MINISTRY OF EDUCATION
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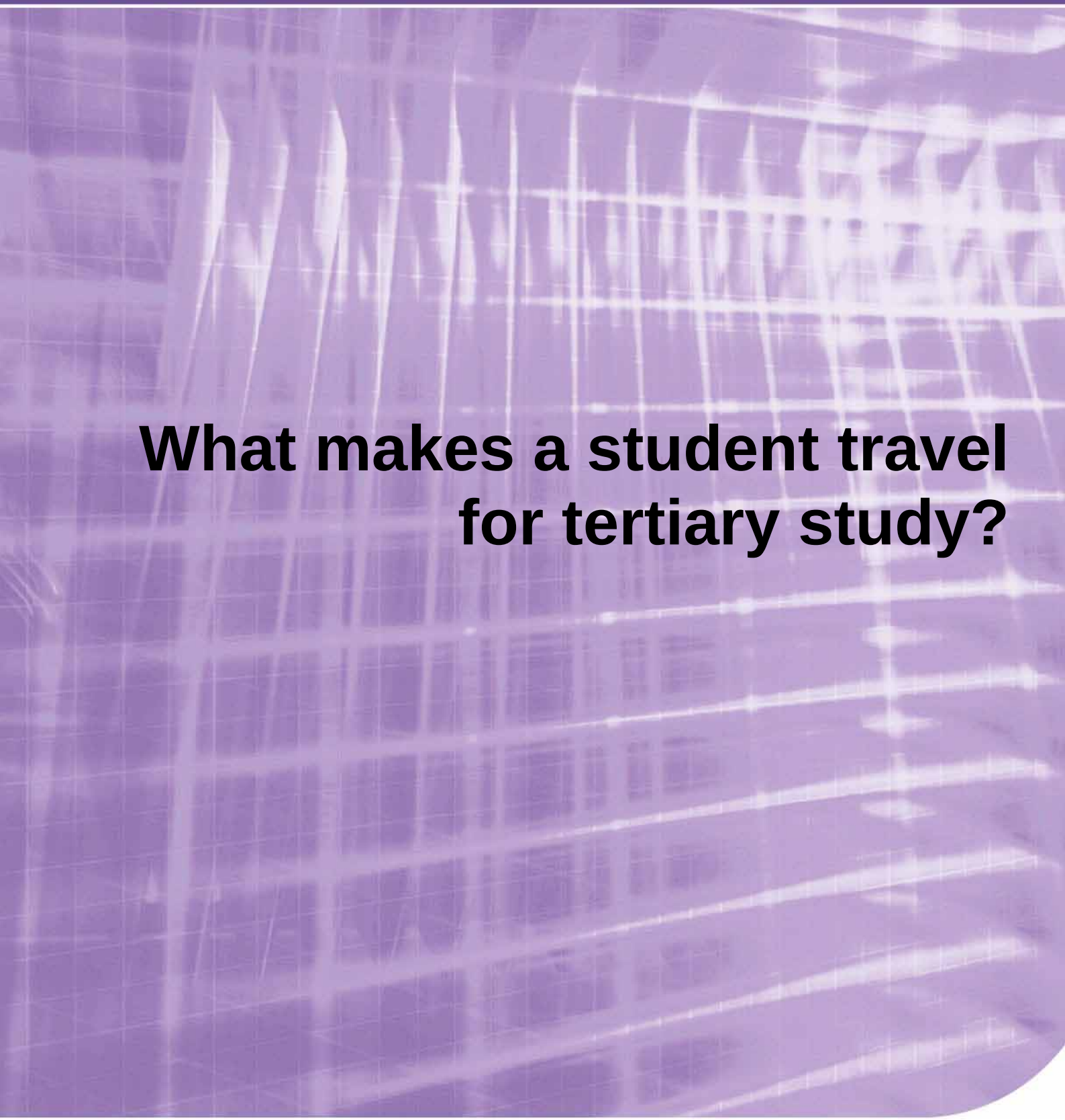

What makes a student travel for tertiary study?

Report
What makes a student travel for tertiary study?

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Summary

The aim of this study is to look at the mobility of tertiary students in undertaking their tertiary studies. It measures the impact of factors such as geographic access to tertiary provision, ethnic group, highest school qualification and tertiary education institution (TEI) campus on the decisions of how far students will travel for tertiary study. This study will help to answer important questions about the relationship between the location of tertiary provision and the decision-making process of tertiary students.

The results of this study show that geographic access to tertiary provision was a statistically significant factor in determining how far a student travelled to attend a TEI campus. Students who were comparatively isolated from tertiary provision had a higher probability of travelling further to attend a TEI campus, holding other factors constant. The effect of geographic access was more important for the group of students who studied at degree level at a university and less important for those who studied at sub-degree level at an institute of technology and polytechnic (ITP) or wānanga.

This result would appear obvious, given that the further a student lived from a TEI campus the further they had to travel, but the results appear to go beyond this. The distance beyond which no student had to travel to attend their closest university was 354km; therefore, we would expect that students with any level of access to tertiary provision would have had an equal probability of travelling more than 354km. However, students who were comparatively more isolated from tertiary provision were more likely to travel more than 354km for tertiary study. In fact, students with the highest probability of travelling more than 354km were from towns such as Upper Hutt, Pukekohe, and Tokoroa, which are all within 80km of a large university campus.

Interestingly, the results from this study show that field of study as an individual effect was not statistically significant in determining how far a student travelled for tertiary study. However, the interaction effect between campus and field of study was statistically significant. So while field of study did in fact play a part in how far students chose to travel, it was a field of study *at a particular campus* that was most important in this decision. The probability for a distance travelled by students to study a specific field of study differed widely across TEI campuses.

TEI campuses were found by this study to be an important factor in determining how far a student travelled for tertiary study. There were certain TEI campuses which had a higher probability of drawing students from large distances. It appears that students were less likely to travel large distances to attend an ITP than they were to attend a university. The exception to this appears to be for smaller ITP campuses which specialise in certain courses.

Students who last attended lower decile schools had a higher probability of travelling further for tertiary study than those from higher decile schools, when holding other factors constant. It may be possible that this is due to students from lower decile schools having greater access to income-tested student support provisions, such as student allowances, which allow them to move away from their parental support more easily. In contrast, students from higher decile schools may be less inclined to move away from the comforts of home and the financial support offered by parents.

The results of the study show that Māori students were more likely than other students to travel long distances for tertiary study. Pasifika students were the least likely to travel long distances and conversely the most likely to study near to their home-base. Women were more likely than men to travel long distances for tertiary study.

The distances travelled by students for tertiary study ranged from 0 to 1,950km with a median of 18km. Approximately 33 percent of students travelled more than 100km, while 14 percent travelled more than 500km. On average, college of education students travelled the furthest and ITP students the shortest distance. On average, students enrolled in degree-level study in their first year travelled further to attend a TEI campus than those students enrolled in sub-degree study. On average, students who studied agriculture travelled further than students enrolled in other fields of study. While this held true for both sub-degree and degree-level study, there were wide differences in the average distance travelled between sub-degree and degree-level study within a field of study.

Approximately 71 percent of students had a TEI campus within 5km of the secondary school they last attended. While 52 percent of students had a TEI campus of the sub-sector they chose to attend within 5km of the secondary school they last attended, just 59 percent of these students chose to attend that campus.

This study uses generalised logistic regression to analyse the impact of factors such as geographic access, ethnic group, highest school qualification, and TEI campus on the decision of tertiary students to travel to undertake tertiary study. The study uses a cohort of 53,000 domestic intramural students who first studied at a TEI in 2003, 2004 or 2005. The study is restricted to full-time students who were under 20 years of age and left secondary school in the previous year. The rationale for these restrictions is that these students are likely to travel for educational purposes, whereas older or part-time students are likely to have more varied reasons for travelling, such as family and work.

There are a number of limitations to the approach used in this study that should be considered when viewing the findings. A student's last secondary school is used as a proxy for his/her home address and the distance between this school and the TEI campus he/she attended is the distance he/she travelled for tertiary study. In some cases, particularly students from rural areas or boarding students, this will not work as a good proxy, given the distance a student's home was from their secondary school.[1] A student's highest school qualification is included in the study as a proxy for academic ability. However, this has a limited capacity to capture, for example, the range of ability between those passing and those passing easily. The study includes the decile of the student's last secondary school as a proxy for socio-economic status. Care is needed when generalising about the effects of socio-economic status from this variable. Secondary schools draw their students from such wide areas that the socio-economic conditions of people living within these wide areas will vary significantly.

[1] It is estimated that approximately 4 percent of the students in the cohort used in this study were boarders at a secondary school the year before they first enrolled in tertiary study.

1 Introduction

This study looks at the mobility of students by analysing the distances students travel from their home-base to undertake their tertiary studies. The distance a student travels to undertake tertiary study depends on a range of factors. Some have to travel a large distance because their home-base is isolated from tertiary providers; for others personal or study reasons dictate how far they will travel. It is the impact of these reasons on the decision of how far students will travel for tertiary study that is the focus of this study.

The tertiary sector has seen significant growth over the last 10 years.[2] One driver of this growth has been the opening of new tertiary education institution (TEI)[3] campuses, particularly in areas of New Zealand that previously had no tertiary provision. How important is the proliferation of tertiary provision throughout New Zealand to addressing the goal of increased participation, particularly to target groups? In addition, most areas in New Zealand are going to experience population decline over the next 20 years.[4] Will such areas be able to support the provision of tertiary education in the future, given what this study tells us about student mobility? This study will help to answer these and other important questions about the relationship between the location of tertiary provision and the decision-making process of tertiary students.

This study uses generalised logistic regression to analyse the impact of student demographic and study characteristics on the decision of students to travel to undertake tertiary study. The advantage of using regression is that it enables us to examine the effect of a single explanatory variable while controlling for other factors. In this way, a more definitive analysis of the impact of geographic access on the likelihood of students travelling a certain distance can be undertaken.

While much research, both New Zealand and international, has been done on the decision-making process of prospective tertiary students, there is limited prior research on how far a student will travel to undertake tertiary study.[5] Much of this research acknowledges that the student decision-making process is a complex relationship between many factors, some of which are beyond the scope of this study. Previous studies show that factors such as socio-economic status, academic achievement and subject area interest are important in the decision-making process of tertiary students. These are factors for which proxy information is included in this study and the impact of these factors is analysed. However, previous studies also acknowledge that factors such as parental influence, financial support, and the influence of schools affect the decision-making process and these are factors which can not be analysed in this study.

There has been a renewed policy focus on the regional role of TEIs, especially institutes of technology and polytechnics (ITPs), in 2005 and 2006. This study

[2] Between 1995 and 2005 domestic student numbers increased from 262,000 to 457,000, an increase of 74 percent.
[3] TEIs are public providers of tertiary education. There are four kinds of institution: universities, institutes of technology and polytechnics, colleges of education, and wānanga.
[4] Refer to McClelland (2006).
[5] For a detailed review of literature on tertiary student decision-making refer to Leach and Zepke (2005).

contributes to our understanding of that focus, by giving a clearer sense of the extent to which TEIs are providing access opportunities in their region.

An Australian study of student mobility (Blakers, Bill, Maclachlan and Karmel, 2003) attempted to explain why 17 to 19 year olds move to undertake study at universities. The study suggests that access to institutions is important but other factors are more important. In particular, subject choice and academic ability are more important than access in a student's decision to move to undertake university study.

This report has the following structure. Section 2 outlines the methodology and the dataset used in this study, and explains the limitations that are relevant to the data. The results of the study are presented in section 3. This includes the summary statistics of the dataset and the results of the regression analysis. In this section, the impact of geographical access and other factors on the likelihood of students travelling a certain distance for tertiary study is presented. In section 4, the study conclusions are presented on the impact of the various factors on the likelihood of students travelling for tertiary study.

There are two appendices at the end of this report. The first is a more detailed explanation of the generalised logistic regression methodology used in the analysis. Appendix 2 provides a more comprehensive look at the summary statistics of the dataset.

2 Data and methodology

The cohort used in this study is the 53,000 domestic intramural students who first studied at a TEI in 2003, 2004 or 2005. The study is restricted to full-time[6] students who were under 20 years of age and left secondary school in the previous year. The rationale for these restrictions is that these students are likely to travel for educational purposes, whereas older or part-time students are likely to have more varied reasons for travelling, such as family and work.

First-time students over three years are used, to ensure that the cohort size was large enough to make the results of the study significant. Tests were run on the data to ensure that the three separate years have similar distributions.

The information used in this study is drawn from two sources. Student information is drawn from a longitudinal matched dataset of student enrolments. This, in turn, is created from administrative returns provided by tertiary institutions to the New Zealand Ministry of Education.

Any analysis of student mobility has to concentrate on campuses rather than institutions. Many TEIs have more than one campus. Often these campuses are in different towns or cities and it is the distance between a student's home-base and the campus he or she studies at that is important. Because of this, information on which campus a student was studying at had to be sourced directly from the electronic Single Data Return[7] (eSDR) database. This campus field was introduced into the SDR in 2001; therefore, any time series analysis is only possible back to this year. There may be some concerns with the accuracy of this variable for some satellite campuses, particularly in the earlier years. However, this study is limited to the years 2003 to 2005, by which time the quality of the data was considered acceptable for statistical analysis.

The second source of information is a dataset containing distances. The secondary school a student attended in the year before starting tertiary study is used as a proxy for their home-base. Driving distances have been calculated from every secondary school in New Zealand to every TEI campus. In this study, the distance between a student's last secondary school and the TEI campus he/she attended is deemed to be the distance he/she travelled for tertiary study.

Limitations

There are some obvious limitations to this approach. While the last secondary school is a very good proxy for most urban school students who live in close proximity to the secondary school they attend, rural school students often live large distances from the secondary school they attend, creating an error in the distance travelled calculation.

[6] For the purposes of this study full-time is defined as 0.8 equivalent full-time students (EFTS) or more a year. This definition also means that those who are full-time for a short period in the year are excluded from the study. This is appropriate, because those who do small amounts of study, even on a full-time basis for a short period of time, are less likely to be basing a decision to travel on their study options.

[7] The SDR is a data collection that draws information at an individual student level that includes fields required by the Ministry and the Tertiary Education Commission (TEC) for the purposes of funding students at tertiary education organisations (TEOs) and for statistical reporting requirements. The information is required to be completed by all TEOs that receive Student Component funding and/or have students with student loans or allowances.

Given that this proxy is the best we have in the data available, this error is considered acceptable.

Those students whose last secondary school was The Correspondence School did not attend a physical school location and therefore there is no way of knowing where their home location was. Between 2003 and 2005 there were 210 students in our cohort who last attended The Correspondence School. These students are excluded from any further analysis, along with 883 other students whose last secondary school could not be used.[8]

There is also the issue of those students who boarded at secondary school, which means their home address is likely to be a large distance from their school address. School address for these students is not a good proxy for their home address. We have no way of identifying these boarding students or of excluding them from the analysis. We do know that approximately 10,000 students stay in school hostels in New Zealand. This accounts for approximately 15 percent of students in secondary schools with hostels. So we can estimate that approximately 2,300 students (or 4 percent) in our cohort were boarders at secondary school. This number is not large enough to cause concern about the results of our analysis.

Generalised logistic regression

Generalised logistic regression[9] is used in this study to model the impact of selected student characteristics on the probabilities of how far a student travelled for tertiary study. The distance travelled to tertiary study is a continuous variable, so in order to fit it into the generalised logistic model we have grouped it into three categories. The three categories are: less than 44km, 44 to 354km, and more than 354km. These three categories have been determined because 43km was the longest distance a student within the greater Auckland[10] area had to travel to study at a TEI campus in this same area and 354km was the longest distance any student had to travel to study at their closest university campus.

The regression analysis is repeated for two separate sub-groups of the main cohort. These two sub-groups are degree-level students who studied at a university and sub-degree-level students who studied at an ITP or wānanga. Results from these separate analyses are discussed within the results.

The student characteristics used in the regression analysis are discussed below.

Access

The access variable is designed to measure a student's relative geographic access to tertiary provision throughout New Zealand from their last secondary school. A simple measure of access to tertiary provision would be the distance from a student's last secondary school to the nearest TEI campus. However, this approach is problematic. For example, using this approach, a student living next to a small campus, with limited study options and no other tertiary provision within 200km, would be recorded

[8] These 883 students included 82 who were home-schooled, 341 who attended a secondary school not on the SDR list, 447 who attended an overseas secondary school, eight who never attended a secondary school, and five whose secondary school was unknown.
[9] More detail on the regression model used in this study is provided in Appendix A.
[10] Greater Auckland in this case is the four cities of North Shore, Waitakere, Auckland and Manukau.

as having high access, when it could be argued that in fact their access is very limited. Therefore, a more complex measure of access is required.

The approach taken in this study in determining the access variable is similar to that taken by Stevenson et al. (2000). It is assumed that the range of study options offered at a TEI campus is linked to the size of the campus. Thus, access to tertiary provision for a student will increase with the size of the campus and decrease with the distance to a campus. Therefore, access is calculated as a function of both the distance to all TEI campuses in New Zealand and the size of those TEI campuses. The access to tertiary provision for a student depends on the size of all campuses (positively) and distance to all campuses (negatively).

The size of a tertiary provider is measured in terms of equivalent full-time student units (EFTS), the most common way of measuring the size of a tertiary provider. Distance is measured from the address of the student's last secondary school to the addresses of all TEI campuses throughout New Zealand.

The access variable is defined as:[11]

$$\text{Access}_i = \sum \frac{\text{EFTS}_j}{D_{ij}^2}$$

where i = student's last secondary school,
j = TEI campus,
D_{ij} = distance between the last secondary school and the TEI campus, and
EFTS_j = the number of equivalent full-time student units enrolled at the TEI campus in 2005.

Two adjustments have been made to the access variable. Firstly, as the distance approaches zero, the access measure increases without limit. This would cause the access variable for students adjacent to large providers to become very large indeed and 'lose context' in comparison with other students. Therefore, the minimum distance is set at 5km on the basis that travel of this distance does not impose any restrictions on attending a TEI campus. Secondly, the access value is capped at 225. This value was chosen as the maximum point on the basis that any values above this added nothing to the explanatory value of the model.[12]

A low access value will indicate that a student has low access to tertiary provision. For example a student who attends secondary school in Tolaga Bay has an access value of 0.29. As the comparative access to tertiary provision increases, the access value also increases. A student from central Auckland has an access value of 225.

Highest school qualification

Past research has shown that secondary school academic ability is a critical factor influencing students' decisions about tertiary education.[13] It is included in this study

[11] Various models were tested using different levels of D_{ij} (ie D, D^2 and D^3) and D^2 gave the best fit and was thus used for this study.
[12] These two adjustments to the access variable were also made by Blakers et al. (2003) in their analysis of the mobility of university students in Australia, although not at the same level reflecting differences between New Zealand and Australia.
[13] Refer to Leach and Zepke (2005).

to determine whether it also has an effect on a student's decision on how far to travel to attend a TEI campus. The impact of academic ability on the mobility of tertiary students is assessed using a student's highest school qualification as a proxy. However, this proxy does have limits. Highest school qualification has a limited capacity to capture, for example, the range of ability between those just passing and those passing easily. There is likely to be a wide range in academic ability among those students with a highest qualification of NCEA level 3.

The introduction of national student numbers in New Zealand in 2003 will, in time, enable national longitudinal data linking students' tertiary enrolment with school achievement in the National Certificate of Educational Achievement (NCEA). For this study, however, the only national proxy available is students' highest school qualification. Dummy variables are included for students with no qualifications, NCEA level 1, and NCEA level 2 qualifications. The reference category is students with NCEA level 3 qualifications.

There are 1,780 students in our cohort who have either an overseas or an unknown qualification. These students are not included in the regression analysis. The students with overseas qualifications are excluded because there is no way of determining the level of these qualifications. Given that they are likely to be at varying levels, an overseas qualification cannot be considered a proxy for academic ability.

Decile of last secondary school

Past research has shown that socio-economic status is a strong predictor in students' decisions about tertiary study. Although there is no variable available for this study that directly measures the socio-economic status of the individual student, the decile of the student's last secondary school is included as a proxy variable. In New Zealand, secondary schools are assigned a decile status which is an indicator of the socio-economic status of the area from which schools draw their students and is used for funding purposes. The decile measure ranges from 1 to 10, with 10 representing schools that are located in areas of highest relative advantage.

Deciles are grouped into bands in the model. Dummy variables are included in the model for decile 1 and 2 schools, decile 3 and 4 schools, decile 5 and 6 schools, and decile 7 and 8 schools. The reference category is decile 9 and 10 schools.

Private schools in New Zealand, in the main, do not get assigned a decile, as they are not funded by the same system. Given their characteristics, private schools are high decile in nature and are therefore included in the decile 9 and 10 schools group.

Care is needed when generalising about the effects of socio-economic status from this variable. Secondary schools draw their students from such wide areas that the socio-economic conditions of people living within these wide areas will vary significantly.

Ethnic Group

To control for the impact of ethnic group, dummy variables are included in the model for Māori, Pasifika, Asian, and students of 'Other' ethnicity. The base category is European. In our cohort there are 819 students who had an unknown ethnic group. These students are not included in the regression analysis.

Gender

A dummy variable is included in the model to determine the effect of gender on the mobility of tertiary students. The reference category is females.

Campus

It is probable that students are more likely to travel large distances to study at some campuses than at others. To control for the effect of campus on the mobility of tertiary students, dummy variables are included in the model for all TEI campuses in New Zealand. Where a TEI has two or more campuses in the same town or city within a short distance these campuses are included together. There are dummy variables for 97 campuses included in the model.[14] The reference category is the University of Auckland's main campus.

Field of study

The field of study that a student chooses is likely to influence how far he/she will travel to attend a TEI campus. In some fields, such as medicine, dentistry and veterinary science, qualifications are offered at only a very few locations. In these cases it is highly likely that many students would need to travel a large distance to undertake the qualification.

To control for the effect of field of study on the mobility of tertiary students, a set of dummy variables for the 12 broad classifications of field of study of the New Zealand Standard Classification of Education (NZSCED) are included in the regression analysis. The reference category is society and culture.

The use of the 12 broad NZSCED classifications for field of study is not ideal for this study. Qualifications such as medicine, dentistry, law and veterinary science, for which it is likely that students would need to travel to undertake, are included with other qualifications in broad categories. Therefore the true effect these qualifications have on a student's decision to travel will not be seen in the field of study variable. Two issues prevent us from unpacking the field of study variable further. Firstly, the number of students in some groups would become too small and make statistical inferences difficult. Secondly, there are some qualifications, such as medicine, in which a student does not specialise until their second year of study and therefore the impact would not be picked up anyway in a study focused on the first year of study.

Level of study

A dummy variable is included in the model to determine the effect of level of study on the mobility of tertiary students. Level of study is grouped into two broad categories, sub-degree and degree. The reference category is degree level.

Interaction effects

Two interaction effects are included in the model as they are likely to have a significant effect on a student's decision to travel for tertiary study. Firstly, the interaction between campus and field of study is included because it is likely that there may be a difference in the factors that influence the distance that students travel to undertake certain fields of study at different campuses. Secondly, the interaction between campus and level of study is included for similar reasons.

[14] For a full list of the campuses used in this study refer to the summary statistics in Appendix 2.

3 Results

Summary statistics[15]

There were 53,454 records included in this study of student mobility, of which 17,700 were first-time students in 2003, 18,060 in 2004 and 17,694 in 2005. Of this cohort, 53 percent were female and 47 percent male. European students were the largest ethnic group (64 percent) followed by Asians (13 percent), Māori (12 percent) and Pasifika (5 percent).

Approximately 63 percent of students were studying at degree level, while 37 percent were studying at sub-degree level. Students who started their studies at a university made up 65 percent of the cohort, and 32 percent started at an ITP. The University of Auckland was the campus with the largest percentage (19 percent) of students in the cohort.

Around 36 percent of the students in the cohort had a highest school qualification of NCEA level 1, and 34 percent had an NCEA level 3 qualification. Students with no school qualification made up 6.5 percent of the cohort. Just less than 40 percent of students last attended a secondary school that was a decile 9, decile 10, or a private school. Students who had previously attended a decile 1 or decile 2 secondary school made up 6.1 percent of the cohort.

The most common fields of study for students in our cohort were society and culture (22 percent), and management and commerce (17 percent). Areas of study that were less common among students were agriculture (2.4 percent) and information technology (2.9 percent).

Distance travelled

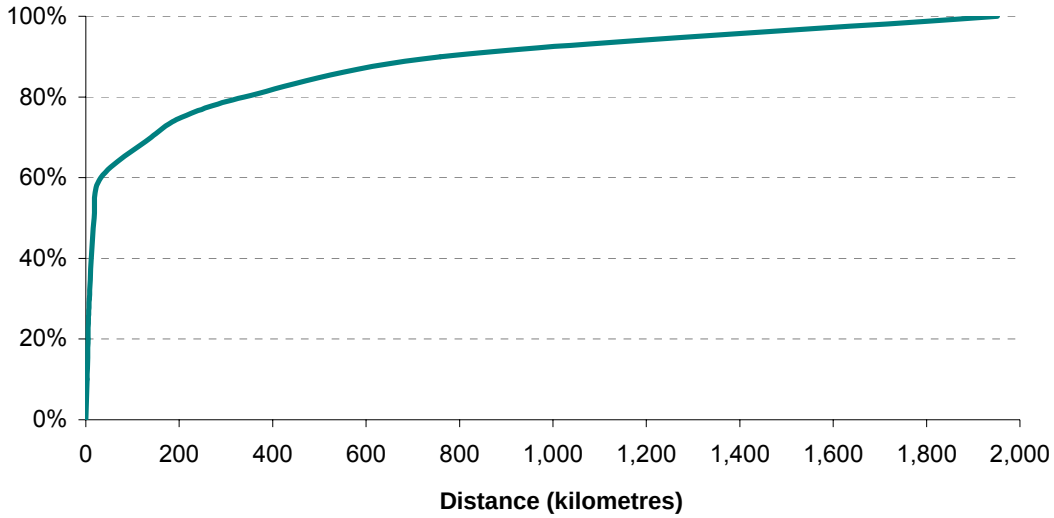
While the distances travelled by students for tertiary study ranged from 0 to 1, 950km the distribution was right-skewed with a mean of 199km and a median[16] of 18km, as shown in figure 1.[17] Approximately 33 percent of students travelled more than 100km, while 14 percent travelled more than 500km.

While the *shape* of the distribution does not vary significantly between universities, ITPs, colleges of education (CoEs) and wānanga, there were differences in the average distance students travelled to these types of providers. On average, CoE students travelled the furthest (median of 27km), followed by wānanga students (22km), then university students (19km), while ITP students, on average, travelled the shortest distance (11km). It may have been expected that university students would travel further given that university campuses are more widely spread throughout New Zealand and therefore require many students to travel large distances. However, around 55 percent of New Zealanders live in a city with a main university campus[18] and therefore the majority of students did not have to travel very far to attend a university.

[15] See Appendix 2 for the full summary statistics for the dataset used in this analysis.
[16] The median is the distance at which 50 percent of students travel less than and 50 percent of students travel more than.
[17] A distribution which is right-skewed will always have a mean that is high compared with the median. This is because the mean will be affected by the relatively few people who travel very large distances while the median is more resistant to the influence of these very large distances.
[18] This figure is based on 2001 Census results.

While it may be a little surprising that, on average, wānanga students travelled further than university students, there were a higher proportion of university students who travelled long distances than of any other students. Around 24 percent of students travelled more than 354km to attend a university, compared with 16 percent for CoEs, 9 percent for ITPs and 7 percent for wānanga.

Figure 1: Cumulative distribution of distance travelled by first-time tertiary students 2003-2005



Note: Distance travelled was the driving distance between a student's last secondary school and the TEI campus they attended in their first year of study.

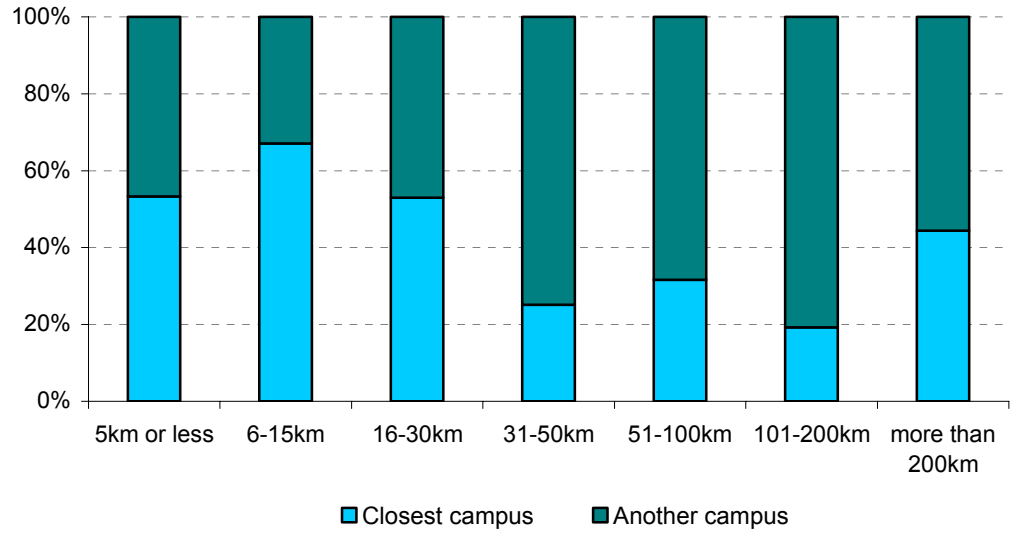
The distance from a student's last secondary school to the *nearest* TEI campus had a very similar distribution in that it was right-skewed. The mean distance a student had to travel to their nearest TEI campus was 10km, with a median of 5km. Around 71 percent of students had a TEI campus within 5km of the secondary school they last attended and 52 percent had a TEI campus of the sub-sector they chose to attend within 5km. Over 43 percent had a university within 5km and 62 percent had an ITP or wānanga within 5km of their last secondary school. Around 89 percent of tertiary students were within 20km of a TEI campus. The furthest distance any student was from their nearest ITP or wānanga campus was 194km, while the furthest distance to a closest university was 354km.

While 52 percent of tertiary students attended a secondary school that was within 5km of a TEI campus of the sub-sector they eventually chose to attend, just 59 percent of these students chose to attend that TEI campus. There were 23,039 students (43 percent) who chose to attend a TEI campus other than the one that was closest[19] to the last secondary school they attended. This pattern of movement would suggest that there were indeed factors other than geographic access contributing to a student's decision of how far they will travel for tertiary study.

[19] Where two or more tertiary campuses are within 10km of each other they are all considered the closest tertiary provider. For example both the University of Auckland and Auckland University of Technology would be considered the closest tertiary provider to a student living in central Auckland.

As figure 2 shows, even those students whose last secondary school was within 5km of a TEI campus were likely to travel a larger distance to their campus of choice. The trend in figure 2 would also suggest that the further a student lives from their closest TEI campus, the more likely they were to travel an even further distance to another TEI campus. It would appear that a student from a large city, close to a TEI campus, was less likely to travel a large distance than a student from an area not as close to a TEI campus. This is further supported by the average distance travelled by a student who lived within 5km of a TEI campus (192km) compared with those who lived more than 100km from a TEI campus (315km).

Figure 2: Students who attended their closest TEI campus by distance to nearest TEI campus from last secondary school attended



Regression results[20]

The pseudo R^2 for the full model[21] in this study was 0.54. The pseudo R^2 increased for the regression analysis of degree-level students studying at universities ($R^2 = 0.62$) and decreased for the model of sub-degree-level students studying at ITPs and wānanga ($R^2 = 0.38$). These results indicate that the factors analysed in this study had a larger impact on the decision on how far students will travel for degree-level study at universities than they do for students who study at sub-degree level at an ITP or wānanga.

The results of the regression analysis show that, in terms of factors analysed in this study, access was the most important factor in determining how far a student travelled for tertiary study and made up 39 percent of the variation. The interaction effect between campus and field of study had a relative importance of 7.6 percent and the individual effect of campus 3.7 percent. The analysis showed that field of study and level of study as individual effects were not statistically significant factors in determining how far a student travelled for tertiary study.

[20] Due to the large number of campuses and the inclusion of the interaction effects the final model is complex and is not included within this report. Should any person want a full copy of the regression model used in this study they may request it from the author.

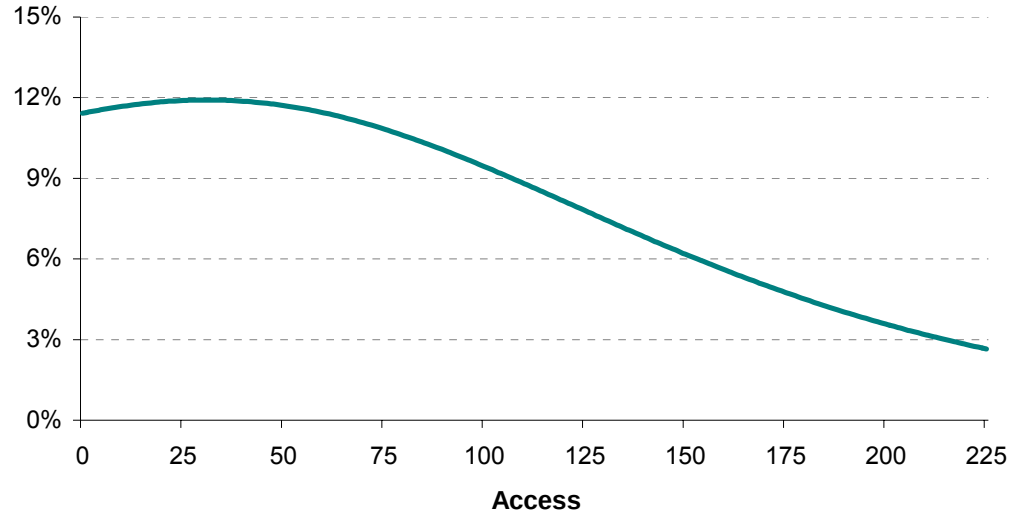
[21] R^2 is the proportion of the total variation in the observed values of the dependent variables that is explained by the overall regression model.

For a clearer understanding of the regression analysis, results in this section have been converted into predicted probabilities. For a detailed explanation of how the predicted probabilities were calculated see Appendix 1.

Access

The results of the regression analysis indicate that access to tertiary provision was the most statistically significant factor contributing to a student's decision on how far he/she travelled for tertiary study. The predicted probabilities of a student travelling more than 354km for the reference group[22] are presented in figure 3. It shows that the more a student was isolated from tertiary provision, the more likely they were to travel more than 354km to attend a TEI campus. The predicted probability of a student from the school[23] most isolated from tertiary provision in New Zealand travelling more than 354km for tertiary study was 11.4 percent compared with 2.7 percent for a student from central Auckland, who had the best access to tertiary provision.

Figure 3: Predicted probability of a student travelling more than 354km for tertiary study by access



Note: The predicted probabilities were calculated using the reference categories for the dummy variables. For the characteristics of the reference group see Appendix 1.

While this result may be intuitively expected, it should be noted again that 354km was the most any secondary school student within New Zealand had to travel to attend their closest TEI campus. Therefore students from more isolated areas were more likely to travel longer distances than they needed to. This would again seem to indicate that there were indeed factors other than access contributing to how far students travelled to attend a TEI campus.

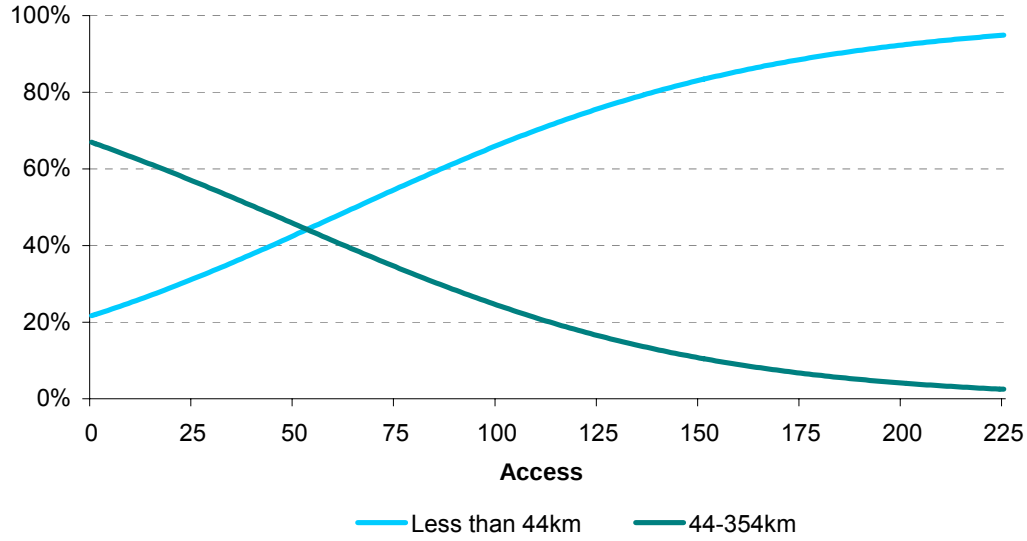
Two other interesting observations back up this assumption. Firstly, while the curve on figure 3 is approaching zero as access increases, it does in fact start to flatten out gradually, indicating that no matter how close to tertiary provision students may have been there were those who elected to travel elsewhere for various reasons. Secondly,

[22] For the characteristics of the reference group see Appendix 1.
[23] The school most isolated from tertiary provision in New Zealand is Karamea Area School on the West Coast of the South Island.

the curve reaches a peak at an access value of about 30. Secondary schools that had an access value of 30 are in towns such as Pukekohe, Upper Hutt, Tokoroa, Whakatane and Nelson, which are hardly isolated from tertiary education. In fact, most of these towns are within 35km of a large university and those that are not have a sizeable ITP/wānanga in the town. For students from these towns to be the most likely to travel more than 354km for tertiary study, there must be something more than access playing a role.

The predicted probabilities of a student travelling less than 44km and between 44 and 354km for the reference group are presented in figure 4. As we would expect, the better a student's access to tertiary provision was the more likely he/she was to travel less than 44km to attend a TEI campus. This is understandable given that many students with poor access to tertiary provision had to travel more than 44km just to attend their closest TEI campus. Interestingly, these two lines are very close to being the mirror image of each other, meeting at an access value of about 53. Therefore students from cities such as New Plymouth and Napier had an equal probability of travelling either of the two distance groups. This is probably related to the choice of type of provider a student makes. There are ITP and wānanga providers in New Plymouth, for example, but not a university. If students decided to attend an ITP, they did not have to travel out of New Plymouth to do so. However, if they decided to attend university, they needed to travel more than 44km.

Figure 4: Predicted probabilities of a student travelling less than 44km and 44-354km for tertiary study by access



Note: The predicted probabilities were calculated using the reference categories for the dummy variables. For the characteristics of the reference group see Appendix 1.

The separate analyses on degree-level students attending universities and sub-degree-level students attending ITPs or wānanga both found that access was the most important factor. However, it was found to be more of an influence on those students enrolling in degree-level study at universities.

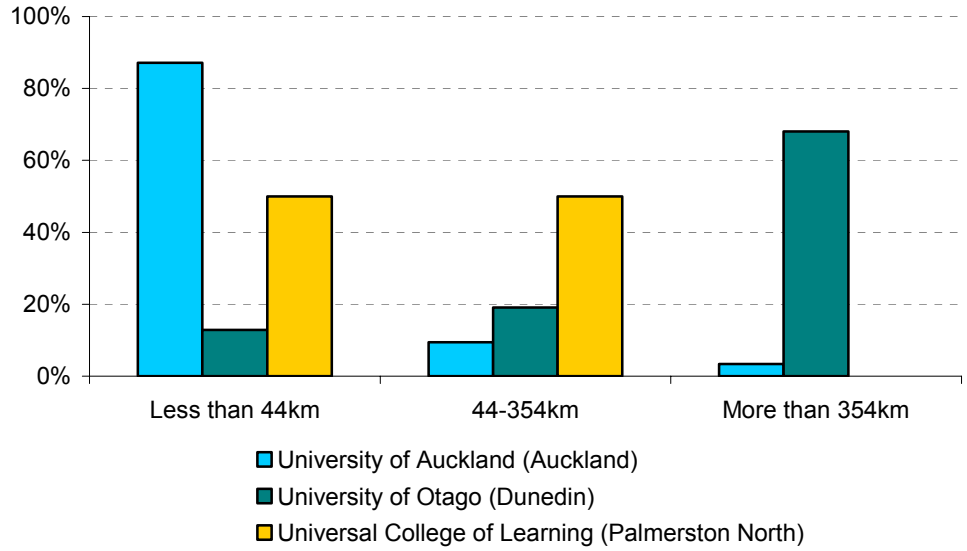
Campus and field of study

The relative importance of the interaction effect between campus and field of study was second only to the access variable. The statistical significance of this interaction

effect indicates that there was a difference between fields of study in how campus affects the distance a student travelled for tertiary study. Therefore, a student was more likely to travel to a particular TEI campus for one field of study than another. The interaction effect between campus and field of study had greater relative importance in the regression analysis results than the individual effects of campus and field of study; this indicates that a field of study *at a particular TEI campus* was more important in a student's decision on how far to travel for tertiary study.

The large number of response values[24] that were possible for the interaction effect between campus and field of study means it was not possible within this report to discuss the results of all response values. However, figure 5 is an example of how the predicted probability of the distance a student travelled for a specific field of study differs between TEI campuses. Students had a higher probability of travelling more than 354km to study science at the University of Otago in Dunedin than the other two campuses, while students had a higher probability of travelling between 44 and 354km to study science at the Universal College of Learning in Palmerston North.

Figure 5: Predicted probabilities of a student travelling to study science at three selected campuses



Campus

The median distances travelled by students to the 25 largest TEI campuses are shown in table 1.[25] While the median distance travelled for tertiary study varies greatly across these campuses, the majority of the values were less than 25km. The University of Otago in Dunedin, on average, drew its students from further away than the other TEI campuses, followed by Lincoln University in Canterbury. The campus that, on average, drew its students from the shortest distance was the Western Institute of Technology Taranaki in New Plymouth.

Campus effects were found by this study to be very important in determining how far a student travelled for tertiary study. This was not a surprising result, given that we know students are attracted to certain TEI campuses for personal or study reasons.

[24] There are 527 possible values that the interaction variable between campus and field of study can take.
[25] For the median distances travelled to all tertiary campuses see Appendix 2.

We know, for example, that many students travel down to Dunedin to live the student lifestyle at the University of Otago.

Of the larger TEI campuses, students were more likely to travel more than 354km to attend Whitireia Community Polytechnic in Porirua, Otago Polytechnic in Dunedin and the University of Otago in Dunedin. Despite two of these campuses being ITPs, students were less likely to travel more than 354km to attend an ITP than they were to attend a university. The exception to this appears to be for smaller ITP campuses which specialise in certain fields, such as Otago Polytechnic in Cromwell and Telford Rural Polytechnic in Balclutha.

Table 1: Predicted probabilities and median distance of how far students travelled to attend the 25 largest[26] TEI campuses

	Predicted probabilities (percent)			Median
Campus	Less than 44km	44-354km	More than 354km	distance travelled (km)
Bay of Plenty Polytechnic (Tauranga)	100%	0%	0%	13
Eastern Institute of Technology (Napier)	100%	0%	0%	14
Western Institute of Technology Taranaki (New Plymouth)	100%	0%	0%	5
Manukau Institute of Technology (Manukau)	99%	1%	1%	10
Waiariki Institute of Technology (Rotorua)	99%	1%	0%	38
Massey University (North Shore)	97%	2%	2%	13
Northland Polytechnic (Whangarei)	97%	2%	1%	8
Unitec New Zealand (Auckland)	96%	1%	3%	12
Auckland University of Technology (Auckland)	95%	3%	2%	13
University of Auckland (Auckland)	95%	2%	3%	12
Universal College of Learning (Palmerston North)	88%	6%	6%	19
Waikato Institute of Technology (Hamilton)	88%	9%	3%	23
Southern Institute of Technology (Invercargill)	83%	1%	16%	32
Southern Institute of Technology (Christchurch)	82%	2%	16%	12
University of Waikato (Hamilton)	82%	13%	5%	81
Wellington Institute of Technology (Lower Hutt)	81%	6%	13%	15
University of Canterbury (Christchurch)	80%	2%	18%	16
Massey University (Palmerston North)	71%	10%	19%	161
Victoria University of Wellington (Wellington)	69%	10%	21%	55
Christchurch Polytechnic Inst of Technology (Christchurch)	68%	4%	28%	7
Lincoln University (Lincoln)	66%	5%	29%	340
Massey University (Wellington)	63%	18%	19%	230
Whitireia Community Polytechnic (Porirua)	34%	0%	66%	14
University of Otago (Dunedin)	33%	9%	58%	807
Otago Polytechnic (Dunedin)	31%	9%	60%	55

Note: The predicted probabilities were calculated using the reference categories for the dummy variables. For the characteristics of the reference group see Appendix 1.

The universities that students were least likely to travel more than 354km to attend, and conversely more likely to travel less than 44km to attend, were Massey University in Albany, and Auckland University of Technology and the University of Auckland, both in Auckland city. It was not unexpected that the three Auckland-based campuses had fewer students travelling from far away, given the large population base they had to draw on for their prospective students. In fact, a fair proportion of the students travelling more than 354km to attend other university campuses were coming from Auckland. This can be best seen in the predicted probabilities of students attending the University of Waikato in Hamilton. Students attending this campus were the most likely to have travelled between 44 and 354km, a distance which takes in not only the many surrounding towns but also greater Auckland.

[26] These are the 25 largest tertiary campuses in terms of students in the cohort used in this study. Therefore they can be considered the largest enrollers of first-time domestic intramural students who are under 20 years of age.

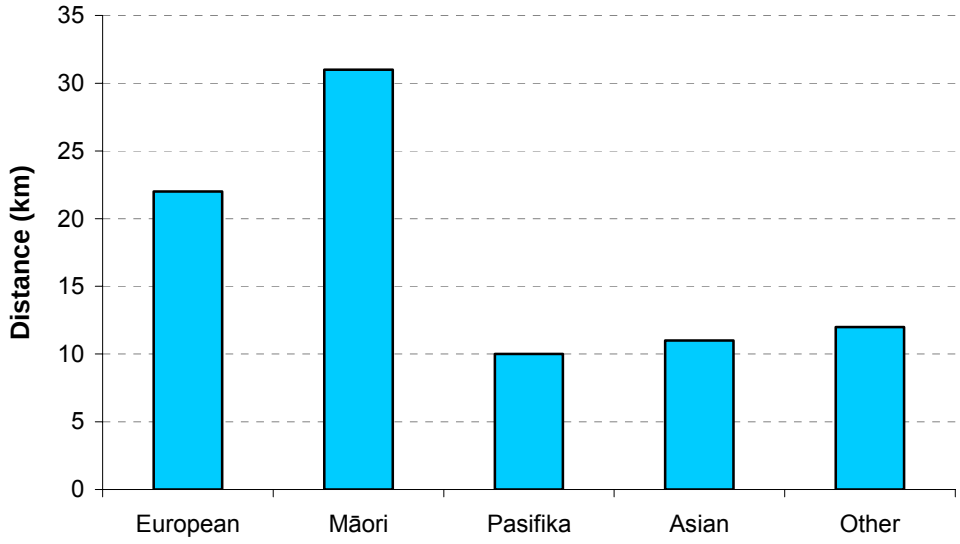
Of the 10 TEI campuses with the highest proportion of students likely to travel less than 44km there were five from greater Auckland and five ITPs located in provincial centres and obviously focused on their region. Of the seven TEI campuses with the lowest proportion of students likely to travel less than 44km there were four in the South Island, which is more sparsely populated, and three in greater Wellington. Perhaps this result shows the attractiveness of Wellington as a study destination as well as factors specific to the three campuses.

Students who attended a wānanga campus had a low likelihood of travelling a large distance to study there. Of the 27 wānanga campuses in this study, 21 of them had a predicted probability of less than 1 percent for students travelling more than 354km to study there. Two wānanga campuses were exceptions to this and had a high predicted probability of students travelling more than 354km. They were Te Wānanga O Aotearoa in Blenheim and Te Wānanga O Raukawa in Otaki.

Ethnic group

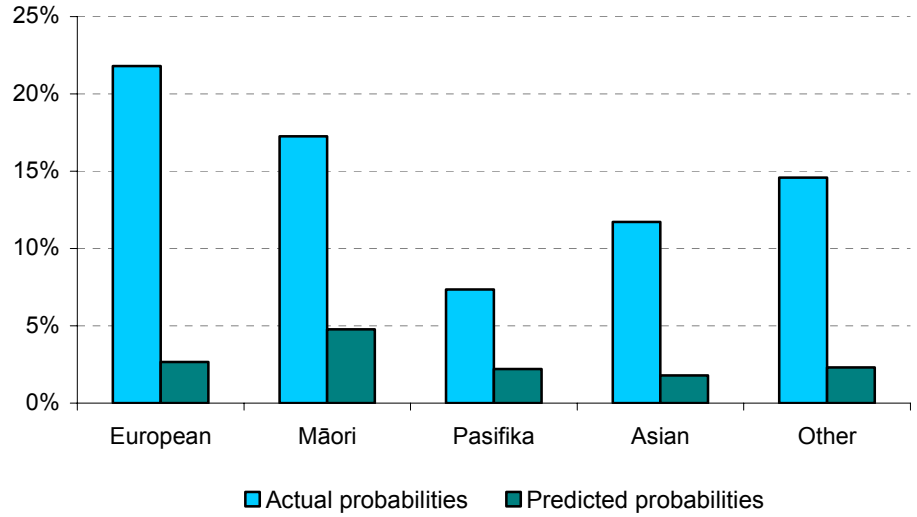
The median distance travelled by each ethnic group is shown in figure 5. Māori students, on average, travelled further, with a median of 31km. Pasifika students, on average, travelled the shortest distance, with a median of 10km.

Figure 6: Median distance travelled for tertiary study by ethnic group



The regression analysis results showed that Māori students were more likely than other students to travel more than 354km for tertiary study. They were also more likely to travel between 44 and 354km for tertiary study. The likelihood of European students travelling more than 354km was statistically significantly higher than that of Pasifika, Asian and 'Other' students. Pasifika students were the least likely to travel more than 354km and conversely the most likely to travel less than 44km for tertiary study.

Figure 7: Actual and predicted probabilities of a student travelling more than 354km for tertiary study by ethnic group



Note: The values of actual probabilities should not be compared directly with the values of the predicted probabilities. This is because of differences in how they are constructed and what each represents. However, the relationship between ethnic groups and actual probabilities and ethnic groups and predicted probabilities can be usefully compared. In particular, note that the value of the predicted probabilities is based on the modal reference group, and will vary if a different reference group is selected.

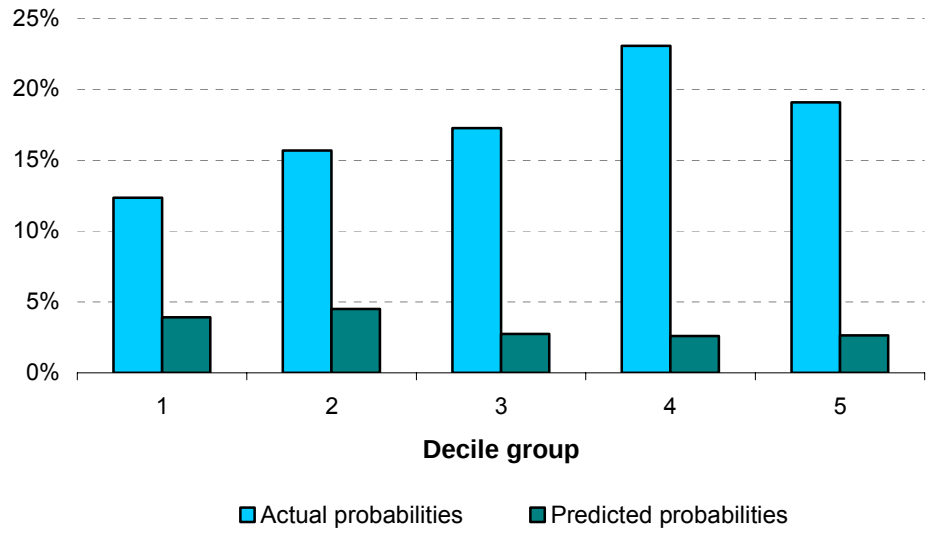
Decile of last secondary school

On an actual basis, students from higher decile schools (ie deciles 7 to 10) were more likely to travel more than 354km to attend a TEI campus. Students from decile 7 and 8 schools, on average, travelled further than other students, with a median of 40km. Rather surprisingly, students from decile 9 and 10 schools, and private schools, on average, travelled the shortest distances, with a median of 15km.[27]

When adjusted for other factors, students from lower decile schools were more likely to travel more than 354km. Those students coming from decile 3 and 4 schools were the most likely to travel more than 354km and conversely the least likely to travel less than 44km to study. Students who last attended a decile 7 or 8 school were the least likely to travel more than 354km and conversely the most likely to travel less than 44km to study.

[27] Boarding students are more likely to have attended a decile 9, decile 10, or a private secondary school. It is approximated that 6 percent of students in this group would have boarded at their last secondary school, and this could be having a small affect on this result.

Figure 8: Actual and predicted probabilities of a student travelling more than 354km by decile of last secondary school



Note: The values of actual probabilities should not be compared directly with the values of the predicted probabilities. This is because of differences in how they are constructed and what each represents. However, the relationship between ethnic groups and actual probabilities and ethnic groups and predicted probabilities can be usefully compared. In particular, note that the value of the predicted probabilities is based on the modal reference group, and will vary if a different reference group is selected.

While the exact reasons for this trend are unknown, it is possible to speculate that it is likely that many students from lower decile schools are entitled to more income-tested student support than those students from higher decile schools, making it easier for them to move away from the support of their parents. Students from higher decile schools may also be less inclined to leave the relative comfort and support of their parents' home. These two reasons could also help explain why students from decile 7 and 8 schools, when adjusted for other factors, were the least likely to travel long distances for tertiary study. They may possibly be stuck in the middle of no income-tested student support and without large parental financial support, perhaps forcing them to choose a TEI campus close to home so that they can continue to live at home.

It should be remembered that care is needed when generalising about the effects of socio-economic status from this variable. Secondary schools draw their students from such wide areas that the socio-economic conditions of people living within these wide areas will vary significantly.

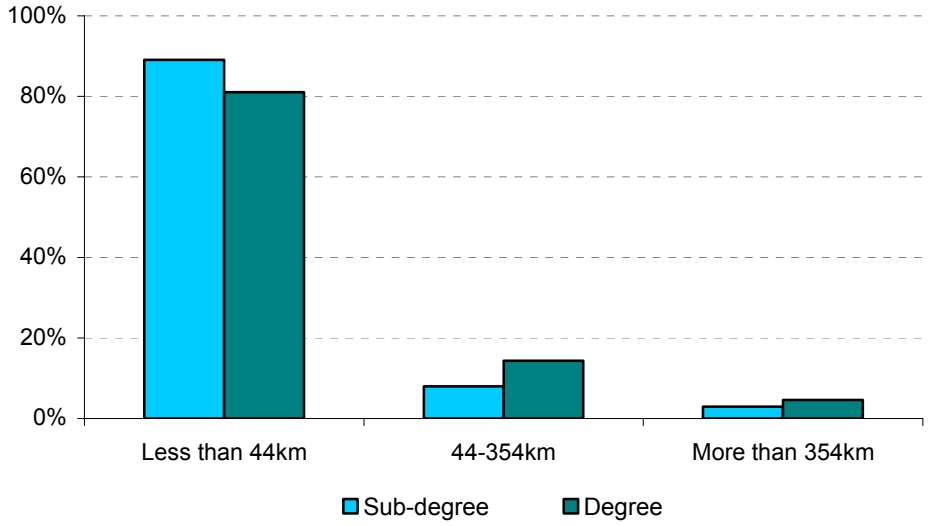
Campus and level of study

The regression analysis results show that the interaction effect of campus and level of study was statistically significant, indicating that there was a difference between sub-degree and degree-level study in how campus affects the distance a student will travel for tertiary study. The large numbers of response values[28] that were possible for this interaction variable make it impossible within this report to discuss the results of all response values. However, figure 9 shows the predicted probabilities of how far students travelled to study at Auckland University of Technology's main campus at

[28] There are 140 possible values that the interaction variable between campus and level of study can take.

both sub-degree and degree level, and it clearly indicates the difference between sub-degree and degree-level study on how far students travelled to attend Auckland University of Technology's main campus.

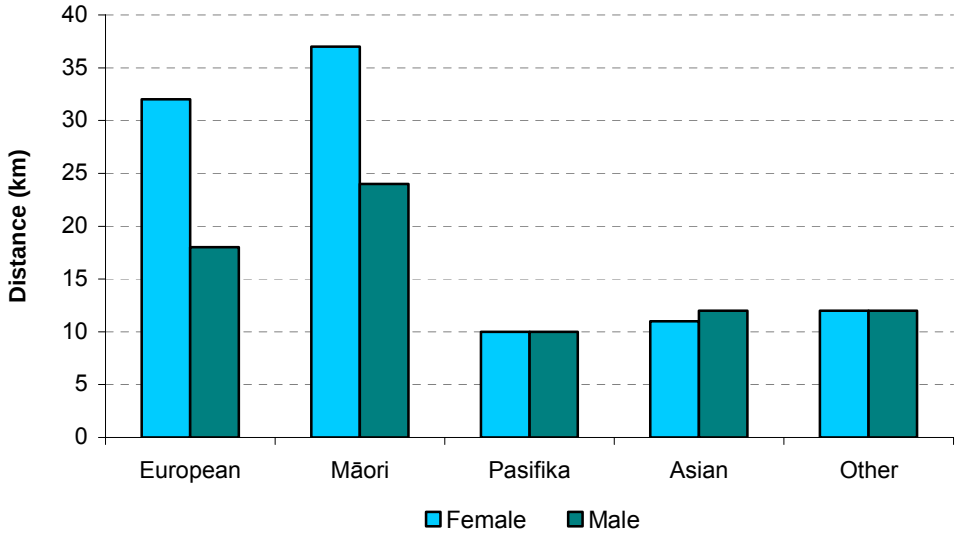
Figure 9: Predicted probabilities of a student travelling to Auckland University of Technology by level of study



Gender

On average, female students travelled further for tertiary study than males. Females travelled a median distance of 19km, compared with a median of 16km for males. Among Pasifika and Asian students there was no difference between females and males in the median distance travelled. However, European and Māori students had quite a significant difference.

Figure 10: Median distance travelled for tertiary study by ethnic group and gender



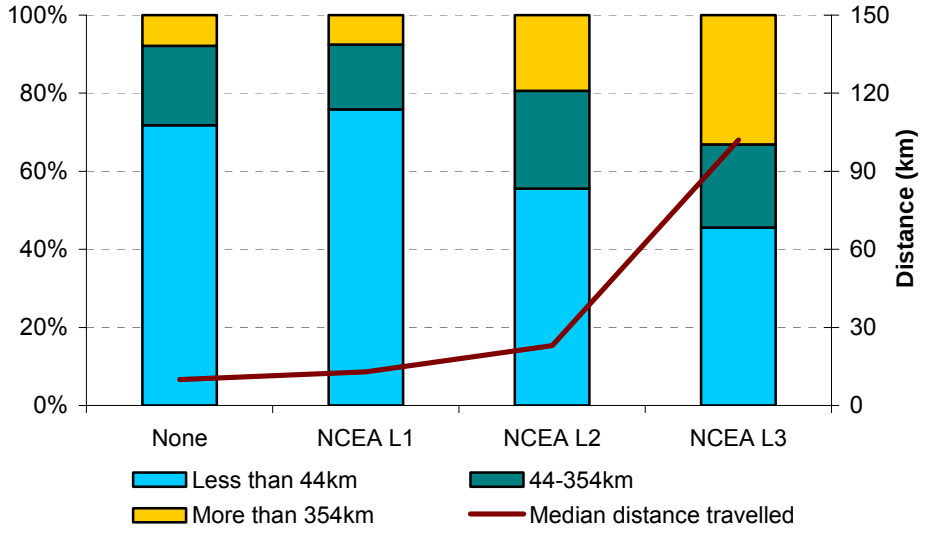
The regression analysis results indicate that women were more likely than men to travel more than 354km and conversely men were more likely to travel less than 44km for tertiary study.

Once other factors were held constant, the effects of gender do not differ greatly across the ethnic groups, with women more likely than men to travel more than 354km for tertiary study for all ethnic groups. Māori women were the most likely to travel more than 354km and Asian men were the least likely to travel that distance.

Highest school qualification

On average, students with a highest school qualification of NCEA level 3 travelled further than other students for tertiary study. Students with NCEA level 3 travelled a median distance of 102km, compared with 23km for students with NCEA level 2, 13km for students with NCEA level 1 and 10km for students with no school qualifications. Students with NCEA level 3 were also more likely than other students to travel more than 354km to attend a TEI campus. Students with NCEA level 1 were the most likely to travel less than 44km for tertiary study.

Figure 11: Distribution and median of distance travelled for tertiary study by highest school qualification



The regression analysis results showed that students who had a highest school qualification of NCEA level 3 were more likely to travel more than 354km for tertiary study, while students with no school qualification were the least likely to travel more than 354km. There was no statistically significant difference in the likelihood of students with no qualification, NCEA level 1 or NCEA level 2 travelling 0 to 44km.

Previous studies have shown that academic ability has an effect on the decision-making process of prospective tertiary students. While the relationship was also significant in this study, it was not found to be as important as in some previous studies. Blakers et al. (2003) found that academic ability was more important than access in a student's decision to move away from home to attend a university. However, the Australian study used the student's University Admissions Index (UAI) score, which is a better proxy of academic ability than that used in this study.[29] The Australian study also found that students with lower academic ability were more

[29] This study used also the level of the school qualification (NCEA level 1, 2 or 3) and did not reference the grades achieved in that qualification, whereas the UAI score uses a graduation of performance at year 12 level in the Australian high school system.

likely to move away from home, perhaps due to competitive entry to Australian universities. This trend was not apparent in our study.

Field of study

Students who study agriculture, environmental and related studies in their first year of tertiary study travelled further, on average, than other students to attend a TEI campus. This holds true for both sub-degree and degree-level qualifications. While, on average, students studying natural and physical sciences travelled the next furthest distance for study, this did not hold true for non-degree-level natural and physical science students. Students who, on average, travelled the shortest distance were studying information technology, perhaps reflecting the large number of providers offering information technology qualifications. Health and education were the only two fields of study where students, on average, travelled further for sub-degree study than degree study.

Table 2: Median distance travelled for tertiary study by field of study and level of qualification

Field of study	Sub-degree (km)	Degree (km)
Natural and physical sciences	14	141
Information technology	9	16
Engineering and related technologies	12	18
Architecture and building	10	18
Agriculture, environmental and related studies	124	340
Health	18	17
Education	25	20
Management and commerce	10	18
Society and culture	14	21
Creative arts	15	19
Food, hospitality and personal services	11	12
Mixed field programmes	13	30
Total	12	21

The regression analysis showed that by itself field of study was not a statistically significant factor in determining the likelihood of students travelling certain distances for tertiary study. However, as previously discussed, there was evidence that field of study was a factor in interaction with the campus variable.

It should be remembered that 12 broad levels were used to determine field of study in this study. It was likely that the use of these 12 levels is masking some of the effects of field of study and it may become more significant as an individual effect if we were able to look at a level of field of study that included, for example, medicine, law and veterinary science.

Level of study

On average, students enrolled in degree-level study in their first year travelled further to attend a TEI campus than those students who enrolled in sub-degree-level study in their first year.

The regression analysis showed that by itself level of study was not a statistically significant factor in determining the likelihood of students travelling certain distances for tertiary study. However, as previously discussed, there was evidence that level of study was a factor in interaction with the campus variable.

4 Conclusion

The results of this study show that geographic access to tertiary provision was a statistically significant factor in determining how far a student will travel to attend a TEI campus. Students who were comparatively isolated from tertiary provision had a higher likelihood of travelling further to attend a TEI campus, holding other factors constant. The effect of geographic access was more important for the group of students who studied at degree level at a university and less important for those who studied at sub-degree level at an ITP or wānanga.

This result would appear obvious, given that the further a student lived from a TEI campus the further they had to travel, but the results appear to go beyond this. The distance beyond which no student had to travel to attend their closest university was 354km; therefore, we could expect that students with any level of access to tertiary provision would have an equal probability of travelling more than this distance. However, students who were comparatively more isolated from tertiary provision were more likely to travel more than 354km to attend a TEI campus. In fact, students who were most likely to travel more than 354km were from towns such as Upper Hutt, Pukekohe and Tokoroa, which are all within 80km of a large university campus.

There was no doubt that students who lived close to tertiary provision had an advantage in that they were much more likely to travel less than 44km to attend a TEI campus.

This result was in contrast to the Australian study on student mobility which found that subject choice and academic ability, rather than access to a campus, are the factors that most influence the decision of students to move. While there are some study methodology reasons[30] for this, differences in the results of these two studies are also likely to be due to differences between New Zealand and Australian tertiary education systems. New Zealand's tertiary education system has fairly open access and this could be contributing to the fact that students with lower academic ability did not have to travel far to find a TEI campus that will accept them. This was likely to be lessening the influence of academic ability in determining how far a student travelled for tertiary study. It should also be noted that this study used highest school qualification as a proxy for academic ability and this is a rather coarse measure of ability.

We now know that students will travel some distance if they are isolated from tertiary provision but what we cannot answer from this study is whether people will choose not to study at tertiary level when disadvantaged by isolation from tertiary provision.

Interestingly, the results from this study show that field of study as an individual effect was not statistically significant in determining how far a student would travel to attend a TEI campus. However, the interaction effect between campus and field of study was statistically significant. So while field of study did in fact play a part in travel decisions of a student, it was a field of study at a particular TEI campus that

[30] The Australian study looks at those students who have moved away from home for study while this study looks at how far from their home base a student travelled for study. And the Australian study looks at just students attending universities while this study looks at students studying at all public tertiary institutions.

was important. Indeed it was the campus that was more important than the field of study in determining how far students travelled to attend a TEI campus.

Students who last attended lower decile schools had a higher likelihood of travelling further to attend a TEI campus than those from higher decile schools, when holding other factors constant. It could be possible that this was due to students from lower decile schools having greater access to income-tested student support provisions, such as student allowances, which made it easier for them to move away from their parental support. In contrast, students from higher decile schools may be less inclined to move away from the comforts of home and the financial support offered by parents.

There were some limitations, however, in making these assumptions based on school decile, given that a secondary school will draw its students from such wide areas that the socio-economic conditions of people living within these wide areas will vary significantly.

Appendix 1: Generalised logistic regression methodology

Generalised logistic regression model

Although distance travelled is a continuous variable for the purposes of this study we grouped it into three discrete responses: less than 44km, 44 to 354km, and more than 354km. Therefore distance travelled can take the value of 1, 2 or 3. Use of ordinary squares is not appropriate in this case as it will violate the assumption of normality and homoscedasticity of residuals and there is no assurance that the predicted value will lie between 0 and 1 (Ramanathan, 1998).

Logistic regression analysis is often used to investigate the relationship between discrete responses and a set of explanatory variables. Therefore, in this study logistic regression is used to analyse the impact of the explanatory variables on the distance a student travelled to attend a TEI campus. Logistic regression applies maximum likelihood estimation after transforming the dependent variable into a logit variable. In this way, logistic regression estimates the probability of a student travelling each of the three distance groups.

For an ordinal response the logistic regression model relies on the assumption of parallel lines across all levels of the response variable. This assumption did not hold true for the response variables in this study. However, generalised logistic regression treats the response variable as nominal and does not rely on the assumption of parallel lines as it fits a model where each non-reference category is contrasted with the reference category. Generalised logistic regression is the model we used in this study.[31] The reference response group is more than 354km.

The base generalised logistic regression equation took the form:

$$\log[DT_i/DT_{>354km}] = \beta_1 + \beta_2 \text{ access} + \beta_3 \text{ highest school qualification} + \beta_4 \text{ campus} + \beta_5 \text{ decile} + \beta_6 \text{ ethnic group} + \beta_7 \text{ field of study} + \beta_8 \text{ gender} + \beta_9 \text{ level of study} + \beta_{10} \text{ campus * field of study} + \beta_{11} \text{ campus * level of study}$$

where DT is the probability of a student travelling one of the three distance groups and i = 0 to 44km, 45 to 354km. Access, highest school qualification, campus, decile, ethnic group, field of study, gender, and level of study were dummy variables for the main effects. Campus * field of study and campus * level of study were the interaction effects.

Predicted probabilities

To aid with the interpretation of the results, predicted probabilities are provided for the variable in question. The predicted probability is calculated by substituting the modal values of the student characteristics into the generalised logit regression equations. This provides a reference group for which probabilities can be calculated. Then the actual value of the independent variable of interest is substituted into the regression equation. By doing so, the impact of the selected student characteristic on the predicted probability can be calculated for this reference group. The characteristics of the reference group in this analysis were: access = 225, highest

[31] SAS Enterprise Guide 3 was used to produce the regression output.

school qualification = NCEA level 3, decile of last secondary school = 9 or 10 or private, ethnic group = European, gender = female, campus = University of Auckland (Auckland), field of study = society and culture, and level of study = degree.

It is important to note that these predicted probabilities of travelling a certain distance are for the selected reference group only. As this reference group includes students who enrolled at the University of Auckland, they were less likely than other groups to travel more than 354km. If a different reference group was chosen, then the values of the predicted probabilities would change. However, the nature of the relationship between the factors analysed and the probability of travelling certain distances would not change if a different reference group was selected.

Appendix 2: Summary model statistics

Table 2 summarises the characteristics of the population used in this study, which is limited to those first-time domestic tertiary students under 20 years of age who had a known secondary school and entered full-time intramural study directly from school.

Table 3: Summary cohort statistics

Characteristic	Number of students	Percent of students	Median distance travelled (km)
Distanced moved			
Less than 44km	30,830	57.7	
44-354km	10,346	19.4	
More than 354km	9,735	18.2	
Gender			
Female	28,272	52.9	19
Male	25,182	47.1	16
Ethnic group			
European	34,306	64.2	22
Māori	6,338	11.9	31
Pasifika	2,835	5.3	10
Asian	7,188	13.4	11
Other	1,968	3.7	12
Unknown	819	1.5	
Highest school qualification			
No school qualification	3,490	6.5	10
NCEA level 1 qualification	19,350	36.2	13
NCEA level 2 qualification	10,825	20.3	23
NCEA level 3 qualification	18,009	33.7	102
Overseas/unknown qualification	1,780	3.3	
Decile of last school attended			
Deciles 1-2	3,261	6.1	18
Deciles 3-4	7,376	13.8	19
Deciles 5-6	10,867	20.3	22
Deciles 7-8	10,994	20.6	40
Deciles 9-10 (including unclassified private schools)	20,956	39.2	15
Field of study			
Natural and physical sciences	7,350	13.8	121
Information technology	1,568	2.9	10
Engineering and related technologies	6,454	12.1	14
Architecture and building	2,080	3.9	13
Agriculture, environmental and related studies	1,283	2.4	201
Health	2,760	5.2	17
Education	1,602	3.0	22
Management and commerce	8,979	16.8	16
Society and culture	11,481	21.5	19
Creative arts	4,466	8.4	17
Food, hospitality and personal services	2,277	4.3	11
Mixed field programmes	3,154	5.9	14
Level of study			
Sub-degree	20,017	37.4	12
Degree	33,437	62.6	21
Sub-sector			
University	34,836	65.2	19
ITP	17,045	31.9	11
College of Education	637	1.2	27
Wānanga	936	1.8	22
Campus			
University of Auckland (Auckland)	10,005	18.7	12
University of Otago (Dunedin)	6,497	12.2	807
Victoria University of Wellington (Wellington)	4,479	8.3	55
University of Canterbury (Christchurch)	3,702	6.9	16
Auckland University of Technology (Auckland)	3,625	6.8	13
University of Waikato (Hamilton)	2,513	4.7	81
Christchurch Polytechnic Institute of Technology (Christchurch)	1,888	3.5	7
Manukau Institute of Technology (Manukau)	1,852	3.5	10
Massey University (Palmerston North)	1,747	3.3	161
Unitec New Zealand (Auckland)	1,731	3.2	12
Otago Polytechnic (Dunedin)	1,258	2.4	55

Characteristic	Number of students	Percent of students	Median distance travelled (km)
Campus - continued			
Wellington Institute of Technology (Lower Hutt)	1,217	2.3	15
Waikato Institute of Technology (Hamilton)	963	1.8	23
Southern Institute of Technology (Invercargill)	878	1.6	32
Bay of Plenty Polytechnic (Tauranga)	867	1.6	13
Universal College of Learning (Palmerston North)	851	1.6	19
Massey University (Wellington)	789	1.5	230
Lincoln University (Lincoln)	774	1.4	340
Massey University (Albany)	674	1.3	13
Eastern Institute of Technology (Napier)	606	1.1	14
Western Institute of Technology Taranaki (New Plymouth)	529	1.0	5
Whitireia Community Polytechnic (Porirua)	506	0.9	14
Southern Institute of Technology (Christchurch)	425	0.8	12
Waiariki Institute of Technology (Rotorua)	419	0.8	38
Northland Polytechnic (Whangarei)	369	0.7	8
Christchurch College of Education (Christchurch)	345	0.6	9
Aoraki Polytechnic (Timaru)	328	0.6	37
Tairawhiti Polytechnic (Gisborne)	287	0.5	3
Nelson Marlborough Institute of Technology (Nelson)	285	0.5	11
Dunedin College of Education (Dunedin)	251	0.5	138
Universal College of Learning (Wanganui)	249	0.5	2
Telford Rural Polytechnic (Balclutha)	245	0.5	437
Tai Poutini Polytechnic (Greymouth)	177	0.3	2
Te Wānanga O Aotearoa (Rotorua)	155	0.3	55
Te Wānanga O Aotearoa (Hamilton)	146	0.3	16
Te Wānanga O Aotearoa (Manukau)	145	0.3	9
Universal College of Learning (Masterton)	143	0.3	2
Tai Poutini Polytechnic (Auckland)	123	0.2	14
Otago Polytechnic (Cromwell)	108	0.2	213
Whitireia Polytechnic (Kapiti)	108	0.2	6
Aoraki Polytechnic (Dunedin)	84	0.2	4
Aoraki Polytechnic (Christchurch)	80	0.1	6
Waiariki Institute of Technology (Whakatane)	78	0.1	1
Te Wānanga O Aotearoa (Tokoroa)	74	0.1	3
Nelson Marlborough Institute of Technology (Blenheim)	64	0.1	3
Te Wānanga O Raukawa	61	0.1	215
Te Wānanga O Aotearoa (Palmerston North)	56	0.1	45
Te Wānanga O Aotearoa (Te Awamutu)	52	0.1	28
Te Wānanga O Aotearoa (Porirua)	42	0.1	24
Te Wānanga O Aotearoa (Te Kuiti)	36	0.1	80
Te Wānanga O Aotearoa (Gisborne)	33	0.1	2
Northland Polytechnic (Kerikeri)	32	0.1	23
Waiariki Institute of Technology (Tokoroa)	29	0.1	29
Dunedin College of Education (Invercargill)	29	0.1	5
Te Whare Wānanga O Awanuiarangi (Whakatane)	28	0.1	11
Eastern Institute of Technology (Hastings)	27	0.1	6
Te Wānanga O Aotearoa (Te Puke)	26	0.0	21
Western Institute of Technology (Taumarunui)	24	0.0	3
Christchurch Polytechnic Institute of Technology (Auckland)	22	0.0	17
Tai Poutini Polytechnic (Christchurch)	22	0.0	4
Waiariki Institute of Technology (Taupo)	21	0.0	3
University of Waikato (Tauranga)	21	0.0	5
Southern Institute of Technology (Gore)	20	0.0	1
Te Wānanga O Aotearoa (Huntly)	19	0.0	69
Te Wānanga O Aotearoa (Whangarei)	18	0.0	113
Otago Polytechnic (Oamaru)	17	0.0	84
Western Institute of Technology Taranaki (Hawera)	17	0.0	1
Bay of Plenty Polytechnic (Edgecumbe)	14	0.0	11
Universal College of Learning (Levin)	14	0.0	2
Northland Polytechnic (Dargaville)	13	0.0	1
Waikato Institute of Technology (Te Kuiti)	11	0.0	24
Northland Polytechnic (Kawakawa)	10	0.0	30
Aoraki Polytechnic (Ashburton)	9	0.0	2
University of Otago (Wellington)	9	0.0	456
Te Wānanga O Aotearoa (Blenheim)	8	0.0	2
Northland Polytechnic (Rawene)	6	0.0	294
Christchurch College of Education (Nelson)	6	0.0	9
Te Wānanga O Aotearoa (Invercargill)	6	0.0	4
Tai Poutini Polytechnic (Wanaka)	5	0.0	138
Te Wānanga O Aotearoa (Paeroa)	5	0.0	60
Northland Polytechnic (Kaitaia)	4	0.0	77

Characteristic	Number of students	Percent of students	Median distance travelled (km)
Campus - continued			
Waikato Institute of Technology (Auckland)	4	0.0	12
Christchurch College of Education (New Plymouth)	4	0.0	40
Te Wānanga O Aotearoa (Dunedin)	4	0.0	4
Te Wānanga O Aotearoa (Hawera)	4	0.0	116
Eastern Institute of Technology (Waipukurau)	3	0.0	50
The Open Polytechnic of New Zealand (Lower Hutt)	3	0.0	510
Te Wānanga O Aotearoa (Hastings)	3	0.0	28
Te Wānanga O Aotearoa (Levin)	3	0.0	3
Te Whare Wānanga O Awanuiarangi (Manukau)	3	0.0	253
Te Whare Wānanga O Awanuiarangi (North Shore)	3	0.0	157
Christchurch College of Education (Rotorua)	2	0.0	6
Te Whare Wānanga O Awanuiarangi (Levin)	2	0.0	65
Te Whare Wānanga O Awanuiarangi (Hamilton)	2	0.0	17
Massey University (Napier)	1	0.0	5
Te Wānanga O Aotearoa (Christchurch)	1	0.0	4
Te Wānanga O Aotearoa (Picton)	1	0.0	2

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