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An Expenditure-based Approach
to Measuring Child Poverty in New Zealand

Abstract

Poverty is complex, has many dimensions and is difficult to define and measure. When considering child poverty reduction policies, we must thus consider as many different dimensions as possible. In this way, researchers can provide data to build a comprehensive understanding of the issues, allowing decision makers to apply their own judgements. This study aims to provide such data by exploring how household expenditure data can add to our understanding of child poverty.

Keywords child poverty, poverty measurement, household expenditure

Poverty indicators

Different countries have approached measuring poverty in different ways. Some countries, like the United States, focus on a poverty indicator that depends on the basic needs of the general population. They measure pre-tax family income and compare it against a threshold that is set at three times the cost of a minimum food diet in 1963, adjusted for family size and location (Institute for Research on Poverty, n.d.). Other countries, such as some of those in the European Union, focus more on relative income measures and consider poverty indicators that measure ability 'actively to participate in society and benefit from the activities and experiences that most people take for granted' (International Labour Organization, 2021, p.1).

In New Zealand, the government focuses on children in poverty and monitors ten official child poverty indicators; these are based on poverty thresholds that are 40%, 50% and 60% of the median equivalised disposable household income before or after deducting housing costs, material hardship, and poverty persistence (Statistics New Zealand, 2021b). This suite of measures therefore includes relative, income-based indicators and a measure of access to a minimum standard of living (material hardship). Using these measures, the New Zealand government monitors the performance of child poverty reduction approaches. In addition, income-based indicators can be modelled to inform the policy development process and to demonstrate the impacts of economic shocks, such as those driven by the Covid-19 pandemic.

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Relative-income poverty measures

Most of New Zealand's official child poverty measures are income-based, relative poverty measures. Income-based poverty measures have many advantages (UNECE Task Force on Poverty Measurement, 2017).

- Disposable income is a desirable indicator for welfare measures because it is considered to be a good monetary indicator of material wellbeing and living standards.

supports and are unlikely to be suffering low levels of economic wellbeing.

- Income for some groups, such as self-employed, temporarily unemployed and seasonal workers, may be particularly susceptible to short-term fluctuations. These fluctuations are normally not reflected in achieved living standards.

Meyer and Sullivan (2012) considered these issues and investigated expenditure data in the US. Their study found that

information on household income, savings,[3] expenditure and wealth, and demographic information on individuals and households. The sample consists of people who are resident in New Zealand and live in private dwellings. HES provides detailed data on income and housing cost expenditure every year, but detailed expenditure data (e.g., expenditure on food and petrol) is only collected every three years. The latest HES with detailed expenditure data is HES 2018/19. The detailed expenditure dataset contains an individual's annualised expenditure on food, housing and household utilities, services, clothing, durable goods, health, alcohol, tobacco, drugs, bills, recreation, transport, education, communication, miscellaneous goods and travel.

The analysis in this study investigates child poverty based on relative household expenditure using HES data and compares the results with analogous income-based relative child poverty estimates. All indicators are calculated using HES 2018/19 data, covering the period from July 2018 to June 2019 (Statistics New Zealand, 2021a).

Although the HES 2018/19 data contains detailed expenditure records, these households are subsamples of the full survey. More specifically, HES 2018/19 selected 21,163 sample households, and all these households completed the survey income and housing cost questionnaire. However, only a subsample of 3,932 households were selected to complete an extra, detailed expenditure questionnaire. The 2019 official income-based child poverty measures were calculated based on the full 21,163 sample households, but for consistency with the expenditure data, this study calculates income-based child poverty rates using the smaller subsample.

Looking into the HES expenditure data

Figure 1 shows the difference between the household income and expenditure deciles in HES 2018/19. Only income decile one and income decile two are selected in this figure because these two deciles are where the most in-poverty households are concentrated. According to Figure 1, nearly half of the population in each income decile has a much higher expenditure decile (expenditure decile four and above). This indicates that using

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- Income-based poverty measures can be directly influenced by existing policy levers. For example, social welfare payments can be targeted to families below the poverty line.
- Income can be disaggregated into different sources, such as wages, pensions and benefits. This provides additional information about the circumstances of groups in poverty and potential causes of income poverty.
- Income data are relatively easier and more cost-effective to collect than other data sources such as material hardship data, which are collected through a survey.

However, as recognised by New Zealand's multi-measure approach to child poverty, income-based measures do not tell the complete story (Statistics New Zealand, 2012; UNECE Task Force on Poverty Measurement, 2017):

- Income-based measures do not account for additional costs such as expenses related to disabilities and childcare.
- Income-based poverty measures do not account for people who have access to economic resources from wealth or other

expenditure-based poverty measurements captured more of the most disadvantaged than those based on income, by accounting for savings, ownership of durable goods, access to credit, and the use of anti-poverty programmes. It is important to note that New Zealand's suite of income-based poverty indicators are different from the poverty measurement regime in the US: they do account for the progressivity of the tax and transfer system and the impact of housing costs, which comprise the biggest component of a household's expenditure. Nonetheless, this article investigates the insights into child poverty that can be derived from detailed expenditure data.

Inspired by Meyer and Sullivan's study, this analysis defines a measure of low household expenditure that is analogous to the income-based child poverty measures to explore what this additional data can tell us about poverty in New Zealand.

The Household Economic Survey (HES)

The Household Economic Survey is an annual survey that runs from July to June and is designed to measure the economic wellbeing of New Zealanders. It collects

household expenditure to measure child poverty might provide a slightly different picture from income-based child poverty.

Defining relative low-expenditure measures

Six of New Zealand's child poverty indicators are income-based (Statistics New Zealand, 2021b).

- BHC50: the number of children in households with income below 50% of the weighted median equivalised disposable household income of all households, before paying housing costs, for the financial year;
- fixed-AHC50: the number of children in households with income below 50% weighted median equivalised disposable household income of all households after paying housing costs for the base financial year, currently set as 2018;
- BHC60: the number of children in households with income below 60% weighted median equivalised disposable household income of all households before paying housing costs for the financial year;
- AHC60: the number of children in households with income below 60% weighted median equivalised disposable household income of all households after paying housing costs for the financial year;
- AHC50: the number of children in households with income below 50% weighted median equivalised disposable household income of all households after paying housing costs for the financial year;
- AHC40: the number of children in households with income below 40% weighted median equivalised disposable household income of all households after paying housing costs for the financial year.

These relative thresholds were chosen as proxies for a minimum standard of living that can be measured using available data. They allow for international comparisons and have also been confirmed through previous focus group studies to provide reasonable poverty thresholds. Household equivalised disposable income refers to the level of total household gross income after tax is deducted. Disposable income is equivalised to allow comparison across various household sizes and composition.

Figure 1: Differences between the household income and household expenditure deciles
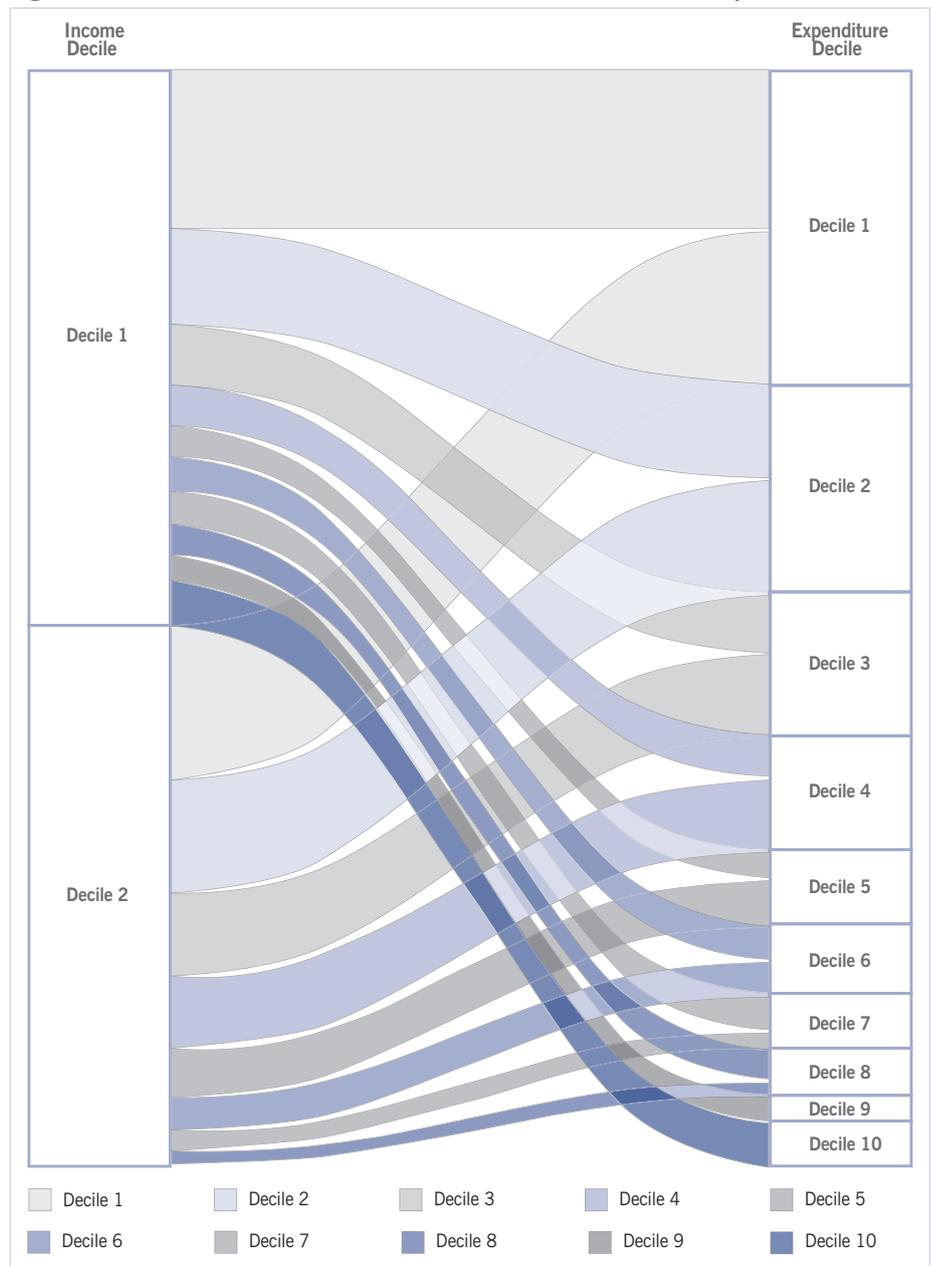
Source: author's calculations

For example, after equivalisation, we can directly compare the income of a two-parent household with one child with that of a single-parent household with three children.

Statistics New Zealand uses the modified OECD (MOECD) equivalisation scale (Statistics New Zealand, 2019a). This scale assigns a value of 1 to the first adult, 0.5 to each additional member of the household aged 14 and over (GTE14) and 0.3 to each child under the age of 14 (LT14) (Hagenaars et al., 1995):
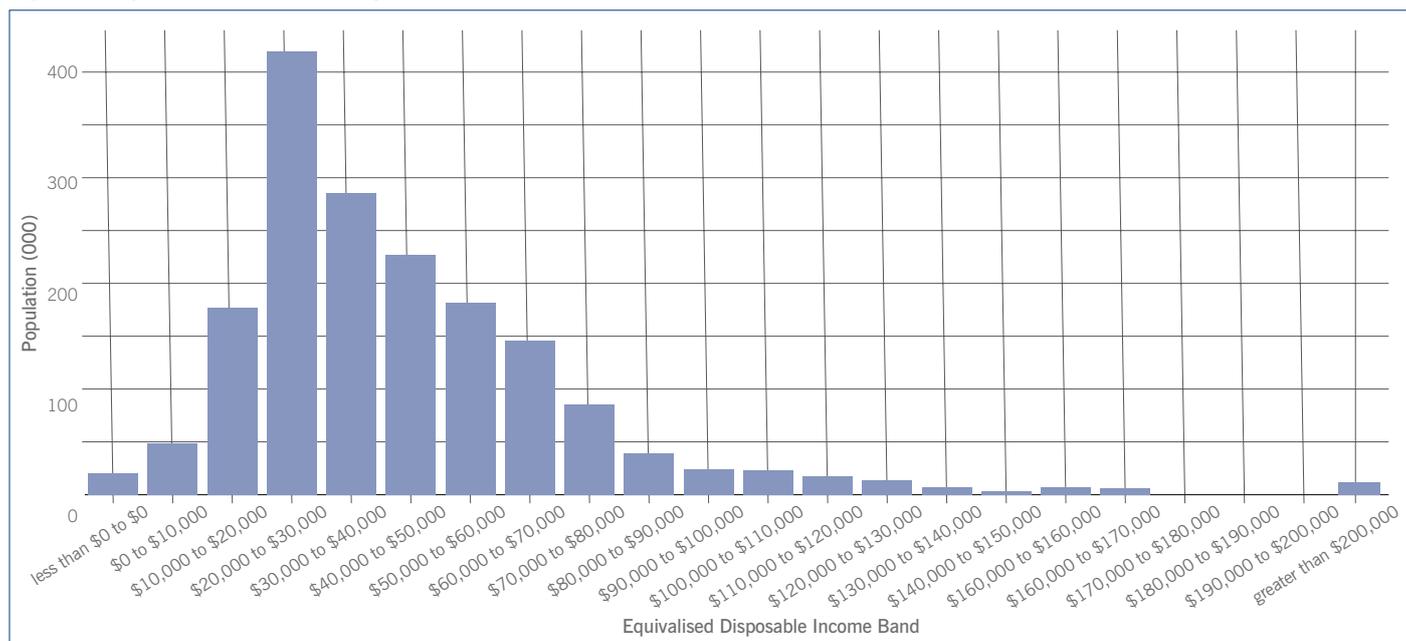
(1)

$$MOECD\ equvalisation\ factor = 1 + 0.5 \times (GTE14 - 1) + 0.3 \times (LT14)$$

The equivalised disposable income is then defined as

(2)

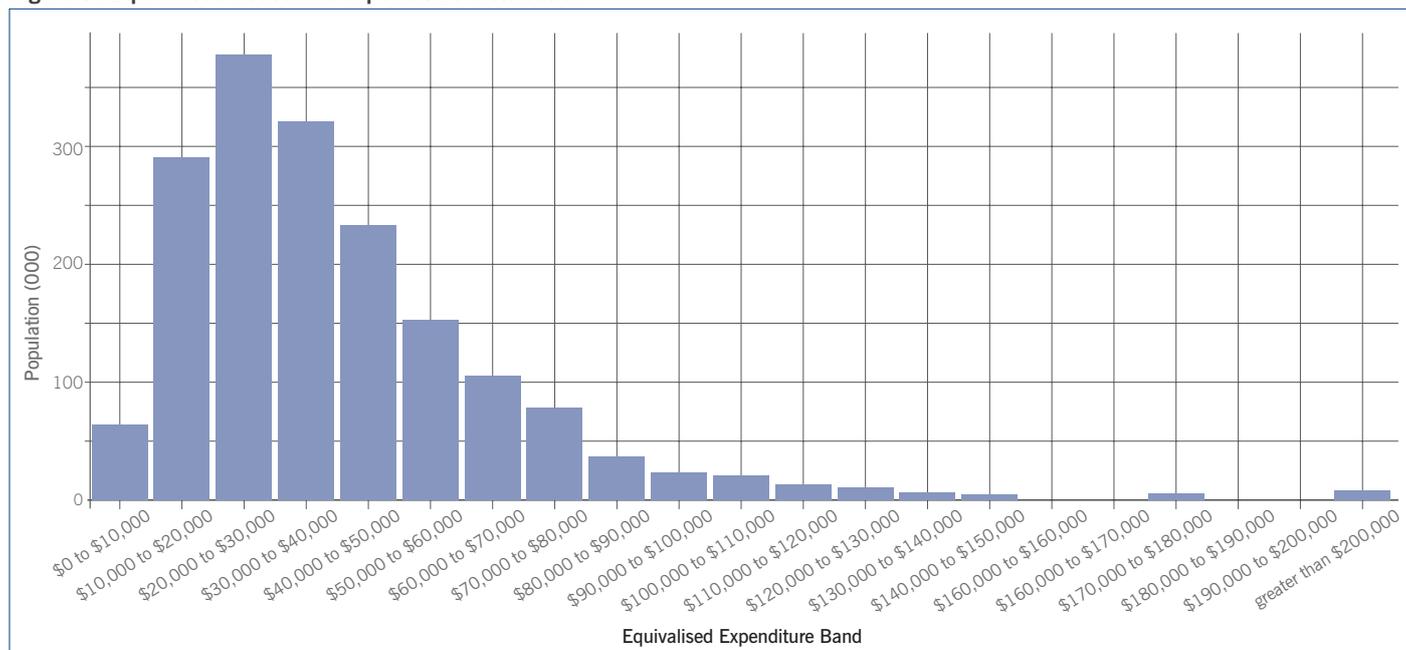$$Equivalisation\ disposable\ income = \frac{Disposable\ income}{MOECD\ equivalisation\ factor}$$

Figure 2: Equivalised household disposable income distribution

Source: author's calculations

Figure 3: Equivalised household expenditure distribution

Source: author's calculations

This analysis also applied MOECD equivalisation to household expenditure to allow for comparisons across various household sizes and composition. This may not appropriately allow for the resources needed in larger households or economies of scale, and is a pragmatic choice given that there is no established expenditure-based equivalisation scale. In addition, this article defines expenditure poverty thresholds that result in similar estimates to the income-based poverty measures.

Figures 2 and 3 show the equivalised household disposable income distribution

and the equivalised household expenditure distribution in 2019. These figures demonstrate that the distributions have similar shapes and the general population concentrated at similar bands, so, as a reasonable comparison, the analysis compares income- and expenditure-based poverty thresholds that are set at 40%, 50% or 60% of the respective median. Thus, we compare the following.

- EXP50 and EXP60 use thresholds based on 50% and 60% of the weighted median equivalised expenditure, which are directly compared to BHC50 and BHC60.

- NHEXP60, NHEXP50 and NHEXP40 use thresholds based on 60%, 50% and 40% of the weighted median equivalised expenditure without including the housing expenditure, which are directly compared to the AHC60, AHC50 and AHC40.

For simplicity, we refer to these new methods as expenditure-based poverty. The fixed-AHC50 threshold is based on a median household in 2017/18 after paying for housing costs; expenditure data for 2017/18 is not available, so this measure is omitted.

Comparing income-based child poverty measures with low-expenditure measures

Table 1 presents income-based child poverty rates using the income records from the 3,932 household subsample and the expenditure-based measures. According to Table 1, the expenditure-based relative child poverty rates are very similar to the income-based child poverty rates – some are slightly higher and some are slightly lower – with the exception of the 60% after-housing-costs threshold. This could indicate that the expenditure-based child poverty measures are telling a slightly different story from the income-based ones.

Although the numbers of children below the comparable thresholds are similar, it is also important to investigate whether expenditure-based indicators capture the same group of children in poverty as do the income-based indicators, or a new group not captured in the income-based analysis, and whether the expenditure-based estimates overlap with material hardship estimates. The data can also tell us which types of households are more likely to have relatively low expenditure levels and whether these households are currently receiving government support. It is also possible to identify whether they are experiencing deep deprivation, such as not having sufficient food.

Figure 4 shows the overlaps of children who fall into income-based poverty,[4] expenditure-based poverty[5] and material hardship. The size of each circle in the figure is proportional to the number of children. Any children who fall below the 60% before- or after-housing-costs income-based relative poverty threshold are defined as in income poverty because the 60% threshold incorporates the 50% and 40% thresholds; in other words, children who are in 60% threshold poverty will be in 50% and 40% threshold poverty as well. For the same reason, any children who fall below the 60% before- or after-housing-costs expenditure-based relative poverty threshold are defined as in expenditure poverty. The material hardship results are calculated based on the material deprivation index. Children are defined as being in material hardship if their household material deprivation index score

Table 1: Comparisons of income-based and expenditure-based proportions of children under different thresholds

	Threshold	Income-based	Expenditure-based
1	50% before housing cost threshold	12.5%	12.8%
2	60% before housing cost threshold	20.1%	21.6%
3	60% after housing cost threshold	26.3%	29.1%
4	50% after housing cost threshold	19.6%	20.7%
5	40% after housing cost threshold	13.4%	13.0%

Source: author's calculations

Figure 4: Interaction of children in income-based poverty, expenditure-based poverty and material hardship
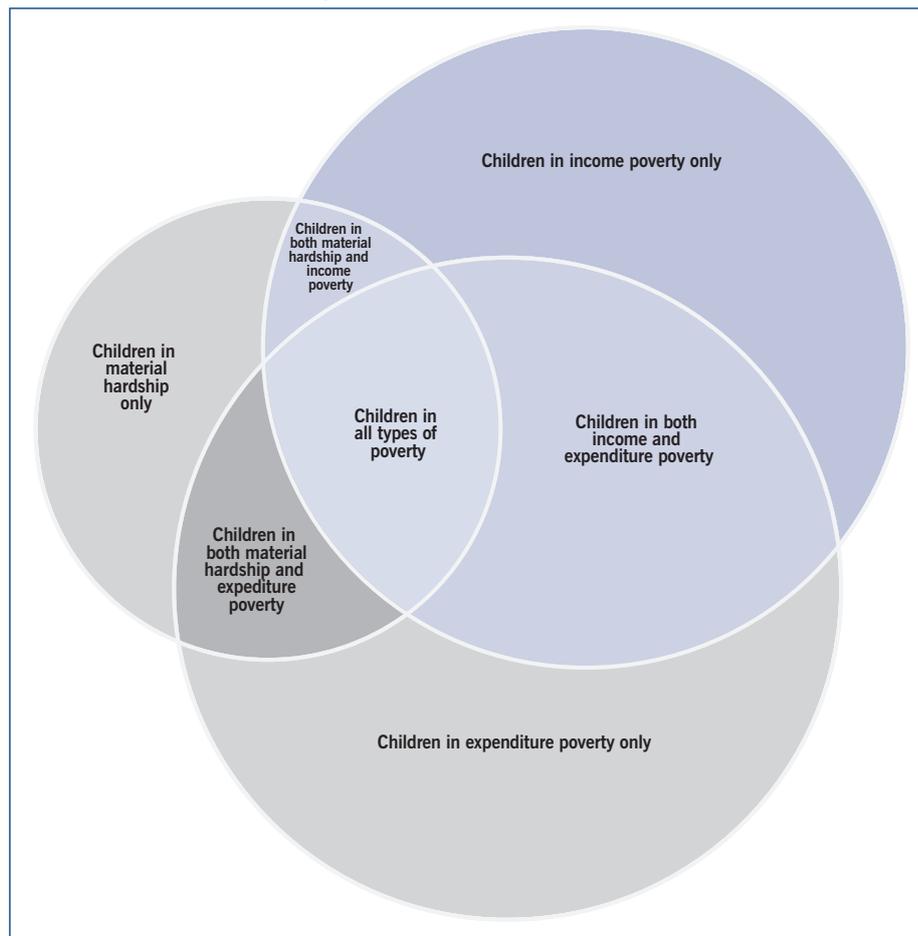
Source: author's calculations

is 6 or more, which is the same as the official definition (Statistics New Zealand, 2019b).

Figure 4 shows that the measures partially overlap, which indicates that the three types of poverty measures have at times captured the same group of children. However, there are also parts that are exclusive to each circle, which means some children are in one type of poverty but not others. There are a significant number of children who are defined as being solely in expenditure-based relative poverty. This suggests that the expenditure-based measures capture a slightly different group

of children to the income-based and material hardship measures. In more detail, Table 2 shows the numbers that underlie the diagram in Figure 4. There are around 157,000 children who are only in expenditure poverty, which is about 13.7% of New Zealand children.

Looking further into these 157,000 children who are only in expenditure-based poverty, we found that around 8,000 children (5.1%) are in single-parent households, around 105,000 children (66.7%) are in two-parent households, and 44,000 children (28%) are in multiple-family households.[6] Most of the children

Table 2: Number of children in income-based poverty, expenditure-based poverty and material hardship

Poverty Type	Number of Children	Percentage of Total Child Population
Only in income relative poverty	144,000	12.6%
Only in expenditure relative poverty	157,000	13.7%
Only in material poverty	39,000	3.4%
In both income and expenditure poverty	119,000	10.4%
In both income and material hardship poverty	15,000	1.3%
In both expenditure and material hardship poverty	35,000	3.1%
In all three kinds of poverty	54,000	4.7%

Source: author's calculations

Table 3: Sensitivity of the results to the equivalence scale used

	MOECD	1988 Revised Jensen	Square Root
50% before housing cost threshold (EXP50)	12.8%	12.1%	12.8%
60% before housing cost threshold (EXP60)	21.6%	19.6%	19.8%
60% after housing cost threshold (NHEXP60)	29.1%	27.9%	27.1%
50% after housing cost threshold (NHEXP50)	20.7%	19.6%	19.9%
40% after housing cost threshold (NHEXP40)	13.0%	11.8%	11.8%

Source: author's calculations

in expenditure-based poverty only are living in two-parent households. Also, looking at the benefit status of these 157,000 children's households, around 63,000 children's households do not have any social welfare transfer records, such as the Working for Families tax credit, a core benefit, etc., which represents approximately 40.1% of the children who are only in expenditure-based poverty.

Household expenditure can be affected by people's choice of lifestyle. Some people might just choose to spend less in order to save more. However, no matter how much people wish to save, they still need to spend a certain amount of money on food to meet their daily nutrition needs. Therefore, this analysis looks at the food security status of these 157,000 children. From food expenditure records in the dataset, we can see which households' annual food expenditure is below the basic food expense line. The basic food expense line used is based on research from the University of Otago's Department of Human Nutrition (2019). They found that the average food expense for an adult to meet everyday basic nutrition needs is around $71 per week, which is $3,692 per year.

To set the basic food expense line for different types of households and make them directly comparable, equivalisation is needed for the $3,692 line. The MOECD equivalisation scale is used to be consistent with other equivalised numbers in the study. The food expenditure records in our dataset also need to be equivalised using the MOECD scale for the same reason. The results show that of these 157,000 children, around 26,000 children's households are spending less than $3,692 per year, which means that about 16.6% of the children who are in expenditure-based poverty only do not have sufficient food to meet their everyday basic nutrition needs.

According to Figure 4 and Table 2, there are also a significant number of children who are defined as being solely in income-based relative poverty. This suggests that these children have low household income but good material wellbeing and sufficient household expenditure. There are around 144,000 children who are only in income poverty, which is about 12.6% of New Zealand children.

Looking further into these 144,000 children who are only in income poverty, we found that around 63,000 of them (43.8%) have their household expenditure decile above or equal to decile 5, i.e. above the median expenditure. Also, 137,000 of the 144,000 children have household expenditure greater than the household income (negative savings), which is 95.1%

of the population only in income poverty. The negative savings could mean these households have other sources of support, have access to credit or live on savings. This can also be a data quality issue.

Testing sensitivity to the equivalence scale
As mentioned earlier, this study applies MOECD equivalisation to household expenditure, which may not appropriately allow for the resources needed in larger households or economies of scale. It is a pragmatic choice, given that there is no established expenditure-based equivalisation scale. How sensitive the results are to the equivalence scale has then been tested to support this decision. The 1988 Revised Jensen Scale and the square root scale are selected for the sensitivity test, and the results are compared with MOECD scale results, as shown in Table 3. According to Table 3, the expenditure-based relative child poverty rates using the MOECD equivalisation scale are very similar to the rates using the other two scales, which suggests that using the MOECD equivalisation scale is a reasonable choice.

HES data, except for income such as wages, benefits, etc., which can be collected through administrative sources, is collected through a survey. This means the data only captures respondents' situations at the time when answering the questionnaires. In the case of demographic changes, such as households separating or combining over the year, which may have a significant impact on their income and expenditure structure, the data is unable to capture such changes. Further, in the case of self-employed respondents experiencing income loss during the time the data is collected but who have significant income gain during other times, again the data is unable to capture such information. The lag of self-employment income might also be one of the reasons some households have low income but not low expenditure or material hardship.

As observed above, it might be argued that a plausible reason for households having low expenditure but not low income or material hardship could be people's choice of lifestyle: people might just prefer to spend less in order to save more. However, as this analysis discovered, a

decent number of children live in households with low expenditure but not low income or material hardship, but who are not spending enough on food to meet their basic nutrition needs. Therefore, although there might be an element of lifestyle choice, at least people would not choose to starve in order to save.

Conclusions

This study explored using expenditure data to add to our understanding of child poverty in New Zealand. Motivated by the work of Meyer and Sullivan (2012), we defined relative low-expenditure measures to compare with income-based poverty and material hardship.

The results of expenditure-based child poverty analysis told us a different story from the income-based one. There is a group of children in households that have relatively low expenditure levels but who are not experiencing material hardship or income poverty. Among these children, most come from two-parent households, but quite a few come from single-parent households or multiple-family households. Of these households, 40.1% are not

receiving any social welfare transfers, and around 26,000 children live in a state of food insecurity.

With the expenditure-based measures added to the child poverty measurement system, we have also identified a group of children who are in income poverty but not experiencing any material hardship, nor have low-level expenditure. Among these children, the household expenditure of almost half of them is above the median expenditure, and most of their households have negative savings.

The aim of this study was to explore a new dimension of child poverty in New Zealand and provide data to build a comprehensive understanding of the issues. This highlighted how using a range of different lenses can provide new insights and help address child poverty in New Zealand.

1 The views, opinions, findings and conclusions or recommendations expressed in this article are strictly those of the author. They do not necessarily reflect the views of the Treasury or the New Zealand government. The Treasury and the New Zealand government take no responsibility for any errors or omissions in, or for the correctness of, the information contained in this article. The article is presented not as policy, but with a view to inform and stimulate wider debate.

2 The results in this study are not official statistics. They have

been created for research purposes from the Integrated Data Infrastructure (IDI) which is carefully managed by Statistics New Zealand. The IDI is a large research database which contains administrative data about people and households. These data come from government agencies and non-government organisations – for example, income and tax records from Inland Revenue and social benefit records from the Ministry of Social Development. For more information about the IDI please visit https://www.stats.govt.nz/integrated-data/. The results are based in part on tax data supplied by Inland Revenue to Statistics New Zealand under the Tax Administration Act 1994 for statistical purposes. Any discussion of data limitations or weaknesses is in the context of using the IDI for statistical purposes and is not related to the data's ability to support Inland Revenue's core operational requirements. Access to the survey data used in this study was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the author, not Statistics New Zealand or individual data suppliers.

3 The income and expenditure data from the HES are used to estimate savings as residual.

4 Includes both before-housing-costs and after-housing-costs poverty.

5 Includes both before-housing-costs and after-housing-costs poverty.

6 Meaning more than two adults in the household. Apparent inconsistencies in totals are due to rounding.

References

Department of Human Nutrition (2019) *Information Package for Users of the New Zealand Estimated Food Costs 2019*, Dunedin: University of Otago, https://ourarchive.otago.ac.nz/bitstream/handle/10523/9819/Food%20Costs%202019.pdf?sequence=1andisAllowed=y

Ellis, G.F.R. (1984) 'The dimensions of poverty', *Social Indicators Research*, 15 (3), pp.229–53, https://doi.org/10.1007/bf00668672

Hagenaars, A., K. de Vos and M.A. Zaidi (1995) *Poverty Statistics in the Late 1980s: research based on micro-data*, European Commission, https://op.europa.eu/en/publication-detail/-/publication/9c787f17-acb6-4f4b-badc-49a2310e65f7

Institute for Research on Poverty (n.d.) 'How is poverty measured?', University of Wisconsin–Madison, https://www.irp.wisc.edu/resources/how-is-poverty-measured/

International Labour Organization (2021) *China's Move to Measuring Relative Poverty: implications for social protection*, ILO working paper 23, https://www.ilo.org/global/publications/working-papers/WCMS_767997/lang--en/index.htm

Meyer, B.D. and J.X. Sullivan (2012) 'Identifying the disadvantaged: official poverty, consumption poverty, and the new supplemental poverty measure', *Journal of Economic Perspectives*, 26 (3), pp.111–36, https://doi.org/10.1257/jep.26.3.111

Statistics New Zealand (2012) *Measuring Child Poverty in New Zealand: issues and practicalities*, https://www.occ.org.nz/assets/Uploads/EAG/Working-papers/Statistics-NZ-Measuring-Child-Poverty-final.pdf

Statistics New Zealand (2019a) *Measuring Child Poverty: equivalence scale*, https://www.stats.govt.nz/assets/Uploads/Methods/Measuring-child-poverty-Equivalence-scale/measuring-child-poverty-equivalence-scale.pdf

Statistics New Zealand (2019b) *Measuring Child Poverty: material hardship*, https://www.stats.govt.nz/methods/measuring-child-poverty-material-hardship

Statistics New Zealand (2020a) *Changes to the household economic survey 2018/19*. https://www.stats.govt.nz/methods/changes-to-the-household-economic-survey-201819

Statistics New Zealand (2020b) 'Household income and housing cost statistics: HES (income)', https://datainfoplus.stats.govt.nz/Item/nz.govt.stats/27d850c1-939c-4e93-b61c-a1b5196b7f27

Statistics New Zealand (2021a) 'Child poverty statistics: year ended June 2021', https://www.stats.govt.nz/information-releases/child-poverty-statistics-year-ended-june-2021

Statistics New Zealand (2021b) *Measuring Child Poverty: concepts and definitions* (2nd edn), February, https://www.stats.govt.nz/methods/measuring-child-poverty-concepts-and-definitions#about

UNECE Task Force on Poverty Measurement (2017) 'Guide on poverty measurement 25 September 2017', agenda item, United Nations Economic Commission for Europe Conference of European Statisticians meeting of the 2017/2018 Bureau, Armenia, https://unece.org/fileadmin/DAM/stats/documents/ece/ces/bur/2017/October/14_Add.pdf