ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Pacheco, Gail; Dye, Jessica

Working Paper

Estimating the Cost of Youth Disengagement in New Zealand

Economics Working Paper Series, No. 2013/04

Provided in Cooperation with:
Faculty of Business, Economics and Law, Auckland University of Technology (AUT)

Suggested Citation: Pacheco, Gail; Dye, Jessica (2013) : Estimating the Cost of Youth Disengagement in New Zealand, Economics Working Paper Series, No. 2013/04, Auckland University of Technology (AUT), Faculty of Business, Economics and Law, Auckland

This Version is available at:
https://hdl.handle.net/10419/242518

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

Department of Economics
Working Paper Series

Estimating the Cost of Youth Disengagement in New Zealand

Gail Pacheco and Jessica Dye

2013/04

0800 AUT UNI
www.autbusiness.ac.nz

Estimating the Cost of Youth Disengagement in New Zealand

Gail Pacheco* and Jessica Dye
Auckland University of Technology
May, 2013

Abstract

Youth exclusion, disengagement, and overall underutilisation in the labour market has short term costs to the economy, as well as long term impacts on society. In this research we project the loss to productivity, measured in foregone wages, and the expected cost to public finances for NZ and Auckland youth aged 15-24 not in employment, education, or training (collectively known as NEET). We estimate the expected per capita cost of each NEET youth in NZ is approximately $26,847 over the next 1-3 years. The analogous cost for the Auckland cohort is found to be higher, due largely to higher foregone wages. Closer inspection reveals that Auckland NEET youth of Maori and Pacifica descent are associated with relatively high per capita costs compared to their NZ European counterparts. This result is driven by the greater propensity of Maori and Pacific Peoples to disengage from the education system earlier, to withdraw from the work force due to caregiving responsibilities at a younger age, and to experience longer durations of unemployment than their NZ European counterparts. The sizeable estimated costs associated with NEET youth highlight the urgent need for policy intervention directed at improving transitions from NEET status to the workforce, or further education/training.

Keywords: NEET, youth disengagement, economic productivity, labour market, transition to work

JEL Classification: J64, J24

* Gail Pacheco is an Associate Professor in the Department of Economics, AUT University, email gail.pacheco@aut.ac.nz

1. Introduction

There has been growing interest in recent years in the labour market issues that youth face. A wide range of empirical evidence suggests that young people out of employment or education are likely to have a lifetime of poorer outcomes in terms of future unemployment (e.g. Gregg, 2001; Bynner & Parsons, 2002; Maloney, 2004; Mroz & Savage, 2006), lower future wages (e.g. Ellwood, 1982; Gibson, 2000; Arulampalam, 2001; Gregg & Tominey, 2005; Cruces, *et al.*, 2012), increased criminal activity (e.g. Carmichael & Ward, 2000; Fergusson, *et al.*, 2001) and even reduced happiness and health (e.g. Goldsmith, *et al.*, 1996; Fergusson, *et al.*, 1997; Clark, *et al.*, 2001; Blanchflower, 2010). For example, employing a longitudinal survey data set of young people in the United States, Goldsmith, *et al.* (1996) find that youth who experience unemployment or time spent out of the labour force can experience long-term harm to their self-esteem, suffering from depression, a sense of loss of identity (self-alienation), and anxiety, as well as future labour force difficulties. In addition to finding evidence of persistence in unemployment, Mroz and Savage (2006) find that early spells of unemployment for U.S. individuals also lead to a wage penalty in later years; with a six month spell of unemployment experienced at 22 years of age, leading to wages that are 2-3% lower than they otherwise would have been at age 30-31. In terms of New Zealand (NZ), Maloney (2004) also finds clear evidence of path dependence in that indications of inactivity at an earlier age are associated with higher probabilities of inactivity at a later age. Meanwhile, Fergusson, *et al.* (1997) and Fergusson *et al.* (2006) present evidence to suggest that young New Zealanders exposed to unemployment have higher rates of substance use and anxiety disorder, and of youth offending respectively.

Such research indicates that youth disengaged from both the labour market, as well as the education system has both short run, as well as serious long term consequences for the individual, and the economy. To better understand this segment of the youth population, Statistics NZ, in 2004, began to measure and publicly report the numbers of youth that were neither employed, nor in education or training – this group is collectively known as NEETs. While the concept of NEETs is related to the measurement of youth unemployment, there are some important differences that need to be recognised. A person is defined as being unemployed in NZ if they do not have a paid job, but were available and had been actively looking for work in the previous four weeks. Therefore, unemployment figures exclude individuals who are available for work, but not actively looking. Consequently, unemployment figures do not fully capture the hardships experienced by youth who have left the education system, but are not actively seeking employment opportunities. In contrast, NEET statistics include some of the economically inactive. As a result,

NEET rates are a common measure of non-utilised youth labour market potential. The Department of Labour (2009) describes NEET individuals as "*missing the opportunity to develop their potential at an age that heavily influences future outcomes*". The implication is that these young people face a higher probability of becoming disadvantaged or marginalised later in life.

While there is considerable literature studying the consequences of youth disengagement, remarkably little research to-date has attempted to quantify the associated individual, social, and economic costs. We contribute to this gap in the literature by estimating the expected economic cost of NEET youth in NZ. Specifically, we project the loss to productivity, measured in foregone wages, and the expected cost to public finances as at December 2012. We focus explicitly on short-term costs (1-3 years) associated with youth aged 15-24 years being NEET. We conduct this analysis at both the aggregate country level of NZ, as well as for the biggest urban area within NZ – Auckland. A priori we expect that the cost attributed to a NEET youth in Auckland will be higher than that for NZ in general, largely due to the higher foregone wages in Auckland. This research will also further devolve our analysis by ethnicity to compare the cost of NEET youth that are Maori, Pacifica, and NZ European. Such sub-group analysis is important in informing policy, such that intervention in the youth labour market can be better targeted. It should be noted at this early stage that the estimated costs projected in the following analysis are conservative in nature, and do not include expected costs that are difficult to quantify or attribute proportionally to NEET versus non-NEET status, e.g. the impact on criminal activity, psychological distress and depression, substance abuse, etc.

The remainder of this paper is as follows: Section 2 presents a discussion of the NEET problem in NZ, and provides descriptive evidence of relevant trends by age group over the period of March 2004 (when Statistics NZ first starting producing these statistics) to December 2012. Relevant literature establishing the negative consequences of youth becoming NEET to individual wellbeing, as well as to the wider society, is then reviewed in Section 3. In Section 4, we outline our methodological approach to computing the economic cost of NEET youth, which is followed by a discussion of results in Section 5.

2. Background Context: NEET in NZ

As at December 2012, there were 88,600 NEET youth aged 15-24 in NZ[1]. Of concern is that while this figure equates to a NEET rate which is lower than the 2012 OECD average (~14% compared to ~16%), the number of NEET youth in NZ increased 34.4% since data for this group was first collected by Statistics NZ in March 2004. Noteworthy is the variation in NEET rates between genders, with females being more prevalent in the NEET statistics. Specifically, the NEET rate for young women aged 15-24 was 17.7% as at December 2012, while that for young men was 10.4%. Disaggregating by age, this result is driven primarily by the older (20-24 years old) group, with the NEET rate for females in this age group more than double that for their male counterparts (24.5% compared to 12.0%). This appears to be due to substantially higher numbers of young women classified as inactive and engaged in caregiving.

Of the total NZ NEET youth population at December 2012, 29,000 lived in the country's economic hub - Auckland. This figure equates to 13% of all young Aucklanders in this age group[2], and ~33% of total NZ NEET in this time period. As with NZ NEET more broadly, the total number of NEET youth in this region has grown substantially (~46%) since March 2004. In both instances, this upward trend is driven largely by a rise in the number of 20-24 year olds that are NEET over the period 2004 to 2012 (see figures 1 – 4 below).

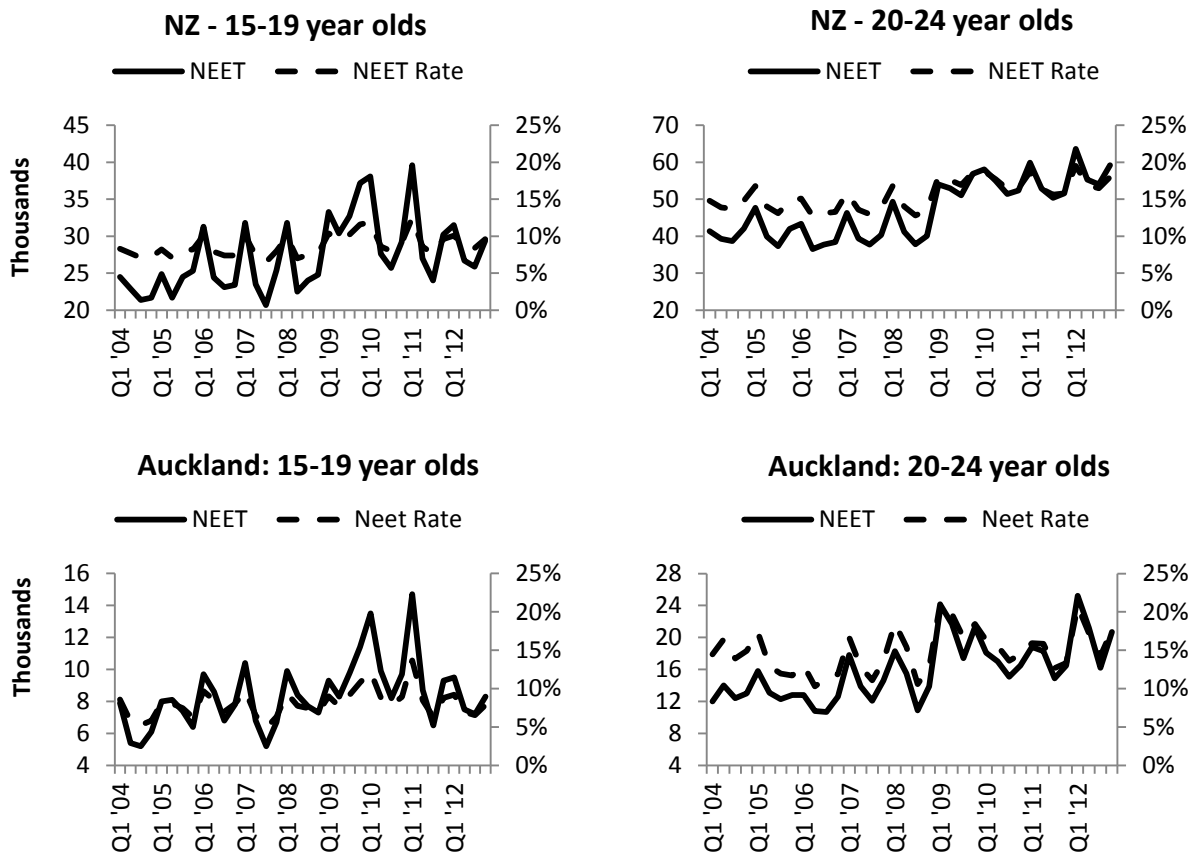
It is important to note that the gravity of the upward trend apparent in NEET rates is somewhat mitigated by the strong national and regional population growth experienced over the last decade (NZ >8%, Auckland >10%[3]). Additionally, the NEET rate itself has only increased 2.5 (1.6) percentage points for NZ (Auckland) over this same time period, going from ~11.4% (~11.4%) in March 2004 to ~13.9% (~13.0%) in December 2012.

Nevertheless, the rising number of youth NEET pre and post the 2008 recession is indicative of wider issues affecting youth in NZ that are yet to be addressed, and likely to get worse as the age cohort of 15-24 year olds looks set to rise. Additionally, the Auckland NEET average for youth masks significant differences among localities and ethnicities[4]. For example, the NEET rate for

[1] Source: Statistics NZ, Household Labour Force Survey.
[2] Specifically, ~13% of Aucklanders in this age group who are classified as usually resident, non-institutionalised, and civilian.
[3] Source: Statistics NZ, Population Estimates.
[4] Birnie, *et al.* (2012) also document these differences.

youth aged 15-24 in the Manukau district ward (which includes two of Auckland's lowest socio-economic districts, Mangere-Otahuhu and Otara-Papatoetoe) in September 2012 was ~21.3%[5], well above the national average. Similarly, youth of Maori and Pacifica descent are at greater risk of becoming NEET compared to their NZ European and Asian counterparts. In December 2012, the NEET rates for individuals aged 15-24 were ~21.5% and ~20.9 for Maori and Pacific Peoples respectively, compared to ~10.4% and ~11% for European and Asian individuals. Consequently, the research within this report is aimed at not only understanding regional differences, in terms of trends and cost, of the rising NEET issue (by comparing Auckland to NZ as a whole), but also ethnic differences. The afore-mentioned statistics highlight that there are ethnic sub-groups within Auckland that require urgent attention/policy directed at improving their transitions between NEET status to the workforce, education, and/or training.

Figures 1 - 4: Number of NEETs, NZ & Auckland: 2004-2012



Source: Statistics NZ, Household Labour Force Survey.

The above figures (Figures 1 – 4) disaggregate 15-24 year old NZ and Auckland NEET youth by age to investigate any distinctive patterns over the sample period of 2004-2012. The first

[5] Source: Statistics NZ, Household Labour Force Survey.

observation is that the number of NEET is consistently lower for 15-19 year olds, relative to 20-24 year olds. This is expected as this age group is more likely to have individuals participating in the education sector – especially since the compulsory school leaving age in NZ is 16[6]. All figures also point to seasonal fluctuations in NEET numbers, particularly evident for 15-19 year old NEETs – with drops in the NEET rate in quarter 4 (December) each year, followed by rises in quarter 1 (March). This is likely due to the rise in part-time and contract employment during the Christmas and summer season. Finally, in-line with prior evidence that young people are particularly sensitive to labour market downturns (e.g. Lynch & Richardson, 1982; Raffe, 1984; Kahn, 2010; Bell & Blanchflower, 2011; Fabling & Mare, 2012), a rise in the number of NEET youth during the 2008/09 recession instigated by the global financial crisis is apparent. With the exception of the Auckland 15-19 year old cohort, NEET numbers have remained at elevated levels since this time courtesy of a subdued labour market. During recessionary periods, NZ youth are not only competing for fewer jobs with older, more skilled/experienced workers, but the industries their employment is typically concentrated in are most vulnerable to changes in economic performance, such as hospitality, tourism, communication services, and construction (Department of Labour, 2010).

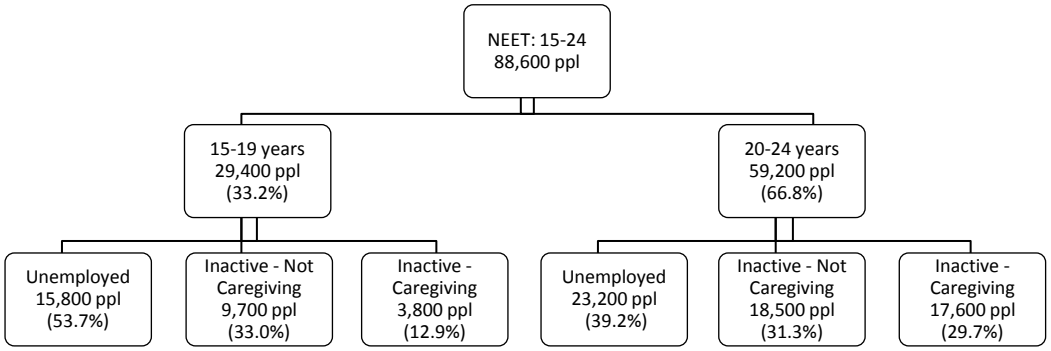
Figures 5 and 6 outline NEET youth in NZ and Auckland by age group and labour force status. Based on estimates from the Household Labour Force Survey, there were **29,400** (59,200) 15-19 (20-24) year olds classified as NEET in NZ in the fourth quarter of 2012. Of these, ~54.7% (~39.2%) in the 15-19 (20-24) group were unemployed, ~33.0% (~31.3%) inactive and not engaged in caregiving, and ~12.9% (~29.7%) inactive and engaged in caregiving. A comparable cohort breakdown reveals similar proportions in labour force status for Auckland NEET youth (Figure 6)[7]. Not demonstrated in the breakdown for the aggregated NEET cohort in Auckland, however, are the differences in labour market status propensities between ethnic sub-groups.

Analogous breakdowns for Auckland NEET youth disaggregated by ethnicity provided in Appendix C highlight distinct variation in NEET status across ethnicities. As at December 2012, unemployment accounted for ~56.7%, ~39.7%, and ~40.5% of European, Maori, and Pacifica

[6] Unfortunately, Statistics NZ does not collect information on individuals that are NEET for the 16-19 age bracket.
[7] Source: Statistics NZ, Household Labour Force Survey. The percentages for either age group of the NZ cohort do not add to 100% (specifically, 99.7% and 100.2% for 15-19 and 20-24 respectively) due to rounding by Statistics New Zealand. Similarly, percentages for the 20-24 age group in the Auckland cohort do not add to 100%, but rather 99.5%.

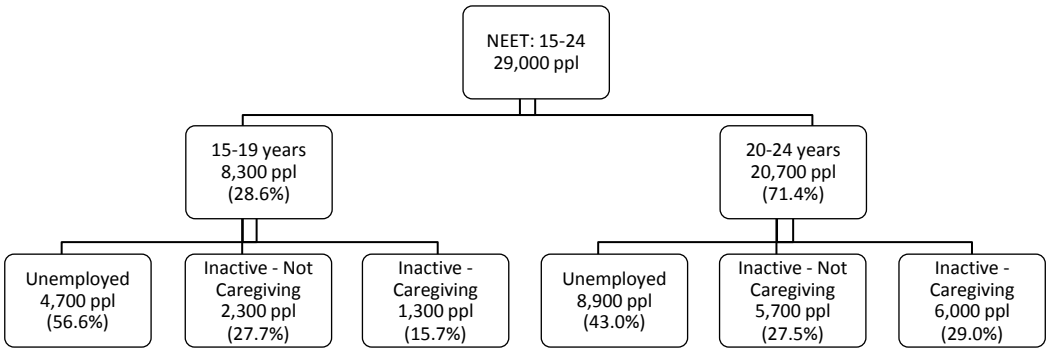
NEET youth aged 15-24 respectively[8]. Meanwhile, inactivity and engaged in caregiving (inactivity not engaged in caregiving) accounted for ~15.8% (~27.5%), ~44.4% (~17.5%), and ~32.1% (~27.4%) of European, Maori, and Pacifica NEET youth in Auckland aged 15-24. Apparent is that the occurrence of European teenagers that are classified as unemployed is markedly higher than youth of Maori and Pacifica descent, for which the propensity to become inactive is greater. The variation in rates of NEET youth aged 15-19 classified as inactive due to care-giving activity is worthy of particular mention. Specifically, the occurrence of Maori (Pacifica) teenagers that are NEET falling into this category is nearly 3 (2) times higher than their NZ European counterparts. This observation is in-line with prior NZ evidence that teenage birth rates are significantly higher for youth of Maori and Pacifica ethnicity than Pakeha (e.g. Dickson, *et al.*, 2000; Families Commission, 2011). A recent report by the Families Commission (2011) finds that Maori teenage women have higher rates of fertility even after controlling for socio-economic factors known to influence teenage pregnancy rates.

Figure 5: Breakdown of NZ NEETs, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

Figure 6: Breakdown of Auckland NEETs, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

[8] Due to very small sample size in some instances we are unable to conduct disaggregated analysis for Auckland NEET of Asian ethnicity.

3. Literature Review

There are a range of negative consequences associated with young people being NEET. Not only are these consequences borne by the individual, they also generate costs to society in terms of lost productivity and public finances, as well as have other wider social implications. The international and domestic literature suggests that these costs broadly include: scarring, in terms of future employment prospects and wages (i.e. reduced economic productivity); increased crime; and reduced quality of life.

Scarring – Future Employment Prospects & Wages

There is considerable evidence to suggest that indications of inactivity at an early age are associated with higher probabilities of inactivity at a later age, as well as lower wages later in life (e.g. Ellwood, 1982; Narendranathan & Elias, 1993; Arulampalam, 2001; Bynner & Parsons, 2002; Maloney, 2004; Gregg & Tominey, 2005; Mroz & Savage, 2006; Cruces, *et al.*, 2012)[9]. For example, Gregg (2001) finds that, even after controlling for risk factors likely to raise the probability of an individual experiencing unemployment, British youth who experience unemployment disproportionately go on to experience further periods of being out of work (either unemployment or inactivity) in their prime age adult years (28-33 years of age). This path dependence is found to be significantly more pronounced for men than for women. Likewise, in terms of NZ, Maloney (2004) finds evidence of path dependence, in that indications of inactivity at an earlier age are associated with higher probabilities of inactivity at a later age.

Prior literature also documents the existence of a scarring effect on the future wages of youth that experience early disengagement (e.g. Ellwood, 1982; Arulampalam, 2001; Gregg & Tominey, 2005; Mroz & Savage, 2006; Cruces, *et al.*, 2012). When these individuals do return to the labour market, they may find work of a lower skill level than their non-NEET counterparts. This results in a wage differential between youth workers that had a period of being NEET (i.e. those who had a longer transition period into the labour market) versus those that have no NEET history (i.e. those that had a relatively smooth transition into the labour market). Gregg and Tominey (2005) find evidence in the UK of scarring in the form of persistently reduced wages stemming from an individual's youth unemployment experience. They find a sizeable wage scar for males and females

[9] Explanations for the observed persistence in unemployment/inactivity and wage scarring vary. Some popular explanations are that bouts of inactivity at a young age might hinder human capital accumulation (Becker, 1964; Mroz & Savage, 2006), damage self-esteem or generate habituation effects (Clark, *et al.*, 2001), and/or signal low productivity to employers (Lockwood, 1991; Manning, 2000).

at age 23, followed by a ten year recovery period, as long as no further unemployment spells are experienced. They also find evidence of a smaller residual wage scar of 8% that can persist for up to 20 years, even if there are no further unemployment experiences. Mroz and Savage (2006) find qualitatively similar results for youth in the U.S., while Cruces, *et al.* (2012) present similar findings within the Argentinian and Brazilian context. Further, while Cruces, *et al.* (2012) find that the wage penalty diminishes over time, their results also point to variations across different skill groups, with low skilled individuals experiencing persistent wage penalties over time.

A factor likely to further accentuate the wage effect for NEET youth is lower educational attainment (Cruces, *et al. 2012*). There is considerable evidence on the returns to education in terms of higher wages. For instance, reviewing the international literature Psacharopoulos and Patrinos (2004) find that the average rate of return for another year of schooling is slightly more than 6% per year in OECD countries. Examining annual wage differentials in NZ, Gibson (2000) shows a high return to academic credentials, particularly for ethnic minorities such as Maori and Pacifica[10]. He posits that this wage effect is attributable to credentials signalling worker productivity to employers[11]. The following empirical analysis takes this factor into consideration, as we explicitly account for the likely impact of educational underachievement on wages in the next 1-3 years for NEET individuals in NZ.

Increased Criminal Activity

Higher rates of youth inactivity and unemployment are also often seen as precursors to rising crime rates (e.g. Chiricos, 1987; Carmichael & Ward, 2000; Fergusson, *et al.*, 2001; Fergusson, *et al.*, 2006; Wu & Wu, 2012). Carmichael and Ward (2000) find a systematic positive relationship between burglary rates and male unemployment rates in England and Wales. While their results are irrespective of age, they do find a consistent and positive relationship between youth unemployment and criminal damage, and robbery rates. Additionally, making use of a NZ birth cohort sample (up to the age of 18), Fergusson, *et al.* (2006) find that an increase in the duration of unemployment was significantly associated with rises in youth offending.

Reduced Quality of Life

Finally, research suggests that unemployment among young people is associated with reductions in quality of life, particular with regard to a rise in the prevalence of mental health issues, such as

[10] Additional NZ evidence confirming this relationship include Brosnan (1985), Maani (1999), and Maani (2000).
[11] See Stiglitz (1975) for in-depth discussion of "screening" theory as it relates to the returns on education.

depression, lower self-esteem, and anxiety (e.g. Feather, 1982; Dooley & Catalano, 1988; Dew, *et al.*, 1992; Goldsmith, *et al.*, 1996; Fergusson, *et al.*, 1997; Mathers & Schofield, 1998; Clark, *et al.*, 2001; Fergusson, *et al.*, 2001; Beland, *et al.*, 2002; Blakely, *et al.*, 2003; Gerdtham & Johannesson, 2003; Blanchflower, 2010), and substance abuse (Fergusson, *et al.*, 1997; Fergusson, *et al.*, 2001; Blanchflower, 2010). Employing a longitudinal survey data set of young people in the United States, Goldsmith, *et al.* (1996) also find that youth which experience unemployment or time spent out of the labour force can experience long-term harm to their self-esteem, suffering from depression, a sense of loss of identity (self-alienation), and anxiety, as well as future labour force difficulties. The impact of these psychological attitudes also places an increasing burden on the immediate family of unemployed youth. For example, in a recent UK survey of young individuals, more than a quarter of those that had been unemployed said unemployment was a cause for arguments with family, and 10% said it drove them to drugs or alcohol[12].

There is also ample evidence in NZ linking unemployment with a lower quality of life. For example, Fergusson, *et al.* (1997) examine the association between exposure to unemployment following school leaving and rates of psychiatric disorder using a NZ birth cohort (up to the age 18). They find that young people exposed to unemployment have higher rates of substance use and anxiety disorder. Moreover, employing census data from 1991, Blakely, *et al.* (2003) find that being unemployed is associated with between a two to three-fold increase in the relative risk of suicide, compared with being employed.

Quantifying the Cost of NEET

The literature reviewed above highlights the wide range of costs associated with youth disengagement. To-date, however, scant work on actually quantifying these costs has been attempted. Notable exceptions are the works by Godfrey, *et al.* (2002) and Coles, *et al.* (2010) which attempt to estimate the life-time cost of NEET youth in the UK. The latter of these studies being an update of the former, the average per capita current cost of UK NEET youth (aged 16 to 18) is estimated to be £16,649 in resource and public finance costs[13]. As yet, no attempt has been made to quantify the cost of NEET youth in NZ.

[12] The Prince's Trust (2010) YouGov Youth Index, The Prince's Trust.

[13] Current costs refer to the cost incurred while these NEET youth are in the 16-18 year age bracket. We derive the per capita cost based on total current resource and public finance costs estimated and NEET numbers presented in the paper by Coles, *et al.* (2010).

In forming our estimate of the cost of NEET youth in NZ we would ideally take into account costs relating to all of the potential consequences: direct and indirect; as well as immediate and delayed. Unfortunately, however, some costs are difficult to quantify due to the unavailability of necessary data in many instances, and the inherent difficulty of estimating costs of an indirect nature. There are a couple of instances in past literature where researchers have attempted to provide a loose framework with which to estimate the cost of outcomes such as poorer health, and increased crime (see Godfrey, *et al.* (2002) and Coles, *et al.* (2010) for research in this vein). However, by the authors' own admission, data limitations lead to largely speculative estimates. Additionally, their estimates rely heavily on assumptions derived from individual case studies, and prior UK research which attributes specific outcomes to NEET versus non-NEET individuals. The lack of such research in NZ further hinders our estimation process of these indirect costs.

The following methodology (outlined next in Section 4) allows us to explicitly consider the likely effect of educational underachievement on future wages when NEET youth (re)enter the labour force. Specifically, we are able to construct cost estimates based on lost productivity and burden on the public finances of the country. Due to unavailability of appropriate panel data, we restrict our purview to estimating short-run costs over a 1-3 year time period. Consequently, our estimated costs are likely an underrepresentation of the true cost of increasing NEET levels, but can nevertheless be viewed as lower bound estimates when designing policy aimed at intervention.

4. Methodology

To compute estimates of the associated costs for NZ NEET youth, the following analysis focuses on: i) youth NEET that are unemployed; ii) youth NEET that are inactive (i.e. neither employed nor in education); and iii) youth NEET that don't reach their educational potential and consequently, upon entering the labour force, underachieve.

We define NEET youth as 15-24 year olds, as this captures the transition into the labour market at different points in a youth's timeline[14]. Data is sourced from statistics NZ for youth aged 15-19 and 20-24. Following Godfrey, *et al.* (2002), costs are defined as the excess cost of being in the NEET group compared to the hypothetical situation that these youth would have experienced (on average) as their non-NEET counterparts aged 15-24. Wherever possible, we have drawn on

[14] This is also similar to analysis by Sissons and Jones (2012) who focus on the 16-24 year bracket for the UK.

recent relevant NZ estimates from Statistics NZ data. Where this was not possible, we use comparable figures from overseas research and state these assumptions.

The focus of our efforts is on **short term costs over a 1 to 3 year period**. As noted, throughout our analysis we take a conservative approach to our estimation, and, hence, view the cost estimates produced forthwith as lower bound estimates for the economic cost of NEET youth in NZ.

We estimate the cost of both NEET youth at the country-level, as well as at the regional level for Auckland. We hypothesize that the economic cost of Auckland NEET youth will be higher than that for the NZ NEET youth cohort due to higher wages foregone. As indicated earlier, Auckland youth of Maori and Pacifica descent are at significantly higher risk of becoming NEET. There are also differences across ethnicities in terms of average wages foregone, durations of unemployment, educational attainment, and NEET status (see section 3) which means the cost of NEET youth will vary across ethnicities. Therefore, we also disaggregate costs by ethnic sub-group in Auckland. In particular, we estimate separately the per capita cost of NEET youth in Auckland that are of European, Maori, and Pacifica descent[15].

Finally, the following sections present an overview of the computation process and all assumptions made, with breakdowns of calculations available in Appendices A to C.

4.1 Unemployment Costs

In order to estimate the cost of unemployed NEET young people in terms of foregone earnings (productivity) and public finance costs, we need to estimate the excess length of time they are unemployed. The average duration of unemployment for New Zealand (Auckland) youth aged 15-24 is 17.7 (17.9) weeks, while the relevant average durations of unemployment for Auckland youth aged 15-24 of European, Maori, and Pacifica descent is 16.4 weeks, 24.7 weeks, and 20.1 weeks respectively[16]. There is, however, evidence to suggest that NEET young people remain in unemployment longer than others (e.g. Payne, 2000). We follow Godfrey, *et al.*'s (2002) analysis of NEET 16-18 year olds in the UK and assume that unemployed NEET individuals remain unemployed for ~50% longer than the average. We further assume that non-NEET 15-19 year

[15] Due to very small sample size in some instances we are unable to conduct disaggregated analysis for Auckland NEET of Asian ethnicity.
[16] Source: Statistics NZ, Household Labour Force Survey. It is the time series average (December 2007 – December 2012) duration of unemployment for the unemployed aged 15-24 across NZ.

olds do not experience unemployment, while 20-24 non-NEETs experience the average duration of unemployment.

To compute the productivity cost, we also require assumptions regarding wages foregone. Based on data from the Household Labour Force Survey (June 2012), the average weekly earnings for men and women in NZ aged 15-19 (20-24) is $96 ($383). Data from the same survey indicates that analogous figures for Auckland youth are ~11% higher. European youth are assumed to earn the average weekly earnings of Aucklanders generally, while Maori (Pacifica) average weekly earnings are assumed to be 17% and 28% lower[17]. Table 1 summarises the assumptions outlined above, together with the subsequent wages foregone by each unemployed NEET estimated.

Table 1: Unemployment Productivity Cost Assumptions

NEET Cohort	Average weeks of unemployment 15-24 years	Excess duration of unemployment in weeks 15-19 (20-24) years	Average weekly earnings in $ 15-19 (20-24) years	Wages foregone in $ 15-19 (20-24) years
NZ	17.7	26.6 (8.9)	$96 ($383)	2,553.6 (3,408.7)
Auckland	17.9	26.9 (9.0)	$107 ($425)	2,878.3 (3,825.0)
European	16.4	24.6 (8.2)	$107 ($425)	2,632.2 (3,485.0)
Maori	24.7	37.1 (12.4)	$89 ($353)	3,301.9 (4,377.2)
Pacific Peoples	20.1	30.2 (10.1)	$77 ($308)	2,325.4 (3,110.8)

Source: Statistics NZ, Household Labour Force Survey; author's computations.

As a result of lower earnings there is a loss in tax revenue (both income tax and indirect tax). A marginal income tax rate of 10.5cents (17.5cents)[18] per $1 is assumed for foregone earnings for 15-19 (20-24) year olds. There are also lost ACC contributions[19] from the employee (employer) of 1.70% (1.15%) of every $1 of taxable income not earned[20]. Davidson (2005) illustrates that indirect taxes account for approximately 15% of disposable income, on average, for household income deciles 1-5. Therefore, we also assume a loss in indirect taxes of 15% of the foregone disposable income of these NEET individuals. Finally, unemployment benefit payments also need to be taken

[17] Refer Supplementary Table 5, "full-time wages for New Zealanders of all ages by ethnicity".
[18] These are the applicable marginal tax rates for the 2012/13 tax year for the income brackets of 'up to $14,000', and 'from $14,000 to $48,000'.
[19] We assume that the ACC payouts (from the government) for workers and non-workers are equal.
[20] ACC levy charges are as at April 2012.

into account. We expect that the average net unemployment benefit received by individuals aged 18-19 is $153.72[21], while that for 20-24 year olds is $170.80[22].

4.2 Inactive/Not in the Workforce

As indicated in Section 2, NEET youth that don't fall into the unemployed category are inactive. This is split into those that are (i) engaged in caregiving, and (ii) those that are not. Unfortunately, information regarding the precise nature of caregiving responsibilities for the NEET cohort is unavailable. Given the high rate of teenage birth rates in NZ (Dickson, *et al.*, 2000; Families Commission, 2011), however, we assume that caregiving activity relates to childcare.

Not being employed is estimated to result in foregone earnings when comparing NEET youth with their non-NEET counterparts (see Section 4.1). Furthermore, as in Godfrey, *et al.* (2002), we assume that young parents that are NEET will be out of the workforce and education sector for 1.5 years (regardless of age group). For other inactive youth (excluding NEET parents), we assume that they will be out of the labour market for 1 year. Key assumptions and the subsequent wages foregone estimated for inactive NEET are summarised in Table 2.

Table 2: Inactivity Productivity Cost Assumptions

NEET Cohort	Weeks of inactivity for engaged in caregiving (Not caregiving): 15-24 years	Average weekly earnings in $ 15-19 (20-24) years	Inactive & engaged in caregiving Wages foregone in $ 15-19 (20-24) years	Inactive, not caregiving Wages foregone in $ 15-19 (20-24) years
NZ	78.0 (52.0)	$96 ($383)	7,488 (29,874)	4,992 (19,916)
Auckland	78.0 (52.0)	$107 ($425)	8,346 (33,150)	5,564 (22,100)
European	78.0 (52.0)	$107 ($425)	8,346 (33,150)	5,564 (22,100)
Maori	78.0 (52.0)	$89 ($353)	6,942 (27,534)	4,628 (18,356)
Pacific Peoples	78.0 (52.0)	$77 ($308)	6,006 (24,024)	4,004 (16,016)

Source: Statistics NZ, Household Labour Force Survey; author's computations.

As with unemployment, foregone earnings results in lost income and indirect tax revenue, including ACC levies. The same assumptions as outlined in Section 4.1 are employed here, with

[21] This is the average of the 2012 net benefit rates for single 18-19 year olds at home and not at home with no children.

[22] Note that this analysis is only focussing on the unemployment benefit, and cannot include any additional supplementary benefits available to those unemployed due to the lack of information on the number of NEET receiving additional benefits.

regard to the relative direct and indirect fiscal incidence rates. We also assume that the net unemployment benefit received by young parents is the 2012 net benefit payable to solo parents of $293.58[23].

4.3 Educational Underachievement

Sections 4.1 and 4.2 conducted cost analysis for the two categories of NEET youth (unemployed and inactive). However, it is also necessary to factor in the lost productivity in educational underachievement which is the likely consequence of a period of unemployment and/or inactivity. As discussed in Section 3, when these individuals do return to the labour market, they may find work of a lower skill level than their non-NEET counterparts, resulting in a wage differential between youth workers that had a period of being NEET (i.e. those who had a longer transition period into the labour market) versus those that have no NEET history (i.e. those that had a relatively smooth transition into the labour market).

Recent information indicates that the proportion of NEET youth aged 15-24 in NZ that have no qualification versus school only qualification as their highest level of educational attainment is ~36.3% and ~32.3% respectively[24]. As statistics by age group are not available, we assume these proportions hold across both age categories. With regard to the Auckland cohort, statistics disaggregated by age group reveal that ~20.5% (~29.5%) of NEET individuals aged 15-19 (20-24) in Auckland have no qualification, and an additional ~49.4% (~26.1%) have school only qualifications. In-line with expectations, educational attainment within the Auckland cohort varies across ethnicities. As at December 2012, ~17.6% (~34.5%), ~31.5% (~36.5%), and ~52.4% (~20.1%) of European, Maori, and Pacifica NEET youth aged 15-24 had no (school only) qualification[25]. Prior research has shown that Maori and Pacific Peoples lag behind their NZ European (and Asian) counterparts in terms of educational attainment at all levels (e.g. Pool, *et al.,* 2005). Interestingly, recent evidence from the Social Report (2010) reveals that for individuals aged 25-64 this educational gap, while still apparent, has reduced considerably over the past two decades for qualifications at the upper secondary and tertiary levels.

[23] Source: Work and Income NZ.
[24] Source: Statistics NZ, Household Labour Force Survey (September 2011).
[25] No school qualification includes "not specified" responses. Therefore, although the "not specified" NEET statistics are typically very small, the figures used here are possibly slightly overstated.

When comparing NEET across both age categories, we need to make assumptions regarding the average level of qualifications for each age group and the likely qualifications for their non-NEET counterparts. We follow the assumptions made by Pacheco (2012). For example, for those with a school qualification in the 15-19 year old NEET group, we assume this is 5th form, and that their relative counterparts in the non-NEET group have at least sixth-form school certificate[26]. We base wage differential calculations for 20-24 NEET individuals with at least school qualification relative to average national wages[27]. As with the 15-19 year old NEETs, no qualification is compared relative to those with 6th form. Therefore, individuals with no qualification are assumed to earn ~68% of the average wage of individuals with 6th form (i.e. a 32% differential), while those with school qualifications are expected to have an 8% differential for 15-19 year olds, and 24% differential for 20-24 year olds[28].

In a similar vein to UK research by Godfrey, *et al.* (2002) we assume that those who are NEET and unemployed in the 15-19 (20-24) age group experience the wage differential for 18(12) months, while those that are NEET and inactive experience the differential for 21(15) months. As noted earlier, the unemployment and inactive figures do not sum to 100% for a number of the NEET cohorts. For the purpose of this calculation, we assume the inactive proportion is the difference between 100% and the proportion classified as unemployed. The estimated wage differentials and subsequent wages foregone are summarised in Table 3 and 4.

As with unemployment and inactivity, reduced wages result in lost income and indirect tax revenue, including ACC levies. The same assumptions outlined for unemployment and inactivity are used here.

[26] While there are no publicly available official statistics on the age breakdown of 15-19 year old NEETs, it is unlikely that there will be a lot of 15 year olds, given the compulsory school leaving age of 16 in NZ. A Department of Labour (2009) report indicates the approximate NEET rate for 15 year olds is 1%.
[27] Average wage is based on an aggregate of all individuals across the educational qualification spectrum.
[28] The 8% differential for 15-19 year olds is based on the fact that those with 5th form earn 92% of the average wage of those with 6th form; and the 24% wage differential for 20-24 year olds is based on the fact that individuals with a level 3 school qualification as their highest level of education achieved earn on average 76% of the average national wage (Source: Statistics NZ, Household Labour Force Survey – Income Supplement (June, 2012)).

Table 3: Educational Underachievement Cost Assumptions - Wage Differentials

NEET cohort	Duration of wage differential in weeks		Wage differential in $	
	For unemployed NEET 15-19 (20-24) years	For inactive NEET 15-19 (20-24) years	For NEET with no qualifications 15-19 (20-24) years	For NEET with school qualifications 15-19 (20-24) years
NZ	78.0 (65.0)	52.0 (91.0)	30.7 (122.6)	7.7 (91.9)
Auckland	78.0 (65.0)	52.0 (91.0)	34.2 (136.0)	8.6 (102.0)
European	78.0 (65.0)	52.0 (91.0)	34.2 (136.0)	8.6 (102.0)
Maori	78.0 (65.0)	52.0 (91.0)	28.5 (113.0)	7.1 (84.7)
Pacific Peoples	78.0 (65.0)	52.0 (91.0)	24.6 (98.6)	6.2 (73.9)

Source: Statistics NZ, Household Labour Force Survey; author's computations.

Table 4: Educational Underachievement Cost Assumptions – Wages Foregone

NEET Cohort	Wages foregone in $ for NEET with no qualification		Wages foregone in $ for NEET with school qualifications	
	Unemployed 15-19 (20-24) years	Inactive 15-19 (20-24) years	Unemployed 15-19 (20-24) years	Inactive 15-19 (20-24) years
NZ	5,445 (6,373)	5,445 (7,966)	4,845 (4,780)	4,845 (11,299)
Auckland	2,671 (7,072)	3,116 (8,840)	668 (5,304)	779 (6,630)
European	2,671 (7,072)	3,116 (8,840)	668 (5,304)	779 (6,630)
Maori	2,221 (5,874)	2,592 (7,342)	555 (4,405)	648 (5,507)
Pacific Peoples	1,922 (5,125)	2,242 (6,406)	480 (3,844)	561 (4,805)

Source: Statistics NZ, Household Labour Force Survey; author's computations.
Note: Wage differentials used for wage foregone calculations are to 2 d.p.

5. Results Discussion

A summary of the short-term costs estimated for the various NEET cohorts (as at December 2012) is provided in Table 5. We project that the loss to productivity of the NZ (Auckland) youth NEET group in the short term (over the next 1 to 3 years) is $1,387,274,374 ($485,902,453). Further, the expected cost to public finances for this group is $1,028,992,473 ($354,538,366) over the same time frame.

Based on cohort sizes as at December 2012, the **per capita cost** of NEET in New Zealand (Auckland) over the next 1-3 years is expected to be $26,847.41 (**$28,980.72).** As expected, the per capita cost for Auckland NEET youth of $28,980.72 is notably higher than that for NZ NEET

youth more broadly. This is primarily due to the higher wages found in Auckland relative to the rest of NZ. Significant variation in the cost associated with being NEET across different ethnic groups within Auckland is also evident. In particular, the **per capita cost** over the next 1-3 years is lowest for NZ European NEET youth at $22,412.37 and highest for Maori NEET youth at $33,634.19, while that for Pacifica NEET youth sits in-between at $26,628.81.

Table 5: Short Term Costs over 1-3 years of NEET by Region & Ethnicity

	NZ*	Auckland*	Auckland NZ European	Auckland Maori	Auckland Pacific Peoples
Number of NEET 15-24 year olds: December 2012	88,600	29,000	12,000	6,300	8,400
Total productivity loss (per capita) $	**1.39bn (15,414)**	**485.9m (16,755)**	**160.6m (13,379)**	**106.3m (16,875)**	**116.4m (13,856)**
Unemployment	119.4m	47.6m	22.1m	10.2m	9.8m
Inactivity	971.1m	348.5m	106.7m	76.4m	79.8m
Educational Underachievement	296.7m	89.8m	31.8m	19.7m	26.7m
Total public finance costs (per capita) $	**1.03bn (11,433)**	**354.5m (12,225)**	**108.4m (9,033)**	**105.6m (16,759)**	**107.3m (12,773)**
Unemployment	136.0m	47.7m	21.0m	11.0m	11.7m
Inactivity	799.1m	278.3m	77.3m	88.3m	87.1m
Educational Underachievement	93.8m	28.5m	10.1m	6.3m	8.5m
Total per capita cost $	**26,847**	**28,981**	**22,412**	**33,634**	**26,629**
15-19 year olds	11,409	12,775	12,194	20,256	15,776
20-24 year olds	34,566	35,479	26,505	38,994	30,975

Source: Author's computations.
Notes: *The NZ and Auckland costs are estimated in an aggregate context without taking into account the ethnic composition of their respective cohorts. **Numbers of 15-19 to 20-24 year olds Auckland European, Maori, and Pacific People NEET may be over or under estimated as they are based off the assumption that the proportion in each age group is the same as for the Auckland cohort.

In terms of the ethnic sub-groups portrayed in Table 5, it appears clear that the differences across ethnicities are driven by a number of factors. Given that the average wages for NZ European are higher than that for Maori and Pacific Peoples, this would suggest the productivity loss in per capita terms would be higher for this sub-group. However, the counter balancing factor at play here is that the average duration of unemployment for ethnic minorities is high, and this results in the per capita productivity loss for Maori to be highest (at $16,8759). Maori and Pacific NEET also have higher proportions of youth that are inactive and engaged in caregiving, relative to Pakeha. This leads to a greater strain on public finances in terms of higher benefit payments, and these individuals are also expected to remain out of the workforce for longer and, consequently, have lower productivity (higher foregone earnings). NEET youth of Maori and Pacifica descent

are further disadvantaged in the labour market as they typically have lower educational attainment than their NZ European counterparts, meaning they are also more likely to experience wage differentials when they do enter the work force.

Evident is that devolving analysis down to ethnic sub-groups is crucial in capturing a more accurate reflection of the economic cost of NEET youth. In fact, the Auckland figure may be an overestimate of NEET costs, as when we employ weighted averages of the per capita costs for the three major ethnic sub-groups (NZ European, Maori and Pacific Peoples) we arrive at an average of $26,336.46, which is lower than the Auckland estimate of $28,980.72. It is important to note that the Auckland figure also includes other ethnicities, such as Asian, MELAA, etc. and is based on Auckland averages from Statistics NZ for wages, duration of unemployment, educational attainment, etc. Consequently, both the NZ and Auckland estimates of NEET costs may have been lower if we were able to control for ethnic composition of the NEET cohort in these aggregate samples. Individuals reporting multiple ethnicities (reflective of NZ's culturally diverse population) will complicate any future research that wishes to venture down the path of controlling for ethnic composition in the aggregate estimates for Auckland and NZ.

As a final discussion point, we have not explicitly estimated the medium or long-term costs of NEET youth. In order to gauge the longer-term impact we draw upon the research of Coles, *et al.* (2010) who compute associated costs (for NEET youth aged 16-18 in the UK) for the medium term of 40-45 years, and long term costs in terms of pension differentials. The present value of the future costs calculated was approximately 9.6 times that of short term costs. Consequently, we arrive at an approximate present value of life time costs per capita of NZ NEET youth of just over a quarter of a million ($257,735), whereas the analogous figure for Auckland NEET is slightly higher at $278,214. An interesting avenue for future research would be to find what the relevant multiplicative factor is in the NZ context.

6. Conclusion

A vast literature shows that youth exclusion, disengagement, and overall underutilisation in the labour market has costs both to the individual, and the economy or society at large. Consequences range from reduced economic productivity to increased criminal activity. Therefore, the rising number of youth in NZ that are classified as NEET is of concern as it signals increasing difficulties for young people making the transition from education into the labour market. This

group increased by ~34%, between 2004 and 2012, driven largely by the sub-group of 20-24 year olds. A similar trend is observed for the country's economic hub, Auckland, with the number of youth aged 15-24 that are NEET rising a worrying ~46% over the same period. Of particular concern is that there are sub-groups of youth in Auckland that appear most vulnerable to becoming lost in the transition between education and the labour force; namely, youth of Maori and Pacifica descent for which NEET rates currently exceed 20%.

This research estimated the expected cost of youth disengagement, in terms of both lost productivity and strain on public finances. When considering the current youth NEET cohort in NZ, we estimated a per capita cost of $26,847 over the next 1-3 years. The analogous figure for the Auckland cohort was found to be higher than that estimated for the average NEET NZ youth ($28,981), which we attribute broadly to higher wages foregone of NEET in Auckland relative to the rest of NZ.

Our analysis also suggests substantial differences in per capita costs of NEET youth across individuals of European, Maori, and Pacifica descent. NEET youth of Maori (Pacifica) descent were found to be associated with the highest per capita cost at approximately $33,634 ($26,629), while the analogous figure for their NZ European counterparts was found to be $22,412. This difference arises due to the greater propensity of Maori and Pacific Peoples to disengage from the education system earlier, to withdraw from the work force due to caregiving responsibilities at a younger age, and to experience longer periods of unemployment.

We must note a number of caveats in this conclusion. First, we have not been able to address the costs associated with other expected outcomes for NEET youth that include poorer physical and mental health outcomes, increased substance abuse, and increased prevalence of crime. Second, it is outside the scope of this study to estimate the medium and long-term effects of youth disengagement. For example, we do not estimate the on-going labour market difficulties such as: underemployment post the short term window of 1-3 years; future unemployment; or future wage differential arising due to lower average educational attainment.

Incorporating these additional costs and longer-term effects when data become available are possible directions for future research in this area. Another possible future research exercise is to investigate predictors of becoming NEET when aged 15-19 or 20-24. Such analysis would require

appropriate panel data from a cohort, and would be useful for designing policy aimed at early intervention, as well as, where necessary, successfully re-engaging youth which become NEET.

References

Arulampalam, W. (2001) Is Unemployment Really Scarring? Effects of Unemployment Experiences on Wages. *The Economic Journal*; 111(475), 585-606.

Becker, G.S. (1964) *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (1st ed.). NBER Books, National Bureau of Economic Research. New York: Columbia University Press.

Beland, F, Birch, S, Stoddart, G. (2002) Unemployment and health: contextual level influences on the production of health in populations. *Social Science and Medicine*; 55(11), 2033-2052.

Bell, D.N.F., & Blanchflower, D.G. (2011) Young People and Recession: A Lost Generation? *IZA Discussion Paper*, No. 5674.

Birnie, D., Maloney, T., Canler, C., & Davies, P. (2012) Labour Market Under-performance in Auckland: An Initial Investigation. *Auckland Council Working Report*, WP2012/002.

Blakely, T., Collings, S., and Atkinson, J. (2003) Unemployment and suicide. Evidence for a causal association? *Journal of Epidemiology and Community Health,* 57, 594-600.

Blanchflower, D.G. (2010) The wellbeing of the young. *British Journal of Industrial Relations*, forthcoming.

Bridges, S. (2013) *Minimum Wage (Starting-out Wage) Amendment Bill – Third Reading*. Retrieved from http://www.parliament.nz/en-NZ/PB/Debates/Debates/9/1/4/50HansD_20130321_00000028-Minimum-Wage-Starting-out-Wage-Amendment.htm

Brosnan, P. (1984) Age, Education and Maori-Pakeha Income Differences. *New Zealand Economic Papers*; 18(1), 49-61.

Bynner, J., & Parsons, S. (2002) Social Exclusion and the Transition from School to Work: The Case of Young People Not in Education, Employment, or Training (NEET). *Journal of Vocational Behaviour*; 60, 289-309.

Carmichael, F. & Ward, R. (2000) Youth Unemployment and the Crime in the English Regions and Wales. *Applied Economics, 32*(5), 559-571.

Chiricos, T.G. (1987) Rates of Crime and Unemployment: An Analysis of Aggregate Research Evidence. *Social Problems*; 34(2), 187-212.

Clark, A.E., Georgellis, Y., & Sanfeym P. (2001) Scarring: The Psychological Impact of Past Unemployment. *Economica*; 68(270), 221–241.

Coles, B., Godfrey, C., Keung, A., Parrott., S., & Bradshaw, J. (2010) *Estimating the Life-time Cost of NEET: 16-18 Year Olds not in Education, Employment or Training.* University of York: York.

Cruces, G., Ham A. & Viollaz, M. (2012) *Scarring Effect of Youth Unemployment and Informality: Evidence from Argentina and Brazil.* Paper presented at the July 2012 IZA Conference: Bonn, Germany.

Davidson, S. (2005) Person income tax in New Zealand. Who pays, and is progressive taxation justified? Wellington: New Zealand Business Roundtable.

Department of Labour (2009) Youth in the New Zealand labour market. *National Monitoring Series*. Wellington, Department of Labour.

Department of Labour (2010, April) The Impact of the Recession on Young People. *HLFS Investigation Report*. Wellington, Department of Labour.

Dew, M., Bromet, E. J., & Penkower, L. (1992). Mental Health Effects of Job Loss in Women. *Psychological Medicine; 22*, 751–764.

Dickson, N., Sporle, A., Rimene, C., & Paul, C. (2000) Pregnancies Among New Zealand Teenagers: Trends, Current status and International Comparisons. *The New Zealand Medical Journal*; 113 (1112), 241-245.

Dooley, D., & Catalano, R. (1988) Recent Research on the Psychological Effects of Unemployment. *Journal of Social Issues*; 44(4), 1-12 .

Ellwood, D. (1982) Teenage Unemployment: Permanent Scars or Temporary Blemishes? In *The Youth Labor Market Problem: Its Nature, Causes and Consequences* by R.B. Freeman & D.A. Wise (Eds.) pp. 349-390. Chicago: University of Chicago Press.

Fabling, R., & Mare, D.C. (2012) Cyclical Labour Market Adjustment in New Zealand: The Response of Firms to the Global Financial Crisis and Its Implications for Workers. *Motu Working Paper,* No. 12-04.

Families Commission. (2011) Teenage Pregnancy and Parenting: An Overview. Retrieved from http://www.familiescommission.org.nz/publications/research-reports/teenage-pregnancy-and-parenting

Feather, N. T. (1982) Unemployment and its Psychological Correlates: A Study of Depressive Symptoms, Self-esteem, Protestant Ethic Values, Attributional Style, and Apathy. A*ustralian Journal of Psychology;* 34(3), 309-323.

Fergusson, D. M., Horwood, L.J., and Lynskey, T.L. (1997) The effects of unemployment on psychiatric illness during young adulthood. *Psychological Medicine*, 27(2), 371-381.

Fergusson, D. M., Horwood, L.J., and Woodward, L.J. (2001) Unemployment and Psychosocial Adjustment in Young Adults: Causation or Selection? *Social Science & Medicine*; 53(3), 305-320.

Fergusson, D.M., Lynskey, M.T., & Horwood, L.J. (2006) The Effects of Unemployment on Juvenile Offending. *Criminal Behaviour and Mental Health*; 7(1), 49-68.

Gerdtham, U.G., & Johannesson, M. (2003) A Note on the Effect of Unemployment on Mortality. *Journal of Health Economics*; 22(3), 505-18.

Gibson, J. (2000) Sheepskin Effects and the Returns to Education in New Zealand: Do They Differ by Ethnic Groups. *New Zealand Economic Papers*; 34(2), 201-220.

Godfrey, C., Hutton, J. B., Coles, B., Craig, G. & Johnson, J. (2002) Estimating the Cost of Being "Not in Education, Employment or Training" at Age 16-18. University of York: Social Policy Research Unit, No. 346.

Goldsmith, A.H., Veum, J.R., & Darity, W. (1996) The Impact of Labor Force History on Self-Esteem and its Component Parts, Anxiety, Alienation and Depression. *Journal of Economic Psychology*; 17, 183-220.

Gregg, P. (2001) The Impact of Youth Unemployment on Adult Unemployment in the NCDS. *The Economic Journal*; 111(475), 626-653.

Gregg, P. & Tominey, E. (2004). The Wage Scar from Youth Unemployment. *Labour economics; 12*(1), 487-509.

Kahn, L.B. (2010) The Long-term Labor Market Consequences of Graduating from College in a Bad Economy. *Labour Economics*; 17(2), 303-316.

Lockwood, B. (1991) Information Externalities in the Labour Market and the Duration of Unemployment. *Review of Economic Studies*; 83(4), 685-709.

Lynch, L., & Richardson, R. (1982) Unemployment of Young Workers in Britain. *British Journal of Industrial Relations;* 20(3), 362-372.

Maani, S. (1999) Private and Public Returns to Investments in Secondary and Higher Education in New Zealand Over Time: 1981-1996. *Treasury Working Paper*; 99(2).

Maani, S. (2000) Secondary and Tertiary Education Attainment and Income Levels for Maori and Non-Maori Over Time. *Treasury Working Paper*; 00(18).

Maloney, T. (2004, March) Isolating the Scarring Effects Associated with the Economic Inactivity of Youth in New Zealand: Evidence from the Christchurch Health and Development Study. Report to the *Labour Department Policy Group*, New Zealand Department of Labour: Auckland.

Manning, A. (2000) Pretty Vacant: Recruitment in Low Wage Labour Markets. *Oxford Bulletin of Economics and Statistics;* 62, 747-70.

Mathers, C.M., & Schofield D.J. (1998) The Health Consequences of Unemployment: The Evidence. *The Medical Journal of Australia*; 168(4), 178–182.

Mroz, T.A., & Savage, T.H. (2006) The Long-term Effects of Youth Unemployment. *Journal of Human Resources*; 41(2), 259-293.

Narendranathan, W., & Elias, P. (1993) Influences of Past History on the Incidence of Youth Unemployment: Empirical Findings for the UK. *Oxford Bulletin of Economics and Statistics*; 55(2), 161-185.

Pacheco, G. (2012) The Cost of Poor Transitions for Youth. *New Zealand Work Research Institute Working Paper Series*.

Payne, J. (2000) Young People not in Education, Employment or Training: Data from the England and Wales Youth Cohort Study. *Department for Education and Employment Paper*.

Pool, I., Baxendine, S., Cochrane, W., & Lindop, J. (2005) New Zealand Regions, 1986-2001: Education and Qualifications. *Population Studies Centre Discussion Paper*, No. 56.

Psacharopoulos, G., & Patrinos, H.A. (2004) Returns to Investment in Education: A Further Update. *Education Economics*; 12(2), 111-134.

Raffe, D. (1984) The Transition from School to Work and the Recession: evidence from the Scottish School Leavers Surveys, 1977-1983. *British Journal of Sociology of Education*; 5(3), 247-265.

Sissons, P. and Jones, K. (2012) *Lost in Transition? The Changing Labour Market and Young People not in Employment, Education or Training*. London: The Work Foundation (Lancaster University).

Stiglitz, J. E. (1975) The Theory of "Screening," Education, and the Distribution of Income. *The American Economic Review*; 65(3), 283-300.

The Social Report 2010. (2010) *Educational Attainment of the Adult Population*. Wellington: The Ministry of Social Development.

Wu, D., & Wu, Z. (2012) Crime, Inequality and Unemployment in England and Wales. *Applied Economics*; 44(29), 3765-3775.

Appendix A: New Zealand NEET

In this appendix, we outline computation of the cost per capita of NEET youth for New Zealand as at December 2012. In the fourth quarter of 2012 there were **29,400** (**59,200**) 15-19 (20-24) year olds classified as NEET in NZ. Unless otherwise stated, all assumptions are the same as those outlined in Section 4.1 to 4.3.

Unemployment

Based on estimates from the Household Labour Force Survey, unemployment accounted for ~53.7% (~39.2%) of NEET youths aged 15-19 (20-24) as at December 2012. The average duration of unemployment for NZ youth aged 15-24 is 17.7 (17.9) weeks. As explained in Section 4.1, we assume that NEET youth remain in unemployment 50% longer than the average individual of this age, and that non-NEET 15-19 year olds do not experience unemployment, while 20-24 non-NEETs experience the average duration of unemployment. These assumptions give us excess durations (comparing NEET with non-NEET) in unemployment of 26.6 (8.9) weeks for 15-19 (20-24) year olds.

1) **Productivity Cost:** Average weekly earnings for men and women across New Zealand aged 15-19 (20-24) is $96 ($383)[29].

Foregone Earnings: 15-19 year olds: (26.6weeks @ $96) * 15,800 people = $40,346,880 20-24 year olds: (8.9weeks @ $383) * 23,200 people = $79,081,840
Unemployed: Foregone Earnings Total: $119,428,720

2) **Public Finance Cost:** As a result of lower earnings there is a loss in tax revenue (both income tax and indirect tax). A marginal income tax rate of 10.5cents (17.5cents)[30] per $1 is assumed for foregone earnings for 15-19 (20-24) year olds. There are also lost ACC contributions[31] from the employee (employer) of 1.70% (1.15%) of every $1 of taxable

[29] Source: Statistics NZ, Household Labour Force Survey – Income Supplement (June, 2012).
[30] These are the applicable marginal tax rates for the 2012/13 tax year for the income brackets of 'up to $14,000', and 'from $14,000 to $48,000'.
[31] We assume that the ACC payouts (from the government) for workers and non-workers are equal.

income not earned[32]. Finally, we assume a loss in indirect taxes of 15% of the foregone disposable income of these NEET individuals[33].

Unemployment benefit payments also need to be taken into account. We expect that the average net unemployment benefit received by individuals aged 18-19 is $153.72[34], while that for 20-24 year olds is $170.80[35].

Public Finance Cost Calculations: Income Tax Revenue: (0.105*40,346,880) + (0.175*79,081,840) = $18,075,744 Lost ACC contributions: 2.85% of $119,428,720 = $3,403,719 Indirect Tax Revenue: 15% of $97,949,257 = $14,692,389 Benefit Payments: 15-19 Year Olds: (26.6weeks @ $153.72) * 15,800 people = $64,605,442 20-24 Year Olds: (8.9weeks @ $170.80) * 23,200 people = $35,266,784
Unemployed: Public Finance Cost Total: $136,044,077

Inactive/Not in the Workforce

The proportion of NEET youth that don't fall into the unemployed category are inactive. This is split into those that are (i) engaged in caregiving, and (ii) those that are not. The percentage of 15-19 (20-24) year old NEET youth in NZ that fall into these two categories are ~12.9% (~29.7%) and ~33.0% (~31.3%) respectively.

1) **Productivity Cost:** As already stated, not being employed is estimated to result in foregone earnings of $96 ($383) for 15-19 (20-24) year olds, when comparing NEET youth, with their non-NEET counterparts. Furthermore, as in Godfrey, *et al.* (2002), we assume that young parents that are NEET will be out of the workforce and education sector for 1.5 years (regardless of age group). For other inactive youth (excluding NEET parents), we assume that they will be out of the labour market for 1 year.

[32] ACC levy charges are as at April 2012.
[33] Davidson (2005) illustrates that indirect taxes account for approximately 15% of disposable income, on average, for household income deciles 1-5. We apply this to the earnings after income tax and ACC contribution deductions.
[34] This is the average of the 2012 net benefit rates for single 18-19 year olds at home and not at home with no children.
[35] Note that this analysis is only focussing on the unemployment benefit, and cannot include any additional supplementary benefits available to those unemployed due to the lack of information on the number of NEET receiving additional benefits.

Foregone Earnings: **Inactive, not engaged in caregiving:** 15-19 year olds: (52weeks @ $96) * 9,700 people = $48,422,400 20-24 year olds: (52weeks @ $383) * 18,500 people = $368,446,000 **Inactive, engaged in caregiving:** 15-19 year olds: (78weeks @ $96) * 3,800 people = $28,454,400 20-24 year olds: (78weeks @ $383) * 17,600 people = $525,782,400
Inactive: Foregone Earnings Total: $971,105,200

2) **Public Finance Cost**: As with unemployment, foregone earnings results in lost income and indirect tax revenue, including ACC levies. The same assumptions with regard to the relative direct and indirect fiscal incidence rates outlined for unemployment are employed here. We also assume that the net unemployment benefit received by young parents is the 2012 net benefit payable to solo parents of $293.58[36].

Public Finance Cost Calculations: Income Tax Revenue: (0.105*76,876,800) + (0.175*894,228,400) = $164,562,034 Lost ACC contributions: 2.85% of $971,105,200 = $27,676,498 Indirect Tax Revenue: 15% of $778,866,668 = $116,830,000 Benefit Payments: 15-19 year olds: (78weeks @ $293.58) * 3,800 people = $87,017,112 20-24 year olds: (78weeks @ $293.58) * 17,600 people = $403,026,624
Inactive: Public Finance Cost Total: $799,112,268

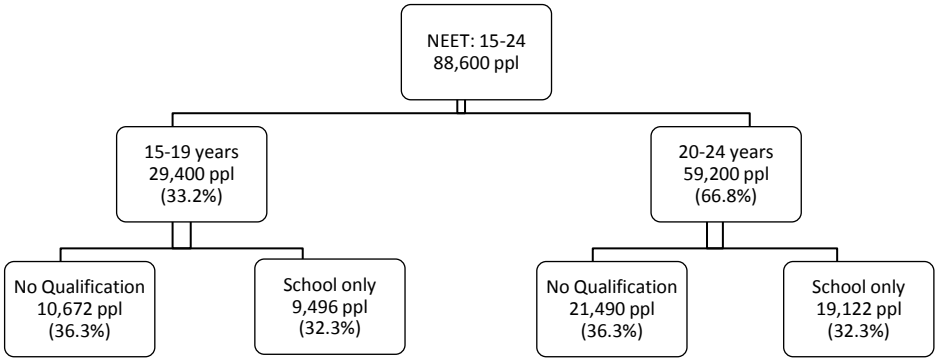
Educational Underachievement

1) **Productivity Cost:** As shown in Figure 7, recent information indicates that the proportions of NEET youth aged 15-24 in NZ that have no qualification versus school only qualification as their highest level of educational attainment is ~36.3% and ~32.3% respectively[37]. Therefore, we estimate 10,672 (9,496) individuals in the 15-19 NEET group have no (school only) qualification, while analogous figures for those in the 20-24 NEET

[36] Source: Work and Income NZ.
[37] Source: Statistics NZ, Household Labour Force Survey (September 2011).

group are 21,490 (19,122) for no (school only) qualifications respectively (see Figure 10). As indicated earlier based on information from the Household Labour Force Survey (December 2012), ~53.7% (~39.2%) of those in the 15-19 (20-24) NEET group are unemployed and the remainder are inactive (i.e. ~46.3% and ~60.8% respectively[38]). Assumptions regarding differing educational attainment and resulting wage differentials between the two NEET age groups and their non-NEET counterparts are outlined in Section 4.3.

Figure 7: Breakdown of NZ NEETs by Highest Qualification, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (September & December, 2012).

15-19 Wage Differentials:

No Qualification: 32% of $96 = $30.72
Unemployed: 18 months (78weeks) @ $30.72 = $2,396
Number of NEET unemployed = 10,672*0.537 = 5,731
5,731 people * $2,396 = **$13,731,476**
Inactive: 21 months (91weeks) @ $30.72 = $2,796
Number of NEET inactive = 10,672*0.463 = 4,941
4,941 people * $2,796 = **$13,815,036**

School Qualification: 8% of $96 = $7.68
Unemployed: 18 months (78weeks) @ $7.68 = $599
Number of NEET unemployed = 9,496*0.537 = 5,099
5,099 people * $599 **= $3,054,301**
Inactive: 21 months (91weeks) @ $7.68 = $699
Number of NEET inactive = 9,496*0.463 = 4,397
4,397 people * $699 = **$3,073,503**

[38] As noted earlier, the unemployment and inactive figures do not sum to 100% for either age group. For the purpose of this calculation, we assume the inactive proportion is the difference between 100% and the proportion classified as Unemployed.

20-24 Wage Differentials:
<u>No qualification</u>: 32% of $383 = $122.56 Unemployed: 12 months (52weeks) @ $122.56 = $6,373 Number of NEET unemployed 21,490*0.392 = 8,424 8,424 people * $6,373 **= $53,686,152** Inactive: 15 months (65weeks) @ $122.56 = $7,966 Number of NEET inactive = 21,490*0.608 = 13,066 13,066 people * $7,966 **= $104,083,756** <u>School Qualification:</u> 24% of $383 = $91.92 Unemployed: 12 months (52weeks) @ $91.92 = $4,780 Number of NEET unemployed = 19,122*0.392 = 7,496 7,496 people * $4,780**= $35,830,880** Inactive: 15 months (65weeks) @ $91.92 = $5,975 Number of NEET inactive = 19,122*0.608 = 11,626 11,626 people * $5,975 **= $69,465,350**
Underachievement: Foregone Earnings Total: $296,740,454

2) **Public Finance Cost:** As with unemployment and inactivity, reduced wages result in lost income and indirect tax revenue, including ACC levies. The same assumptions outlined for unemployment and inactivity are used here.

Public Finance Cost Calculations:
Income Tax Revenue: (0.105*33,674,316) + (0.175*263,066,138) = $49,572,377 Lost ACC contributions: 2.85% of $296,740,454 = $8,457,103 Lost Indirect Tax Revenue: 15% of $238,710,974 = $35,806,646
Underachievement: Public Finance Cost Total: $93,836,126

Appendix B: Auckland NEET

In this appendix, we outline computation of the cost per capita of NEET Auckland youth as at December 2012. In the fourth quarter of 2012 there were **8,300** (**20,700**) 15-19 (20-24) year olds in Auckland classified as NEET. Unless otherwise stated, all assumptions are the same as those outlined in Section 4.1 to 4.3.

Unemployment Costs

Based on estimates by the Household Labour Force Survey, unemployment accounted for ~56.6% (~43.0%) of NEET youths aged 15-19 (20-24) as at December 2012. The average duration of unemployment for Auckland youth aged 15-24 is 17.9 weeks[39]. Employing the same assumptions relating to unemployment durations for NEET and non-NEET youth outlined in Section 4.1, we estimate excess durations (comparing NEET with non-NEET) in unemployment of 26.9 (9.0) weeks for 15-19 (20-24) year olds.

1) **Productivity Cost:** Average weekly earnings for men and women in Auckland aged 15-19 (20-24) is $107 ($425)[40].

Foregone Earnings: 15-19 year olds: (26.9weeks @ $107) * 4,700 people = $13,528,010 20-24 year olds: (9.0weeks @ $425) * 8,900 people = $34,042,500
Unemployed: Foregone Earnings Total: $47,570,510

2) **Public Finance Cost:** Public finance costs assumptions remain as per Section 4.1.

Public Finance Cost Calculations: Income Tax Revenue: (0.105*13,528,010) + (0.175*34,042,500) = $7,377,879 Lost ACC contributions: 2.85% of $47,570,510 = $1,355,760 Indirect Tax Revenue: 15% of $38,836,872 = $5,825,531 Benefit Payments: <u>15-19 Year Olds</u>: (26.9weeks @ $153.72) * 4,700 people = $19,434,820 <u>20-24 Year Olds</u>: (9.0weeks @ $170.80) * 8,900 people = $13,681,080

[39] Source: Statistics NZ, Household Labour Force Survey. It is the time series average (December 2007 – December 2012) duration of unemployment for the unemployed aged 15-24.

[40] Source: Statistics NZ, Household Labour Force Survey – Income Supplement (June, 2012). Auckland wages are assumed to be 11% higher than the national average (refer Supplementary Table 6).

Unemployed: Public Finance Cost Total: $47,675,070

Inactive/Not in the Workforce

The proportion of NEET youth that don't fall into the unemployed category are inactive. This is split into those that are (i) engaged in caregiving, and (ii) those that are not. The percentage of 15-29 (20-24) year old NEET youth in Auckland that fall into these two categories are ~15.7% (~29.0%) and ~27.7% (~27.5%) respectively.

1) **Productivity Cost:** Not being employed is estimated to result in foregone earnings of $107 ($425) for 15-19 (20-24) year olds, when comparing NEET youth, with their non-NEET counterparts. We retain the assumptions relating to durations of inactivity and wages foregone outlined in Section 4.2.

Foregone Earnings: **Inactive, not engaged in caregiving:** 15-19 year olds: (52weeks @ $107) * 2,300 people = $12,797,200 20-24 year olds: (52weeks @ $425) * 5,700 people = $125,970,000 **Inactive, engaged in caregiving:** 15-19 year olds: (78weeks @ $107) * 1,300 people = $10,849,800 20-24 year olds: (78weeks @ $425) * 6,000 people = $198,900,000
Inactive: Foregone Earnings Total: $348,517,000

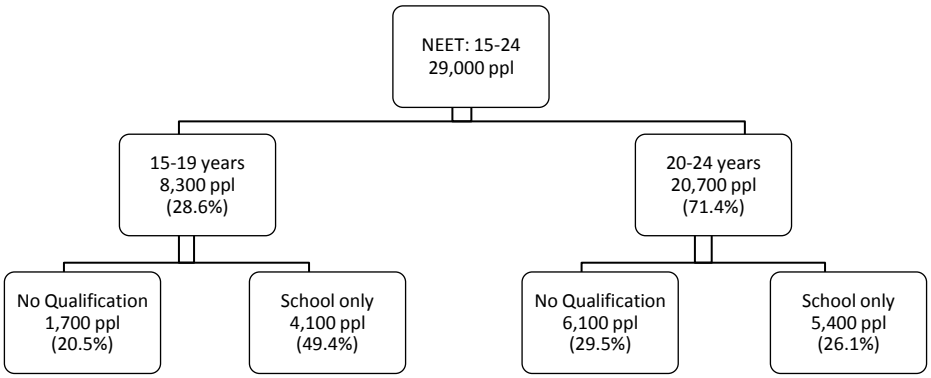
2) **Public Finance Cost**: Public finance costs assumptions remain as per Section 4.2.

Public Finance Cost Calculations: Income Tax Revenue: (0.105*23,647,000) + (0.175*324,870,000) = $59,335,185 Lost ACC contributions: 2.85% of $348,517,000= $9,932,735 Indirect Tax Revenue: 15% of $279,249,080 = $41,887,362 Benefit Payments: <u>15-19 year olds:</u> (78weeks @ $293.58) * 1,300 people = $29,769,012 <u>20-24 year olds:</u> (78weeks @ $293.58) * 6,000 people = $137,395,440
Inactive: Public Finance Cost Total: $278,319,734

Educational Underachievement

1) **Productivity Cost:** As shown in Figure 8, recent information from the Household Labour Force Survey (December 2012) indicates that ~20.5% (~29.5%) of NEET individuals aged 15-19 (20-24) have no qualification, and an additional ~49.4% (~26.1%) have school only qualifications[41]. Therefore, we estimate 1,700 (4,100) individuals in the 15-19 NEET group have no (school only) qualification, while analogous figures for those in the 20-24 NEET group are 6,100 (5,400) for no (school only) qualifications respectively. Assumptions regarding differing educational attainment and resulting wage differentials between the two NEET age groups and their non-NEET counterparts are outlined in Section 4.3.

Figure 8: Breakdown of Auckland NEETs by Highest Qualification, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (September & December, 2012).

15-19 Wage Differentials:

No Qualification: 32% of $107 = $34.24
Unemployed: 18 months (78weeks) @ $34.24 = $2,671
Number of NEET unemployed = 1,700*0.566 = 962
962 people * $2,671 = **$2,569,502**
Inactive: 21 months (91weeks) @ $34.24 = $3,116
Number of NEET inactive = 1,700*0.434 = 738
738 people * $3,116 = **$2,299,608**

School Qualification: 8% of $107 = $8.56
Unemployed: 18 months (78weeks) @ $8.56 = $668
Number of NEET unemployed = 4,100*0.566 = 2,321

[41] Figures obtained from the Household Labour Force Survey, December 2012.

2,321 people * $668 **= $1,550,428**
Inactive: 21 months (91weeks) @ $8.56 = $779
Number of NEET inactive = 4,100*0.434 = 1,779
1,779 people * $779 = **$1,385,841**

20-24 Wage Differentials:

No qualification: 32% of $425 = $136
Unemployed: 12 months (52weeks) @ $136 = $7,072
Number of NEET unemployed = 6,100*0.430 = 2,623
2,623 people * $7,072 **= $18,549,856**
Inactive: 15 months (65weeks) @ $136 = $8,840
Number of NEET inactive = 6,100*0.570 = 3,477
3,477 people * $8,840 **= $30,736,680**

School Qualification: 24% of $425= $102
Unemployed: 12 months (52weeks) @ $102 = $5,304
Number of NEET unemployed = 5,400*0.430 = 2,322
2,322 people * $5,304**= $12,315,888**
Inactive: 15 months (65weeks) @ $102 = $6,630
Number of NEET inactive = 5,400*0.570 = 3,078
3,078 people * $6,630 **= $20,407,140**

Underachievement: Foregone Earnings Total: $89,814,943

2) **Public Finance Cost:** We retain the assumptions outlined for unemployment and inactivity in Section 4.1.

Public Finance Cost Calculations:
Income Tax Revenue: (0.105*7,805,379) + (0.175*82,009,564) = $15,171,239
Lost ACC contributions: 2.85% of $89,814,943 = $2,559,726
Lost Indirect Tax Revenue: 15% of $72,083,978 = $10,812,597

Underachievement: Public Finance Cost Total: $28,543,562

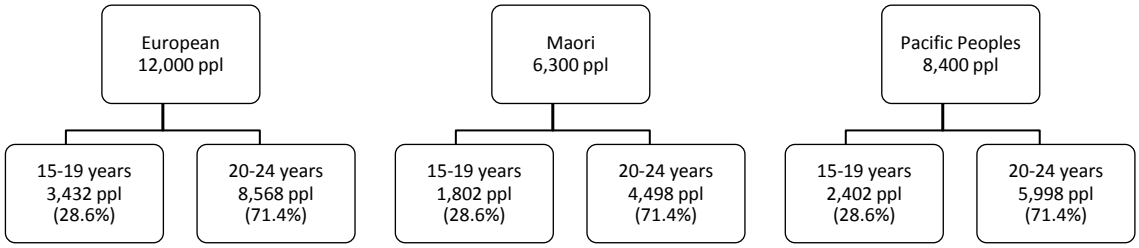
Appendix C: Auckland NEET by Ethnicity Workings

In this appendix, we outline computation of the cost per capita of NEET Auckland youth by ethnicity as at December 2012. Unless otherwise stated, all assumptions are the same as for the New Zealand and Auckland calculations outlined in Sections 4.1 to 4.3.

As discussed earlier, Auckland youth of Maori and Pacifica descent are at significantly higher risk of becoming NEET. There are also differences across ethnicities in terms of average wages foregone, durations of unemployment, and educational attainment which means the cost of NEET youth will vary across ethnicities. In this section, we perform the same costing exercise undertaken in Part II but this time disaggregating costs by ethnic sub-group in Auckland. In particular, we estimate separately the per capita cost of NEET youth in Auckland that are of European, Maori, and Pacifica descent.

Figure 9 shows that as at December 2012 there were 12,000 NEET youth aged 15-24 that are NZ European, 6,300 classified as Maori, and 8,400 Pacific Peoples[42]. As disaggregated figures by age group (i.e. 15-19 and 20-24) are unavailable due to small sample size in some instances, we need to assume that the proportions of Auckland NEET youth that are 15-19 and 20-24 respectively also apply to the ethnic sub-groups (i.e. 28.6% and 71.4% respectively, refer Figure 3).

Figure 9: Breakdown of Auckland NEETs by Ethnicity, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

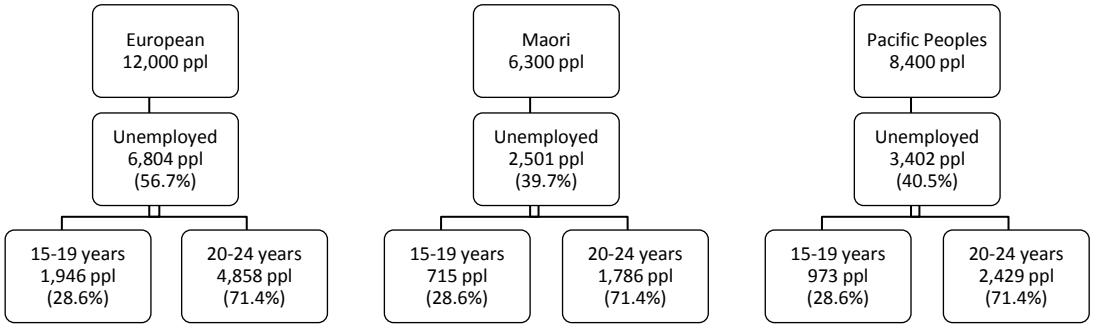
Unemployment

As at December 2012, unemployment accounted for ~56.7%, ~39.7%, and ~40.5% of European, Maori, and Pacifica NEET youth aged 15-24 respectively (see Figure 10). We assume these

[42] Note where an individual reported more than one ethnicity, they have been counted once in each group.

proportions are the same across both age categories, which equates to 1,946 (4,858), 715 (1,786), and 973 (2,429) European, Maori, and Pacific Peoples aged 15-19 (20-24) respectively.

Figure 10: Breakdown of Unemployed Auckland NEETs by Ethnicity, 15-24 year olds.



Source: Statistics NZ, Household Labour Force Survey (December 2012).

In calculating the productivity cost for these NEET groups (i.e. foregone earnings) we take into account differences in both the average durations of unemployment. For instance, the relevant average durations of unemployment for Auckland youth aged 15-24 of European, Maori, and Pacifica descent is 16.4 weeks, 24.7 weeks, and 20.1 weeks respectively[43]. We assume that unemployed NEET individuals remain unemployed for ~50% longer than the average and that non-NEET 15-19 year olds do not experience unemployment, while 20-24 non-NEETs experience the average duration of unemployment. This gives excess durations (comparing NEET with non-NEET) in unemployment of 24.6 (8.2) weeks for European 15-19 (20-24) year olds, excess durations of 37.1 (12.4) for Maori aged 15-19 (20-24), and excess durations of 30.2 (10.1) for Pacific Peoples aged 15-19 (20-24). With regard to foregone earnings, we assume that NZ European Auckland NEET youth aged 15-19 (20-24) forego $107 ($425), whereas those of Maori ethnicity forego $89 ($353), and those of Pacifica descent forego $77 ($308)[44]. Public finance costs assumptions remain as per Section 4.1.

[43] Source: Statistics NZ, Household Labour Force Survey. It is the time series average (December 2007 – December 2012) duration of unemployment for the unemployed aged 15-24 across NZ.

[44] Source: Statistics NZ, Household Labour Force Survey (June, 2012). Based on the average weekly earnings for men and women in Auckland aged 15-19 and 20-24. European youth are assumed to earn the average weekly earnings of Aucklanders generally, while Maori (Pacifica) average weekly earnings are assumed to be 17% and 28% lower (refer Supplementary Table 5, full-time wages for New Zealanders of all ages by ethnicity).

1) European NEET

Foregone Earnings: 15-19 year olds: (24.6weeks @ $107) * 1,946 people = $5,122,261 20-24 year olds: (8.2weeks @ $425) * 4,858 people = $16,930,130
Unemployed: Foregone Earnings Total: $22,052,391

Public Finance Costs: Income Tax Revenue: (0.105*5,122,261) + (0.175*16,930,130) = $3,500,610 Lost ACC contributions: 2.85% of $22,052,391 = $628,493 Lost Indirect Tax Revenue: 15% of $17,923,288 = $2,688,493 Benefit Payments: 15-19 Year Olds: (24.6weeks @ $153.72) * 1,946 people = $7,358,822 20-24 Year Olds: (8.2weeks @ $170.80) * 4,858 people = $6,803,920
Unemployed: Public Finance Cost Total: $20,980,338

2) Maori NEET

Foregone Earnings: 15-19 year olds: (37.1weeks @ $89) * 715 people = $2,360,859 20-24 year olds: (12.4weeks @ $353) * 1,786 people = $7,817,679
Unemployed: Foregone Earnings Total: $10,178,538

Public Finance Costs: Income Tax Revenue: (0.105*2,360,859) + (0.175*7,817,679) = $1,615,984 Lost ACC contributions: 2.85% of $10,178,538 = $290,088 Lost Indirect Tax Revenue: 15% of $8,272,465 = $1,240,870 Benefit Payments: 15-19 Year Olds: (37.1weeks @ $153.72) * 715 people = $4,077,654 20-24 Year Olds: (12.4weeks @ $170.80) * 1,786 people = $3,782,605
Unemployed: Public Finance Cost Total: $11,007,201

3) Pacific Peoples NEET

Foregone Earnings: 15-19 year olds: (30.2weeks @ $77) * 973 people = $2,262,614 20-24 year olds: (10.1weeks @ $308) * 2,429 people = $7,556,133
Unemployed: Foregone Earnings Total: $9,818,747

Public Finance Costs: Income Tax Revenue: (0.105*2,262,614) + (0.175*7,556,133) = $1,559,898 Lost ACC contributions: 2.85% of $9,818,747 = $279,834 Lost Indirect Tax Revenue: 15% of $7,979,015 = $1,196,852 Benefit Payments: 15-19 Year Olds: (30.2weeks @ $153.72) * 973 people = $4,517,001 20-24 Year Olds: (10.1weeks @ $170.80) * 2,429 people = $4,190,219
Unemployed: Public Finance Cost Total: $11,743,804

Table 6: Summary of Unemployment Costs by Ethnicity

1) **European:**
   Unemployed: Foregone Earnings Total: $22,052,391
   Unemployed: Public Finance Costs: $20,980,338

2) **Maori:**
   Unemployed: Foregone Earnings Total: $10,178,538
   Unemployed: Public Finance Costs: $11,007,201

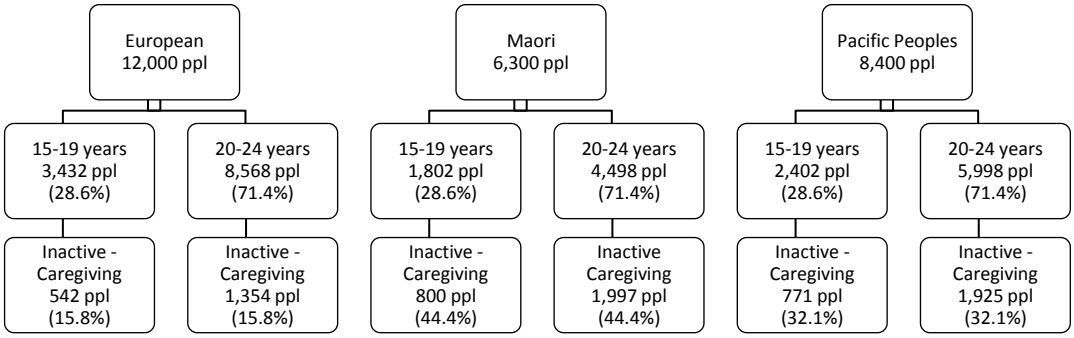
3) **Pacific Peoples:**
   Unemployed: Foregone Earnings Total: $9,818,747
   Unemployed: Public Finance Costs: $11,743,804

Inactive/Not in the Workforce

As at December 2012, inactivity and engaged in caregiving (inactivity while not engaged in caregiving) accounted for ~15.8% (~27.5%), ~44.4% (~17.5%), and ~32.1% (~27.4%) of European, Maori, and Pacifica NEET youth aged 15-24. As above, we assume these proportions hold across both age groups. Therefore, we estimate 542 (1,354), 800 (1,997), and 771 (1,925) NZ European, Maori, and Pacific individuals aged 15-19 (20-24) that are inactive and engaged in

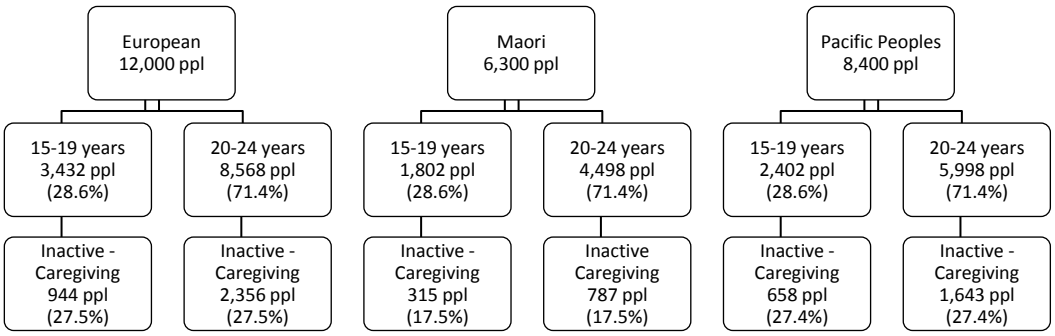
caregiving (see Figure 11). Similarly, we estimate 944 (2,356), 315 (787), and 658 (1,643) NZ European, Maori, and Pacifica individuals aged 15-19 (20-24) are inactive and not engaged in caregiving (see Figure 12). We retain the assumptions regarding foregone earnings outlined in Section 4.1, as well as the assumptions regarding duration of inactivity and accompanying benefit payments outlined in Section 4.2.

Figure 11: Breakdown of Inactive (Engaged in Caregiving) Auckland NEETs by Ethnicity, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

Figure 12: Breakdown of Inactive (Not Engaged in Caregiving) Auckland NEETs by Ethnicity, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

1) European NEET

Foregone Earnings:
Inactive, not engaged in caregiving:
15-19 year olds: (52weeks @ $107) * 944 people = $5,252,416
20-24 year olds: (52weeks @ $425) * 2,356 people = $52,067,600

Inactive, engaged in caregiving: 15-19 year olds: (78weeks @ $107) * 542 people = $4,523,532 20-24 year olds: (78weeks @ $425) * 1,354 people = $44,885,100
Inactive: Foregone Earnings Total: $106,728,648

Public Finance Costs: Income Tax Revenue: (0.105*9,775,948) + (0.175*96,952,700) = $17,993,197 Lost ACC contributions: 2.85% of $106,728,648 = $3,041,766 Indirect Tax Revenue: 15% of $85,693,685 = $12,854,053 Benefit Payments: 15-19 year olds: (78weeks @ $293.58) * 542 people = $12,411,388 20-24 year olds: (78weeks @ $293.58) * 1,354 people = $31,005,571
Inactive: Public Finance Cost Total: $77,305,975

2) Maori NEET

Foregone Earnings: **Inactive, not engaged in caregiving:** 15-19 year olds: (52weeks @ $89) * 315 people = $1,457,820 20-24 year olds: (52weeks @ $353) * 787 people = $14,446,172 **Inactive, engaged in caregiving:** 15-19 year olds: (78weeks @ $89) * 800 people = $5,553,600 20-24 year olds: (78weeks @ $353) * 1,997 people = $54,985,398
Inactive: Foregone Earnings Total: $76,442,990

Public Finance Costs: Income Tax Revenue: (0.105*7,011,420) + (0.175*69,431,570) = $12,886,724 Lost ACC contributions: 2.85% of $76,422,990 = $2,178,625 Indirect Tax Revenue: 15% of $61,377,641 = $9,206,646 Benefit Payments: 15-19 year olds: (78weeks @ $293.58) * 800 people = $18,319,392 20-24 year olds: (78weeks @ $293.58) * 1,997 people = $45,729,782
Inactive: Public Finance Cost Total: $88,321,169

3) Pacific Peoples NEET

Foregone Earnings: **Inactive, not engaged in caregiving:** 15-19 year olds: (52weeks @ $77) * 658 people = $2,634,632 20-24 year olds: (52weeks @ $308) * 1,643 people = $26,314,288 **Inactive, engaged in caregiving:** 15-19 year olds: (78weeks @ $77) * 771 people = $4,630,626 20-24 year olds: (78weeks @ $308) * 1,925 people = $46,246,200
Inactive: Foregone Earnings Total: $79,825,746

Public Finance Cost Calculations: Income Tax Revenue: (0.105*7,265,258) + (0.175*72,560,488) = $13,460,937 Lost ACC contributions: 2.85% of $79,825,746 = $2,275,034 Indirect Tax Revenue: 15% of $64,089,775 = $9,613,466 Benefit Payments: 15-19 year olds: (78weeks @ $293.58) * 771 people = $17,655,314 20-24 year olds: (78weeks @ $293.58) * 1,925 people = $44,081,037
Inactive: Public Finance Cost Total: $87,085,788

Table 7: Summary of Inactivity Costs by Ethnicity

1) **European:**
   Inactive: Foregone Earnings Total: $106,728,648
   Inactive: Public Finance Costs: $77,305,975

2) **Maori:**
   Inactive: Foregone Earnings Total: $76,442,990
   Inactive: Public Finance Costs: $88,321,169

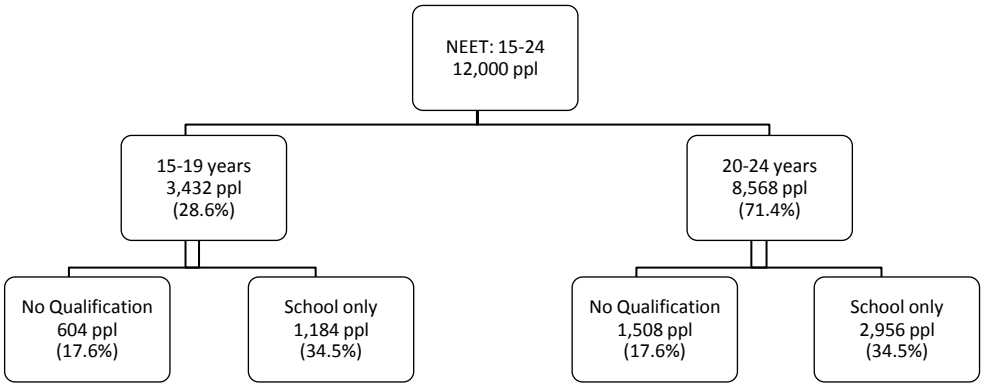
3) **Pacific Peoples:**
   Inactive: Foregone Earnings Total: $79,825,746
   Inactive: Public Finance Costs: $87,085,788

Educational Underachievement

As at December 2012, ~17.6% (~34.5%), ~31.5% (~36.5%), and ~52.4% (~20.1%) of NZ European, Maori, and Pacifica NEET youth aged 15-24 had no (school only) qualification[45]. The breakdown of these individuals into the age brackets of 15-19 and 20-24 year olds are summarised in Figures 13 - 15. Further, as indicated earlier based on information from the Household Labour Force Survey (December 2012), unemployment accounted for ~56.7%, ~39.7%, and ~40.5% of European, Maori, and Pacifica NEET youth aged 15-24 respectively, and the remainder are inactive (i.e. ~43.3%, ~60.3%, and ~59.5% respectively). Assumptions regarding differing educational attainment and resulting wage differentials between the two NEET age groups and their non-NEET counterparts are outlined in Section 4.3. As with unemployment and inactivity, reduced wages result in lost income and indirect tax revenue, including ACC levies. The same assumptions outlined for unemployment and inactivity are used here.

As at December 2012, ~17.6% (~34.5%), ~31.5% (~36.5%), and ~52.4% (~20.1%) of European, Maori, and Pacifica NEET youth aged 15-24 had no (school only) qualification[46]. Average weekly earnings used to calculate wage differentials are as per Section 4.1, while all other assumptions, such as the wage differentials themselves and the length of time each NEET cohort experiences the differential, are as per Section 4.3.

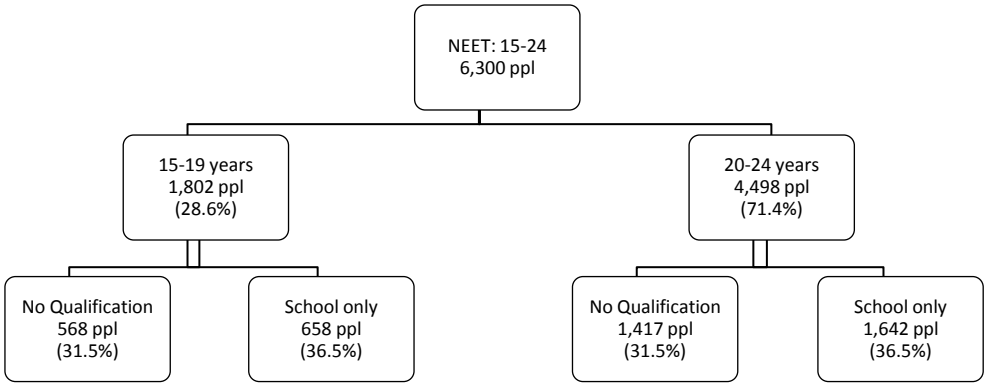
Figure 13: Breakdown of European Auckland NEETs by Highest Qualification, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

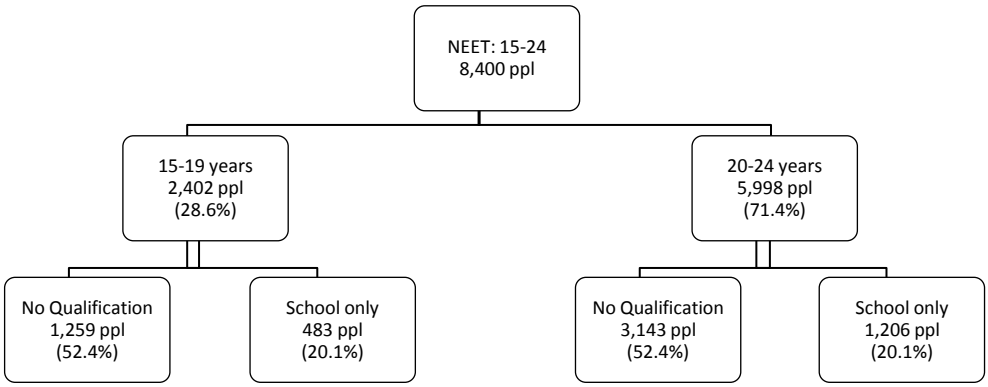
[45] No school qualification includes "not specified" responses. Therefore, although the "not specified" NEET statistics are typically very small, the figures used here are likely slightly overstated.
[46] No school qualification includes "not specified" responses. Therefore, although the "not specified" NEET statistics are typically very small, the figures used here are possibly slightly overstated.

Figure 14: Breakdown of Maori Auckland NEETs by Highest Qualification, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

Figure 15: Breakdown of Pacific People Auckland NEETs by Highest Qualification, 15-24 year olds



Source: Statistics NZ, Household Labour Force Survey (December 2012).

1) European NEET

15-19 Wage Differentials:

No Qualification: 32% of $107 = $34.24
Unemployed: 18 months (78weeks) @ $34.24 = $2,671
Number of NEET unemployed =604*0.567 = 342
342 people * $2,671 = **$913,482**
Inactive: 21 months (91weeks) @ $34.24 = $3,116
Number of NEET inactive = 604*0.433 = 262
262 people * $3,116 = **$816,392**

School Qualification: 8% of $107 = $8.56
Unemployed: 18 months (78weeks) @ $8.56 = $668
Number of NEET unemployed = 1,184*0.567 = 671
671 people * $668 **= $448,228**

Inactive: 21 months (91weeks) @ $8.56 = $779
Number of NEET inactive = 1,184*0.433 = 513
513 people * $779 = **$399,627**

20-24 Wage Differentials:

No qualification: 32% of $425 = $136
Unemployed: 12 months (52weeks) @ $136 = $7,072
Number of NEET unemployed = 1,508*0.567 = 855
855 people * $7,072 **= $6,046,560**
Inactive: 15 months (65weeks) @ $136 = $8,840
Number of NEET inactive = 1,508*0.433 = 653
653 people * $8,840 **= $5,772,520**

School Qualification: 24% of $425= $102
Unemployed: 12 months (52weeks) @ $102 = $5,304
Number of NEET unemployed = 2,956*0.567 = 1,676
1,676 people * $5,304**= $8,889,504**
Inactive: 15 months (65weeks) @ $102 = $6,630
Number of NEET inactive = 2,956*0.433 = 1,280
1,280 people * $6,630 **= $8,486,400**

Underachievement: Foregone Earnings Total: $31,772,713

Public Finance Cost Calculations:
Income Tax Revenue: (0.105*2,577,729) + (0.175*29,194,984) = $5,379,784
Lost ACC contributions: 2.85% of $31,772,713 = $905,522
Lost Indirect Tax Revenue: 15% of $25,487,407= $3,823,111

Underachievement: Public Finance Cost Total: $10,108,417

2) Maori NEET

15-19 Wage Differentials:

No Qualification: 32% of $89 = $28.48
Unemployed: 18 months (78weeks) @ $28.48 = $2,221
Number of NEET unemployed = 568*0.397 = 225
225 people * $2,221 = **$499,725**
Inactive: 21 months (91weeks) @ $28.48 = $2,592
Number of NEET inactive = 568*0.603 = 343
343 people * $2,592 = **$889,056**

School Qualification: 8% of $89 = $7.12
Unemployed: 18 months (78weeks) @ $7.12 = $555
Number of NEET unemployed = 658*0.397 = 261
261 people * $555 **= $144,855**
Inactive: 21 months (91weeks) @ $7.12 = $648
Number of NEET inactive = 658*0.603 = 397
397 people * $648 = **$257,256**

20-24 Wage Differentials:

No qualification: 32% of $353 = $112.96
Unemployed: 12 months (52weeks) @ $112.96 = $5,874
Number of NEET unemployed = 1,417*0.397 = 563
563 people * $5,874 **= $3,307,062**
Inactive: 15 months (65weeks) @ $112.96 = $7,342
Number of NEET inactive = 1,417*0.603 = 854
854 people * $7,342 **= $6,270,068**
School Qualification: 24% of $353= $84.72
Unemployed: 12 months (52weeks) @ $84.72 = $4,405
Number of NEET unemployed = 1,642*0.397 = 652
652 people * $4,405**= $2,872,060**
Inactive: 15 months (65weeks) @ $84.72 = $5,507
Number of NEET inactive = 1,642*0.603 = 990
990 people * $5,507 **= $5,451,930**

Underachievement: Foregone Earnings Total: $19,692,012

Public Finance Cost Calculations:
Income Tax Revenue: (0.105*1,790,892) + (0.175*17,901,120) = $3,320,740
Lost ACC contributions: 2.85% of $19,692,012 = $561,222
Lost Indirect Tax Revenue: 15% of $15,810,050 = $2,371,507

Underachievement: Public Finance Cost Total: $6,253,470

3) Pacific Peoples NEET

15-19 Wage Differentials:

No Qualification: 32% of $77 = $24.64
Unemployed: 18 months (78weeks) @ $24.64 = $1,922
Number of NEET unemployed = 1,259*0.405 = 510
510 people * $1,922 = **$980,220**

Inactive: 21 months (91weeks) @ $24.64 = $2,242
Number of NEET inactive = 1,259*0.595 = 749
749 people * $2,242 = **$1,679,258**

School Qualification: 8% of $77 = $6.16
Unemployed: 18 months (78weeks) @ $6.16 = $480
Number of NEET unemployed = 483*0.405 = 196
196 people * $480 **= $94,080**
Inactive: 21 months (91weeks) @ $6.16 = $561
Number of NEET inactive = 483*0.595 = 287
287 people * $561 = **$161,007**

20-24 Wage Differentials:

No qualification: 32% of $308 = $98.56
Unemployed: 12 months (52weeks) @ $98.56 = $5,125
Number of NEET unemployed = 3,143*0.405 = 1,273
1,273 people * $5,125 **= $6,524,125**
Inactive: 15 months (65weeks) @ $98.56 = $6,406
Number of NEET inactive = 3,143*0.595 = 1,870
1,870 people * $6,406 **= $11,979,220**

School Qualification: 24% of $308= $73.92
Unemployed: 12 months (52weeks) @ $73.92 = $3,844
Number of NEET unemployed = 1,206*0.405 = 488
488 people * $3,844 **= $1,875,872**
Inactive: 15 months (65weeks) @ $73.92 = $4,805
Number of NEET inactive = 1,206*0.595 = 718
718 people * $4,805 **= $3,449,990**

Underachievement: Foregone Earnings Total: $26,743,772

Public Finance Cost Calculations:
Income Tax Revenue: (0.105*2,914,565) + (0.175*23,829,207) = $4,476,141
Lost ACC contributions: 2.85% of $26,743,772 = $762,198
Lost Indirect Tax Revenue: 15% of $21,505,434 = $3,225,815

Underachievement: Public Finance Cost Total: $8,464,154

Table 8: Summary of Educational Underachievement Costs by Ethnicity

1) **European:**
   Underachievement: Foregone Earnings Total: $31,772,713
   Underachievement: Public Finance Costs: $10,108,417

2) **Maori:**
   Underachievement: Foregone Earnings Total: $19,692,012
   Underachievement: Public Finance Costs: $6,253,470

3) **Pacific Peoples:**
   Underachievement: Foregone Earnings Total: $26,743,772
   Underachievement: Public Finance Costs: $8,464,154