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Making sense of the numbers

Education awa – Ngāi Tahu

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Flow down the river

In New Zealand, from the age of six years old, tamariki start their journey at the head of the education awa. The awa has many turns and falls as flows to the moana. The moana is vast and diverse, and the contributing awa flow from many different valleys.

The New Zealand education awa has been designed to keep the flow moving; progressing students through the prescribed channel. For tamariki that hit hard rocks along the way, and separate from the main flow to the moana, are left behind, needing to carve through rock or swim up-stream to re-join the flow.

Through the primary school system, tamariki flow from year to year until they reach high school, where they are met with carefully crafted canal, with stop banks and flow meters, measuring achievement and directing the flow towards the next stages on the awa. Eventually, this canal should enable tamariki to accomplish high academic achievements. In reality, a straight narrow flow in education is not always practical, and might not equip rangatahi with the opportunities to engage with the labour force and make decisions about their career path. The way the system is established, any missed turns result in limiting opportunities. For students that go down an alternative flow, they are able to reengage with education, though this can be very challenging.

The story of a 100 Ngāi Tahu students

We have condensed the data to be reflected through a 100 Ngāi Tahu students. The first step at high school, NCEA level 1 is not completed by 14 rangatahi, meaning that they leak out of the main flow of the awa. Another 17 leave at the next step, NCEA level 2, with only 42 reaching the end of high school with NCEA level 3.

For students that complete level 3, the next stage of the awa is enrolment in tertiary education. Of the 42 students that leave with NCEA level 3, 35 enrol directly in tertiary education. Some students also make this transition from school a year early, with some students enrolling after completing NCEA level 2.

The tertiary education system has fewer barriers than secondary school, and many students enrol and do not complete their qualification. This is a particularly important issue for apprentices, where half don't complete their apprenticeship.

Overall, just under half of Ngāi Tahu (47 of the school leavers) don't achieve a tertiary qualification by the time they are 25, and of these only 32 are in employment.

Completing a qualification, particularly a level 4 or above, leads to more positive outcomes. Of the 40 students that achieve one of these higher qualifications, only five are not in employment, and many receive high incomes. The one challenge for this group is the rate of underemployment, with many working in retail and hospitality, two of the lowest paying sectors of employment.

While the education system has a number of challenges, there are also flows that result in high levels of success. Having higher qualifications results in higher incomes, while also resulting in higher income equity.

Some apprenticeships can also result in high income while generating an income during study, giving apprentices a financial head-start on their peers.

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Disclaimer

The results in this report are not official statistics. They have been created for research purposes from the Integrated Data Infrastructure (IDI), managed by Statistics New Zealand (Stats NZ).

The opinions, findings, recommendations, and conclusions expressed in this [report, paper etc.] are those of the authors, not Statistics NZ, the Ministry of Education, Inland Revenue or the Ministry of Social Development.

Access to the anonymised data used in this study was provided by Statistics NZ under the security and confidentiality provisions of the Statistics Act 1975. Only people authorised by the Statistics Act 1975 are allowed to see data about a particular person, household, business, or organisation, and the results in this report have been confidentialised to protect these groups from identification and to keep their data safe.

Careful consideration has been given to privacy, security, and confidentiality issues associated with using administrative and survey data in the IDI. Further detail can be found in the Privacy assessment for the Integrated Data Infrastructure available from www.stats.govt.nz.

The results are based on tax data supplied by Inland Revenue to Statistics NZ under the Tax Administration Act 1994. This tax data must be used only for statistical purposes, and no individual information may be published or disclosed in any other form, or provided to Inland Revenue for administrative or regulatory purposes.

Any person who has had access to the unit record data has certified that they have been shown, have read, and have understood section 81 of the Tax Administration Act 1994, which relates to secrecy. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes, and is not related to the data's ability to support Inland Revenue's core operational requirements.

1 The awa of education

Participating in the New Zealand education system is like flowing down an awa to a moana of success. The system is a network of streams, with some parts being crafted into canals. From year 1 to 13, the system has been designed to focus the flow to progress students towards achieving university entrance and then moving to tertiary education.

Like flowing down the awa, while in the main flow the journey is easy, and continuing down the awa eventually lead students to the prescribed destinations. However, what if people divert from the main stem of the awa? Once outside of the traditional flow, the support systems are not there, the route is unclear and there it is very difficult to return to the main flow of the awa.

In New Zealand, with a diverse and ever-changing labour force, not all students are needed to be in the same part of the moana, and having a wide range of skills will always be required. Given this need, the education system needs to be remodelled, acknowledging that there is more than one route to success, and success looks different for different students.

100 school leavers

This report includes data from two cohorts of school leavers. Throughout this report, we refer to the group as 100 representative individuals, each representing one percent of Ngāi Tahu school leavers from their respective cohort.

The first cohort looks at 4,700 rangatahi of Ngāi Tahu that are in year 11 from 2008-2012. The final outcomes include outcomes at age 25 for all school leavers from 2008 to 2010. In total, this group is made up of 2,800 rangatahi Ngāi Tahu until they are 25 years old.

Importance of education in addressing equity

The Ngāi Tahu and Māori populations are both youthful and growing in size. In the coming years, Ngāi Tahu will form an increasing share of the New Zealand labour force.

In 2018, BERL completed a study on the income gap for Māori in New Zealand. Accounting for the significant differences in the age profile of Māori, they found an income gap of \$2.6 billion per year. Perpetuation of this inequality with the growing Māori population will cause this gap to grow significantly. By 2040, this is projected to grow to \$4.3 billion.

This study also considered the differences in employment and education levels for Māori. With low education limiting the ability for Māori to access high-skilled jobs. It is evident that we need to remove the obstacles to achieving higher education, and achieving education that has relevant and quality employment opportunities.

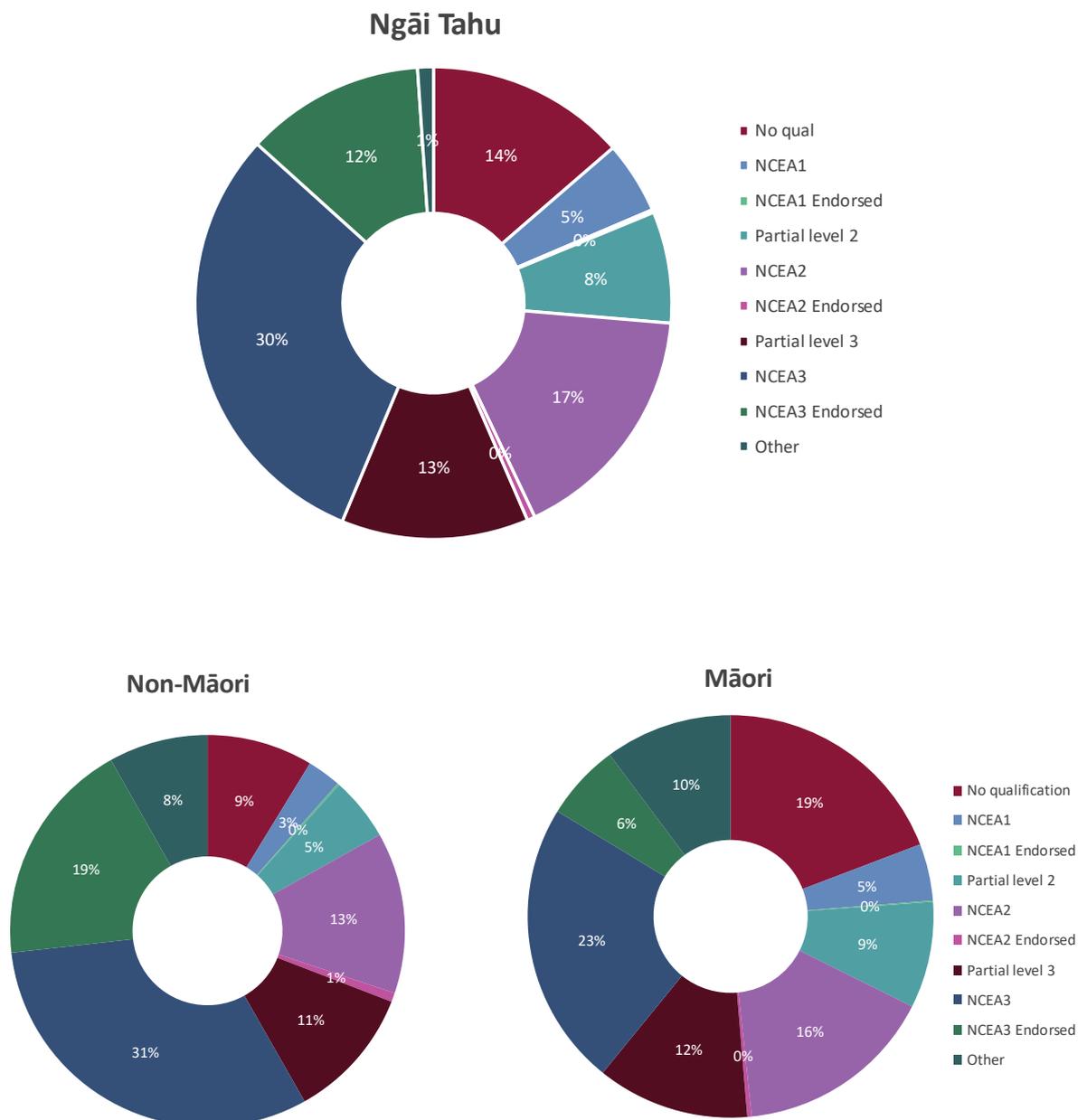
2 Pressure points in the awa

From the 100 Ngāi Tahu school leavers it is evident that a significant proportion does not follow the well-established flow of the awa. There are many challenges throughout the education awa. In this study, we highlight some of these challenges and some opportunities to correct them.

2.1 High school achievement

Figure 1 shows the high school attainment of school leavers for Ngāi Tahu. This is a picture of the start of the crossroads, with the NCEA level 3 being the main flow. Leaving before level 3 can be the result of choosing alternative education directions, or being obstructed by rocks and diverted down a more difficult channel.

Figure 1 Highest qualification of school leavers



Ngāi Tahu have high levels of school achievement, more can be done

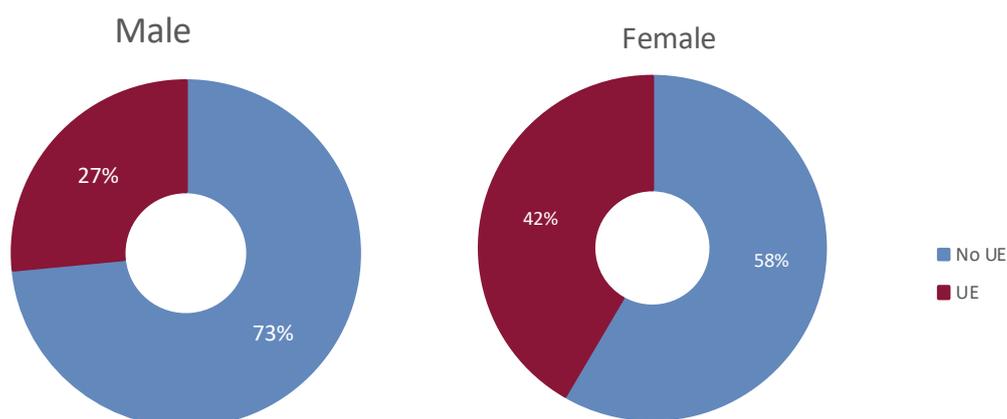
For every 100 Ngāi Tahu school leavers, 14 have no qualifications, this is relatively high compared to the non-Māori but lower than the Māori average of 19 percent. There is still more work to be done at the early stages of the education awa to reach or pass the level for non-Māori of nine percent.

42 Ngāi Tahu school leavers achieve NCEA level 3, including 12 school leavers achieving Merit or Excellence endorsements. This is still lower than the 58 non-Māori school leavers achieving NCEA level 3, but much higher than the total for Māori at 39.

Many characteristics influence an individual’s education decisions: the decisions made can depend on the individual, or based on the subjects or careers that seem most enjoyable or rewarding. The decision to continue in education is closely linked with their level of achievement in previous years.

While high achievement typically results in continued education, lack of achievement can also result in barriers to further education. Achievement at high school can restrict opportunities to participate in subjects at higher levels while not having University Entrance (UE) limits access to universities and degree programmes. Ngāi Tahu have a high UE attainment rate compared with the rate of all Māori in New Zealand; 40 percent of female and 27 percent of male rangatahi of Ngāi Tahu achieve UE.

Figure 2 University Entrance attainment by gender



2.2 Tertiary enrolment

Of the Ngāi Tahu school leave cohort, more than half enrol in some form of education in the year after leaving school, the largest group enrolling with one of New Zealand’s eight universities. A significant proportion also enrol in polytechnics and apprenticeships. A detailed figure showing annual enrolments is presented in Appendix C.

Once in tertiary education, students have the opportunity to change their minds about their study options, through changing subject areas or changing education providers. Often any achievement from one provider will be able to cross-credited to another provider, even if the fields of study are not closely related.

3 End of the awa – completing tertiary education

3.1 Background

Individuals seek higher education for a wide range of reasons. Increasing capability, increased employment opportunities and higher future incomes are common reasons for pursuing tertiary educations. Having higher education levels also benefits the New Zealand economy. This provides the main rationale for the Government to invest significant resources into tertiary education and training.

3.2 Tertiary enrolment

Enrolment in tertiary education is the most common post-school activity for our cohort, though a large proportion also have some form of employment, including as part of their education and training. The education decisions of individuals are also related to their overall employment decisions.

3.3 Tertiary achievement

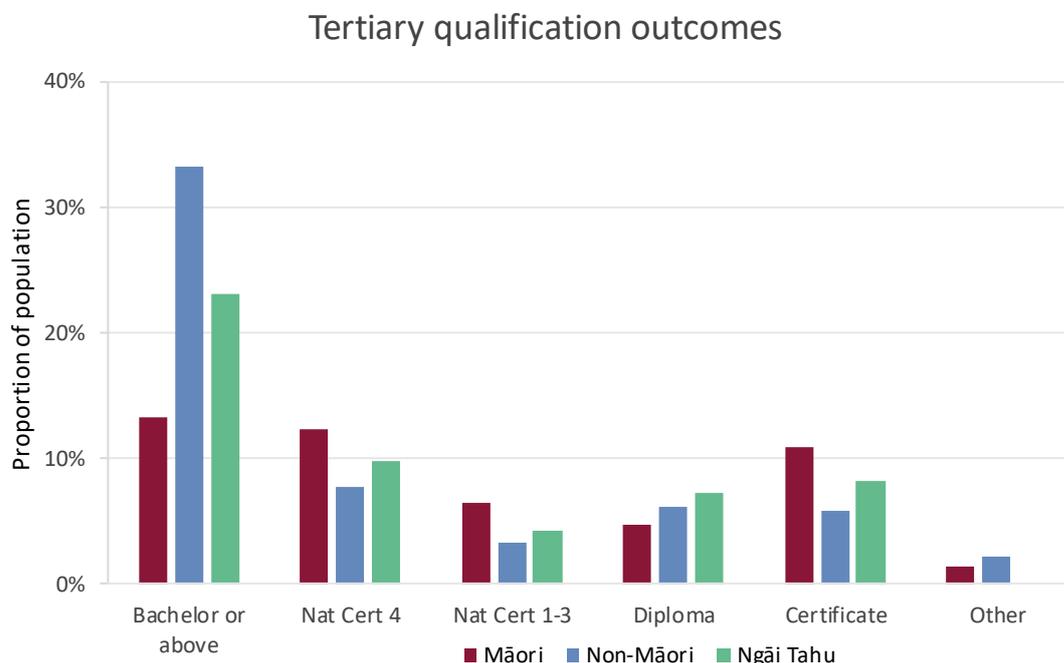
One common measure of student success is the completion of qualifications and/or the progression in to higher levels of study. Qualifications are a signal – they are used by employers to determine what level of skill, experience or knowledge a person may have. They are also used as a signal in terms of salary.

In regulated industries or sectors, a qualification is often a requirement for entry, showing that a person has passed the minimum requirements for registration and may be a suitable candidate for this profession. This practice is common for accountants, lawyers, engineers, medical professionals, builders, and many other areas of employment.

From the 100 Ngāi Tahu school leavers, 53 will achieve a tertiary qualification by age 25. A comparison of Ngāi Tahu with Māori and non-Māori in New Zealand is presented in [Figure 3](#).

Ngāi Tahu school leavers that achieve qualifications typically receive high qualifications; of the 100 school leavers, 23 will achieve a Bachelor's degree. This compares to 33 for non-Māori and 13 for Māori.

Figure 3 Tertiary education outcomes of Ngāi Tahu school leavers, age 25



3.3.1 Apprenticeships, trades training and level 4 qualifications

Apprenticeships are a practical opportunity for individuals to learn on-the-job, while earning an income. With reduced need for any student loans, this can be a financially rewarding flow to the labour force. On average, some existing research shows that apprenticeships have similar lifetime outcomes to degrees. This requires that individuals complete their training. Leaving a trade early, particularly for labouring jobs, can result in a short-term increase in income, but can significantly restrict the potential for income to continue to grow. Increasing this completion rate, through improving support for apprentices to complete their apprenticeship, and perhaps new apprenticeship formats, is essential for improving the skills of the New Zealand labour force while filling shortages in qualified tradespeople.

3.3.2 Tertiary providers and degrees

New Zealand has eight universities as well as a range of polytechnics that provide degrees. On average, the population that receive a degree have the highest average income in this cohort. One of the largest hurdles for individuals to get a degree is achieving UE. The rate of degree completions at universities is very high, and much more comparable between Māori and non-Māori than achieving UE.

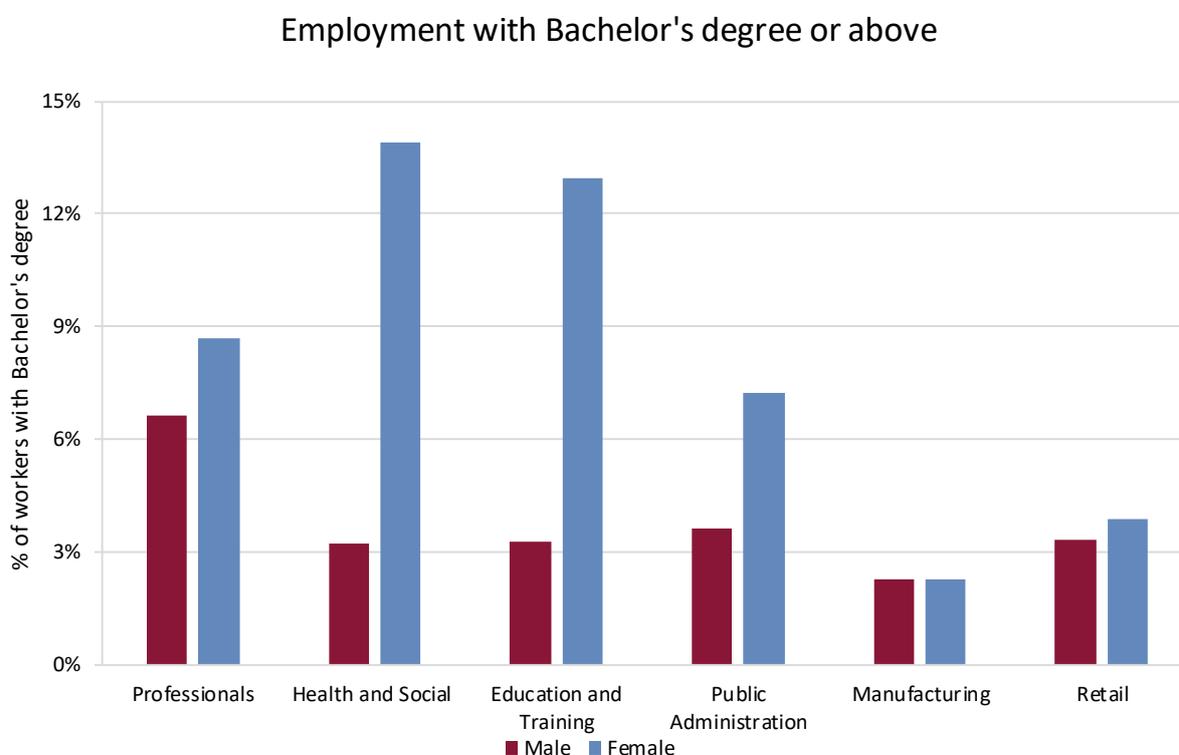
4 Employment and income

The qualifications achieved by Ngāi Tahu students, have flow-on effects on the employment opportunities available. Having a career in the field of completed qualifications is typically associated with higher income levels.

4.1.1 Employment of degree holders

The employment outcomes of Ngāi Tahu graduates with bachelor’s degrees varies significantly between male and female. Male degree graduates are much more likely to become professionals than their female peers, while female degree graduates are much more likely to be employed in health and social services or education. As the number of female graduates in employment is 85 percent larger than male graduates, there are more female professionals than male.

Figure 4 Sector of employment for Ngāi Tahu degree holders, age 25



29 percent of employed Ngāi Tahu graduates with a bachelor’s degree are employed in a sector not shown in the above figure (13 percent Female, 16 percent Male).

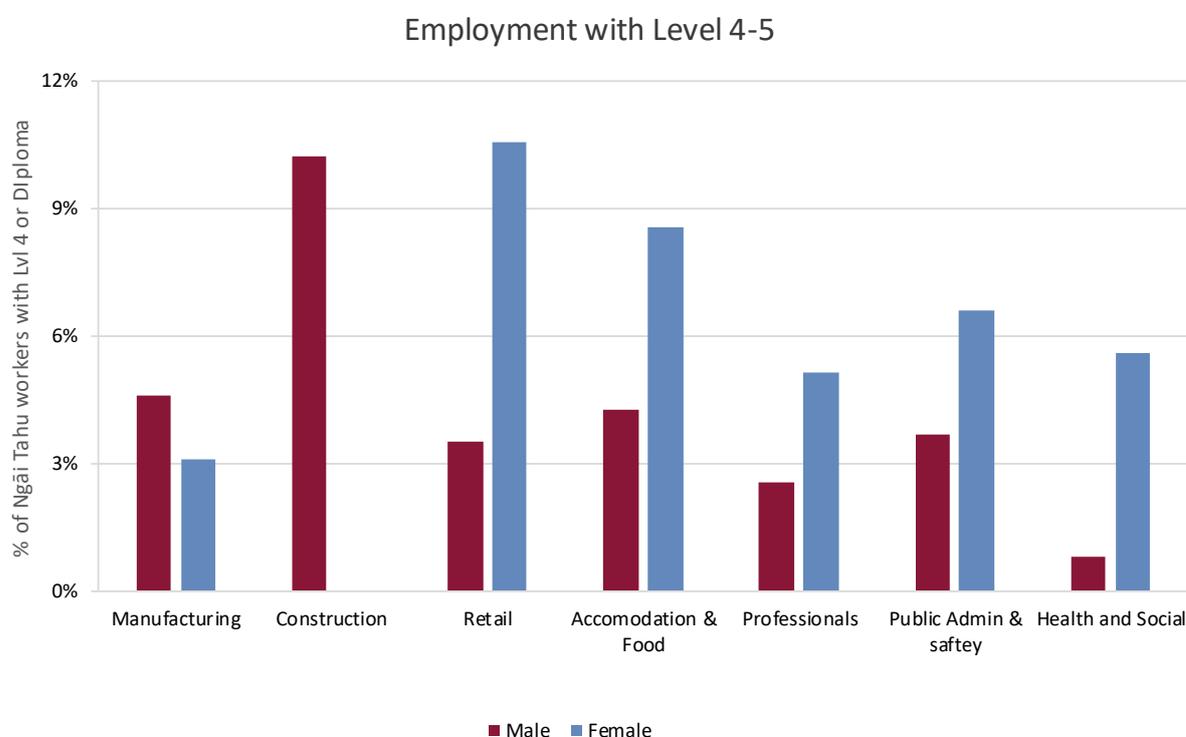
4.2 Employment with National Certificate level 4

While degrees have the highest average annual earnings of the major qualification types, degrees are not the only flows to success. The high debt often required to complete a degree and the years of limited earning ability while studying can result in no different lifetime earning outcomes when compared with apprenticeships.

Employment with a National Certificate level 4 also significantly reduces the differences in the income gaps between Māori and non-Māori as outlined in the national level report.

Construction and manufacturing employ one-in-five of the working population with level 4 qualifications and have comparable income levels for Māori and non-Māori.

Figure 5 Top 7 largest sectors of employment for NC level 4 holders, age 25



11 percent of male and 20 percent of female graduates with a level 4 certificate or diploma work in an industry not shown in [Figure 5](#). Manufacturing and construction are both predominantly male, with all¹ employees with a level 4 certificate or diploma in construction being male.

¹ This does not necessarily mean no females have a level 4 qualification work in construction. For confidentiality, StatsNZ require small numbers to be suppressed.

4.3 Employment with no qualifications

A substantial proportion of Ngāi Tahu rangatahi particularly males have no qualifications. Of Ngāi Tahu rangatahi with no qualifications in employment, 62 percent are male. These individuals are heavily concentrated in the manufacturing and construction sectors. These jobs are often the result of individuals working in labouring rather than completing apprenticeships. This practice can result in higher short-term earnings, but can significantly reduce earnings later in life.

Figure 6 employment with no qualifications, age 25



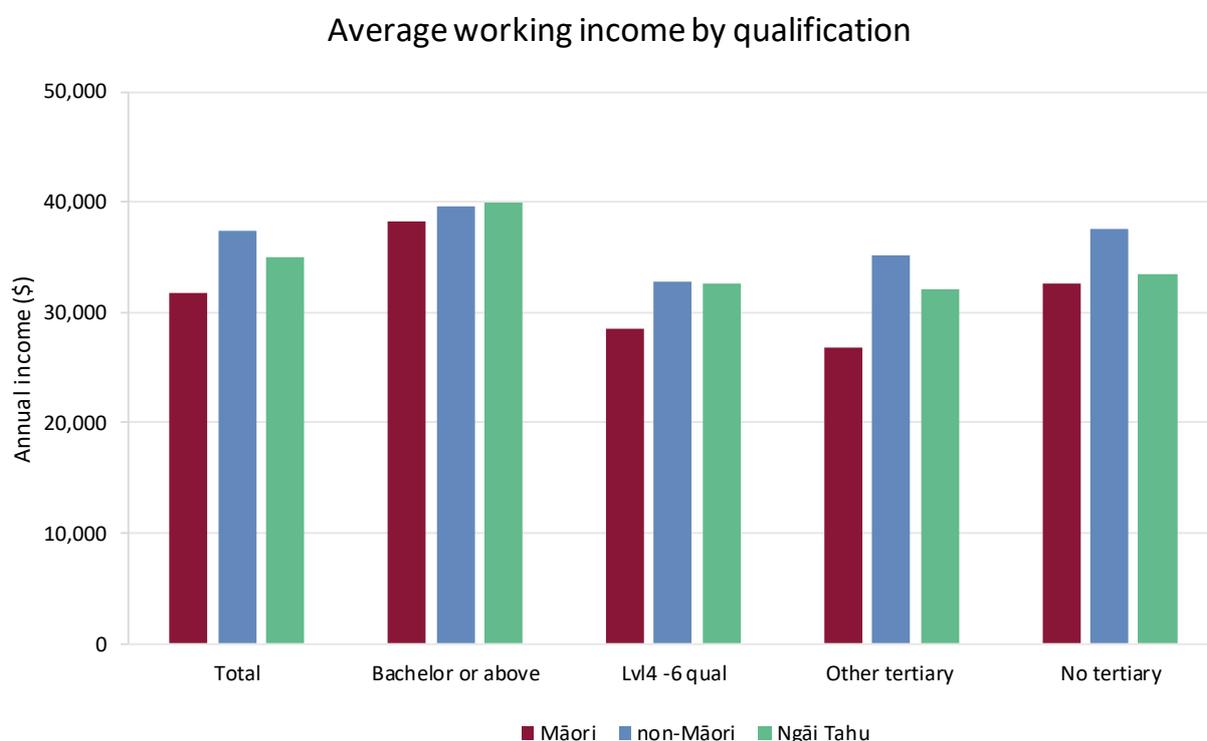
36 percent of rangatahi with no qualifications are in other industries (16 percent male 20 percent female).

4.4 Income outcomes

The end of the education pipeline is the start of an individual’s career. After starting a career, some individuals retrain, upskill and change occupations, though for many this will be the platform that they build their career on.

Having higher qualifications is on average associated with higher income. Seven years after leaving high school, the income of individuals that have achieved a degree are higher than for individuals that have any other qualification or no qualification. Achieving a degree also results in a significant decrease in the income gap between Māori and non-Māori as shown in [Figure 7](#). For Ngāi Tahu rangatahi, the income outcomes are comparable to non-Māori for equivalent qualification levels.

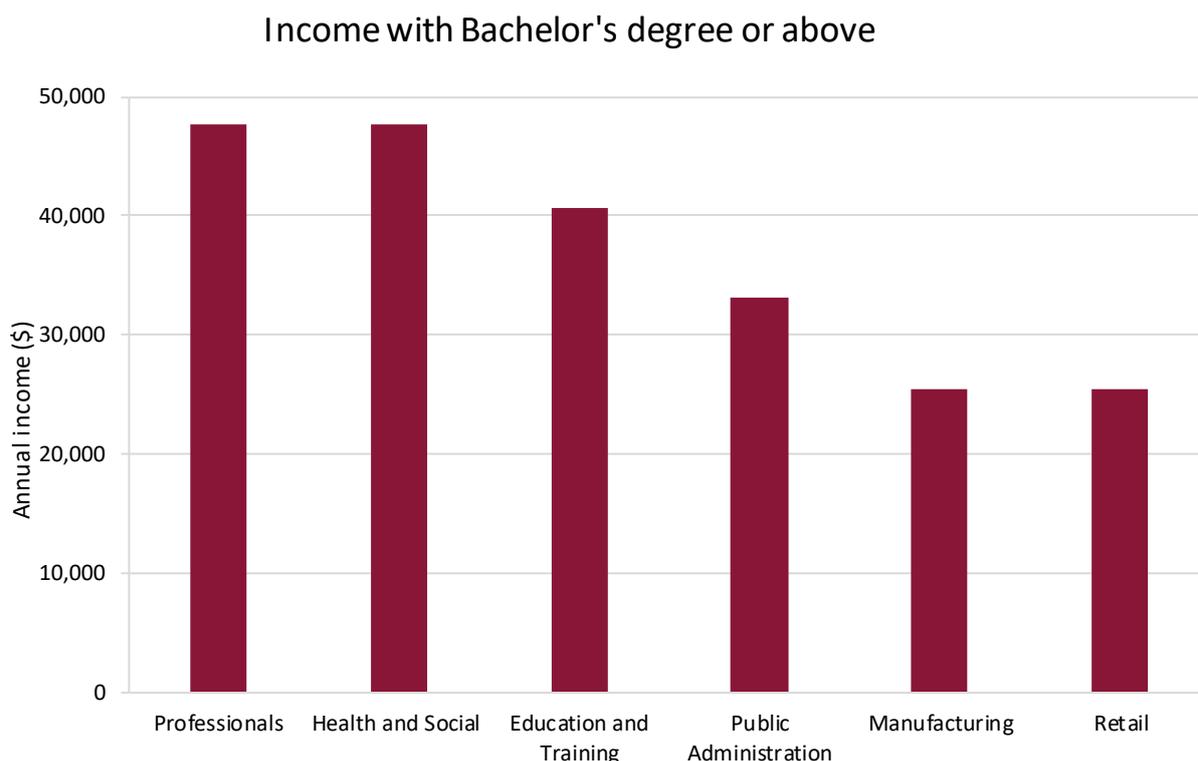
Figure 7 Average working income by income, age 25



4.5 Income with qualifications

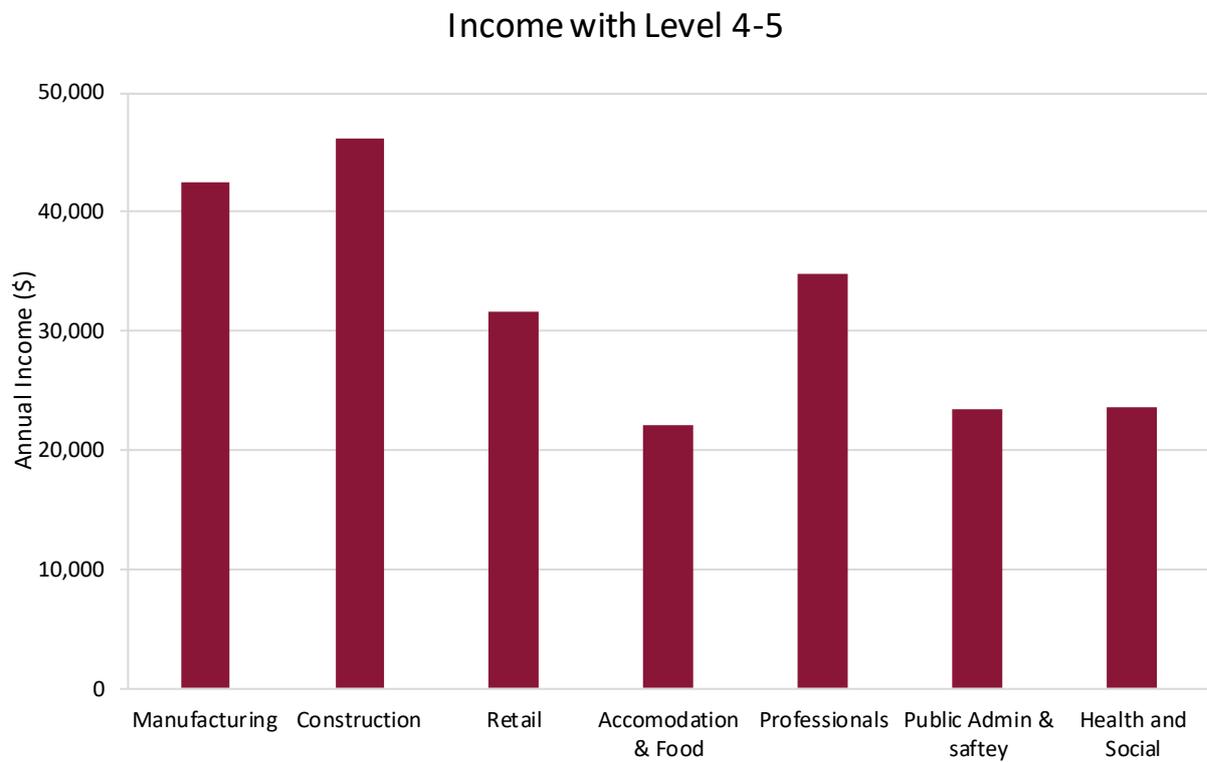
Achieving qualifications and then obtaining a job in a related field results in positive earning opportunities. Students that achieve a bachelor’s degree and are employed as professionals or in the health sector earn almost double than their counterparts in the retail industry as seen in [Figure 8](#). In the retail industry the average Ngāi Tahu earnings are only \$25,000 per year.

Figure 8 Income of Ngāi Tahu with a Bachelor’s degree or higher by industry, age 25



The income levels with a National Certificate level 4 or 5 is also dependent on the industry of employment after completing qualifications. The manufacturing and construction industries, both of which have a high concentration of level 4 qualifications, have substantially higher income levels than individuals working in the tourism or retail related industries, as seen in [Figure 9](#). On average individuals in the manufacturing and construction sectors earn more than \$40,000 per year, compared with just over \$20,000 for individuals in the accomodation and food sector.

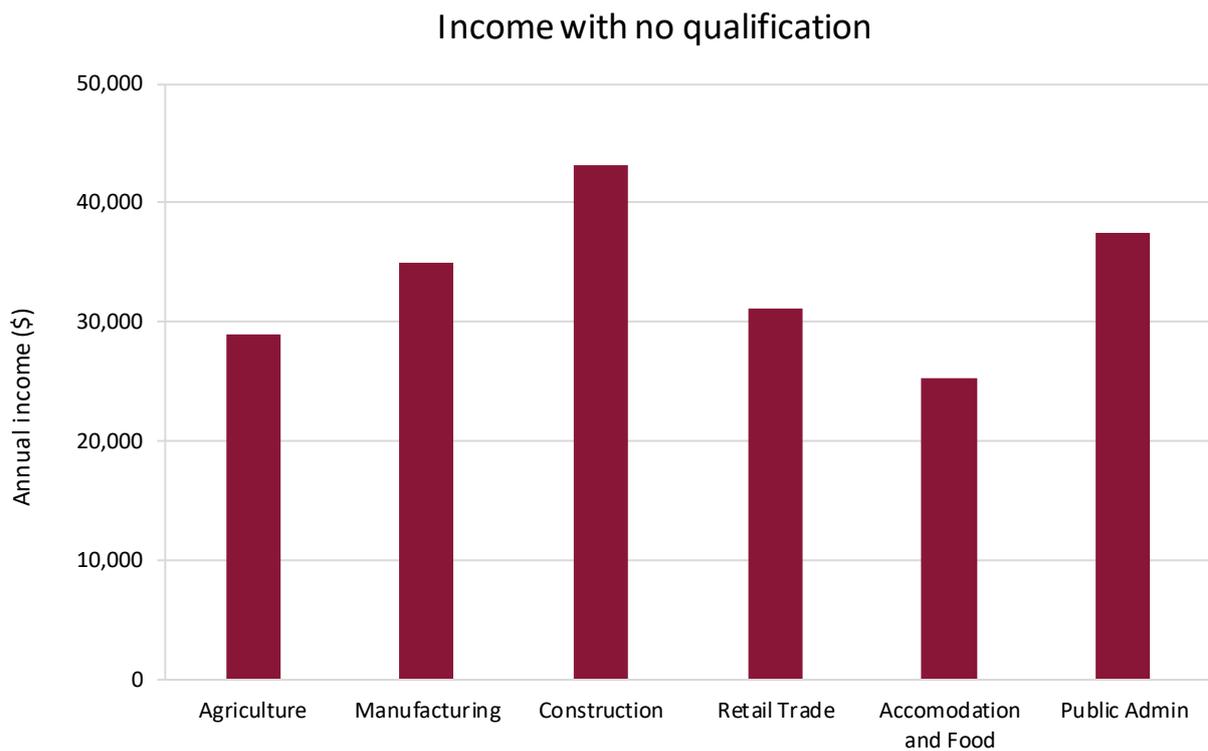
Figure 9 Income of Ngāi Tahu with a level 4-5 qualification by industry, age 25



4.6 Income with no qualifications

Having no qualifications can result in relatively high short-term incomes, particularly in the construction sector. However, moving these individuals into higher-skill roles in this sector often requires additional qualifications such as completing an apprenticeship. Similarly, in the manufacturing and agriculture sectors, building up specialised skills can result in greatly improved income levels.

Figure 10 Income of Ngāi Tahu with a level 4-5 qualification by industry, age 25



Appendix A Data

The data used for this study is the StatsNZ Integrated Data Infrastructure (IDI). The IDI is a very detailed database linking individual data across a number of Government agencies and over a number of years. Every person in New Zealand is assigned a unique identifier, which can be used to link data from the census to their actual employment information through Inland Revenue and educational outcomes from the Ministry of Education.

Census Data

The data for this analysis is limited to individuals that were present at the 2013 New Zealand Census. The Census forms the basis of the demographic information used, including sex, ethnicity and age. The Ngāi Tahu group was defined as any individual that self-identified as being of Ngāi Tahu descent.

Māori is defined as any individual that self-identified as Māori in the 2013 Census, as any one of their ethnic groups.

Ministry of Education data

The Ministry of Education (MoE) data is the primary data source.

Tertiary data

The tertiary education data is based on the tertiary education tables. A student is considered enrolled if they enrol with any tertiary provider in that calendar year. There are some cases where students are enrolled in more than one institution in the year and will be counted as in both groups.

Secondary school data

The secondary school data is primary sourced from the school leaver data. These data include the highest qualification attained, the reason for leaving. Students that left to go overseas are dropped and not included in the figures and statistics.

Inland Revenue data

The main financial information is obtained from Inland Revenue. These data are used for measuring annual family income, and the outcomes of students

The income in a given year for students is in calendar years rather than financial years as individuals typically finish school at the end of the calendar year. Upon completing high school, leavers range from 17 and a half to 18 and a half years old.

Appendix B Methodology

This report uses data from the Stats NZ Integrated Data Infrastructure (IDI) to build a picture of the education pipeline. The journey through the education system.

Due to data limitations, it is not possible to track a single group of individuals from primary school through to their career. To overcome this data limitation, we have divided the education pipeline into three sections, which can be combined to tell a picture of the full pipeline. Through the education system, there are a wide range of factors that affect an individual's ability to achieve their potential. This report considers the effect of some of these factors on individuals at that time period, to generate evidence for the whole education pipeline.

The main points being considered in this report are from primary school to high school, from high school to tertiary education or work, and tertiary education into work.

Transition 1 - Primary School to High School

Once an individual has left school, there are a number of factors that will affect their employment outcomes. Many of the post school outcomes are inter-related including the relationship between recognised skills and qualifications and income levels. When comparing individuals of similar qualification levels, the outcomes are similar, though there are significant differences in the proportion of individuals with qualifications between Māori and non-Māori.

By the time individuals are 25 years old, they had seven years to obtain post-school education and work experience. On average, by age 25 a significant gap between Māori and non-Māori has already emerged in terms of education and employment. In this section we explore the differences in education and employment in the seven years following completion of high-school.

Transition 2 - High School into work

After completing year 11 at high school, students have a wide range of options for what they will do in the subsequent years. With no more compulsory schooling, students can seek employment, continue education in or outside of their high school or engage in neither employment nor education. While there is a wide range of possibilities, these can be significantly limited based on educational achievement and participation.

The major limiting characteristics include university entrance, having numeracy and literacy skills, and achieving NCEA levels 1 to 3.

The cohort for this transition selects individuals based on when they were in year 11 at school. Where the school enrolment did not have an enrolled year indicator, their age was used based on birth date from July to June. Students in year 11 from 2008 to 2012 were included in this cohort.

Transition 3 - Post School education and employment into work

Post-school education and employment decisions also make a significant impact on long-term employment outcomes. The skills, qualifications and work experience obtained by the time an individual is 25 years old.

The cohort for this transition is based on the time when individuals completed school. At the end of year 13, students are aged from 17 and a half years old to 18 and a half years old. We select students that are in this age range from 2008 to 2010, and track the cohort to the end of the 2018 financial year.

The main limitation to the data is the amount of consecutive years for tracking an individual. The MoE data for primary and high schools is only accurate from 2008 onwards. This limits the outcomes to be a maximum of nine subsequent calendar years. To increase the population size, and achieve more specific outcomes, years can be combined, though this reduces the number of years to track outcomes. Due to this limitation, we measure outcomes for three cohorts. To maximise the number of observations for each transition, the cohort is made up of the total population of the school year, which is then reduced based on specific characteristics to compare outcomes based on certain characteristics.

Who are the people that are part of the cohorts?

- How have we selected these people
- How do we follow them
- What information is available to us on these people

What are the limitations of using this data

- Horizon
- What do we not know, and therefore what assumptions are we making
- How robust is the IDI data compared to other data sources, or methods of data collection such as sample surveys.

Outcomes measured

Qualifications

While there are significant differences in averages, some Māori have very positive outcomes. One observation from the data includes the comparison of outcomes for Māori with a bachelor's degree. Once limiting the population to individuals with at least a bachelor's degree, the difference between Māori and non-Māori disappears.

While this is a positive observation, non-Māori are much more likely to have a bachelor's degree. Around a third of the study population have a degree, compared with about 15 percent for Māori.

Industry training and apprenticeships

Another form of building capability and lifting employment outcomes is through learning trades. There are a number of benefits of trades, including the lack of student debt, earning an income while gaining experience. For Māori that completed an apprenticeship, or on-the-job training, there are also very similar income levels once these individuals are 25 years old.

Appendix C Detailed figures

