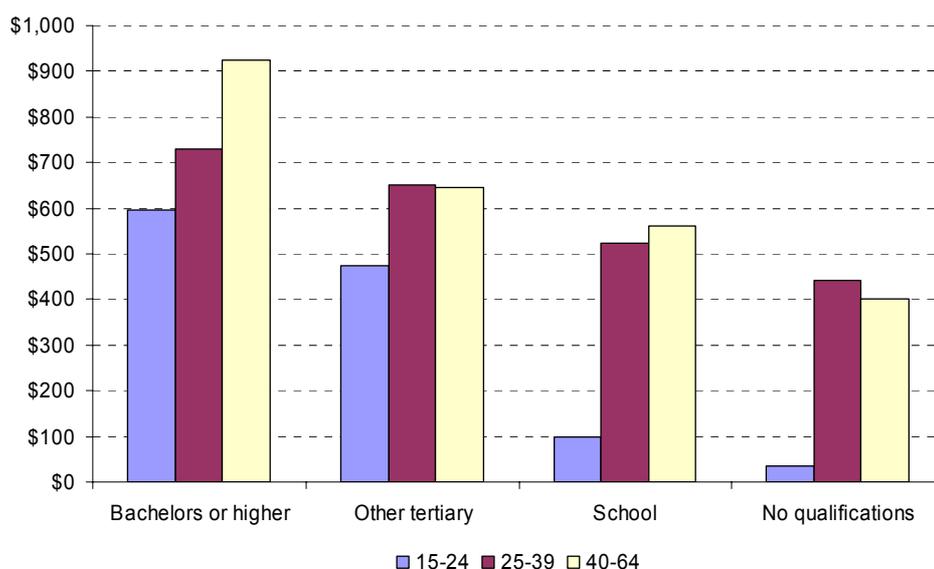
Of those in the working-age population with a bachelors or higher degree, those in the older age groups have a higher median weekly income. In 2005, the median weekly income for those with a bachelors or higher qualification aged 15 to 24 was \$652, for those aged 25 to 39 it was \$806, and those aged 40 to 64 it was \$990.

For those with an ‘other tertiary’ qualification, the median weekly income was highest for those aged 25 to 39. The median weekly income for this age group was \$652, compared with \$474 for those aged 15 to 24, and \$645 for those aged 40 to 64.

Those in the working-age population with school-level or no qualifications experienced very slight gains in income or falls between those aged 25 to 39 and those aged 40 to 64.

The data would suggest that a bachelors or higher qualification is likely to lead to increasing weekly income with age and therefore experience, compared with non-degree and lower qualifications.

**Figure 54: Median weekly income by highest qualification and age group 2005**



Note: Refer to technical notes 2, 3, 4, 5 and 6.

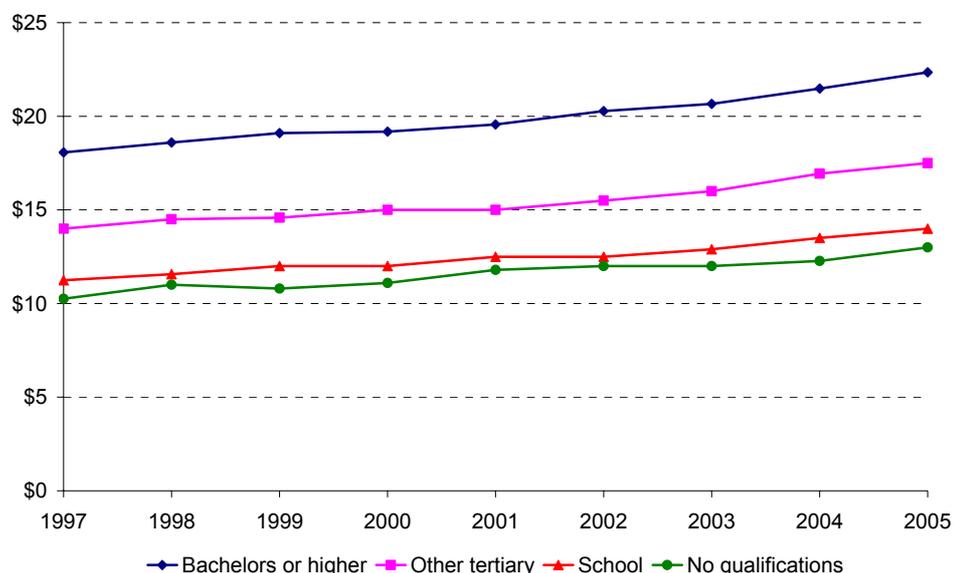
Source: Statistics New Zealand, *New Zealand Income Survey*

### Median hourly wage by level of qualification

The analysis of the impact of highest qualification on the median weekly income in the preceding sections has the disadvantage of not disaggregating the impact of hours worked on weekly income. To gain a clearer picture of the returns to highest qualification, this section analyses the impact of highest qualification on the median hourly wage for those people in employment.

Figure 55 shows the median hourly wage of employed people at various levels of highest qualification. It clearly shows that higher tertiary qualifications lead to a higher median hourly wage. In 2005, employed people with a highest qualification at the bachelors or higher level had a median hourly wage of \$22.35. This compares with a median hourly wage of \$17.50 for those with an ‘other tertiary’ qualification, \$14 for those with school qualifications, and \$13 for those with no qualifications.

**Figure 55: Median hourly wage for people in employment by highest qualification 1997-2005**



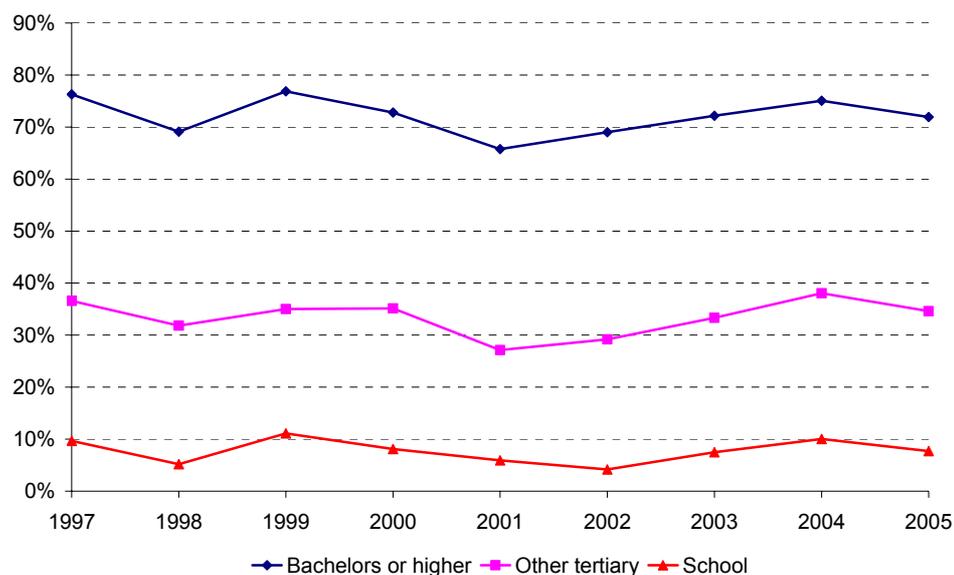
Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *New Zealand Income Survey*

An examination of the premium on the median hourly wage from higher qualifications over time shows that the premium has generally been rising since 2001. In 2001, the premium on the median hourly wage for a person holding a bachelors or higher qualification, compared with someone with no qualifications, was 66 percent. By 2005 the premium had risen to 72 percent. A similar trend is exhibited for those with an ‘other tertiary’ qualification, where the premium compared with those without qualifications rose from 27 percent to 35 percent.

Figure 56 shows the change between 1997 and 2005 in the premium on the median hourly wage from higher qualifications compared with someone with no qualifications.

**Figure 56: Percentage gain in the median hourly wage for people in employment highest qualification compared with someone with no qualifications 1997-2005**



Note: Refer to technical notes 2, 3, 4 and 5.

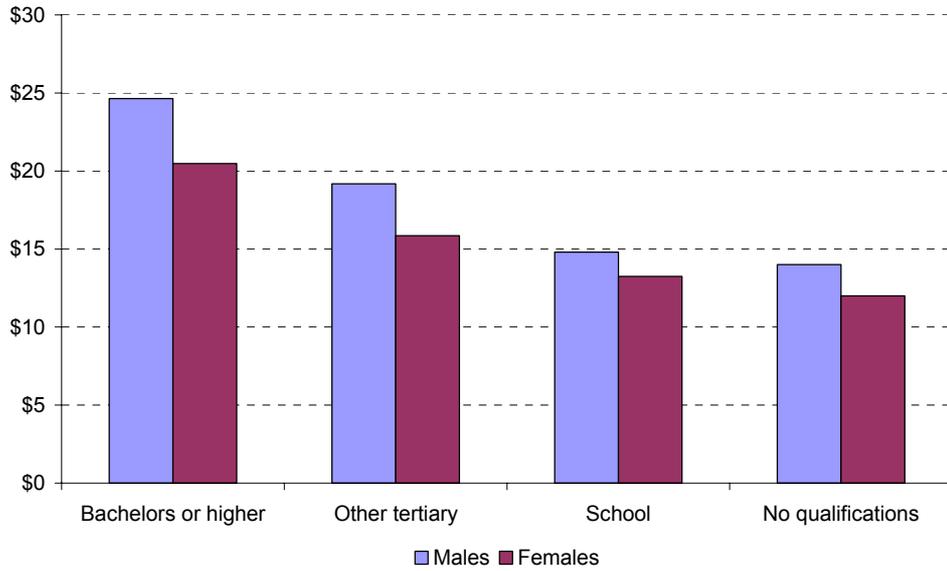
Source: Statistics New Zealand, *New Zealand Income Survey*

The analysis, set out earlier in this report, of weekly median income suggested that the premium on a bachelors or higher qualification had been falling since 2000 (see Figure 49). This analysis of the median hourly wage data suggests that this fall was due to people with no qualifications working more hours per week, rather than a relative increase in the hourly wage.

### **Median hourly wage by level of qualification and gender**

Women and men both exhibit the higher qualification/higher median hourly wage relationship. However, as can be seen in Figure 57, women have a lower median hourly wage at all levels of qualification than men. In 2005, the median hourly wage for men with a bachelors or higher qualification was \$24.64. This compares with a median hourly wage for women of \$20.48 with the same qualification. Men with an 'other tertiary' qualification had a median hourly wage of \$19.18 in 2005, compared with \$15.85 for women. It should be noted that these inequalities will be influenced by choice of occupation, with many women being employed in traditionally lower-paid occupations.

**Figure 57: Median hourly wage for people in employment by highest qualification and gender 1997-2005**

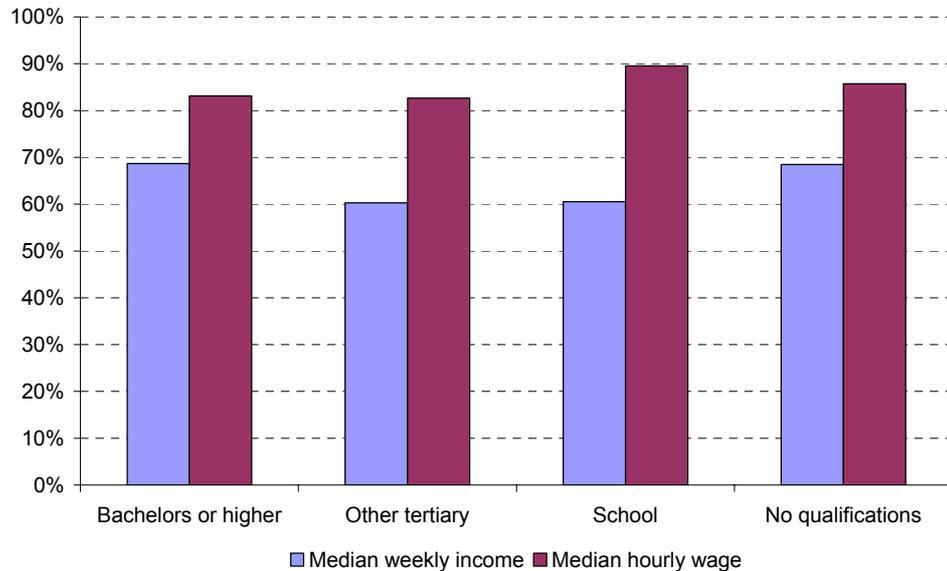


Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *New Zealand Income Survey*

The impact of hours worked per week on the relative weekly median income of men and women is clearly illustrated by the median hourly wage data. Figure 58 expresses the female weekly median income and median hourly wage as a percentage of the male equivalents by highest qualification in 2005.

**Figure 58: Female income as a percentage of male income by highest qualification and type of income 2005**



Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *New Zealand Income Survey*

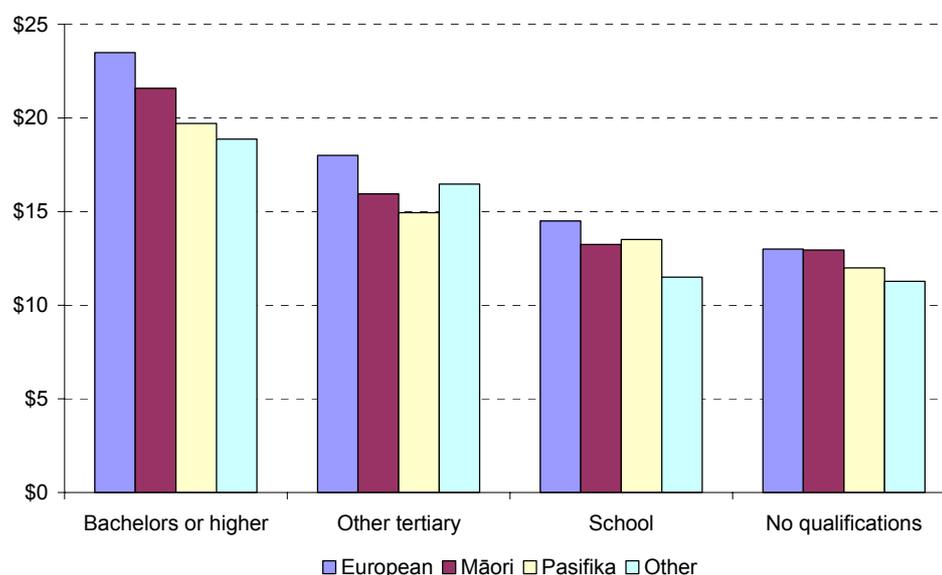
Whereas the median weekly income for women with a bachelors or higher qualification was just 69 percent of that of men, the median hourly wage for women with this level of qualification was 83 percent of that of men. A similar reduction in disparities was exhibited at all other levels of qualification.

### **Median hourly wage by level of qualification and ethnic group**

Although all ethnic groups exhibited the higher qualifications/higher median hourly wage relationship, Māori and Pasifika ethnic groups earned lower median hourly wages than Europeans at all levels of qualifications.

In 2005, Europeans with a bachelors or higher qualification had a median hourly wage of \$23.49. This compares with \$21.58 for Māori and \$19.71 for Pasifika. Europeans with an ‘other tertiary’ qualification earned a median hourly wage of \$18.00. This compares with a median hourly wage of \$15.95 for Māori and \$14.94 for Pasifika.

**Figure 59: Median hourly wage for people in employment by highest qualification and ethnic group 1997-2005**



Note: Refer to technical notes 2, 3, 4 and 5.

Source: Statistics New Zealand, *New Zealand Income Survey*

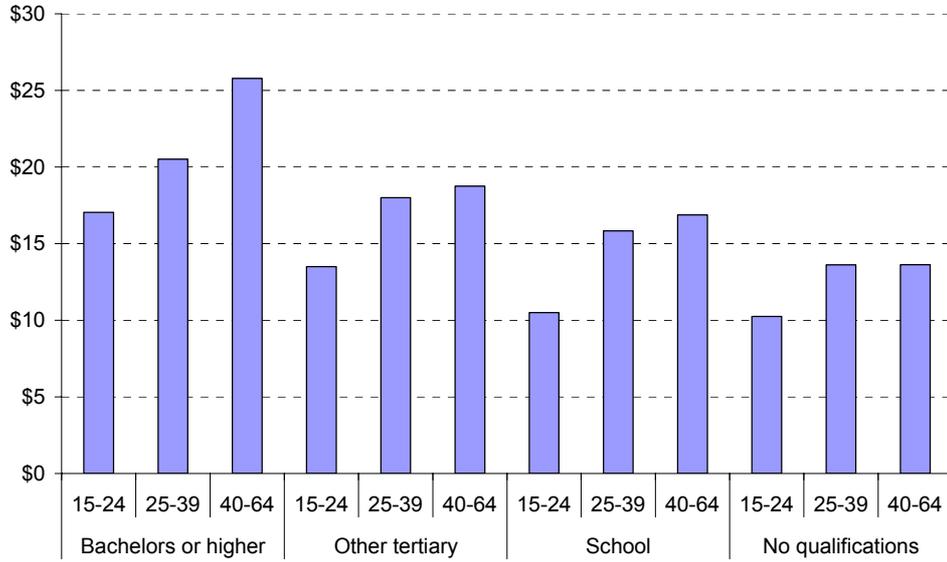
Analysis described earlier in this paper showed that the weekly median income of Māori with a bachelors or higher qualification exceeded that of Europeans (see Figure 52). The median hourly wage data suggests that although Māori may have a higher median weekly income than Europeans, they may achieve this through having to work longer hours.

### **Median hourly wage by level of qualification and age group**

As was the case in the analysis of median weekly income (see Figure 54), the median hourly wage of those with a bachelors degree continues to rise as people get older. In 2005, the median income of a person holding a bachelors or higher qualification in the 15 to 24 age group was \$17.04. This compares with \$20.51 for the 25 to 39 age group and \$25.78 for the 40 to 64 age group.

For those with an ‘other tertiary’ qualification, the median hourly wage was only marginally higher for a person in the 40 to 64 age group (\$18.75) than for someone in the 25 to 39 age group (\$18.00). Similar patterns were observed for those with a school qualification or no qualifications.

**Figure 60: Median hourly wage of people employed by highest qualification and age group 2005**



Note: Refer to technical notes 2, 3, 4 and 5.

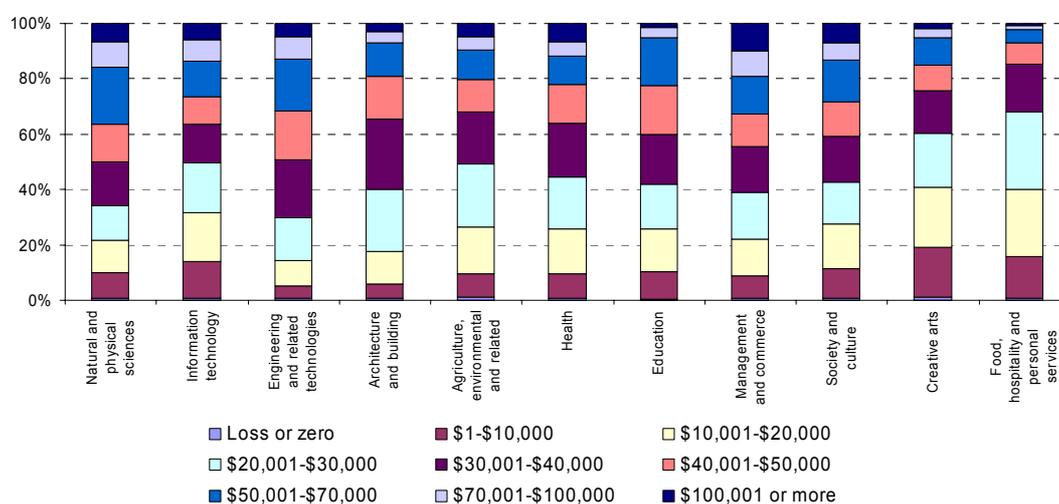
Source: Statistics New Zealand, *New Zealand Income Survey*

### The relationship between field of study and income<sup>20</sup>

According to Census 2001 data, the fields of study that had the highest proportion of graduates earning annual incomes greater than \$50,000 were 'natural and physical sciences' (36 percent of those with post-school qualifications in this subject who completed the income question), 'management and commerce' (33 percent), and 'engineering and related technologies' (32 percent). The fields of study that had the highest proportion of graduates earning annual incomes of \$20,000 or less were 'creative arts' (41 percent), 'food, hospitality and personal services' (40 percent), and 'information technology' (32 percent). The proportion of people with no post-school qualification earning greater than \$50,000 per annum was just 10 percent.

The field of study that had the highest proportion of male graduates receiving an annual income greater than \$50,000 was 'health' at 58 percent of those who specified an income. The equivalent figure for female graduates was 14 percent. For graduates earning income greater than \$50,000, the field of study that had the highest proportion of women was 'natural and physical sciences' at 20 percent, with the equivalent figure for men being 48 percent. The field of study that had the highest proportion of male graduates earning income of \$20,000 or less was 'creative arts' at 32 percent and the equivalent figure for female graduates in this field of study was 46 percent. 'Food, hospitality and personal services' was the field of study that had the highest proportion of female graduates earning income of \$20,000 or less (52 percent), while the equivalent figure for male graduates was 24 percent.

**Figure 61: Percentage of population aged 15 and over with a post-school qualification by earned income and field of study 2001**



Source: Statistics New Zealand, *Census of Population and Dwellings, 2001*

<sup>20</sup> This section was previously published in Ministry of Education (2004) *Profile and Trends: New Zealand's Tertiary Education Sector 2003*, pp-101-102.

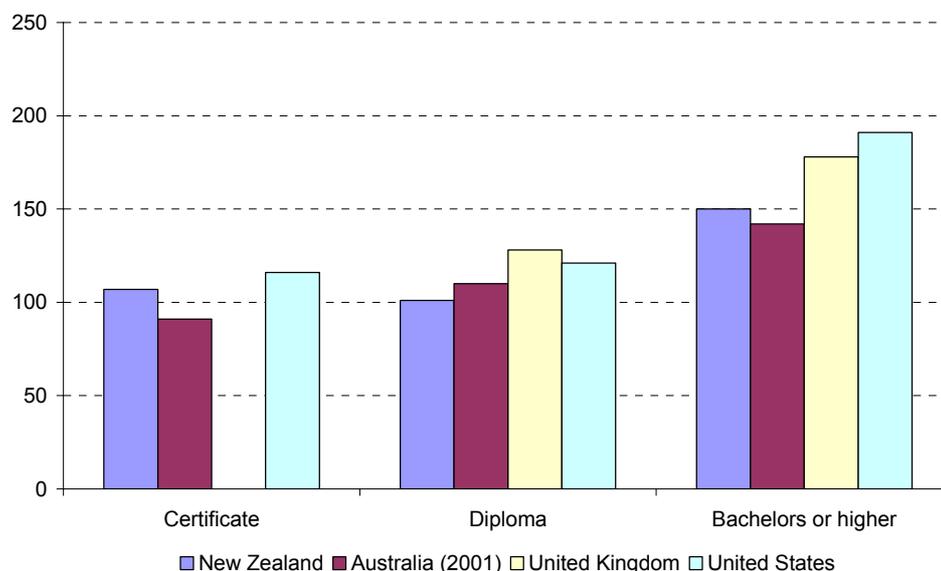
### International comparisons<sup>21</sup>

The OECD publication *Education at a Glance 2005* compared the returns to education in several countries. One indicator that reports on the earnings of workers with different educational attainment, and relates those earnings to the cost of acquiring qualifications, is shown in Figure 62. In New Zealand, education enhanced the earnings of people with all types of tertiary education, with those people with a bachelors or higher education receiving the highest return. New Zealanders in this group received an income 50 percent higher than the earnings of those with an upper secondary education. New Zealanders with certificate and diploma-level qualifications received earnings 7 percent and 1 percent higher respectively than a person with upper secondary.

An analysis of the indicator by gender showed that women who had a diploma-level education had a higher return than their male counterparts. However, men who had studied at certificate level and at bachelors or a higher level received a higher return on their education than women.

A comparison of the returns to education internationally shows that the returns for those with a higher-level education are greater in countries such as the United Kingdom and the United States than in New Zealand. For example, for those people with a bachelors or higher education, the relative earnings score was 178 in the United Kingdom and 191 in the United States. In Australia, the earnings score of 142 for a bachelors or higher degree was slightly lower than New Zealand's (although the Australian data refers to 2001).

**Figure 62: Relative earnings score of the population aged 25 to 64 with income from employment by level of tertiary education and by country, compared with those with upper secondary education 2003**



Note: The standardised earnings score for the population with upper secondary education = 100.

Source: OECD, *Education at a Glance: OECD Indicators 2005*

<sup>21</sup> This section was previously published in Ministry of Education (2005a) *Profile and Trends: New Zealand's Tertiary Education Sector 2004*, pp 172-173.

The OECD reported that, although women and men with higher education earned more, men still earned considerably more than women with a similar level of educational attainment. In New Zealand, in the 30 to 44 age group, women with an educational level of below upper secondary had average earnings that were 68 percent those of men. The corresponding percentages were 61 percent for upper secondary and certificate-level education, 62 percent for diploma-level education and 58 percent for bachelors level or above. Across all levels of education, women in New Zealand earned 61 percent of the amount that men earned. In part, the differences are explained by career and occupational choices, the amount of time that men and women spend in the labour force, and the relatively high incidence of part-time work among women.

## **Findings about post-study income from the integrated dataset on Student Loan Scheme borrowers<sup>22</sup>**

An individual's employment prospects and income are influenced by a number of factors in addition to the level of educational qualifications. Factors such as motivation, past work experience, attitudes and the level of innate ability will also impact on income levels. In other words, while there is a clear association between higher qualifications and higher incomes, this relationship does not mean that we can attribute all of the increased income to the higher qualifications. Some of the effect on income derives from higher qualifications and some from innate ability and other qualities. In order to gain some measure of the separation of the effects of the qualification from the effects of innate ability, it is useful to compare the incomes of those people who completed a specific type of qualification with those who attempted that type of qualification, but who abandoned study without completing it.

The integrated dataset on Student Loan Scheme borrowers was used to conduct this analysis. This dataset comprises information on people who have drawn down a student loan to help finance their tertiary studies. It matches their tertiary education details with their student loan borrowings, their demographic characteristics, their post-study income and their student loan debt.

An analysis by the Ministry of Education (Hyatt, Gini and Smyth, 2005) of the median earned income in 2002 of people who successfully completed qualifications in 1997, compared with that of people who studied the same qualifications but did not complete, showed that there were significant gains in income from successfully completing higher qualifications.

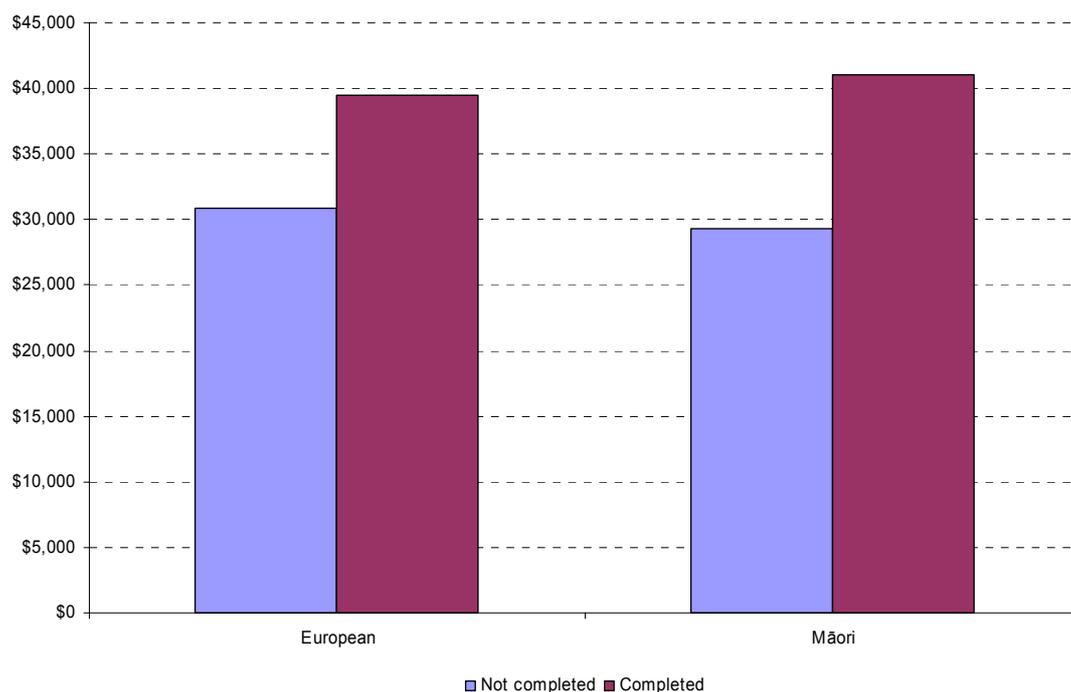
Analysis of the earnings in 2002 of those who last studied in 1997 and had a student loan shows that the median earnings of those who successfully completed a bachelors degree was 1.3 times the median income of those who left study without completing a degree. For men, the median earnings were \$43,530 if they completed, compared with \$31,720 if they did not complete. For women, the median incomes were \$37,950 and \$29,440 respectively.

A comparison of the median earned income received by people who completed a bachelors degree with that of those that did not complete showed that there were significant gains for both Europeans and Māori. Māori had the highest gain in earnings from successfully completing a bachelors degree. The median earned income for Māori who successfully completed at this level was \$41,090, compared with \$29,340 for Maori who studied but did not complete.

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<sup>22</sup> Some of the material in this section has previously been published in Ministry of Education (2005a) *Profile and Trends: New Zealand's Tertiary Education Sector 2004*, pp 170-172.

**Figure 63: Median income in 2002 of those who left study at the bachelors level in 1997 by ethnic group and completion status**



**Notes:**

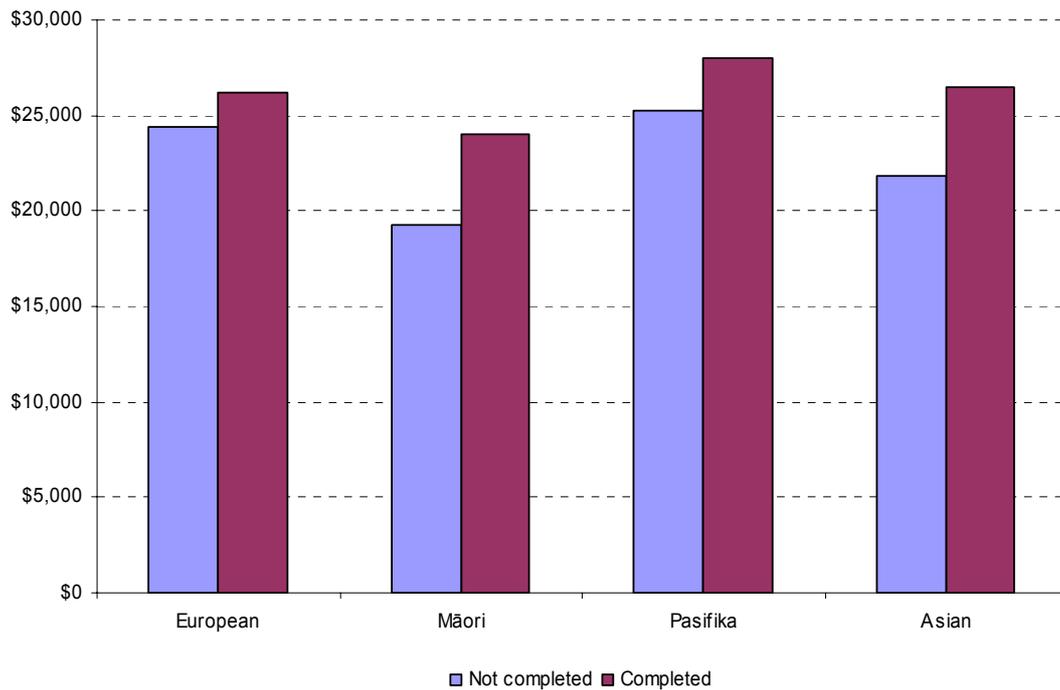
1. This study was of those Student Loan Scheme borrowers who last studied in 1997.
2. The graph records median earned income in 2002.
3. Due to privacy issues, data for the Pasifika and Asian ethnic groups is not reported, Source: Statistics New Zealand and Ministry of Education, Integrated Dataset on Student Loan Scheme Borrowers

At the tertiary certificate level,<sup>23</sup> the gain in median income from successful completion was minimal for the European ethnic group. However, for Māori, Pasifika and Asian ethnic groups there was a relatively large gain from successful completion. Completion of a certificate was thus also associated with a reduction in disparities in earnings. The median income for Māori who successfully completed a certificate-level qualification was \$24,010, compared with \$19,250 for Māori who did not complete. For Pasifika, the median earned income was \$28,000 and \$25,230 respectively. For Asians, the median earned income was \$26,480 and \$21,840 respectively.

The median earnings of those of European ethnicity who studied at certificate level but did not complete was 1.3 times the median earnings of Māori who did not complete. Among those who did complete, the median earnings of those of European ethnicity were 1.1 times those of Māori.

<sup>23</sup> Note that in this section a certificate qualification refers to a level 1 to 3 qualification.

**Figure 64: Median income in 2002 of those who left study at the certificate level in 1997 by ethnic group and completion status**



**Notes:**

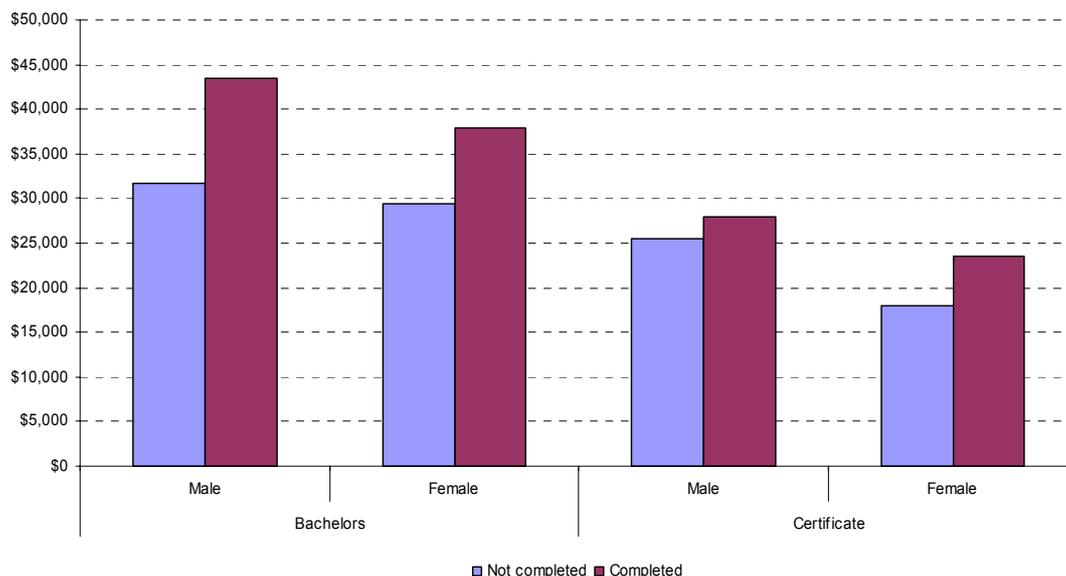
1. This study was of those Student Loan Scheme borrowers who last studied in 1997.
2. The graph records median earned income in 2002.
3. A certificate refers to a level 1 to 3 qualification.

Source: Statistics New Zealand and Ministry of Education, Integrated Dataset on Student Loan Scheme Borrowers

A further finding from this study of the integrated dataset is that the median earnings of those who studied at bachelors level, whether they completed or not, were higher than those who completed a certificate. The median earnings of men who successfully completed a bachelors degree was \$43,530, 1.6 times the median earnings of men who successfully studied at the certificate level. For men who did not successfully complete a bachelors degree, their median earnings were still 1.1 times those of a man who successfully completed certificate-level study. For women, the corresponding values were 1.6 times and 1.3 times respectively.

In addition, the data showed that the higher the level of qualification, the higher were the person's earnings. For example, the median earnings of women who completed a certificate-level qualification were \$23,480 and for men \$27,990. These were significantly lower than the median earnings for completing a bachelors qualification.

**Figure 65: Median income in 2002 of those who left study in 1997 by selected qualification level, gender and completion status**



**Notes:**

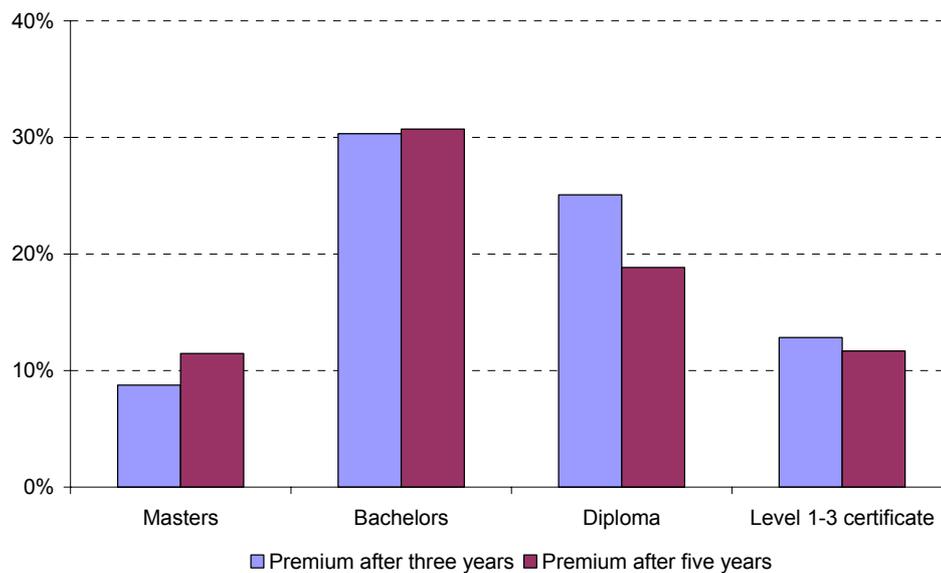
1. This study was of those Student Loan Scheme borrowers who last studied in 1997.
2. The graph records median earned income in 2002.
3. A certificate refers to a level 1 to 3 qualification.

Source: Statistics New Zealand and Ministry of Education, Integrated Dataset on Student Loan Scheme Borrowers

A study by the Ministry of Education (Hyatt and Smyth, 2006) of the median incomes of the 1997 leavers over time shows a trend towards a higher premium on completion for those with higher qualifications and a reduced premium for those with lower-level qualifications. In 2000 (three years post-study), the median income of masters students who successfully completed a qualification was 8.8 percent higher than those who did not complete. In 2002 (five years post-study), this premium on completion increased to 11 percent.

While the premiums on completion at the bachelors level remained constant between 2000 and 2002, the premium on completion of level 1-3 certificates fell. In 2000, the median income of those who completed a level 1-3 certificate was 13 percent higher than those who did not. In 2002, this premium on completion had fallen slightly to 12 percent. The decrease in the premium on completion was more significant for diploma students. In 2000, the premium on completion of diplomas was 25 percent. By 2002, the premium had decreased to 19 percent.

**Figure 66: Premium on completion of tertiary qualifications three and five years after leaving study by level**



**Notes:**

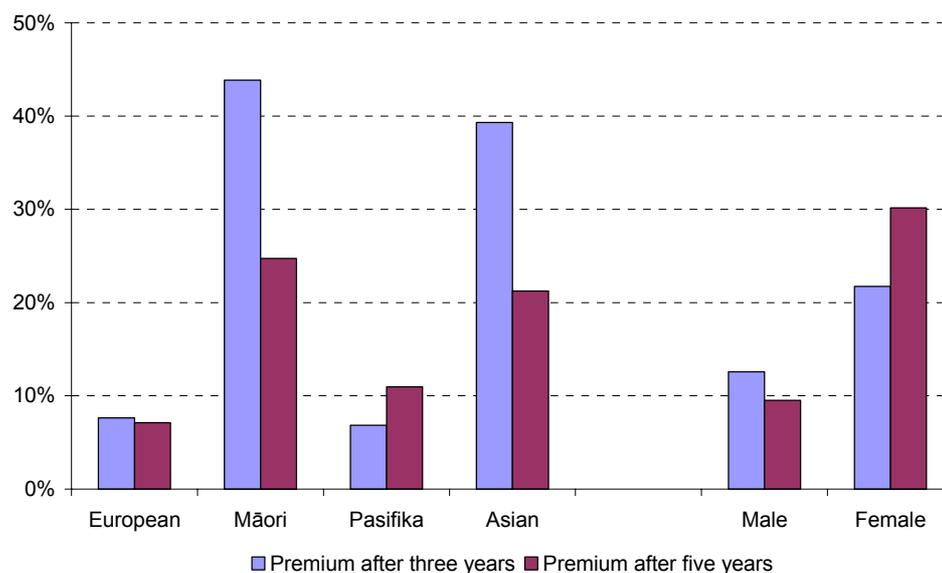
1. This study was of those Student Loan Scheme borrowers who last studied in 1997.
  2. 'Premium after three years' refers to the percentage that the median income of successful completers in 2000 exceeds the median income of unsuccessful completers in 2000. 'Premium after five years' refers to the percentage that the median income of successful completers in 2002 exceeds the median income of unsuccessful completers in 2002.
- Source: Statistics New Zealand and Ministry of Education, Integrated Dataset of Student Loan Scheme Borrowers

At the bachelors level, there has been little change in the premium for completion across the various ethnic groups and genders. However, for those who studied at the level 1 to 3 certificate level, there were differences in the premiums over time.

While the premium on completion of a tertiary qualification by Europeans remained relatively constant between 2000 and 2002, the premium on completion fell for Māori. In 2000, the premium on completion for Māori was 44 percent. This fell to 25 percent in 2002. Similarly, the premium for completion fell for Asians from 39 percent in 2000 to 21 percent in 2002. However, the premium on completion increased for the Pasifika ethnic group. In 2000, the median income of those who completed a level 1 to 3 certificate was 6.9 percent higher than for those that do not. In 2002, this premium increased to 11 percent.

In terms of gender, men had a decrease in the premium for completion between 2000 and 2002, while women had an increase. In 2000, the median income for men who completed a level 1 to 3 certificate was 13 percent higher than for those that did not. In 2002, this premium for completion fell to 10 percent. For women, the premium on successful completion was 22 percent in 2000, but rose to 30 percent in 2002.

**Figure 67: Premium for completion of level 1 to 3 certificate three and five years after leaving study by ethnic group and gender**



**Notes:**

1. This study was of those Student Loan Scheme borrowers who last studied in 1997.
2. 'Premium after three years' refers to the percentage by which the median income of successful completers in 2000 exceeds the median income of unsuccessful completers in 2000. 'Premium after five years' refers to the percentage by which the median income of successful completers in 2002 exceeds the median income of unsuccessful completers in 2002.

Source: Statistics New Zealand and Ministry of Education, Integrated Dataset on Student Loan Scheme Borrowers

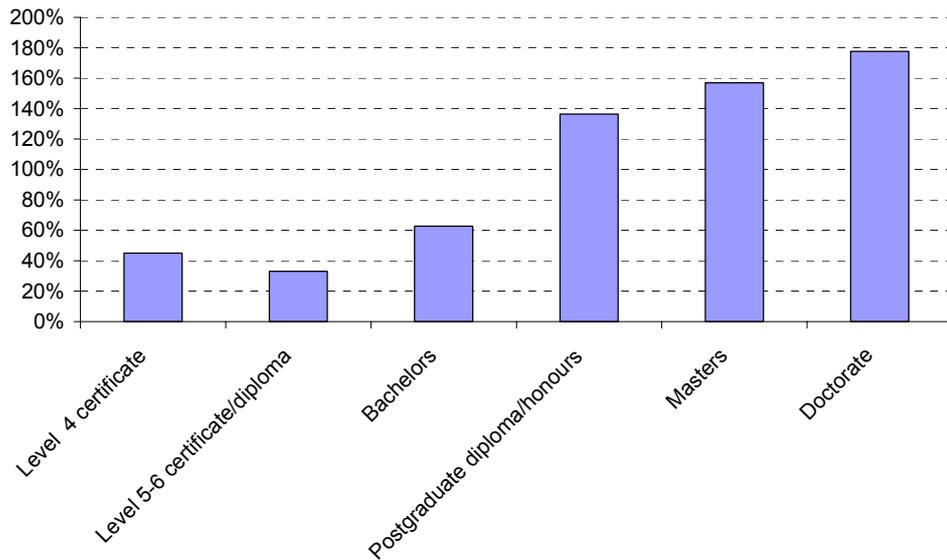
***The impact of field of study, industry of employment, and level of qualification, on post-study incomes***

A recent study by Nair (2006) applied statistical modelling to the integrated dataset on Student Loan Scheme borrowers (IDS) to analyse the impact of educational, demographic and employment variables on the post-study income of Student Loan Scheme borrowers. Nair used data for around 98,000 borrowers who left tertiary education between 1997 and 1999. In an important advance on previous studies of the impact of tertiary education on post-study income (such as Maani (1999) and Maani and Maloney (2004)), Nair included a variable that captured the industry in which the borrower was employed in. The strong explanatory power of this variable suggests that it is an important factor in determining post-study income.

Nair found that those with higher qualifications received higher predicted incomes. Borrowers with a doctorate had the highest return on income with a premium of 178 percent on those borrowers with a level 1 to 3 certificate, holding other factors constant.<sup>24</sup> Borrowers with a masters degree received a premium of 157 percent and those with a bachelors degree 63 percent.

<sup>24</sup> Such as age, gender, ethnic group etc.

**Figure 68: Premium on higher qualifications compared with a level 1 to 3 certificate**



**Notes:**

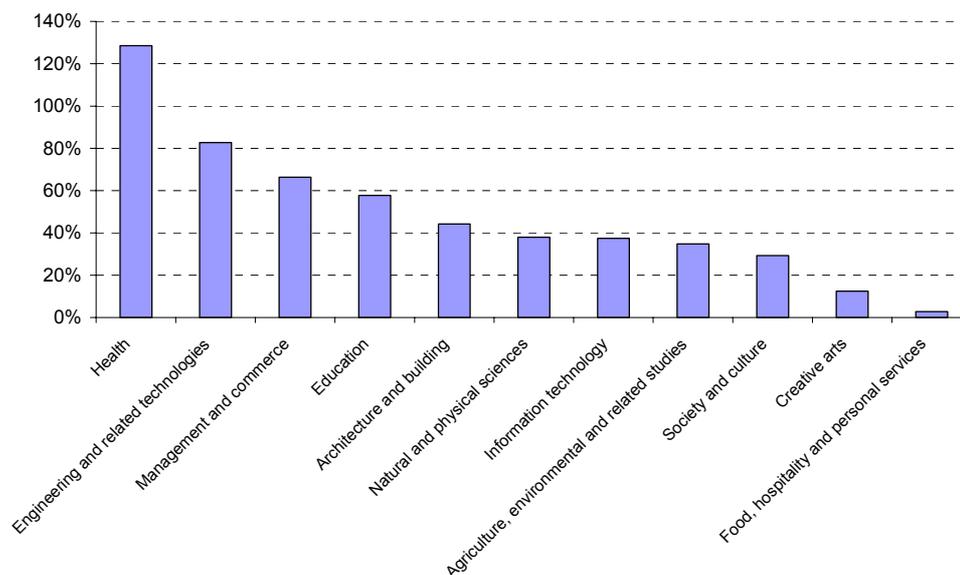
1. The premium is the ratio of the predicted earnings of borrowers at the indicated level of qualification compared with the predicted earnings of a Level 1-3 certificate.
2. This analysis focused on the income of borrowers three years post-study who left tertiary study between 1997 and 1999.

Source: Nair B (2006) *What Factors Impact on Graduates' Earnings Three Years Post Study?*

Nair also analysed the impact of the field of study of the student on their post-study income. Once the other factors were controlled for, borrowers in the field of 'health studies' were found to have the highest predicted earnings.<sup>25</sup> These borrowers had predicted earnings over twice as high as someone who had studied a mixed field programme. They were followed by borrowers who studied in the field of 'engineering' and 'management and commerce studies'. Borrowers who studied 'mixed field programmes' had the lowest predicted earnings. The premium on the predicted earnings of the various fields of study, compared with the predicted earnings of someone from a 'mixed field programme' are shown in Figure 69.

<sup>25</sup> It is important to note that the premium on income across the various fields of study (and industries) can vary widely at different levels of tertiary qualification. The reader should refer to Nair's full report for a presentation of more in-depth findings of these 'interaction effects'.

**Figure 69: Premium on income by field of study compared with a mixed field programme**



**Notes:**

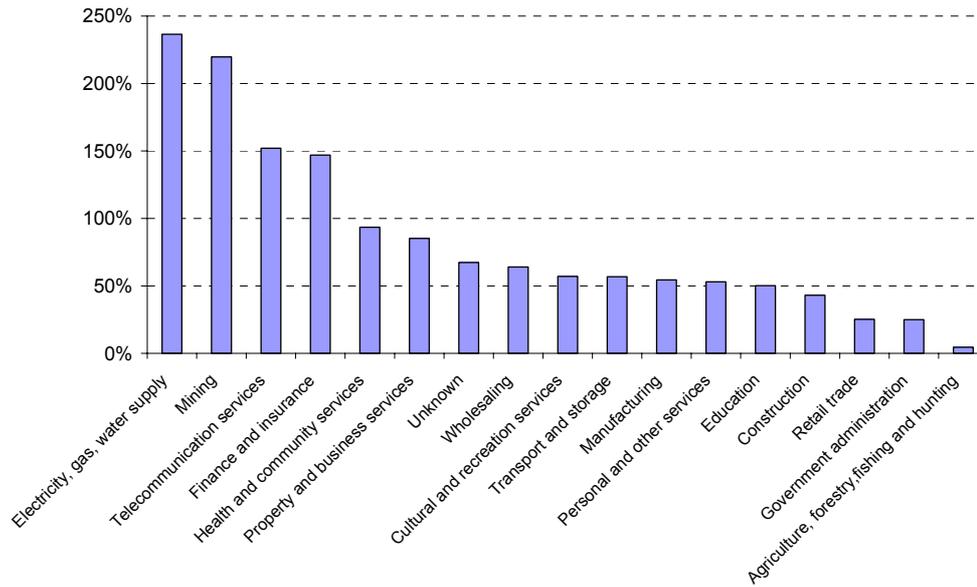
1. The premium is the ratio of the predicted earnings of borrowers in the indicated field of study with the predicted earnings of someone that studied in a mixed field programme.
2. This analysis focused on the income of borrowers three years post-study who left tertiary study between 1997 and 1999.
3. The premium on income across the various fields of study can vary widely at different levels of tertiary qualification. The reader should refer to Nair's full report for a presentation of more in-depth findings of these 'interaction effects'.

Source: Nair B (2006) *What Factors Impact on Graduates' Earnings Three Years Post Study?*

In an advance on previous studies of post-study income, Nair included a variable that captured the industry that a borrower was employed in. The results showed that industry was a major factor in determining the level of post-study income. Borrowers in the 'electricity, gas, water supply' industry had the highest predicted earnings, once other factors are controlled for. As is shown in Figure 70, a borrower in this field received a predicted income over twice as high as someone employed in the 'accommodation' industry.<sup>26</sup>

<sup>26</sup> As previously mentioned, it is important to note that the premium on income across the various industries can vary widely at different levels of tertiary qualification. The reader should refer to Nair's full report for a presentation of more in-depth findings of these 'interaction effects'.

**Figure 70: Premium on income by industry compared with the accommodation industry**



**Notes:**

1. The premium is the ratio of the predicted earnings of borrowers in the indicated industry with the predicted earnings of a borrower employed in the accommodation industry.
2. This analysis focused on the income of borrowers three years post-study who left tertiary study between 1997 and 1999.
3. The premium on income across the various industries can vary widely at different levels of tertiary qualification. The reader should refer to Nair's full report for a presentation of more in-depth findings of these 'interaction effects'.

Source: Nair B (2006) *What Factors Impact on Graduates' Earnings Three Years Post Study?*

### **Analysis of the returns in income from tertiary qualifications<sup>27</sup>**

The University of Auckland economist Dr Sholeh Maani has explored the relationship between income and educational qualifications. She conducted detailed analyses of data on income and qualifications for the Census years 1981 to 1996. Those studies quantified the relationship between the level of education and the level of total income.<sup>28</sup> The results established the relationship between education and income and showed that expenditure on gaining a tertiary education had a positive and significant return. Moreover, the benefits of higher education to the individual became more pronounced over time. Maani showed that the benefits of education were higher in 1996 than in 1981 and 1986.<sup>29</sup> This finding was significant because, over the years covered by Maani's research, the number of people in the workforce with higher-level tertiary qualifications was rising. However, the increased supply of people with higher-level qualifications did not appear to have the effect of lowering the return on qualifications.

A recent study<sup>30</sup> replicated Maani's approach using data from the 1996 and 2001 Census. The study showed that there was an increase in the rates of return for all post-school qualifications between 1996 and 2001. In 2001, the gain in income for men with a bachelors degree over those with less than School Certificate was 85 percent. For women the figure was 84 percent. The percentage gain in income for men with a masters degree over those with less than School Certificate was 100 percent. For women the figure was 110 percent. As this growth occurred during a time of significant increases in the number of people holding tertiary qualifications, it reinforces the previous finding that the increased supply of tertiary-level graduates does not appear to be impacting on the return to tertiary education.

This finding is supported by a previous study<sup>31</sup> that investigated the issue of upskilling in the New Zealand labour force. The study found that under certain assumptions it could be shown that there was an increase in real incomes over the period 1991 to 2001, in the face of an increasing supply of skilled workers.

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<sup>27</sup> This section has previously been published in Ministry of Education (2004) *Profile and Trends: New Zealand's Tertiary Education Sector 2003*, pp 99 -101, and Ministry of Education (2005a) *Profile and Trends: New Zealand's Tertiary Education Sector 2004*, pp 169-170.

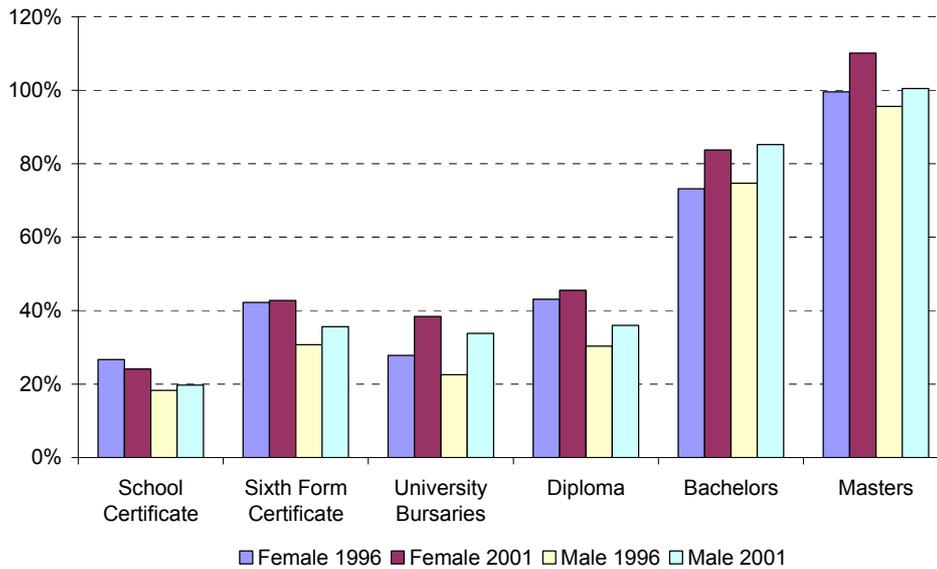
<sup>28</sup> Maani's studies used Census data on total income. Total income includes income from salaries, wages, benefits, self-employment and investments.

<sup>29</sup> Maani, S A (1999) *Private and Public Returns to Investments in Secondary and Higher Education in New Zealand Over Time: 1981-1996* research report commissioned by the New Zealand Treasury. [http://www.treasury.govt.nz/working\\_papers/default.htm](http://www.treasury.govt.nz/working_papers/default.htm).

<sup>30</sup> Penny, N (2005) *The Approach to Measuring the Returns to Secondary and Tertiary Qualifications in New Zealand: An Investigation and Update Using Data from the 2001 Census*, unpublished thesis.

<sup>31</sup> Dillingham, S (2003), *New Zealand's Workforce: Qualifications and Evidence of Upskilling*, Labour Market Policy Group, Department of Labour, Wellington.

**Figure 71: Percentage gain in annual earnings by highest qualification compared with a person with less than School Certificate 1996 and 2001**



Source: Penny, N (2005), *The Approach to Measuring the Returns to Secondary and Tertiary Qualifications in New Zealand: An Investigation and Update Using Data from the 2001 Census*, unpublished thesis

A study<sup>32</sup> by Dr Maani, in collaboration with Dr Tim Maloney, used statistics from the HLFS Income Supplement over the period from 1997 to 2002, to analyse the impact of higher education qualifications on earned income.<sup>33</sup> The advantage of using HLFS data over the Census was that it allowed Maani’s previous work to be extended by analysing the relationship between education and income using a variety of measures of income. Whereas the Census allows an analysis of total annual income, the HLFS Income Supplement records total income and earned income and reports these on a weekly basis and an hourly basis. It also records the hours of work.<sup>34</sup> In each of these measures, the authors found a significant percentage gain in income for people attaining higher educational qualifications, confirming previous findings using Census data. An additional advantage of using the HLFS data was that, for people with several educational qualifications, the impact of each of the qualifications on income could be analysed, not just the highest qualification.

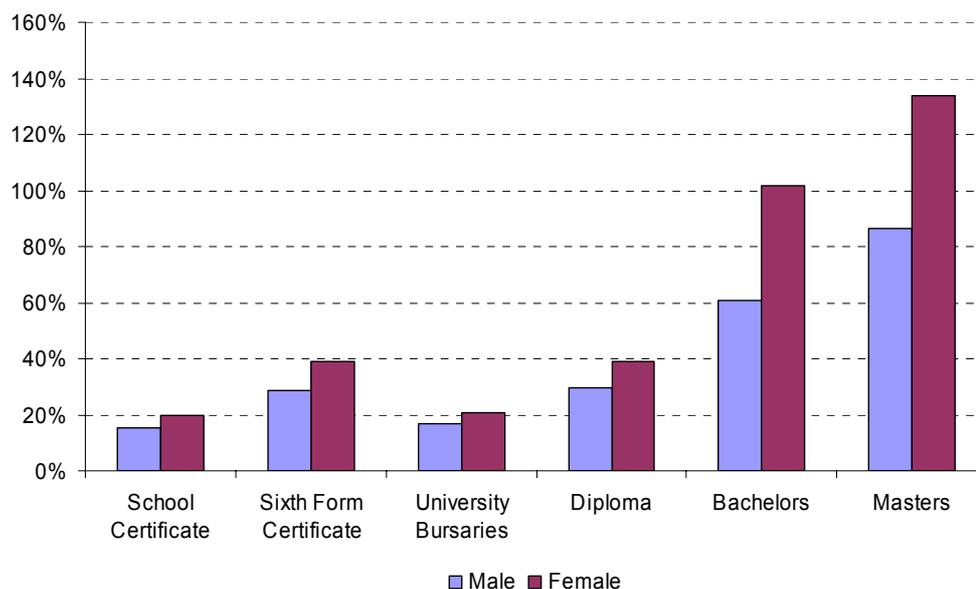
An analysis of the return on weekly earned income from a person’s highest qualification is presented in the following graph.

<sup>32</sup> Maani, S A and T Maloney. (2004) *Returns to post-school qualifications: New Evidence Based on the HLFS Income Supplement (1997-2002)* report to the Labour Market Policy Group, Department of Labour, New Zealand.

<sup>33</sup> The length of time period analysed (six years) is relatively short, and with a turnover rate in the labour market of approximately 2 percent per annum the results need to be treated with a degree of caution.

<sup>34</sup> Using earned income, as opposed to total income, which may include an unearned component, allows for a truer indication of the return on income from a higher qualification.

**Figure 72: Percentage gain in weekly earnings by highest qualification compared with a person with less than School Certificate by gender**



Notes:

1. The dataset comprises people aged 25 to 59.
  2. The analysis uses pooled data for the period between 1997 and 2002.
- Source: Maani S A and T Maloney (2004) *Returns to Post-school Qualifications: New Evidence Based on the HLFS Income Supplement (1997-2002)*, Department of Labour

Figure 72 compares the weekly earned income of people with various qualifications with that for those people without qualifications. For both men and women, the return on earned income for high-level tertiary qualifications was significantly greater than for lower-level tertiary or school qualifications. At each qualification level, the return for women was higher than the return for men. This does not mean that women earn more than men: rather, it implies that higher qualifications have the effect of reducing the disparities that exist between the earnings of men and women. Maani and Maloney’s study found that the mean weekly earnings of men whose highest qualification was a bachelors degree were 1.4 times those of a woman with a bachelors degree as a highest qualification. That compared with a ratio of 1.5 times for those without qualifications.

The greatest gain was for an individual with a masters degree. For men with a masters qualification, the gain in income was 87 percent, compared with men with less than School Certificate. For women the gain was 134 percent. This compared with a diploma-level qualification where the gain for men was 30 percent and the gain for women 39 percent. People whose highest qualification was a year 12 school qualification<sup>35</sup> had a similar gain compared with people who had a diploma as a highest qualification. Compared with other school-level qualifications, the year 12 qualification provided the greatest gain in income for both men and women.<sup>36</sup>

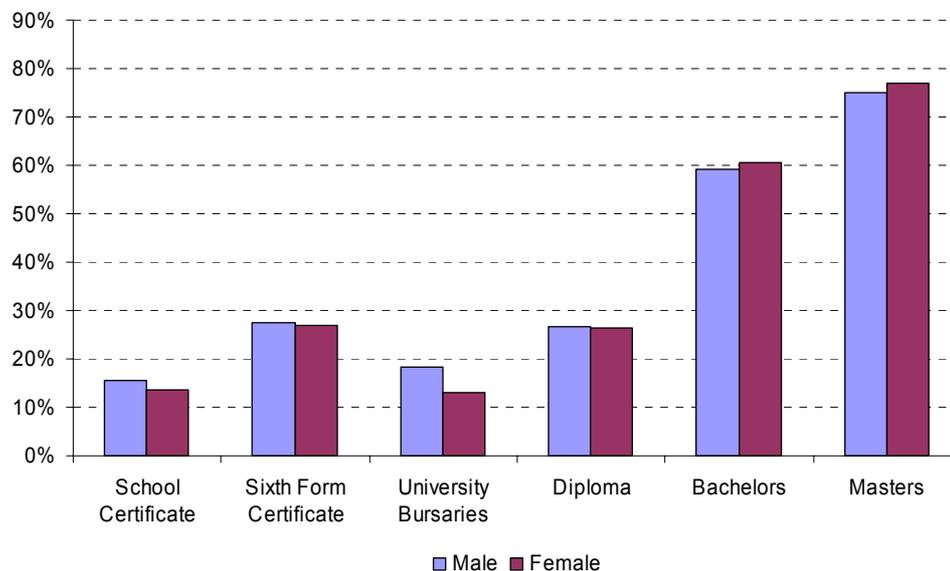
<sup>35</sup> Such as Sixth Form Certificate.

<sup>36</sup> A reason for this result might be that University Bursaries does not provide a ‘sheepskin’ or credentialing effect in its own right. Added to the extra year that a person would be studying, this might well partly explain the higher return of Sixth Form Certificate.

Part of the explanation for the higher percentage gain in income for women compared with men lies in the impact that the number of hours worked per week had on these results. For men, analysis of the impact of higher tertiary qualifications on number of hours worked found no significant relationship. However, for women, higher educational qualifications led to a higher percentage gain in the number of hours worked. For example, women with a bachelors degree worked 26 percent more hours than women with no qualifications. Therefore, the higher returns in weekly earnings were partly due to the fact that women with higher qualifications tended to work more hours.

By analysing the effects of higher qualifications on hourly wages, Maani and Maloney were able to isolate the impact of the number of hours worked from weekly earned income. The results of this analysis showed that the return on hourly wage earnings was similar for men and women, though women still retained a slight edge.<sup>37</sup>

**Figure 73: Percentage gain in hourly wage by highest qualification compared with people with less than School Certificate by gender**



**Notes:**

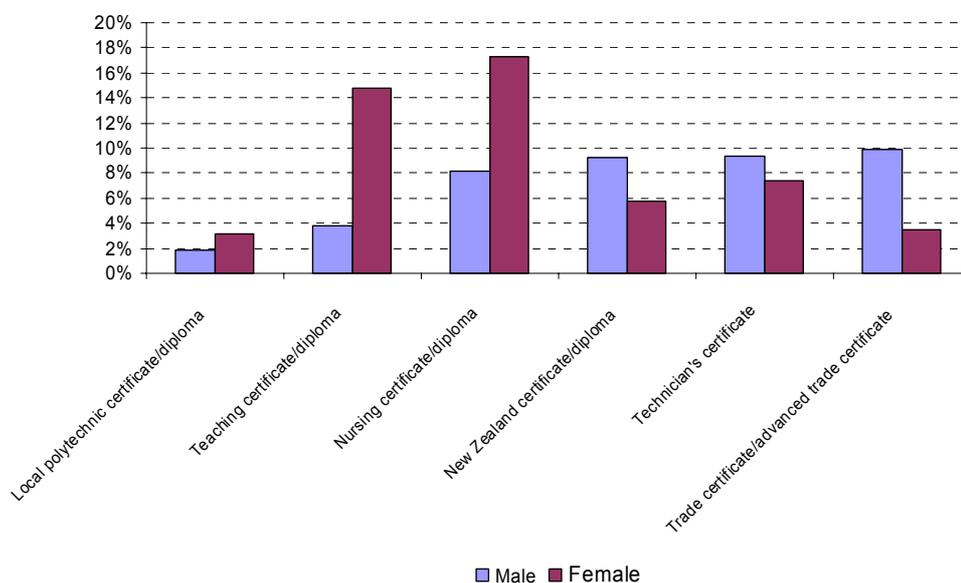
1. The dataset comprises people aged 25 to 59.
  2. The analysis uses pooled data for the period between 1997 and 2002.
- Source: Maani S A and T Maloney (2004) *Returns to Post-school Qualifications: New Evidence Based on the HLFS Income Supplement (1997-2002)*, Department of Labour

Because the HLFS is an interviewer-administered survey with a comprehensive set of questions, the Income Supplement data also allowed an analysis both of the impact different types of qualifications have on income and of how multiple tertiary-level qualifications influence income.<sup>38</sup> The percentage gain in the hourly wage for people with various types of vocational tertiary qualifications, compared with those without post-secondary qualifications, is presented in the following graph.

<sup>37</sup> Remembering that female wages come from a lower base than those for men.

<sup>38</sup> Earlier studies of returns to tertiary education - such as Maani's studies referred to elsewhere in this chapter - used aggregations of categories of qualifications. Because there are so many different types of tertiary qualifications at the sub-degree level, that aggregation may have introduced distortion.

**Figure 74: Percentage gain in hourly wage for people with vocational tertiary qualifications compared with people without post-secondary school qualifications by gender**



**Notes:**

1. The dataset comprises people aged 25 to 59.
2. The analysis uses pooled data for the period between 1997 and 2002.

Source: Maani S A and T Maloney (2004) *Returns to Post-school Qualifications: New Evidence Based on the HLFS Income Supplement (1997-2002)*, Department of Labour

A wide variation in the returns to different types of vocational qualifications was evident, especially for women. Trade certificate qualifications provided the highest percentage gain in hourly wage for men (9.9 percent), and nursing qualifications for women (17 percent).<sup>39</sup> The lowest return for both women and men was from a polytechnic local sub-degree qualification. The percentage gain in that case was 3.1 percent for women and 1.8 percent for men.

With an increasing number of people attaining multiple tertiary qualifications, Maani and Maloney analysed how each of an individual's post-school qualifications impacted on the rate of return, not just the one at the highest level. They found that each qualification did have an impact on the percentage gain in income. One example of this described by Maani and Maloney was the case of men with a teaching qualification combined with bachelors and postgraduate qualifications. A man who had a teaching qualification, bachelors degree and also a postgraduate qualification had a percentage gain in income of 21 percent compared with a man with no post-secondary qualifications. However, men with a bachelors degree along with a postgraduate qualification but no teaching qualification had a percentage gain of 42 percent compared with a man with no post-secondary qualifications.

<sup>39</sup> The percentage gain is compared with an individual without post-school qualifications.

### **Net worth and the level of qualifications**

A recent study by Scobie, Gibson and Le (2005) *Household Wealth in New Zealand*, analysed the impact of a variety of factors on the net worth<sup>40</sup> of New Zealanders. Using a cohort of data from the 2001 New Zealand Savings Survey, the authors found that the number of years of secondary schooling had a small but statistically significant effect on the net worth of individuals, while the number of years of post-secondary education was not a statistically significant factor. However, as the authors noted, this finding is clouded by the fact that those people who stay longer at school tend to go on to tertiary study. Therefore, some of the effect of post-secondary education is captured by the years of schooling. In addition, some New Zealanders will have only a few years of secondary schooling before studying towards certificate-level qualifications at tertiary providers. Therefore, students who spent a greater number of years at secondary school may in fact have a greater level of net worth than this group.

The authors also estimated the value of the human capital for various groups within the dataset by measuring the estimated premium on earnings during the lifetime of an individual. They found that the level of education qualification has a major impact on the level of human capital, with those with higher qualifications having higher levels of human capital. For example, they found that a 30 year old European male university graduate has a level of human capital four times that of a 30 year old male with no qualifications.

### **Comparing the field of study and field of employment of tertiary graduates**

A study by Marē and Liang (2006) matched the field of study of tertiary graduates with their field of employment in 2001. They found that there were certain fields with high levels of 'in-field' employment – tertiary graduates who had studied in a specific field and were employed in the same field. Fields of study with a high relative degree of specialisation included 'beauty service and hairdressing', 'medicine', 'nursing', and 'teacher education'. Fields of study with low degrees of specialisation included 'business and management', 'office studies', and 'sales and marketing'.

The authors then analysed how being employed 'in-field' impacted on the incomes of tertiary graduates. For tertiary graduates aged between 18 and 65, the median income of those employed 'in-field' was 11 percent higher than those employed 'out-of-field'. The premium for those graduates aged between 18 and 30 was higher at 20 percent, suggesting that as graduates get older the premium for working 'in-field' falls.

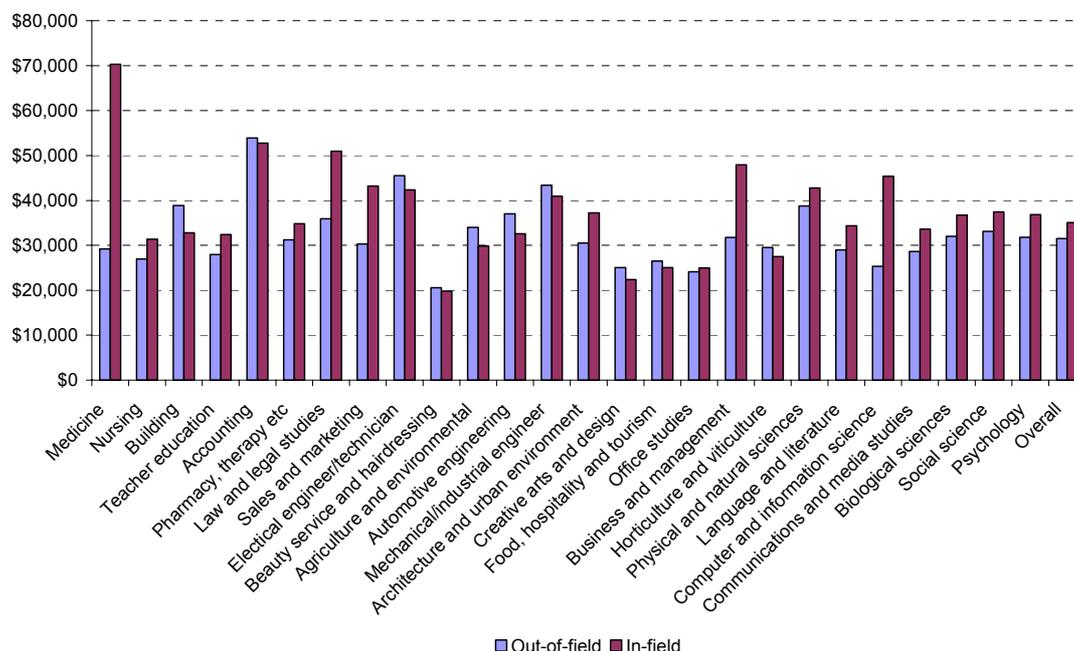
However, Marē and Liang found considerable variation exists in the premium for working 'in-field' across fields of study. For those aged 18 to 65, 16 out of 26 fields of study had a higher median income for those that were employed 'in-field' than those employed 'out-of-field'. Fields of study that showed significant positive returns to working 'in-field' were 'medicine' with a premium of 141 percent, 'computer and information science' (79 percent) and 'business and management' (51 percent). This compares with fields of study such as 'building' and 'automotive engineering' that

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<sup>40</sup> Net worth is measured as the difference between the assets of New Zealanders and their liabilities.

displayed negative returns from working ‘in-field’ of 16 percent and 12 percent respectively.

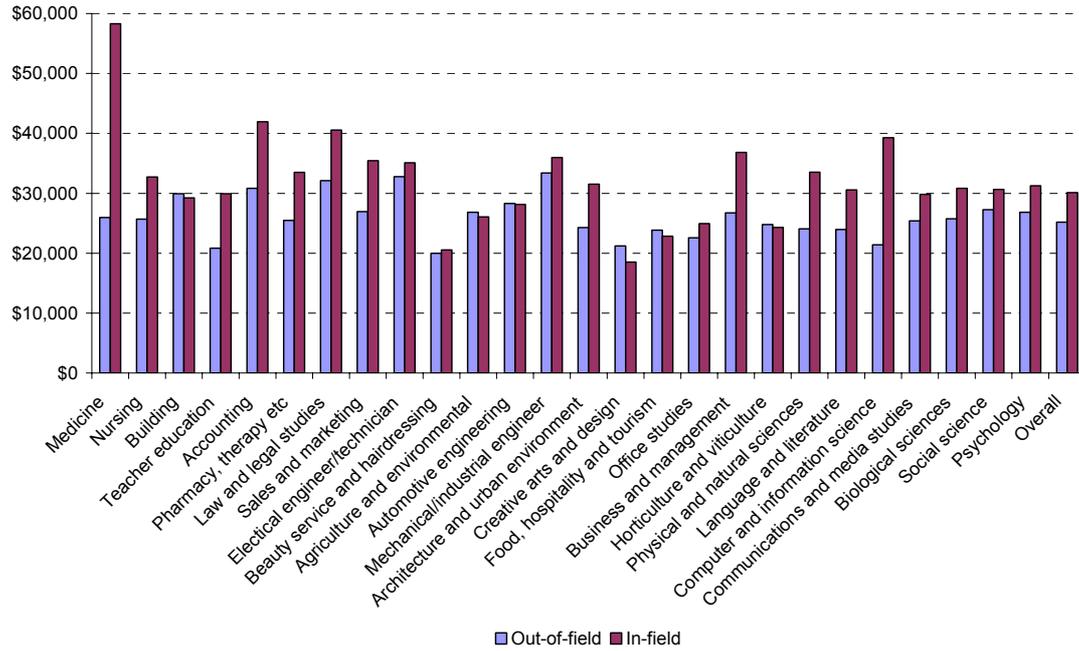
**Figure 75: Median income of tertiary graduates aged 18 to 65 by in-field and out-of-field employment status and field of study 2001**



Source: Marē, D and Y Liang (2006) *Labour Market Outcomes for Young Graduates*, Department of Labour

For graduates aged between 18 and 30, 20 out of 26 fields of study displayed a higher median income for those that were employed ‘in-field’ than those that were employed ‘out-of-field’. ‘Medicine’ and ‘computer and information science’ once again displayed strong positive returns to working ‘in-field’ of 125 percent and 84 percent respectively. Of fields of study that had negative returns from working ‘in-field’, ‘creative arts’ was the most significant with a median income 13 percent lower for those that were employed ‘in-field’ than those employed ‘out-of-field’.

**Figure 76: Median income of tertiary graduates aged 18 to 30 by in-field and out-of-field employment status and field of study 2001**



Source: Marē, D and Y Liang (2006) *Labour Market Outcomes for Young Graduates*, Department of Labour

## **6 Unemployment, income and level of qualifications**

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Previous sections have looked separately at the relationship between higher qualifications and the effect they have on income and unemployment. In this section, the unemployment rates and median weekly income of the working-age population are compared across various qualification levels. By doing so, the degree to which the gains to achieving higher qualifications come in the form of greater chances of employment or higher income can be analysed.

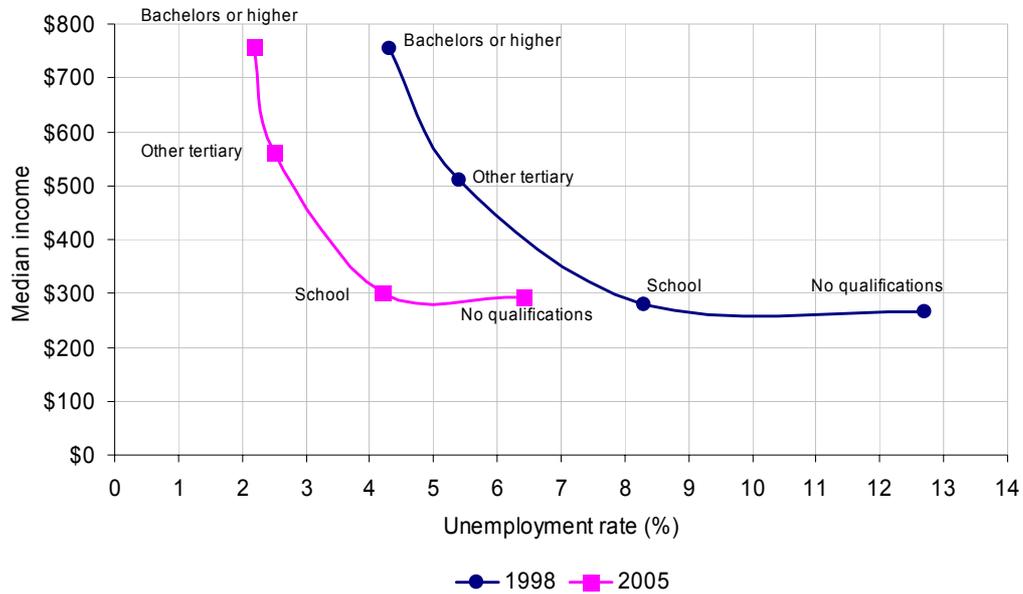
Figure 77 combines data from the HLFS and NZIS to compare the unemployment rate and median weekly income of the population aged 15 and over by highest qualification. It shows that in 2005, for people with no or low qualifications, the main gains from upskilling come in lower rates of unemployment rather than significantly higher median incomes.

In 2005, the median weekly income of a person with school qualifications (\$301) was 1.03 times higher than that of a person with no qualifications (\$293). However, the unemployment rate of a person with no qualifications (6.4 percent) was 1.5 times higher than that of a person with school qualifications (4.2 percent).

For people with higher qualifications, the main gains from upskilling would appear to come in the form of higher median weekly income rather than a significantly lower unemployment rate. In 2004, the median weekly income of people with a bachelors or higher qualification (\$756) was 1.4 times higher than that of people with 'other tertiary' qualifications (\$560). This compares with the unemployment rate of people with 'other tertiary' qualifications (2.5 percent), which is 1.1 times higher than that of people with bachelors or higher qualifications (2.1 percent).

Data for the 1998 year is also provided, with the median weekly income being adjusted for inflation and presented in 2005 dollars. It shows a similar relationship to the 2005 data, but the significantly higher unemployment rates reflect the recession phase of the economic cycle that the New Zealand economy was experiencing at the time.

**Figure 77: Unemployment rates and real median weekly income for the population aged 15 and over by highest qualification 1998 and 2005**



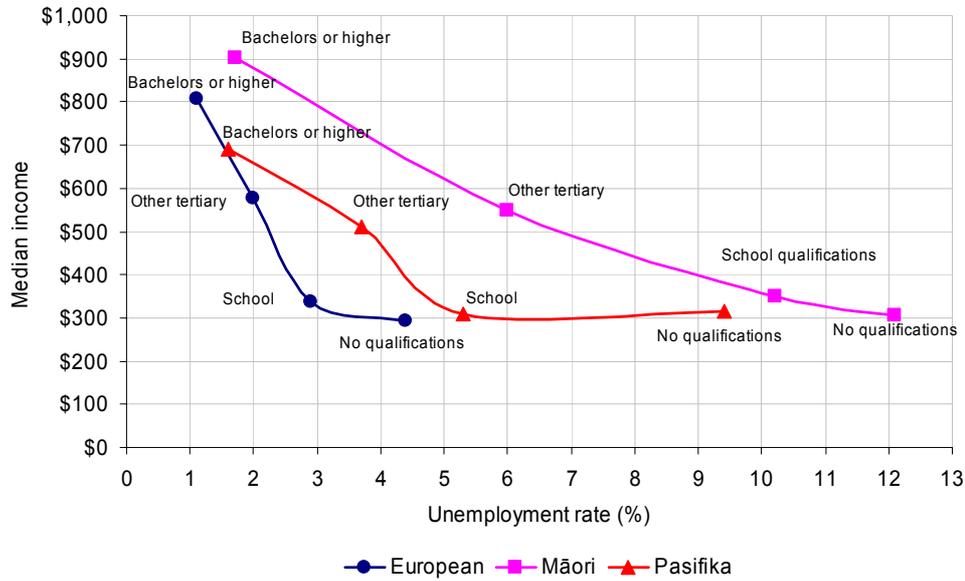
Notes:

1. Refer to technical notes 2, 3, 4, 5 and 6.
2. Median income is expressed in 2005 dollars.

Source: Statistics New Zealand, *New Zealand Income Survey* and *Household Labour Force Survey*

Figure 78 shows the unemployment rates and median weekly income of ethnic groups by level of qualification in 2005. It shows that for Māori there are gains in both a reduction in unemployment rate and an increase in median weekly income from higher qualifications. For Europeans, the gains in tertiary qualifications mainly come in the form of higher median weekly incomes, with a modest decline in unemployment rate.

**Figure 78: Unemployment rates and median weekly income for the population aged 15 and over by highest qualification and ethnic group 2005**



Note: Refer to technical notes 2, 3, 4, 5 and 6.

Source: Statistics New Zealand, *New Zealand Income Survey and Household Labour Force Survey*

## 7 Education and economic growth<sup>41</sup>

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Higher education plays an important role in contributing to the economic growth of New Zealand, through the increase in human capital that results from the education process. In addition to the gains that accrue to the individual from attaining higher levels of education, there are economic and social benefits to a community from having a tertiary education provider located in their region. TEOs can be substantial employers of staff and their presence has a significant impact on the region in which they are located. The wages paid to tertiary education staff and the flow-on effects that result can make a major contribution to the economic activity of a region, especially in provincial areas.<sup>42</sup>

International students are a major source of export earnings for New Zealand. The strong growth experienced in international student numbers over the last five years has increased the importance of this source of foreign exchange.<sup>43</sup> Education New Zealand estimated<sup>44</sup> that international students studying in the tertiary education sector earned New Zealand \$1.4 billion in 2004 (this includes spending on fees and living costs).<sup>45</sup> This compares with spending of \$0.2 billion in 1997.

Internationally, a number of studies have focused on the impact of education on the economy. One such study by the OECD<sup>46</sup> has investigated the role of human capital in driving economic growth. Their study focused on the period 1990 to 2000 and found that increases in labour productivity accounted for at least half the growth in per capita GDP in most OECD countries during that period. The study also found that improvements in human capital, as measured by the average number of years spent in formal education, partly explained the increases in labour productivity in a majority of OECD countries. The OECD data shows that countries who give individuals one more year of education will boost productivity and economic output by between 3 percent and 5 percent over time (Schleichler, 2006).

Recent research suggests that literacy rates appear to be a better predictor of economic performance than measures such as 'years of participation in formal education'. A study by Statistics Canada and Ottawa University economists<sup>47</sup> used literacy scores from the 1994 International Literacy Survey to estimate the human capital of the population of 14 countries over a time period from 1960 to 1995. The results of their

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<sup>41</sup> This section was previously published in Ministry of Education (2005a) *Profile and Trends: New Zealand's Tertiary Education Sector 2004*, p 174.

<sup>42</sup> For an example of a study that analyses the gains to a local economy from the presence of a tertiary provider, see Walton, M (2006) *The University of Auckland: Economic Contribution to the Auckland Region*. Examples of other similar studies can be found in Ministry of Education (2004) *Profile and Trends: New Zealand's Tertiary Education Sector 2003* and Ministry of Education (2005a) *Profile and Trends, New Zealand's Tertiary Education Sector 2004*.

<sup>43</sup> There is evidence that the numbers of international students studying at the tertiary level in New Zealand may be starting to fall, especially among those from China.

<sup>44</sup> Education New Zealand (2005) [www.educationnz.org.nz/facts\\_stats/key\\_facts.html](http://www.educationnz.org.nz/facts_stats/key_facts.html).

<sup>45</sup> The actual impact would be even larger, as this figure does not include any flow-on effects, nor the impact of families visiting students in New Zealand.

<sup>46</sup> OECD (2003) *The Sources of Economic Growth in OECD Countries*, OECD, Paris.

<sup>47</sup> Couloumbe, S, J-F Tremblay and S Marchand (2004) *Literacy Scores, Human Capital and Growth Across 14 OECD Countries*, Statistics Canada and Human Resources and Skills Development Canada, Ottawa.

analysis showed that a country able to increase its literacy scores by 1 percent relative to the international average will achieve a 2.5 percent relative rise in labour productivity and a 1.5 percent rise in per capita GDP. The three countries with the fastest growth in literacy levels between the oldest and the youngest generations had the fastest growth in output per worker, whereas, in the three countries in which literacy levels grew the slowest - of which New Zealand was one - growth was slower.

## 8 The impact of education on health, living standards and crime

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Many studies have been conducted into the link between education and factors such as health, living standards and crime. However, because there are so many potentially confounding factors, there is less certainty about the impact of education in these areas. Also, the studies tend not to isolate the impact of tertiary education, rather focusing on attendance in the education system in total. Nevertheless, research generally shows that more education is associated with better health and crime outcomes, as well as higher living standards. A summary of the findings of analysis into these areas are presented below.

### Health<sup>48</sup>

In *Education at a Glance 2005*, the OECD reported that there are three key routes through which higher levels of education can affect people's health.<sup>49</sup> Firstly, those with higher levels of education generally have lower levels of unemployment and therefore avoid some of the physical and mental health issues associated with this state. In addition, the higher incomes associated with higher levels of education can result in better access to health care and avoid stresses involved with financial insecurity.

Secondly, individuals with higher levels of education can make better-informed decisions about their health care. In addition, the OECD mentions that research has found positive associations between higher levels of education and health behaviours such as lower smoking participation and lower incidences of excessive alcohol consumption.

Finally, the level of education can impact on the way in which people deal with the situations faced as part of daily living. Higher education can improve problem-solving skills and self-esteem, which can help people respond to situations of adversity.

However, the OECD acknowledges that the relationship between education levels and health is a complex one, and a positive relationship between higher education and better health does not hold across all countries.

A study by Wirt, Choy, Rooney, Provasnik, Sen and Tobin (2004) found a positive relationship between the level of education and the health of individuals in the United States. This analysis used responses from the National Health Interview Survey in 2001 to identify how factors such as income, age, poverty status and education level are related to health.

The survey found that even after controlling for factors such as family income, there was still a positive relationship between education level and health. For example, among people in families with the same income band, those with higher educational

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<sup>48</sup> Part of this section was previously published in Ministry of Education (2005a) *Profile and Trends: New Zealand's Tertiary Education Sector 2004*, pp 174-175.

<sup>49</sup> See OECD (2005) *Education at a Glance: OECD Indicators 2005*, OECD, Paris, pp 151-153.

qualifications were more likely to report themselves as being in excellent or very good health.

A number of New Zealand studies (Fergusson, Swain-Campbell and Horwood, 2002; Meich, Caspi, Moffit, Entner Wright and Silva, 1999) have used the Christchurch Health and Development Study and Dunedin Multi-disciplinary Health and Development Study to analyse the impact of education and health. In a review of these and overseas studies, Johnston (2004) concluded that they suggest that greater education leads to better mental and physical health outcomes. However, Johnston points out that the New Zealand studies look at outcomes for the participants between the ages of 18 and 21, and, therefore, there is less certainty that the benefits associated with more education persist as people get older.

The relationship between education and mortality rates has been examined in the New Zealand Census-Mortality Study.<sup>50</sup> This study linked Census data between 1981 and 1996 with mortality records in the three years following each Census. The study produced age and ethnic group standardised mortality rates of the population for each of the Census cohorts. The results showed that people with a highest qualification at the tertiary level had lower mortality rates from all causes than people with a highest qualification at school level or those with no qualifications. Although the standardised mortality rates have fallen in each subsequent Census cohort, the high qualification/low mortality relationship has remained.

Figure 79 shows the age and ethnic group standardised mortality rates for those aged between 25 and 77 by gender for each of the four Census cohorts analysed. Between 1996 and 1999, women with post-school qualifications had a standardised mortality rate of 402 per 100,000 women.<sup>51</sup> This compares with a mortality rate for women with school qualifications of 477 per 100,000 and 567 per 100,000 for women with no qualifications.

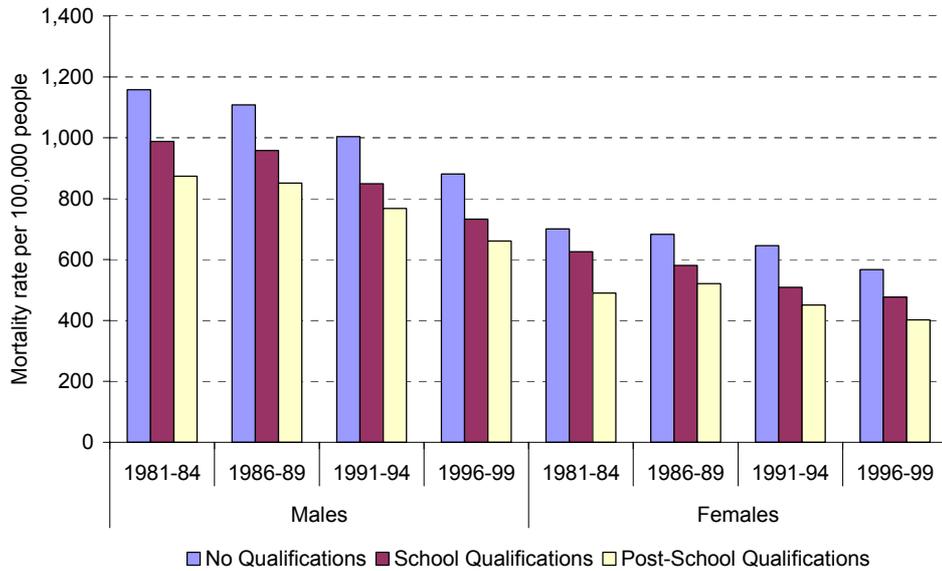
Although men exhibited higher mortality rates than women, the same high qualification/low mortality rate relationship exists. Between 1996 and 1999, men with post-school qualifications had a standardised mortality rate of 874 per 100,000 men. This compares with 988 per 100,000 for men with school qualifications and 1,158 per 100,000 for men with no qualifications.

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<sup>50</sup> See Atkinson, J New Zealand Census-Mortality Study WebTable, Department of Public Health, Wellington School of Medicine and Health Sciences, University of Otago.  
<http://www.otago.ac.nz/NZCMSWebTable>. [Accessed 10 June 2006]

<sup>51</sup> Although these standardised mortality rates are reported here as point estimates, there are confidence intervals that apply. The confidence intervals are included in the web tables that accompany this report.

**Figure 79: Standardised mortality rates (from all causes) of the New Zealand population aged 25 to 77 by gender and Census cohort 1981-1984 to 1996-1999**



Note: These mortality rates have been standardised by age group and ethnic group.  
 Source: Atkinson, J New Zealand Census-Mortality Study WebTable, Department of Public Health, Wellington School of Medicine and Health Sciences, University of Otago.  
<http://www.otago.ac.nz/NZCMSWebTable>. [Accessed 10 June 2006]

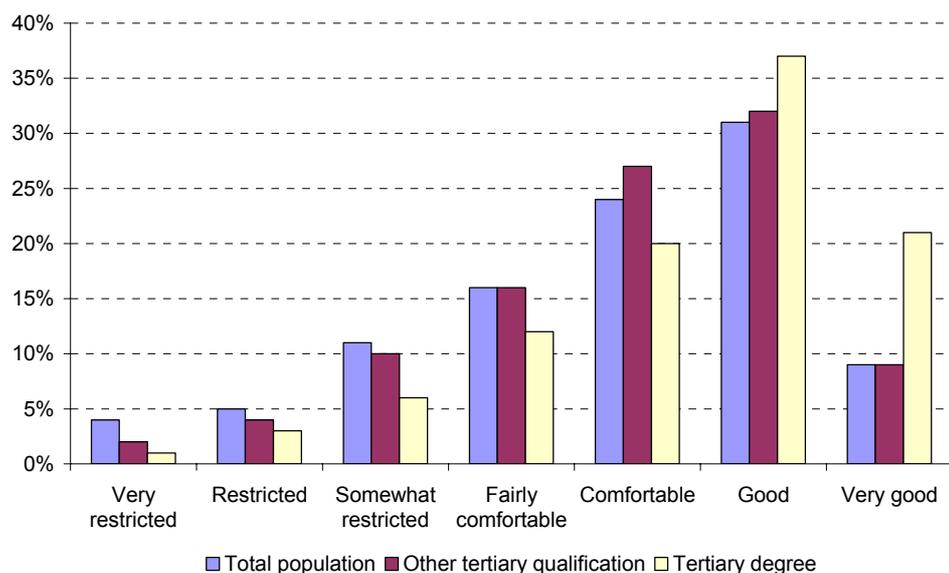
### Living standards

A report released by the Ministry of Social Development (MSD) in 2002, *Living Standards 2000*, developed a new social measurement tool, the Economic Living Standards Index (ELSI), to consolidate large amounts of information about different aspects of economic wellbeing into a single score.

The ELSI scale comprises seven bands which describe the living standards of the New Zealand population from ‘very restricted’ to ‘very good’. The following graph shows the percentage of all New Zealanders in each of these seven bands compared with the percentage for those with tertiary qualifications.

Analysis of the effects of education on the ELSI index clearly shows how increased education has a positive effect on living standards. Overall, 20 percent of the total population fell into the bottom three categories of ‘very restricted’, ‘restricted’ or ‘somewhat restricted’, compared with only 10 percent of those with tertiary degrees. Whilst 58 percent of those with tertiary degrees fell into the top two categories of ‘good’ or ‘very good’, only 40 percent of the total population were in those categories.

**Figure 80: Living standards of New Zealanders 2000**



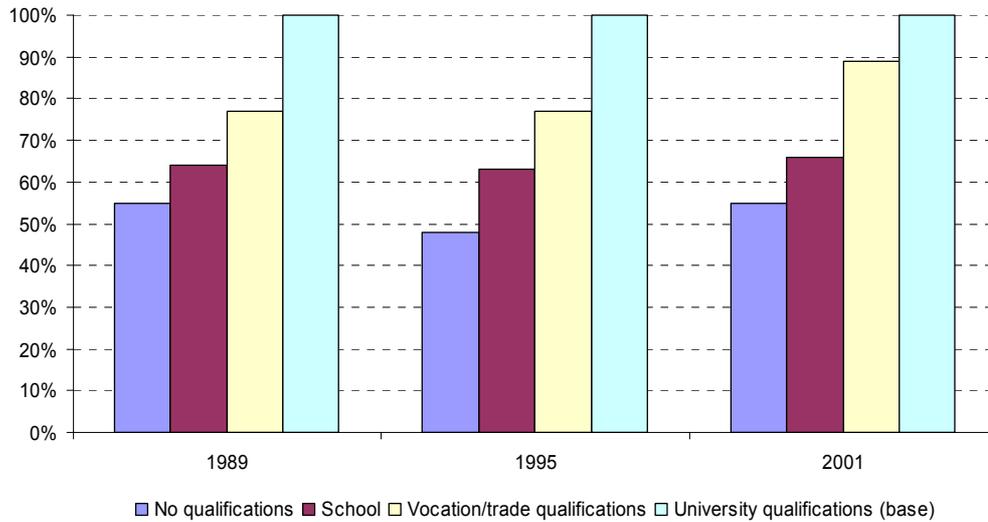
Source: Ministry of Social Development (2002) *Living Standards 2000*

A more recent study by MSD, *Trends in economic wellbeing: changing patterns in New Zealand 1989 to 2001*, analysed the impact of education qualifications on the living standards of New Zealand economic family units (EFUs) between 1989 and 2001.<sup>52</sup> This study used data from Statistics New Zealand’s Household Economic Survey to calculate an estimate of the median disposable income of the EFU, adjusted by an equivalence scale for factors such as the number of children. This measure was used as a proxy for the living standards of New Zealanders.

Figure 81 shows the relative living standards of EFUs by level of educational qualification. The base category is an EFU where the principal income earner has a university qualification - it is set at 100 percent. The analysis showed that the only group to register an increase in relativity with the base group during the period were those with a vocational or trade qualification. The living standard increased from 77 percent of those with a university-level qualification in 1989 to 89 percent in 2001. The authors identified an increase in the demand for the skills of those individuals as a possible reason for the increase in relativity. The other groupings, those with a principal income earner with no qualifications or school qualifications, remained relatively static compared with the base category.

<sup>52</sup> The EFU is defined in the study as a person who is financially independent, or a group of people who usually reside together and are financially interdependent.

**Figure 81: Relativities of real median equivalised disposable incomes between different educational qualifications 1989, 1995 and 2001**



Source: Krishnan, V and J Jenson (2005), *Trends in Economic Wellbeing: Changing Patterns in New Zealand 1989 to 2001*

## Crime

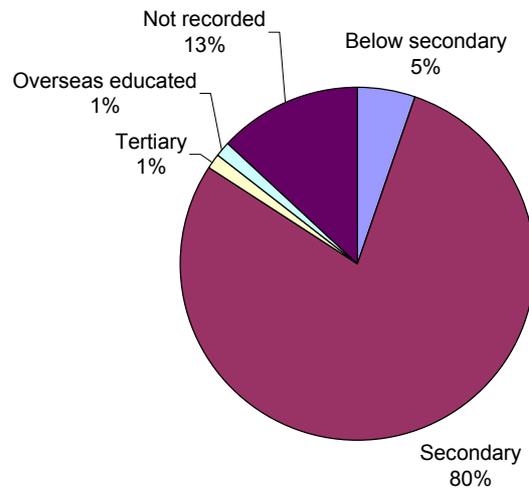
The link between education and crime is complex, with many confounding factors contributing to the likelihood of someone committing crime, some of which may have been set in place before the individual comes into contact with the education system.

Johnston (2004) reviewed New Zealand studies (Fergusson, Swain-Cambell and Horwood, 2002; Henry, Caspi, Moffit, Harrington and Silva, 1999) and overseas studies on the link between education and crime. Although the findings of the New Zealand studies were mixed (Fergusson et al found education had no effect, while Henry et al found that more education led to a lesser chance of juvenile crime for men), Johnston concluded that there would appear to be an association between more education and lower crime, but the effect may be relatively modest.

The latest census on the prison population in New Zealand shows few inmates have attended tertiary-level study. In 2003, just 1 percent of prison inmates had attended tertiary education (see Figure 82).<sup>53</sup>

<sup>53</sup> In fact, 73 percent of the inmate population had only attended up to year 11.

**Figure 82: Level of educational attendance of prison inmates 2003**



Source: Department of Corrections (2006) *Census of Prison Inmates and Home Detainees 2003*

## **9 Conclusion**

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A major investment is made in funding the operations of the New Zealand tertiary education system by the government and students alike. The evidence presented in this report shows that there are significant and positive outcomes from this investment, for the individual student, for the New Zealand economy and for New Zealand society as a whole.

At the individual level, the evidence shows that despite a significant increase in the supply of tertiary graduates in the last 15 years, the positive returns to the individual from tertiary education remain. New Zealanders with a tertiary qualification have a lower chance of being unemployed than those without. Also, New Zealanders who have tertiary qualifications earn higher incomes than those who do not.

At the national level, the evidence shows that there are gains to the wider economy from the tertiary education system. Many regional economies are boosted by the operational expenditure associated with tertiary providers. The spending by international students attending New Zealand tertiary education providers also earns significant foreign exchange for the country. In addition, international studies suggest that higher levels of education enhance labour productivity, and through this improve the economic growth of an economy.

There is also a substantial weight of evidence that suggests that obtaining higher levels of education is associated with better health, a better lifestyle, and a lesser likelihood of committing crime.

Taken as a whole, the outcomes presented in this report illustrate the importance and relevance of the tertiary education system in enhancing the lifestyle of New Zealanders and in helping to achieve national goals. As such, continued monitoring and improvement of the tertiary system are vital to ensure that these positive outcomes are maintained over time.

## **Technical notes**

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1. Students have been counted in each type of qualification that they completed; hence the sum may not add to the total number of students.
2. 'Bachelors or higher' qualifications include postgraduate degrees, certificates or diplomas.
3. 'Other tertiary' qualifications include university certificates or diplomas, teaching certificates or diplomas, nursing certificates or diplomas, New Zealand certificates or diplomas, technician's certificates, local polytechnic certificates or diplomas, and trade certificates or advanced trade certificates.
4. 'School' qualifications include year 11, 12 and 13 qualifications and overseas school qualifications.
5. Data is for the June quarter.
6. Median weekly income excludes investment income.
7. The sampling methodology used by Statistics New Zealand in collecting the data for the HLFS and NZIS can result in the figures for the smaller ethnic groups (Māori and Pasifika) being less stable than for larger groups (Europeans) due to larger sampling error. A similar situation applies to smaller age groups such as those with a tertiary qualification aged 65 and over. Caution therefore should be exercised in interpreting changes in the data for these smaller groups over time.

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