

**An Estimate  
of the  
National Costs  
of  
Child Poverty  
in  
New Zealand**

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## Introduction

Analytica members became interested in the topic of “child poverty” and the fact that no matter what efforts have been made in New Zealand the problem persists.

About 200,000 children are affected by lack of sufficient food, warm housing, adequate health care, and suffer difficulties at school with poor educational outcomes resulting in unemployment, are attracted to alcohol, smoking and drugs and an involvement in crime.

“Child Poverty” is agreed to be an important, difficult problem.

Our question was – what is child poverty costing New Zealand? We found no national cost estimates of child poverty for New Zealand, only for the UK and [USA](#).

Our consultations with relevant agencies and actors, research and observation of related academic, political and other groups’ discourse left us particularly frustrated by the lack of a basis for a common objective appreciation of the long-term national balance-sheet implications of current levels of child poverty.

Child poverty is a national economic issue deserving treatment as such, rather than being viewed - and largely addressed- through the prism of moral and ethical considerations.

Making policy choices is all about long term benefits and short term costs. This is an attempt to clarify the potential benefits in terms of education, crime and justice, health and social welfare.

The economic cost of child poverty is large. *When considered in relation to its social consequences, it may be more important to New Zealand’s future than global warming.*

Our modeling suggests a point-estimate of some \$8 billion as the cost p.a. of child poverty to our economy, some 4.5% of GDP. The paper seeks similarly and conservatively, to estimate the benefits over time of its ‘elimination’. While such may be unrealistic, the data provides an objective benchmark for cost-benefit analysis of new interventions; of the significant payback for the country of even of a 75% reduction in its scope.

The comparison with Global warming is instructive. The US Natural Resources Defense Council estimates the impact of global warming on the US economy at 3.6% of GDP, and global warming’s impact on New Zealand might be similar. The action of 4 million New Zealander’s on world climate is necessarily small. But child poverty is 4.5% of NZ’s GDP, and it is in our power to change that.

We would welcome others’ contributions to this focus.

Janne Pender

Convenor Analytica

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## Executive Summary

This report makes a preliminary estimate of the annual costs to New Zealand of child poverty. These economic and thus social costs indicate the potential economic benefits of eliminating, or reducing child poverty.

The debate about child poverty is essentially a moral and ethical one. However, making policy decision requires some estimation of costs and benefits. To the best of our knowledge, no comprehensive attempt has been made to estimate the national costs of child poverty in New Zealand. This is a preliminary attempt to fill that gap.

The hypothesis behind this investigation is that prevention is more cost effective than cure, and that when the costs of child poverty to New Zealand are more widely understood, the support for targeted, proven, effective preventive interventions will become a much greater part of more cost effective policies.

The costs of child poverty have been estimated in four categories: increased earning capacity; reduced costs and consequences of crime; reduced health costs; and savings in social welfare costs.

Child poverty damages children's futures through its impact on health and education. Major benefits of eliminating child poverty accrue from improved educational success leading to better qualifications, better jobs and higher earnings.

Reducing the effects of poverty also improves children's health, which improves their health in adult life.

Studies show that deprived children have higher rates of involvement in crime. Lifting the experiences and attitudes of deprived children to mirror those of less deprived groups can significantly reduce the costs of the justice and penal systems.

Finally, reducing poverty reduces the demand on the welfare system.

Our analysis estimates that the annual cost of child poverty is between \$6 and \$16 billion annually, with the best estimate in the region of \$8 billion. This is 3.5% to 9% of GDP, with the best estimate being about 4.5%.

Another way to express these costs is to look at their pattern over time. If we assume that Child Poverty can be eliminated over 10 years, the present value of these costs is \$33 billion, assuming a 5% discount rate and taking a 50 year time span.

Alternatively, an investment of \$2.0 billion annually for 10 years, reducing to \$0.5 billion annually after 20 years, and sustained at that level, would be justified by achieving a 75% reduction in child poverty long term.

These costs, or potential savings, are very substantial no matter how they are expressed. They provide an indication of the benefits that could accrue to well-designed policy interventions to eliminate child poverty. Whilst total elimination may be impossible, even a 50% reduction in the destructive effects of children growing up in poverty would provide substantial benefits to the national economy.

# 1 Purpose

This document was prepared to produce an initial estimate of the costs of Child Poverty in NZ. The aim is a preliminary estimate, made within limited available resources, but with sufficient precision to establish the order of magnitude of the present cost of child poverty in New Zealand. The purpose is to demonstrate that investment in cost-effective policies could lead to greater national wealth & improved quality of life.

Historically public policy has focussed overwhelmingly on “bottom of the cliff” interventions, identifying children suffering the effects of poverty, and providing resources to repair the damage. The hypothesis behind this investigation is that prevention is more cost effective than cure, and that when the costs of child poverty to New Zealand are more widely understood, support for targeted, proven, effective preventive interventions will become a much greater part of more cost effective policies<sup>1</sup>.

## 1.1 Defining Poverty

For the purpose of this analysis we define child poverty as the relative lack of access to resources, and experiences, which have adverse effects on children’s later educational and personal development. Our focus is on those children most at risk of adverse consequences, and is focussed primarily, though not exclusively, on those in the lowest socio-economic sub-populations.

For individuals, the consequences of poverty are more related to “Poverty of Experiences” because those are the factors that influence their future opportunities, than directly to low income. Income is only a surrogate measure of likely poverty of experience. This is demonstrated because some children from poor families are very successful. PISA 2009<sup>2</sup> explores this personal resilience as demonstrated at age 15 in educational performance. However, the differences in socio-economic group averages are indicators of the overall damage to society of child poverty.

Stephens, Waldegrave & Frater<sup>3</sup> used focus groups to establish a minimum adequate household expenditure level in New Zealand in 1993.<sup>4</sup> They defined family poverty as not having

*“sufficient income to purchase its own food and clothing, pay for its utilities and rent without going into debt, or needing to visit food banks, or take out special benefits. Meals out, videos, holidays and luxury spending were excluded. Minimum participation means that the family can take part in church, school and local activities, but not visit a restaurant or cinema.”*

They found that the minimum adequate household disposable income to achieve this was 59.8% of median equivalent household income, (and 60.1% of median equivalent expenditure).

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<sup>1</sup> Early Intervention: The Next Steps An Independent Report to Her Majesty’s Government Graham Allen MP 2010

<sup>2</sup> PISA 2009 Vol Educational Outcomes – Socio-economic Impacts pg62

<sup>3</sup> Measuring Poverty in New Zealand, Stephens, Waldegrave & Frater on spj5, NZ Poverty Measurement Project. Data was 1991 adjusted to 1993 values.

<sup>4</sup> “minimum adequate household expenditure” quantification was developed in focus groups of single parent households in Porirua, Lower Hutt, and Wainuiomata.

A lower poverty threshold was also tested as a sensitivity measure, more closely aligned with the then prevalent concept of benefits set as a “modest safety net”. It has been argued (Stephens et al (1992)) that expenditure is a better measure of poverty than income. Because much of the discrepancy between the two measures arises from the self-employed, and those with temporarily declined incomes, poverty estimates based on income are considered more reliable by Statistics NZ. Poverty of experience may also be more closely related to limits on expenditure.

Poverty definitions at 50% or 60% of median income are conceptually consistent with the Wilkinson & Pickett<sup>5</sup> view that relative inequality is co-related to adverse social outcomes. (Wider inequality will shift more into the “poverty” class.) Recent IMF pronouncements support this view<sup>6</sup>, and suggest that the risks of inequality are serious.

In the Health domain, the NZ Deprivation Index is an alternative, and possibly more accurate, measure of poverty.

Based on the poverty definition used, estimates of the proportion of families in poverty are made based on the Census and income data, and the NZ General Social Survey.

**Depending on the exact measure used, between 18% (194,000) and 22% (237,000) of children grow up in relative poverty in New Zealand<sup>7</sup>.** The differences are not significant, and not material to this estimate of the national costs of child poverty.

## 1.2 Measures of Cost of Poverty

A number of measures of “Cost of Poverty” are possible. These include:-

1. The sum of the opportunity costs to individuals;
2. The national loss of add value from lost employment opportunities,
3. The loss of Government revenue from taxation and increased Government costs from providing for Health, Welfare and community safety ;
4. The reduction in GDP;

and these measures apply over 1 or more generations, since there are cumulative intergenerational effects.

Any policy action to effectively reduce these kinds of costs has a long time horizon to achieve its effects. Since the effects are long lasting, the horizon of policy option evaluation and of the cost of poverty assessment must be at least 25 years and possibly over 2 generations (50 years) or more. For example, productivity benefits in children lifted out of poverty today will continue to accrue until after they retire in 60-70 years’ time.

In this analysis we endeavour to estimate the costs of the present policy set, compared to the case of eliminating child poverty. We envisage that the elimination of child poverty would shift the life experience of children currently in poverty to be comparable with the rest of the child population.

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<sup>5</sup> The Spirit Level, Wilkinson and Pickett.

<sup>6</sup> Rodney Ramcharan at <http://www.imf.org/external/pubs/ft/fandd/2010/09/Ramcharan.htm>

<sup>7</sup> Eradicating Child Poverty in New Zealand June 2010 - Every Child Counts –NZ p5

In assessing the “Costs of Poverty” we are comparing the present reality with one of two desirable future scenarios. These “Counterfactuals” are either the elimination of child poverty in the sense of “Poverty of Experience”; or its reduction by some arbitrary amount (say a 75% reduction); through the adoption of some alternative set of policy actions. The costs of poverty are the difference in the “Wealth and Public Good” between the present reality and the Counterfactual.

### 1.3 Early Poverty

Because of the greater impact of poverty early in life, policy action which focuses on family conditions prior to and during the first 5 years of the child’s life will have the maximum impact.

### 1.4 Domains of Estimation

Education affects both the probability of being in work (as opposed to unemployed) and the likely level of earnings. Measures of education are essentially qualification levels although some independent competency measures exist (PISA reading skills). There is New Zealand data on income in relation to qualification, so this provides a link to productivity.

Education is also related to lifetime health outcomes.

The relationship between socio-economic status and criminal behaviour is available from a longitudinal study in New Zealand.

The categories of cost impacts of growing up in poverty which we have considered are:

1. Educational Impacts. These focus on differences in educational performance and its effects on lifetime income. Direct educational spending differences are ignored.
  - a. Lifetime income effects on individual earnings
  - b. Lifetime income effect on Government tax revenue
  - c. Lifetime income effect on national “added value” ( GDP)
  - d. Intergenerational effects on 2<sup>nd</sup> generations children’s probabilities of experiencing poverty, which are relevant to on-going costs of eliminating child poverty.
2. Justice System Costs. ( Police, Courts, Corrections, and victim’s costs)
3. Health system costs, including the effects on individual’s income and support benefit costs.
4. Social welfare costs, including MSD costs, benefits, and housing support costs.

Not all of these proved quantifiable.

These will accumulate to:

1. Effects on individuals expected lifetime earnings.
2. Effects on government cash flow
  - a. Tax revenue
  - b. Health, Justice and Social Welfare system costs
  - c. Welfare payments.



The approach outlined below is fairly simple, and provides an initial estimate of the costs of child poverty. We note the absence of any available government estimate of the total costs of poverty to New Zealand. This analysis provides a starting point.

The approach is based largely on that of Bramley & Watkins, 2008, Rowntree Trust, in estimating UK costs of poverty.<sup>8</sup> It is based on recent or current costs, without rationalisation of data to a common year, or consideration of population growth.

#### **1.4.1 Education & Productivity**

Estimates of the costs of poverty arise from a consideration of the effect of community socio-economic status on school pass rate of the entry qualification to tertiary education.

#### **1.4.2 Crime**

Fergusson et al<sup>9</sup> reported self-reported criminal behaviour in 15-21 year olds, by family socio-economic status prior to age 6, and compared this with their Police conviction records. This provides an insight into the effects of poverty on criminal careers.

#### **1.4.3 Health**

There is information on hospital admissions for youth related to their socio-economic status, and this provides a basis for a preliminary estimate of the health effects of poverty.

#### **1.4.4 Social Welfare**

It is a corollary that eliminating child poverty will reduce the numbers of families in poverty and so reduce the demands on the benefit system. Policies that reduce poverty are expected to increase employment prospects and this potential saving has also been estimated.

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<sup>8</sup> The public service cost of child poverty, Bramley & Watkins, 2008, Rowntree Trust

<sup>9</sup> How does childhood economic disadvantage lead to crime? Fergusson, Swain-Campbell, Horwood 2004

## 2 Productivity Savings

### 2.1 Education & Productivity

Estimates of the costs of poverty arise from a consideration of the effect of community socio-economic status on school pass rate of the entry qualification to tertiary education. There is some evidence<sup>10</sup> that the actual effect for individuals is stronger than the school decile gradient of pass rate because each school decile group contains on average differing proportions of pupils from the lowest socio-economic decile. There is a dilution of the “pure poverty” effects by varying proportions of children who are not deprived in each school zone.

### 2.2 Assumptions

Because of the long time lapse between birth and the effects of educational results on economic contribution, an estimate of the costs of poverty assumes that the historic “qualification – income” linkages are fairly stable over time.

It is also implicit that the socio-economic status (SES), and more significantly the poverty of experience that results for some children is a significant influence on pupil qualification. School qualifications are a consequence of teaching excellence, school resources and pupil capability to learn. The variability of school capability which influences pupil’s qualifications is capable of improvement through benchmarking and similar activities. That means that low decile schools could do as well as high decile schools given less disadvantaged pupils. Stated differently, it assumes that pupil intelligence is not co-related to school decile. The wide distribution of results within school deciles, and the robust decile-qualification probability trend suggests these assumptions are not unreasonable.

### 2.3 University Entrance Pass rates

School decile is a measure of the percentage of lowest socio-economic status pupils and there is a strong correlation to University Entrance (UE) pass rate. There is evidence that preschool “poverty of experiences” affects the probability of attaining a school qualification. The implied assumption is that lifting pre-school experience – avoiding the omissions that undermine learning - could lift qualification rates.

University Entrance pass rate data from 2009 shows.<sup>11</sup>

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<sup>10</sup> Engler in [http://www.educationcounts.govt.nz/data/assets/pdf\\_file/0006/74148/Schl-leavers-progres-bachelorsFINAL-26032010.pdf](http://www.educationcounts.govt.nz/data/assets/pdf_file/0006/74148/Schl-leavers-progres-bachelorsFINAL-26032010.pdf)

<sup>11</sup> [http://www.educationcounts.govt.nz/statistics/schooling/school\\_leavers2/university-entrance-standard-numbers-2009](http://www.educationcounts.govt.nz/statistics/schooling/school_leavers2/university-entrance-standard-numbers-2009)

Table 1 University Entrance Exam results 2009

Decile	1	2	3	4	5	6	7	8	9	10
UE	574	807	922	1809	2217	2683	2449	3467	3701	5298
Not UE	2100	2843	2435	3862	3987	4346	2639	3655	2602	2049
Total Leavers	2674	3650	3357	5671	6204	7029	5088	7122	6303	7347
Proportion of Population	5%	7%	6%	10%	11%	13%	9%	13%	12%	13%
%Leavers with UE	21%	22%	27%	32%	36%	38%	48%	49%	59%	72%
Group averages	Lowest 20%			Rest of Population						
POTENTIAL GAINS	24%			48%						
	34%			41%				65%		

The key question is what level of improvement might be expected from eliminating child poverty.

In order to include 20% of the population, an approximation of the number of children in poverty, the set of lowest “deciles” needs to cover schools in deciles 1,2,3 and 10% of the 4<sup>th</sup> decile of schools. On this basis the average pass rate of the students from low, probably poverty exposed deciles, is 24%. Increasing their performance by eliminating poverty might improve performance to the decile 4-5 average- the minimum gain of 10 percentage points to 34%; to the decile 4-8 average of 41%, a 17 percentage point gain; or to 48%, the whole “non-poverty” exposed sub-population – a 24 percentage point gain, or even lift performance to that achieved by the highest quintile schools, a 41 percentage point gain to 65% pass rate.

Currently, individual schools average UE pass rates range from 0% to 90%. A key factor in estimating the cost of poverty is the level of qualification that could be achieved by lifting pupils out of poverty, and so changing their probability of achieving a UE qualification. (This is the useful relevant indicator available of general educational success).

The key issue is how far these pass rates could be lifted, and hence what is a realistic measure of the educational costs of child poverty?

## 2.4 Targets

The range of choices expected to result from eliminating child poverty can be demonstrated by five scenarios.

1. The results of the 3 lowest decile schools might be lifted to the average of the decile 4-5 schools
2. The results of the 3 lowest decile schools might be lifted to the average of the decile 4-8 schools. ( The middle ground)
3. The results of the 3 lowest decile schools might be lifted to the average of the decile 4-10 schools. ( The average of all the pupils “Out of poverty”)
4. The results of the 3 lowest decile schools might be lifted to the average of the decile 9-10 schools. (Targeting low decile schools to achieve with the best.)

- The results of all the schools in deciles 1 to 8 might be lifted to the average of the decile 9-10 schools. (Benchmarking and lifting all schools to achieve with the best.)

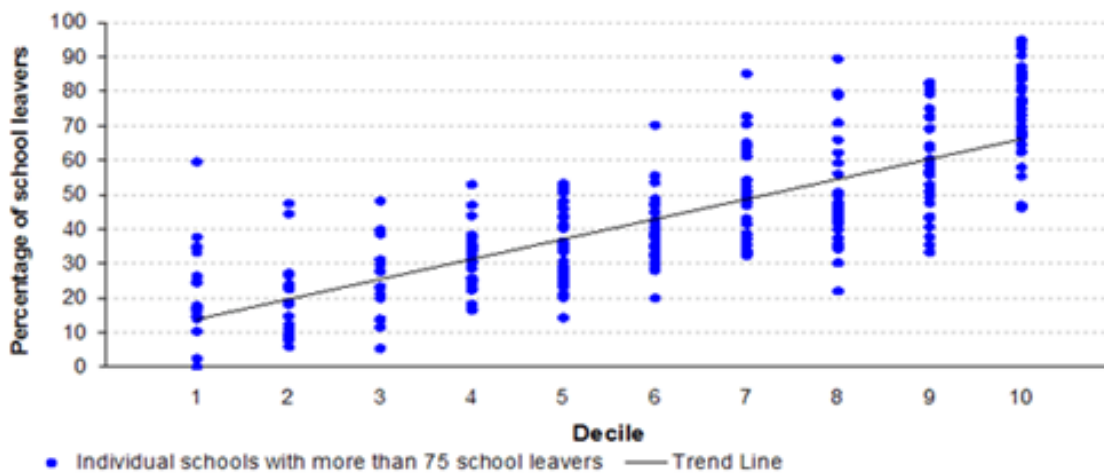
Clearly, these scenarios will have different costs, and different levels of benefit. The first 4 are shown in [Table 1](#).

We assume, based on Neff<sup>12</sup> that the innate ability of pupils in each decile is essentially similar. It follows that if the effects of “poverty of experience” were eliminated, there is no insurmountable barrier to the achievement of results equivalent to higher decile schools by those schools serving low decile populations. Scenario 3 above, targeting families in decile 1-3 areas, and deploying policies to lift results in this 20% of students in poverty (and so in these schools) to the average of all decile 4-10 schools, appears a realistic objective. However, deploying a similar policy set across the 80% of schools in deciles 1-8, and lifting results to the level of decile 9-10 schools will, as we show, offer even greater benefits.

As [Figure 1](#) shows, the range of results in decile 9-10 schools is large. (30% to 95% UE passrates) Through benchmarking many schools would be capable of achieving similar results, if the “school – readiness” of pupils in lower decile schools were improved by relevant early childhood and parenting policies. The narrow view of the full cost of child poverty is shown by scenario 4. The true cost of child poverty, that poverty afflicts some children in all socio-economic groups, in varying degrees, is reflected by Scenario 5.

Figure 1 Percentage of school leavers with UE qualification by School decile<sup>13</sup>

Figure 3: Percentage of school leavers achieving a university entrance standard, by school decile and school (2009)



*“There is a clear positive correlation between the socioeconomic mix of the school the student attended and the percentage of school leavers achieving a university entrance standard. Schools in the lowest deciles (deciles 1 and 2) draw their students from communities with the highest degree of socio-economic disadvantage. Students from schools in the highest deciles (deciles 9 and 10) are three times more likely to leave school having achieved a university entrance standard, than students from schools in the lowest decile schools.”*

<sup>12</sup> Socioeconomic status and intelligence: A critical survey. Neff, W. S. Psychological Bulletin, Vol 35(10), Dec 1938, 727-757. doi: [10.1037/h0055707](https://doi.org/10.1037/h0055707) “The major conclusion is that “[intelligence] tests cannot be used for measuring the capacity of different social levels within our own society.” A corollary interpretation is that “All... of the twenty-point mean difference in IQ found to exist between children of the lowest and highest status may be accounted for entirely in environmental terms.”

<sup>13</sup> [www.educationcounts.govt.nz](http://www.educationcounts.govt.nz) School leavers with university entrance standard (2009)

*There is a large variation in the proportion of school leavers achieving a university entrance standard amongst schools within each decile.”*

We note the great potential for improving average results by inter-school benchmarking to lift most schools within their own decile group closer to the best within its decile. The best decile 1 and 2 schools results overlap with the worst decile 10 schools.

The approach we have adopted to estimating productivity is to look at UE pass rates by school decile; to extrapolate higher qualifications within the group who achieve UE pass; and to examine income by qualification data. This enables an estimate of income gain from higher qualification levels. Estimates of the costs of poverty arise from a consideration of the effect of community SES on school pass rate of the entry qualification to tertiary education. As we have seen in [Figure 1](#) there is robust evidence higher SES schools get higher results, and higher qualifications translate on average to higher earnings.

As discussed, there is some evidence<sup>14</sup> that the actual effect for individuals is stronger than the school decile gradient of [Figure 1](#) shows because each school decile group contains on average differing proportions of pupils from the lowest socio-economic decile.

## 2.5 Higher Qualifications

Lifting UE pass rates for children from the lowest 20% of students- deciles 1, 2, and 3 - will flow on to their higher educational achievement. Currently, of the 60% of the workforce reported to have UE or higher qualifications<sup>15</sup> 46% go on to vocational or degree status and a 96% average higher earnings than the unqualified. This compares with a current 45% UE pass rate, and about 60% of these qualifying for degrees, certificates and diplomas<sup>16</sup>. So a 10% to 24% UE pass rate gain for the lowest quintile would be reflected in 2% to 5% higher proportion of the more qualified, and with consequent higher earnings.

## 2.6 Earnings information

As an example Statistics New Zealand<sup>17</sup>, reports median weekly incomes (2008) as \$324 for no qualifications, and \$360 for school qualifications, an 11% advantage; \$614 for a non-degree tertiary qualification, a 90% advantage; and \$844 for a Degree, a 160% advantage over no qualification. As the chart below shows, the premia for degree qualification are declining slightly.

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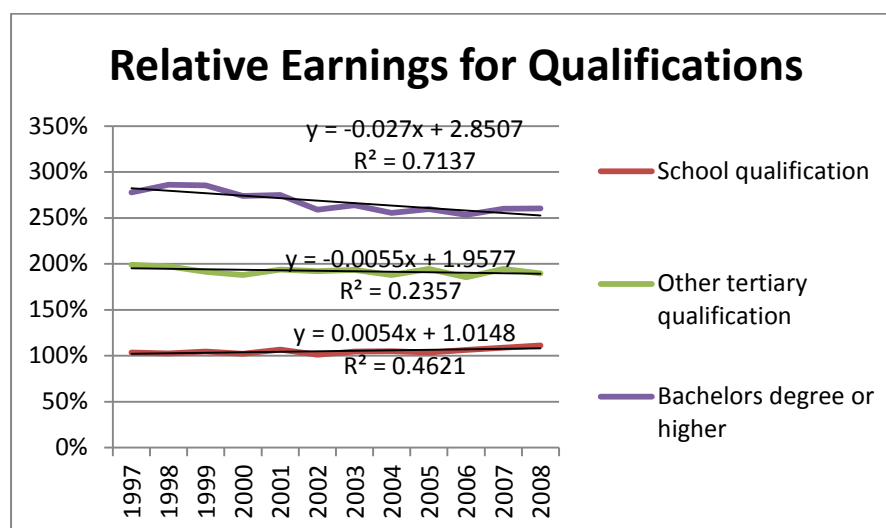
<sup>14</sup> Engler in [http://www.educationcounts.govt.nz/data/assets/pdf\\_file/0006/74148/Schl-leavers-progres-bachelorsFINAL-26032010.pdf](http://www.educationcounts.govt.nz/data/assets/pdf_file/0006/74148/Schl-leavers-progres-bachelorsFINAL-26032010.pdf)

<sup>15</sup> Nzisjue10qtralltables Table 5 Contd and see nzis-june09qtr-all-tables Table 1

<sup>16</sup> Educational attainment mix 2008 Min of Ed website.

<sup>17</sup> Effect of Tertiary Education on Income New Zealand Income Survey (1997-2008, June Quarter)

Figure 2 Trends of premiums for qualifications 1997-2008



Currently Statistics NZ reports<sup>18</sup> for those in paid employment and not employed show significant benefits from school qualifications. However, most of the gains are from ability to find employment, not actual earnings for qualifications. See [Table 2](#) below.

Table 2 Weekly Earnings by Qualification Statistics Dept 2010

	In paid employment			Not in paid employment			Employed & unemployed			Mix of all
	Average: all sources collected	Median: all sources collected	Number of people (000)	Average: all sources collected	Median: all sources collected	Number of people (000)	Average: all sources collected	Median: all sources collected	Number of people (000)	
<b>Highest qualification</b>										
No qualification	\$720	\$665	370.8	\$248	\$266	490.5	\$451	\$438	861.3	26%
School Cert / NCEA level 1	\$744	\$683	151.5	\$181	\$95	114.5	\$502	\$430	266.0	8%
Sixth form / NCEA level 2	\$736	\$640	128.1	\$141	\$0	69.4	\$527	\$415	197.5	6%
Higher school / NCEA level 3	\$703	\$581	123.3	\$148	\$113	73.5	\$496	\$406	196.8	6%
Other school	\$805	\$671	64.7	\$200	\$192	70.8	\$489	\$421	135.5	4%
Vocational or trade	\$945	\$863	674.4	\$289	\$279	259.6	\$763	\$701	934.0	28%
Bachelor's or higher degree	\$1,330	\$1,055	479.3	\$254	\$110	113.7	\$1,124	\$874	593.0	18%
Other post-school	\$928	\$800	104.2	\$297	\$269	52.6	\$716	\$622	156.8	5%
<b>Total<sup>(5)</sup></b>	<b>\$947</b>	<b>\$800</b>	<b>2,149</b>	<b>\$237</b>	<b>\$230</b>	<b>1272</b>	<b>\$683</b>	<b>\$588</b>	<b>3421</b>	<b>100%</b>

Note 5 Totals include "not specified" category

The percentage increases over "No Qualifications" are summarised below in [Table 3](#).

<sup>18</sup> Nzisjune10qtralltables ex Statistics website Table 5 cont & Table 7

Table 3 Percentage benefits of School Qualifications over No Qualifications 2010

	In paid employment			Not in paid employment			Employed & unemployed		
	Average: all sources collected	Median: all sources collected	Number of people (000)	Average: all sources collected	Median: all sources collected	Number of people (000)	Average: all sources collected	Median: all sources collected	Number of people (000)
<b>Highest qualification</b>									
No qualification									861.3
School Cert / NCEA level 1	3.3%	2.7%		-27.0%	-64.3%		11.2%		266.0
Sixth form / NCEA level 2	2.2%	-3.8%		-43.1%			16.8%		197.5
Higher school / NCEA level 3	-2.4%	-12.6%		-40.3%	-57.5%		9.9%		196.8
Other school	11.8%	0.9%		-19.4%	-27.8%		8.4%		135.5
<b>School averages</b>							<b>11.8%</b>		<b>1657.1</b>
Vocational or trade							69.0%	60.1%	934.0
Bachelor's or higher degree							149.0%	99.6%	593.0
Other post-school							58.8%	42.1%	156.8
<b>Total<sup>(5)</sup></b>									<b>3341</b>
							<b>Post UE average</b>	<b>96%</b>	<b>72%</b>

School qualifications on average lift incomes by 11.8% compared to “No Qualification”. Vocational, Tertiary, or Degree qualifications lift incomes further.

### 2.6.1 Employment prospects

According to this survey, only 64% of individuals report paid employment. The main driver of benefit from qualification is the probability of being employed. The Table below shows the reducing probability of unemployment with qualification.

Table 4 Effect of Qualification on probability of paid employment<sup>19</sup>

Highest qualification	Probability of Unemployment Unemployment%
No qualification	57%
School Cert / NCEA level 1	43%
Sixth form / NCEA level 2	35%
Higher school / NCEA level 3	37%
Other school	52%
Vocational or trade	28%
Bachelor's or higher degree	19%
Other post-school	34%
<b>Total<sup>(5)</sup></b>	<b>49%</b>

Weekly income advantages of 11% to 12% appear reasonable average values for school qualifications. Vocational or Trade qualifications show a 69% premium, degrees a 149% premium, and other post-school qualifications 59%.

( I note the unresolved inconsistency with unemployment statistics, probably because of this data covering all individuals, not only those seeking work.)

<sup>19</sup> Nzisjune10qtralltables NZ Statistics Dept

## 2.7 Earnings data summary

The NZ Income Survey shows 2008 median weekly income premiums of 11% for a school qualification, 90% for a non-Bachelor tertiary qualification, and 160% for a Bachelors or higher degree.<sup>20</sup> These sources are fairly consistent.

However, one study of annual income studies shows a different picture. David Scott, in Social and Economic Indicators of Education Section 3.3 Income (Aug 2010) Ministry of Education ([www.educationcounts.govt.nz](http://www.educationcounts.govt.nz)) concluded that a school qualification is worth a 37% premium in median household income over no qualification.; and a 64% premium in median personal income. This contrasts with the 12% shown in [Table 3](#).

In this analysis we have based our calculations on the Income Survey weekly earnings.

## 2.8 Areas of Uncertainty

### 2.8.1 Heredity

Holzer<sup>21</sup> suggests, based on Jencks & Tach (2006) that only about 60% of the effects of inequality can be attributed to environmental factors (i.e. 40% heredity factors). Rhee & Waldman (2002) in a meta study of 51 twin and adoption studies quote heritability influences from zero to 0.71. Walters (1992) meta study found a 9% influence. Mason and Frick (1994) suggest 50% genetic influence. Miles and Carey (1997) found up to 50%. James (2002) in “They F\*\*\* you up” quotes twin studies showing heritability of antisocial traits, but that the expression of these traits in anti-social behaviour is highly modulated by upbringing- environmental conditions. In other words expression of hereditary effects is not significant for behavioural outcomes compared to early childhood environment. There is clearly a great uncertainty about the impact of genetic factors on educational attainment and the extent to which, over time, environmental changes can influence educational capability. Lareau, in “Unequal childhoods: Class Race & Family life (2003)” (quoted by Gladwell in Outliers (2008)) shows how broadly one can identify two parenting styles, which differ along class lines. She describes middle class parenting as “*concerted cultivation to foster a child’s talents, opinions and skills*” which “*exposes the child to a wide range of experiences, and social skills in dealing with authority figures.*” These children had a sense of self- control of their lives, and the confidence to act for their own benefit in school and social situations. In contrast the poorer children were characterised by “*an emerging sense of distance, distrust, and constraint*”. Their parents were less involved with their lives, and let them make their own lives much earlier. These children lacked the sense of entitlement and the social skills to influence outcomes to their advantage. Gladwell in Outliers (2008) also points out that this difference is neither inherited nor racial, it is family culture driven. We conclude that hereditary has little impact, and that family culture is a much more powerful lever on educational, and life potential. Accordingly we believe that the proportion of educational potential impact of hereditary factors estimated by Holzer above is very high. From the sources quoted we concluded that the hereditary influence is only around 10%. We adopt a more conservative 25% heredity effect in our estimate and 75% environmental factors, and reduce estimated savings from better educational outcomes by this amount. (See [Table 9](#))

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<sup>20</sup> Statistics New Zealand, New Zealand Income Survey (1997-2008, June Quarter).

<sup>21</sup> Holzer et al (2007)



## 2.8.2 Resilience

The PISA study<sup>22</sup> indicates that many disadvantaged students demonstrate “resilience”. (Defined as students for whom the difference between predicted performance based on socioeconomic background, and actual performance, is in the top quartile of differences.) For New Zealand, some of these 37% of resilient students may already have overcome the effects of their poverty; and so they might benefit less from the elimination of child poverty. However, arguably this effect is already reflected in existing UE pass rates of all schools, and it may therefore have no impact on our measure.

## 2.8.3 Poverty of Experience in higher Socio-economic Quintiles

In the Rowntree study<sup>23</sup> “The public service costs of child poverty” Bramley & Watkins (2008) found that the proportion of children in poverty varied widely across geographic areas of poverty.

*“The table breaks down areas using the same deprivation bandings used in the ‘Mainstream’ study. The most affluent 25% of areas still have some children in poverty, on average 8.3%.”*

**Table 5 Proportion of children in poverty by IDACI grouping**

Table 3: Cost of child poverty on children’s personal social services estimates for England

Deprivation band	Child poverty IDACI	Cost per child/week costpchild	Cost per child/year costchpa	Cost effect of poverty	Aggreg effect £m England
Most prosperous 25%	0.083	6.75	146	87	158.6
Mod. prosperous 25%	0.129	9.80	211	135	311.8
Mod. deprived 25%	0.201	14.39	311	211	623.1
Fairly deprived 15%	0.301	20.62	445	317	696.7
Most deprived 10%	0.470	28.40	613	494	624.0
<b>Total</b>	<b>0.213</b>	<b>14.79</b>	<b>319</b>	<b>223</b>	<b>2414.1</b>
Top:Bottom Ratio	5.67	4.21	4.21	5.67	
Total Expenditure					3421.4
Poverty-Related Share					70.6%

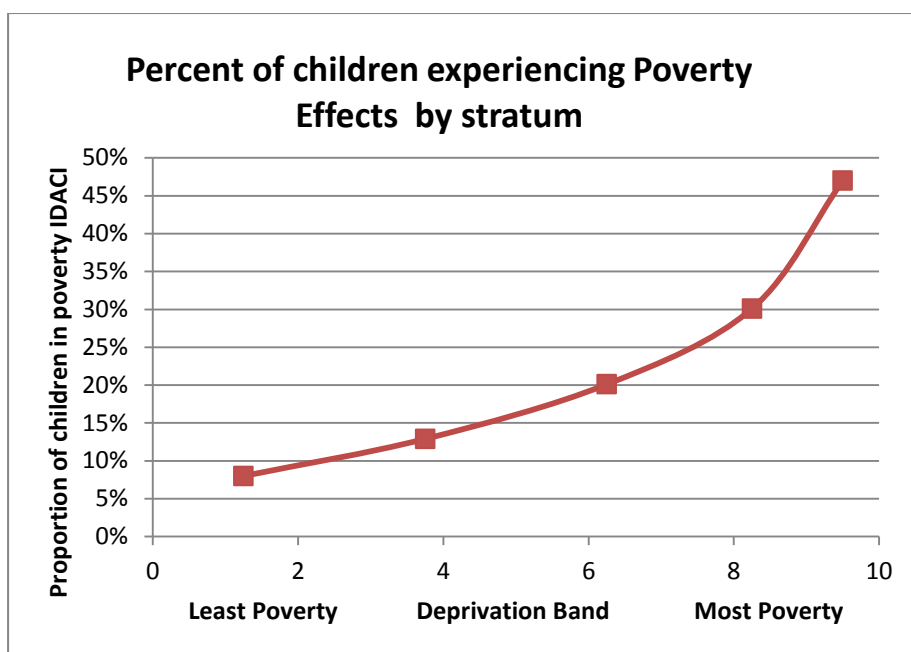
Note: IDACI is an indicator of the Indices of Multiple Deprivation (IMD) system used by Bramley and Watkins as the indicator of child poverty.

The proportion of children in poverty by stratum are shown in [Figure 3](#) below.

<sup>22</sup> PISA 2009 Vol 2 p62; Educational Outcomes –SocioEconomic Impacts

<sup>23</sup> “The public service costs of child poverty” Bramley & Watkins (2008) Rowntree Trust.

Figure 3 Proportion of children in poverty by socio-economic strata.



We see here indicators showing how the extent of poverty decreases between deciles when measured on a geographic basis (as is done for school deciles in New Zealand). The proportion of individuals exposed to poverty in the poorest decile is 47%, and less than 8% in the highest most prosperous decile. The ratio of highest to lowest incidence of poverty in a geographically ranked decile is potentially in the ratio of 6:1. Thus although nearly half of families in the lowest decile areas experience child poverty (as measured by the IDACI) significant proportions of higher ranked decile and quintiles also contain significant proportions of families on poverty. In the example shown, only 24% of families in poverty are in the most deprived decile areas<sup>24</sup>. In this British example, measures which estimate the effect of poverty by comparing the outcomes for quintile regions evaluated for their deprivation, would only be capturing 47% of the families in poverty (the lowest quintile of incomes). The standards of comparison for what could be achieved if poverty were eliminated would still be populations including the effects of the remaining 53% of families which were also experiencing poverty. This suggests that addressing the issues for all children experiencing poverty might increase the UE performance to decile 9 and 10 levels.

Table 6 Distribution of poverty within IDACI categories

Quintile / Quartiles	Top 25%	2nd 25%	3rd 25%	2nd Bottom 15%	Bottom 10%
Rowntree estimate of impact of poverty	8%	13%	20%	30%	47%
Proportion of all child Poverty	10%	17%	26%	23%	24%
				<b>47%</b>	

<sup>24</sup>  $(10\% \times 47\%) / (10\% \times 47\% + 15\% \times 30\% + 25\% \times 20\% + 25\% \times 13\% + 25\% \times 8\%) = 24\%$

The second observation is that this chart shows how poverty has non-linear impacts; the increase in effects is greatest where poverty is greatest.

This suggests that the focus on the lowest school deciles (the most disadvantaged 20% of children) may only address the potential benefits for 40% to 50% of children experiencing poverty, and demonstrates the potential of Scenario 5 as discussed in Section 2.4 .

#### 2.8.4 Availability of jobs

This approach assumes that increased qualifications will be reflected in job opportunities and earning capability to absorb a workforce with higher qualifications and potential. This increase in jobs also requires capital investment and economic growth. We consider that this investment represents part of the cost (or rather the investment) side of potential policy changes to reduce poverty. Such productive investment in jobs will be expected to create its own return on capital, and is essentially self-funding. The successful lifting of educational attainment, as represented by qualifications, is a good first approximation of long term benefit, and hence opportunity value, since investment in jobs may be assumed to be made on internal project economic considerations. The implied assumption is that all value creating new jobs will be private sector jobs and policy settings will attract investment in job creation.

#### 2.8.5 Intergenerational effects

A further issue is the intergenerational effects. Improving qualifications outcomes for 24% of children will impact on their socioeconomic life histories, and also on their children.

Duncan, Ziol-Guest & Kalil<sup>25</sup> show that intergenerational income effects for families of 0-5 year olds, and the child's earnings at age 37, are both significant, and very non-linear. They set out to

*“obtain relatively unbiased estimates of the total effects association between early-childhood poverty and adult attainment, behavior, and health.”*

Their results show high co-relations for early family income. They comment:

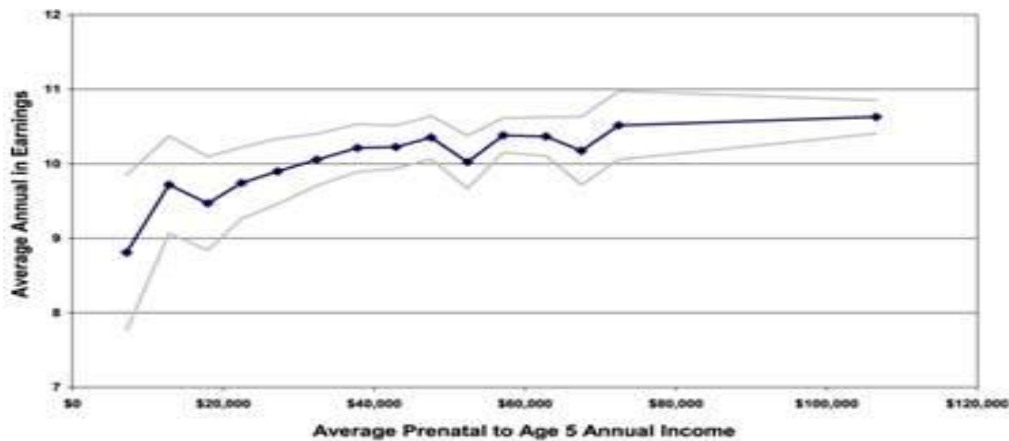
*“that additional income in the prenatal to age 5 period for the lowest-income children is associated with significantly greater adult earnings and work hours, and less food stamp receipt.”*

This paper also illustrates the highly non-linear effect of family income for under aged 5 children on future earnings.

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<sup>25</sup> Early Childhood poverty & Adult attainment, behaviour & Health at <http://onlinelibrary.wiley.com/doi/10.1111/j.1467-8624.2009.01396.x/full> Child Development Vol 81, Issue 1 pg306-325 Jan2010.

Figure 4 Effect on Average Earnings of Family Income ages 0-5



A paper by [Duncan and Brooks-Gunn \(1997\)](#)<sup>26</sup> draws similar conclusions that

*“family economic conditions in early childhood appear to matter more for shaping later development than economic conditions during adolescence. Developmental theory suggests that given the nature of developmental tasks, sensitivity to change, and interactions with the environment, early childhood is a developmental period that may be especially sensitive to environmental conditions affected by family income (Shonkoff & Phillips, 2000). Moreover, early courses of development may reach well into adulthood. Waddington (1957) has described development as proceeding along the branches of a tree—although changes in developmental trajectories can occur at any point at which a new branch is formed, the ability of the individual to alter his or her developmental course substantially becomes increasingly difficult over time. These themes are reflected in economic, psychological, and neurobiological perspectives on the importance of early childhood”*

Similar significant responses to escaping from early childhood poverty could be expected for New Zealand. This suggests that lifting the lowest decile out of poverty might have large effects. Even children who do not achieve a school qualification might gain significantly in earnings.

This intergenerational benefit means that the scale and costs that will lift the current 20% of children out of poverty can be greatly reduced in the second generation, without loss of benefits. Growing up without suffering the effects of child poverty is largely self-sustaining, and “immunises” the child against subsequent adult poverty.

## 2.9 Calculation of Productivity Effects

We have seen ([Table 1](#)) how eliminating poverty for the lowest quintile of children (the three lowest school “deciles”) might improve their pass rates by between 10%, 24% and up to 41% points (to 34% or 48% or 65%) in the UE exams. Combining these performance increases with the income data in [Table 2](#) we can expect a long term benefit of \$2bn to \$10bn annually in increased income. This represents “future earning capability”, typically at about age 34, so it is delayed about 18 years from their passing of University Entrance. The calculation is summarised below. The first table shows the

<sup>26</sup> Duncan, G. J., & Brooks-Gunn, J., (Eds.). (1997). *Consequences of growing up poor*. New York: Russell Sage Foundation

current situation (2010), the second shows the UE pass rates by school decile, and the third the potential if poverty was eliminated.

Table 7 Current UE qualifications and modelled earnings, and hence GDP contribution

Highest Qualification	No Qual	NCEA1 /SC	NCEA2	NCEA3 /UE	Other School	Other Post School	Vocational	Degree
Numbers June '10	861300	266000	197500	196800	135500	156800	934000	593000
Workforce Mix June '10	25.8%	8.0%	5.9%	5.9%	4.1%	4.7%	28.0%	17.7%
Weekly Income	\$451	\$502	\$527	\$496	\$489	\$716	\$763	\$1124
Annual Income	\$23452	\$26104	\$27404	\$25792	\$25428	\$37232	\$39676	\$58448
<b>School Leavers</b>								
Leaving Qualification	17.1%	13.1%	26.3%	43.5%				
Expected Final Qualification	12.0%	9.7%	17.8%	5.9%	4.1%	4.7%	28%	17.8%
Earnings by Group \$bn	\$9.40	\$8.46	\$16.3	\$5.09	\$3.46	\$5.86	\$37.11	\$34.78
<b>Total \$bn</b>	<b>\$120.46</b>							

Table 8 UE pass rates by school decile (2009)

Decile	1	2	3	4	5	6	7	8	9	10	
UE	574	807	922	1809	2217	2683	2449	3467	3701	5298	23927
Not UE	2100	2843	2435	3862	3987	4346	2639	3655	2602	2049	30518
<b>Total Leavers</b>	<b>2674</b>	<b>3650</b>	<b>3357</b>	<b>5671</b>	<b>6204</b>	<b>7029</b>	<b>5088</b>	<b>7122</b>	<b>6303</b>	<b>7347</b>	<b>54445</b>
Proportion of Population	5%	7%	6%	10%	11%	13%	9%	13%	12%	13%	
% Leavers with UE	21%	22%	27%	32%	36%	38%	48%	49%	59%	<b>72%</b>	44%
	Lowest 20%					Rest of Population					
Group averages	24%			48%							
						41%			66%		
Source UE results by decile 2009						34%					

If UE pass rates rose to the decile 4 to decile 10 average of 48% (Scenario 3), then we would see a gain of \$2 bn as the table below shows.

Table 9 Impact of improving Decile 1-3 pass rates to Decile 4-10 average levels

Highest Qualification	No Qual	NCEA1 /SC	NCEA2	NCEA3/UE	Other School	Other Post School	Vocational	Degree
Expected Final Qualification	10.0%	8.35%	17.1%	6.5%	4.5%	5.2%	28.9%	19.7%
Earnings by Group \$bn	\$7.81	\$7.28	\$15.68	\$5.62	\$3.82	\$9.46	\$38.34	\$38.38
<b>Total \$bn</b>	<b>\$123.4</b>							
<b>Increased Earnings</b>			\$2.94					
<b>Heredity discount</b>			25%					
<b>Increased Earnings \$bn</b>			<b>\$2.21</b>	% of Income		1.83%	<b>% GDP</b>	<b>1.24%</b>

If UE pass rates rose to the Decile 9-10 average of 66% (Scenario 5), then we would see a gain of \$9.6 bn.

Table 10 Impact of improving all children's pass rates to Decile 9-10 average

Highest Qualification	No Qual	NCEA1 /SC	NCEA2	NCEA3/UE	Other School	Other Post School	Vocational	Degree
Expected Final Qualification	1.0%	2.4%	14.1%	9.0%	6.2%	7.2%	33.1%	27.0%
Earnings by Group \$bn	\$0.76	\$2.05	\$12.92	\$7.73	\$5.25	\$8.89	\$43.83	\$52.78
<b>Total \$bn</b>	<b>\$134.21</b>							
<b>Increased Earnings</b>			\$13.75					
<b>Heredity discount</b>			25%					
<b>Increased Earnings \$bn</b>			<b>\$10.31</b>	% of Income		8.56%	<b>% GDP</b>	<b>5.79%</b>

A simple example is to consider the change in prospects for a person without University Entrance qualification. They earn on average \$727 per week if employed, and \$219 if not in employment. They have a 51% probability of not being in employment<sup>27</sup>. If they qualify for University Entrance, then long term they will average \$1024 p.w. if in employment, and \$260 if not employed; and have a 23% probability of not being in employment. The probable benefit of gaining UE is \$560 per week. This simple approach indicates a \$2.5 billion annual gain when UE pass rates are 48%, and \$13.8 b at 66% pass rates.

<sup>27</sup> Nzisjune10qtralltables from NZ Statistics Dept.

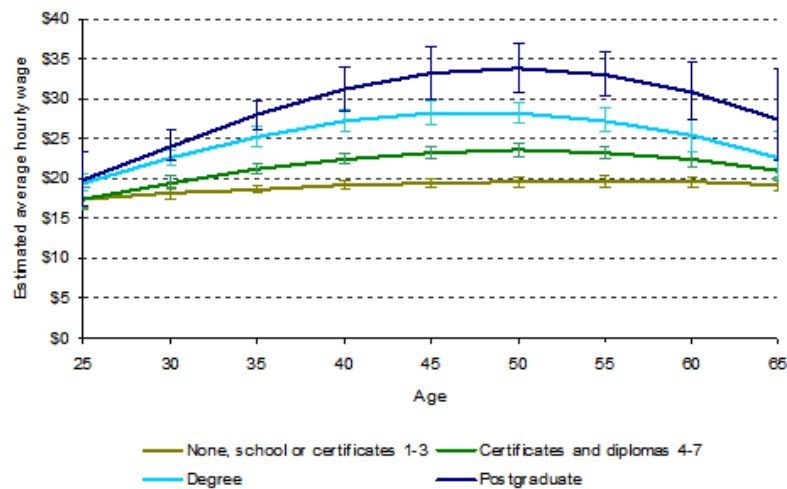
## 2.10 Timing of Benefits

The savings created by better educational outcomes are delayed. Typically (Figure 5), earnings from qualifications will be less in the age span 18-24 and will then grow to their premium levels from about ages 24-34 continuing to maintain those premiums to age 65.<sup>28</sup> These benefits will arise steadily from the introduction of a policy set which reduces or eliminates child poverty. A stable level of savings might take of the order of 20 years to achieve, and another 30 years before a full level of benefit is achieved.

Figure 5 Earnings trajectory by age and qualification

Figure 6

Estimated average hourly wages by age and highest qualification



Note: Reference group is men, with average document literacy and English as a first language.

In evaluating the value of benefits of eliminating child poverty, the issue of the appropriate discount rate for future benefits will be a major factor in perceptions of value.

This is discussed in Section 6.1.1 [Timing Issues](#).

## 2.11 Productivity Summary.

Productivity gains from eliminating child poverty are estimated in the range of \$ 2.2 billion to \$10.3 billion annually. Comparison of the results of schools drawing on differing proportions of children growing up in poverty shows major impacts on educational qualification outcomes. Reductions in the effects of child poverty will deliver better “learning ready” children to schools, and leads to much higher rates of educational achievement.

<sup>28</sup> Earle (2010-05) Labour market Outcomes of skills and qualifications.

### 3 Crime & Justice System Savings

In New Zealand there is a Treasury estimate of the national costs of crime, which provides a firm foundation for estimating the impact of child poverty.

Our approach is to use the Treasury cost of crime estimate as a basis; to examine its core assumptions and correct for apparent omissions and errors; and then estimate the impact of poverty on firstly youth crime, and then consequently on adult crime.

In 2006 NZ Treasury estimated the costs of crime in NZ<sup>29</sup>. They concluded:-

*“Our study concludes that the estimated total cost of crime in New Zealand in 2003/04 is \$9.1 billion, as a result of an estimated 1.8 million criminal acts in that year. The public sector’s share comprises about \$2.1 billion and the private sector’s share about \$7 billion.”*

The major costs by category are summarised in their table.

Table 11 Treasury estimate of number of criminal acts by category

Table 2 – Estimated number of criminal acts, by category of crime

2003/04	NZ recorded crime (incidents)	Multiplier	Estimated number of criminal acts
Offences against the person	48,245	6.93	334,300
- Violent offences	43,231	7.19	311,000
- Sexual offences	3,179	5.20	16,500
- Robbery	1,835	3.70	6,800
Offences against private property	286,161	4.66	1,334,600
- Burglary	60,630	2.20	133,400
- Theft	165,091	5.73	946,600
- Property damage	42,872	4.30	184,300
- Fraud	17,568	4.00	70,300
Offences with no direct or intended victim	123,409	1.00	123,400
- Drug offences	22,249	1.00	22,200
- Serious traffic	31,667	1.00	31,700
- All other	69,494	1.00	69,500
<b>Total</b>	<b>457,816<sup>2</sup></b>	<b>3.92</b>	<b>1,792,400</b>

Note : The Multiplier is the ratio of recorded crime to estimated actual crime.

#### 3.1 Review of Treasury Estimates

Treasury identify that the assumptions around the ratio of recorded to actual crime rates are difficult and so the variability of estimates is large. They assumed an average multiplier of 3.92. They treated drug offences as victimless crimes, with no victims (and so none are treated as unreported), and no estimate of health or lost output is included. Drink & dangerous driving offences are also treated as

<sup>29</sup> Estimating the costs of crime in New Zealand 2003/4 Topper & Thompson Treasury Working Paper 06/04



“all reported” on the assumption that they all involve injury. The table below summarises costs by offence category and sector, with costs largely UK based converted to NZ\$ at 2004 Purchasing Power Parity.

Table 12 Treasury estimate of average costs to private and health sectors of crime

**Appendix Table 5 – Average costs borne by the private sector and the health sector**

Average costs (\$)	Preventative expenditure	Insurance administration	Property lost	Intangible costs	Lost output	Total private sector	Health sector costs
Violent offences	3	3	0	5,195	1,624	6,820	1,153
- Homicide	349	552	0	2,072,670	1,086,732	3,160,300	1,855
- Grievous assaults	2	2	0	10,971	2,809	13,780	3,247
- Intimidation & threats	2	2	0	10,971	2,809	13,780	3,247
- Kidnapping & abduction	2	2	0	10,971	2,809	13,780	3,247
- Other assaults	2	2	0	1,898	648	2,550	296
Sexual offences	7	12	0	50,033	9,300	59,350	2,045
- Sexual violation	7	12	0	148,010	24,006	172,040	5,016
- Other	7	12	0	42,030	8,099	50,150	1,802
Robbery	0	51	246	7,343	2,436	10,070	1,164
Burglary	532	426	2,436	1,556	154	5,100	0
Theft	74	105	543	374	16	1,110	0
- Of vehicles	1,472	942	5,608	1,927	113	10,060	0
- From vehicles	279	120	855	641	48	1,940	0
- Other & receiving	0	79	348	284	7	720	0
Property damage	31	87	511	1,137	14	1,780	0
Fraud	0	0	12,352	1,556	0	13,910	0
Drug offences	0	0	0	0	0	0	0
- Cannabis	0	0	0	0	0	0	0
- Other drugs	0	0	0	0	0	0	0
Serious traffic offences	897	574	3,417	461,889	239,876	706,650	2,943
Alcohol/speed with death	1,472	942	5,608	2,072,670	1,086,732	3,167,420	1,855
Alcohol/speed with injury	736	471	2,804	10,971	2,809	17,790	3,247
All other offences	0	0	0	0	0	0	0

The zero “private and health sector” cost attributed to drug crime (and possibly its Customs and Police costs) under-represents real costs. NZ Crime Statistics 2010<sup>30</sup> reports 23,000 drug offences in 2010 92.5% of which were resolved (of a total 426,345 offences, 47.5% of which were resolved.) Drug crimes are therefore about 5.4% of recorded crime. The Drug Harm Index<sup>31</sup> reported Drug Use as costing NZ society \$1.3 billion annually in 2008 of which \$546m was social costs, \$353m were Court costs, \$108m were prison costs and \$21 million were community sentence costs.

<sup>30</sup> [http://www.police.govt.nz/sites/default/files/00\\_national\\_2010\\_official\\_stats\\_final.pdf](http://www.police.govt.nz/sites/default/files/00_national_2010_official_stats_final.pdf)

<sup>31</sup> <http://www.mapinc.org/drugnews/v08/n628/a04.html?1051>

BERL in a report to the Law Commission<sup>32</sup> said:-

*“As discussed in our Issues Paper, a recent paper by the Business and Economic Research Limited (BERL) estimated that the annual total social costs resulting from the harmful consumption of illegal drugs in New Zealand was \$1,585 billion. These costs comprised:*

*.. costs for tangible (monetary) harms (\$1,191.7 billion) borne by individuals (for example, lost wages, reduced productivity, medical treatment) and government (for example, crime costs, police and justice resources, healthcare costs, accident compensation, road crashes); and*

*.. intangible (non-monetary) harms (\$393.6 million) (for example, pain and suffering as a result of accident, loss of life).”*

The BERL report identified Police costs for drug offences at \$303 million in 2005/6. Ross Meurant (ex Police Inspector & MP) has argued that as much as 50% of all crime is drug related.<sup>33</sup>

All this suggests that the Treasury estimate of the multiplier between recorded and actual crime may be too low and hence its estimate of the cost of crime too low.

## 3.2 Calculation

The largest uncertainty in estimating the true national costs of crime is in the multipliers used to get from reported crime to actual crime, and the effect of this on victim costs.

The first obvious omission is Drug crime. Whilst this may officially be victimless, it is not without costs to the Justice and Health Sector, or to the very real victims.

Accordingly we first adjust the Treasury estimate of \$9.1 billion to include drug related costs. This brings the total to \$10.4 billion. (\$9.1b+ \$353m Court+\$108m Prison+\$303m Police+ \$546 victims=\$10.41billion)

### 3.2.1 Ministry of Justice Crime & Safety Survey 2006 & 2009

The New Zealand Crime and Safety Survey (NZCASS) also provides information on the relationship between crime as perceived by the population at large, and official NZ Police statistics on crime. In the 2006 Survey the results report that:

- **A third of all NZCASS offences were reported to the Police** – though reporting rates varied by type of offence. Thefts of vehicles were by far the most often reported. Just over half of thefts from vehicles were reported, and nearly as many burglary offences.

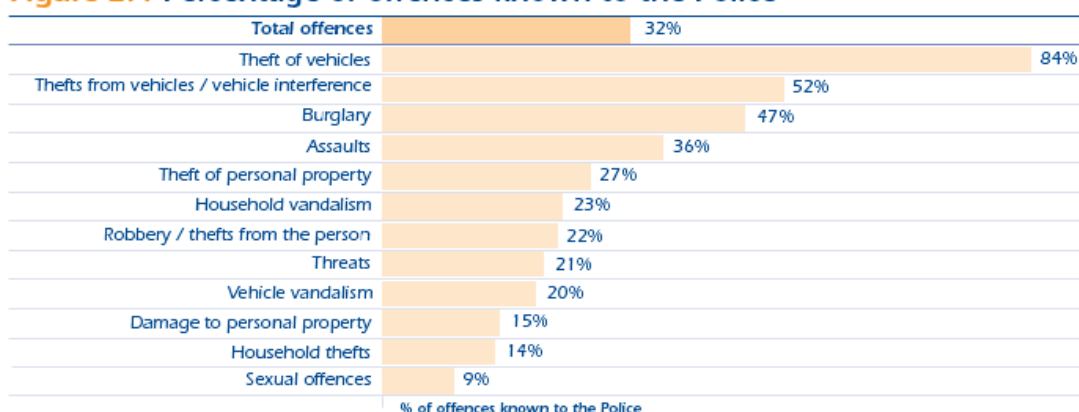
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<sup>32</sup> [http://www.lawcom.govt.nz/sites/default/files/publications/2011/05/part\\_1\\_report\\_-\\_controlling\\_and\\_regulating\\_drugs.pdf](http://www.lawcom.govt.nz/sites/default/files/publications/2011/05/part_1_report_-_controlling_and_regulating_drugs.pdf) quoting Business and Economic Research Limited (BERL) *Costs of Harmful Alcohol and Other Drug Use* (prepared for Ministers of Health and ACC, BERL, Wellington, July 2009)

<sup>33</sup> NZ Herald 21 June 2011

Table 13 Percentage of Offences known to Police 200

Figure 2.4 Percentage of offences known to the Police



- Some types of offences measured by the NZCASS can be compared with the equivalent number recorded by the Police. The survey shows that there were eight times more offences estimated by the survey than in Police figures. However, this figure should be seen as suggestive rather than precise.

There is considerable loss of information between actual offences, offences as reported by victims, and Police recording and results. The table above, and the two tables below give the most recent examples of this.

Table 13 above shows 32% of all offences as known to the Police.

Table 14 shows 41% (2009) and 44% (2005) of offences as known to the Police.

By no means all of the offences known to the Police are recorded by them.

Table 14 Estimates of Crime by Survey, Reported to Police, & Recorded by Police

Table 2.2 NZCASS estimates of crime in 2005 and offences recorded by the Police

	Police 000s	NZCASS 000s	% reported to the Police %	Estimated number reported 000s	% recorded of reported number %	% recorded of all NZCASS crimes %
Thefts of vehicles	20	29	84	24	80	67
Thefts from vehicles / vehicle interference	54	117	52	61	89	46
Burglary	38	330	47	154	25	12
Robbery / thefts from the person	4	49	22	11	40	9
Assaults	32	720	36	260	12	4
<b>Total comparable subset</b>	<b>147</b>	<b>1,245</b>	<b>44</b>	<b>552</b>	<b>27</b>	<b>12</b>

Notes:

Police figures are adjusted to improve comparability with the NZCASS figures (see Appendix B).

For how the NZCASS number of offences is derived, see Note 1 in Table 2.1.

The percent of NZCASS offences reported is based on the reporting rate for all incidents over the full recall period.

and for 2009

**Table 3.7: NZCASS estimates of crime and Police recorded crime in the 2009 NZCASS**

Comparable offences	Police recorded crime 2008	NZCASS 2009	Reported to Police	Estimated number reported to Police	Recorded of reported	Counted of all NZCASS
	000s	000s	%	000s	%	%
Thefts of vehicles	18	19	76	15	125	95
Thefts from vehicles/vehicle interference	51	86	58	50	102	59
Burglary	41	342	43	147	28	12
Robbery/theft from the person	6	72	<i>18</i>	<i>13</i>	46	8
Assaults	42	699	32	224	19	6*
<b>Total comparable subset</b>	<b>157</b>	<b>1,217</b>	<b>41</b>	<b>499</b>	<b>32</b>	<b>13</b>

Notes:

The percent of NZCASS offences reported is based on the reporting rate for all incidents over the full recall period.

Figures may not add to the totals shown due to rounding.

Figures in gray italics have a high relative standard error and are not statistically reliable.

\* indicates statistical significance at the 95% confidence level.

- *There are two main reasons for the gap. First, many crimes are not reported to the Police. For survey offences that can be compared with equivalent Police figures, only 44% became known to the Police. Second, not all offences that are reported to the Police are recorded by the Police (based on their figures).*

NZCASS 2009 estimated 910,000 offences against households, and 1,702,000 offences against persons, a total 2.6 million offences. This excludes commercial crime, drug crime, offences against bylaws, and administrative offences. (The 2003/4 Treasury estimate was of 1.8 million criminal acts in total).

On the face of it, the number of offences recorded by the Police is 27% to 32% of the number that victims believed had been drawn to their attention, and only 12% to 13% of all offences of which victims are aware. **Crime, as experienced by victims is about 8 times Police recorded crime.**

NZ Police discount the NZCASS data<sup>34</sup>, and quote the “Rare Event Phenomenon”. The Conference Summary on which they rely<sup>35</sup> concludes (pg 63)

*“The self-report method for measuring this rather sensitive topic of undetected criminal behavior appears to be reasonably valid. The content validity of the recent inventories is acceptable, the construct validity is quite high, and the criterion validity appears to be in the moderate-to-strong range”*

Several studies also suggest that self-reports may provide more comprehensive data.<sup>36, 37</sup>

<sup>34</sup> Gavin Knight, Police Statistics Dept pers Comm.

<sup>35</sup> Measurement Problems in Criminal Justice Research, ISBN 0-309-08635-3

<sup>36</sup> Hindelang (1979) self reports excludes serious crime; Elliott & Ageton (1980) –truncated reporting of seriousness and frequency

<sup>37</sup> The Fergusson data, while not based on identical samples and therefore “potentially misleading” (quote Horwood pers comm) gives a self reported crime to conviction ratio of 8:1 also. The estimates have significant uncertainty.

### 3.2.2 Actual to Reported Crime discussion

There are several sources of information to compare in assessing crime statistics. These include:

1. Treasury Working Paper 06-04, Estimate of Cost of Crime of 2006, using 2003/4 data
2. The New Zealand Crime and Safety Survey 2006 & 2009, by the Ministry of Justice, based on 2005 and 2008 data<sup>38</sup>
3. Poverty and Criminal behaviour, Fergusson, Swain –Campbell & Horwood 2004, based on a Christchurch sample of about 3,000 15,17 & 20 year olds using 1992,1994,& 1997 data
4. NZ Police Crime Statistics 2010
5. Patterns in Police Apprehensions report 2005-2009 NZ Statistics Dept
6. Police Apprehension Statistics 2007-2010 from Statistics NZ

A review of these various sources lead us to conclude that **actual to Police recorded crime ratios ranging from 5:1 to 7:1**, and perhaps as high as 8:1 if the NZCASS data is reliable. We conclude that the Treasury estimate based on 3.92:1 seriously underestimates the level of true crime, and hence the costs to victims. Since unreported crime is presumably less serious on average than reported crime, we have assumed a ratio of 6.5:1 in our calculations.

Because unreported crimes are expected to be less serious on average, we have also used a victim cost at 50% for the higher level of unreported crimes above 4:1.

This crude analysis suggests that the Treasury methodology for estimating actual to reported crime could be underestimating actual crime by around 50% or more of the real value.

### 3.2.3 Socio-economic factors in Youth crime

Fergusson<sup>39</sup> reports incidence ratios of violent / property crime with SES for 15-21 yr olds as follows for NZ.

**Table 15 Relative incidence of self-reported crime and convictions**

**Table 4** Incidence rate ratios between measures of economic disadvantage and rates of violent/property crime before and after adjustment for family, individual, school and peer factors

Adjustment	Socio-economic status (0-6 years)						p
	1	2	3	4	5	6	
a) Self-reported offending							
Unadjusted	1	1.26	1.59	2.01	2.53	3.21	<.001
Family factors	1	1.13	1.28	1.45	1.64	1.85	<.001
Family, individual factors	1	1.10	1.20	1.32	1.45	1.59	<.001
Family, individual, school factors	1	1.08	1.17	1.26	1.37	1.48	<.01
Family, individual, school, peer factors	1	1.04	1.09	1.13	1.18	1.23	>.10
b) Officially recorded convictions							
Unadjusted	1	1.92	3.67	7.03	13.48	25.82	<.001
Family factors	1	1.60	2.56	4.10	6.55	10.48	<.001
Family, individual factors	1	1.54	2.37	3.65	5.61	8.64	<.01
Family, individual, school factors	1	1.29	1.66	2.14	2.76	3.56	>.10
Family, individual, school, peer factors	1	1.14	1.30	1.48	1.69	1.93	>.40

The implication is that lower sextile socio-economic status individuals are responsible for a disproportionate proportion (about 49%) of officially reported youth crime (and 28% of self-reported, i.e. actual crime). If the results for the most deprived 20% of youth, socioeconomic Group

<sup>38</sup> This survey excludes “victim less” crime e.g. drug offences which are about 14% of crime costs- See [Table 20](#) and about 10% of offences – analysis of patterns- of-police-apprehensions.

<sup>39</sup> How does childhood economic disadvantage lead to crime? Fergusson, Swain-Campbell, Horwood 2004

6 and part of Group 5 were to shift to the average for Group 1-5, there would be 16% less self reported crime (and so 16% less victim damage) and 46% less police, courts, and Corrections costs for property & violent crime by youth.<sup>40</sup>

This table also indicates that lower socioeconomic status individuals have overall a much higher probability (about 8x) of being convicted based on the level of self-reported crime.

### 3.2.4 Youth Crime

Based on the Treasury estimates, we see the potential to reduce youth crime through reducing child poverty, by 16% actual crime (as self-reported) in its victim costs; and by 46% in convictions. The reduced conviction level is an indicator of reduced Police, Justice and Corrections costs. Since the New Zealand age split of offenders is 43% under 21 (and 24% of custodial sentences under 21<sup>41</sup>), so this reduction in public sector crime cost corresponds to 20% (=46% x 43%) of Justice Sector costs; and 7% (= 16% x 43%) of victim costs, which are split as Health \$564m, Private Sector \$7 billion.

As discussed in Section 3.3.2, this is discounted by 7% for heredity effects.

On the basis of the Treasury estimates, reducing child poverty could save \$0.71b p.a. in costs of crime about 0.40% of GDP.<sup>42</sup>

Based on more likely multipliers of actual to reported crime of around 6.5, this could be **\$0.8 billion, 0.45% of GDP.**

Table 16 Value of eliminating poverty on Youth Crime

	Crime Multiplier =4	Crime Multiplier =6.5
Treasury Costs of Crime	\$9.10b	
Adjusted for Drugs	\$10.41b	\$10.41b
Proportion under 21	43%	43%
Justice Sector Costs	\$2.86 b	\$2.86 b
Proportion of costs of crime for under 21	43%	43%
Savings from eliminating child poverty	46%	46%
Savings in Justice Sector	\$2.86b x 46% x 43% =\$0.57b	\$2.86b x 46% x 43% =\$0.57b
Victims Costs	\$7.55 b	\$9.94 b
Savings from eliminating child poverty	16%	16%
Savings in Victims	\$7.55b x 16% x 43% =\$0.52b	\$9.94b x 16% x 43% =\$0.68b
Heredity discount on savings	7%	7%
Total Savings	\$1.09b less 7% \$1.01 b 0.57% GDP	\$1.24b less 7% \$1.15 b 0.65% GDP

<sup>40</sup> Spreadsheet Estimate of NZ Cost of Poverty .xls H242-3 & K 248-9

<sup>41</sup> NZ Convicted Offenders ex Corrections Dept.

<sup>42</sup> Risk Ver 3 Unescalated CoCP Model 29 July /Assumptions, Education & Crime/C655

### 3.2.5 Effects of Youth Crime reduction on Adult crime.

Official apprehension rates by age are available<sup>43</sup> from the Justice Dept.

Table 17 Police Apprehension rates by offence and age group

**Table 2.1: Police apprehension rates per 10,000 population for non-traffic offences, by offence category and age group, 2008<sup>1,2,3</sup>**

Offence category	0 to 9	10 to 13	14 to 16	17 to 20	21 to 30	31 to 50	51+	Over all ages
Violence	1	39	198	305	225	127	18	101
Other against persons	0	8	46	90	60	34	6	27
Property	8	232	964	836	355	119	15	192
Drug	0	8	71	189	120	59	6	49
Against justice	0	1	21	121	87	44	4	33
Against good order	1	41	221	390	172	71	12	82
Miscellaneous	0	7	50	222	77	25	5	35
Overall	10	336	1572	2153	1097	478	66	519

Notes:

1 The data used to produce this table was sourced from New Zealand Police. For consistency with the court statistics in this report, offences are grouped using the Ministry of Justice offence classification rather than the Police classification. The miscellaneous category includes a small number of apprehensions that were classified as unknown. The figures in this table do not refer to distinct offenders, as people who are apprehended for more than one offence are counted once for each offence. See Appendix 2 for more detail on statistics sourced from New Zealand Police.

2 Rates per 10,000 have been calculated using population estimates in Table A1.1. See Appendix 1 for more detail on population estimates sourced from Statistics New Zealand.

3 See Table A2.3 for the number of Police apprehensions for non-traffic offences, by offence category and age group, 2008; and Table A2.4 for the percentage of Police apprehensions for non-traffic offences, by offence category and age group, 2008.

**Table 17** shows apprehension rates for ages 14-20 for property violent and other crime. Since violence and property crime is about 2/3rds of all recorded crime by 14-20 year olds, we have taken the overall crime apprehension rates as the indicator of crime by age. The weighted average for 14-20 year olds is 1,906 apprehensions per 10,000 pop (19%)<sup>44</sup>. Fergusson reports 7.6% of individuals aged 15-21 had 1 or more convictions for violence or property crimes. This is consistent with an average of about 2 crimes per convicted person.

This table also indicates that apprehension rates are 3 times average for age groups 14-16, 4 times average for age 17-20, and twice average for age 21-30. Comparing the 14-20 age groups and over 21 populations we calculate apprehension rates of 730, and 408 per 10,000<sup>45</sup>. Given the high recidivism rates for prisoners under 20 (88% reconvicted within 5 years of prison release) in New Zealand<sup>46</sup>, we can calculate that 66% of all crime by those over 21 is committed by those who have

<sup>43</sup> [http://www.justice.govt.nz/publications/global-publications/c/child-and-youth-offending-statistics-in-new-zealand-1992-to-2008/documents/Child\\_and\\_youth\\_offending\\_statistics\\_in\\_New\\_Zealand\\_1992-2008\\_full\\_report.pdf](http://www.justice.govt.nz/publications/global-publications/c/child-and-youth-offending-statistics-in-new-zealand-1992-to-2008/documents/Child_and_youth_offending_statistics_in_New_Zealand_1992-2008_full_report.pdf) pg 19 Table 2.1

<sup>44</sup> Estimate of NZ Costs of Child Poverty /Sheet1 /PQ 240

<sup>45</sup> See calculation table on "Estimate of NZ Costs of Child Poverty /Sheet1 /N239:T341

<sup>46</sup> Overall recidivism rates in NZ on [http://www.corrections.govt.nz/data/assets/pdf\\_file/0009/394902/Complete-Recidivism-Report-2009-DOC.pdf](http://www.corrections.govt.nz/data/assets/pdf_file/0009/394902/Complete-Recidivism-Report-2009-DOC.pdf)

already committed an offence prior to age 21. On that basis, about 81% of all convictions for crime are a result of young people drifting into crime before age 21.

The calculation is shown in the table below.

**Table 18 Impact of Youth Crime on Adult Crime**

	Age mix of Crime							Overall
	0-9	10-13	14-16	17-20	21-30	31-50	51+	
Apprehension /10000	10	336	1572	2153	1097	478	66	519
Population	593,750	238,016	188,836	254,998	525,360	1,211,640	1,305,450	4,318,050
Apprehensions	594	7,997	29,685	54,901	57,632	57,916	8,616	224,107
	93177				124164			217342
Mix of Crime	42.9%				57.1%			
Grouped App'hen'n Rate	13.58%				4.08%			5.19%
App rate 10-20	19.06%							
App rate 0-20yr	7.30%							
Reoffending rate for under 20 year olds	88%							
Proportion of Adult Crime arising from Youth Crime	66%							
<b>Youth driven Crime</b>	175173				42168			217342
	<b>81%</b>				19%			

An alternative approach based on 1995 sources produces a similar result. Over 20 year olds had at least an 81% probability of a prior conviction.<sup>47</sup>

**Table 19 Prior Convictions and recidivism 1995**

Ages	14-16	17-19	20-24	25-29	30-39	40+
No prior Convictions	80.10%	38.90%	19%	12.50%	13.90%	26.40%
Mean Number of Offences	0.7	3.9	9.9	17.4	19.7	12.8
<b>Prob. of having a prior Offence</b>	19.90%	61.10%	81.00%	87.50%	86.10%	73.60%
Weighting by 2009 Pop	188836	193998	305,000	281,360	576,670	1,940,420
Prob of Prior conviction	41%		78%			
	73%					
Number of Apprehensions	29,685	41,768	334,585	308,652	275,648	128,068
Number of Convicts	42,407	10,710	6,128	4,160	4,241	5,003
Proportion of Prior Conviction Convicts	19.90%	61.10%	<b>81.00%</b>	<b>87.50%</b>	<b>86.10%</b>	<b>73.60%</b>

<sup>47</sup> Risk based cost of Child Poverty model Ver 2 June 2011/Assumptions / B556:H566



If instead of the proportion of youth crime relative to all crime of 43% we assume that 81% of all crime costs for both youth and subsequent adult crime arises from Youth crime, then longer term the potential savings are much greater at **\$2.2 billion annually, about 1.2% of GDP.**

### 3.2.6 Productivity effects of reduced crime

The potential savings in Justice Sector costs represent 20% of those costs. All other things being equal, this could be expected to reduce the staffing levels required proportionately, and free up 4,300<sup>48</sup> current public servants to work in the productive sector, with a positive effect on national productivity. At an average income of \$49,000 p.a. (Table 2) this would add \$212 million annually to the productive sector. This element has not been included in the cost of poverty calculation.

### 3.2.7 Crime Savings Summary

The result can be summarised as in the Table below

Table 20 Summary of Costs of Crime Youth and Adult

Youth Crime	Crime Multiplier =4	Crime Multiplier =6.5
Treasury Costs of Crime	\$9.10b	
Adjusted for Drugs	\$10.41b	\$10.41b
Proportion under 21	43%	43%
Savings in Justice Sector	0.57b	0.57b
Savings in Victims	\$0.52b	\$0.68b
Total Savings	\$1.01b 0.57% GDP	\$1.24b 0.70% GDP
<b>PLUS Adult Crime</b>		
ALL Crime	Crime Multiplier =4	Crime Multiplier =6.5
Adjusted for Drugs	\$10.41b	\$10.41b
Proportion under 21	81%	81%
Savings in Justice Sector	\$2.86b x 46% x 81% =\$1.07b	\$2.86b x 46% x 81% =\$1.07b
Savings in Victims	\$7.55b x 16% x 81% =\$0.98b	\$9.94b x 16% x 81% =\$1.29b
Total Savings	\$2.05b 1.15% GDP	\$2.36b 1.36% GDP
Heredity discount on savings	7%	7%
<b>Total Savings</b>	<b>1.91B</b> <b>1.07% GDP</b>	<b>2.19B</b> <b>1.23% GDP</b>

<sup>48</sup> 20% of 7,800 Corrections staff –Dept of Corrections Annual Report 2009-10; 11,000 Police - <http://www.police.govt.nz/about>; and 2,900 Min of Justice staff - <http://www.justice.govt.nz/about-the-ministry>

## 3.3 Areas of Uncertainty

### 3.3.1 Actual crime to Police recorded crime ratio

As discussed, the victim cost of crime, which depends critically on the multiplier of real crime to reported crime is a major area of uncertainty. The analysis done here discounts costs of unreported crime above the Treasury estimate by 50% on the basis that unreported crime on average will be less serious than reported crime as reported in the NZCASS.

The effect of reducing youth crime and diverting youth into law-abiding, as opposed to criminal behaviour is reflected in reduced long term adult crime. The impact estimate of this [Table 18](#) is also uncertain but very significant long term. Second generation effects will also arise from the reduced number of parents whose lifestyle leads their children into crime, creating a sustainable reduction in crime.

These potential savings also ignore the impact on capital requirements of Courts and Prisons if present levels of crime continue. Reducing the effects of poverty can significantly reduce this increased demand. (Of the order of \$0.4 billion long term<sup>49</sup>. This figure is not included in our estimate.)

Budget escalation of Corrections Department has averaged 11% p.a. since 2001, and this increase has also not been factored into our future savings estimate.

The figures above ignore traffic- driving- offences, which are probably a significant component of the consequences of youthfulness.

### 3.3.2 Heredity

There is a view that much criminal behaviour is genetically driven, in the sense that children migrate to crime because their parents are criminal, and they are genetically pre-disposed to crime. To the extent that this is true, then eliminating poverty will have a diminished effect on reducing crime.

Recent meta-analysis suggested the effects are small.<sup>50</sup>

*This investigation used the statistical technique of meta-analysis to probe the putative association between heredity and crime. The data for this study were 54 effect sizes obtained from 38 family, twin, and adoption studies on crime. In addition to the overall gene-crime relationship, the potential moderating effects of gender, sample nationality, date of publication, and quality of the research design were also investigated. It was predicted that heredity and crime would not coincide, although subsequent analyses disclosed a low-moderate correlation between these two variables (mean unweighted phi coefficient = .25; mean weighted phi coefficient = .09). Further analysis of these data revealed that better designed and more recently published*

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<sup>49</sup> Corrections deploys \$2 billion of assets for 8,500 prisoners. A 20% reduction in prisoners would save about \$0.4b capital.

<sup>50</sup> A META-ANALYSIS OF THE GENE-CRIME RELATIONSHIP<sup>†</sup> GLENN D. WALTERS. Criminology Vol30 Issue 4 pp595-614 Nov 1992.

*studies provided less support for the gene-crime hypothesis than more poorly designed and earlier published investigations*

In our analysis we discounted savings for hereditary effects on crime at the level of 7% (See [Table 20](#))

### 3.3.3 Timing of Results

Savings from reduced crime commence at about age 12-15 and are reflected in sustainable savings as criminal careers are avoided. This is shown in [Figure 12](#).

## 3.4 Crime Summary

From Treasury estimates we have developed a national cost of crime. Based on Fergusson's survey of youth behaviour, we can estimate the impact of eliminating poverty on youth crime, and from examining recidivism effects we can estimate the overall long term impact of reducing youth crime.

Long term the potential savings from reduced crime are about **\$2.2 billion annually, about 1.2% of GDP.**

## 4 Health

Three sources of information were located to enable an estimate of the effect of child poverty on health. The first was the reported health system costs<sup>51</sup>, which provided a system wide view of health costs. The second, which gave us a pointer towards socio-economic effects, was the Indicator Handbook<sup>52</sup> data which looked at the relative incidence of hospital admissions for children by SES. A third was Treasury analysis of health outcomes by education.<sup>53</sup>

Based on these three resources, the impact of child poverty, and the potential gains in health costs from reducing child poverty can be broadly estimated, in three steps.

1. The relative demand on health system costs from increased ill-health of children co-related to deprivation can be estimated (Indicator Handbook data).
2. The proportion of total national health system costs attributable to children can be estimated (Health expenditure data).
3. The changes in adult health system costs consequent on better average child health can be estimated.

The Indicator Handbook gives relative admission rates by Deprivation Index<sup>54</sup> (Dep Index) for a range of illnesses. This can serve as a source of an estimate of the relative impact of deprivation on health outcomes.<sup>55</sup>

Admission rates per 100,000 were summarised for the available causes of admission, and the rates were summarised by Dep Index Quintile

Table 21 Relative Hospital Admission by Deprivation Index

Dep Index	1-2	3-4	5-6	7-8	9-10
Admissions by SES	9253	10736	12777	17115	28043
Share by SES of all admissions	12%	14%	16%	22%	36%
RR to population average	<b>0.59</b>	<b>0.69</b>	<b>0.82</b>	<b>1.10</b>	<b>1.80</b>

The relative risk (RR) of admission increases three-fold with relative deprivation.

### 4.1 Targets

We assume that eliminating child poverty will have an impact on the child health outcomes and costs for children currently living in poverty. The value of this impact depends on the assumption of how large an improvement will result from “eliminating child poverty”.

<sup>51</sup> Health Expenditure Trends in New Zealand 1996-2006, MoH 2008 from Ministry of Health’s website: <http://www.moh.govt.nz>

<sup>52</sup> Monitoring the Health of New Zealand Children And Young People, Indicator Handbook, Elizabeth Craig & Catherine Jackson Feb 2007 MoH & Pediatric Society

<sup>53</sup> TWP 10-04 The Cost of Ill Health Heather Holt

<sup>54</sup> Dep Index is a NZ Statistics measure of relative deprivation based on measures of benefit dependency and low income, unemployment, lack of access to a car or telephone, single parent status, renting, and size of living space.

<sup>55</sup> Spreadsheet “Cost of adverse Health Estimates.xls”

In the absence of more detailed information we make the simplifying assumptions that non-hospital costs (primary care) have a similar sensitivity to poverty as do hospital costs, and that in a long term view, all costs are essentially variable to volume at the margin (i.e. overheads can be reduced as system demand reduces). Because of the long term nature of these savings, organisational adjustment can be planned and proceed in a measured and non-disruptive way.

There are a range of possible scenarios for what might be achieved (analogous to the situation discussed in relation to education).

1. The most cautious assumption might be that children in Deprivation Index 9 & 10 areas might be improved to be equivalent to those of Dep Index 7 & 8.
2. The health of children in Deprivation Index 9 & 10 areas might be improved to be equivalent to those currently in all families ( Dep Index 1 to 10)
3. The health of children in Deprivation Index 9 & 10 areas might be improved to be equivalent to those currently in all “non-deprived” families ( Dep Index 1 to 8)
4. The most aggressive assumption is that health outcomes for all children could be lifted to the equivalent of Dep Index 1 & 2.

The effects of deprivation on child health are hypothesised to be mediated through lack of prompt access to medical care; parent knowledge and culture; housing conditions; transport difficulties; lower educational outcomes; and attitudes arising from experiencing inequality. A recent summary<sup>56</sup> quotes:

*The reasons are not hard to find. Inadequate nutrition and the related predisposition towards obesity among the poor; overly cramped living quarters; high levels of stress resulting from the never-ending clash between basic needs and insufficient income; the financial barriers to prescription medicines as well as proper dental and eye care; and, in many cases, a sheer lack of knowledge about the practices that contribute of good health and the resources to put them into effect.*

The extent to which “eliminating child poverty” would improve the health outcomes for children growing up in poverty is dependent on the particular policies that might be adopted to alleviate poverty. The fact of different socio-economic groups experiencing quite different outcomes suggests that models for change exist. The first 3 of the scenarios above are considered feasible outcomes from adoption of different policy sets.

We have based our estimations on Scenarios 1, 2, and 3 above, assuming that a realistic set of policies would improve the health outcomes for children in Deciles 9 & 10 to the same distributions of outcomes that now apply to Deciles 7 and 8, or even improve to do as well as Deciles 1 to 8.

## 4.2 Health System Costs

An extract from Table 4.3 of the Health Expenditure Trends study<sup>57</sup> shows the costs of health issues for 2005/2006:

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<sup>56</sup> The Cost of Poverty, An Analysis of the Economic Cost of Poverty in Ontario, Nate Laurie for the Ontario Association of Food Banks 2008. On [www.oafb.ca](http://www.oafb.ca)

<sup>57</sup> Health Expenditure Trends in New Zealand 1996-2006, MoH 2008 from Ministry of Health’s website: <http://www.moh.govt.nz>

Table 22 Cost of Health Expenditure

Health care services and goods by function	ICHA-HC code	2005/06 (000s)	Increase 2004/05 to 2005/06 (000s)	Average annual growth rate	Comments
Services of curative and rehabilitative care	HC.1:HC.2	8,302,245	714,777	9.7%	Total personal costs
Services of long-term nursing care	HC.3	2,469,891	311,131	8.9%	
Ancillary services to health care	HC.4	1,045,490	73,579	11.8%	
Medical goods dispensed to outpatients	HC.5	2,025,115	169,894	12.0%	
Pharmaceuticals and other medical non-durables	HC.5.1	1,912,182	163,195	11.9%	
Therapeutic appliances and other medical durables	HC.5.2	112,933	6,700	14.0%	
<b>Subtotal: Personal medical services/goods</b>		<b>13,842,741</b>	<b>1,269,381</b>	<b>10.0%</b>	
Prevention and public health services	HC.6	982,761	107,689	16.4%	
Health administration and health insurance	HC.7	607,505	69,063	7.7%	
<b>Total current expenditure on health</b>		<b>15,433,007</b>	<b>1,446,113</b>	<b>10.3%</b>	
<b>Memorandum items: Further health-related functions</b>					
Education and training of health personnel	HC.R.2	577,477	44,592	10.1%	
Research and development in health	HC.R.3	207,766	11,356	13.1%	
Food, hygiene and drinking-water control	HC.R.4	249,417	20,846	12.3%	
Environmental health	HC.R.5	1,277,485	66,333	6.0%	
<b>Total health-related expenditure</b>		<b>2,312,145</b>	<b>143,127</b>	<b>8.3%</b>	
<b>Total health and health-related expenditure</b>		<b>17,745,152</b>	<b>1,589,260</b>	<b>10.0%</b>	

The sub-total: Personal medical service /goods, reflects the national expenditure on personal health matters. Administration and further health functions are additional to give a total current expenditure of \$15,433,007,000. The other items are treated as fixed costs. A re-formulation of Table 5.3 Appendix 5 of the source document shows the mix of these costs.

Table 23 Re-presentation of Health System Costs from Appendix 5 Table 5.3 Health Expenditure Trends MoH

<b>Hospitals</b>	Hospitals \$000	Nursing & residential care facilities	Ambulatory health care providers	Total
Inpatients	\$3,401,268	\$1,251,586	\$257,645	4,910,499
Outpatients	\$1,252,926	\$80,270	\$2,401,495	3,734,691
<b>Primary Care</b>				
Physicians offices	\$1,079,419			
Dentists	203,072			
Other Health professionals	846,711			
Outpatient Care Centres	904,723			
Medical Laboratories	\$924,673			
Home care providers	\$1,267,703			
Retail medical goods	2,033,513			
Chemists dispensaries	1,098,908			
Public Health Provision & Admin	539,319			
General Health Admin & Insurance	614,386			
Total per Table 4.1				\$15,433,000

For the purpose of estimating the impacts of improved child health, we might summarise these as follows:

Inpatient Costs of Hospitals	\$4,901,499,000
Outpatient Costs	\$3,374,691,000
Physicians & health providers	\$7,155,853,000

This last includes doctors, dentists, health professionals and medical goods, both dispensed and retail medicines.

I note that these costs are increasing at a real annual average rate of 4.57% p.a. over the last 10 years, and forecast increases are a serious concern of funders. The 2009/10 total would be around \$18.45 billion. (This probable 20% increase has not been factored into our calculation).

### 4.3 Youth Health Costs

The age mix of health costs can be approximated by the hospital discharge data<sup>58</sup>. In 2007-8 there were 933,000 discharges of inpatients, and 278,800 day cases treated. The age mix of these is shown on the table below.

<sup>58</sup> Publicly-funded-hospital-discharges-07-08

Table 24 Hospital Discharges by Age mix<sup>59</sup>

Ages	Percent	Cumulative %
0-4	14.4%	14.4%
5-9	2.8%	17.2%
10-14	2.2%	19.4%
15-19	4.5%	<b>23.9%</b>
20-24	5.4%	29.3%
25+	70.7%	100.0%
0-14	19.4%	
0-24	29.3%	

We see that 14% of admissions are for 0-4 year olds, 19% for under 15s, and 24% for under 20 year olds.

#### 4.4 Effects of Youth Health savings on Adult Health Costs.

A second component of the consequences of poverty is the longer term impact on adult health costs, affecting the population aged 20 and older.

Treasury, in Working Paper 10-04<sup>60</sup> identified the risk of ill health by educational qualification.

Table 25 Hospital Costs by highest qualification

	People affected			Cost	
	Count	% of all people	% of those affected	\$bn	% of cost
Degree or Higher	26,000	5.6	9.7	0.082	6.3
Post-school vocational	99,100	9.4	37.0	0.479	37.1
School qualification	64,400	8.0	24.1	0.310	24.0
No qualification	78,100	13.3	29.2	0.416	32.2
<b>Total</b>	<b>267,700</b>	<b>9.2</b>	<b>100.0</b>	<b>1.290</b>	<b>100.0</b>

Source: SoFIE/NZHS Wave 3 Version 4, adjusted longitudinal weights, Statistics New Zealand

Notes:

1. These are for hospital appointments that start in reference period of interviews held between October 2004 and September 2005.
2. Columns may not sum to totals owing to rounding.

This shows that the unqualified have a 13% probability of an annual ill-health in-patient cost, compared to 9.2% for the population at large ( and 8.4% for the qualified groups). This is a 45% or 58% higher probability-i.e. relative risk- for the unqualified. A high proportion of children growing up in poverty are in this unqualified group, currently about 17%.

<sup>59</sup> Estimate of NZ Costs of Child Poverty Sheet 1 D208-W208

<sup>60</sup> TWP 10-04 The Cost of Ill Health Heather Holt



We have seen that eliminating poverty would shift unqualified students (2% to 4.8% of all students) into the qualified group, to the school qualification group, and possibly 1½ % to 4%- to the post – school and degree groups.

In another Treasury Working Paper (TWP)<sup>61</sup> Judge & Paterson work hard to undermine any connection between income inequality and health. However, they then conclude:-

*“There is a growing body of evidence from the new generation of multi-level studies that the frequently observed association between income inequality and population health at the regional level, especially in the USA, is a by-product of two factors. First, the non-linear relationship between individual income and health, which means that poverty is strongly associated with adverse health outcomes. Secondly, the fact that income inequality may act as a marker for other area characteristics such as ethnicity or the extent of social welfare infrastructure that do influence health. The relative importance of these two factors is not absolutely certain but the first seems more significant than the second.”*

and

*“We are more convinced that health inequalities are the outcome of cumulative differentials in exposures to poor material conditions – including low income – and resultant behavioural and biological risk factors, which can endure throughout the life course.”*

In Childhood Poverty & Adult Health<sup>62</sup> researchers for End Child Poverty a UK charity, quote C Power, L Li and O Manor, ‘A Prospective Study of Limiting Longstanding Illness in Early Adulthood’, International Journal of Epidemiology 29, 2000, pp131-39 that

*“Adults at 33 years of age in the 1958 British national cohort were 50 per cent more likely to report limiting illness if they had experienced disadvantage at seven and 11 years of age.”*

Magnuson & Votruba-Drza<sup>63</sup> reported that

*“By age 50, individuals who have experienced poverty in childhood are 46 percent more likely to have asthma, 83 percent more likely to have been diagnosed with diabetes, and 40 percent more likely to have been diagnosed with heart disease, in comparison to individuals whose incomes are 200 percent of the poverty line or greater.”*

The comparison of those under the poverty line, with those at or above twice that level, corresponds to the first quintile compared to the other 4 quintiles, in NZ wages terms.<sup>64</sup> This is equivalent to comparing Dep Index 9 & 10 with a population of Dep Index 1-8.

These studies suggest that child poverty and associated poor health increase the risk of adult poor health by 40% to 80% compared to the average income groups, and around twice the risk of work limiting or chronic ill health. (The Treasury 45%-58% higher risk for unqualified as compared to

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<sup>61</sup> TWP 01-29 Poverty, Income inequality and Health, Judge & Paterson

<sup>62</sup> Childhood Poverty & Adult Health, on

[http://www.endchildpoverty.org.uk/files/Childhood\\_Poverty\\_and\\_Adult\\_Health.pdf](http://www.endchildpoverty.org.uk/files/Childhood_Poverty_and_Adult_Health.pdf)

<sup>63</sup> R. C. Johnson and R. F. Schoeni, “Early-Life Origins of Adult Disease: The Significance of Poor Infant Health and Childhood Poverty,” Unpublished manuscript, 2007. Quoted in “Enduring influences of childhood poverty” Magnuson & Votruba-Drzal, Focus Vol26 No2 Fall 2009

<sup>64</sup> Nzisjune10qtrtables /Table8. Personal Incomes; Quintile1=\$180 pw; Quintile 2 = \$379 pw

qualified people is a little below the middle of this range.) In this estimate we have assumed that there is a 40% to 80% impact on adult health risk and costs from poor child health.

## 4.5 Health Savings Calculation

We can now summarise the health savings from eliminating child poverty.

The first step is to calculate the direct savings to child and youth health costs.

Inpatient Costs of Hospitals	\$4,901,499,000 <sup>65</sup>
Outpatient Costs	\$3,374,691,000
Physicians & health providers	\$7,155,853,000
System Costs	<u>\$15,433,000,000</u>
Proportion of costs attributable to children under 20	24% <sup>66</sup>
Costs of health for under 20 year olds	<u>\$3,688,000,000</u>

Considering the three target results for health costs (Section 4.1) we can then use the relative admission rates to calculate the savings from reducing the Dep Index 9-10 quintile admission rates to the level of the various possible targets.

**Table 26 Reduction in Hospital admission from eliminating child poverty (refers to Table 21)**

Dep Index	1-2	3-4	5-6	7-8	9-10
Admissions by SES	9253	10736	12777	17115	28043
Share by SES of all admissions	12%	14%	16%	22%	36%
RR to pop'n average	<b>0.59</b>	<b>0.69</b>	<b>0.82</b>	<b>1.10</b>	<b>1.80</b>

Target Levels	Dep Index 7-8	Dep Index 1-10	Dep Index 1-8
Dep Index 9-10 admissions	1.80	1.80	1.80
Target admissions	1.10	1.00	0.80
Reduction in relative admissions for Deciles 9-10	0.70	0.80	1.00
Overall % Reduction ages 0-20	<b>14%</b>	<b>16%</b>	<b>20%</b>

### Youth Health Cost Savings

<b>Youth Health costs</b>	\$3.69 billion		
Youth Health Cost savings	<b>\$0.52</b>	<b>\$0.59</b>	<b>\$0.74</b>
Proportion of Health costs	3.4%	3.8%	4.8%
Proportion of GDP	0.29%	0.33%	0.41%

<sup>65</sup> Health Expenditure Trends in New Zealand 1996-2006, MoH 2008 from Ministry of Health's website:

<http://www.moh.govt.nz> and [Table 23](#)

<sup>66</sup> [Table 24](#)

However, the second component of the consequences of poverty is the longer term impact on adult health costs.

If child ill-health were reduced by 14% to 20% as shown in [Table 26](#) and the increased health risk to adults from child poverty is 40% to 80% (Section 4.4) then in the long term, consequential adult ill-health could be expected to reduce by 6% (=14% x 40%) to 16% (=20% x 80%). Since adult health costs are \$11.7 billion (=76% of \$15.4 billion), the long term annual impact on adult health costs is of the order of \$0.66 billion to \$1.88 billion. This is 4.2% to 12.2% of Health system costs; about ½% to 1.0% of GDP.

The combined impact on child health and consequent adult health is summarised in a more exact calculation below.

**Table 27 Health System Cost Savings – Adult Health**

<b>Target Levels</b>	<b>Dep Index 7-8</b>		<b>Dep Index 1-10</b>		<b>Dep Index 1-8</b>	
Youth Health savings	14%		16%		20%	
Impact of child health on adult health costs	40%	80%	40%	80%	40%	80%
Adult health cost savings proportion	5.6%	11.2%	6.4%	12.8%	8.0%	16.0%
Adult Health costs	\$11.74					
Adult health cost savings	<b>\$0.66</b>	<b>\$1.32</b>	<b>\$0.75</b>	<b>\$1.50</b>	<b>\$0.94</b>	<b>\$1.88</b>

**Table 28 Combined Adult and Youth Health cost savings from eliminating poverty**

<b>Target Levels</b>	<b>Dep Index 7-8</b>		<b>Dep Index 1-10</b>		<b>Dep Index 1-8</b>	
Impact of child health on adult health costs	40%	80%	40%	80%	40%	80%
Combined Health system cost savings	<b>\$1.18</b>	<b>\$1.84</b>	<b>\$1.34</b>	<b>\$2.09</b>	<b>\$1.68</b>	<b>\$2.61</b>
Proportion of GDP	<b>0.66%</b>	<b>1.03%</b>	<b>0.75%</b>	<b>1.18%</b>	<b>0.94%</b>	<b>1.47%</b>

In summary we might expect eliminating child poverty to save under 20 year olds health costs of \$0.52 b to \$0.74 billion annually, i.e. 3.4% to 4.8% of Health system costs (which are \$15.4 billion annually); and in the adulthood of those children a further \$0.66 billion to \$1.88 billion; 4.2% to 12.2% of total health system costs annually.

These savings are reduced by 7% by the hereditary effects discussed in Section 4.6.

Table 29 Combined Adult & Youth Health savings adjusted for Heredity.

Target Levels	Dep Index 7-8		Dep Index 1-10		Dep Index 1-8	
Combined Health system cost savings	\$1.09	\$1.71	\$1.25	\$1.95	\$1.56	\$2.43
Proportion of GDP	0.61%	0.96%	0.70%	1.09%	0.88%	1.37%

**This puts the total long term cost of child ill-health from poverty at \$1.1 billion to \$2.4 billion. 0.6% to 1.4% of GDP.**

#### 4.6 Areas of Uncertainty

The issue of possible hereditary effects on the potential savings has been considered. Holzer et al estimated this impact at only 7% of possible health savings, based on a review of Case<sup>67</sup>. In an extreme context of Bosnia, Ifeta Licanin, Redzic & Dedic<sup>68</sup> found no evidence of inherited impacts on drug use in adolescents. We have not been able to find other evidence of the impact of inherited factors on poor health in children, although anecdotal observation suggests that a proportion of ill health would remain for children in the absence of poverty. In the absence of other data we have relied on Holzer, and discounted savings by 7%.

The impact of poverty in childhood on adult health costs is also an area of considerable uncertainty.

The annual Health system costs used in this analysis were \$15.4 billion (2005/6) of which \$4.9 billion were in-patient costs.

Treasury<sup>69</sup> estimated that hospital inpatient costs from ill health were \$5.4 billion to \$12.8 billion annually, but made no estimate of the outpatient and non-hospital health system costs which we estimate at around \$10.5 billion annually. (This indicates that the Treasury estimate of the health system costs of ill health might be \$10.5 billion too low but this difference is unresolved and not included.)

Treasury's estimate of the consequential productivity costs, through lost working time of ill health, were \$4 to \$11.5 billion (2004/5). Allowing for the non-inpatient costs, it may be that total costs of ill health are \$4.5 billion to \$19.4 billion, 29% to 126% greater than our estimate (Table 22). In this case the health cost savings would include the estimate of productivity loss, and would increase to range from \$1.6 billion to \$4.7 billion, a \$0.5b to \$2.3b increase compared to our estimate of \$1.09 to \$2.43b, Table 29.

<sup>67</sup> Case, Anne; Angela Fertig and Christina Paxson. 2005. "The Lasting Impact of Childhood Health and Circumstance." *Journal of Health Economics*, Vol. 24, No. 2, 365-89.

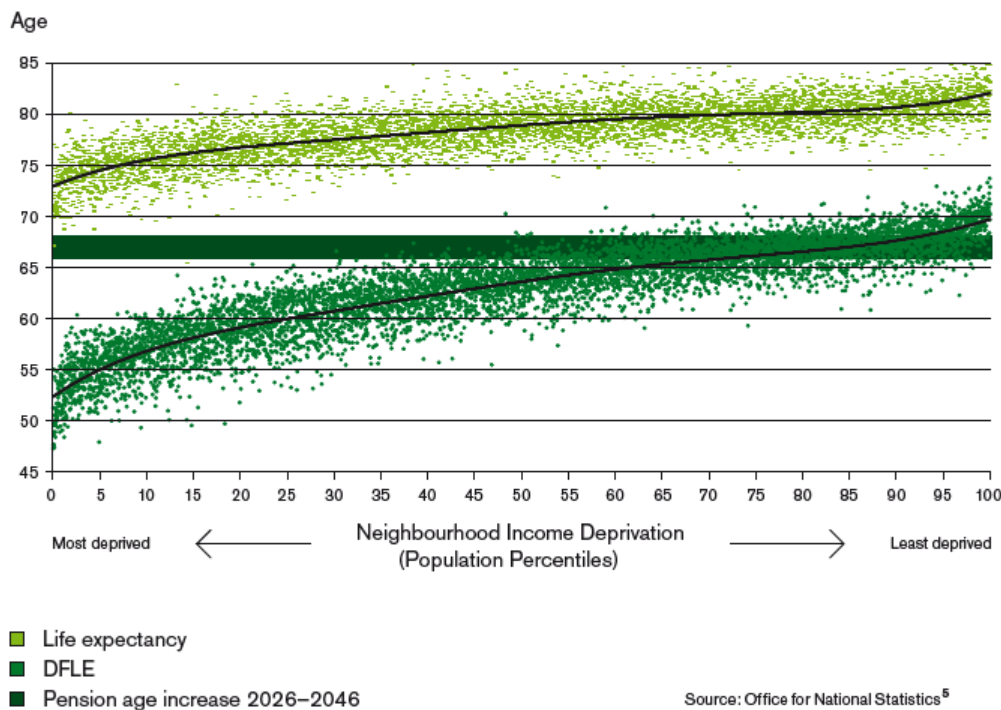
<sup>68</sup> Impact of Hereditary Factors on Adolescents' Behavior Related to Tobacco, Alcohol and Drugs Use in Bosnia and Herzegovina Ifeta Licanin, Amira Redzic, Amira Dedic  
Psychiatric Clinic of University of Sarajevo, Bosnia and Herzegovina Department of Biology and Human Genetics, Faculty of Medicine, University of Sarajevo, Bosnia and Herzegovina Department of Oral Medicine and Periodontal Diseases, Faculty of Dental Medicine, University of Sarajevo, Bosnia and Herzegovina

<sup>69</sup> TWP10-04 The Costs of Ill Health- Heather Holt (2010)

We have not estimated the effects of increased mortality arising from child poverty on contribution to the economy, although this may be significant. British data<sup>70</sup> suggests that the effect of deprivation on life expectancy (and disability-free life expectancy- an indicator of capacity for work) is significant, and that the difference between the lowest quintile (the “poverty region”) and the average is of the order of 6 years of disability free life (63-57). This represents about 13% (= 10/(65-20)) working life, and is an underestimate of lost earnings, because the lost years are at the higher end of age related earnings. The Marmot chart is reproduced below.

Figure 6 Changes in Disability -free Life Expectancy

Figure 1 Life expectancy and disability-free life expectancy (DFLE) at birth, persons by neighbourhood income level, England, 1999–2003



Applying the Marmot “6 additional years” of work capability to the 20% of each age cohort currently raised in poverty, indicates 60,000 additional workforce after 57 years, and at an additional gain of average income of \$35,500 (See Table 2) is a benefit of \$2.1 billion annually.

The largest uncertainty in Health cost savings relates to the current high rate of cost escalation.

Health costs are increasing at a real annual average rate of 4.57% p.a. in constant (uninflated) dollars over the last 10 years, and 5.1% since 1925<sup>71</sup> and forecast increases are a serious concern for funders. Clearly this is unsustainable. We have explored containing this rapid cost growth in real terms over periods of 10-30 years. The real health cost inflation is nearly two-fold and has a significant influence on the potential savings, if cost increases are not contained in fairly short time

<sup>70</sup> The Marmot Review *Fair Society, Healthy Lives: A Strategic Review of Health Inequalities in England Post-2010* was published on 11 February 2010.

<sup>71</sup> Health Expenditure Trends Sep08.pdf pg 13 & 17

frames. Clearly the associated health costs of not controlling cost escalation are unsustainably high, and we have ignored this uncertainty.

These uncertainties are summarised in the Table below.

**Table 30 Impact of possible uncertainties on Health cost and productivity savings**

<b>Target Levels</b>	<b>Dep Index 7-8</b>		<b>Dep Index 1-10</b>		<b>Dep Index 1-8</b>	
Estimate of Health Costs of Child Poverty \$b	<b>\$1.09</b>	<b>\$1.71</b>	<b>\$1.25</b>	<b>\$1.95</b>	<b>\$1.56</b>	<b>\$2.43</b>
Productivity costs of Ill Health	\$0.56	\$1.61	\$0.64	\$1.84	\$0.80	\$2.30
Health and Productivity Savings	<b>\$1.65b</b>	<b>\$3.32b</b>	<b>\$1.89b</b>	<b>\$3.78b</b>	<b>\$2.36b</b>	<b>\$4.73b</b>
Plus Reduced Mortality \$b	\$2.21b	\$2.21b	\$2.21b	\$2.21b	\$2.21b	\$2.21b
<b>Total Savings incl Uncertainties.</b>	<b>\$3.86b</b>	<b>\$5.53 b</b>	<b>\$4.1b</b>	<b>\$6.0b</b>	<b>\$4.57b</b>	<b>\$6.94b</b>

We have conservatively adopted the estimates of [Table 29](#) (line 1 of [Table 30](#)) for our estimate of Health impacts.

#### **4.7 Timing**

Effects on child health will begin to be achieved as new policies are introduced. Their cumulative impact will grow as the effect of new cohorts of children avoid spending their early years suffering the effects of poverty, and will continue to grow throughout their lifetimes, as they suffer less ill health in adulthood.

## 5 Social Welfare Savings

We can view the social welfare costs of child poverty and hence the value of eliminating it in two ways.

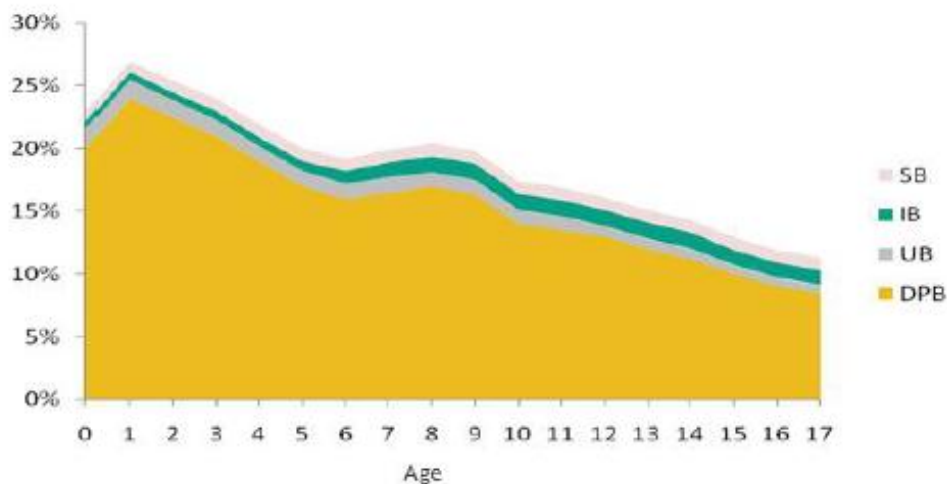
1. If worthwhile, accessible, adequately paid work was available for the parents of many children in poverty, then the direct costs of their welfare benefits could be saved.
2. The children who thereby avoided growing up in poverty would have better education and earning prospects and would reduce the future demand for welfare benefits, as they in turn reached working age.

In the Treasury presentation to the Welfare Working Group<sup>72</sup> they note that child poverty rates are 75% for “workless” households, compared to 11% when one adult is in full time work. (Perry 2010) This suggests that a very high value attaches to job creation and that making the choice to work a sensible choice for parents is an important policy requirement.

Average poverty rates are very child age dependent, and are twice as high for 1-2 yr olds as for 16-17 yr old children. As we have seen, poverty for children under 5 has the most severe consequences.

([Table 25](#), [Table 26](#))

Figure 7 Proportion of children (0-17) reliant on a benefit (2009)



*“Children are particularly at risk of poverty. At the end of 2009 around one in five New Zealand children were living in benefit dependent families. For these children, the rates of poverty are significantly higher – with a recent MSD report on hardship finding that child poverty rates are almost 75 percent for ‘work-less households’ compared to 11 percent where at least one adult is working-full time”<sup>73</sup>*

<sup>72</sup> Treasury Slideshow WWG Sept2010.pdf

<sup>73</sup> Treasury Report WWG Sept 2010.pdf

## 5.1 Costs of Welfare Benefits

The benefit costs of children growing up in poverty are largely the benefit cost of the whole family. Although in concept, one might separate the benefit cost of a family with or without a child, in practice the families benefit exists to provide for both the parent and the child.

The potential impact of savings from eliminating poverty is large. Treasury's report says

### *"Fiscal savings*

*The annual fiscal costs of each benefit type are a function of the benefit rates that are paid and the number of beneficiaries on each benefit. The benefits with limited or no work obligations, referred to in this paper as 'non-work focused' benefits<sup>19</sup> (Domestic Purposes Benefit (DPB), Sickness Benefit (SB) and Invalids Benefit (IB)), and the various second and third tier assistance account for the majority of the current annual fiscal costs of the benefit system.*

*The long-term liability associated with these 'non-work focused' benefits is also higher, reflecting both the higher payment they receive but, more importantly, the longer duration of recipients on these benefits. For example, DPB recipients make up 30 percent of beneficiaries who spent 5 years or more out of the last 10 on a benefit."*

Figure 8 Annual Costs of Social Welfare benefit by type

	2009/10 estimates \$000	Share of Direct Benefits	Benefit & share of Accommodation /Rent	Beneficiaries Apr 2010	Annual Costs incl share of Accom
Domestic Purposes Benefit	\$1,694,360	32%	\$2,229,808	108,300	\$20,589
Invalids Benefit	\$1,302,459	24%	\$1,714,059	95,700	\$17,911
Accommodation Support	\$1,157,683				
Unemployment Benefit	\$938,662	18%	\$1,235,296	75,300	\$16,405
Sickness Benefit	\$713,516	13%	\$939,000	65,700	\$14,292
Income Related Rents	\$527,851				
Disability Allowance	\$411,711	8%	\$541,819		Av'ge UB & DPB
Hardship Assistance (Special Benefit, TAS and SNG)	\$272,963				\$18,873
<b>Direct benefits</b>	\$5,333,671				
<b>Accommodation</b>	\$1,685,534				

An approximate impact of eliminating child poverty would be to eliminate much of the DPB; and the proportion of accommodation support & income related rents related to DPB recipients, as families were lifted out of poverty. The DPB totals around \$1.7b and represents about 32% of non-housing benefits; so the pro-rata DPB share of housing costs is about \$550m p.a. Eliminating child poverty could save around \$2.2b of Benefit costs long term. This is 31% of the annual \$7b Benefit costs, and 1.2% of GDP. A practical "poverty elimination" policy might reasonably aim to create work for



parents of children over 6, so that they became self-sufficient, and so would reduce DPB costs by 6 of a child's 18 years, a reduction of about 67% saving \$1.45b annually, 0.8% of GDP.<sup>74</sup>

The other potential benefit saving is in improved employment reducing Unemployment Benefit (UB).

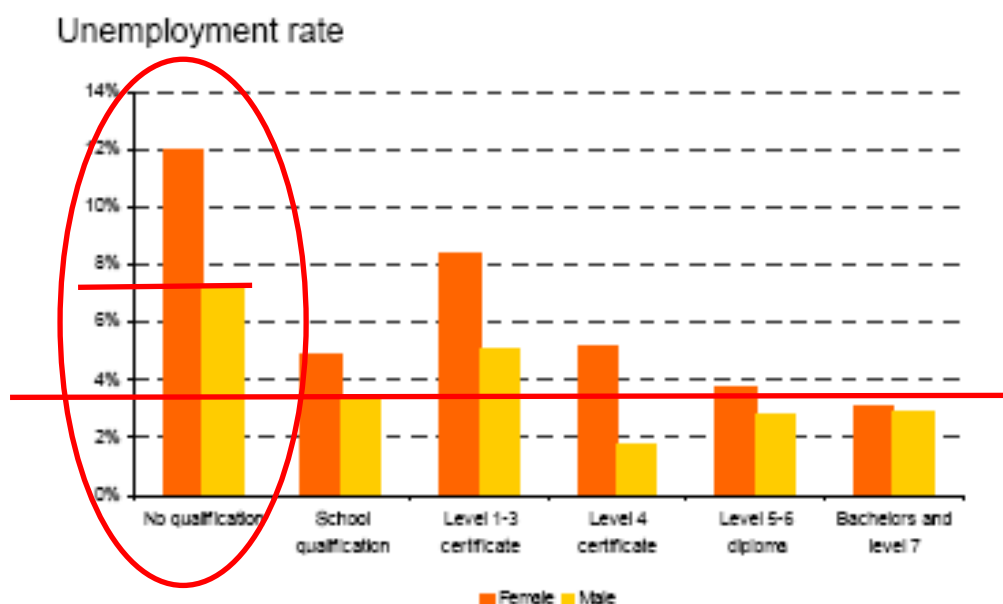
## 5.2 Reduction in probability of unemployment

The Welfare Working Group<sup>75</sup> provided future per person costs of future benefits.

Earle (May 2010), in "Benefits of tertiary certificates and diplomas" shows the employment prospect effect of school qualifications for 25-39 year olds, from the 2006 Census. Base Census data showed 1.987m employed, and 108,500 unemployed, a total labour force of 2.092m, and 962,000 not in the labour force. (All 15 years and over) 48% male; 52% female

Earle showed charts of employment, unemployment and labour participation rates relative to qualifications.

Figure 9 Unemployment rates by qualification

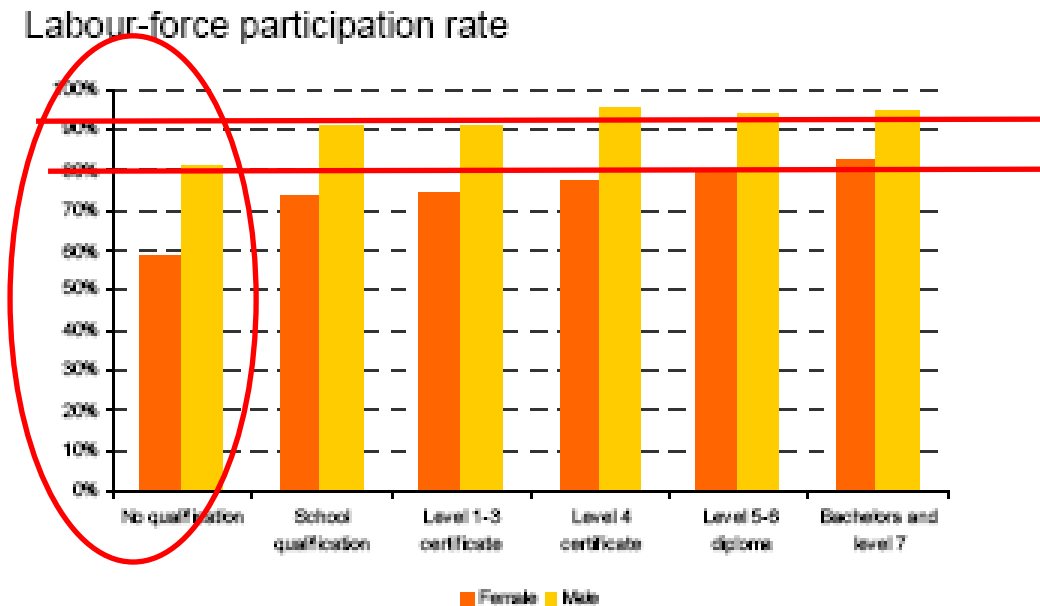


Unemployment rates showed that attaining a qualification reduce the risk of unemployment from 7% to 3 ½ % for males, and 12% to 5% for females.

<sup>74</sup> A reasonable check is that there are 1.08 million under age 18. About 200,000 (20%) experience poverty. About 100,000 families (76,000 solo parents, 27,000 2 parent families) with dependent children have incomes under \$30,000 (2006 Census), roughly equal to number of DPB recipients. Average family on DPB about 2 children. So 100,000 DPB families equates to about 200,000 children in poverty.

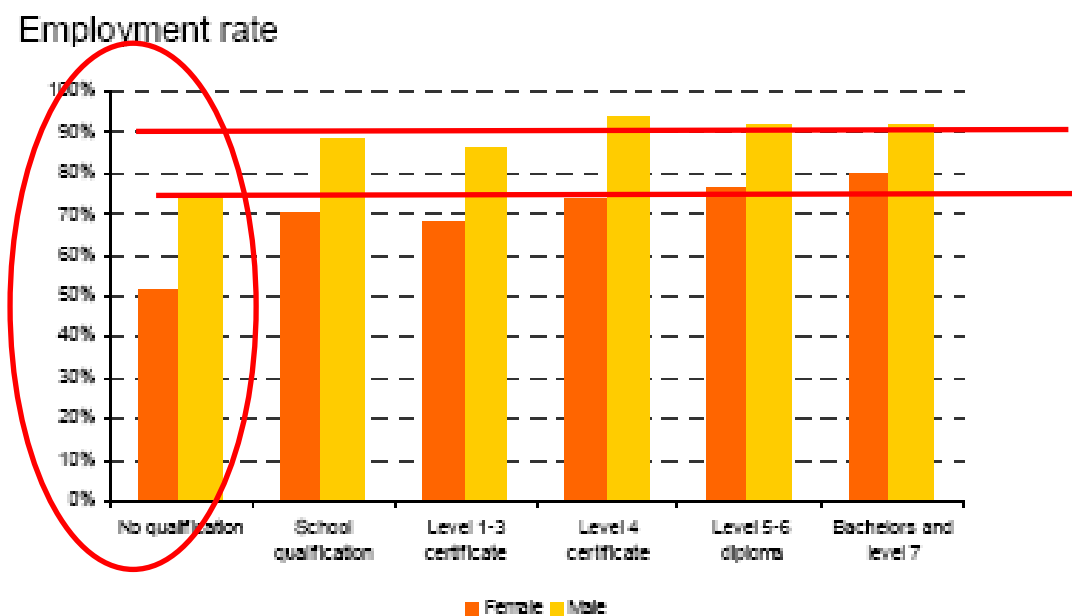
<sup>75</sup> WWG Long Term Dependency Detailed Issues paper Table 6.2

Figure 10 Labour force participation rate by qualification



Labour force participation rate lifts by 10% (male) to 17% points (female) from attaining a qualification.

Figure 11 Employment rate by qualification



Employment rate lifts by 12% points (female) to 19% points (male) for attaining a qualification.

Since moving into employment reduces the need for a benefit, the 10% to 24% increase in numbers able to qualify at UE level, if poverty were eliminated, should translate into higher employment. An assessment of the increased employment is set out in the Table below.

Table 31 Proportion of workforce gaining employment from higher qualification.

		Decile 1-3 Increased UE Pass rate			
<b>Proportion of Workforce without School Qualification</b>		<b>26%</b>	<b>26%</b>	<b>26%</b>	<b>26%</b>
<b>Employment category</b>	<b>Effect on Probability of Employment, if currently Without School Qualification</b>	<b>Incr by 10% to 34%</b>	<b>Incr by 17% to 41%</b>	<b>Incr by 24% to 48%</b>	<b>Incr by 41% to 65%</b>
Employment 1.987m (2006)	Males 75% to 91% = +16% Females 51% to 74% = + 23%	0.36%	0.65%	0.80%	4.3%
Unemployment 108,500	Males 7% to 3 ½ % = - 3 ½ % Females 12% to 5% = -7%				
Lab Force Participation 2.092m	Males 80% to 90%= + 10% Females 58% to 75% = + 17%	0.25%	0.45%	0.55%	3.0%

Currently about 26% of the workforce are unqualified, and of the 17% of pupils who do not achieve a school qualification, it appears that about 5% eventually reach a vocational qualification. Improved UE pass rates will draw from those who now obtain NZCEA 1 or 2 qualifications, and who now obtain no qualification. We assume that an equal number of presently unqualified students will gain some NCEA qualification as gain UE when poverty is eliminated. This assumption is summarised in the Table above.

If we consider Targets 1,2 and 3 of Section 2.4 then a 0.25% to 0.8% higher employment rate for those without a school qualification, should result in a significant number of people gaining employment; around 4,900 to 15,900 all other things being equal. Assuming an average unemployment benefit including accommodation costs of around \$16,400 (Figure 8) this increased employment represents an annual saving of \$80 million to \$260 million in Social Welfare costs if all the new UE passes came from current students who currently received no school qualification, and whose risk of unemployment is therefore reduced by their escape from child poverty. This is, however, a very speculative estimate on sparse information.

A side effect of policy action to encourage private sector investment in productive jobs would be to increase the impact on unemployment.

### 5.3 Summary of Social Welfare cost savings

From this analysis we can estimate long term savings in Social Welfare costs of:

1. DPB reduction up to \$1.45 billion
2. UB savings \$0.08 to \$0.260 billion

This is a range of Social Welfare savings from \$1.0 billion to \$1.7 billion (0.6% to 0.9% of GDP).

## **5.4 Areas of Uncertainty**

This estimate is very dependent on a policy set that creates job opportunities relevant to the workforce qualification mix achievable by lifting families out of poverty. As discussed in Section 2.8.4 successful investment for job creation is a necessary component in any effective new policy set to eliminate child poverty.

## **5.5 Timing**

Social welfare savings accrue (mainly DPB savings) immediately families are lifted out of poverty, and in the context of eliminating child poverty, this means from the time these children turn 7 until age 18. The much smaller UB savings accrue from about age 20 onwards.

## 6 Summary of Cost Savings

The preliminary estimates can be summarised as follows:-

Table 32 Summary of potential savings from eliminating Child Poverty

Area of Saving	Overseas comparison	New Zealand Estimate		
Educational Benefits	1% to 2% of GDP UK 2.1% of GDP US less 40% hereditary, 1.3% of GDP. (1% under 5s)	Improved UE pass rate for Decile 1-3 <b>24%-&gt;48%</b> <b>24%-&gt;65%</b>		
		Saving % of GDP	\$2.21b 1.24%	\$10.3b 5.8%
Justice System and Victim costs	1.9% to 3.2% of GDP UK	Ratio of Actual to Recorded	4x	<b>6.5x</b>
		Youth Crime	\$1.01b 0.57%	\$1.15b 0.65%
		Adult Crime included	\$1.91 1.07%	\$2.19b 1.23%
Health System Costs	0.4% of GDP direct costs to age 18 only UK 1.3% GDP of US 1.8% of GDP US	Target	<b>Dep 7-8</b> <b>Dep 1-10</b> <b>Dep 1-8</b>	
		Children's Health	\$520m 0.29%	\$590m 0.33%
Social Welfare Costs		67% of DPB costs	\$1 b to \$1.45b 0.6% to 0.8% of GDP	
		UB savings	\$0.08 to \$0.26 billion 0.06% of GDP	
Total Savings	<b>3% to 6%<sup>76</sup></b>	<b>Range</b>	<b>\$6.30b to \$16.63b</b>	
		<b>Point Estimate</b>	<b>\$8 billion</b>	
			<b>3.5% to 9.3% of GDP</b>	
			<b>4.5% of GDP</b>	

These savings will appear in two broad areas.

Government revenue will be enhanced by the taxes arising from increased productivity and consequent personal income of the previously disadvantaged, and by reduction in the expenses necessary, all other things remaining equal, in Health, Policing, Courts and Corrections. Government will see benefits long term of \$3.7 to \$8.6 billion annually (6% to 14% of current total tax take-[Table 33](#)).

Citizen's personal economic wellbeing will be enhanced by the increased income after taxes and the reduction in the costs they face as victims of crime. They will benefit between \$2.5 and \$8.2 billion annually, 1% to 3% of the \$240 billion annual personal incomes of the 3.34 million taxpayers.<sup>77</sup>

<sup>76</sup> The Cost of Poverty, An Analysis of the Economic Cost of Poverty in Ontario, Nate Laurie for the Ontario Association of Food Banks 2008. On [www.oafb.ca](http://www.oafb.ca) reports 5.5% to 6.6% of GDP

Table 33 Split of savings between citizens and Crown

	<b>Citizens Benefits</b>	<b>Government Benefits</b>
<b>Added Productivity</b>	\$2.2 to \$10.3 b	
<b>Taxes of all kinds<sup>78</sup></b>	(\$0.7 to \$3.4b)	\$0.7 to \$3.4b
<b>Nett Productivity benefit</b>	\$1.5b to \$6.9b	
<b>Savings as Victims</b>	\$1.0b to \$1.3b	
<b>Savings in Health, Police, Justice, &amp; Corrections</b>		\$0.9b to \$2.7b \$1.07b
<b>Social Welfare Savings</b>		\$1.0 to \$1.40b
<b>Total Savings</b>	\$2.5b to \$8.2b	\$3.7 to \$8.6
	40% to 48%	60% to 51%

## 6.1 Commentary on Results

The range of potential savings outlined here are the estimates of the annual costs to society of child poverty. The numbers are somewhat larger than UK and US estimates. This arises from several factors:-

1. From higher estimates of the effects on productivity from better educational results.
2. From greater estimates of the reduced costs of crime, especially on victims.
3. From recognition that policies that reduce the effects of poverty will impact not only on children in the lowest income/socio-economic decile, but also on those children in higher deciles, who never-the-less experience the effects of “deprivation of experiences”. This influences the “up-side” estimates.
4. From recognition that eliminating child poverty is not merely about lifting the poorest children up to the level of those just above the poverty line, but about setting goals to enable them to perform as effectively, in their education, and in their social inclusion, as children in the top socio-economic deciles.
5. From recognition of a greater impact of environmental factors relative to heredity in influencing life outcomes.
6. From direct estimates of savings in social welfare costs (DPB & UB).

Although we have not sought to quantify this factor, the conclusions of Wilkinson & Pickett in the “Spirit Level” are consistent with our conclusion here. They found that improvements which reduce poverty would improve all the quantifiable factors we have examined, with the limited data available, and by improving economic performance would enhance quality of life across many dimensions.

The conclusions in [Table 32](#) do not include the effects of escalating real health costs, population growth, the 6 year longer working life expected from avoiding childhood poverty, the possible larger underestimation of the effects of ill-health on worker productivity identified by Treasury, or policy

<sup>77</sup> Table 5 contd of nzisjune10alltables of Weekly Incomes ex Dept of Statistics

<sup>78</sup> Crown Tax revenue in Estimates of Appropriations 2011.on

<http://www.treasury.govt.nz/budget/2011/estimates/est11sumtab.pdf> Taxes at 33% of GDP

changes currently in train. They also ignore the impact on avoiding or delaying capital investment in justice and health facilities. They are based on a simple comparison of the present and recent past, with the potential for a “child poverty free” future.

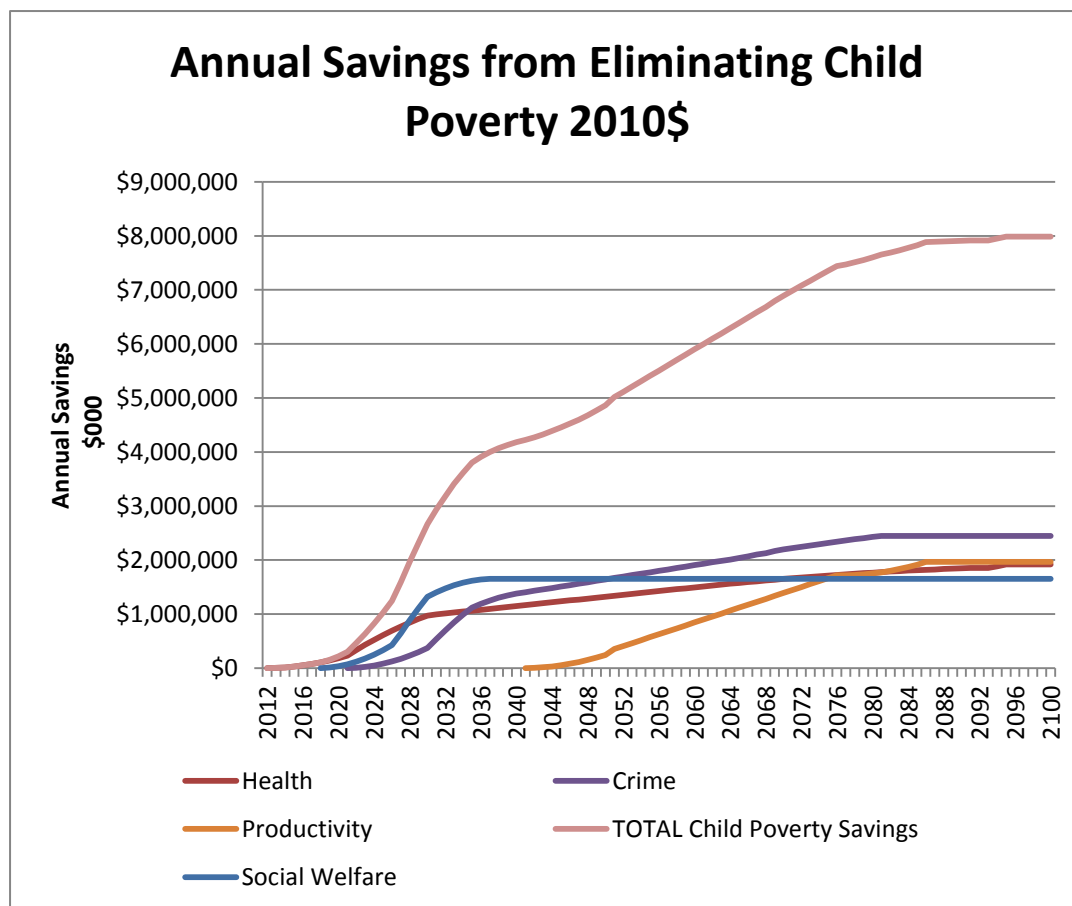
### 6.1.1 Timing Issues

Evaluating the costs of child poverty is important because elimination of these costs, or a large proportion of them, are the potential “benefits” in any Benefit: Cost comparison of policies to reduce child poverty.

The effects of most policy changes to eliminate poverty are long term. The economics of eliminating child poverty or reducing it by a significant amount depend on understanding the significant time lags between policy implementation and the costs incurred, and the flow of benefits which accrue much later.

A simple long term analysis of an example of the savings from eliminating child poverty is shown in the figure below. It is based on a 10 year deployment of policies that eliminate child poverty over 10 years, and a single point estimate of the value of various uncertainties, leading to a long term annual \$8 billion saving from eliminating child poverty.

Figure 12 Annual Savings from Eliminating Child Poverty



The chart shows clearly the long time scale of the benefits of eliminating child poverty. Annual savings stabilise after about 80 years.

### 6.1.2 Present Value of Benefits

The biggest impact on the cost of child poverty, in the sense that these costs are comparable with the policy costs of eliminating child poverty, is the timescale of the improvements, and the discount rate applied to evaluating these benefits.

A useful way to understand the value of long term projects is Present Value, which discounts the future savings back to present values.

The present value of the savings has been modelled and is summarised in the table following:-

**Table 34 PV of Eliminating Child Poverty at various Discount rates & Time Horizons**

PV Billion	90 yrs	75 yrs	50 yrs	25 yrs
8%	\$16.8	\$16.6	\$15.1	\$7.9
7%	\$22.4	\$22.0	\$19.4	\$9.4
6%	\$30.7	\$29.9	\$25.3	\$11.2
5%	\$43.4	<b>\$41.5</b>	<b>\$33.3</b>	\$13.4
4%	\$63.4	<b>\$59.4</b>	<b>\$44.5</b>	\$16.0
3.5%	\$77.8	<b>\$71.8</b>	<b>\$51.7</b>	\$17.6
3%	\$96.5	\$87.6	\$60.2	\$19.3
2%	\$153.4	\$133.4	\$82.6	\$23.4
1%	\$255.4	\$210.2	\$115.1	\$28.4

Note: Real discount rates, 2010 \$

Depending on the parameters chosen the PV ranges from \$8 to \$255 billion in 2010 dollar terms.

We believe that an appropriate (real) discount rate for this evaluation is in the range 2% to 5%, and PV between \$30 and \$70 billion. Our estimate is that eliminating child poverty has a present value of \$52 billion.

### 6.1.3 Affordable Costs

A useful way to interpret this Present Value is to consider the affordable programme to reduce child poverty. We have modelled an example, where an intensive commitment to reduce child poverty is made over 10 years, with expenditure then scaled back to a maintenance level over the next 10 years. We assumed child poverty was reduced by 75% over 20 years, and then the on-going maintenance level of added expenditure was 25% of the initial commitment, because intergenerational benefits reduce the extent of poverty creation.

In that scenario achieving 75% of the \$52 billion PV of the benefits would justify an incremental \$2.0 billion annual investment for 10 years, reducing to \$500m p.a. over the next 10 years, and remaining annually at that level.

This example illustrates the order of magnitude of economically sensible incremental investment in reducing child poverty.



## 7 Overall Results

Our modelling suggests a “point estimate” of \$8 billion annually (2010\$) as the cost of child poverty (Figure 12) which might be saved in the long term. Conventional estimates of uncertainty indicate a range of \$6 to \$16 billion annually (Table 32)

Policies which were capable of addressing the “Poverty of Experience” of children living above the lowest Socio-Economic quintile, and lifting all children’s performance to the level of today’s highest quintile, (the natural potential of all children) could increase these savings by 30% to 100%.

Table 35 Summary of Range of Estimates of Annual Costs of Child Poverty

Range of Estimates 2010\$	Annual Savings	% of GDP
Point Estimate	\$8 b	4.5%
Range	\$6.4 b to \$16.9 b	3.6% to 9.5%
Unrecognised “ Poverty of experience” outside lowest Quintile, and setting “ Top Quintile” targets	Savings increased by 30% to 100%	

We contend that economic gains of this magnitude cannot be overlooked, and policy changes are necessary to capture a significant proportion of these potential benefits. Our children deserve no less.

## 8 Conclusion

High levels of inequality and child poverty are damaging New Zealand's culture and economy. So far, this has been treated as a largely moral and ethical issue. This paper advances the view that it is also a fundamental economic issue, and offers an estimate of the current costs to New Zealand of tolerating high levels of child poverty.

It seeks to encourage debate on what should be done to reclaim this loss of national opportunity, and the unnecessary blighting of children's, and citizen's lives.

It challenges the Crown, politicians, and the public service, to produce its own comprehensive, professional estimate of the national lost opportunity cost of its present policies, and to continue to seek better ways of preventing child poverty.

John Pearce  
Quality Strategic Decisions Ltd  
for  
Analytica.  
Auckland  
August 2011

## 9 Appendix I: Capturing the Benefits

Establishing a high cost of poverty requires some comment on ways to capture this potential benefit.

The “Costs of Poverty” estimates are based on the difference between the current lowest Quintile (numerically similar in size to the number of families with children growing up in relative poverty<sup>79</sup>), and lifting the educational attainments to the average of the 1<sup>st</sup> to 4<sup>th</sup> Quintiles, based on the creation of policy alternatives which would make the outcomes for the 5<sup>th</sup> quintile similar to those of the rest of the population (those not suffering from relative poverty). This is a first level assumption about realistically achievable improvements. However, it is based on the need for a strong policy option set which is capable of creating such an improvement. These policy changes must address two key issues:-

1. Creation of jobs that enable all those who are able to work to find economically valuable work and
2. Cultural education and motivation of families in poverty to recognise and act on the potential to lift their children to a lifetime out-of-poverty. At its heart, this is about building a society which chooses to adopt “middle class” values towards their children’s upbringing, education and aspirations. It is based on supporting “peer leadership” by the natural leaders of local communities. Its success is probably dependent on creating multi-generational “villages” which can provide personal support to individual children and parents.

In spite of the best efforts of the past, over 200,000 New Zealand children remain in poverty.

***“To resolve the unresolvable requires that we think the unthinkable.”***

New policy thinking is required. Specific policies which might be considered include many of the following:-

- a. Creating sufficient jobs
  - i. Attracting investment to create jobs & to raise productivity so those jobs pay adequately. Without jobs we cannot reduce poverty permanently. Without adequate productivity and consequently adequate pay we cannot attract some beneficiaries to work.<sup>80</sup>
- b. Regulating Bank lending for investment in (non-owner occupied) houses to reduce land (and house) prices.
- c. Taxing foreign exchange transactions to manage Exchange rates and volatility, and supporting export focused NZ businesses.
- d. Taxing capital gains on investment housing, to direct investment to productive ends.
- e. Constructing 50,000 State Houses over 10 years to address accommodation problems.
- f. Simplifying the Benefit System based on a Minimum Income (Negative Income Tax)
- g. Changing tax treatment of childcare and Early Childhood Education for children of working parents. (i.e. Treating child care as a deductible expense)

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<sup>79</sup> Under 24 yr olds are reported in 2001 ( NZ Dep Index Table 135 of Indicator Handbook) at 1,345,870, approx. 1 million under 18. One quintile = 200,000. Dep Index Dec 9 + 10=24.5%, approx. 245,000.

<sup>80</sup> We envisage that appropriate policy settings are capable of attracting investment from the private sector to create these jobs.

- h. Creating initiatives to reduce the impact of poverty on childhood experiences.
  - i. Supporting provision of real and effective ECE access for all children.
  - ii. Developing cheap access to 24/7 medical support for under 12 year olds.
  - iii. Utilising of independent community organisations to identify & connect with parents of children at risk. (E.g. Plunket; Maori community organisations, personal mentoring, a “Corps of Grandmothers”).
  - iv. Utilising more local community groups as contracted support providers / contractors, focussed on supporting parents in poverty.
  - v. Providing on-going parental training linked to income support for parents on benefits.
  - vi. Expanding extension of schooling opportunities for disadvantaged children.
- i. Sending all 17 year olds who have grown up in poverty to Outward Bound to build a sense of confidence and competence.
- j. Encouraging a better balance in the community between Rights & Responsibilities, through responsible political discussion.
- k. Changing the current coercive philosophy of Ministry of Social Development to a more client-support perspective.

Estimations of potential savings will depend on the expected proportion of Quintile 5 children, and other children suffering the effects of poverty, for whom a change in lifetime outcomes can be created by a particular policy set.

## 10 Appendix II: Discount Rates

Estimations of future cost are mainly useful for understanding the reasonable current expenditure that might be useful in creating future savings- for “Benefit: Cost” studies. Traditional Treasury thinking has been dominated by the “Opportunity Cost” of private sector capital. Recent rates applied to government spending have been 10% and more recently 8% real discount rates.

For projects with long time horizons, this has been recognised as a limited perspective. For example the WHO in its Burden of Disease studies uses a 3% discount rate, based on research into individual’s time preferences for future over present health benefits<sup>81</sup>. More generally, some philosophers and economists dispute that it is ethically defensible for society to value benefits more now for no other reason other than the mere passing of time. Many notable economists have argued that it is not ethically defensible (Ramsey, Pigou, Harrod, Koopmans, Solow and Cline. Refer to Arrow (1999)).

In another field of long term projects, Transport, NZTA<sup>82</sup> explores this issue and concludes that a discount rate of 3% for long term projects is more appropriate.

*“Possible values of each parameter for the New Zealand case are represented in table 4.3 based on the ranges and rationales of each study referred to in section 6.2. The medium estimate arguably has a reasonable judgement of each individual parameter:*

- *d = 0.5, which is significantly above zero*
- *L = 0.6, corresponding with a probability of 0.06 that benefits in 10 years will not eventuate for reasons that are not project-specific*
- *h = 1.25, reflecting that we do not appear too averse to redistributing wealth*
- *g = 1.5, representing New Zealand’s low GDP per capita real growth rate.*

*Such parameters would result in an STPR of 3%.”*

**Table 36 Possible range of STPR for New Zealand-NZTA**

Estimates	$\delta$	$L$	$\eta$	$g$	$r$
Low	0	0.1	0.7	1	0.8
Low-medium	0.2	0.3	1	1.4	1.9
Medium	0.5	0.6	1.25	1.4	2.9
Medium	0.5	0.5	1.5	2	4.0
Medium-high	1	1	1.5	2	5.0
High	2	1.25	2.5*	2	8.25

NZTA comments

<sup>81</sup> Gold M, Siegel J, Russell L, Weinstein M. Cost effectiveness in health and medicine. New York, Oxford: Oxford University Press; 1996.

<sup>82</sup> NZ Transport Agency 2009 Research Report 392 Chris Parker Hyder Consulting <http://www.bettertransport.org.nz/wp-content/uploads/2010/02/BCR-study-by-NZTA.pdf>

Equation 4.2 shows a revised formula for the STPR:  $r = L + \delta + \eta g$ . (Equation 4.2)

This comprises three elements:

(i) catastrophe risk,  $L$

(ii) pure time preference,  $\delta$ .

These elements are additive ( $r = L + \delta$ ).

(iii)  $\eta g$  = Elasticity times Consumption growth per capita.

*“We should note that values lower than this are defensible, particularly the choice of 0.0 and 0.1 for  $d$  and  $L$  respectively, which would result in a discount rate of 2.0% if  $h = 1.25$  and  $g = 1.5\%$ . Heal (2008) recently argued that the chance of Armageddon ( $L$ ) is ‘small enough to be neglected. However the point seems to be valid conceptually,’ and that ‘my own judgement is that the right rate of pure time preference is zero...but I have never actually been tempted to do so’. Given the economic uncertainty being experienced over 2008 and 2009, it is not outside the realm of possibility that expected real GDP per capital growth could be negative for some time. A value of  $g$  equalling  $-1.0$  would lower the ‘low’ STPR to  $-0.6$ , but could only be applied to those years experiencing the negative growth and would be revised upward for cashflows in subsequent years.”*

We propose that the current levels of discount rate applied to government investment may require reconsideration for long term inter-generational policy like the elimination of child poverty.