

TRACKING LIVING STANDARDS: IS IT DONE BETTER BY EDY OR HEDY?

John Jensen¹

Vasantha Krishnan

Knowledge Management Group

Ministry of Social Policy

Abstract

There has been longstanding interest in the extent to which commonly available standard statistical information can provide a valid basis for monitoring hardship. The most common approach is based on applying income equivalisation to household income data. In this paper, a particular application of that approach is used to specify a metric called EDY. A second metric, called HEDY, is also specified. Its novel feature is that it incorporates an adjustment intended to take account of the variability in housing costs that occurs independently of income (reflected in previous findings that some with low incomes have relatively high housing costs and vice versa).

A series of analyses are made comparing the properties of EDY and HEDY with a view to assessing which on balance provides the better basis for monitoring living standards. The results show that both display similar trends over the decade 1988-98, although HEDY moves more smoothly, showing less year-to-year fluctuations. However, they present somewhat different pictures of the relative position of some sub-populations, with HEDY results implying that economic changes occurring over the decade have had a disproportionately severe impact on the living standards of children. The authors conclude by stating their provisional preference for the HEDY metric, but point to the need for further work – which they intend to carry out – to more clearly resolve the issue.

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INTRODUCTION

There has been a long-standing interest in using statistical information to develop a picture of likely level of hardship in the population and whether it has been changing over time. Although household income has primarily been used for this purpose, its limitation is that it does not take into account differences in size. The most common way to deal with this is to equivalise.

Recent reports into poverty and income adequacy (see Stephens et al. 2000, Waldegrave and Sawrey 1994) and results from the Ministry of Social Policy's Living Standards Survey 2000 (2001) highlight the significance of housing cost as a factor that affects living standards. As a result of these studies, the authors have become interested in exploring an alternative approach for measuring living standards – one that incorporates housing cost into an equivalised income measure. The simplest way to do this is to subtract housing cost from income and equivalise the remaining net amount. In this paper, the remaining net amount is referred to as the Housing-adjusted Equivalised Disposable Income (HEDY) metric². This is in contrast to the commonly used Equivalised Disposable Income (EDY) metric.

This paper examines some of the issues that arise in such metrics for creating monitoring statistics (which most commonly are reported as the proportion of the population below a particular threshold). The central purpose of this paper is to begin a systematic examination of the relative merits of two metrics (EDY and HEDY) as the basis for living standards monitoring.

Using the metric to produce proportion-below-threshold statistics, the analysis will focus on three key questions:

- How sensitive is the broad trend to the choice of metric?
- Within the broad trend, how sensitive is the pattern of movement to choice of threshold?
- How sensitive is the relative position of sub-populations and the trend movements for sub-populations to the choice of metric?

It is worth noting that the creation of proportion-below-threshold statistics (for the population as a whole, or sub-populations, such as Māori, or children) is not the only way of using the metrics to create monitoring information. For example, they can be

² Access to the Household Economic Survey data used in this study was provided by Statistics New Zealand under conditions designed to give effect to the confidentiality provisions of the Statistics Act 1975. The results presented in this study are the work of the authors.

used to define index-type measures. However, consideration of the metrics for such wider purposes is not the topic of the present paper.

USING INCOME FOR THE PROXY MEASUREMENT OF LIVING STANDARDS

Income and housing costs have been referred to as factors that influence standard of living, but research has identified other factors that also are of major importance, implying that both the EDY and HEDY metrics are necessarily imperfect indicators of living standards. People with the same income level can have substantially different living standards as a result of their lifecycle stage (youth, middle age, older people), ownership of assets, the extent to which they receive assistance from others, and the extent to which they have atypical expenditure commitments (e.g. unusually high medical costs, debt repayments, transport costs, electricity costs, etc.).

Despite these disadvantages, such narrowly specified metrics as EDY and HEDY have some convenient features. Income is the single most accessible indicator of economic well-being for the residents of any given country at any given point in time. Income is concrete and measurable, and statistical information on income is widely collected and reported. Income can be compared across groups and within groups. Housing cost data are similarly quite widely collected and reported (although to a lesser extent than income data).

To address the three questions set out above, we have used the EDY and HEDY metrics to generate population-below-threshold statistics for a variety of thresholds (see Appendix Two).

The second of the questions required that the lowest threshold should be sufficiently low for the majority of income-tested beneficiaries and superannuitants to have EDY values above it throughout the period examined. (As discussed later, this was to minimise group-selection effects, whereby changes in real benefit rates for particular beneficiary groups can cause them to move en masse from a bit above the line to a bit below, or vice versa, causing the monitoring statistic to exhibit substantial lurches that do not reflect sudden substantial movements of living standards.) Similarly, it was necessary that the highest threshold should be sufficiently high for the majority of income-tested beneficiaries and superannuitants to have EDY values below it throughout the period. This resulted in a wide separation between the lowest and highest thresholds.

Two further thresholds were specified intermediate between the highest and lowest threshold. These are referred to as the second (highest) and third (highest) thresholds. For each EDY threshold value we identified a corresponding HEDY value that resulted in a proportion below threshold in 1988 that was the same as the 1988 EDY proportion below threshold.

This has resulted in four pairs of trend lines being generated with each pair being at the same value at the beginning period (1988), but being free to diverge from that year onwards according to the combined effects of various economic and demographic changes (i.e. changes in income, living costs, family size, etc.).

THINGS TO CONSIDER IN DEVELOPING INCOME-BASED MEASURES OF HARDSHIP

The most analytically satisfactory approach to an income-based living standards measure is to express income (by itself, or housing-adjusted on the basis of costs) in an equivalised form (thus taking account of the different relative needs of family units of different sizes), and relate the amount to a specified threshold value set in the lower part of the range. This results in each family being designated as being below or above the threshold (or "line").

There are several dimensions to this task. They relate to:

- the unit of analysis that should be used;
- how account should be taken of differences in the sizes of the units;
- how an income-based standard of living proxy measure should be defined for that unit (including whether it should include an adjustment for housing costs);
- whether the line should be defined in distributional or nominal terms;
- how the self-employed should be treated; and
- the form of the measure (head count of the number below threshold as a proportion of population, poverty index, etc.).

Each will be discussed briefly, in turn.

Unit of Analysis

Historically, households have been used as the base units for analysis. The rationale is that the members of a household can be assumed to have commingled their financial affairs to function as an economic unit whose members have a common standard of living. This may have been substantially true when the system of household statistics

was first established, but has become increasingly doubtful as household composition has become increasingly heterogeneous.

An alternate approach is to use “economic family units” (also known as “family core economic units”). An economic family unit refers to a person who is financially independent or a group of people who usually reside together and are financially interdependent. This unit is essentially the unit of eligibility for core income-tested Social Security benefits (see Appendix One). A single household can be made up of several economic family units with different incomes (see Mowbray 1994).

For the present purpose, the economic family unit has been chosen as the unit of analysis. Given that economic families with different economic circumstances can be found within the same household, this can be expected to give a more valid measure than one based on the household as a whole³.

Current data sources do not permit examination of the degree of resource pooling within economic families, nor the equity of resource use. Similarly, the sources do not permit examination of sharing of resources between units (whether they are within the same household or in different households). Use of the household as the unit would give rise to similar qualifications about inability to ascertain intra-unit and inter-unit sharing.

Accounting for Differences in Family Size (Equivalisation)

Families differ in size and composition. An income that provides one family with an adequate standard of living may be inadequate for another. It is necessary to allow for such differences in order to make meaningful analyses of the distribution of income and well-being among families. Equivalence scales are one tool for adjusting family incomes to allow for differences in size and composition.

The present analysis uses income equivalence scaling to deal with the issue of differences in family size. The scale used primarily is the Revised Jensen Scale (RJS).

³ As described in the next section, size differences between units have been taken into account through the use of equivalence scales. Where a unit is just one of several units that make up a household, the equivalence value probably should be a bit lower than if the unit made up the whole household. This is because the multi-unit arrangement probably has an economic advantage. However, the results produced by the analysis are unlikely to be sensitive to this effect, and no attempt has been made to adjust for it.

Specifications of Income-Based Standard of Living Proxy Measures, with and without Housing Adjustment

In the area of measurement of living standards, there are arguments both in favour and against taking income after housing costs. Many households have little choice over their housing costs, which results in differences in standard of living independent of income. Housing costs also vary in ways (by region, lifecycle, etc.) that do not reflect variations in quality. On the other hand, housing costs are a consumption item over which households can exercise substantial choice in the long term. Part of the cost for owner-occupancy leads to the accumulation of an asset that will eventually lower cash costs for the same quality of housing.

The authors take the provisional view that, ideally, some adjustment is required to deal with the variability in housing circumstances between renters and homeowners (and those with and without mortgages). This gives rise to the question: what form should that adjustment take (given that the data available about each unit are income and housing cost)? The simplest adjustment is to subtract housing cost from income, and thus create a living standard proxy, based not on the unit's full income, but on the amount it has available for consumption after meeting its housing cost. It is this method of adjustment that is examined in the present paper⁴. Other methods are possible, and will be considered in future work.

Arising from the comments made above, the present analysis makes use of two alternative definitions, whose comparison is the main focus of the paper. The first is equivalised disposable income (of the economic family unit). As indicated in the introduction, this has been referred to as the EDY metric (where the symbol "Y" is used to indicate income, in accordance with a common convention). The second is equivalised disposable income-less-housing-cost, referred to as the HEDY metric⁵.

⁴ Housing costs have been equally apportioned among the adults in an economic family unit. The authors consider it desirable to explore the robustness of this procedure for allocating housing costs to economic family units.

⁵ The same equivalence scale (RJS) has been used as the basis of both EDY and HEDY. As it is a scale relating to income as a whole (as are all of the common scales), its use to obtain values of HEDY could be regarded as problematical. Use of a housing-adjusted equivalence scale would be more technically correct, but probably not sensitive to results (see McClements 1978).

Whether the Line Should be Defined in Distributional or Nominal Terms

A threshold is a chosen equivalent income value on a distribution. The threshold can be either of two types:

- Fixed value threshold, which results in a nominal measure; or
- Distributionally based threshold, which results in a relative measure.

The nominal measure designates an equivalent income value in constant dollar terms. The distributional measure relates the units in the bottom part of the income distribution to those in the rest of society.

A nominal threshold is relatively straightforward to interpret (having a rationale similar to that of a price index). The movement of a family from below the threshold to above it indicates that it can now consume more, own more and do more than it could previously. A nominal threshold needs to be reviewed and adjusted from time to time to reflect changing social perceptions of hardship and affluence.

Distributional measures perform this adjustment automatically, in a way that may not be entirely satisfactory. They are also subject to other reservations. In periods of rapid change in economic conditions (or government policy) they may become unstable and give results that mask or distort changes in living standards of poorer people.

The distribution of household incomes in New Zealand is skewed because of the proportions of beneficiaries and New Zealand Superannuitants in the population. Being a small population with a relatively large beneficiary population has a considerable effect on the distribution of household incomes. The pattern that generally emerges is one of a "peaking" of household incomes around the level of New Zealand Superannuation and basic benefit rates. This means that a relatively small change in the benefit or superannuation rates can cause the threshold to move in a way that can either include or exclude large groups of income support recipients in a manner which is largely arbitrary.

The authors consider that for most purposes of social monitoring, the use of a nominal threshold is more informative, and relates more directly to the sorts of questions that users typically are asking (especially those of the type: "Are more or fewer people having difficulty making ends meet this year compared with last year?"). Accordingly they have used nominal thresholds.

Treatment of Self-Employed

The reported incomes of those who are self-employed in the labour market can seriously distort any measure due to the inaccuracies inherent in the reported incomes of the self-employed. These inaccuracies result from factors such as survey rules which allow income to be reported with business expenses deducted and the ability of some self-employed to be income-poor but asset-rich.

There are three ways of dealing with the incomes of the self-employed:

- Ignore the distortions and include them in the distribution;
- Exclude them from the distribution; and
- Exclude them from the primary results but present separate results for the self-employed.

For the main analysis reported here, the self-employed have been included. Sensitivity testing of the effects of excluding the self-employed shows very little alteration to the distribution of cumulative incomes of economic family units.

Types of Measures Possible within a Low-incomes Threshold Framework

Essentially three types of measures are possible:

- a Head Count expressed as a proportion below the defined threshold;
- a measure based on aggregating and standardising the actual amounts by which those below a threshold fall short of it; and
- a Poverty Index, which in the present context probably would involve an elaboration of the above approach.

The present analysis reports only on the first type of statistic (i.e. proportion below threshold).

In summary, two alternative metrics (EDY and HEDY) have been defined as putative living standard proxy variables, being based on the economic family as the unit of analysis. The metrics can be used to generate proportion-below-threshold monitoring statistics, and the decision has been made to use a nominal threshold.

DETERMINING THE ANALYTICAL THRESHOLDS

The highest and lowest EDY thresholds were set first, and these were used to determine corresponding HEDY thresholds.

Each economic family was assigned an EDY value by using the RJS equivalence scale (specified with a single person as the reference unit) to equalise the family's after-tax income, inflation-adjusted by means of the CPI for all groups. The highest EDY threshold was set at a value that placed it above all income-tested benefit rates and superannuation rates over the ten-year analysis period. The resulting threshold value (cf. Appendix Three) resulted in 23% of economic families being below-threshold in 1988.

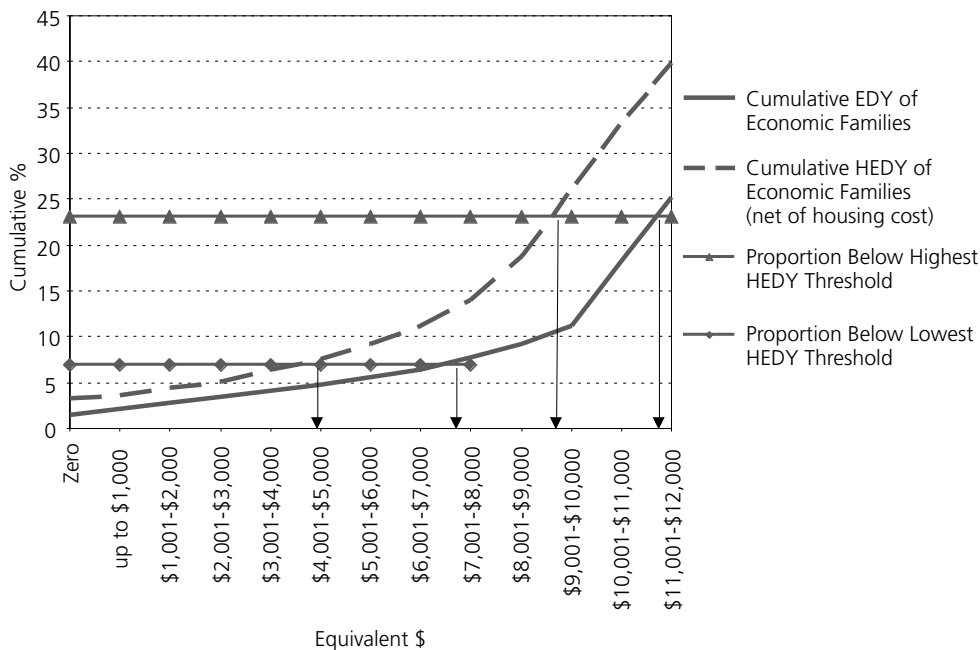
Similarly, each economic family was assigned a HEDY value by equalising the family's after-tax income minus its accommodation cost, inflation-adjusted by means of the CPI for all groups less housing. The highest HEDY threshold was set at a value that also resulted in 23% of economic families being below-threshold in 1988. The relationship between the highest EDY threshold and the corresponding HEDY threshold is shown in Figure 1. That figure gives the cumulative distributions of EDY and HEDY, and indicates the EDY and HEDY amounts corresponding to 23% on the distributions.

The lowest EDY threshold was set at a value that placed it below most income-tested benefit rates and superannuation rates over the ten-year analysis period. The resulting threshold value (cf. Appendix Three) resulted in 7% of economic families being below-threshold in 1988. The matching HEDY threshold was determined by the same process described above for the highest threshold, with Figure 1 also showing the relationship between the lowest EDY and HEDY thresholds.

As mentioned earlier, the reason for incorporating housing costs into the HEDY metric is the variability in the housing costs of families with similar incomes. This variability is sufficiently great to mean that for some families the differences between EDY and HEDY values are quite large. The general effect is to cause EDY to have a higher mean than HEDY. This is reflected in the gap between the cumulative percentage lines drawn in Figure 1.

There is a relatively large difference between the highest and lowest threshold; that is to say, they cover a relatively large span. For the purposes of the analysis, two intermediate EDY thresholds were also specified, with each giving rise to a corresponding HEDY threshold. The thresholds are referred to as the second and third thresholds. The values of these thresholds are also given in Appendix Three.

Figure 1 Cumulative Distribution of Equivalent Disposable Incomes of Economic Family Units 1987-88 (%)



Source: Derived from Statistics New Zealand’s Household Economic Survey by Ministry of Social Policy.

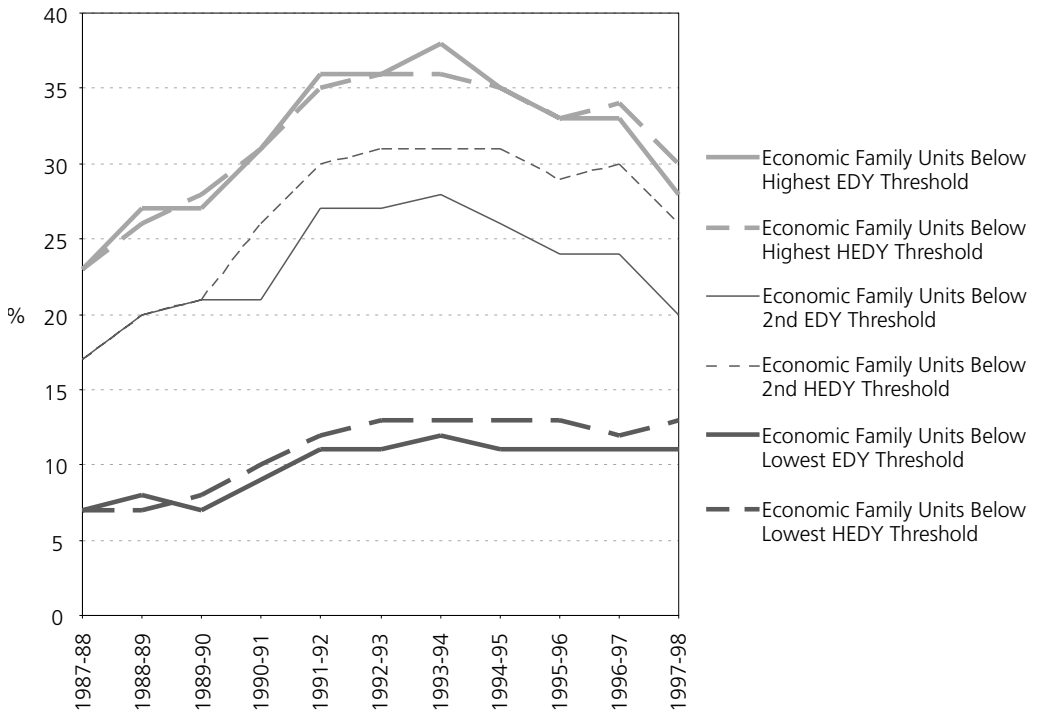
HOW SENSITIVE IS THE TREND TO THE CHOICE OF METRIC?

Figure 2 shows that the general pattern over time for thresholds specified on both the EDY and HEDY metrics is the same.

The figure presents trend lines for three thresholds: the highest, second and lowest. (The third threshold is not shown because the results are similar to those for the second threshold, and its inclusion makes the figure visually cluttered.)

For both the EDY and HEDY lines, there is a rising trend over the first half of the decade. For the second half of the decade, the lines for the lowest threshold are roughly static, while the lines for higher thresholds move downwards. (In no case, however, is the value at the end of the period – i.e. 1998 – as low as in 1988.)

Figure 2 Proportion of Economic Family Units Below Various Thresholds for EDY and HEDY Metrics



Source: Derived from Statistics New Zealand's Household Economic Survey by Ministry of Social Policy.

Although the general trends for the EDY and HEDY lines are the same, there is a difference which is worth noting. At all but the highest threshold, the HEDY line has risen above the EDY line by 1991, and tracks above the EDY line for the rest of the decade. At the highest threshold, this divergence does not occur, and the two lines weave around one another. It is likely that this is largely a consequence of the higher proportion of superannuitants included below this threshold, whose housing costs are lower and more static (because of the higher rates of mortgage-free home ownership), compared with other groups.

The overall pattern shown by the lines imply that the housing costs paid by low-income families rose more rapidly than prices generally, causing low-income families to have a greater fall in their living standard than would otherwise have been the case.

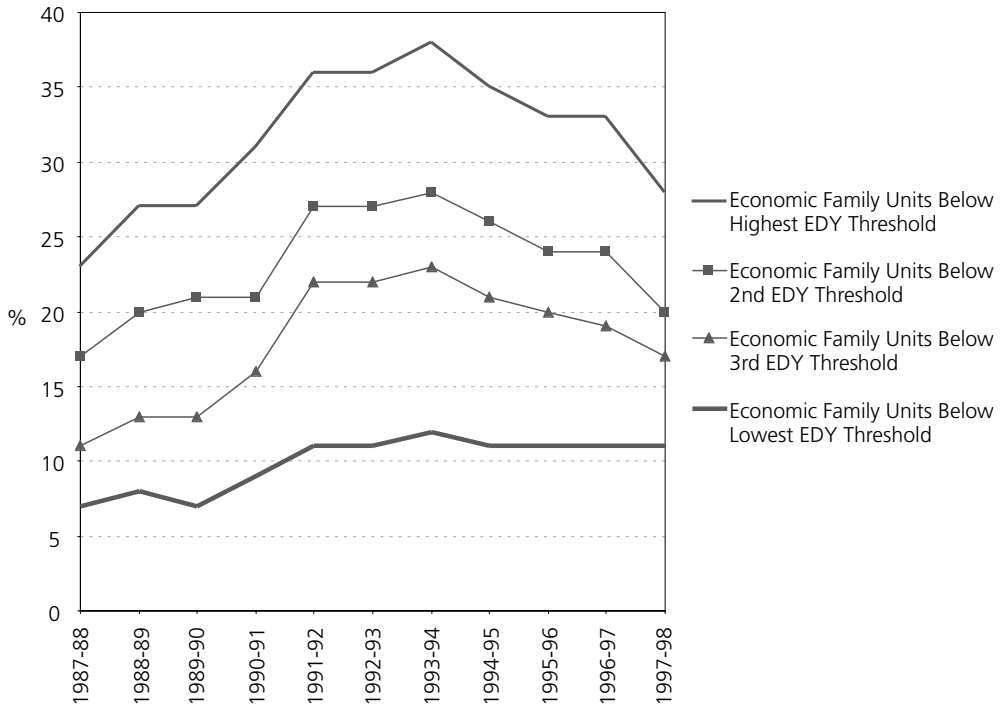
HOW SENSITIVE IS THE PATTERN OF MOVEMENT TO CHOICE OF THRESHOLD?

Figure 3A enables comparisons to be made between the EDY trend lines for all four thresholds. Figure 3B shows the corresponding HEDY lines.

The most salient point to emerge from examining patterns of movement across different thresholds specified on both metrics is that the pattern of year-to-year movement does not fluctuate as sharply on the HEDY metric as it does on the EDY metric. This suggests that one should be reasonably wary of the spikiness of the EDY metric when reporting on rises and falls (see Figure 3A)⁶. In contrast, while the overall trends portrayed in both metrics are similar, the HEDY metric portrays a smoother movement that suggests it may be more reliable as an indication of annual changes, being less subject to idiosyncratic movements that probably reflect group-selection effects (see Figure 3B).

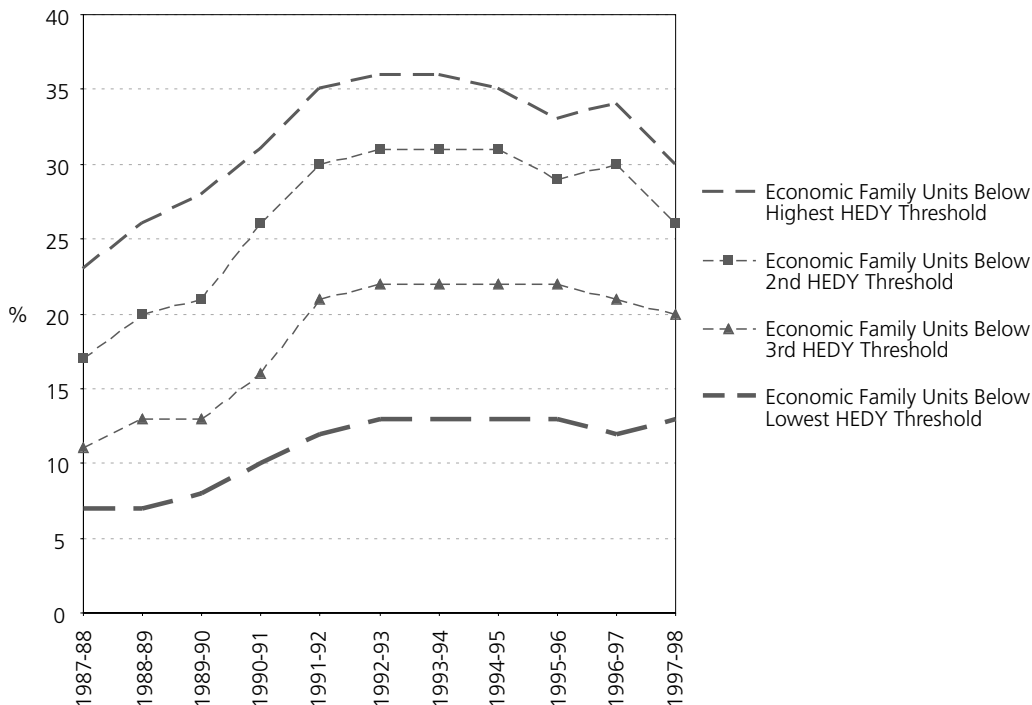
⁶ It was anticipated that the highest EDY threshold would show fewer year-to-year fluctuations than the two lines below it (corresponding to the second and third thresholds). This is not found to be the case. There are several possible reasons for the result, but the authors do not know which apply and any comment by them at this point would be almost entirely speculative.

Figure 3A Proportion of Economic Family Units Below Four Thresholds on the EDY Metric 1988-98



Source: Derived from Statistics New Zealand's Household Economic Survey by Ministry of Social Policy.

Figure 3B Proportion of Economic Family Units Below Four Thresholds on the HEDY Metric 1988-98



Source: Derived from Statistics New Zealand’s Household Economic Survey by Ministry of Social Policy.

HOW SENSITIVE IS THE RELATIVE POSITION OF SUB-POPULATIONS AND THE TREND MOVEMENTS FOR SUB-POPULATIONS TO CHOICE OF METRIC?

To separately examine the effect of subtracting housing costs on results for families with dependent children, below-threshold proportions have been produced specifically for such families, along with results for some other sub-populations. This has resulted in a four-way matrix for analysis (see Table 1).

Table 1 Matrix Structure to Understand Characteristics of Economic Family Units Below Defined Thresholds

	Below lowest threshold	Below highest threshold
EDY	Proportions below threshold for selected sub-populations	Proportions below threshold for selected sub-populations
HEDY	Proportions below threshold for selected sub-populations	Proportions below threshold for selected sub-populations

The results applying this matrix are given in Table 2.

Table 2 Proportions of Sub-Populations Below EDY and HEDY Thresholds

	%		
	1987-88	1992-93	1997-98
<u>Lowest EDY threshold</u>			
Economic families	7	11	11
People	6	7	8
Families with dependent children	6	7	6
Dependent children	6	7	6
<u>Lowest HEDY threshold</u>			
Economic families	7	13	13
People	6	9	11
Families with dependent children	6	11	11
Dependent children	6	12	11
<u>Highest EDY threshold</u>			
Economic families	23	36	28
People	21	32	24
Families with dependent children	19	37	23
Dependent children	23	39	25
<u>Highest HEDY threshold</u>			
Economic families	23	36	30
People	23	35	30
Families with dependent children	25	44	37
Dependent children	29	46	40

Source: Derived from Statistics New Zealand's Household Economic Survey by Ministry of Social Policy.

Table 2 demonstrates how the composition of the population varies for each of the specifications on the matrix.

Economic family units below the lowest EDY threshold increased from 7% in 1988 to 11% in 1998. These family units represented 8% of people in 1998, up from 6% in 1988. They also represented 6% of families with children and 6% of all New Zealand children in 1998.

In 1998, 28% of economic family units fell below the highest EDY threshold, up from 23% in 1988. These units represented 24% of people, 25% of children and 23% of families with dependent children in 1998.

The highest EDY threshold gives more variation in the proportion of economic family units falling below this line and the proportion grew substantially from 23% to 36% between 1988 and 1993. Since 1993, the outlook has improved, with declines in the proportion of families below this line by 1998.

For the lowest HEDY threshold, subtracting housing costs results in an increase in the proportion of children, and of families with children, who fall below the lowest line.

For the highest HEDY threshold, subtracting housing costs results in a similar trend, but with a more pronounced growth in the proportion of children, and of families with children, who fall below this line. This is due to more families with children being captured by this measure and the higher likelihood of families with dependent children having substantial housing costs.

WHICH METRIC IS TO BE PREFERRED?

The question arises as to which metric can be regarded as the more valid proxy for living standards. In other words, which of the patterns shown above best reflect living standard changes that occurred. For reasons given previously, it is plausible to believe that some of the variation in living standards is accounted for by variation in housing costs. Taken by itself, this would suggest that it would be best to lean towards the HEDY measure.

As noted from the trend analysis, both EDY and HEDY display similar trends over the decade 1988-98, although HEDY moves more smoothly, showing fewer year-to-year fluctuations.

Comparisons of EDY and HEDY results for sub-populations imply that economic changes occurring over the decade have had a disproportionately severe impact on the living standards of children. This conclusion is consistent with reports by voluntary

agencies of rising family hardship in the early 1990s (sometimes mentioned in connection with comments about high housing costs), although anecdotal and other informal evidence of this type cannot be taken as more than suggestive.

The best test would be one that permitted results for the two metrics to be compared with those provided by an independent assessment of living standards. Data that would enable this to be done have been collected by a programme of research on the living standards of older people. The research was initiated by the Super 2000 Taskforce, and was carried out under the auspices of the Ministry of Social Policy after the Taskforce was terminated in 2000. Unfortunately, it has not yet been possible to make the necessary analysis. However, this will be done over the next few months, and will be reported in a future paper. The authors' provisional preference for the HEDY metric will be revisited when the analysis using survey data has been carried out.

THE EFFECTS OF EQUIVALENCE

As mentioned earlier in this paper, equivalence scales are one tool for adjusting family incomes to allow for differences in family size and composition. Family incomes are divided by factors from the scale to give an equivalent income.

The equivalence scale factor used here adjusts the income of the economic family unit to what a single-person unit would need to maintain an equivalent standard of living (per capita equivalence). That is, the value of one on the scale is assigned to a single-person economic family unit.

The RJS used in this study takes into account the number of adults and children in the family with an adjustment for the age of the child. The RJS is derived from the original Jensen scale (Jensen 1978), which is estimated from a theoretically based two-parameter mathematical equation whose parameter values were set to give a good fit to the Whiteford Geometric Scale (Whiteford 1985). The Whiteford Scale is, in fact, the geometric average of a large number of individual scales used internationally.

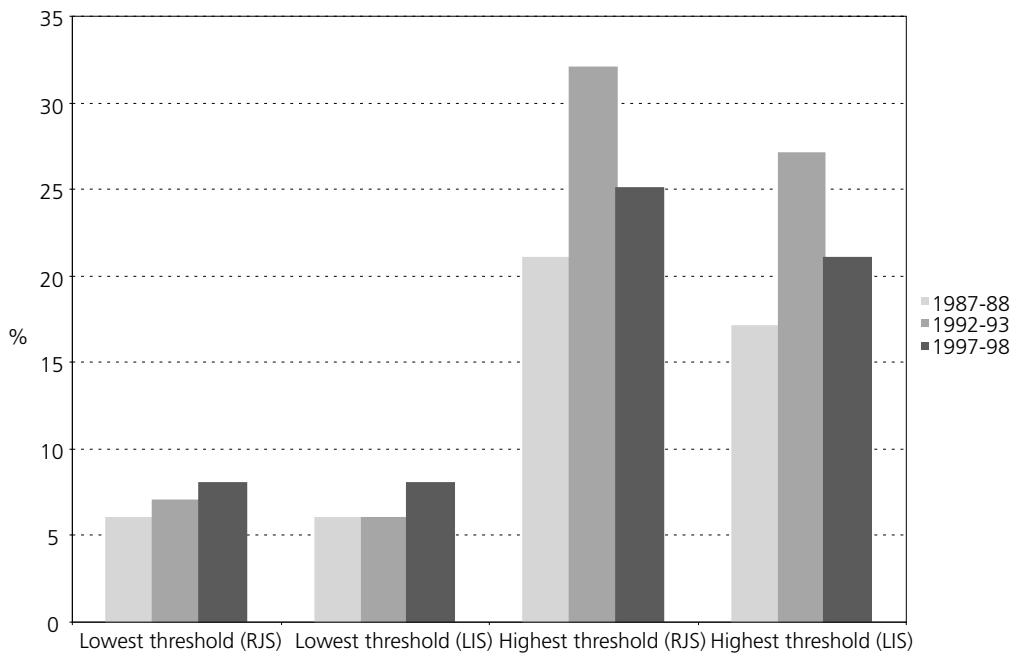
As Whiteford's research documented, there are many different scales available. None can claim to be definitive, nor is there any methodology for scale derivation that can claim to be the best. Whiteford's bringing together of a large number showed that there is broad commonality, but great differences at the extremes.

One of the scales that has been most widely used in Europe is that associated with the Luxembourg Income Study (the LIS scale). This scale simply sets the scale value

proportionally to the square root of the number of persons in the family, regardless of whether they are adults or children (Statistics New Zealand 1999).

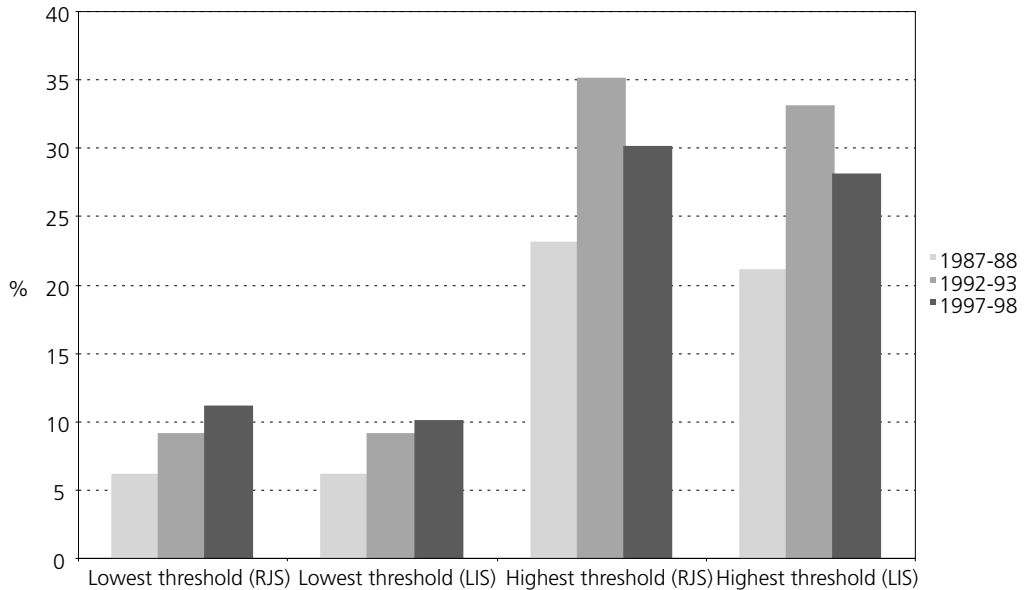
To get some sense of how dependent the preceding results may be on the use of the RJS, analysis was also carried out using the LIS. Although specific percentages altered a little, the pattern of results was the same. This is indicated by Figures 4A and 4B, which show proportions below the EDY and HEDY thresholds for different time periods, as estimated using the two scales.

Figure 4A Proportion of Population Below Thresholds Specified on the EDY Metric 1988-98



Source: Derived from Statistics New Zealand's Household Economic Survey by Ministry of Social Policy.

Figure 4B Proportion of Population Below Thresholds Specified on the HEDY Metric 1988-98



Source: Derived from Statistics New Zealand's Household Economic Survey by Ministry of Social Policy.

The above comparisons show that the two equivalence scales give very similar estimates of the proportions of the population below the lowest and highest threshold values for both metrics.

Table 3 extends the analysis by using the scales to estimate below-threshold proportions for various family types. The results demonstrate that the propensity to fall below threshold is very similar across different family types. This is true of both the lowest and highest thresholds. For example, both RJS and LIS scale estimates on the HEDY metric show that 18% of sole parents are below the lowest threshold and 69% are below the highest threshold. The differences between the RJS and LIS estimates on the HEDY metric range from nil for many characteristics across both thresholds to a five-percentage-point difference for economic family units with three or more dependent children below the highest threshold. For the EDY metric, the widest variation is found for couple-only units below the highest threshold, which results in an eight-percentage-point difference between the RJS and LIS scales.

Table 3 Proportions of Different Family Types Below Thresholds Specified on the EDY and HEDY Metrics Using the RJS and LIS Scales, 1997-98, %

	EDY Metric				HEDY Metric			
	Proportion of population below lowest threshold		Proportion of population below highest threshold		Proportion of population below lowest threshold		Proportion of population below highest threshold	
	RJS	LIS	RJS	LIS	RJS	LIS	RJS	LIS
Population	8	8	25	21	11	10	30	28
Children	6	5	25	23	11	10	40	36
Economic family units (EFUs)	11	11	28	26	13	12	30	29
EFUs with dependent children	6	6	24	22	11	11	37	35
EFUs with one dependent child	6	6	22	22	10	11	34	32
EFUs with two dependent children	7	7	23	20	11	11	36	34
EFUs with three or more dependent children	4	4	26	23	11	10	43	38
Sole-parent families with dependent children	8	9	44	45	18	18	69	69
Two-parent families with dependent children	5	5	17	14	8	8	26	23
Single-adult EFU	20	20	41	41	20	20	39	39
Couple-only EFU	4	4	15	7	4	4	10	9

Source: Derived from Statistics New Zealand's Household Economic Survey by the Ministry of Social Policy.

SUMMARY WITH CONCLUDING REMARKS

The various analyses reported in this paper chart a rather irregular route between the starting point and the destination. It may provide a helpful perspective on the paper to briefly retrace that route.

The starting point was the desire for a metric that can readily be used as a proxy measure for material living standard in social analysis. The effort to pursue this goal took as "given" the conventional (and obvious) view that simple income (of households, or some more refined unit) does not constitute a satisfactory living standard proxy because units containing different numbers of people (and perhaps

differing also in other regards) require different incomes to attain a comparable standard of living.

The simplest and most common response to this difficulty is to re-scale incomes to take account of the compositional differences between the units. The most basic re-scaling procedure recognises only one compositional feature, the number of people in the unit, and uses a simple statistical transformation called "income equivalisation" to create a new metric. The EDY metric is the result of applying this approach.

Again following convention, it was desired to use the metric to define some "lines", whereby trends can be determined in the proportion of the population that fall below designated threshold values of the metric (i.e. below particular standard of living levels). Because beneficiaries predominantly fall within a narrow range of EDY values, they are closely bunched together in the overall population distribution of EDY values. As a consequence, a threshold value that is below the main bunch of beneficiaries at the beginning of a period, but above at the end (or vice versa), will give rise to a lurch in the trend because of the group-selection effect. To avoid the potential for trend results to be distorted in this way, thresholds for the EDY metric were chosen that would result in the bulk of beneficiaries being below the higher line for the whole of the analysis period, and above the lower line. In other words, the thresholds were chosen to ensure that beneficiaries were largely "corralled" between the two levels.

A further possible elaboration of the approach was then examined. This was done because of evidence from various sources to suggest that even when account is taken of income and the number of people in the unit, large differences in housing costs are found between units with similar incomes, tending to erode the precision of simple equivalised income as a living standard proxy. (The issues that arise here are complex. If housing is viewed as just one of many consumption items, such as breakfast cereal, it would be expected that differences in housing expenditures would be associated with differences in the "quality and quantity" of housing, in which case they should not require any special acknowledgement. However, it is clear from some housing research that some differences in housing expenditures are not reflected in commensurate differences in quality and quantity, but arise partly from idiosyncratic factors such as differences in tenure, region, status of neighbourhood, relative local scarcity for certain types of housing, and so on.)

A second metric, HEDY, was therefore defined, whose novel feature was that it took account of differential housing costs by subtracting housing cost from after-tax income before equivalisation was applied. This is a straightforward response to the problem

discussed, but risks overcompensating by introducing a new source of distortion (i.e. failure to recognise sufficiently the extent to which differences in housing costs reflect quality differences that have partly shaped housing choices, in which case the living standard metric might be insufficiently sensitive to differences in housing quality).

The case for making adjustments for housing is supported by some recent poverty research (Waldegrave and Sawrey 1994 and Stephens et al. 2000). Support is also provided by the observation that the existence of subsidised housing, particularly the re-introduction of income-related rents for state houses, creates a degree of distortion in a metric without some adjustment. For example, two families on similar incomes in the same neighbourhood, one in a state-subsidised house and the other renting privately, would result in the state house tenant having a higher standard of living for a given level of income. The HEDY metric would reflect this while the EDY metric would not.

Given that both metrics offer cause for reservation, the important issue becomes which is the more valid. Work carried out to date suggests to the authors a tentative conclusion in favour of the HEDY metric, but this needs to be established more authoritatively through analyses of data not currently available.

Various results have been produced that permit a limited range of comparisons between the properties of the two metrics (EDY and HEDY). For the purposes of the comparisons, it was necessary to use thresholds for the HEDY metric that were derived (in the manner described) from previously set EDY thresholds. All of the reported results using the HEDY metric are based on those particular thresholds. The thresholds were chosen for the purpose of facilitating the clarification of a methodological issue. Those particular thresholds would not necessarily be the best ones to use for continuing social monitoring of living standards.

In relation to that latter purpose (social monitoring), an important issue that arises concerns the “meaning” of the thresholds used, in terms of the living standard levels that they represent. That issue has not been addressed in the present paper. One way of approaching it would be to provide descriptions of the people who are at the thresholds in terms of such people’s possessions and household amenities, and the extent to which they are constrained in basic types of consumption (e.g. food, clothing, recreation, seeking medical care when sick, etc.). It is hoped to be able to provide information of this type through future work, along with the previously mentioned additional work on which of the metrics is to be preferred.

APPENDIX ONE: THE ECONOMIC FAMILY UNIT

The economic family unit refers to a person who is financially independent or a group of people who usually reside together and are financially interdependent according to current social norms. A young adult member of the family is “financially independent” if they are aged 18 years and over or, if aged 16-17 years, they are either receiving a social welfare benefit in their own right or engaged in full-time employment.

The economic family unit is essentially the unit of eligibility for core income-tested Social Security benefits. A single household can be made up of several economic family units with different incomes.

Economic family units have been referred to by other names, including family core economic units, core support units and British minimal household units.

In practice, economic family units have one of four forms:

- Single adult not caring for dependent children (see above);
- Single adult caring for one or more dependent children;
- Couple (whether in a legal or “social” marriage relationship) not caring for dependent children; and
- Couple (whether in a legal or “social” marriage relationship) caring for one or more dependent children.

Working Example of Conversion of a Household Unit into Economic Family Units

Suppose a household comprises:

- one grandparent;
- one couple with two dependent children;
- two adult children; and
- one unrelated adult boarder.

This household contains five economic families, specifically:

- the grandparent;
- the couple with two dependent children;
- the first adult child;
- the second adult child; and
- the boarder.

APPENDIX TWO: FORMAL SPECIFICATION OF THE HEDY METRIC

The HEDY metric is specified by five essential features:

1. It relates to the economic family unit (EF), as previously defined;
- 2 and 3. It derives from the economic family's after-tax income minus its net housing cost. Housing costs have been equally apportioned between the adults in an economic family unit. Housing costs include property rent, mortgage payments, payments to local authorities, rent of private dwellings, boarding-house and student accommodation not paid with formal fees;
4. The above amount (income minus housing cost) is equivalised using the Revised Jensen Equivalence Scale (RJS);
5. The (income minus housing cost) amounts are inflation-adjusted using the CPI for all groups less housing, with the "real" amounts for all years being expressed in 2000 dollars.

Definitions

For any particular year,

E_{Fi} = economic family i

a_i = number of adult members of E_{Fi}

c_i = number of child members of E_{Fi}

Y_i = after-tax income of E_{Fi} (in "real" 2000 \$)

H_i = housing cost of E_{Fi} (in "real" 2000 \$)

$HEDY_i$ = for E_{Fi} , after-tax income minus housing cost, equivalised

$$\text{Then } HEDY_i = \frac{Y_i - H_i}{(a_i + 0.730348 * c_i)^{0.621488}}$$

The corresponding value for the EDY metric is given by

$$EDY_i = \frac{Y_i}{(a_i + 0.730348 * c_i)^{0.621488}}$$

where inflation adjustment of Y has been made using CPI for all groups.

APPENDIX THREE: THRESHOLDS FOR THE EDY AND HEDY LINES

Annual results are given in the paper for proportions of economic family units below the lower and higher thresholds for the EDY and HEDY metrics.

These proportions are formally specified as follows.

For an economic family in year t , HEDY refers to HEDY $_i$ as defined in Appendix Two, with the subscripted i dropped for convenience.

The values of the lowest, third highest, second highest and highest thresholds on the EDY metric are designated T^*_L , T^*_T , T^*_S , and T^*_H . The corresponding thresholds on the HEDY metric are designated T_L , T_T , T_S , T_H .

That is:

$$\begin{array}{ll} P^*_{L,t} \equiv P_t(\text{EDY} < T^*_L) & P_{L,t} \equiv P_t(\text{HEDY} < T_L) \\ P^*_{T,t} \equiv P_t(\text{EDY} < T^*_T) & P_{T,t} \equiv P_t(\text{HEDY} < T_T) \\ P^*_{S,t} \equiv P_t(\text{EDY} < T^*_S) & P_{S,t} \equiv P_t(\text{HEDY} < T_S) \\ P^*_{H,t} \equiv P_t(\text{EDY} < T^*_H) & P_{H,t} \equiv P_t(\text{HEDY} < T_H) \end{array}$$

The reported results have been calculated using the following threshold values (annual amount in 2000 \$):

Thresholds	EDY Metric		HEDY Metric	
Lowest	7,499	(T^*_L)	4,556	(T_L)
Third	9,941	(T^*_T)	6,871	(T_T)
Second	10,770	(T^*_S)	8,692	(T_S)
Highest	11,699	(T^*_H)	9,652	(T_H)

Then for the EDY metric, $P^*_{L,t}$ is the proportion of economic families below the lowest threshold in year t . Similarly, $P^*_{T,t}$, $P^*_{S,t}$, and $P^*_{H,t}$ are the proportions below the third highest, second highest and highest thresholds for the EDY metric. The corresponding proportions below the HEDY thresholds are $P_{L,t}$, $P_{T,t}$, $P_{S,t}$ and $P_{H,t}$.

APPENDIX FOUR: VALUES FOR THE LOWEST AND HIGHEST ANALYTICAL
THRESHOLDS REFERRED TO IN THIS PAPER, FOR VARIOUS TYPES OF
ECONOMIC FAMILIES EXPRESSED IN 2000 DOLLARS

As an aid to interpreting the results for proportions below the lowest and highest thresholds, the thresholds have been translated into 2000 dollar amounts for various types of economic families. For compactness, the amounts are presented just for the lowest and highest thresholds, and not for the third and second thresholds that have been referred to in this paper.

For different economic family types: amounts corresponding to the lowest HEDY and EDY thresholds: 2000 \$

Economic family type	After-tax income minus housing cost (per week) (Lowest HEDY threshold)	After-tax income assuming 30% of income spent on housing cost (Lowest HEDY threshold)	After-tax income assuming 50% of income spent on housing cost (Lowest HEDY threshold)	After-tax income (Lowest EDY threshold)
Single adult	\$88	\$125	\$175	\$144
Couple	\$135	\$193	\$270	\$222
Single adult + 1 child	\$123	\$176	\$246	\$203
Single adult + 2 children	\$153	\$219	\$307	\$252
Single adult + 3 children	\$180	\$257	\$360	\$297
Single adult + 4 children	\$205	\$293	\$410	\$337
Couple + 1 child	\$164	\$234	\$327	\$269
Couple + 2 children	\$190	\$271	\$379	\$312
Couple + 3 children	\$213	\$305	\$427	\$351
Couple + 4 children	\$236	\$337	\$472	\$388

For different economic family types: amounts corresponding to the highest HEDY and EDY thresholds: 2000 \$

Economic family type	After-tax income minus housing cost (per week) (Highest HEDY threshold)	After-tax income assuming 30% of income spent on housing cost (Highest HEDY threshold)	After-tax income assuming 50% of income spent on housing cost (Highest HEDY threshold)	After-tax income (Highest EDY threshold)
Single adult	\$186	\$265	\$371	\$225
Couple	\$286	\$408	\$571	\$346
Single adult + 1 child	\$261	\$373	\$522	\$316
Single adult + 2 children	\$325	\$464	\$650	\$394
Single adult + 3 children	\$382	\$545	\$764	\$463
Single adult + 4 children	\$434	\$620	\$868	\$526
Couple + 1 child	\$347	\$495	\$693	\$420
Couple + 2 children	\$402	\$574	\$803	\$487
Couple + 3 children	\$452	\$646	\$905	\$548
Couple + 4 children	\$500	\$714	\$999	\$606

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