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Low income measurement; what do different measures tell us

Sylvie Michaud, Preston Poon
Statistics Canada

For additional information please contact:
Author Name(s) : Sylvie Michaud or Preston Poon
Author Address(es) : Income Statistics Division, Statistics Canada, Jean-Talon building, K1A-0T6
Author E-Mail(s) : michsyl@statcan.ca
Author FAX(es) : (613) 951-0085
Author Telephone(s) : (613) 951-9482

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Author FAX(es) : (613) 951-0085
Author Telephone(s) : (613) 951-9482

Executive summary

Currently, Canada has no official measure of poverty. The key reasons for this are the absence of consensus on the meaning of poverty and a lack of consensus on how to measure income poverty. The approach can be relative, usually based on a percentage of average or median income, adjusted to take household size into account. Or alternatively, an absolute measure can be used where a specific standard of living is represented by the cost of a basket of goods and services.

While there is no official measure of poverty in Canada, Statistics Canada has been producing Low Income Cut-offs (LICOs) for the past 40 years. These lines are calculated to indicate an income threshold below which a family is likely to spend significantly more on food, clothing or shelter than the average family. There are separate cut-offs for seven sizes of family – from unattached individuals to families of seven or more persons – and for five community sizes – from rural areas to urban areas with a population of more than 500,000. The LICO is neither a pure relative measure nor an absolute measure; the same thresholds (updated for inflation) have been used since 1992.

In the late 1990s, a Federal/Provincial/Territorial Working Group on Social Development Research and Information recommended the creation of an absolute measure of low income called the Market Basket Measure (MBM). The MBM represents the cost of a basket that includes: a nutritious diet, clothing and footwear, shelter, transportation, and other necessary goods and services (such as personal care items or household supplies). The cost of the basket is compared to a disposable income concept for each family to determine low income rates and is calculated for 48 areas. The MBM, although produced by STC, is under the responsibility of Human Resources and Social Development Canada.

Since 1991, a low-income measure (LIM) has been released every year. The LIM is a relative low income measure defined as half the median family income; where the family income is adjusted to take into account equivalence scales. Another LIM based measure has been suggested by Corak (2005); with the difference being that the LIM would be anchored in time and serve as an absolute type measure of low-income.

A number of countries feature more than one low-income rate as part of their release of low-income measures (the US now has over 20 alternate low –income indicators, while the UK appears to have three indicators). In Europe, a set of indicators known as the Laeken Indicators has been developed. The measures based on income are LIM type measures however a number of longitudinal indicators looking at persistence are also produced.

More recently in Canada, pressure has been growing to start featuring a multitude of indicators of low-income. The purpose of this paper is to examine low-income rates and see how trends vary depending on the indicator used. The paper also examines the impact of the choice of the income measure on the low-income rates.

A number of findings come out of the paper. First, relative measures and absolute measures show a different trend, especially since the start of the new millennium. While the absolute measures show decreases, the relative measures are either flat or show very slight increases. Second, in the years examined, the movement away from a concept of income after-tax to a disposable income concept increases the low-income rate by about two percent. Third, although the LICO and the MBM show similar results at the Canada level when using the same income concept, the two measures give significantly different results in terms of provincial ranking.

Finally, results show that in general for those who remain *above* the low income threshold no matter which income concept (after-tax or disposable) is used, payroll deductions are usually the most important deduction. For those *below* the low income threshold, medical expenses are the largest deduction, and this holds true for all family types. For those who flip-flop across the low income threshold depending on the income concept used, different deductions (medical expenses, support payments or child care) are responsible depending on the family type.

1. Description of the measures

Statistics Canada produces several measures of low income, each with their own history, conceptual approaches, strengths and weaknesses. The three main low income measures are the Low Income Cut-offs (LICOs), the Low Income Measures (LIMs), and the Market Basket Measure (MBM).

1.1 The Low Income Cut-off

The LICOs were first published in 1967 in Incomes of Canadians, written by Jenny Podoluk as part of the 1961 Census monograph series. These LICOs were based on the 1959 Family Expenditure Survey (FAMEX) data. The approach was to construct an income threshold at which a family would typically spend 20 percentage points more than the average on the necessities of food, shelter and clothing. Five cut-offs were published, corresponding to families of size one to five, with no urban/rural dimension. These thresholds were compared to family income from Statistics Canada's major income survey, the Survey of Consumer Finances (SCF) to produce low income rates. Today's cut-offs utilize the same approach but now cover 7 family sizes and 5 sizes of area of residence (rural plus five different urban sizes) for a total of 35 cut-offs.

The latest LICOs are based on the 1992 Famex.[1] Chart 1 uses data from the 1992 FAMEX to illustrate how a LICO is calculated. Each dot in the chart represents the after-tax income and the percentage of after-tax income spent on food, shelter and clothing for a family of four living in an urban area with a population of 30,000 to 99,999. The solid horizontal line in Chart 1 shows the average spent on food, shelter and clothing by all households; in 1992 this was 43.6% of after-tax income. The LICO methodology then adds 20 percentage points to this average, representing the situation of a family that is spending significantly more than the average on necessities. The corresponding after-tax income at which the regression line equals 63.6% is the after-tax LICO for this particular group ($21,300 in this case). For simplicity, Chart 1 shows the calculation of an after-tax low income cut-off for a specific family size in a specific urban size class. In fact, all 35 after-tax low income cut-offs are produced together by one regression that covers the seven family sizes and the five sizes of area of residence. The same exercise is also carried out using total income to generate a set of 35 total income cut-offs. For the years between base years, the LICOs are updated annually using the change in prices as measured by the all-items Consumer Price Index (CPI). For example, the 1993 LICOs were calculated by multiplying the 1992 LICOs by the increase in the all items CPI (1992 CPI =100.0, 1993 CPI=101.8 -> growth of 1.8%).

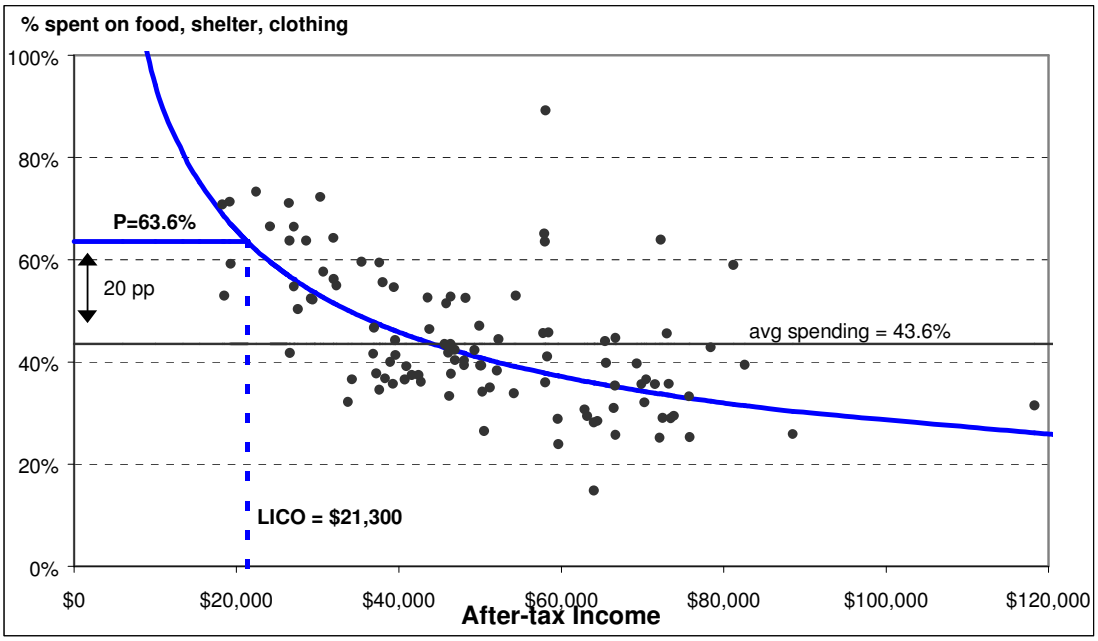
The main advantage of using the LICOs to describe the incidence of low income is its long history. Statistics Canada has produced low income cut-offs using the LICO methodology since the 1960s, providing readily available data which span a relatively long period of time and thus are useful for monitoring trends over time. Another advantage of the LICO is the hybrid approach it takes to reporting low income data—incorporating both relative and absolute aspects. That is, the relationship between income and the proportion spent on the necessities of food, shelter and clothing is at the heart of the low-income cut-offs, which is a unique approach to measuring low income. At the time it is calculated in the base year, the LICO is a purely relative measure: a family's spending is viewed in the context of average spending on necessities by all families in Canada. However, annual updating using the CPI introduces an absolute dimension to

[1] The LICOs were rebased every four to six years corresponding with a new FAMEX survey. In fact, the LICOs were rebased in 1969, 1978, 1986 and finally in 1992. The only FAMEX year that the LICOs were not rebased was 1982 because the differences between 1978 and 1982 were not significant enough to justify a break in the time series.

the LICOs. Since the last update of the LICOs has been done in 1992, it is considered more an absolute measure.

The most common criticism of the LICOs is that they do not adequately account for geographical differences since the cut-offs are based on size of area of residence and family size only. As such, only one cut-off is derived for all large urban areas with a population greater than 500,000 even though it is readily apparent that the costs for necessities varies significantly from city to city. Other criticisms have focused on the complex method and the definition of necessities. [2] As can be seen from the table in Appendix 1, the LICO has an implicit equivalent scale obtained through the model which is quite different from the scale obtained through other measures.

Chart 1.



1.2 The Low Income Measure

Internationally, the LIM is the most commonly used low income measure. Statistics Canada has been publishing the LIMs since 1991, although they are available back to 1980. In simple terms, the LIM is defined as half (50%) of the median family income, where family size and composition are taken into account. To adjust for family size and composition, the following equivalence scale is used: the oldest person is assigned a value of 1.0, the second oldest person 0.4, all other family members ages 16 and over a value of 0.4, and all other family members under age 16 a value of 0.3 After dividing each family's income by their equivalence scale, the resulting values can then be compared since they are now on the same basis (i.e., equivalent family units). The LIM for a 1 adult family is calculated as being half of the median of the newly adjusted family incomes. LIMs for other family sizes are then obtained by multiplying the LIM for one adult by the same equivalence scale.

[2] See Evans and Wolfson (Statistics Canada's Low Income Cut-offs Methodological Concerns and Possibilities) or Cotton, Webber and Saint-Pierre (Should the Low Income Cut-offs be updated? A Discussion Paper) for more details.

Given the LIM's relative simplicity, the main advantages are its ease of understanding and its comparability internationally. It has been criticized however for being less sensitive to economic fluctuations; a result of being a purely relative measure.

1.3 The Market Basket Measure(MBM)

The MBM is an experimental measure developed by an intergovernmental Working Group on Social Development Research and Information. It is an absolute low income measure that attempts to define a standard of living that is a balance between subsistence and social inclusion. It is built around the cost of a basket of goods and services that would allow a family to: eat a nutritious diet; buy clothing for work and social occasions; house themselves in their community; satisfy basic transportation needs for work, school, shopping, community activities; and pay for other necessary expenses. The MBM includes 5 major components (food, shelter, transportation, clothing, other expenses) which are priced for a reference family of four (2 adults, 2 children) for different geographic areas. Forty-eight cut-offs are derived to represent the costs of the basket in various parts of the country (see Appendix 3 for the 2003 MBM cut-offs). The same equivalence scale as the LIM is applied to derive cut-offs of different family sizes.

Once the cost of the basket has been established, a family is considered to be above the MBM line if it has enough income to purchase the basket and below the line if it does not. Non-discretionary expenditures are subtracted from total income to determine how much money is actually available to purchase the basket. The following expenses are subtracted from total family income to derive the "MBM disposable income": federal, provincial and territorial income taxes; employee portion of payroll taxes; union and professional dues; child care costs incurred to enable both parents (or a lone parent) to work; child support payments made by non-custodial parents; and out-of-pocket costs of medically prescribed expenditures for drugs, dental and vision care.

The MBM is meant to provide an alternative picture of low-income to the one provided by the LICO. While the MBM methodology is fairly easy to understand, the methodology behind the calculation is more complex because the data needed to compile the information comes from a variety of sources.

Food and clothing are based on the price for a nutritious food basket and on the cost of a basket of clothing. The shelter cost is based on the average of the median rent of a two and a three bedroom apartment. A macro-adjustment is done at the provincial level to reflect the fact that appliances are included in apartments at varying rates among provinces. When public transportation is available in a city, the transportation costs are based on the cost of using such a service. In areas where it is not available, the cost is based on the cost of having to use a car (assuming the purchase and maintenance of a used car). The multiplier is based on the expenditure survey.

The measurement of a basket in forty eight locations and the ability to have provincial thresholds has been highlighted as advantages of the MBM. The criticisms have been related to the fact that it is a fairly new measure that has not been released systematically yet. The basket is not final yet and there have been questions around the mechanisms that need to be put in place to update the measure.

1.4 Laeken indicators

In their battle against poverty and social exclusion, EU members agreed to a set of common statistical indicators they could use for comparison purposes. In principle, the indicators present

the multidimensional aspect of social exclusion; as such they cover financial poverty, employment, health and education. An initial set of 18 indicators (10 primary and 8 secondary) was endorsed by the Laeken European Council in 2001. This was followed, in 2003, by a revised set of indicators which added 2 more primary indicators and another secondary indicator for a total of 21. The indicators are diverse and range from an at-risk-of-poverty rate (based on the share of persons with an equivalised disposable income below 60% of the national median equivalised disposable income) to a long-term unemployment rate (long-term being defined as >= 12 months) to measures of life expectancy and literacy (Appendix 2 for the complete list).

1.5 Measured anchored in time

In his paper on measuring child poverty (2005), Corak suggests that the labelling of absolute and relative poverty lines may lead to some confusion and that instead they should be referred to as fixed and a moving poverty lines. One fixed poverty line that could allow comparisons between countries would be to use a simple relative low-income measure (such as the LIM) anchored at a given moment in time which would then be adjusted it each year by an inflation factor (in Canada the all-items CPI index).

2. Data source and results

2.1 Methodology

Low income rates are calculated using data from the Survey of Labour and Income Dynamics (SLID); the official source of cross-sectional income estimates in Canada. SLID is a panel survey with an overlapping design with respondents being selected from a sub-sample of respondents from the Canadian Labour Force Survey. Longitudinal respondents are interviewed once a year in January for a period of six years. The first panel - introduced in January 1994 - asked retrospective information mostly on family composition, labour market activity and income for the previous calendar year. The next new panel was introduced three years later. For any given year, income estimates are produced on a sample of roughly 30,000 households. SLID became the official source of income statistics in 1996 and so the comparisons in the following sections will be limited to starting from 1996. To provide some context on the Canadian economy in 1996, it represented the year in which low-income was at it's highest in Canada since the early 1990's.

For purposes of comparisons, three measures will be labelled in the group of "absolute" low-income measures (or fixed measure).Although the LICO is neither a pure absolute nor relative measure; as mentioned previously, given that the last thresholds have not been revised since 1992 (they have only been updated through inflation), one could argue that they are probably close to an absolute measure.

The MBM can also be labelled as an absolute measure. Officially released data is available for the years 2000, 2001 and 2002. Two MBM rates are calculated; even though the MBM thresholds do not change, the MBM as specified is based on a different income concept called the MBM disposable income (DI) which is defined as total income after income taxes have been removed and other specified non-discretionary expenses: payroll deductions such as Canada Pension Plan and Employment Insurance, registered pension plan deductions, union or professional dues including liability insurance premiums, child or spousal support payments paid on a regular basis, work related child care expenses, out-of-pocket medical expenses and public health insurance premiums. Users of low income statistics based on Statistics Canada's Low

Income Cut-offs (LICOs) are accustomed to seeing low income rates based on after-tax income. To see the impact of the income concept on the low-income rates, MBM rates are calculated hypothetically, using the income after-tax concept. Since by definition disposable income is lower than after-tax income, the rates will be higher and the extent to which it happens will be examined.

Finally, the third absolute measure is the anchored LIM. It uses the 1992 LIM (1992 also corresponds to the year when the LICO was last updated) and is inflated for subsequent years using the Consumer Price Index.

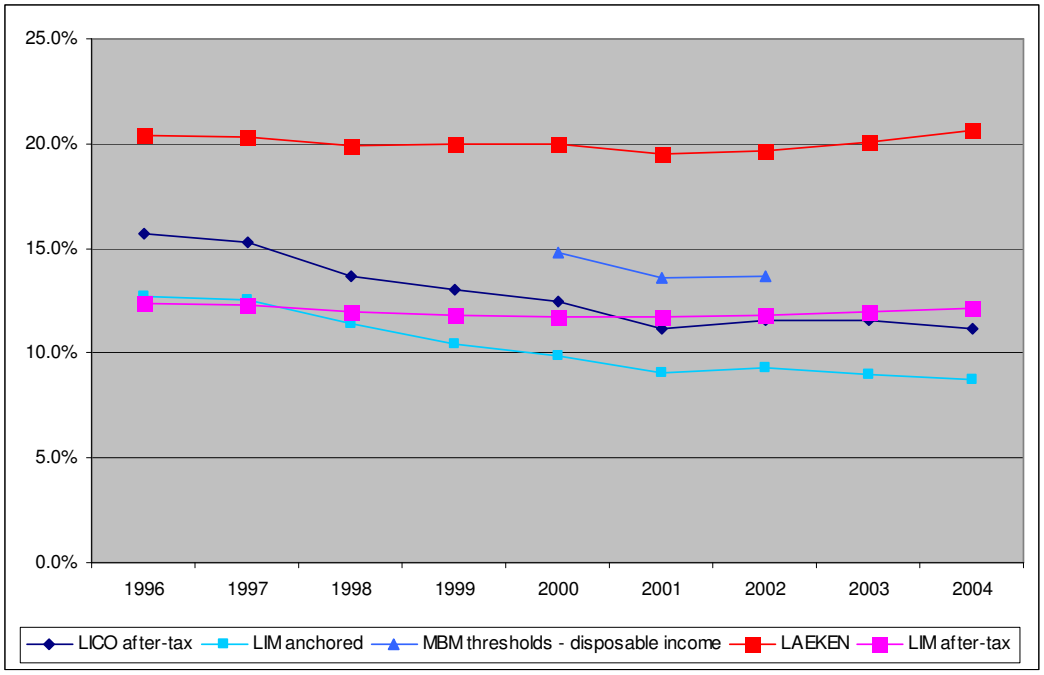
Two relative measures are also examined. The LIMs have been calculated, based on income after-tax. As mentioned earlier, they correspond to 50% of the median adjusted income. The second measure is based in principle on the LIM based measure from the Laeken set of indicators. It differs slightly in two respects: it is calculated based on income after-tax while the Laeken specification is based on disposable income. Secondly, the equivalence scale used is the LIM scale rather than the modified OECD scale. The threshold of 60% of the adjusted after-tax income is used while other thresholds based on 40%, 50% and 70% are also calculated. Persistence of low-income is also examined in the context of the various measures using the longitudinal nature of SLID.

2.2 Results

2.2.1 Low income rates

As can be seen from Chart 2, the relative measures (shades of blue) and the absolute measures (shades of red) show different trends. While the absolute measures show a decrease, the relative measures are either flat or show a slight increase. The decrease in the LICO and the LIM anchored series is a reflection of the growth in family income outpacing the growth in inflation. In contrast, the Laeken and LIM measures show a relatively flat trend.

Chart 2. Low income rates – Canada (person level) using various low-income measures (source: SLID)



The use of a relative measure has the largest impact on seniors (Table 1). Both the LIM and the Laeken show an upward trend while the absolute measures are either flat or trend downwards. The lowest trend line is the anchored LIM where rates are fairly constant since 1996. Transfers (old age security, guaranteed income supplement and Canada Pension Plan/Quebec Pension Plan) represent the major source of income for seniors, most of which are indexed to inflation. In this context, the flatness of the trend simply reflects the fact that the anchored LIM cut-offs and transfers are inflated by roughly the same inflation factors. The decreasing trend in the LICO reflects in part a geographic shift whereby over the timeframe, a smaller proportion of seniors are living in the largest urban category which has the highest LICO. This shift is not reflected in the anchored LIM since the LIM does not account for geographical differences.

Table 1. Low income rates by age group (source: SLID)

		1996	1997	1998	1999	2000	2001	2002	2003	2004
<16	LICO after-tax	19.1%	18.3%	16.1%	15.0%	14.5%	12.6%	12.6%	13.0%	13.1%
	LIM anchored	16.6%	16.3%	14.2%	12.9%	11.7%	10.8%	10.7%	11.1%	10.1%
	MBM thresholds - disposable income					19.0%	17.2%	17.3%		
	LAEKEN	25.6%	24.9%	24.5%	24.3%	24.4%	23.3%	23.6%	24.5%	25.1%
	LIM after-tax	16.1%	15.9%	15.0%	14.4%	13.9%	13.9%	14.0%	14.4%	14.6%
16 to 24	LICO after-tax	22.6%	21.4%	18.4%	16.7%	15.7%	15.2%	17.3%	17.1%	16.0%
	LIM anchored	20.1%	18.6%	16.4%	14.3%	13.7%	13.5%	14.9%	14.9%	13.9%
	MBM thresholds - disposable income					18.7%	18.0%	19.4%		
	LAEKEN	28.2%	26.8%	24.6%	23.8%	23.3%	23.9%	25.3%	25.8%	26.2%
	LIM after-tax	19.6%	18.4%	17.2%	15.9%	15.5%	16.4%	17.6%	18.1%	17.5%
25 to 64	LICO after-tax	14.1%	14.1%	12.8%	12.5%	12.1%	10.8%	10.8%	11.0%	10.7%
	LIM anchored	11.8%	11.9%	11.2%	10.5%	10.0%	9.0%	9.1%	9.2%	8.8%
	MBM thresholds - disposable income					14.4%	13.1%	12.9%		
	LAEKEN	18.0%	18.3%	17.8%	18.1%	18.1%	17.4%	17.2%	17.6%	18.1%
	LIM after-tax	11.5%	11.7%	11.6%	11.6%	11.6%	11.3%	11.1%	11.4%	11.6%
65 and over	LICO after-tax	9.8%	9.1%	8.6%	7.8%	7.6%	6.7%	7.6%	6.8%	5.6%
	LIM anchored	2.3%	2.4%	2.5%	1.8%	2.2%	2.1%	2.3%	2.2%	1.7%
	MBM thresholds - disposable income					5.8%	5.5%	5.6%		
	LAEKEN	13.9%	14.7%	16.4%	17.3%	17.9%	18.3%	19.0%	18.7%	19.0%
	LIM after-tax	2.2%	2.3%	2.9%	3.7%	4.4%	4.7%	5.5%	5.0%	4.9%

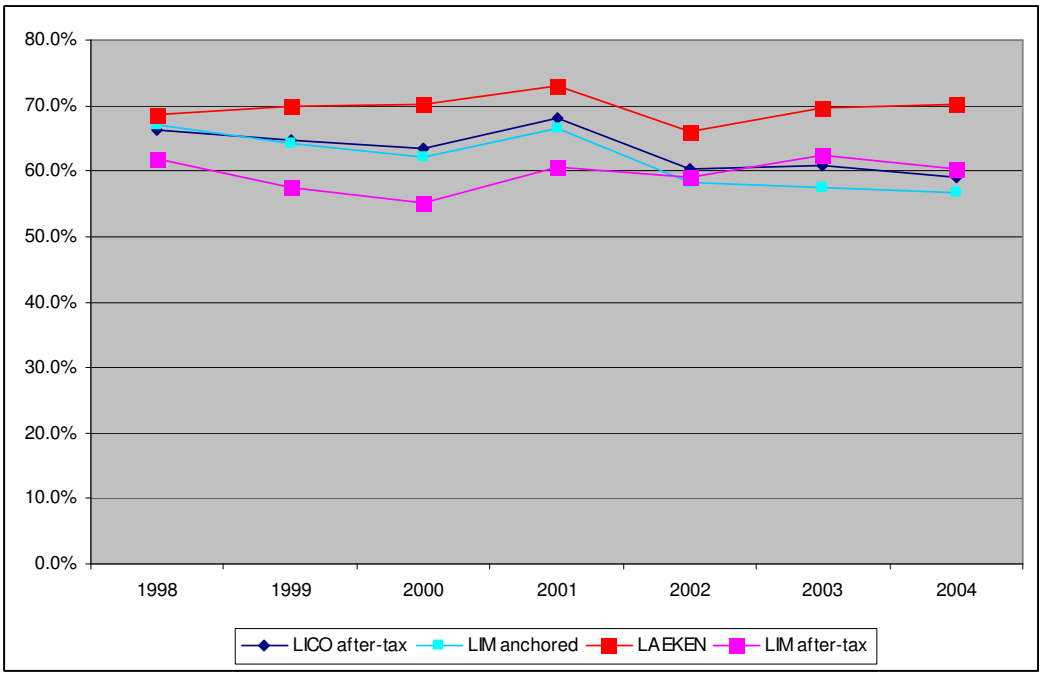
The increases in the LIM and the Laeken are a result of the average and median income of seniors not rising as fast as what has been observed for the rest of the population. This makes sense in the context of a growing economy where wage/income growth has outpaced inflation. As mentioned previously, although seniors have seen an increase in their market income, transfers still remain the highest percentage of the income. Since these programs are indexed only by

inflation, incomes for seniors have grown less than the relative measures. The Laeken are also much higher than the LIM indicating a fair concentration of seniors between the 50% (LIM) and 60% (Laeken) thresholds.[3]

2.2.2 Persistence of low income

Persistence is defined as being under the low income threshold for the current year and for at least two of the three previous years. All the measures show that the persistence rate is fairly high with on average two thirds of people being persistently under the low income cut-off (Chart 3). The movements are similar for all the measures with the absolute measures (LICO and LIM anchored) again tracking very closely with one another.

Chart 3. Persistence of low income for various low-income measures (source: SLID)



By age, independent the choice of measure the persistence of low-income is the highest for the youngest group (Table 2). Persistence hovers between 63% and 78% for this group; in contrast, persistence for those in the 25 to 64 group varies between 58% and 74% and for the group 16 to 24, 43% to 62%. The choice of measure for seniors is again very important with a great deal of variability depending on which one is chosen.

[3] Some of this is due to a difference in how weights are applied in determining the relevant medians. The LIMs are calculated based on a family weight while the Laekens are based on individual weights. Nonetheless, comparisons between a 50% based Laeken and a 60% based one still show this same phenomenon. In 2004, the gap between a 50% and 60% Laeken was nearly 12% (7.1% versus 19%).

Table 2. Persistence of low income by age group (source: SLID)

		1998	1999	2000	2001	2002	2003	2004
<16	LICO after-tax	75.1%	70.9%	69.0%	69.7%	67.6%	66.4%	67.1%
	LIM anchored	75.9%	71.7%	69.7%	70.0%	66.5%	63.7%	68.6%
	LAEKEN	74.3%	78.2%	77.6%	77.8%	73.2%	76.6%	76.7%
	LIM after-tax	70.3%	65.5%	63.1%	63.2%	67.3%	70.0%	70.8%
16 to 24	LICO after-tax	51.4%	52.2%	45.6%	47.7%	42.6%	49.2%	46.2%
	LIM anchored	55.2%	54.3%	48.2%	47.5%	42.7%	46.6%	46.1%
	LAEKEN	60.7%	61.6%	62.4%	61.3%	55.4%	62.1%	62.1%
	LIM after-tax	53.3%	50.8%	44.0%	43.9%	43.0%	51.8%	51.0%
25 to 64	LICO after-tax	67.3%	65.0%	65.0%	70.3%	61.9%	63.0%	59.2%
	LIM anchored	68.2%	65.4%	63.9%	69.3%	60.9%	59.5%	57.5%
	LAEKEN	69.8%	70.0%	69.7%	74.0%	67.4%	69.8%	68.6%
	LIM after-tax	62.7%	59.9%	58.3%	64.3%	62.4%	64.1%	60.7%
65 and over	LICO after-tax	68.6%	71.1%	69.8%	82.1%	67.4%	57.4%	64.4%
	LIM anchored	60.5%	54.1%	52.6%	75.0%	49.7%	43.2%	41.7%
	LAEKEN	64.9%	64.4%	69.1%	74.2%	61.7%	67.3%	74.2%
	LIM after-tax	36.7%	20.2%	22.3%	56.2%	46.8%	50.6%	51.1%

The longitudinal design of SLID may contribute to some of the volatility in these longitudinal persistence type measures. Since a new panel is introduced every three years, there will be seams where estimates will shift from being based on one panel to another. For example, persistence for the year 2002 was based on Panel 3 while persistence for the year 2001 was based on panel 2.

2.2.3 Low income by province

The various absolute measures also show some important differences at the provincial level with Quebec going from being the province with one of the highest rates (LICO) to the province with the lowest rate (MBM)(Table 3). These provincial differences are a result of both a change in income concepts and a change in the actual thresholds/method. In order to isolate these effects, 2 separate comparisons are made:

LICO after-tax versus MBM after-tax -> pure change in threshold/method

MBM after-tax versus MBM disposable income -> pure income concept change

Table 3. Low income rates by province for 2002 (source: SLID)

	LICO	LIM anchored	MBM - disposable income
Province			
Newfoundland and Labrador	11.40%	13.70%	21.30%
Prince Edward Island	7.30%	8.00%	13.00%
Nova Scotia	9.90%	10.70%	16.40%
New Brunswick	9.70%	10.40%	15.50%
Quebec	12.30%	9.60%	11.00%
Ontario	10.70%	8.00%	12.30%
Manitoba	12.20%	10.40%	13.70%
Saskatchewan	8.60%	10.70%	13.20%
Alberta	9.30%	7.30%	11.30%
British Columbia	16.00%	12.30%	22.50%
Canada	11.60%	9.30%	13.70%

When comparing the LICO rate versus the MBM – after-tax rate, the impacts are largest in the Atlantic Provinces, Saskatchewan and Quebec (Table 4). The province of Quebec goes from having the second highest LICO rate in 2002 to having the second lowest rate when using the MBM threshold. These provincial differences are expected given that the MBM thresholds are based on a more detailed level of geography; 48 separate thresholds versus 5 for the LICO. For example, in determining the LICO for large cities such as Vancouver, Montreal and Toronto; they are grouped with other cities with populations greater than 500,000 and one threshold is calculated for all of them. This is done in spite of the fact that shelter costs are quite different between the cities. This same method is employed for the other urban size categories as well. In contrast, for the MBM separate baskets are calculated for each of 48 geographies (see Table 5 for some comparisons). Some of the differences are also due to the fact that the threshold in the MBM includes costs for transportation while this is not the case for the LICO. The cost for transportation is much higher in the areas that do not have public transportation (rural areas and smaller towns). This explains in part the higher rates in the Atlantic provinces.

Finally, it should be noted that while most of the differences can be attributed to geography; part may be due to the different equivalence scales that are used and/or differences in a spending based measure (LICO) versus a cost of a fixed basket based measure (MBM). More works needs to be done in this area.

Table 4. Low income rates by province for 2002, after-tax income concept (source: SLID)

	LICO	MBM - after-tax income	Difference
Province			
Newfoundland and Labrador	11.40%	17.50%	6.10%
Prince Edward Island	7.30%	10.70%	3.40%
Nova Scotia	9.90%	13.10%	3.20%
New Brunswick	9.70%	12.80%	3.10%
Quebec	12.30%	9.50%	-2.80%
Ontario	10.70%	10.70%	0.00%
Manitoba	12.20%	11.40%	-0.80%
Saskatchewan	8.60%	11.20%	2.60%
Alberta	9.30%	8.70%	-0.60%
British Columbia	16.00%	17.80%	1.80%
Canada	11.60%	11.40%	-0.20%

Table 5. Threshold comparisons, MBM based versus LICO based (source: HRSD and ISD)

	Newfoundland and Labrador			
		family of 4	couple	single
LICO	100,000 to 499,999	25,737	16,567	13,612
	Less than 30,000	22,784	14,667	12,050
	rural	19,908	12,815	10,529
MBM	St. John's (100,000 to 499,999)	24,825	17,378	12,413
	Less than 30,000	26,684	18,679	13,342
	rural	26,152	18,306	13,076

	Quebec			
		family of 4	couple	single
LICO	500,000 and over	30,433	19,590	16,096
MBM	Montreal (500,000 and over)	23,522	16,465	11,761
	Quebec City (500,000 and over)	23,278	16,295	11,639

	Ontario			
		family of 4	couple	single
LICO	500,000 and over	30,433	19,590	16,096

MBM	Toronto (500,000 and over)	29,343	20,540	14,672
	Ottawa (500,000 and over)	27,708	19,396	13,854

	British Columbia			
		family of 4	couple	single
LICO	500,000 and over	30,433	19,590	16,096
	100,000 to 499,999	25,737	16,567	13,612
	30,000 to 99,999	25,417	16,361	13,442
	Less than 30,000	22,784	14,667	12,050
	rural	19,908	12,815	10,529
MBM	Vancouver (500,000 and over)	28,944	20,261	14,472
	Victoria (100,000 to 499,999)	27,318	19,123	13,659
	30,000 to 99,999	25,475	17,833	12,738
	Less than 30,000	27,670	19,369	13,835
	rural	27,597	19,318	13,799

As expected, the use of disposable income rather than after-tax income has the effect of increasing all the low income rates (Table 6). The impact of the increase is different however depending on a variety of things. For example, the government of Quebec provides a low cost child care program; thus the effect of subtracting child care costs from after-tax income has a smaller effect in Quebec. Another example is the subtraction of medical expenses. In the province of British Columbia, this reduction is important since a large number of seniors live in the province. The use of disposable income versus after-tax income will be further discussed in the following section.

Table 6. MBM Low income rates – change in income concept (source: SLID)

	MBM - after-tax income	MBM - disposable income	Difference
Province			
Newfoundland and Labrador	17.50%	21.30%	3.80%
Prince Edward Island	10.70%	13.00%	2.30%
Nova Scotia	13.10%	16.40%	3.30%
New Brunswick	12.80%	15.50%	2.70%
Quebec	9.50%	11.00%	1.50%
Ontario	10.70%	12.30%	1.60%
Manitoba	11.40%	13.70%	2.30%
Saskatchewan	11.20%	13.20%	2.00%
Alberta	8.70%	11.30%	2.60%
British Columbia	17.80%	22.50%	4.70%
Canada	11.40%	13.70%	2.30%

2.2.4 The choice of the income concept

With the implementation of the MBM, a concept of disposable income was defined. The use of disposable income instead of after-tax income to calculate low income rates based on the MBM thresholds increases the number of individuals in low income by approximately 780 thousand, from 3.5 million to 4.2 million. The result is an increase in the low income rate by 2.3 percentage points from 11.4% to 13.7% (Table 7).

Table 7. MBM low income rates 2002 using after tax income versus disposable income (source: SLID)

	No. of persons **#**	LI Rate-after-tax **%**	LI Rate-disposable **%**	Difference
Total	30,610,947	11.4	13.7	2.3
Family Type				
Unattached individuals	4,275,287	24.2	26.5	2.2
Senior	1,145,193	8.3	10.0	1.7
Non-senior	3,130,094	30.0	32.5	2.4
Economic families	26,335,660	9.3	11.6	2.3
Senior	2,611,471	4.1	5.1	1.0
Non-senior	23,724,189	9.9	12.3	2.4
Couples with no children	4,048,921	7.9	9.0	1.1
Couples with children	12,337,805	7.2	10.3	3.0
Lone-parent families	1,965,413	36.8	41.7	5.0
Other families	5,372,049	7.8	8.8	1.0

It especially increases low income rates for people living in two types of families: couples with children and lone-parent families. The fact that disposable income includes the deduction of child care costs has an effect on these families that can be seen in the low income rates for their members.

The demographic breakdowns used above highlighted the effect of childcare deductions on low income rates, but we want to examine the impact of the other deductions, such as the medical expenses and the social contributions.

To compare the use of after-tax income versus disposable income, the sample is divided into three groups:

- the above group - those not in low income no matter which income concept is used;
- the alternating group - those in low income when disposable income is used but not when after-tax income is used;
- the below group - those in low income no matter which income concept is used.

The above group represents approximately 86% of the population, the alternating group 3% and the below group 11%.

To assess the role of the various deductions, for every person, each deduction is represented as a percentage of the difference between the family after-tax income and disposable income. The results are tabulated for each of the three study groups (Table 8).

Overall, payroll deductions such as Canada or Quebec pension plan payments and employment insurance payments account for 45% of all disposable income deductions – the largest share. Medical expenses are the second largest deduction, at 18%, followed by registered pension plans at 15%, child care at 12%, union dues at 5% and support payments at 5%. However, this pattern does not hold true for all three study groups or for the different types of families.

Above group

For the above group the pattern is similar to the overall pattern. This is to be expected since the above group represents 86% of the population. Thus, payroll deductions account for 46% of the difference between after-tax income and disposable income, with medical expenses and registered pension plan contributions coming second and third at 17% and 16% respectively. This pattern differs for certain family types. For senior economic families and senior unattached individuals[4] medical payments take the number one spot accounting for 76% and 94% of all disposable income deductions respectively. Child care takes the number two spot for families where children (aged less than 18) are present. And for non-senior unattached individuals, support payments at 12%, not pension plans, take the number three spot. Overall, support payments only account for 5% of all disposable income deductions.

Below group

For the below group, made up of those who would be in low income no matter which income definition is used, medical expenses at 51%, and not payroll deductions, account for the largest share of the difference between after-tax income and disposable income. (Poor health prevents or limits labour force activity, which lowers income.) This holds true for all family types – even those with children where child care might have been expected to be the most important.

Payroll deductions are the second largest deduction for the below group at 29%, and child care is third at 11%. Exceptions to this pattern include lone-parent families where child care deductions come second at 31%. Naturally, child care deductions play no part in the calculation of disposable income for families without children. For these families medical deductions are above average at 62%.

Table 8. Components of the difference between after-tax income and disposable income (source: SLID)

	Mean *			Percentage of the difference between after-tax income and disposable income					
	ATI	DI	ATI - DI	*Payroll deductions*	*Medical expenses*	*Registered pension plans*	*Child care*	*Union dues*	*Support payments*
Total	57,236	51,838	5,398	45.4%	18.3%	15.0%	12.0%	4.9%	4.5%
above	63,617	57,644	5,973	46.3%	17.1%	15.6%	11.8%	5.0%	4.2%
alternating	28,334	22,934	5,400	23.5%	35.3%	4.2%	19.2%	1.8%	16.0%
below	14,734	13,687	1,048	28.4%	50.5%	3.2%	11.3%	1.6%	5.0%
By family type									
Unattached individuals	24,614	22,583	2,031	44.7%	21.6%	13.8%	0.4%	4.5%	14.9%

[4] Economic families consist of two or more related persons living in the same dwelling. Seniors are those 65 or over. Senior economic families are families with the major income recipient aged over 65. Unattached individuals are persons living alone or with non-relatives.

above	30,435	27,980	2,455	47.9%	17.9%	15.0%	0.5%	4.9%	13.9%
alternating	15,810	10,743	5,067	10.1%	49.2%	4.3%	0.0%	1.0%	35.4%
below	7,750	7,289	462	29.3%	52.1%	5.7%	0.0%	2.1%	10.8%
Senior	22,519	21,693	826	0.7%	93.5%	1.0%	0.0%	0.5%	4.3%
above	23,556	22,881	675	0.8%	94.1%	0.9%	0.0%	0.6%	3.5%
alternating	19,211	7,953	11,258	0.0%	91.4%	1.3%	0.0%	0.0%	7.2%
below	11,971	11,696	275	4.4%	95.6%	0.0%	0.0%	0.0%	0.0%
Non-senior	25,381	22,909	2,471	50.1%	12.8%	15.4%	0.5%	5.0%	16.2%
above	33,787	30,464	3,322	52.5%	10.4%	16.3%	0.5%	5.3%	14.9%
alternating	14,917	11,475	3,442	18.8%	13.0%	6.8%	0.0%	1.8%	59.6%
below	7,323	6,843	481	30.7%	49.6%	6.1%	0.0%	2.2%	11.4%
Economic families	62,532	56,588	5,944	45.4%	18.1%	15.1%	12.6%	4.9%	3.9%
above	68,100	61,651	6,449	46.2%	17.1%	15.6%	12.4%	5.0%	3.7%
alternating	30,339	24,885	5,454	25.5%	33.2%	4.2%	22.0%	1.9%	13.1%
below	17,673	16,379	1,294	28.3%	50.2%	2.8%	13.0%	1.5%	4.1%
Senior	44,296	42,314	1,982	12.6%	76.9%	2.8%	1.0%	1.3%	5.3%
above	45,663	43,666	1,998	13.0%	76.4%	2.9%	1.0%	1.2%	5.4%
alternating	22,463	17,545	4,918	0.9%	95.9%	2.5%	0.0%	0.7%	0.0%
below	18,081	17,182	899	7.8%	77.4%	0.0%	5.7%	4.7%	4.4%
Non-senior	64,539	58,159	6,381	46.5%	16.1%	15.5%	13.0%	5.0%	3.9%
above	70,772	63,793	6,979	47.3%	15.1%	16.0%	12.8%	5.1%	3.7%
alternating	30,700	25,222	5,479	26.5%	30.7%	4.3%	22.9%	2.0%	13.7%
below	17,654	16,342	1,312	29.0%	49.4%	2.9%	13.3%	1.4%	4.1%
Couples, no children	57,272	52,471	4,801	52.5%	19.6%	17.3%	0.1%	5.6%	4.9%
above	61,896	56,759	5,138	53.2%	18.6%	17.6%	0.1%	5.7%	4.8%
alternating	19,875	16,594	3,281	29.3%	43.7%	3.2%	0.1%	1.5%	22.2%
below	9,089	7,967	1,123	27.5%	61.6%	8.4%	0.0%	1.7%	0.8%
Couples with children	67,882	60,483	7,399	43.3%	14.3%	15.0%	19.4%	4.6%	3.4%
above	72,792	64,884	7,908	43.9%	13.2%	15.5%	19.4%	4.8%	3.3%
alternating	33,777	27,896	5,881	28.3%	34.9%	3.6%	23.8%	2.0%	7.5%
below	21,300	19,577	1,723	30.5%	47.7%	2.6%	15.0%	1.4%	2.7%
Lone-parent families	32,898	29,575	3,323	35.8%	16.4%	13.1%	22.7%	4.5%	7.4%
above	43,401	38,546	4,855	38.5%	13.5%	15.0%	20.7%	5.0%	7.3%
alternating	24,636	20,543	4,093	22.7%	17.8%	4.0%	38.1%	2.6%	14.8%
below	17,368	16,578	791	19.5%	43.6%	1.5%	31.2%	1.2%	3.0%
Other families	73,916	67,565	6,351	53.9%	18.7%	16.4%	1.4%	5.7%	4.0%
above	79,283	72,522	6,761	54.6%	18.1%	16.7%	1.3%	5.8%	3.4%
alternating	29,220	22,209	7,011	18.8%	14.2%	8.8%	10.9%	1.5%	45.7%
below	16,904	15,423	1,481	34.7%	51.6%	1.8%	0.1%	1.5%	10.2%

* Mean = sum of family income for each member divided by total number of persons

Alternating Group

Unlike the above group where payroll deductions took up the lion's share of the difference between after-tax income and disposable income or the below group where it is medical expenses that dominates, for the alternating group as a whole no one deduction stands out. Two of the six deductions account for 59% of the difference (medical 35% and payroll 24%). Child care makes up another 19% while support payments account for 16%.

Like the below group, medical expenses are important for seniors, both individuals and families; over 90% of the difference between after-tax income and disposable income is made up of medical expenses. Medical expenses are also important for alternating group couples with no children.

Child care is overwhelmingly the major disposable income deduction for lone-parent families (38%) but not for couples with children where the deductions are divided among child care, medical expenses, and payroll deductions. Support payments are the most important disposable income deduction for non-senior individuals (60%) and "other" families (46%). "Other" families include, for example, lone-parent or couple families with other relatives present or siblings who share living accommodation.

The change in income concept from an after-tax to a disposable income highlights the impact of medical expenses, support payments, and child care costs and suggests that they all play an important role in being above or below the MBM low income threshold. Comparisons done at the more aggregate level (as in Table 7) are only able to detect the effect of childcare expenses. When the analysis is broken down further, it becomes clear that the other deductions play a significant and varying role depending on family type.

3. Conclusion

This purpose of this paper is not to choose the best low-income measurement rather it is meant to take stock of what is currently available in Canada and to see the extent to which various measures provide a different picture of the low-income situation of Canadians. A lot more work needs to be done but a few trends have emerged.

The study shows different low-income trends, depending on whether an absolute or a relative measure is used and this varies for different groups. At a minimum, it is probably important to feature two measures, a relative measure and an absolute measure as they provide a different picture of low-income. For the relative measure, the choice of the threshold (50% versus 60%) has an impact, especially for the seniors. As such, the choice of the threshold in the relative measure should be examined carefully.

Although the absolute measures (LICO, MBM and anchored LIM) give a similar picture at the Canada level, a different story emerges at the provincial level. In particular, shelter costs vary greatly, and a measure like the LICO does not reflect adequately enough regional variations. The MBM also includes transportation as part of the necessities, which is not the case in the LICO. This may have an impact especially in the Atlantic provinces. Another element that could also have an impact is the difference in equivalence scales; the LICO uses an implicit scale that is derived through a model which is quite different from the one used in the MBM. The impact of the choice of the equivalence scale should be examined in the future. Finally, although an

anchored LIM offers the advantage of simplicity, unlike the LICO or the MBM, no consideration of geographical differences is accounted for. This may be an important limitation to the measure.

It is difficult to adequately assess the impact of the choice of the measurement of low-income on the persistence estimates. Some groups have a higher persistence rate (such as children) while for seniors, the situation varies depending on the measure used. Part of this may be due to the design of the survey; where a new panel is introduced every three years which may add some noise in the time series. In the future, it may be worth examining measures of deprivation through the use of a cross-sectional survey to address the issue of persistence.

Finally, the choice of the income measure also has an impact. Based on the MBM, low income rates are 2% higher when disposable income is used as opposed to after-tax income. As well, the various deductions (child care costs, payroll taxes …) have different effects depending on family type.

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Appendix 1. Equivalence scales –adjustment factors for additional members in the family

Scale		Family size			
		2	3	4	5
LICO	1959	.67	.33	.33	.33
	1969	.45	.40	.35	.26
	1978	.32	.44	.27	.33
	1986	.36	.29	.18	.09
	1992	.22	.26	.25	.12
LIM (usual)		.4	.3	.3	.3
SCF subjective	1983	.2	.22	.23	.07
	1986	.17	.27	.23	0
Square root family size		.41	.32	.27	.24
OECD new		.5	.3	.3	.3

Appendix 2. Laeken indicators

	Primary Indicators
1	At-risk-of-poverty rate
1a	At-risk-of-poverty rate by household type
1b	At-risk-of-poverty rate by the work intensity of households
1c	At-risk-of-poverty rate by most frequent activity status
1d	At-risk-of-poverty rate by accommodation tenure status
2	At-risk-of-poverty threshold (illustrative values)
3	Income quintile ratio (S80/S20)
4	Persistent at-risk-of poverty rate
5	Relative median poverty risk gap
6	Regional Cohesion
7	Long term unemployment rate
8a	Population living in jobless households: children
8b	Population living in jobless households: prime-age adults
9	Early school leavers not in education or training
10	Low reading literacy performance of pupils
11	Life expectancy
12	Self-defined health status by income level
	Secondary Indicators
13	Dispersion around the at-risk-of-poverty threshold
14	At-risk-of-poverty rate anchored at a moment in time
15	At-risk-of-poverty rate before social cash transfers
16	Gini coefficient
17	Persistent at-risk-of-poverty rate (50% of median equivalised income)
18	In-work poverty risk
19	Long-term unemployment share
20	Very long term unemployment rate
21	Persons with low educational attainment

Appendix 3. MBM FOR 2002(2 adults, 2 children)

	Total	Food	Clothing	Shelter	Transportation	Multiplier
Newfoundland						
rural	26,152	7,453	2,267	5,943	3,928	6,561
<30K	26,684	7,453	2,267	6,475	3,928	6,561
St. John's	24,825	7,227	2,267	7,403	1,519	6,409
PEI						
rural	24,831	6,761	2,167	6,233	3,643	6,027
<30K	25,512	6,761	2,167	6,914	3,643	6,027
Charlottetown	26,545	6,761	2,167	7,947	3,643	6,027
Nova Scotia						
rural	26,017	6,987	2,257	6,536	3,997	6,240
<30K	26,492	6,987	2,257	7,011	3,997	6,240
30K - 100K	24,275	6,987	2,257	7,286	1,505	6,240
Halifax	25,814	6,955	2,257	8,815	1,569	6,218
Cape Breton	23,483	6,829	2,257	6,969	1,295	6,133
New Brunswick						
rural	25,582	7,050	2,284	5,822	4,125	6,301
<30K	26,099	7,050	2,284	6,339	4,125	6,301
Fredericton	25,206	6,927	2,284	8,328	1,449	6,218
Saint John	23,528	6,896	2,284	6,510	1,641	6,197
Moncton	24,229	6,771	2,284	7,793	1,269	6,112
Québec						
rural	23,986	6,500	2,307	5,568	3,666	5,945
<30K	24,193	6,500	2,307	5,775	3,666	5,945
30K - 100K	22,167	6,500	2,307	6,133	1,282	5,945
100K - 500K	22,731	6,500	2,307	6,503	1,476	5,945
Québec City	23,278	6,538	2,307	6,855	1,607	5,971
Montréal	23,522	6,491	2,307	7,384	1,401	5,939
Ontario						
rural	25,714	6,006	2,244	7,965	3,930	5,569
<30K	25,812	6,006	2,244	8,063	3,930	5,569
30K - 100K	23,867	6,006	2,244	8,531	1,517	5,569
100K - 500K	25,441	6,257	2,244	9,410	1,792	5,738
Ottawa	27,708	6,719	2,244	11,058	1,637	6,050
Hamilton/ Burlington	25,020	5,856	2,244	9,791	1,661	5,468
Toronto	29,343	6,356	2,244	12,497	2,441	5,805
Manitoba						
rural	24,243	6,560	2,246	5,366	4,127	5,944
<30K	25,512	6,560	2,246	6,635	4,127	5,944
Brandon	23,144	6,560	2,246	6,996	1,398	5,944

Winnipeg	24,168	6,528	2,246	7,738	1,733	5,923
Saskatchewan						
rural	23,824	6,316	2,288	5,430	3,982	5,808
<30K	24,822	6,316	2,288	6,428	3,982	5,808
30K - 100K	22,319	6,316	2,288	6,605	1,302	5,808
Saskatoon	24,549	6,805	2,288	7,933	1,385	6,138
Regina	23,905	6,457	2,288	7,872	1,385	5,903
Alberta						
rural	25,827	6,948	2,162	7,084	3,484	6,149
<30K	27,033	6,948	2,162	8,290	3,484	6,149
30K - 100K	25,631	6,948	2,162	9,021	1,351	6,149
Edmonton	25,104	6,630	2,162	8,847	1,530	5,935
Calgary	27,070	6,740	2,162	10,599	1,560	6,009
British Columbia						
rural	27,597	7,032	2,302	8,045	3,917	6,301
<30K	27,670	7,032	2,302	8,118	3,917	6,301
30K - 100K	25,475	7,032	2,302	8,477	1,363	6,301
100K - 500K	27,318	7,233	2,302	9,998	1,349	6,436
Vancouver	28,944	7,120	2,302	11,446	1,716	6,360