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Costs of raising children[*]

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Abstract

This paper estimates the costs of children in New Zealand. The costs of children are derived as the additional expenditure that households with children incur compared to households with an equivalent living standard but without children. The results show that the average costs of children in New Zealand households varies with the age of the child, households' income level and the number of children in the household. The findings should help inform a review by the government of the formula that New Zealand uses to determine the amount a parent has to pay under the child support scheme administered by Inland Revenue.

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1.0 Introduction

What are the costs of raising a child in New Zealand? The answer to this question is particularly important in the context of child support as parents may have less of an incentive to pay their child support obligations if they are not based on the costs of raising a child. This paper estimates the costs of children in New Zealand measured by actual parental expenditure.

The estimates should help inform a review, which was announced by the Minister of Revenue, of the formula that New Zealand uses to determine the amount that a parent has to pay under the child support scheme administered by Inland Revenue. The current formula used in the New Zealand scheme adopts an approach often used internationally to determine a parent's child support liabilities for the year, of applying a child support percentage to the liable parent's income. Although this approach is intended loosely to reflect the costs of raising a child, there has not been any detailed analysis of whether it is reflective of costs and incomes in New Zealand.

Australia recently undertook a comprehensive series of studies into the costs of children under a range of scenarios, as part of its child support reforms. To derive estimates of the cost of children for New Zealand, this paper applies the methodology employed in one of the Australian studies. It uses Statistics New Zealand's Household Economic Survey (HES) data to estimate what parents actually spend on raising their children at different levels of household income.

The paper proceeds as follows. Section 2 discusses New Zealand's current child support scheme. Section 3 summarises key international studies into measuring the costs of children. Section 4 outlines the data and methodology used to estimate parental expenditures on their children in New Zealand. Section 5 presents the results while Section 6 summarises and concludes.

2.0 New Zealand's current child support scheme

This section provides an overview of New Zealand's current child support scheme. Appendix 1 outlines how the scheme works in more detail[2].

New Zealand's current child support scheme has been in operation for almost twenty years. Both parents automatically come within the scheme when the parent receiving the child support is a welfare beneficiary, but other parents can also opt to have their child support contributions determined under the scheme. Consequently, the scheme now provides financial support for over 200,000 children, and directly involves over 250,000 parents. Also, parents outside the scheme often use the child support calculations as a benchmark for agreeing their own private arrangements to financially support their children when they live apart.

The current scheme is based on a scheme first developed for the State of Wisconsin in the early 1980s. A key distinguishing feature is that parents' child support contributions are determined administratively, through a formula. Previous schemes relied largely on

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[2] See also www.ird.govt.nz/childsupport

the courts to determine contributions, which could be a far more time consuming and costly process.

The scheme is therefore intended to be a simple and efficient method of establishing the amount of financial support that parents have to pay towards the costs of raising their children when they are living apart. Not all parents that interact with the scheme, however, perceive it to be so and over the years since its introduction in 1992 there have been various calls to make the child support scheme 'fairer'.

One of the areas of concern is whether some parents are paying too much. From their perspective, their child support payments cover not just the cost of raising their children but also partly help to fund the living standards of the receiving parent. Such concerns can make parents less willing to pay their contributions or increase their desire to have those contributions reviewed, which tends to make the process more time consuming and costly.

Although it seems infeasible to ensure that receiving parents use the child support payments they receive solely for the benefit of their children[3], it is possible to evaluate whether the payments are currently exceeding the likely costs of raising those children. Also, it may be possible to spread the costs more evenly between parents on the basis of their relative ability to pay.

The child support scheme was designed with multiple objectives in mind, the key ones being:

- to establish an adequate level of financial support to assist receiving parents to raise their children;

- to ensure that paying parents take financial responsibility for their children when parents live apart; and

- to ensure contributions are made towards the taxpayer-funded sole-parent benefits.[4]

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[3] Willis (2004) argues that parents' incentives change when they separate. The parent with custody of the children will have less of an incentive to take into account the other parent's desires for the children. This may add to the non-custodial parent's perceptions that their payments are helping to maintain the other parent's lifestyle. Willis discusses the use of matching payments and tagging payments to specific types of expenditures as ways to try to redress this incentive problem. In practice, however, these are unlikely to be feasible options.

[4] The traditional role of the government's social policy has been to ensure that everyone living in New Zealand has an equal opportunity to participate in and contribute to New Zealand society. This includes providing a safety net through the benefit system for those who are unable, for various reasons, to financially support themselves. In the context of child support, this means that child support payments are collected and delivered for the benefit of the children they are intended for, and that parents do not pass their responsibilities to financially maintain their children onto other members of society. This is why parents can be liable for child support even when the custodial parent receives a state-provided benefit. The child support scheme is also relevant when parents cannot mutually agree on their relative financial contributions to support their children. Although many parents are able to reach private agreements on their financial contributions and contact arrangements, many others cannot. In this context, the government has a role in both determining an appropriate amount of payment and in enforcing payment.

The scheme was not, however, intended to provide financial compensation to offset any decline in peoples' living standards as a result of parents living apart. A decline in living standards is often an inevitable consequence when parents live apart because a range of additional costs arise from a loss of economies of scale. There is a duplication of housing and related costs, such as utilities and household furnishings, as well as additional costs associated with the children visiting or staying with the non-custodial parent (play and study space, toys and play equipment, and additional transport costs). Henman (2005) found the additional costs to be greatest when care is evenly shared between parents living apart.

The intention of the child support scheme in New Zealand focuses on the costs of raising children rather than any wider objective such as providing a general income supplement for single-parent households[5]. This focus on the costs of raising children is not, however, unique to New Zealand. There has long been an acceptance internationally that child support contributions should reflect the cost to parents of raising children and various jurisdictions have tried to factor this into their schemes. Australia, for example, undertook a substantial review of its child support system in 2005, the result of which was a fundamental change in the way that child support liabilities have been calculated since 1 July 2008. Part of that work involved estimating the costs of children and reflecting the results in the new scheme.

3.0 Key international studies into measuring the costs of children

This section first discusses some of the difficulties in measuring the costs of children. It then reviews the methodologies used in past studies and summarises the results from a recent comprehensive series of studies undertaken as part of Australia's child support reforms.

3.1 Measuring the costs of children

There is a long history of research into the costs of children, dating back to the mid nineteenth century with the work of Ernst Engel. Engel (1857) measured families' consumption of different commodities and observed how expenditures varied by the level of income and the number of household members. He found that as income rose, the share of income allocated to food consumption declined and the share allocated to luxury goods and to savings increased. This observation has become known as Engel's law.

Since Engel's seminal work various methods have been developed to try to measure the costs of children. They invariably involve deriving a 'cost' under some form of estimation technique and then translating it into a percentage of income to represent the assumed costs of raising a child for a particular income level or range.

Even New Zealand's current scheme incorporates a measure of the costs of children to derive the income percentages used in its formula[6]. However, as noted above, a

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[5] There are already other income transfer mechanisms that are targeted at achieving this wider objective, namely, spousal maintenance, Working for Families Tax Credits and state provided benefits.
[6] The approach initially adopted in the State of Wisconsin as a way to recover from paying parents welfare payments made to receiving parents, was based on a study by Van Der Gaag (1982) who

commonly raised criticism of the current scheme, in particular its formula, is that it does not accurately reflect the costs of children in varying family circumstances in New Zealand. This is partly a function of the approach assuming that the paying parent is the sole income earner and that the receiving parent is the main care provider. However, even when these assumptions hold true, there is an issue about whether the formula produces payments that exceed the costs of raising a child.

Crucial in all of this is being able to identify what it costs to raise a child or at least having a proxy for this that is a fair reflection in the vast majority of circumstances. Accordingly, in this paper we explore these issues.

Identifying the items that make up cost or expenditure is generally not a problem. These are housing costs[7], energy consumption, food, clothing and footwear, household goods and services[8], child care, health, transport, leisure[9], personal care and possibly education. Identifying a dollar amount for each of these items is more difficult.

Reasons why it is difficult to gauge cost include:

- Whether cost should be based on actual expenditures (as per household survey data) or, alternatively, a basket of goods that a child is considered to need for an acceptable living standard.[10]

- The need to compare like with like. For example, families need to have the same living standards for comparisons to be valid. Also, when analysing actual expenditures it is necessary to make assumptions about the way in which having a child affects the amount that parents spend on themselves as this is not directly measured in household survey data.

- How to allocate costs of goods and services used collectively by the family, the key ones being housing and transport.

- Whether to take into account the additional duplicate costs arising when parents live apart. These essentially arise from shared care; for example, an extra bedroom, toys and clothes at the paying parent's home, and travel.

- The need to reduce costs by any tax credits and other similar benefits received as these in effect subsidise the costs to parents.[11] Subsidised childcare and medical subsidies also need to be factored in.

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developed a table of child costs expressed as a percentage of gross income. This approach was subsequently adopted in Australia in the late 1980s and in New Zealand in 1992.

[7] Because of the variability of housing and the fact that the costs of home ownership, such as a mortgage, are used to acquire an asset that adds to wealth, studies may instead use private rents as their cost guide. For example, Henman (2005) used median private rents. Costs of the child were based on whether an additional bedroom was required, which depended on the number, age and sex of the children.

[8] This includes an assumed reduction in the life of general household appliances and utensils.

[9] Leisure includes the costs of toys, books, sporting equipment and outings.

[10] Identifying living standards is an issue in itself.

[11] Income tax aspects were not taken into account in the current model as the scheme was originally intended in Wisconsin to apply to income earners paying little or no tax. Differences between gross and net income were not an issue in those circumstances.

There seems to be consensus that opportunity costs, such as forgone earnings while looking after the children, should not be taken into consideration. This is because they are a non-cash cost. There is also some debate over the extent to which childcare costs should be included as they depend on the extent to which one or both parents work. Parents' participation in the labour force varies significantly so simply including an average cost of childcare within the cost of children estimates could overstate the child costs for those who do not incur child care and understate the cost for those who, even after allowing for government subsidies, may have substantial child care costs.

3.2 Methodologies used in past studies

While there is a range of approaches to measuring costs, the two main methods are:

- To analyse actual household expenditure data to estimate how children add to observed couple-household expenditure. Households with an equivalent standard of living, with and without children, are compared under this *expenditure approach*.

- To calculate how much it costs couple households to meet the non-discretionary needs of children, holding living standards constant. Rather than using actual expenditure data, this *basket of goods approach* prices a basket of goods and services considered appropriate for the relevant living standard.[12]

There are supporters and detractors for both of these approaches and their variants. The consensus internationally is that there is no single method that is best and that produces an unambiguous 'true cost' of raising a child.

The Australian Ministerial Taskforce on Child Support (2005) undertook one of the most comprehensive studies of this area and concluded that in the end it is a matter of judgement, with that judgement needing to be informed by the existing empirical estimates and be evidence based. The National Academy of Sciences Panel on Poverty and Family Assistance in the United States of America, which undertook a major study on how to measure poverty and equivalence scales, came to the same view.

3.3 Australian studies and results

The Australian Taskforce took the view that the formula percentages should be based on the best available estimates of the direct costs of children. It considered that the fairest basis for the scheme is the costs of children in intact couple families, with the research on the costs of children in separated families informing the issue of how to take account of the costs of contact. The Child Support Taskforce compared the results of various methodologies to reach what they considered to be the best and most up-to-date estimates of the costs of children in intact Australian families.

The Australian Household Expenditure Survey was used to examine actual patterns of expenditure on children. Another study used a basket of goods to assess how much

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[12] This approach has been used as the basis for many child support guidelines in the United States.

parents would need to spend to give children a specific standard of living, taking account of differences in housing costs all over Australia. The results of these two studies were then compared with earlier Australian research findings on the costs of children. The Australian estimates were also benchmarked against international studies on the costs of children.

The key findings from this work were:

- The dollar cost of children increases with family income but declines as a proportion of income. Henman (2005) found that a middle income household spent on average 30 percent more on a child than a low income family.

- The cost of children rises with the age of the children (teenagers were found to cost two to three times as much as very young children).

- There are economies of scale, so that, in general, each additional child costs less than the last.

- Subsidies delivered through the tax system mean that the community as a whole now plays a much more substantial role in sharing the costs of children in all types of families. Percival and Harding (2005) found that as result of these subsidies, there was no net increase in costs after three children.[13]

4.0 Costs of children in New Zealand: methodology and data

We now turn to estimating the costs of raising children in New Zealand using the expenditure approach. This section first describes the data and methodology we used to predict parents' expenditures on children and households' living standards.

4.1 Data

To estimate parental expenditure on children we used Statistics New Zealand's 2006-07 Household Economic Survey (HES). This survey collects detailed information on household income and expenditure as well as demographic information on individuals and households.[14] The survey population comprises New Zealand residents aged 15 years or over living in private dwellings in the North Island, South Island and Waiheke Island of New Zealand. An estimated 1,569,215 households were eligible to participate in the 2006-07 survey. A total of 4,667 addresses were visited and 2,550 randomly selected households provided responses.

Information was collected from each household using five documents:

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[13] The Australian Taskforce consequently recommended basing child support liabilities on the contribution parents normally make out of their own earnings towards the costs of raising their children in intact family situations, rather than on the total costs.
[14] For details about the survey see www.stats.govt.nz

1. A household questionnaire requested information on the composition of the household and on the demographic characteristics and educational experience of each household member.

2. An expenditure questionnaire gathered information on expenditure and sales in areas such as housing, home maintenance, household operation, transport, holidays, health and education.

3. A diary survey recorded the details of items purchased and any other money spent by each household member aged 15 years or over for a period of between 7 to 14 days.

4. Each household member aged 15 years or over completed an income questionnaire, providing details of current employment, of any previous employment in the 12 months before the interview date, and of their income in dollar amounts by source.

5. In addition, one randomly selected member of each household, aged 18 years or over, completed an Economic Standard of Living (ELSI) short-form questionnaire.

The working file used in our estimation comprises a subset of the households in the HES. It includes one-family households with two adults with and without children. Both adults are at least 19 years old and one adult is 59 years or under. For households with children at least one child is 18 years of age or younger. In the estimation household members were grouped into four age group categories: 0-12, 13-18, 19-24 and 25 years or over. Moreover, the following households were excluded:

- Households whose expenditure is zero or negative.

- Households whose ratio of food at home to household expenditure is greater than one.

- Households whose income is zero or negative.

- Households whose ratio of household expenditure to income is greater than two.

After all the exclusions the final working file contained 930 households.

4.2 Methodology

The methodology we employ measures the costs of children by estimating parents' actual expenditures on their children rather than the costs of goods and services (or basket of goods) necessary to achieve a specified living standard. The reason we focus on actual parental expenditure is that if children are not to share in the decreased living standard that necessarily results from the costs of parents living apart, then child support payments should be based on previous expenditure on children in the intact family.

Estimating the level of parents' expenditures on raising their children requires apportioning total household expenditure to individual household members. But directly attributing household expenditure to individuals is often not possible for two of

the reasons mentioned earlier. First, expenditure data is typically collected at the household level and not separately identified for individuals. For instance, expenditures on food should, in principle, be assignable to individuals, but expenditure surveys tend to report only a single annual dollar figure for the household unit. Second, some expenses are conceptually difficult to assign to family members. For instance, all family members likely consume the services provided by a kitchen, television or car although their level of consumption of these items may vary. There is not an obvious way to apportion these costs to individuals.

To estimate the costs of children in New Zealand, we followed Percival and Harding (2000 and 2005), who applied methodology developed by Espenshade (1984). Under this approach parental expenditure on children is defined as the additional expenditure that households with children incur compared to households with an equivalent living standard but without children.

There are several ways to estimate the living standard of a household. We used the proportion of expenditure on:

- food at home (i.e. expenditure on food less restaurant meals and ready-to-eat food);

- non-durable household supplies and services;

- communication equipment and services; and

- personal care products and services.

This measure is close to the one employed by Percival and Harding (2005) but excludes household energy. The reason for excluding household energy is discussed in the next section.

Households with the same proportion of expenditure on food at home, non-durable household supplies and services, communication equipment and services and personal care products and services are assumed to have the same standard of living, irrespective of other differences like the total dollar amount spent on consumption, household size or composition.

The costs of a single child, for example, can then be measured by the difference in expenditures of a couple only household and a couple household with a child, where both households have the same standard of living. Similarly, the cost of a second child can be measured by the differences in expenditures of a couple household with one child and a couple household with two children.

Following Percival and Harding (2005) expenditure is measured by household expenditure as recorded in the HES less:

- home ownership capital expenses (e.g. purchase of housing, mortgage principle repayments, materials and / or services for property alterations, additions and improvements);

- expenditure on life insurance; and

- contributions to savings.

The above items are excluded in an attempt to measure households' consumption. Moreover, they are likely to have a non-discretionary element and be influenced by the presence of children. For instance, households with children would be expected to be more likely to purchase life insurance than households without children.

Determining the costs of children involves the estimation of two equations by ordinary least squares (OLS) to predict (i) households' expenditure and (ii) households' standard of living.

To predict households' expenditure the following equation is estimated:

$$E_i = \alpha_1 Y_i + \alpha_2 (Y_i)^2 + \alpha_3 \, Ages(1)_i + ... + \alpha_6 \, Ages(4)_i + \varepsilon_i \tag{1}$$

Equation (1) posits that household i's weekly expenditure, E_i, is linearly related to the household's weekly income, Y_i, the square of weekly income, the number of persons in household i in age group j, $Ages(j)_i$, where j = 1,2,3,4[15] and a disturbance term, ε_i.[16]

To predict households' living standard the following equation is estimated:

$$LS_i = \beta_1 \ln\left(\frac{E_i}{F_i}\right) + \beta_2 \left(\ln\left(\frac{E_i}{F_i}\right)\right)^2 + \beta_3 \ln(F_i) + \beta_4 \frac{Ages(1)_i}{F_i} + ... + \beta_7 \frac{Ages(4)_i}{F_i} + \mu_i \tag{2}$$

where household i's living standard, LS_i, is measured by the proportion of expenditure on food at home, non-durable household supplies and services, communication equipment and services and personal care products and services. F_i is household i's total size, i.e. the sum of $Ages(j)_i$. Equation (2) conjectures that household i's living standard is linearly related to the log of the household's per capita weekly expenditure, the square of the log of per capita expenditure, the log of household i's size and the number of persons in age group j divided by household size.

The estimated coefficients from equations (1) and (2) can be used to predict parental expenditure on a single child in either of the two age groups. For example, for a three-member household with two adults aged 26 years or older, total weekly income of $900 and one child aged 12 year or under, the costs of the child can be calculated as follows:

1. Calculate the predicted total expenditure, $\hat{E}_1$, of the couple household with one child for $Y_1 = 900$, $Ages(1)_1 = 1$ and $Ages(4)_1 = 2$.

2. Using $\hat{E}_1$, $F_1 = 3$, $Ages(1)_1 / F_1 = 1/3$ and $Ages(4)_1 / F_1 = 2/3$ calculate the household's predicted living standard, $\hat{LS}_1$.

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[15] The four age groups being 0-12, 13-18, 19-24 and 25 years or over.
[16] Weekly expenditure and income are divided by 1,000.

3. Substitute $\hat{LS}_1$ into equation (2), assume $F_2 = 2$ and Ages $(4)_2 / F_2 = 1$ and calculate the predicted expenditure, $\hat{E}_2$, of a couple household with no children.

4. The costs of one child in a two adult household with total weekly income of Y can be estimated by the difference between the expenditures of the couple with and without a child, i.e. $\hat{E}_1 - \hat{E}_2$.

The costs of more than one child can be calculated accordingly from estimates of the following equations:

$$E_i = \gamma_1 Y_i + \gamma_2 (Y_i)^2 + \gamma_3 NC_i + \gamma_4 \, Ages(3)_i + \gamma_5 \, Ages(4)_i + \varepsilon_i \qquad (3)$$

and

$$LS_i = \delta_1 \ln\left(\frac{E_i}{F_i}\right) + \delta_2 \left(\ln\left(\frac{E_i}{F_i}\right)\right)^2 + \delta_3 \ln(F_i) + \delta_4 \frac{NC_i}{F_i} + \delta_5 \frac{Ages(4)_i}{F_i} + \delta_6 \frac{Age(4)_i}{F_i} + \mu_i \qquad (4)$$

where NC_i is the number of children in household i.

5.0 Results

This section first discusses the appropriateness of the living standard variable and then presents our principal findings.

5.1 *Standard of living measure*

The living standard measure used in this study is a variant of the Engel estimator. It is the proportion of households' expenditure on food at home but also includes expenditures on non-durable household supplies and services, communication equipment and services and personal care products and services. To determine whether this measure is a suitable living standard indicator, we verify that it meets the five criteria established in Espenshade (1984). They are:

1. *Monotonicity*. Increases in household size holding income constant or increases in income holding household size constant should be reflected in monotonic changes in the living standard indicator; that is, changes in the indicator should either go up or down but not up and down across household sizes or across income levels.

2. *Elasticity*. The living standard indicator varies with changes in income and household size.

3. *Prominence*. The selected expenditure categories are a substantial component of total expenditure to keep random fluctuations from dominating the measure.

4. *Consistency*. Increases in household size holding income constant have an impact on the living standard measure that is opposite in sign from increases in income holding household size constant, i.e. living standards are expected to fall if household size increases with no change in income and living standards are expected to rise if income increases with no change in household size.

5. *Conformity with a priori expectations*. The living standard measure is consistent with previous or other countries' findings.

Table 1 reports the results for two living standard measures. The first is the measure we used, which is the proportion of expenditure on food at home, non-durable household supplies and services, communication equipment and services and personal care products and services. The second is the Percival and Harding (2005) measure, which also included household energy.

Table 1 shows that the first measure satisfies all five criteria. The proportion spent on the selected items averages between 18 and 27.6 percent and represents a relatively large proportion of households' budgets. It declines with higher household incomes and increases as the number of children rises.[17] The second measure is less well behaved. It exhibits non-monotonic behaviour in households with two children and weekly income below $1,036. That is, the average proportion of expenditure on food at home, household energy, non-durable household supplies and services, communication equipment and services and personal care products is lower for households with two children than for households with one child.

Table 1: Two living standard measures (as a proportion of expenditure)

Weekly income	All families	No children	1 child	2 children	3 or more children
		Food at home, non-durable household supplies and services, communication equipment and services and personal care products and services			
Under $1,036	25.0	22.0	26.7	26.9	27.6
$1,036 to $1,534	22.3	21.1	21.6	23.5	24.9
Above $1,534	19.6	18.0	19.8	20.7	23.4
		Food at home, **household energy**, non-durable household supplies and services, communication equipment and services and personal care products and services			
Under $1,036	30.6	27.9	32.3	**32.1**	33.1
$1,036 to $1,534	27.1	26.0	26.3	28.3	29.7
Above $1,534	23.4	21.5	23.9	24.5	27.5

5.2   Estimated costs of children

Using the proportion of expenditure spent on food at home, non-durable household supplies and services, communication equipment and services and personal care

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[17] Households with three or more children represent the smallest number of households and the income bands were determined by dividing the number of these households into terciles.

products and services as the living standard measure, we estimated equations (1) to (4) and then calculated the costs of children for parents aged 26 years or over at three income levels: low, middle and high[18]. The income levels were derived by dividing the number of households with children into quintiles. Low income households are defined as the bottom one fifth of households with children, middle income households the middle one fifth and high income households are the highest income one fifth. We also report the results for the average income of households with children.

Table 2 and Figure 1 present the average estimated expenditure by households with different incomes on a single child aged 12 years or under and 13 to 18 years old. The results show that parental expenditures increase as households' incomes rise. Our estimates suggest that high income households on average spend more than twice as much on their child than do low income households. Moreover, the costs of teenagers are found to be higher than those of children 12 years or under. On average, low, middle and high income households spend respectively 33, 20 and 12 percent more on teenagers than on children 12 years or under.

Table 2: Average estimated weekly costs of a single child

Level of income	Average weekly income	Age of child	
		0 to 12	13 to 18
Low income	$704	$147	$196
Middle income	$1,365	$243	$291
High income	$2,838	$426	$477
Average income	$1,552	$268	$316

Figure 1: Average estimated weekly costs of a single child

■ Single child 12 years or younger   ■ Single child 13 to 18 years old

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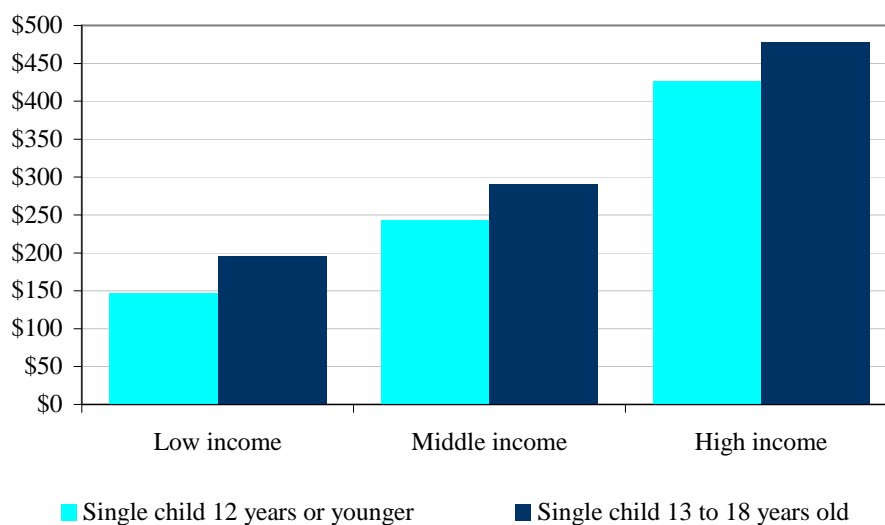
[18] The regression results are provided in appendix 2.

Although the costs of the child rise with households' income, the proportion of income spent on the child declines. This is shown in Table 3 and Figure 2. Low income households spend about 21 percent of their income on a 0 to 12 year old child and 28 percent on a teenager. This compares to, respectively, 15 and 17 percent for a high income household.

High income households with a child have on average about four times higher incomes than low income households but spend less than three times as much as low income households on a child 12 years or under, and less than two and a half times on a teenager. As a result, the proportion of income spent on older children falls faster as income rises than the proportion of income spent on younger children (falling from 28 to 17 percent compared to a fall from 21 to 15 percent).

Table 3: Average estimated weekly costs of a single child as a proportion of households' weekly income (in percent)

Level of income	Average weekly income	Age of child	
		0 to 12	13 to 18
Low income	$704	21%	28%
Middle income	$1,365	18%	21%
High income	$2,838	15%	17%
Average income	$1,552	17%	20%

Figure 2: Average estimated weekly costs of a single child as a proportion of households' weekly income (in percent)

Single child 12 years or younger   Single child 13 to 18 years old
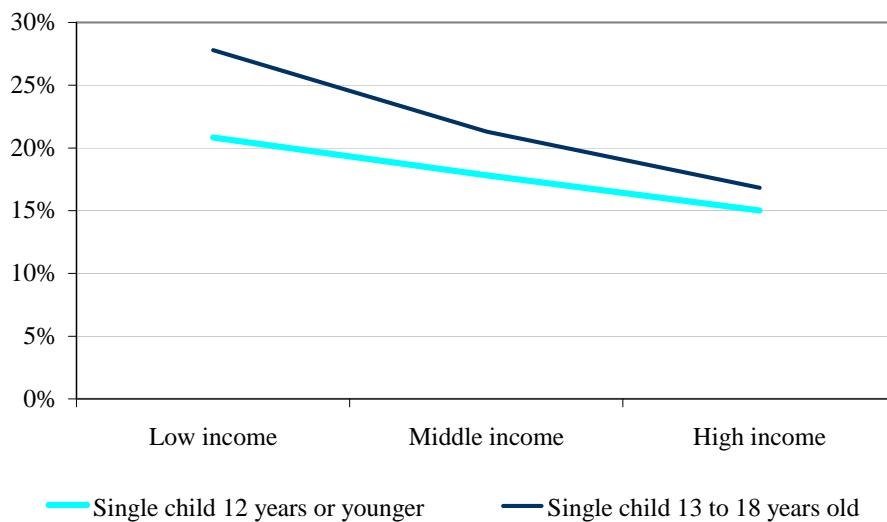
The estimated costs of children depending on the number of children in the household are reported in Tables 4 to 6 and Figures 3 to 5. They represent parental expenditure of children averaged across both age ranges. The results show that parental expenditure increases with the number of children and household income. As is the case with single child households, the proportion of income spent on children by high income households is lower than that of low income households (Table 5 and Figure 4). It falls from about 40 percent for low income households with two children to 25 percent for high income households. For households with four children the decline in costs is even sharper from around 68 percent to about 38 percent.

Table 4: Average estimated weekly costs of one to four children

Level of income	Average weekly income	Number of children in household			
		1 child	2 children	3 children	4 children
Low income	$704	$157	$279	$381	$479
Middle income	$1,365	$254	$431	$569	$686
High income	$2,838	$438	$718	$919	$1,075
Average income	$1,552	$279	$471	$617	$740

Figure 3: Average estimated weekly costs of one to four children
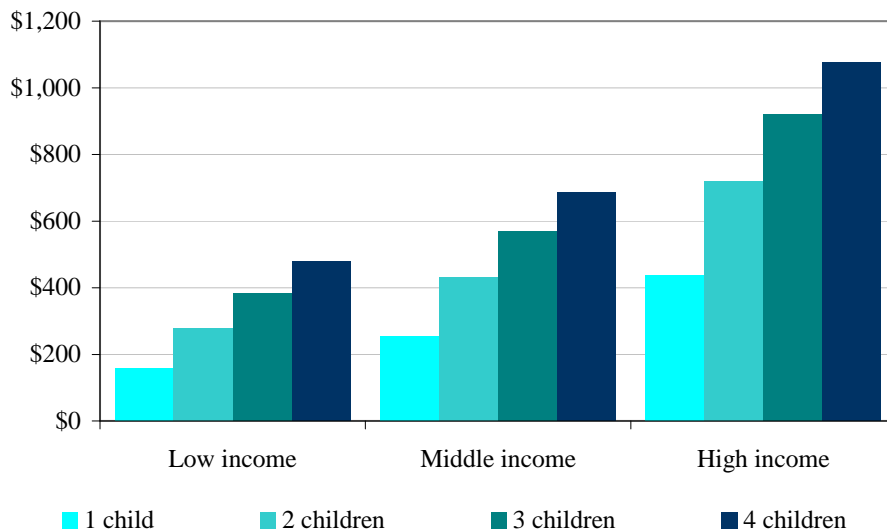
Table 5: Average estimated weekly costs of one to four children as a proportion of households' weekly income (in percent)

Level of income	Average weekly income	Number of children in household			
		1 child	2 children	3 children	4 children
Low income	$704	22%	40%	54%	68%
Middle income	$1,365	19%	32%	42%	50%
High income	$2,838	15%	25%	32%	38%
Average income	$1,552	18%	30%	40%	48%

Figure 4: Average estimated weekly costs of one to four children as a proportion of households' weekly income (in percent)
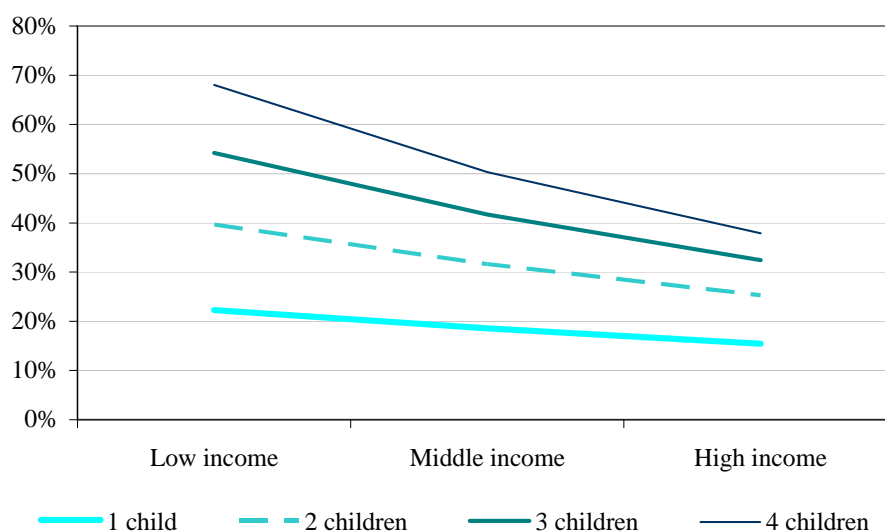
Although the costs of children rise as household size increases, the costs of an additional child are lower than those of the previous children. This is shown in Table 6 and Figure 5.

For low income households the costs of a second child are about 78 percent of the costs of the first child, the costs of a third child fall to about 65 percent of those of the first child, while the costs of the fourth child are marginally less at 62 percent.

For high income households the decline is more dramatic. The costs of the second, third and fourth child as a proportion of the first child costs are, respectively, 64, 46 and 36 percent.

The reductions in the average costs of an additional child arise from the economies of scale associated with raising more than one child. They may also partly result from income constraints.

Table 6: Average estimated weekly costs of the first, second, third and fourth child

Level of income	Average weekly income	First child	Second child	Third child	Fourth child
Low income	$704	$157	$122	$102	$98
Middle income	$1,365	$254	$177	$138	$117
High income	$2,838	$438	$280	$201	$156
Average income	$1,552	$279	$192	$146	$123

Figure 5: Average estimated weekly costs of the first, second, third and fourth child
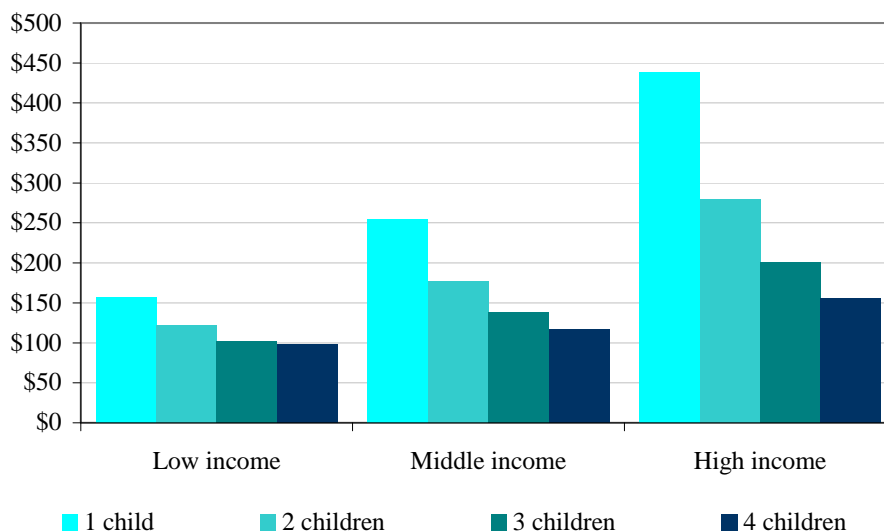
6.0 Summary and conclusions

This paper estimated the costs of children in New Zealand. The costs of children were defined as parental expenditures on children up to 18 years of age. The level of expenditure was determined by comparing the expenditures of two adult households with children with those without children but with the same estimated standard of living. The living standard was measured by the proportion of households' expenditure on food at home, non-durable household supplies and services, communication equipment and services and personal care products and services.

The results showed that the average costs of children in New Zealand varies according to the age of the child, households' level of income and the number of children in the household. Higher income households spend more on their children than lower income households but the proportion of household income falls, particularly for children aged 13 to 18 years. The average expenditure per child is greatest for households with one child and progressively declines with additional children. Moreover, the costs of children aged 12 years and under are lower than those of teenagers.

This paper investigated the costs of children using the expenditure approach, which is based on households' actual expenditure. The next step is to estimate the costs of children using the basket of goods approach, which prices a basket of goods and services considered necessary for raising children at given living standards.

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Appendix 1: How child support works

A parent that has a child support liability, as calculated using the child support formula, has to pay the amount to the Crown who then passes it on to the person who has primary care for the child. When, however, the care giver is receiving a sole parent benefit the child support payments are retained by the Crown to help defray the cost of the benefit with any excess being passed on to the care giver.

The current formula for calculating child support is:

$$(a - b) \times c$$

where:
"a" is the child support income amount;
"b" is the living allowance; and
"c" is the child support percentage.

For most paying parents, the child support income amount is their taxable income in the prior income year. The maximum child support income that can be assessed is set at two and a half times the national average earnings for men and women as at mid February of the tax year before the year of assessment. The maximum is currently $114,191.

There are six separate living allowance levels, ranging from $14,038-$35,187 depending on whether the paying parent is living alone or with a partner and/or other children. The allowance is based on benefit rates plus a set amount for each dependent child up to a maximum of four children.

Once the living allowance has been deducted from taxable income, the product is multiplied by the child support percentage relevant for the number of children being supported. The standard percentages are:

No. of children	Child support percentage Sole care
1	18
2	24
3	27
4 and more	30

Generally there is a minimum amount of child support payable each year, the current minimum amount being $799.

If either parent considers that an assessment derived from the formula is not appropriate, they can apply for an administrative review under one or more of the ten grounds set out in the Child Support Act. In such cases the Commissioner of Inland Revenue appoints an independent review officer experienced in relevant court cases to consider the application. The review officer then makes a recommendation as to whether departure from the child support formula assessment is warranted. That recommendation is invariably adopted as a decision by the Commissioner although the Commissioner does have the discretion to decide otherwise.

Appendix 2: Regression results

Equation (1)
Dependent variable: Expenditure
Included observations: 930

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Income	0.4668	0.0207	22.5930	0.0000
Income^2	-0.0181	0.0013	-13.4447	0.0000
Ages(1)	0.0190	0.0134	1.4248	0.1545
Ages(2)	0.0646	0.0246	2.6271	0.0088
Ages(3)	0.1107	0.0371	2.9813	0.0029
Ages(4)	0.1706	0.0181	9.4107	0.0000
R-squared	0.3994	Mean dependent var		1.0453
Adjusted R-squared	0.3962	S.D. dependent var		0.5414
S.E. of regression	0.4207	Akaike info criterion		1.1126
Sum squared resid	163.5307	Schwarz criterion		1.1438
Log likelihood	-511.3574	Durbin-Watson stat		2.0434
Jarque-Bera stat	689.2244	Prob.		0.0000
White heteroskedasticity test (no cross tems):				
F-statistic	13.3552	Prob. F(9,920)		0.0000
Obs*R-squared	107.4630	Prob. Chi-Square(9)		0.0000
White heteroskedasticity test (cross tems):				
F-statistic	8.4790	Prob. F(19,910)		0.0000
Obs*R-squared	139.8783	Prob. Chi-Square(19)		0.0000

Equation (2)
Dependent variable: Living standard
Included observations: 930

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ln(per capita expenditure)	-0.6527	0.0769	-8.4866	0.0000
(ln(per capita expenditure))^2	-0.1499	0.0303	-4.9492	0.0000
ln(household size)	0.2070	0.3230	0.6408	0.5218
Ages(1) / household size	2.0069	0.6956	2.8852	0.0040
Ages(2) / household size	2.0540	0.7038	2.9186	0.0036
Ages(3) / household size	2.1516	0.2434	8.8388	0.0000
Ages(4) / household size	2.3719	0.2269	10.4540	0.0000
R-squared	0.1533	Mean dependent var		2.9869
Adjusted R-squared	0.1478	S.D. dependent var		0.4858
S.E. of regression	0.4485	Akaike info criterion		1.2415
Sum squared resid	185.6241	Schwarz criterion		1.2779
Log likelihood	-570.2834	Durbin-Watson stat		2.0165
Jarque-Bera stat	2021.4400	Prob.		0.0000
White heteroskedasticity test (no cross tems):				
F-statistic	12.3526	Prob. F(12,917)		0.0000
Obs*R-squared	129.4130	Prob. Chi-Square(12)		0.0000
White heteroskedasticity test (cross tems):				
F-statistic	11.1487	Prob. F(26,903)		0.0000
Obs*R-squared	225.9891	Prob. Chi-Square(26)		0.0000

Equation (3)
Dependent variable: Expenditure
Included observations: 930

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
Income	0.4680	0.0207	22.6413	0.0000	
Income^2	-0.0181	0.0013	-13.4819	0.0000	
Number of children	0.0291	0.0119	2.4415	0.0148	
Ages(3)	0.1075	0.0371	2.8978	0.0038	
Ages(4)	0.1699	0.0181	9.3646	0.0000	
R-squared	0.3976	Mean dependent var		1.0453	
Adjusted R-squared	0.3950	S.D. dependent var		0.5414	
S.E. of regression	0.4211	Akaike info criterion		1.1134	
Sum squared resid	164.0133	Schwarz criterion		1.1394	
Log likelihood	-512.7275	Durbin-Watson stat		2.0538	
Jarque-Bera stat	670.9566	Prob.		0.0000	
White heteroskedasticity test (no cross tems):					
F-statistic	16.8960	Prob. F(7,922)		0.0000	
Obs*R-squared	105.7346	Prob. Chi-Square(7)		0.0000	
White heteroskedasticity test (cross tems):					
F-statistic	12.1220	Prob. F(13,916)		0.0000	
Obs*R-squared	136.5100	Prob. Chi-Square(13)		0.0000	

Equation (4)
Dependent variable: Living standard
Included observations: 930

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
ln(per capita expenditure)	-0.6537	0.0768	-8.5096	0.0000	
(ln(per capita expenditure))^2	-0.1507	0.0302	-4.9936	0.0000	
ln(household size)	0.2098	0.3227	0.6500	0.5158	
Number of children / household size	2.0121	0.6951	2.8946	0.0039	
Ages(3) / household size	2.1488	0.2432	8.8353	0.0000	
Ages(4) / household size	2.3700	0.2267	10.4529	0.0000	
R-squared	0.1532	Mean dependent var		2.9869	
Adjusted R-squared	0.1486	S.D. dependent var		0.4858	
S.E. of regression	0.4482	Akaike info criterion		1.2395	
Sum squared resid	185.6544	Schwarz criterion		1.2707	
Log likelihood	-570.3594	Durbin-Watson stat		2.0138	
Jarque-Bera stat	2013.0320	Prob.		0.0000	
White heteroskedasticity test (no cross tems):					
F-statistic	14.6948	Prob. F(10,919)		0.0000	
Obs*R-squared	128.2067	Prob. Chi-Square(10)		0.0000	
White heteroskedasticity test (cross tems):					
F-statistic	15.2244	Prob. F(19,910)		0.0000	
Obs*R-squared	224.3173	Prob. Chi-Square(19)		0.0000	