

Characteristics of Children at Greater Risk of Poor Outcomes as Adults

Prepared by the Analytics and Insights team at the Treasury

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Abstract

This paper summarises the main findings of an analysis of integrated administrative data that describes the characteristics of children who are at greater risk of poor long-term outcomes. It provides information on their contacts with selected government social service agencies and some of the costs associated with the provision of services by those agencies. The research is part of a broader work programme which seeks to improve the lives of New Zealanders by using information and evidence to better understand the characteristics and needs of people who use public services and the impact of those services on longer-term outcomes.

JEL CLASSIFICATION I38 Welfare, well-being and poverty: Government programmes
 J13 Childcare, children and youth
 C55 Large data sets: modelling and analysis

Executive Summary

Purpose of the paper

This paper uses integrated administrative data to identify and describe the characteristics of children who are at higher risk of poor long-term outcomes, including low school attainment, long-term benefit receipt and contact with the justice system.

This work is part of a broader work programme which seeks to improve the lives of New Zealanders by applying evidence-based investment practices to social services. The “social investment” approach aims to use information and technology to better understand the people who need public services and what works, and to adjust services accordingly¹.

The analysis updates and extends an earlier study² that also identified groups of children at higher risk of poor long-term outcomes. It makes use of new information available in Statistics New Zealand’s Integrated Data Infrastructure (IDI), including information on selected health service use, births, border movements, and educational participation. The report provides separate analyses of data for children aged 0-5 and 6-14 years, reflecting the initial focus of social sector agencies on the younger age group. Results for all children aged 0-14 years are also included.

Research objectives

The earlier study found that a small number of characteristics observed in the integrated administrative data were correlated with poorer outcomes as young adults, including low school attainment, long-term benefit receipt and contact with the justice system. The current analysis focuses on the children who had two or more of the following characteristics (or indicators):

- ▶ having a substantiated finding of abuse or neglect by Child, Youth and Family (CYF) or having spent time in their care
- ▶ having spent more than three-quarters of their lifetime supported by benefits
- ▶ having a parent who has received a community or custodial sentence
- ▶ having a mother who has no formal qualifications

The choice of the four indicators was based on the characteristics identified in the earlier work and subsequent decisions made by social agencies on how the priority (or target) population would be defined.

¹ <http://www.treasury.govt.nz/statesector/socialinvestment>

² Crichton, S., Templeton, R., and Tumen, S. (2015) *Analytical Paper 15/01: Using Integrated Administrative Data to Understand Children at Risk of Poor Outcomes as Young Adults*, The Treasury. See: www.treasury.govt.nz/publications/research-policy/ap/2015/15-01/

Having defined the priority population, the aims of this work were to:

- ▶ update the earlier work³ that was undertaken using MSD's Integrated Child Dataset (ICD), using the additional data that is held in the Integrated Data Infrastructure (IDI)
- ▶ examine a wider set of characteristics than previously, making use of the more extensive relationship, health and education data in IDI
- ▶ provide a complementary analysis to that previously undertaken for 15 to 24 year olds,⁴ so that a more comprehensive picture of children and young adults at greater risk of poorer outcomes (aged 0 to 24 years) is available.

Data and methods

The study uses the Integrated Data Infrastructure (IDI), which brings together information from a wide range of government departments. Records are linked using name and date of birth. After linking the data is anonymised and made available for research purposes.

The analysis describes various characteristics of the population of children aged 0 to 14 years at the end of December 2013. This time point was chosen so that the analysis was consistent with the analysis of youth aged 15 to 24 years, undertaken in 2015.

Future outcomes and selected future service costs are estimated for this population using data for earlier birth cohorts and statistical record linkage techniques. The methods used are described in Treasury's Analytical Paper 15/01.

In particular, the analysis of a recent population of children aged 0-14 years has been informed by a cohort analysis of individuals born in 1993, who can be observed through to age 21 in the dataset. The cohort analysis assessed the statistical strength of relationships between characteristics observed by each year of age and particular outcomes that were experienced as young adults.

Limitations and caveats

The study has a number of limitations and caveats:

- ▶ the scope of the study is limited by the nature and breadth of the information collected in agencies' administrative systems and included in the IDI. For example, the administrative data provides only a partial picture of childhood adversity, service use and service costs
- ▶ the population coverage errors, linkage errors and biases present mean that the results are indicative only, and not highly accurate estimates

³ Crichton, S., Templeton, R., and Tumen, S. (2015) *Analytical Paper 15/01: Using Integrated Administrative Data to Understand Children at Risk of Poor Outcomes as Young Adults*, The Treasury. See: www.treasury.govt.nz/publications/research-policy/ap/2015/15-01/

⁴ McLeod, K., Templeton, R., Ball, C., Tumen, S., Crichton, S., and Dixon, S. (2015) *Analytical Paper 15/02: Using Integrated Administrative Data to Identify Youth Who Are at Risk of Poor Outcomes as Adults*, The Treasury. See: www.treasury.govt.nz/publications/research-policy/ap/2015/15-02/

- ▶ the methods used to estimate future outcomes and costs are designed to provide a comparative picture of future outcomes and costs for different population subgroups, but they have some significant limitations. These estimates should be viewed as indicative, and *not* as forecasts of the actual outcomes and costs that will be incurred in the future.

While the results highlight the power of using integrated administrative data in new and innovative ways, some of the methods are exploratory in nature, and as such the results should be considered as preliminary, requiring further testing and development over time.

Key Findings

- ▶ A small number of key characteristics (or indicators) observed in the agency's administrative data are highly correlated with poorer outcomes as young adults⁵:
 - having a finding of abuse or neglect, or having spent time in care of child protection services
 - having spent most of their lifetime supported by benefits
 - having a parent who has received a community or custodial sentence
 - having a mother who has no formal qualifications.

Children with these characteristics were more likely to have poorer educational attainment, to be long-term welfare recipients, and to serve custodial sentences. Compared to children with none of the four indicators, children aged 0-5 years with two or more of the four indicators are:

- eight times more likely to have contact with Youth Justice services before age 18 (14% compared to 2%)
- three times more likely to leave school with no qualifications (36% compared to 13%)
- six times more likely to receive benefits for more than two years before the age of 21 (20% compared to 3%)
- ten times likely to spend time in jail before the age of 21 (6% compared to 0.6%)
- four times more likely to receive benefits for more than five years when they are aged 25-34 years (21% compared to 5%).

⁵ The four indicators do not necessarily cause poorer outcomes directly, but they are likely to be correlated with other factors that lead to poorer developmental outcomes, such as having insufficient parental support and supervision, or having unmet health or learning needs.

- ▶ Groups of children at different levels of risk can be identified based on the number and combination of the four indicators present.

In general, the greater the number of indicators the child has the higher the likelihood of having poorer outcomes. Around 14% of children aged 0 to 14 years have two or more of the four indicators, 5% have three or more, and 1% have all four indicators. Children who have three particular indicators (they have a CYF finding, have mainly been supported by benefits since birth, and have a parent with a community or custodial; sentence history) have similarly poor outcomes as children with all four indicators. Together these two groups comprise 3% of all children aged 0 to 14 years who are at particularly high risk of having poorer long term outcomes. Note there are other groups of children who are also at high risk of poor outcomes, including those who have ever been placed in CYF care (AP 15/01).

- ▶ The number and type of indicators present are correlated with a range of other characteristics that are observable in the integrated dataset. For example, compared to those with none of the four indicators, children aged 0 to 5 years with two or more of the four indicators are:
 - nine times more likely to have a mother who were was single at their birth (71% compared to 8%)
 - twice as likely to have had an injury-related hospitalisation (10% compared to 5%)
 - four times less likely to have participated in early childhood education (9% compared to 2%)
 - between two and three times more likely to have parents reporting behavioural, emotional, or peer relationship problems, or requiring referrals for hearing, vision, dental problems (assessed during the Ministry of Health Before School Check)
 - ten times more likely to have changed address at least once a year on average since birth (16% compared to 1.6%).
- ▶ It is important to note that many children at risk of poor outcomes remain outside the priority population, defined by having two or more of the four specific indicators. While on average those with none or just one indicator have much lower rates of poor outcomes than those with two or more indicators, because they are a much larger group, there are significant numbers of children who have none or one indicator who will have go on to have poor outcomes. For example 20.4% of those with two or more of the four indicators (or 10,800 of 53,100) are expected to spend more than two years on benefit before age 21, compared to 4.4% of those with none or one indicator (or 13,700 of 309,700).
- ▶ Some of the information included in this report is also available in an interactive mapping tool on The Treasury's website www.treasury.govt.nz/sij. The mapping tool provides information on the number of children and youth, by age group, who have particular characteristics by region, territorial authority and area unit.

1 Introduction

1.1 Purpose

This work makes use of integrated administrative data held in Statistics NZ's Integrated Data Infrastructure (IDI) and managed by Statistics New Zealand to ensure the security and confidentiality of people's information. This study is focussed on children aged 0 to 14, and builds on closely related earlier work that identified specific groups within this population that are at particular risk of poor longer term outcomes.

1.2 Related studies

This work is related to two analytical projects undertaken in 2015:

- ▶ "Using Integrated Administrative Data to Understand Children at Risk of Poor Outcomes as Young Adults" (AP 15/01), which used integrated administrative data to identify groups of children who are at greater risk of experiencing poorer longer-term outcomes, at later ages in childhood or when they are young adults.
- ▶ "Using Integrated Administrative Data to Identify Youth who are at Risk of Poor Outcomes as Adults" (AP 15/02), which identified groups of youth between the ages of 15 and 24 who are at greater risk of experiencing poorer long-term outcomes when aged 25-34.

The first study used MSD's Integrated Child Dataset (ICD) which was the most comprehensive dataset on children available at the time the study was undertaken in early 2015. With the inclusion of information from Child, Youth and Family in mid 2015, Statistics New Zealand's Integrated Data Infrastructure (IDI) became the most comprehensive dataset available. This study updates and extends the first study by making use of information available in IDI on parent-child relationships, border movements, selected health service use, and participation and achievement in education.

This report focuses on children aged 0 to 14, and in doing so complements the IDI based analysis of 15 to 24 year olds in the second study. This report provides separate results for children aged 0-5 and 6-14 years, reflecting the initial focus of social sector agencies on the younger age group. Results for all children aged 0-14 years are included in the Appendix.

The earlier ICD based analysis found that a small number of characteristics observed in the agencies administrative data were strongly associated with poor outcomes as young adults. The current analysis focused on children who had two or more of four particular characteristics or indicators. The choice of the four risk indicators was based on the earlier ICD based work and subsequent decisions made by key social agencies on how the priority population would be defined among children aged 0-5 years.

1.3 Report structure

The report is structured as follows:

- ▶ Section 2 describes the data and methods used including key limitations and caveats.
- ▶ Section 3 describes the characteristics of children aged 0-5 years, making use of the more extensive relationship, health and education data available in the IDI. The analysis describes all children, but with a particular focus on children who have two or more of four specific characteristics (or indicators). The characteristics and future outcomes of various groups of children with differing levels of risk.
- ▶ Section 4 extends the analysis to children aged 6-14 years. Information on all those aged 0-14 years is included in the Appendix 2.
- ▶ Section 5 summarises the findings.

2 Data and methods

2.1 Data description

The study uses the Integrated Data Infrastructure (IDI), which was developed and is maintained by Statistics New Zealand. The data is held in a secure environment, and made available to bona fide researchers under strict conditions. The IDI includes a wide range of survey and administrative data from across government agencies. This study uses data sourced primarily from the Ministry of Social Development (related to benefits, care and protection services and youth justice services), the Department of Corrections (sentencing), the Ministry of Education (schooling and tertiary study participation and achievement), the Department of Internal Affairs (birth and death registrations), the Ministry of Health (service use, including mental health and addiction services, and pharmaceutical use), Inland Revenue (salaries and wages) and the Ministry of Business, Innovation and Employment (movements into and out of New Zealand).

Further discussion of various data issues can be found in the two analytical papers Treasury Analytical Paper 15/01 and 15/02⁶, which used similar data sources.

2.2 Study populations

Two study populations were used in the analysis. The first was a 'current' population, comprising people who were aged 0 to 14 years on the 31 December 2013. This population was used to examine the relationship between the four indicators and the wider set of contemporary measures available in the IDI. The second was a birth cohort that was used to examine the relationship between characteristics observed at a given age and subsequent outcomes.

At the time the IDI based study of 15-24 year olds was undertaken most of the key datasets covered the period up to the end of 2014, however the Ministry of Education data only covered the period up to the end of 2013. The 31 December 2013 time point was chosen so that the analysis was consistent with the analysis of youth aged 15 to 24 years, undertaken in mid-2015.

The 'current' population comprises those who were aged 0 to 14 years at 31 December 2013, who were eligible to live in NZ on a permanent basis (ie, had New Zealand citizenship or permanent residence entitlement), and were living in New Zealand for at least six months during 2013.⁷

⁶ Crichton, S., Templeton, R., and Tumen, S. (2015) *Analytical Paper 15/01: Using Integrated Administrative Data to Understand Children at Risk of Poor Outcomes as Young Adults*, The Treasury. See: www.treasury.govt.nz/publications/research-policy/ap/2015/15-01/

⁷ Young people were also excluded if they had no records in the Ministry of Education data, or were aged 19 or older and had no records in the IRD data.

There were 362,800 people aged 0-5 and 510,400 people aged 6-14 in the current population. These numbers represent 97% and 95% respectively of Statistics NZ's estimates of the resident populations in these age groups in the December 2013 quarter. Our study populations are smaller because we exclude temporary residents, those who were out of NZ for six months or longer in 2013, and those who could not be linked to the key data sets in IDI.

For the regression analysis a birth cohort was selected which included all people who were born in 1993 who were enrolled as domestic students in New Zealand schools in 2008 or 2009 (ie, when they were aged 15 and 16 years). This cohort is observed in IDI up to their 21st birthday.

Defining the birth cohort population in this way means that a small number of children are excluded because a link could not be established between their administrative data records. We did not include people who were away from New Zealand for much of 2008 or 2009, but were continuously resident at earlier or later phases of their lives. We include some people who were overseas for a substantial part of their childhood or young adulthood. These individuals will be missing from the administrative datasets in earlier and/or subsequent years, and will appear to have had no contact with the welfare, child protection or corrections systems. We are able to identify when these people were overseas, but do not remove them from the study population.

2.3 Defining the priority population

The previous study (AP 15/01) found that children with the following characteristics were much more likely to experience poor longer-term outcomes⁸ compared to other children:

- ▶ having been notified to Child, Youth and Family
- ▶ having spent more than three-quarters of their lifetime supported by welfare benefits (ie, their parents or caregivers received benefits)
- ▶ having a parent with a corrections history (including both community and custodial sentences), where parents and caregivers were identified through the benefit data only.

Consultation with key social agencies led to the addition of a new criterion (having a mother with no formal qualifications) and to a narrowing of the child protection contact measure to children who had a substantiated finding of abuse or neglect or had been placed in care.

Children aged 0 to 5 years who had two or more of the four characteristics were defined to be the *priority population*:

- ▶ the child has a substantiated finding of abuse or neglect, or has been placed in the care of Child, Youth and Family⁹
- ▶ the child has been supported by benefits more than three-quarters of the lifetime, or if aged 0 they were supported by benefit at birth

⁸ Poor educational attainment, long-term benefit receipt, received a community or custodial sentence.

⁹ Or if aged 2 years or under they have a sibling who had a substantiated finding, or if aged 0 they had a sibling who had been notified to CYF.

- ▶ either parent has a corrections history (including both community and custodial sentences)
- ▶ mother has no formal qualifications.

Information on parent-child relationship used in the third and fourth criteria is based on birth registration data. In the previous study parents and caregivers were identified through the benefit data. The change to using parents identified on the birth register meant that a much higher proportion of children who had a parent with a corrections history were identified.

Information on mother's qualifications is based on information collected by MSD about those who receive benefits, as well as information from the Ministry of Education about qualifications completed since 2003. Information on educational attainment collected by MSD is incomplete with around 25% of mothers with a benefit history have missing values for educational attainment. Even where the field is populated it is not necessarily updated, particularly for those receiving Sole Parent Support. Hence the "no formal qualification" measure only identifies mothers who received benefits at some stage since becoming an adult, are recorded as having no formal qualifications, and have not completed any qualifications after 2002.

Regression analysis was used to examine the strength of the relationship between various characteristics (including the four indicators) and selected outcomes at age 21, including school attainment, welfare receipt, and contact with correction (ie, having received a community or custodial sentence). A summary of this analysis is included in Appendix 1.

This regression analysis showed that being notified to CYF (ie, the broader CYF contact measure), the proportion of time supported by welfare benefits, having a parent with a corrections history, ethnicity, and gender were the characteristics most strongly associated with poor outcomes. Having a "mother having no formal qualifications" was also associated with poor outcomes, but less so than the other factors. This result likely reflects the partial nature of the qualification measure that can be derived from the information available in IDI. The analysis of international longitudinal survey data shows that mother's educational attainment is correlated with children's outcomes.

This regression analysis showed that being notified to CYF (ie, the broader CYF contact measure) was more strongly associated with poor outcomes than the narrower CYF contact measure based on having a substantiated finding of abuse or neglect or a period in care. For children aged 0-14 years the proportion of children known to CYF was around twice the proportion that had a substantiated finding or had spent time in care (8% compared to 17%). The broader CYF contact measure leads to around 17.2% of children aged 0-14 having two or more of the four indicators, compared to 13.9% based on the narrower measure.

2.4 Information about children in the priority population

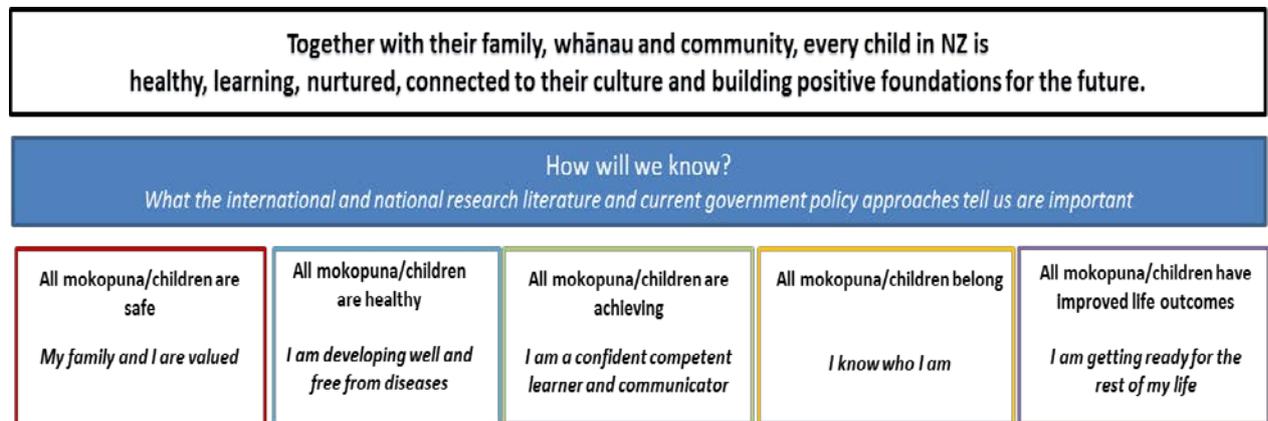
Having defined the priority population, the main objective of the current analysis was to extend the earlier work by incorporating additional information available in the IDI.

The choice of measures was informed the information available with the IDI and the outcomes framework developed for 0-5's and their families/whānau by the cross-agency working group.¹⁰

¹⁰ The outcomes framework considered those developed for Vulnerable Children and for Whānau Ora.

It includes the aspirational statement “*together with their family, whānau and community, every child in New Zealand is healthy, learning, nurtured, and building positive foundations for the future*”. Figure 1 shows the five domains which sit underneath this.

Figure 1: Excerpt from the Social Sector Investment for Family/Whānau with Vulnerable Children Aged 0-5 Outcomes Framework



Measures were derived from the identity, education, health, corrections, and welfare data available in the IDI. The measures selected were considered to be the best that could be developed in the time available, and to represent a broad, but not exhaustive, range of characteristics and outcomes that impact on the lives of young people. The selected measures included:

- ▶ mother smoked around the time of the child’s birth (based on diagnosis codes present on the delivery event record, only available for women delivering in hospital)
- ▶ mother was single at the child’s birth (derived based on child being included in Sole Parent Support paid to mother, or father not being identified in the birth registration, the registration indicates that the parents were not in a relationship at the time of the child’s birth)
- ▶ low birth weight (sourced from the birth registration record)
- ▶ parent or caregiver received income support (welfare benefits) around the time of the child’s birth (child was included in benefit within 45 days of its birth)
- ▶ either parent had a previous or current gang affiliation (as recorded by the Correction department)
- ▶ contact with Child, Youth and Family (ie, they were the subject of a report of concern or notification, they had a substantiated finding or they were placed in care)
- ▶ family violence notification by Police to CYF
- ▶ injury related hospital admission (excluding short stays to the Emergency Department)
- ▶ ambulatory sensitive hospitalisation (ASH)
- ▶ received disability support from the Ministries of Health and Education (received disability support services from MoH or enrolled in a special education school)

- ▶ participated in ECE before starting school, collected by the Ministry of Education when the child enrolled at school, available only for children aged 5 at the end of 2013
- ▶ parent assessed their child as having abnormal conduct or behavioural issues (Before School Check administered by Ministry of Health which includes a numbers of other measures)
- ▶ referred to dental services (Before School Check which includes vision and dental referrals)
- ▶ moved house at least once a year on average (based on Ministry of Health information on address history sourced from the NHI and PHO databases).

Appendix 2 Table 1 lists some additional measures that were derived for this study. Note that not all measures were available for children aged 0 to 14 due to data limitations, for example participation in the Ministry of Health’s Before School Check (B4SC) and participation in early childhood education were only known for children aged 5 years.

2.5 Information on service costs

This paper includes analysis of the costs associated with different individuals and subpopulations. The costs included cover income support payments, costs associated with serving sentences administered by the Department of Corrections, and costs associated with the services provided by CYF in childhood.

Adult benefit costs are derived from the database of Work and Income’s Income Support Expenditure (ISE) which stores the payments from January 1993. The payments were categorised into three groups, Tier 1 (main benefits), Tier 2 (supplements) and Tier 3 (support for people in hardship). Adult income support assistance can be received from the age of 16. To attribute welfare costs directly to children when they were supported by an adult’s main benefit, we multiplied the number of days that the child was included as a dependent child in an adult benefit by an average per day payment of approximately \$14, which was approximately the extra benefit entitlement for beneficiaries with a dependent child. The benefit costs included in this study did not include Working for Family tax credits, student allowances or student loans.

Corrections costs were calculated by multiplying the length of each sentence (taking the days actually served) by an average cost per day from a table of average per day sentence costs provided by the Department of Corrections. The average cost figures provided by the Department of Corrections related to the last four financial years. In this analysis, the cost figures for those four years were averaged (giving more weight to recent data) and applied historically (after adjusting for inflation). The cost estimates both direct and indirect costs. Note that *average* per person costs are not the same as marginal costs, and therefore the figures used in this analysis cannot be used to calculate the aggregate costs that could be added or saved by increasing or decreasing the total numbers of persons serving sentences.

CYF costs can be distinguished by the two distinct areas of services it provides, care and protection for children (up to age of 17, or 20 in exceptional cases) and youth justice for children or young adults (ages 14 to 17 only) who have been referred to CYF. The CYF costs data used in this study include both direct and indirect costs. Direct cost estimates are derived from actual detailed receipts covering the actual services provided. Indirect cost estimates are

averages that are applied to cover more general business overhead costs. Note that a very small proportion of outlier cost records were excluded from this analysis due to their implausibility. All cost estimates used in this study are CPI adjusted to December 2014 dollars. Further information on the costs data is available in Treasury's Analytical Paper 15/01.

2.6 Estimating future outcomes and costs using statistical matching

A statistical record linkage technique was used to help estimate the likely longer-term outcomes of the study population. This process is discussed in detail in Treasury's Analytical Paper 15/01 in the context of earlier analysis of MSD's Integrated Child Dataset (ICD) data, and is only summarised briefly in this paper.

The approach involved linking data for an older birth cohort (specifically the July 1978 to June 1979 birth cohort) to the data for the 1993 birth cohort population, to simulate the likely outcomes for this latter population. Records were linked on the basis of benefit receipt and corrections sentencing rates and patterns when aged 16 to 21 years inclusive, as well as on gender and ethnicity. Observed outcomes and costs experienced by the 1978/79 cohort were then used to estimate the outcomes and costs of the 1993 cohort up to age 35.

Using a similar matching technique the outcomes of the current population of children aged 0 to 14 years are estimated by linking each of them to an individual from the 1993 cohort. Records were linked on the basis of the child's contact with child and protection services, caregivers benefit receipt, caregivers corrections sentencing history, and some early secondary school enrolment data (for the 13 and 14 year olds) as well as gender and ethnicity. The link through to the 1978/79 birth cohort provides outcome and costs projections to age 35 for all children aged 0-14 years.

Matching individuals rather than population groups gives us the flexibility to estimate costs for very different subsets of the population. This is particularly important when we are looking to identify specific target populations for investment decisions. The statistical matching method uses real patterns for individuals over time with very similar observed characteristics up to a certain age.

The approach assumes longitudinal patterns of benefit receipt and corrections sentences can be moved around in time from one cohort to another, and that conditional on a set of 'early indicator' matching variables, these patterns remain relevant to later cohorts. The success of this depends on how well we establish good matching criteria and on how relevant these are for forecasting future outcomes. The range of variables used in the matching process also had some significant omissions, such as region and NCEA achievement. As a result some caution must be taken with analysis based on these characteristics. Differences in groups defined by these characteristics are probably more diluted than the differences in other group comparisons.

We have also not accounted for differences in macro-economic conditions experienced by the 1978/79 cohort, and those that may be faced by the 1993 cohort in future years. As a result future outcome estimates will in part reflect the particular patterns of labour demand and unemployment that have occurred over the last 20 years. Ideally we would like to remove the effects of these macroeconomic fluctuations and have a more constant underlying macro-economic picture underpinning the analysis. This remains an issue for further investigation.

Long-run shifts in New Zealand's social assistance policies could also influence the success of the cohort matching if they have affected the outcomes of different birth cohorts very differently. Ideally, we would adjust individuals' outcomes to remove the effects any secular trends that are external to the individual but affect the outcomes of the cohort as a whole. In practice, however, it may be difficult to do so in an objective way using the data currently available.

2.7 Caveats

The process of matching records is probabilistic and creates some level of error, as there are likely to be some cases where individuals cannot be matched (and appear in the data with less service use than actually occurred), as well as cases where individuals have been wrongly matched (and appear in the data with inaccurate estimates of service use).

The data covers a specific time and cohort, and some care must be taken in generalising results to the experience of more recent cohorts of children. Cohorts born more recently have had a higher likelihood of being notified to CYF, partly because of administrative changes related to family violence events attended by police. This is described in further detail in Treasury Analytical Paper 15/01.

There are also possible biases for those young people who have spent any lengthy period of time outside of New Zealand before the age of 21. The characteristics of these people, including any outcomes achieved, are less likely to be visible in our data, as any contact with government agencies may happen outside of New Zealand. It may look like these people fail to gain qualifications, avoid prison sentences or benefits, and do not access health services, where these things happen out of New Zealand.

To some degree this is controlled for by including an indicator in the modelling when a young person is out of the country for the entire previous year, however there may be some biases introduced that may be better controlled for by including more sophisticated measures of time outside of the country, or by treating this group differently, possibly excluding some from the analysis. There is no single approach that would be better however, and more thinking may be needed on this issue for future work.

3 Characteristics of children aged 0 to 5 years at risk of poor outcomes

In this section we examine an extended set of characteristics for children aged 0 to 5 years that is available through the IDI. The section focuses on children aged 0 to 5 years, with corresponding results for 6 to 14 year olds in Section 4. Appendix 2 has results for all children aged 0 to 14 years.

The four key characteristics (or indicators) that were used to define the priority population are examined, including how selected characteristics vary depending on which and how many indicators are present.

Recall that children who had two or more of the following characteristics have been defined as the priority population:

- ▶ the child has a substantiated finding of abuse or neglect or has ever been placed in the care of Child, Youth and Family¹¹
- ▶ the child has been supported by benefits more than three-quarters of the lifetime, or if aged 0 they were supported by benefit at birth
- ▶ either parent has received a community and custodial sentence
- ▶ mother has no formal qualifications.

Section 2 describes how these characteristics have been defined.

Various characteristics were derived from the identity, education, health, corrections, and welfare data available in the IDI. The measures reflected what could be developed in the time available, and attempted to represent a broad, but not exhaustive, range of characteristics and outcomes that impact on the lives of young people. Section 2 describes some of the characteristics (or measures) derived from the data for this study.

Note that all measures were available for all children aged 0 to 14 due to data limitations, for example participation in the Ministry of Health's Before School Check (B4SC) and participation in early childhood education were only known for children aged 4 or 5 years.

Children with a particular indicator

Table 1 shows the profile of children aged 0-5 who had each of the four indicators. The proportion of children with a particular indicator varies considerably:

- ▶ 8.1% had a substantiated finding of abuse or neglect or had been placed in the care of Child, Youth and Family¹²

¹¹ Or if aged under 3 they have a sibling who had a substantiated finding, or if aged 0 they had a sibling who had been notified to CYF.

- ▶ 18.6% had been supported by benefits for more than three-quarters of the lifetime, or if aged 0 they were supported by benefit at birth
- ▶ 16.9% had a parent who had received a community and custodial sentence
- ▶ 9.1% had a mother has no formal qualifications.

In each case having a particular indicator is correlated with a range of other characteristics, including having a mother who was single at birth, being supported by benefits at birth, having an injury or ASH hospitalisation, non-participation in ECE, having required a referral to dental services before starting school, and having changed addresses frequently.

There is considerable overlap between the four groups. For example around 57% of children who had a substantiated finding of abuse or neglect had spent most of their lifetime supported by benefits.

With regard to projected future outcomes, those who have a particular indicator are much more likely to have poorer outcomes than those without it. Overall around 7% of children are expected to have been supported by welfare benefits (when they are independent adults) for more than 2 years by their 21st birthday. For children who have a substantiated finding, 22% are expected to be supported by benefits for more than 2 years, while for children who have spent most of their lifetime so far supported by benefits, around 18% are expected to spend more than 2 years supported by benefits as independent adults by their 21st birthday.

There are similar patterns with respect to other outcomes, including the likelihood of being referred to Youth Justice, not achieving qualifications, receiving community or custodial sentence by age 21 and by age 35.

¹² Or if aged under 3 they have a sibling who had a substantiated finding, or if aged 0 they had a sibling who had been notified to CYF.

Table 1: Characteristics of children aged 0 to 5 years with individual indicator present

	Total	Indicator			
		Substantiated finding of abuse or neglect	Mostly supported by welfare benefits since birth	Parent with a sentence history	Mother with no formal qualifications
Number of children	362,832	29,286	67,326	61,485	33,186
Percentage of children	100.0	8.1	18.6	16.9	9.1
Percentage					
Gender					
Male	51.4	51.7	51.5	51.7	51.3
Female	48.6	48.3	48.5	48.3	48.7
Ethnicity					
Asian	11.9	2.4	3.2	1.9	2.5
European	46.7	23.8	21.4	23.2	33.3
Māori	28.6	59.9	58.6	62.4	50.4
Other	2.0	0.9	1.8	0.6	1.2
Pacific	10.6	13.0	15.0	11.9	12.6
Indicator					
Substantiated finding of abuse or neglect	8.1	100.0	24.8	30.1	22.9
Mainly supported by benefits since birth	18.6	57.0	100.0	53.2	41.0
Parent has a community or custodial sentence history	17.0	63.2	48.6	100.0	41.2
Mother has no formal qualifications	9.2	26.0	20.2	22.2	100.0
Selected characteristics					
Parental characteristics					
Received income support at the time of the birth	19.8	60.6	85.4	55.7	43.6
Had a previous or current gang affiliation	2.0	11.3	7.4	11.4	6.0
Mother was single at birth	24.4	63.8	76.8	58.5	47.8
Mother was teenager at birth	6.5	14.2	19.9	16.0	7.8
Safety					
Had a police family violence referral to CYF	4.6	32.2	15.4	18.3	12.3
Notified to CYF	11.6	67.7	35.2	38.6	28.9
Had an injury-related hospitalisation	6.2	11.3	8.7	8.9	8.4
Mother smoked around the time of the child's birth	11.7	37.5	32.7	34.1	29.9
Health					
Dental referral from B4SC (before school check)*	4.6	9.1	9.7	8.1	7.5
Had an ambulatory sensitive hospitalisation**	11.0	16.9	16.2	16.4	15.5
Low weight at birth	5.9	9.4	7.7	8.0	7.8
Received disability support	1.3	2.3	1.7	1.5	1.7
Achieving					
Did not participate in ECE prior to starting school*	3.8	8.6	9.0	7.5	9.3
Parent reported abnormal conduct at the B4SC*	13.4	26.1	24.5	24.5	21.5
Belonging					
Changed address at least once a year on average**	4.6	19.8	12.1	13.7	10.3

Underlying population refers to all 0 to 5 years unless otherwise stated

* refers to those aged 5 only

** refers to those aged between 1 and 5 (inclusive)

Table 2: Projected outcomes and costs for children aged 0 to 5 years with individual indicator present

	Total	Indicator			
		Substantiated finding of abuse or neglect	Mostly supported by welfare benefits since birth	Parent with a sentence history	Mother with no formal qualifications
Number of children	362,832	29,286	67,326	61,485	33,186
Percentage of children	100.0	8.1	18.6	16.9	9.1
Projected outcomes before age 21 (%)					
Further contact with CYF	19.2	70.8	50.5	48.2	39.2
Contact with Youth Justice	4.2	15.8	12.2	11.6	9.3
Did not achieve any school qualifications	17.5	36.2	32.9	31.4	27.1
Did not achieve a level 2 qualification	26.7	48.9	46.8	44.3	38.7
Received Sole Parent Support	4.8	13.2	12.8	11.5	9.4
Received a benefit for more than 2 years	6.8	22.1	18.1	17.0	14.0
Received a community or custodial sentence	5.8	18.1	14.9	14.5	11.6
Received a custodial sentence	1.6	7.3	5.0	5.1	3.7
Has a current or previous gang affiliation	0.6	3.2	2.1	2.3	1.6
Projected outcomes when aged 25 to 34 (%)					
Received a community or custodial sentence	8.5	21.4	18.7	18.9	15.1
Received a custodial sentence	3.2	9.5	7.9	8.0	6.4
Spent more than 5 years receiving benefit	8.7	21.4	19.3	18.4	15.5
Projected average costs before age 21					
Average benefit costs when a child	16,700	46,700	56,900	42,900	35,200
Average care and protection costs	3,300	27,400	10,600	12,400	9,700
Average Youth Justice costs	600	2,800	1,900	1,900	1,400
Average total cost of CYF, YJ, benefits as a child	20,600	77,000	69,500	57,200	46,300
Average benefit costs	5,400	14,900	13,100	12,100	10,100
Average corrections costs	1,200	5,700	3,900	4,000	2,900
Average total cost*	27,300	97,500	86,500	73,300	59,300
Projected average costs before age 35					
Average benefit costs	37,700	86,800	79,700	75,500	64,200
Average corrections costs	7,600	29,300	22,400	22,900	16,800
Average total costs*	66,000	193,100	171,500	155,600	127,300

* includes CYF, YJ, child benefit costs

Number of indicators present

Table 3 shows the profile of children aged 0-5 by number of indicators present. About 68% of 0-5 year olds have none of the indicators, 17% have one, 9% have two, 4% have three and 1% have all four of the indicators.

The numbers of indicators present is correlated with a range of other characteristics, including having a mother who was single at birth, being supported by benefits at birth, having an injury or ASH hospitalisation, non-participation in ECE, having required a referral to dental services before starting school, and having changed addresses frequently.

For example, those with two or more indicators were nine times more likely to have a mother who were was single at their birth, twice as likely to have had an injury related hospitalisation or ASH hospitalisation, four times less likely to have participated in ECE, three times more likely to require a referral to dental services when the before starting school, and ten time more likely to have changed addresses frequently, compared to those with no indicators.

Those with three or four indicators were nearly ten times more likely to have a mother who were was single at their birth, twice as likely to have had an injury related hospitalisation or ASH hospitalisation, five times less likely to have participated in ECE, three times more likely to require a referral to dental services when the before starting school, and twelve time more likely to have changed addresses frequently, compared to those with no indicators.

The number of indicators that a child has increases their risk of poor outcomes quite substantially. Those with two or more indicators are eight times more likely to have contact with Youth Justice, six times more likely to have been long-term benefit for more than two years before turning 21, and six times more likely to have received a corrections administered community or custodial sentence, and ten times likely to have received a custodial sentence, compared to those with no indicators.

Those with three or four indicators are nine times more likely to have contact with Youth Justice, seven times more likely to have been long-term benefit for more than two years before turning 21, and seven times more likely to have received a community or corrections sentence, compared to those with no indicators.

While children who had two or more of the four indicators present have been defined as the priority population, the number of indicators present can be used to identify small groups of high risk children (those with 3 or more indicators say), as well as a broader group (those with 2 or more indicators) who are at moderate to high risk. There may well be proposed interventions which can be focussed on a small high risk group and others where it makes more sense to broaden definition of risk to include those with moderate risk.

Table 3: Characteristics of children aged 0 to 5 years by number of indicators present

	Total	Number of indicators present					Two or more	Three or more
		None	One	Two	Three	Four		
Number of children	362,832	247,713	61,995	33,678	15,858	3,591	53,124	19,449
Percentage of children	100.0	68.3	17.1	9.3	4.4	1.0	14.6	5.4
		Percentage						
Gender								
Male	51.4	51.3	51.5	51.5	51.8	51.4	51.6	51.7
Female	48.6	48.7	48.5	48.5	48.2	48.6	48.4	48.3
Ethnicity								
Asian	11.9	15.8	5.4	1.8	0.6	0.2	1.3	0.6
European	46.7	56.0	31.2	22.4	19.8	20.0	21.4	19.9
Māori	28.6	17.1	43.7	61.8	69.3	72.3	64.8	69.9
Other	2.0	2.3	2.1	1.0	0.6	0.3	0.8	0.5
Pacific	10.6	8.6	17.6	13.1	9.7	7.2	11.7	9.2
Indicator								
Substantiated finding of abuse or neglect	8.1	0.0	8.0	27.9	71.3	100.0	45.8	76.6
Mainly supported by benefits since birth	18.6	0.0	41.1	72.2	88.1	100.0	78.8	90.3
Parent has a community or custodial sentence history	17.0	0.0	29.8	73.3	92.8	100.0	81.0	94.1
Mother has no formal qualifications	9.2	0.0	21.1	26.5	47.8	100.0	37.9	57.5
Selected characteristics								
Parental characteristics								
Received income support at the time of the birth	19.8	2.8	41.0	68.4	82.9	90.9	74.2	84.4
Had a previous or current gang affiliation	2.0	0.0	1.6	8.4	16.1	20.4	11.5	16.9
Mother was single at birth	24.4	8.1	45.2	68.0	76.8	80.0	71.4	77.4
Mother was teenager at birth	6.5	2.4	13.6	18.3	16.2	10.8	17.2	15.2
Safety								
Had a police family violence referral to CYF	4.6	0.7	5.4	15.5	32.0	42.8	22.3	34.0
Notified to CYF	11.6	2.6	16.4	37.5	63.4	78.5	48.0	66.2
Had an injury-related hospitalisation	6.2	5.2	7.5	9.2	10.4	10.9	9.7	10.5
Mother smoked around the time of the child's birth	11.7	3.5	19.7	34.7	43.8	50.2	38.5	45.0
Health								
Dental referral from B4SC (before school check)*	4.6	3.1	6.7	8.9	10.6	10.3	9.5	10.5
Had an ambulatory sensitive hospitalisation**	11.0	8.8	14.5	16.7	17.4	18.1	17.0	17.5
Low weight at birth	5.9	5.1	6.4	7.9	9.6	10.9	8.6	9.8
Received disability support	1.3	1.1	1.5	1.9	1.7	1.8	1.8	1.7
Achieving								
Did not participate in ECE prior to starting school*	3.8	2.1	5.8	8.7	10.5	14.5	9.6	11.2
Parent reported abnormal conduct at the B4SC*	13.4	9.5	19.0	25.0	28.5	31.4	26.3	29.0
Belonging								
Changed address at least once a year on average**	4.6	1.6	6.7	13.6	19.1	22.1	15.7	19.7

Underlying population refers to all 0 to 5 years unless otherwise stated.

* refers to those aged 5 only. ** refers to those aged between 1 and 5 (inclusive)

Table 4: Projected future outcomes for children aged 0 to 5 years by number of indicators present

	Total	Number of indicators present					Two or more	Three or more
		None	One	Two	Three	Four		
Number of children	362,832	247,713	61,995	33,678	15,858	3,591	53,124	19,449
Percentage of children	100.0	68.3	17.1	9.3	4.4	1.0	14.6	5.4
Projected outcomes before age 21 (%)								
Further contact with CYF	19.2	8.6	27.5	49.3	72.6	87.1	58.8	75.3
Contact with Youth Justice	4.2	1.7	5.9	11.6	17.7	22.0	14.1	18.5
Did not achieve any school qualifications	17.5	12.6	21.7	32.2	40.5	46.0	35.6	41.5
Did not achieve a level 2 qualification	26.7	20.2	33.6	45.7	54.1	59.6	49.1	55.1
Received Sole Parent Support	4.8	2.2	7.4	11.9	15.6	18.7	13.5	16.2
Received a benefit for more than 2 years	6.8	3.2	9.5	17.1	24.9	31.1	20.4	26.1
Used mental health services or pharms	17.7	15.5	19.1	23.6	29.9	32.3	26.1	30.3
Received a community or custodial sentence	5.8	2.9	7.8	14.3	21.0	25.6	17.0	21.8
Received a custodial sentence	1.6	0.6	2.0	4.6	8.4	10.7	6.2	8.9
Has a current or previous gang affiliation	0.6	0.1	0.7	2.2	3.9	4.1	2.8	3.9
Projected outcomes when aged 25 to 34 (%)								
Received a community or custodial sentence	8.5	5.1	11.8	18.0	25.2	28.0	20.8	25.7
Received a custodial sentence	3.2	1.7	4.5	7.4	11.3	13.9	9.0	11.8
Spent more than 5 years receiving benefit	8.7	5.2	12.6	18.7	23.7	28.3	20.9	24.6
Projected average costs before age 21								
Average benefit costs when a child	16,700	5,300	30,300	49,500	59,700	66,100	53,700	60,900
Average care and protection costs	3,300	500	3,300	10,600	24,200	37,000	16,500	26,500
Average Youth Justice costs	600	200	800	1,800	3,100	4,100	2,400	3,200
Average total cost of CYF, YJ, benefits as a child	20,600	6,000	34,400	62,000	87,000	107,200	72,500	90,700
Average benefit costs	5,400	3,000	7,500	12,400	16,900	20,000	14,300	17,500
Average corrections costs	1,200	400	1,400	3,600	6,900	7,800	4,900	7,000
Average total cost*	27,300	9,500	43,400	78,100	110,700	135,000	91,700	115,200
Projected average costs before age 35								
Average benefit costs	37,700	23,800	52,400	77,100	97,300	112,100	85,500	100,000
Average corrections costs	7,600	3,000	10,000	20,000	35,700	46,000	26,500	37,600
Average total costs*	66,000	32,800	96,800	159,100	219,900	265,300	184,500	228,300

* includes CYF, YJ, child benefit costs

The priority population (children with two or more indicators) by gender

Table 5 and 6 provide a summary of the priority population (children with two or more indicators) by gender. The proportion of girls in the priority population (48.4%) is very similar to that in the total population (48.6%). The characteristics of boys and girls included in the priority population are also very similar.

A key difference between girls and boys is the different types of poor outcomes they experience on average. Boys in the priority population are much more likely to have contact with Youth Justice, and to receive community or custodial sentences, while girls are more likely to be long-term benefit recipients, including receiving sole parent support.

About 20.5% of boys in the priority population are expected to have contact with Youth Justice, compared to 7.4% of girls. About 10.4% of boys are expected to receive a custodial sentence before age 21, compared to 1.7% of girls. About 28.7% of girls are expected to have received benefits for more than two years by the time they turn 21 compared to 12.5% of boys. About 26.2% of girls are expected to have received sole parent support at some stage before they turn 21 compared to 1.5% of boys. About 29.1% of girls are expected to have received benefits for more than five years when they are aged 25-34 years, compared to 13.1% of boys. About 14.2% of boys are expected to receive a custodial sentence when aged 25-34 years, compared to 3.5% of girls.

Table 5: Characteristics of children aged 0 to 5 years by whether they are in the priority population or not, by gender

	Total	Total		Male		Female	
		Priority population					
		No	Yes	No	Yes	No	Yes
Number of children	362,832	309,708	53,124	159,033	27,390	150,672	25,734
Percentage of children	100.0	85.4	14.6	85.3	14.7	85.4	14.6
Percentage							
Gender							
Male	51.4	51.4	51.6	100.0	100.0	0.0	0.0
Female	48.6	48.7	48.4	0.0	0.0	100.0	100.0
Ethnicity							
Asian	11.9	13.7	1.3	13.7	1.3	13.7	1.3
European	46.7	51.0	21.4	51.0	21.2	51.1	21.6
Māori	28.6	22.4	64.8	22.5	64.9	22.4	64.6
Other	2.0	2.2	0.8	2.3	0.9	2.2	0.7
Pacific	10.6	10.4	11.7	10.4	11.7	10.5	11.7
Indicator							
Substantiated finding of abuse or neglect	8.1	1.6	45.8	1.6	45.9	1.6	45.6
Mainly supported by benefits since birth	18.6	8.2	78.8	8.2	78.7	8.2	78.9
Parent has a community or custodial sentence history	17.0	6.0	81.0	6.0	81.1	5.9	80.8
Mother has no formal qualifications	9.2	4.2	37.9	4.2	37.7	4.2	38.0
Selected characteristics							
Parental characteristics							
Received income support at the time of the birth	19.8	10.4	74.2	10.6	74.1	10.3	74.4
Had a previous or current gang affiliation	2.0	0.4	11.5	0.4	11.7	0.4	11.4
Mother was single at birth	24.4	15.8	71.4	15.9	71.3	15.7	71.6
Mother was teenager at birth	6.5	4.6	17.2	4.7	17.3	4.6	17.1
Safety							
Had a police family violence referral to CYF	4.6	1.6	22.3	1.7	22.5	1.6	22.0
Notified to CYF	11.6	5.4	48.0	5.4	48.3	5.3	47.8
Had a injury-related hospitalisation	6.2	5.7	9.7	6.2	10.4	5.0	8.8
Mother smoked around the time of the child's birth	11.7	6.9	38.5	6.9	38.4	6.8	38.6
Health							
Dental referral from B4SC (before school check)*	4.6	3.8	9.5	4.0	9.2	3.6	9.8
Had an ambulatory sensitive hospitalisation**	11.0	9.9	17.0	10.6	17.9	9.2	16.0
Low weight at birth	5.9	5.4	8.6	5.1	7.8	5.7	9.4
Received disability support	1.3	1.2	1.8	1.5	2.5	0.8	1.1
Achieving							
Did not participate in ECE prior to starting school*	3.8	2.9	9.6	2.8	9.9	2.9	9.2
Parent reported abnormal conduct at the B4SC*	13.4	11.4	26.3	12.8	28.8	9.9	23.6
Belonging							
Changed address at least once a year on average**	4.6	2.6	15.7	2.7	15.9	2.5	15.5

Underlying population refers to all 0 to 5 years unless otherwise stated

* refers to those aged 5 only

** refers to those aged between 1 and 5 (inclusive)

Table 6: Projected future outcomes and average costs for children aged 0 to 5 years by whether they are in the priority population or not, by gender

	Total	Total		Male		Female	
		Priority population					
		No	Yes	No	Yes	No	Yes
Number of children	362,832	309,708	53,124	159,033	27,390	150,672	25,734
Percentage of children	100.0	85.4	14.6	85.3	14.7	85.4	14.6
Projected outcomes before age 21 (%)							
Further contact with CYF	19.2	12.4	58.8	12.4	58.6	12.4	59.1
Contact with Youth Justice	4.2	2.5	14.1	3.9	20.5	1.2	7.4
Did not achieve any school qualifications	17.5	14.4	35.6	17.3	39.3	11.4	31.7
Did not achieve a level 2 qualification	26.7	22.9	49.1	26.9	52.6	18.6	45.5
Received Sole Parent Support	4.8	3.3	13.5	0.4	1.5	6.4	26.2
Received a benefit for more than 2 years	6.8	4.4	20.4	2.8	12.5	6.1	28.7
Used mental health services or pharms	17.7	16.2	26.1	14.8	27.3	17.8	24.7
Received a community or custodial sentence	5.8	3.8	17.0	6.1	24.9	1.4	8.7
Received a custodial sentence	1.6	0.9	6.2	1.5	10.4	0.2	1.7
Has a current or previous gang affiliation	0.6	0.2	2.8	0.5	5.1	0.0	0.4
Projected outcomes when aged 25 to 34 (%)							
Received a community or custodial sentence	8.5	6.4	20.8	9.5	28.9	3.1	12.2
Received a custodial sentence	3.2	2.2	9.0	3.6	14.2	0.8	3.5
Spent more than 5 years receiving benefit	8.7	6.6	20.9	4.0	13.1	9.5	29.1
Projected average costs before age 21							
Average benefit costs when a child	16,700	10,300	53,700	10,400	53,600	10,200	53,800
Average care and protection costs	3,300	1,100	16,500	1,100	16,900	1,100	16,000
Average Youth Justice costs	600	300	2,400	500	3,700	100	900
Average total cost of CYF, YJ, benefits as a child	20,600	11,700	72,500	12,000	74,200	11,400	70,800
Average benefit costs	5,400	3,900	14,300	2,800	9,600	5,100	19,300
Average corrections costs	1,200	600	4,900	1,100	8,600	100	900
Average total cost*	27,300	16,200	91,700	15,900	92,300	16,600	91,000
Projected average costs before age 35							
Average benefit costs	37,700	29,500	85,500	17,700	49,200	41,900	124,100
Average corrections costs	7,600	4,400	26,500	7,900	46,500	800	5,100
Average total costs*	66,000	45,600	184,500	37,600	169,800	54,100	200,000

* includes CYF, YJ, child benefit costs

Groups of children within the priority population can also be identified based on the type and number of indicators present

Table 7 and 8 provide a summary of breakdown of the priority population (children with two or more indicators) by the number and type of indicators present.

Table 1 and the regression analysis described in Appendix 1, showed that having a “mother having no formal qualifications” was less strongly associated with poor outcomes than the three other indicators¹³. Children who have the three “stronger” indicators (2.3%) have very similar outcomes to those with all four indicators (1.0%). Together these two groups comprise 3.3% of all children aged 0 to 5 and are a particularly high risk group. Nearly 80% of mothers were single at the time of the child’s birth, and 90% were supported by benefit at the time of the child’s birth.

A fifth of these children are expected to have contact with Youth Justice, 44% are expected to leave school without any qualifications, 29% are expected to have received benefits for more than two years by the time they turn 21, 10% are expected to have received a custodial

¹³ This result likely reflects the partial nature of the qualification measure that can be derived from the information available in IDI.

sentence by the time they are 21, 27% are expected to have received benefits for more than five years when they are aged 25-34 years, and 13% are expected to receive a custodial sentence when aged 25-34 years.

Table 7: Characteristics of children aged 0 to 5 years within the priority population by number and combination of indicators present

	Total two or more indicators	Combination of two or more of four indicators			
		2 indicators: NO QUAL and one of: CYF, BEN, CORR	2 indicators: CYF, BEN or CORR	3 indicators: NO QUAL and two of: CYF, BEN, CORR	3 indicators: CYF, BEN, CORR or 4: CYF, BEN, CORR, NO QUAL
Number of children	53,124	8,931	24,744	7,581	11,865
Percentage of children with 2 or more indicators	100.0	16.8	46.6	14.3	22.3
Percentage of all children	14.6	2.5	6.8	2.1	3.3
		Percentage			
Gender					
Male	51.6	51.8	51.4	50.8	52.3
Female	48.4	48.2	48.7	49.2	47.7
Ethnicity					
Asian	1.3	2.2	1.6	0.6	0.5
European	21.4	27.7	20.4	21.6	18.7
Māori	64.8	54.0	64.7	68.2	70.9
Other	0.8	1.8	0.7	0.7	0.4
Pacific	11.7	14.4	12.6	8.9	9.4
Indicator					
Substantiated finding of abuse or neglect	45.8	10.9	34.0	40.1	100.0
Mainly supported by benefits since birth	78.8	48.4	80.8	75.0	100.0
Parent has a community or custodial sentence history	81.0	40.6	85.2	84.9	100.0
Mother has no formal qualifications	37.9	100.0	0.0	100.0	30.3
Selected characteristics					
Parental characteristics					
Received income support at the time of the birth	74.2	51.5	74.5	74.6	90.7
Had a previous or current gang affiliation	11.5	3.0	10.4	12.9	19.5
Mother was single at birth	71.4	57.9	71.6	74.0	79.6
Mother was teenager at birth	17.2	9.9	21.4	13.8	16.0
Safety					
Had a police family violence referral to CYF	22.3	8.0	18.2	21.2	42.2
Notified to CYF	48.0	23.6	42.5	50.0	76.6
Had a injury-related hospitalisation	9.7	8.7	9.4	9.5	11.2
Mother smoked around the time of the child's birth	38.5	32.8	35.4	44.1	45.6
Health					
Dental referral from B4SC (before school check)*	9.5	9.0	8.9	10.6	10.5
Had an ambulatory sensitive hospitalisation**	17.0	16.3	16.8	17.5	17.6
Low weight at birth	8.6	7.6	8.0	10.2	9.6
Received disability support	1.8	2.2	1.7	1.6	1.8
Achieving					
Did not participate in ECE prior to starting school*	9.6	11.3	7.6	11.6	10.9
Parent reported abnormal conduct at the B4SC*	26.3	23.9	25.4	29.0	29.0
Belonging					
Changed address at least once a year on average**	15.7	9.8	15.0	17.7	21.1

Underlying population refers to all 0 to 5 years unless otherwise stated

* refers to those aged 5 only

** refers to those aged between 1 and 5 (inclusive)

Table 8: Projected future outcomes and average costs for children aged 0 to 5 years within the priority population by number and combination of indicators present

	Total two or more indicators	Combination of two or more of four indicators			
		2 indicators: NO QUAL and one of: CYF, BEN, CORR	2 indicators: CYF, BEN or CORR	3 indicators: NO QUAL and two of: CYF, BEN, CORR	3 indicators: CYF, BEN, CORR or 4: CYF, BEN, CORR, NO QUAL
Number of children	53,124	8,931	24,744	7,581	11,865
Percentage of children with 2 or more indicators	100.0	16.8	46.6	14.3	22.3
Percentage of all children	14.6	2.5	6.8	2.1	3.3
Projected outcomes before age 21 (%)					
Further contact with CYF	58.8	37.6	53.5	61.7	84.0
Contact with Youth Justice	14.1	8.7	12.7	15.2	20.6
Did not achieve any school qualifications	35.6	28.0	33.7	38.0	43.8
Did not achieve a level 2 qualification	49.1	40.7	47.5	51.7	57.3
Received Sole Parent Support	13.5	9.6	12.7	14.2	17.4
Received a benefit for more than 2 years	20.4	13.6	18.3	21.5	29.0
Used mental health services or pharms	26.1	20.6	24.7	27.2	32.3
Received a community or custodial sentence	17.0	10.8	15.5	18.7	23.9
Received a custodial sentence	6.2	2.7	5.3	6.5	10.4
Has a current or previous gang affiliation	2.8	1.2	2.5	3.3	4.3
Projected outcomes when aged 25 to 34 (%)					
Received a community or custodial sentence	20.8	14.4	19.3	22.1	28.0
Received a custodial sentence	9.0	6.0	7.9	9.4	13.4
Spent more than 5 years receiving benefit	20.9	15.7	19.8	21.4	26.6
Projected average costs before age 21					
Average benefit costs when a child	53,700	41,000	52,600	56,400	63,800
Average care and protection costs	16,500	5,400	12,500	17,200	32,500
Average Youth Justice costs	2,400	1,100	2,100	2,400	3,800
Average total cost of CYF, YJ, benefits as a child	72,500	47,500	67,300	75,900	100,100
Average benefit costs	14,300	10,200	13,200	15,100	19,000
Average corrections costs	4,900	2,100	4,200	5,500	8,000
Average total cost*	91,700	59,800	84,700	96,500	127,100
Projected average costs before age 35					
Average adult benefit costs	85,500	64,700	81,600	89,600	106,700
Average corrections costs	26,500	13,900	22,200	25,000	45,700
Average total costs*	184,500	126,000	171,100	190,500	252,500

* includes CYF, YJ, child benefit costs

4 Characteristics of children aged 6 to 14 years at risk of poor outcomes

In this section we examine an extended set of characteristics for children aged 6 to 14 years that are available through the IDI. Appendix 2 has information for all children aged 0 to 14 years.

Children with a particular indicator

Table 9 shows the profile of children aged 6 to 14 years who had each of the four indicators. The proportion of children with a particular indicator varies considerable:

- ▶ 8.3% had a substantiated finding of abuse or neglect or had been placed in the care of Child, Youth and Family
- ▶ 12.8% had been supported by benefits for more than three-quarters of their lifetime
- ▶ 17.0% had a parent who had received a community and custodial sentence
- ▶ 11.3% had a mother has no formal qualifications.

The proportion of children who have been supported by benefits for more than three-quarters of their lifetime decrease with age, with 18.6% of children aged 0-5 years compared to 12.8% of children aged 6-14 years.

In each case having a particular indicator is correlated with a range of other characteristics, including having a mother who was single at birth, being supported by benefits at birth, having an injury or ASH hospitalisation, non-participation in ECE, having required a referral to dental services before starting school, and having changed addresses frequently.

There is considerable overlap between the four groups. For example around 45% of children who had a substantiated finding of abuse or neglect had spent most of their lifetime supported by benefits, and 62% had a parent has a corrections history.

With regard to projected future outcomes, those who have a particular indicator are much more likely to have poorer outcomes than those without it. Overall around 7% of children are expected to have been supported by welfare benefits (when they are independent adults) for more than 2 years by their 21st birthday. For children who have a substantiated finding, 27% are expected to be supported by benefits for more than 2 years, while for children who have spent most of their lifetime so far supported by benefits, around 23% are expected to spend more than 2 years supported by benefits as independent adults by their 21st birthday.

There are similar patterns with respect to other outcomes, including the likelihood of being referred to Youth Justice, not achieving qualifications, receiving community or custodial sentence by age 21 and by age 35.

Table 9: Characteristics of children aged 6 to 14 with each indicator present

	Total	Indicator			
		Substantiated finding of abuse or neglect	Mostly supported by welfare benefits since birth	Parent with a sentence history	Mother with no formal qualifications
Number of children	510,351	42,543	65,184	86,949	57,417
Percentage of children	100.0	8.3	12.8	17.0	11.3
		Percentage			
Gender					
Male	51.2	51.1	50.7	51.4	51.3
Female	48.8	49.0	49.3	48.6	48.7
Ethnicity					
Asian	9.4	2.9	3.1	1.9	3.5
European	52.6	27.7	23.2	25.5	40.2
Māori	26.0	54.7	59.1	59.4	42.4
Other	2.0	1.2	1.8	0.8	1.1
Pacific	10.0	13.6	12.9	12.3	12.8
Indicator					
Substantiated finding of abuse or neglect	8.3	100.0	29.3	30.1	19.7
Mainly supported by benefits since birth	12.8	45.0	100.0	40.2	28.1
Parent has a community or custodial sentence history	17.0	61.6	53.7	100.0	37.5
Mother has no formal qualifications	11.3	26.5	24.7	24.8	100.0
Selected characteristics					
Parental characteristics					
Received income support at the time of the birth	19.8	59.6	75.0	54.6	42.0
Had a previous or current gang affiliation	1.6	8.4	6.9	8.9	4.1
Mother was single at birth	20.4	52.9	64.9	46.6	36.7
Mother was teenager at birth	5.9	17.3	19.9	17.9	13.1
Safety					
Had a police family violence referral to CYF	9.6	58.9	33.9	33.0	20.4
Notified to CYF	20.0	99.8	58.2	56.8	40.2
Had a injury-related hospitalisation	15.2	24.4	21.0	20.8	18.5
Mother smoked around the time of the child's birth	9.8	24.5	25.3	25.2	20.7
Health					
Had an ambulatory sensitive hospitalisation	22.2	33.9	34.4	33.2	31.3
Low weight at birth	6.1	9.3	8.3	8.1	7.9
Belonging					
Changed address at least once a year on average	0.9	5.2	3.1	3.7	2.7

Table 10: Projected future outcomes for children aged 6 to 14 with each indicator present

	Total	Indicator			
		Substantiated finding of abuse or neglect	Mostly supported by welfare benefits since birth	Parent with a sentence history	Mother with no formal qualifications
Number of children	510,351	42,543	65,184	86,949	57,417
Percentage of children	100.0	8.3	12.8	17.0	11.3
Projected outcomes before age 21 (%)					
Further contact with CYF	18.3	75.6	51.7	48.4	34.8
Contact with Youth Justice	4.6	19.7	15.0	14.1	9.5
Did not achieve any school qualifications	17.7	42.7	38.6	35.4	27.6
Did not achieve a level 2 qualification	27.3	56.0	52.1	49.0	40.3
Received Sole Parent Support	5.2	15.8	15.2	13.4	9.7
Received a benefit for more than 2 years	7.4	26.9	22.6	19.6	14.4
Used mental health services or pharms	18.5	33.0	25.7	26.0	22.4
Received a community or custodial sentence	6.1	22.0	17.1	17.1	11.5
Received a custodial sentence	1.7	9.1	6.0	6.0	3.7
Has a current or previous gang affiliation	0.6	3.7	2.7	2.6	1.5
Projected outcomes when aged 25 to 34 (%)					
Received a community or custodial sentence	8.4	24.7	20.7	20.0	14.2
Received a custodial sentence	3.2	11.6	9.0	8.7	5.9
Spent more than 5 years receiving benefit	8.6	25.1	21.4	19.1	14.4
Projected average costs before age 21					
Average benefit costs when a child	18,500	52,300	72,100	47,400	35,900
Average care and protection costs	3,300	31,200	9,200	12,800	8,500
Average Youth Justice costs	600	3,500	2,000	2,100	1,300
Average total cost of CYF, YJ, benefits as a child	22,400	86,900	83,300	62,300	45,700
Average benefit costs	5,800	17,600	15,500	13,600	10,200
Average corrections costs	1,200	6,800	4,500	4,400	2,600
Average total cost*	29,400	111,300	103,300	80,300	58,500
Projected average costs before age 35					
Average adult benefit costs	37,700	100,200	88,900	80,300	61,300
Average corrections costs	7,700	35,100	25,700	24,800	15,300
Average total costs*	67,700	222,300	198,000	167,300	122,400

* includes CYF, YJ, child benefit costs

Number of indicators

Table 11 shows the profile of children aged 6-14 by number of indicators present. About 70% have none of the indicators, 17% have one, 9% have two, 4% have three and 1% have all four of the indicators. This is very similar to the number of indicators present among 0-5 year olds.

The numbers of indicators present is correlated with a range of other characteristics, including having a mother who was single at birth, being supported by benefits at birth, having an injury or ASH hospitalisation, non-participation in ECE, having required a referral to dental services before starting school, and having changed addresses frequently.

For example, those with two or more indicators were seven times more likely to have a mother who was single at their birth, nearly twice as likely to have had an injury related hospitalisation or ASH hospitalisation, and more than ten times more likely to have changed addresses frequently, compared to those with no indicators.

The number of indicators that a child has increases their risk of poor outcomes quite substantially. Those with two or more indicators are ten times more likely to have contact with Youth Justice, seven times more likely to have been long-term benefit for more than two years before turning 21, and seven times more likely to have received a corrections administered community or custodial sentence, and fifteen times more likely to have received a custodial sentence, compared to those with no indicators.

While children who had two or more of the four indicators present have been defined as the priority population, the number of indicators present can be used to identify small groups of high risk children (those with 3 or more indicators say), as well as a broader group (those with 2 or more indicators) who are at moderate to high risk.

Table 11: Characteristics of children aged 6 to 14 years by number of indicators present

	Total	Number of indicators					Two or more	Three or more
		None	One	Two	Three	Four		
Number of children	510,351	354,864	87,234	44,142	19,857	4,254	68,250	24,111
Percentage of children	100.0	69.5	17.1	8.6	3.9	0.8	13.4	4.7
Percentage								
Gender								
Male	51.2	51.2	51.0	51.3	51.4	50.5	51.3	51.2
Female	48.8	48.8	49.0	48.7	48.7	49.5	48.7	48.8
Ethnicity								
Asian	9.4	11.9	5.0	2.1	0.9	0.6	1.7	0.8
European	52.6	61.7	37.6	25.6	22.0	21.2	24.3	21.9
Māori	26.0	15.8	39.9	57.9	66.9	70.5	61.3	67.5
Other	2.0	2.3	1.8	1.1	0.6	0.3	0.9	0.6
Pacific	10.0	8.3	15.6	13.2	9.5	7.5	11.8	9.2
Indicator								
Substantiated finding of abuse or neglect	8.3	0.0	10.2	33.9	72.7	100.0	49.3	77.5
Mainly supported by benefits since birth	12.8	0.0	22.5	57.2	81.1	100.0	66.8	84.4
Parent has a community or custodial sentence	17.0	0.0	35.8	74.8	92.9	100.0	81.7	94.2
Mother has no formal qualifications	11.3	0.0	31.6	34.1	53.2	100.0	43.7	61.5
Selected characteristics								
Parental characteristics								
Received income support at the time of the birth	19.8	6.6	36.1	62.2	76.3	82.1	67.6	77.4
Had a previous or current gang affiliation	1.6	0.0	1.7	7.0	12.8	17.3	9.3	13.6
Mother was single at birth	20.4	8.2	33.9	53.8	62.5	65.8	57.1	63.1
Mother was teenager at birth	5.9	2.0	10.6	18.8	22.3	25.0	20.2	22.7
Safety								
Had a police family violence referral to CYF	9.6	2.3	13.4	33.3	56.8	74.7	42.7	59.9
Notified to CYF	20.0	6.9	32.8	62.5	87.4	100.0	72.1	89.6
Had a injury-related hospitalisation	15.2	13.3	17.7	21.1	23.9	26.3	22.2	24.3
Mother smoked around the time of the child's	9.8	4.0	15.9	25.3	30.5	34.6	27.4	31.2
Health								
Had an ambulatory sensitive hospitalisation	22.2	18.0	28.9	34.3	36.4	38.3	35.2	36.7
Low weight at birth	6.1	5.3	6.8	8.3	9.9	9.8	8.9	9.9
Belonging								
Changed address at least once a year on	0.9	0.1	1.3	3.5	6.0	7.2	4.5	6.2

Table 12: Projected future outcomes for children aged 6 to 14 years by number of indicators present

	Total	Number of indicators					Two or more	Three or more
		None	One	Two	Three	Four		
Number of children	510,351	354,864	87,234	44,142	19,857	4,254	68,250	24,111
Percentage of children	100.0	69.5	17.1	8.6	3.9	0.8	13.4	4.7
Projected outcomes before age 21								
Further contact with CYF	18.3	7.9	27.7	51.9	73.3	83.7	60.1	75.1
Contact with Youth Justice	4.6	1.7	6.5	14.0	22.5	26.7	17.2	23.2
Did not achieve any school qualifications	17.7	11.9	23.1	37.2	47.0	52.7	41.0	48.0
Did not achieve a level 2 qualification	27.3	19.9	36.0	51.1	60.1	66.0	54.6	61.1
Received Sole Parent Support	5.2	2.5	7.9	13.7	19.1	21.0	15.7	19.4
Received a benefit for more than 2 years	7.4	3.3	10.6	20.7	30.3	35.3	24.4	31.1
Used mental health services or pharms	18.5	16.1	20.8	26.4	31.8	34.3	28.5	32.3
Received a community or custodial sentence	6.1	2.8	8.6	16.9	24.4	29.2	19.9	25.3
Received a custodial sentence	1.7	0.5	2.3	5.8	9.8	12.6	7.4	10.3
Has a current or previous gang affiliation	0.6	0.1	0.8	2.2	4.5	5.9	3.1	4.7
Projected outcomes when aged 25 to 34								
Received a community or custodial sentence	8.4	4.8	11.9	20.1	27.2	30.3	22.8	27.7
Received a custodial sentence	3.2	1.6	4.7	8.8	12.7	13.8	10.2	12.9
Spent more than 5 years receiving benefit	8.6	4.9	12.2	20.2	27.0	29.0	22.7	27.4
Projected average costs before age 21								
Average benefit costs when a child	18500	6900	32900	55700	67700	75700	60400	69100
Average care and protection costs	3300	400	3600	14100	24900	28100	18100	25500
Average Youth Justice costs	600	100	700	1900	3600	4900	2600	3800
Average total cost of CYF, YJ, benefits as a child	22,400	7,400	37,300	71,800	96,200	108,700	81,200	98,400
Average benefit costs	5,800	3,200	8,300	14,500	19,400	21,700	16,400	19,800
Average corrections costs	1,200	300	1,500	4,200	7,700	9,000	5,500	8,000
Average total cost*	29,400	10,800	47,100	90,500	123,300	139,300	103,100	126,100
Projected average costs before age 35								
Average adult benefit costs	37,700	23,200	52,900	84,300	108,700	119,500	93,600	110,600
Average corrections costs	7,700	2,700	10,100	24,200	40,000	47,200	30,300	41,300
Average total costs*	67,700	33,300	100,300	180,300	244,900	275,300	205,000	250,300

* includes CYF, YJ, child benefit costs

The priority population (children with two or more indicators)

Table 13 and 14 provide a summary of the priority population (children with two or more indicators) by gender.

As with children aged 0-5, a key difference between girls and boys is the different types of poor outcomes they experience on average. Boys in the priority population are much more likely to have contact with Youth Justice, and to receive community or custodial sentences, while girls are more likely to be long-term benefit recipients, including receiving sole parent support.

Table 13: Characteristics of children aged 6 to 14 years by whether they are in the priority population or not, by gender

	Total	Total		Males		Females	
		Priority population					
		No (none or one indicator)	Yes (two or more indicators)	No (none or one indicator)	Yes (two or more indicators)	No (none or one indicator)	Yes (two or more indicators)
Number of children	510,351	442,098	68,250	226,185	34,986	215,916	33,264
Percentage of children	100.0	86.6	13.4	86.6	13.4	86.7	13.3
Percentage							
Gender							
Male	51.2	51.2	51.3	100.0	100.0	0.0	0.0
Female	48.8	48.8	48.7	0.0	0.0	100.0	100.0
Ethnicity							
Asian	9.4	10.6	1.7	10.6	1.6	10.4	1.7
European	52.6	56.9	24.3	56.5	24.1	56.8	24.5
Māori	26.0	20.6	61.3	20.5	61.6	20.4	60.9
Other	2.0	2.2	0.9	2.2	1.0	2.2	0.9
Pacific	10.0	9.7	11.8	9.7	11.7	9.7	11.9
Indicator							
Substantiated finding of abuse or neglect	8.3	2.0	49.3	2.0	49.3	2.0	49.4
Mainly supported by benefits since birth	12.8	4.4	66.8	4.4	66.4	4.5	67.2
Parent has a community or custodial sentence history	17.0	7.1	81.7	7.1	81.7	7.0	81.6
Mother has no formal qualifications	11.3	6.2	43.7	6.2	44.0	6.3	43.5
Selected characteristics							
Parental characteristics							
Received income support at the time of the birth	19.8	12.5	67.6	12.4	67.4	12.5	67.7
Had a previous or current gang affiliation	1.6	0.4	9.3	0.4	9.3	0.3	9.3
Mother was single at birth	20.4	13.9	57.1	13.7	56.9	14.0	57.4
Mother was teenager at birth	5.9	3.7	20.2	3.7	20.4	3.7	20.0
Safety							
Had a police family violence referral to CYF	9.6	4.5	42.7	4.5	42.7	4.4	42.6
Notified to CYF	20.0	12.0	72.1	12.0	72.0	12.0	72.1
Had an injury-related hospitalisation	15.2	14.2	22.2	15.8	24.6	12.5	19.7
Mother smoked around the time of the child's birth	9.8	6.6	27.4	6.6	27.3	6.6	27.6
Health							
Had an ambulatory sensitive hospitalisation	22.2	20.2	35.2	21.2	36.4	19.1	33.8
Low weight at birth	6.1	5.7	8.9	5.3	8.3	6.0	9.5
Belonging							
Changed address at least once a year on average	0.9	0.4	4.5	0.4	4.4	0.4	4.5

Table 14: Projected future outcomes and average costs for children aged 6 to 14 years by whether they are in the priority population or not, by gender

	Total	Total		Males		Females	
		Priority population					
		No	Yes	No	Yes	No	Yes
Number of children	510,351	442,098	68,250	226,185	34,986	215,916	33,264
Percentage of children	100.0	86.6	13.4	86.6	13.4	86.7	13.3
Projected outcomes before age 21 (percentage)							
Further contact with CYF	18.3	11.8	60.1	12.0	60.7	11.6	59.5
Contact with Youth Justice	4.6	2.6	17.2	4.0	24.8	1.2	9.3
Did not achieve any school qualifications	17.7	14.1	41.0	17.1	44.6	11.1	37.3
Did not achieve a level 2 qualification	27.3	23.0	54.6	27.2	58.1	18.7	51.0
Received Sole Parent Support	5.2	3.5	15.7	0.3	1.7	6.9	30.4
Received a benefit for more than 2 years	7.4	4.8	24.4	3.1	15.6	6.5	33.6
Used mental health services or pharms	18.5	17.0	28.5	15.3	29.3	18.8	27.6
Received a community or custodial sentence	6.1	3.9	19.9	6.3	28.9	1.5	10.4
Received a custodial sentence	1.7	0.9	7.4	1.5	12.5	0.2	2.1
Has a current or previous gang affiliation	0.6	0.3	3.1	0.5	5.7	0.0	0.4
(percentage)							
Received a community or custodial sentence	8.4	6.2	22.8	9.4	31.5	2.9	13.7
Received a custodial sentence	3.2	2.2	10.2	3.6	16.2	0.7	3.9
Spent more than 5 years receiving benefit	8.6	6.4	22.7	3.9	14.0	9.0	31.9
Projected average costs before age 21							
Average benefit costs when a child	18,500	12,000	60,400	12,000	60,200	12,100	60,600
Average care and protection costs	3,300	1,000	18,100	1,000	18,500	1,000	17,800
Average Youth Justice costs	600	200	2,600	400	4,200	100	1,000
Average total cost of CYF, YJ, benefits as a child	22,400	13,300	81,200	13,400	82,900	13,100	79,400
Average benefit costs as an adult	5,800	4,200	16,400	3,000	10,900	5,400	22,100
Average corrections costs	1,200	600	5,500	1,000	9,700	100	1,100
Average total cost*	29,400	18,000	103,100	17,400	103,500	18,700	102,600
Projected average costs before age 35							
Average adult benefit costs	37,700	29,100	93,600	17,600	53,200	41,100	136,100
Average corrections costs	7,700	4,200	30,300	7,500	53,100	700	6,200
Average total costs*	67,700	46,500	205,000	38,500	189,200	54,900	221,700

* includes CYF, YJ, child benefit costs

Groups of children within the priority population based on the type and number of indicators present

Table 15 and 16 provide a breakdown of the priority population (children with two or more indicators) by the number and type of indicators present.

Table 9 and the regression analysis described in Appendix 1, showed that having a “mother having no formal qualifications” was less strongly associated with poor outcomes than the three other indicators¹⁴. Children who have the three “stronger” indicators (1.9%) have very similar outcomes to those with all four indicators (0.8%). Together these two groups comprise 2.7% of all children aged 6 to 14 years and are a particularly high risk group. 660% of mothers were single at the time of the child’s birth, and 81% were supported by benefit at the time of the child’s birth.

¹⁴ This result likely reflects the partial nature of the qualification measure that can be derived from the information available in IDI.

A quarter of these children are expected to have contact with Youth Justice, half are expected to leave school without any qualifications, one third are expected to have received benefits for more than two years by the time they turn 21, 12% are expected to have received a custodial sentence by the time they are 21, 30% are expected to have received benefits for more than five years when they are aged 25-34 years, and 14% are expected to receive a custodial sentence when aged 25-34 years.

Table 15: Characteristics of children aged 6 to 14 years within the priority population by number and combination of indicators present

	Total two or more indicators	Combination of two or more of four indicators			
		2 indicators: NO QUAL and one of: CYF, BEN, CORR	2 indicators: CYF, BEN or CORR	3 indicators: NO QUAL and two of: CYF, BEN, CORR	3 indicators: CYF, BEN, CORR or 4: CYF, BEN, CORR, NO QUAL
Number of children	68,250	15,033	29,109	10,572	13,539
Percentage of children with 2 or more indicators	100.0	22.0	42.7	15.5	19.8
Percentage of all children	13.4	2.9	5.7	2.1	2.7
		Percentage			
Gender					
Male	51.3	51.7	51.1	51.7	50.8
Female	48.7	48.3	48.9	48.3	49.2
Ethnicity					
Asian	1.7	2.7	1.8	0.9	0.8
European	24.3	33.4	21.6	26.7	18.1
Māori	61.3	47.2	63.5	62.4	71.4
Other	0.9	1.5	1.0	0.7	0.5
Pacific	11.8	15.2	12.2	9.3	9.1
Indicator					
Substantiated finding of abuse or neglect	49.3	12.5	45.0	48.8	100.0
Mainly supported by benefits since birth	66.8	33.6	69.4	64.5	100.0
Parent has a community or custodial sentence history	81.7	54.0	85.6	86.8	100.0
Mother has no formal qualifications	43.7	100.0	0.0	100.0	31.4
Selected characteristics					
Parental characteristics					
Received income support at the time of the birth	67.6	50.6	68.2	73.0	80.7
Had a previous or current gang affiliation	9.3	3.0	9.0	10.8	15.7
Mother was single at birth	57.1	45.2	58.5	59.8	65.7
Mother was teenager at birth	20.2	16.2	20.2	23.1	22.5
Safety					
Had a police family violence referral to CYF	42.7	18.1	41.1	42.1	73.9
Notified to CYF	72.1	43.9	72.1	76.3	100.0
Had a injury-related hospitalisation	22.2	19.3	22.0	22.3	25.9
Mother smoked around the time of the child's birth	27.4	24.1	26.0	31.3	31.2
Health					
Had an ambulatory sensitive hospitalisation**	35.2	34.3	34.3	36.0	37.3
Low weight at birth	8.9	8.0	8.5	10.3	9.6
Belonging					
Changed address at least once a year on average**	4.5	2.7	3.9	6.5	5.9

Table 16: Projected future outcomes and average costs for children aged 6 to 14 years within the priority population by the number and combination of indicators present

	Total two or more indicators	Combination of two or more of four indicators			
		2 indicators: NO QUAL and one of: CYF, BEN, CORR	2 indicators: CYF, BEN or CORR	3 indicators: NO QUAL and two of: CYF, BEN, CORR	3 indicators: CYF, BEN, CORR or 4: CYF, BEN, CORR, NO QUAL
Number of children	68,250	15,033	29,109	10,572	13,539
Percentage of children with 2 or more indicators	100.0	22.0	42.7	15.5	19.8
Percentage of all children	13.4	2.9	5.7	2.1	2.7
Projected outcomes before age 21 (percentage)					
Further contact with CYF	60.1	35.9	60.1	64.8	83.1
Contact with Youth Justice	17.2	8.8	16.6	19.2	26.3
Did not achieve any school qualifications	41.0	30.1	40.9	44.1	51.0
Did not achieve a level 2 qualification	54.6	44.7	54.4	57.5	63.9
Received Sole Parent Support	15.7	10.2	15.5	16.9	21.3
Received a benefit for more than 2 years	24.4	14.6	23.8	26.9	34.5
Used mental health services or pharms	28.5	22.9	28.2	29.5	34.4
Received a community or custodial sentence	19.9	11.9	19.5	21.0	28.6
Received a custodial sentence	7.4	3.2	7.2	7.7	12.4
Has a current or previous gang affiliation	3.1	1.1	2.8	3.1	6.0
Projected outcomes when aged 25 to 34 (percentage)					
Received a community or custodial sentence	22.8	15.2	22.7	24.7	30.1
Received a custodial sentence	10.2	6.3	10.1	11.1	14.3
Spent more than 5 years receiving benefit	22.7	15.1	22.9	24.3	29.8
Projected average costs before age 21					
Average benefit costs when a child	60,400	43,500	62,000	61,000	75,400
Average care and protection costs	18,100	5,500	18,600	24,900	25,900
Average Youth Justice costs	2,600	1,000	2,400	3,000	4,500
<i>Average total cost of CYF, YJ, benefits as a child</i>	81,200	49,900	83,100	88,900	105,800
Average benefit costs as an adult	16,400	10,800	16,500	17,700	21,500
Average corrections costs	5,500	1,800	5,400	6,100	9,400
Average total cost*	103,100	62,500	105,000	112,600	136,700
Projected average costs before age 35					
Average adult benefit costs	93,600	65,800	93,800	98,600	120,000
Average corrections costs	30,300	14,200	29,400	31,100	49,300
Average total costs*	205,000	129,900	206,300	218,500	275,000

* includes CYF, YJ, child benefit costs

5 Conclusion

This paper has updated and extended an earlier study¹⁵ undertaken by The Treasury which used integrated administrative data to identify and describe the characteristics of children at greater risk of poor long-term outcomes.

This analysis focused on children aged 0-14 years and made use of new information available in Statistics New Zealand's Integrated Data Infrastructure (IDI). It updates and extends the earlier analysis by incorporating information on parent-child relationships, border movements, health service use, and educational participation and achievement. This report provides separate analysis of children aged 0-5 and 6-14 years, reflecting the initial focus of social sector agencies on the younger age group.

The earlier analysis identified that a small number of characteristics observed in the agencies administrative data were strongly associated with poor outcomes as young adults. The current analysis focuses on children who had two or more of four particular characteristics or indicators. The choice of the four indicators was based on the earlier work and subsequent decisions made by the key social agencies on how the priority population would be defined.

The priority population comprises children with two or more of the following characteristics (or indicators):

- ▶ having a finding of abuse or neglect, or having spent time in care of child protection services
- ▶ having spent most of their lifetime supported by benefits
- ▶ having a parent who has received a community or custodial sentence
- ▶ having a mother who has no formal qualifications.

Children with these characteristics were more likely to have poorer educational attainment, to be long-term welfare recipients, and to have served community or custodial sentences. Compared to children with none of the four indicators, children aged 0 -5 years with two or more of the four indicators are:

- ▶ eight times more likely to have contact with Youth Justice services before age 18 (14% compared to 2%)
- ▶ three times more likely to leave school with no qualifications (36% compared to 13%)
- ▶ six times more likely to receive benefits for more than two years before the age of 21 (20% compared to 3%)

¹⁵ Crichton, S., Templeton, R., and Tumen, S. (2015) *Analytical Paper 15/01: Using Integrated Administrative Data to Understand Children at Risk of Poor Outcomes as Young Adults*, The Treasury. See: www.treasury.govt.nz/publications/research-policy/ap/2015/15-01/

- ▶ ten times likely to spend time in jail before the age of 21 (6% compared to 0.6%)
- ▶ four times more likely to receive benefits for more than five years when they are aged 25-34 years (21% compared to 5%).

In general, the greater the number of indicators the child has the higher the likelihood of having poorer outcomes. Around 14% of children aged 0 to 5 years (and aged 0 to 14 years) have two or more of the four indicators, 5% have three or more, and 1% have all four indicators. Children who have three particular indicators (they have a CYF finding, have mainly been supported by benefits since birth, and have a parent with a community or custodial sentence history) have similarly poor outcomes as children with all four indicators. Together these two groups comprise 3% of all children aged 0 to 5 (and aged 0 to 14 years) and are at particularly high risk of having poorer long term outcomes.

The number and type of indicators present are correlated with a range of other characteristics that are observable in the integrated dataset. For example, compared to those with none of the four indicators, children aged 0 to 5 years with two or more of the four indicators are:

- ▶ nine times more likely to have a mother who were was single at their birth (71% compared to 8%)
- ▶ twice as likely to have had an injury-related hospitalisation (10% compared to 5%)
- ▶ four times less likely to have participated in early childhood education (9% compared to 2%)
- ▶ between two and three times more likely to have behavioural, emotional, or peer relationship problems, or requiring referrals for hearing, vision, dental problems (assessed during the Ministry of Health Before School Check)
- ▶ ten times more likely to have changed address at least once a year on average since birth (16% compared to 1.6%).

While children who had two or more of the four indicators present have been defined as the priority population, the number and combination of indicators present can be used to identify smaller groups of higher risk children (those with 3 or more indicators say), as well as a broader group (those with 2 or more indicators) who are at moderate to high risk of having poorer outcomes.

It is important to note that many children at risk of poor outcomes remain outside the priority population defined by having two or more of the four specific indicators. While on average those with none or just one indicator have much lower *rates* of poor outcomes than those with two or more indicators, because they are a much larger group, there are significant *numbers* of children who have none or one indicator who will have go on to have poor outcomes.

Some of the information included in this report is also available in an interactive mapping tool on The Treasury's website www.treasury.govt.nz/sii. The mapping tool provides information on the number of children and youth, by age group, who have particular characteristics by region, territorial authority and area unit.

Appendices

Appendix 1: Modelling poor outcomes for those aged 0-14 years

Predictive modelling was used to investigate the extent to which various characteristics (observed at age 0 through to age 14) were associated with poor outcomes as young adults.

In Treasury's Analytical Paper 15/01 regression models were estimated for selected outcomes based on characteristics observed at age 5 and age 13 in the integrated data. This analysis identified that three particular characteristics were strongly associated with poor school attainment, long-term benefit receipt by age 21, and receiving a correction sentence before age 21:

- ▶ being known to Child, Youth and Family (the child was the subject of a notification or report of concern)
- ▶ having spent more than three-quarters of their lifetime supported by welfare benefits (ie, their parents or caregivers received benefits over this period)
- ▶ having a parent with a corrections history (including both community and custodial sentences), where parents and caregivers were identified through the benefit data only.

These three characteristics were used to identify groups of children who were at risk of poor outcomes.

In Treasury's Analytical Paper 15/02 a somewhat more systematic approach (for youth aged 15-24) was used where a large number of potential indicators derived from the integrated data were included in a large modelling exercise.

For youth a set of measures was developed based on the Youth Outcomes Framework¹⁶, across the domains of:

- ▶ Enjoying Economic Opportunity
- ▶ Engaging & Achieving in Education
- ▶ Maintaining Good Health, and
- ▶ Enjoying Safety & Security.

¹⁶ This framework includes five domain areas (the four listed above, as well as Social Participation, for which an appropriate measure proved difficult to identify in the IDI). It was derived from the Global Youth Wellbeing Index, which set out six domains by which youth wellbeing could be defined; equivalents to the five used in the Youth Outcomes Framework, as well as Information Communication and Technology. Information about the Global Youth Wellbeing Index can be accessed at www.youthindex.org

Four outcomes measures were selected and defined as follows:

- ▶ not achieving at least a Level 2 education qualification by age 19
- ▶ use of mental health or addiction services whilst aged between 18 and 20
- ▶ receiving a custodial or community sentence before age 21
- ▶ being on benefit for 2 years or more before age 21.

Logistic regression models were run at each year of age for females and males separately for four outcome measures. Forward selection was used to select the model. This process allowed us to identify the key indicators for each age/gender combination and outcome measure, and calculate a predicted risk score for each outcome for each individual in the population. The average predicted risk score across the 4 outcomes was used to identify the 15% (and 10% and 5%) of youth with the highest average predicted score.

In this project a very similar modelling exercise was undertaken for children aged 0 to 14 years. The same outcome measures were used. This analysis helped us understand whether taking a more formal modelling approach would lead to a similar groups of children being identified.

Appendix 1 Table 1 and 2 shows the variables that were the most important based on the order they were included in the model.

Note that for the 1993 birth cohort, information about parents/caregivers corrections history and mother/female caregiver's educational attainment is coming from the welfare system, and hence is only known for children who have been supported by benefit at some point. (For children born before 2000 information on parent's date of birth in the birth register is incomplete and wasn't used in the cohort analysis.)

"Benefit caregiver has a community or custodial sentence history" took the values – child never supported by benefit, child supported by benefit and caregiver /parent did not have a sentence history, child supported by benefit and caregiver /parent had a sentence history.

"Benefit female caregiver has no formal qualifications" took the values – child never supported by benefit, child supported by benefit and female caregiver did not have a qualification, child supported by benefit and female caregiver had a qualification, child supported by benefit and did not have a female caregiver.

This regression analysis showed that for children aged 0-5 years being known to CYF (ie, the broader CYF contact measure), the proportion of time supported by welfare benefits, having a parent with a corrections sentence history, ethnicity, and gender were the characteristics most strongly associated with poorer outcomes. Having a "mother having no formal qualifications" was also associated with poorer outcomes, particularly qualification attainment, but less so than the other 3 indicators. This result likely reflects the partial nature of the mother's qualification measure that can be derived from the information available in IDI (this is discussed further in Section 2). The analysis of international longitudinal survey data shows that mother's educational attainment is correlated with children's outcomes.

Comprehensive information on school enrolments is only available from 2006 onwards, which meant that when these children born in 1993 information on school characteristics and attendance was only available from age 13 onwards. Appendix 1 Table 2 shows that being stood down from school becomes an important variable, along with being known to CYF (ie, the broader CYF contact measure), the proportion of time supported by welfare benefits, ethnicity, and having a parent with a corrections sentence history.

Appendix 1 Table 1: The most important variables in the regression models for children aged 0-5 years

Benefit 2+ years	Corrections sentence	No Level 2 qualification	Mental health service use
Extent of time supported by benefit since birth	Benefit caregiver has a community or custodial sentence history	Extent of time supported by benefit since birth	Known to CYF
Known to CYF	Known to CYF	Benefit female caregiver has no formal qualifications	Ethnicity
Ethnicity	Ethnicity	Known to CYF	Benefit caregiver has a community or custodial sentence history
Neighbourhood deprivation index	Regional Council	Ethnicity	Type of benefit
Benefit caregiver has a community or custodial sentence history	Extent of time supported by benefit since birth	Benefit caregiver has a community or custodial sentence history	Regional Council

Appendix 1 Table 2: The most important variables in the regression models for children aged 13-14 years

Benefit 2+ years	Corrections sentence	No Level 2 qualification	Mental health service use
Known to CYF	Days stood down from school	Extent of time supported by benefit since birth	Known to CYF
Extent of time supported by benefit since birth	In CYF care	Days stood down from school	Ethnicity
In CYF care	Benefit caregiver has a community or custodial sentence history	Known to CYF	Days stood down from school
Ethnicity	Known to CYF	School type (private, public, integrated)	In CYF care
Days stood down from school	Ethnicity	Days truant from school	Territorial Authority

This regression analysis showed that being known to CYF (ie, the broader CYF contact measure), the proportion of time supported by welfare benefits, having a parent with a corrections history, ethnicity, and gender were the characteristics most strongly associated with poorer outcomes. Having a “mother having no formal qualifications” was also associated with poorer outcomes, particularly qualification attainment, but less so than the other 3 indicators. This result likely reflects the partial nature of the mother’s qualification

measure that can be derived from the information available in IDI. The analysis of international longitudinal survey data shows that mother’s educational attainment is correlated with children’s outcomes.

This regression analysis showed that being known to CYF (ie, the broader CYF contact measure which include children notified to CYF) was more strongly associated with poor outcomes than the narrower CYF contact measure (based on having a substantiated finding of abuse or neglect or a period in care). For children aged 0-14 years the proportion of children known to CYF was around twice the proportion that had a substantiated finding or had spent time in care (8% compared to 17%). The broader CYF contact measure leads to leads to around 17.2% of children aged 0-14 having two or more of the four indicators, compared to 13.9% based on the narrower measure.

Appendix 1 Table 3 shows the characteristics of children identified through the modelling exercise as being most at risk of poor outcomes, based on the average predicted score. The 15% of children identified as being at highest risk of a particular outcome were much more likely to have a finding of abuse or neglect, supported by benefits most of their lifetime, and to have a parent with a correction sentence history. They are also more likely to be male (59%) and Maori (67%).

Appendix 1 Table 3: Characteristics of children aged 0-14 by predicted risk score

	Total	Level of predicted risk			
		Highest 5% average risk	Highest 10% average risk	Highest 15% average risk	Lowest 85% average risk
Number of children	873,180	43,653	87,306	131,025	742,155
Percentage of children	100.0	5.0	10.0	15.0	85.0
Percentage					
Gender					
Male	51.3	63.9	60.8	59.3	49.8
Female	48.7	36.1	39.2	40.7	50.2
Ethnicity					
Asian	10.4	0.2	0.3	0.4	12.2
NZ European	50.0	19.1	22.9	25.5	54.3
Māori	27.0	76.3	70.7	66.5	20.1
Other	10.2	3.9	5.3	6.7	10.9
Pacific	2.0	0.6	0.7	0.9	2.2
Indicators					
Substantiated finding of abuse or neglect	8.2	62.3	50.1	40.8	2.5
Mainly supported by benefits since birth	15.2	69.8	63.3	57.9	7.6
Parent has a community or custodial sentence history	17.0	78.5	69.2	61.5	9.2
Mother has no formal qualifications	10.4	31.7	28.3	25.9	7.6
Number of risk factors					
0	69.0	2.2	6.2	11.0	79.3
1	17.1	13.7	21.1	26.2	15.5
2	8.9	35.4	36.1	34.4	4.4
3	4.1	37.0	28.7	22.8	0.8
4	0.9	11.7	7.8	5.7	0.1
2+	13.9	84.1	72.7	62.9	5.3
3+	5.0	48.7	36.6	28.5	0.8
Combination of 2+ risk factors					
2 factors: NO QUAL and one of: CYF, BEN, CORR	2.7	4.9	6.4	7.2	2.0
2 factors: CYF, BEN or CORR	6.2	30.5	29.7	27.2	2.4
3 factors: NO QUAL and two of: CYF, BEN, CORR	2.1	14.4	12.4	10.6	0.6
3 factors: CYF, BEN, CORR or 4 factors: CYF, BEN, CORR, NO QUAL	2.9	34.3	24.2	17.8	0.3

There is a moderate degree of overlap between the high risk 15% identified through the modelling exercise and the priority (or target) population with 63% of those identified having

2 or more of the four indicators. Hence a more formal modelling approach leads to somewhat different groups of children being identified, compared to using a small number of key indicators.

Appendix 1 Table 4 shows that the expected outcomes for the two groups of children are very similar, and a simplified approach based on using a small number of key indicators identifies a similarly high risk group.

Appendix 1 Table 4: Projected outcomes for children aged 0-14 years by predicted risk score and number of indicators present

	Total	Level of predicted risk		Number of 4 indicators present	
		Highest 15% average risk	Lowest 85% average risk	Two or more	None or one
Number of children	873,180	131,025	742,155	121,377	751,803
Percentage of children	100.0	15.0	85.0	13.9	86.1
Projected outcomes before age 21 (%)					
Further contact with CYF	18.6	67.5	10.0	59.5	12.0
Contact with Youth Justice	4.4	17.5	2.1	15.9	2.6
Did not achieve any school qualifications	17.7	40.7	13.6	38.7	14.3
Did not achieve a level 2 qualification	27.0	54.7	22.2	52.2	23.0
Received a benefit for more than 2 years	7.1	22.4	4.4	22.6	4.6
Received a community or custodial sentence	5.9	20.2	3.4	18.6	3.9
Received a custodial sentence	1.7	7.5	0.7	6.9	0.9
Projected outcomes when aged 25 to 34 (%)					
Received a community or custodial sentence	8.5	23.9	5.8	21.9	6.3
Received a custodial sentence	3.2	10.7	1.9	9.7	2.2
Spent more than 5 years receiving benefit	8.6	21.9	6.3	21.9	6.5
Projected average costs before age 21					
Average total cost of CYF, YJ, benefits as a child	21,600	75,500	12,100	77,400	12,600
Average benefit costs as an adult	5,700	15,400	3,900	15,500	4,100
Average corrections costs	1,200	5,600	500	5,200	600
Average total cost*	28,500	96,600	16,500	98,100	17,300
Projected average costs before age 35					
Average benefit costs	37,700	88,600	28,700	90,000	29,300
Average corrections costs	7,700	31,100	3,500	28,600	4,300
Average total costs*	67,000	195,100	44,400	196,000	46,200

* includes CYF, YJ, child benefit costs

Appendix 2: Supplementary tables

The following tables are included in the excel spreadsheet which accompanies this report.

Appendix 2 Table 1: Additional characteristics of the children aged 0-5 years by number of indicators present

Appendix 2 Table 2: Number of children aged 0 to 5 years by location region, territorial authority and local board

Appendix 2 Table 3: Number of children aged 6 to 14 years by location region, territorial authority and local board

Appendix 3: Information for children aged 0-14 years

The following tables are included in the excel spreadsheet which accompanies this report.

Appendix 3 Table 1: Characteristics of the children aged 0-14 years by number of indicators present

Appendix 3 Table 2: Selected outcomes for children aged 0-14 years by number of indicators present

Appendix 3 Table 3: Characteristics of the children aged 0-14 years by whether they are included in the priority population or not, by gender

Appendix 3 Table 4: Selected outcomes for children aged 0-14 years by whether they are included in the priority population or not, by gender

Appendix 3 Table 5: Characteristics of the children aged 0-14 years by combination of two or more indicators present

Appendix 3 Table 6: Selected outcomes for children aged 0-14 years by combination of two or more indicators present