

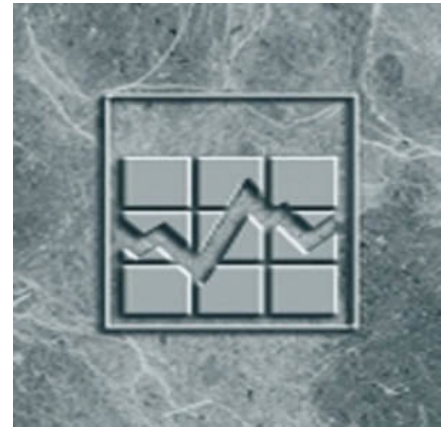
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Improvements to the Canadian Income Survey Methodology for the 2021 Reference Year

by Nathalie Caron and Keith Lam

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Improvements to the Canadian Income Survey Methodology for the 2021 Reference Year

by **Nathalie Caron** and **Keith Lam**

Introduction

The Canadian Income Survey (CIS) has introduced improvements to the methods and systems used to produce income estimates with the release of its 2021 reference year estimates. Key among these improvements is the shift to using the Administrative Personal Income Masterfile (APIM) as the primary source of income estimates, while previous reference years estimates were produced using only T1 tax return information. Estimates for 2021 also include updates to income processing and improvements to the weighting methodology.

This paper begins by explaining the advantages of moving to the APIM data source rather than the T1. Then, it describes other changes in the processing system introduced at the same time, as well as the newly implemented weighting strategy. Finally, it presents the approximate net result of these changes on income estimates using data for 2019 and 2020. The changes described in this paper highlight the ways in which data quality has been improved while producing minimal impact on key CIS estimates and trends.

Administrative Personal Income Masterfile (APIM)

The Administrative Personal Income Masterfile is a comprehensive, centrally processed source of personal income data generated from tax returns and associated tax slips. The annual database contains income information for over 30 million Canadians, covering the tax-filing population and those who have not filed by the time of data production, providing a comprehensive picture of each individual's annual income situation.

Each year, the APIM database is produced upon receipt of the Canada Revenue Agency (CRA) tax files by Statistics Canada. These files are processed centrally at Statistics Canada to ensure coherent and consistent income concepts across the agency. The foundation of the APIM is the T1 Enhanced Database, which is sourced from the T1 Personal Masterfile—a database of personal tax returns. This is then supplemented with other tax slips providing information on income and related matters that are issued for the tax year by employers, the government or other institutions, and submitted to the CRA¹.

Certain non-taxable income sources that are not available from any CRA records, such as provincial tax credits, are estimated based on the individual's situation (auxiliary information) and government program specifications. Other income variables may require imputation through probabilistic matching on socio-demographic characteristics, as well as any available information that correlate with the income variables targeted.

Advantages of the APIM

The primary advantage of the APIM data source is that the T1 file is supplemented with the direct use of tax slips for key credits which were previously imputed (e.g., the Goods and Services Tax (GST) Credit file, the Canada Child Benefits (CCB) file), or previously underreported income sources (e.g., smaller T4 values, scholarships and bursaries, Registered Education Savings Plan (RESP), Registered Disability Savings Plan (RDSP)).

As a result, income data based on the APIM provides more comprehensive and accurate income estimates for individuals and families than data previously based on only the T1 file, which relied more on imputation for sources not found on the T1 file.

For example, 85.1% of the records on the 2021 CIS sample linked directly to the T1 file, 8.1% did not link to a social insurance number (SIN), while 6.8% of records linked to a SIN with no associated T1 record. Of the 6.8% of records linked to a SIN with no T1 record, 81% (representing 5.5% of records) have income from one or more tax slips and 19% (representing 1.3% of records) have no tax slips. The 5.5% of records with income from one or more tax slip but no T1 have additional processing and imputation performed directly on the APIM to complete missing

1. For a complete list of the administrative files used to construct the APIM income data, please refer to [Surveys and statistical programs - Administrative Personal Income Masterfile \(APIM\) \(statcan.gc.ca\)](#).

concepts only available on the T1. Under the old processing environment, additional processing and imputation would have been required for the 14.9% of records that didn't link to the T1 file. However, using the APIM data source significantly reduces the number of records that require additional processing due to the existence of the records that linked to tax slips. This reduced the percentage of records that required imputation from 14.9% to 9.4% in 2021. Additionally, the methods for imputing income data for these records were updated to take further advantage of tax slips and available auxiliary information.

Improvements to the income processing system

In addition to updating the data source to include various tax slips in the new system, improvements were also made to the processing of certain income sources. Specifically, the processing of child benefits and social assistance were updated to provide more comprehensive and accurate data. This section will describe the changes to the derivation of these income sources, while the impacts of these changes will be presented in the final portion of the paper.

Updates to the processing of child benefit amounts

Prior to 2021, child benefit amounts in the CIS were imputed using a deterministic method based on the family situation reported in the survey and the family income indicated in the T1. As the name suggests, the Administrative Person Income Masterfile method for deriving child benefit amounts is driven by administrative data, specifically the combination of T1 and data from tax slips.

However, shifting to a 100% administrative-based method would have led to some incoherence between those expected to receive child benefits and those where child benefits were reported on their tax slips. This is due to discrepancies in family composition between the CIS and the administrative data. For example, individuals with children on the survey, who therefore appear eligible, may have zero child benefit, while conversely, individuals without children on the survey may have received child benefits. Parents with shared custody, for example, may have reported their child(ren) in the survey (or not), depending on the timing of the interview, leading to potential differences between the family composition and the administrative data.

As one of the goals of capturing child benefits is to measure the impact of the benefits on poverty rates for children and families with children, a new child benefit model was produced to edit the data and maintain a historical time series between the former and new processing system, resulting in more consistent poverty measures.

Under the new child benefit method, data are processed using the administrative data as the default values. When there are inconsistencies based on the family composition, the deterministic method is used to derive child benefit amounts.

Specifically, for families where no child benefits were expected based on their composition (i.e., unattached individuals and married or common-law couples without children), the child benefit amount, if any, is set to zero.

For expected recipients of child benefits based on family composition (i.e., married or common-law couples with children and lone-parent families), the amount on APIM (which was based on the Canada Child Benefit file amount) is used. If the APIM value of child benefits is zero, an amount is derived based on the family composition².

Finally, the new child benefit model was updated so that benefit amounts are derived using the previous year's income, which is in line with how the CRA determines the child benefit amounts, whereas those derived under the old method utilized the current year's income as a proxy.

Updates to the processing of social assistance amounts

The T5007 (Statement of Benefits) is used to derive social assistance amounts on the APIM processing system, providing a more accurate picture for recipients of this benefit.

Under the old processing system, social assistance amounts based on the T1 tax slip were typically underreported. Therefore, the CIS question about receiving social assistance payments was used to impute an

2. The CIS cannot be used to measure recipient or non-recipient rates of government benefits. Employment and Social Development Canada (ESDC) indicated a benefit take-up rate of 96%+ of the eligible population for the Canada Child Benefit: [Report 1—Access to Benefits for Hard-to-Reach Populations \(oag-bvg.gc.ca\)](#).

amount for individuals who did not report an amount on the T1. However, over the years, this question seems to have been misunderstood by many respondents, as many interpreted this question as other types of government transfers and wrongly answered 'yes' to the survey question, thus receiving a social assistance amount. This led to a higher estimate for the number of recipients of the benefit.

In addition, seniors' supplements for some provinces that were previously included in social assistance payments are now included in "other government transfers".

Improvements to the weighting strategy

In addition to the shift in income data sources, the 2021 reference year data also introduced an improved weighting strategy. The updates produce better CIS income estimates that are closer to the benchmarks of administrative tax files, and the new models and processes have improved functionality and reduce production time.

The details of the updates to the weighting methodology could be summarized as follows:

- The non-response adjustment was updated to include four new auxiliary variables (two major sources of income variables, household-level income decile, person-level income decile), and a new logistic regression model was used to calculate the non-response adjustment factors. The role of non-response adjustment is to reduce the non-response bias and to control the non-response variance as much as possible.
- The calibration classes were adjusted. Calibration is the process of modifying the weights so that the estimates from the survey for relevant population characteristics respect population totals from other reliable sources. Calibration is applied to correct for coverage and non-response issues. In the CIS, the weights were calibrated to match known control totals for population counts based on the 2016 Census, provided by Statistics Canada's Centre for Demography, including the number of persons by selected geographies, age groups and sex, and economic family sizes by province. It also ensures that the weighted distribution of income (based on wages and salaries classes) in the estimates matches that of the Canadian population based on the APIM. In the new weighting methodology, household size categories, which were also previously included in the calibration classes, have been dropped and a third economic family size (3+) was added to ensure that larger families were properly represented. A few minor adjustments to the sex-age calibrations classes were also made, and the 65+ age group was removed from the number of paid employees in wages and salaries classes, because it is not the main source of income for this age group.
- For the 2021 reference year, additional control totals were included in calibration to adjust for tenure and number of recipients of the Canada Recovery Benefit (CRB) by province.
- An updated generalized calibration system was used.
- The automated treatment of outlier values was modified and expanded to analyze all records and more income variables, and to adjust the weights as needed based on the distribution of the income variables on the APIM. The goal of an influential record treatment is to decrease the impact that an influential record has on the sampling variance of the income estimate without introducing too much bias.

Impacts on the Canadian Income Survey (CIS) estimates

This section will discuss some of the key changes resulting from transitioning to the APIM processing environment. For the tables presented, estimates for four reference years are included to provide context for the transition in 2021. Estimates for the 2018 reference year were produced using the old processing system only. For the 2019 and 2020 reference years, estimates were developed using the new data source, processing system and methodology (experimental), and compared to those which were disseminated using the old (published) system. For 2021, the estimates were produced by the new APIM environment only.

It is important to point out that the updates to the data source and processing system have an impact on the number of recipients and the medians for each income source, while the updates to the weighting methodology also have an impact on the number of people by category (e.g., the number of persons by family type).

The results of this analysis should be treated as experimental, as not all elements of the new processing environment were introduced for the 2019 and 2020 reference years. The results of the analysis were used to fine tune these approaches. Therefore, the results should not be considered as replacements for the official (published) estimates for 2019 or 2020.

Note that although the following tables highlight the key impacts on the CIS estimates, there are many more differences when looking at the data at more disaggregated levels.

Modest changes to median after-tax income, market income and government transfers

The median after-tax income for economic families and persons not in an economic family at both the Canada and provincial levels show relatively small changes between the published estimates and the experimental estimates (Table 1). The differences range from a decrease of 2.0% to an increase of 3.5%, with the only statistically significant difference being for Manitoba in 2020.

Table 1
Median after-tax income, economic families and persons not in an economic family, Canada and provinces, 2021 constant dollars

	2018		2019			2020			2021
	Published	2021 constant dollars	Published	Experimental	Difference	Published	Experimental	Difference	Published
	2021 constant dollars		2021 constant dollars	percent	2021 constant dollars	percent	2021 constant dollars		
Canada	64,100	64,500	65,300	1.2	69,000	69,700	1.0	68,400	
Newfoundland and Labrador	61,000	57,800	57,500	-0.5	61,300	62,800	2.4	62,100	
Prince Edward Island	58,100	59,100	57,900	-2.0	61,400	61,100	-0.5	62,500	
Nova Scotia	54,600	55,100	56,100	1.8	59,400	60,100	1.2	60,200	
New Brunswick	56,600	56,700	56,200	-0.9	58,800	59,600	1.4	60,000	
Quebec	55,500	57,200	57,900	1.2	61,700	62,400	1.1	61,400	
Ontario	68,400	67,300	68,500	1.8	72,500	73,400	1.2	73,000	
Manitoba	63,400	62,700	63,100	0.6	65,100	67,400	3.5*	64,700	
Saskatchewan	66,700	66,600	66,700	0.2	70,000	71,200	1.7	68,200	
Alberta	78,900	76,900	78,700	2.3	80,300	80,600	0.4	77,000	
British Columbia	63,000	65,100	64,500	-0.9	69,700	70,000	0.4	68,500	

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Looking at the Canadian median after-tax income for selected family types (Table 2), we see that the main differences were for non-seniors not in an economic family. Differences for other family types were not statistically significant.

Table 2
Median after-tax income by selected family type, Canada, 2021 constant dollars

	2018		2019			2020			2021
	Published	2021 constant dollars	Published	Experimental	Difference	Published	Experimental	Difference	Published
	2021 constant dollars		2021 constant dollars	percent	2021 constant dollars	percent	2021 constant dollars		
Economic families and persons not in an economic family	64,100	64,100	65,300	1.2	69,000	69,700	1.0	68,400	
Economic families	90,600	90,600	90,900	0.6	95,500	95,800	0.3	95,200	
Senior families	67,200	67,200	67,700	2.1	70,800	72,000	1.7	69,900	
Non-senior families	97,300	97,300	97,300	-0.5	102,900	102,800	-0.1	103,100	
Couples with children	108,300	108,300	109,300	0.0	114,400	113,200	-1.0	113,700	
Lone-parent families	55,600	55,600	57,200	-5.9	63,300	62,600	-1.1	61,300	
Persons not in an economic family	32,500	32,500	34,900	5.1*	35,700	36,600	2.5	36,100	
Seniors not in an economic family	29,800	29,800	30,900	1.3	32,500	32,700	0.6	31,400	
Non-seniors not in an economic family	34,100	34,100	37,500	7.4*	37,100	38,800	4.6*	39,600	

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Median market income was about 3% higher under the new environment for both 2019 and 2020, driven by higher amounts for non-seniors not in an economic family (Table 3). For this group, the median market income was 10.3% and 11.2% higher in 2019 and 2020, respectively. This is mainly the result of the availability of the T4 and T4A forms in the new processing environment, which produces slightly higher median market income overall, and can be attributed to a higher number of recipients for wages, salaries and commissions (from the T4) and other income (from the T4A).

Table 3
Median market income by selected family type, Canada, 2021 constant dollars

	2018		2019		2020		2021	
	Published	Published	Experimental	Difference	Published	Experimental	Difference	
	2021 constant dollars	2021 constant dollars	2021 constant dollars	percent	2021 constant dollars	percent	Published 2021 constant dollars	
Economic families and persons not in an economic family	59,500	59,600	61,200	2.7*	57,500	59,200	3.0*	61,700
Economic families	89,400	89,500	90,500	1.1	87,100	87,300	0.2	92,100
Senior families	42,900	39,900	43,400	8.8	41,800	43,200	3.3	43,900
Non-senior families	102,400	103,400	103,300	-0.1	100,400	99,700	-0.7	104,600
Couples with children	115,500	115,700	115,500	-0.2	113,600	111,800	-1.6	116,000
Lone-parent families	40,300	46,500	46,000	-1.1	39,300	41,100	4.6	46,000
Persons not in an economic family	27,100	27,700	30,200	9.0*	24,700	27,600	11.7*	30,300
Seniors not in an economic family	12,400	12,800	13,600	6.3	12,800	13,100	2.3	13,200
Non-seniors not in an economic family	34,800	36,000	39,700	10.3*	33,000	36,700	11.2*	41,000

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Couples with children saw an increase in government transfers, while lone-parent families saw a decrease under the new environment (Table 4). These differences were driven by changes in the derivation of child benefits. A subsequent section of this paper will describe the impact of child benefit changes on these family types.

Also worth noting is the increase of median government transfers for persons not in an economic family in 2019, even though the median for both sub-categories (seniors not in an economic family and non-seniors not in an economic family) barely changed. This can be explained by the fact that for persons not in an economic family, the weighting strategy changes caused the numbers of seniors to increase, while the number of non-seniors decreased. Since government transfer amounts are significantly larger for seniors than for non-seniors, an increase in the number of seniors led to increased government transfers for persons not in an economic family.

Table 4
Median government transfers by selected family type, Canada, 2021 constant dollars

	2018		2019		2020		2021	
	Published	Published	Experimental	Difference	Published	Experimental	Difference	
	2021 constant dollars	2021 constant dollars	2021 constant dollars	percent	2021 constant dollars	percent	Published 2021 constant dollars	
Economic families and persons not in an economic family	7,700	8,500	8,800	3.5	17,000	17,100	0.6	13,300
Economic families	9,700	10,200	10,300	1.0	21,300	21,500	0.9	16,700
Senior families	31,000	31,200	31,200	0.0	34,400	34,500	0.3	32,400
Non-senior families	5,600	6,400	6,700	4.7	16,200	16,600	2.5	10,700
Couples with children	7,700	8,300	9,000	8.4*	17,100	18,500	8.2*	13,400
Lone-parent families	15,000	14,000	12,100	-13.6	24,400	21,700	-11.1*	17,000
Persons not in an economic family	2,100	2,900	4,600	58.6*	11,600	11,300	-2.6	7,500
Seniors not in an economic family	19,700	19,900	19,900	0.0	21,200	21,300	0.5	19,800
Non-seniors not in an economic family	900	1,000	800	-20.0*	3,900	3,300	-15.4	1,000

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Updated weighting strategy results in increased number of families with children and unattached seniors

Updates to the weighting strategy resulted in changes to the distribution of family types between the old and new processing environments (Table 5). Worth noting are the significant increases in the number of families with children, specifically lone-parent families.

As we saw in the changes for seniors and non-seniors in Table 4, the increase in median government transfers for persons not in an economic family in 2019 can be explained by the changes in distribution of the two sub-categories for this family type (seniors not in an economic family and non-seniors not in an economic family).

Table 5
Number of families (in thousands) by selected family type, Canada

	2018		2019		2020		2021	
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published
	(in thousands)	(in thousands)	(in thousands)	percent	(in thousands)	(in thousands)	percent	(in thousands)
Economic families and persons not in an economic family	15,864	16,069	16,105	0.2*	16,221	16,240	0.1*	16,425
Economic families	9,831	9,934	9,970	0.4*	10,002	10,020	0.2*	10,103
Senior families	1,959	1,996	1,960	-1.8	2,071	2,068	-0.1	2,153
Non-senior families	7,872	7,939	8,010	0.9	7,930	7,952	0.3	7,949
Couples with children	3,006	2,957	3,075	4.0*	2,970	3,062	3.1*	3,069
Lone-parent families	510	538	606	12.6*	548	614	12.0*	588
Persons not in an economic family	6,034	6,135	6,135	0.0	6,220	6,220	0.0	6,322
Seniors not in an economic family	1,828	1,944	2,114	8.7*	1,988	2,062	3.7	2,059
Non-seniors not in an economic family	4,206	4,191	4,020	-4.1*	4,232	4,158	-1.7	4,263

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

The number of recipients of wages, salaries and commissions were higher for all family types. Specifically, large differences were observed for lone-parent families and seniors not in an economic family. As seen in Table 5, these two groups had the largest differences in the number of families resulting from the weighting methodology updates.

It is also worth noting that in APIM, wages and salaries are derived from both the T1 and T4, while in the old method, only the T1 was used. This could explain the overall increase in recipients of this income source.

Table 6
Number with wages, salaries or commissions (in thousands) by selected family type, Canada

	2018		2019		2020		2021	
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published
	(in thousands)	(in thousands)	(in thousands)	percent	(in thousands)	(in thousands)	percent	(in thousands)
Economic families and persons not in an economic family	11,681	11,833	12,069	2.0*	11,695	11,981	2.4*	12,218
Economic families	8,225	8,320	8,469	1.8*	8,236	8,369	1.6*	8,482
Senior families	932	900	937	4.1	877	924	5.4	1,007
Non-senior families	7,293	7,420	7,532	1.5*	7,359	7,444	1.2*	7,474
Couples with children	2,860	2,829	2,943	4.0*	2,834	2,933	3.5*	2,943
Lone-parent families	403	437	509	16.5*	430	499	16.0*	488
Persons not in an economic family	3,457	3,513	3,600	2.5	3,458	3,612	4.5*	3,737
Seniors not in an economic family	330	340	424	24.7*	326	382	17.2*	369
Non-seniors not in an economic family	3,127	3,173	3,176	0.1	3,132	3,230	3.1*	3,368

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

“Other income” recipients and amounts increased under APIM

Other income consists of alimony, scholarships and bursaries, income from a Registered Education Savings Plan (RESP), income from a Registered Disability Savings Plan (RDSP) and other market income not included elsewhere. We see differences for other income recipients and medians under the new environment. The addition

of the T4A slips allows the APIM to better capture bursaries, RESP and RDSP amounts, so both the number of recipients (Table 7) with other income and the amounts (Table 8) are higher. This is especially true for non-seniors not in an economic family, specifically for the younger age groups.

The only family type that saw significantly less other income recipients was lone-parent families. The main reason is that support payments for 2019 and 2020 only included amounts found on tax files under the new system, while under the old system, support payments collected through the CIS questionnaire were also included. Since support payments are usually underreported on tax files, for the 2021 reference year, support payments collected through the survey were also included, which is more in line with what was done in previous years.

Table 7
Number with other income (in thousands) by selected family type, Canada

	2018		2019			2020			2021
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published	
	(in thousands)	(in thousands)	(in thousands)	percent	(in thousands)	(in thousands)	percent	(in thousands)	
Economic families and persons not in an economic family	3,844	3,928	4,561	16.1*	4,000	4,357	8.9*	4,591	
Economic families	2,884	2,941	3,376	14.8*	3,014	3,206	6.4*	3,400	
Senior families	626	620	639	3.1	651	647	-0.6	670	
Non-senior families	2,257	2,320	2,737	18.0*	2,362	2,559	8.3*	2,730	
Couples with children	769	761	940	23.5*	760	851	12.0*	904	
Lone-parent families	193	189	167	-11.6	195	156	-20.0*	224	
Persons not in an economic family	960	988	1,185	19.9*	986	1,151	16.7*	1,191	
Seniors not in an economic family	410	456	471	3.3	430	434	0.9	449	
Non-seniors not in an economic family	551	532	714	34.2*	557	717	28.7*	742	

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

In Table 8, we see that the majority of family types have higher median other income under the new environment, which is due to the previously described addition of information from the T4A slips.

Table 8
Median other income (excluding zeros) by selected family type, Canada, 2021 constant dollars

	2018		2019			2020			2021
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published	
	2021 constant dollars	2021 constant dollars	2021 constant dollars	percent	2021 constant dollars	2021 constant dollars	percent	2021 constant dollars	
Economic families and persons not in an economic family	1,900	1,900	2,500	31.6*	2,100	2,600	23.8*	2,500	
Economic families	2,100	2,100	2,800	33.3*	2,400	2,700	12.5*	3,000	
Senior families	900	1,000	1,200	20.0	1,100	1,100	0.0	1,000	
Non-senior families	2,500	2,600	3,400	30.8*	2,700	3,200	18.5*	3,700	
Couples with children	2,400	2,400	3,000	25.0	2,600	3,000	15.4	3,400	
Lone-parent families	3,900	5,200	5,100	-1.9	4,300	4,500	4.7	5,400	
Persons not in an economic family	1,300	1,000	1,600	60.0*	1,500	1,700	13.3	1,800	
Seniors not in an economic family	900	800	700	-12.5	900	800	-11.1	800	
Non-seniors not in an economic family	1,700	1,300	2,400	84.6*	2,100	2,600	23.8	2,700	

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Child benefits change as a result of the new method

Generally, both the number of families receiving child benefits (Table 9) and the median amounts for recipient families (Table 10) are higher under the new environment.

Lone-parent families had a higher number of recipients (12.0%) which is in line with the higher number of lone-parent families (12.0%) previously seen on Table 5.

Table 9
Number of families with child benefits (in thousands) by selected family type, Canada

	2018	2019	2020			2021
	Published	Published	Published	Experimental	Difference	Published
	(in thousands)	(in thousands)	(in thousands)		percent	(in thousands)
Economic families	3,505	3,488	3,792	3,968	4.6*	3,791
Senior families	65	61	56	54	-3.6	71
Non-senior families	3,440	3,428	3,736	3,915	4.8*	3,721
Couples with children	2,657	2,590	2,867	2,972	3.7*	2,824
Lone-parent families	503	529	548	614	12.0*	584
Male lone-parent families	89	116	108	124	14.8	121
Female lone-parent families	414	413	439	490	11.6*	463

* denotes differences that are statistically significant at the 95% confidence level.

Note: The updated child benefit method was not fully implemented until the 2020 reference year. Therefore, the experimental comparison is not shown for the 2019 reference year.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Child benefit amounts are derived using the previous year's income in the new environment, which led to higher amounts in 2020 than those derived previously in the old environment (which utilized the current year's income as a proxy). In Table 10, we see that child benefit amounts were typically higher for families in 2020 under the new environment.

However, the medians were lower (although not statistically significant) for lone-parent families. This is a result of the previously described processing updates, as the administrative tax amount is retained for records where a child benefit amount was reported. So, those receiving partial child benefits would lower the median. Under the old method, these families would have received a higher deterministically calculated child benefit amount.

Table 10
Median child benefits (excluding zeros) by selected family type, Canada, 2021 constant dollars

	2018	2019	2020			2021
	Published	Published	Published	Experimental	Difference	Published
	2021 constant dollars	2021 constant dollars	2021 constant dollars		percent	2021 constant dollars
Economic families	5,700	5,600	5,500	6,100	10.9*	6,200
Senior families	7,300	6,800	7,500	7,700	2.7	8,000
Non-senior families	5,700	5,500	5,400	6,100	13.0*	6,100
Couples with children	5,200	5,200	5,000	5,700	14.0*	5,900
Lone-parent families	8,300	7,500	8,200	7,700	-6.1	7,300
Male lone-parent families	6,600	6,300	7,400	6,300	-14.9	5,500
Female lone-parent families	9,000	8,100	8,600	8,000	-7.0	8,400

* denotes differences that are statistically significant at the 95% confidence level.

Note: The updated child benefit method was not fully implemented until the 2020 reference year. Therefore, the experimental comparison is not shown for the 2019 reference year.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Fewer social assistance recipients, while amounts higher in the new environment

Social assistance is the income variable that shows the largest differences. The number of recipients is significantly lower under the new environment, which uses the T5007 slip amount. The difference is mainly attributable to the previously described frequent misinterpretation of the CIS question in the old processing environment.

Also, the large difference for seniors not in an economic family is due to provincial senior supplements that were previously included in social assistance payments now being included in the "other government transfers" income source category.

Table 11
Number with social assistance benefits (in thousands) by selected family type, Canada

	2018		2019			2020			2021
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published	
	(in thousands)	(in thousands)	(in thousands)	percent	(in thousands)	(in thousands)	percent	(in thousands)	
Economic families and persons not in an economic family	1,730	1,809	1,155	-36.2*	1,702	1,145	-32.7*	1,039	
Economic families	1,096	1,160	722	-37.8*	1,064	696	-34.6*	601	
Senior families	180	211	134	-36.5*	204	120	-41.2*	111	
Non-senior families	917	949	588	-38.0*	860	576	-33.0*	490	
Couples with children	293	310	157	-49.4*	245	124	-49.4*	110	
Lone-parent families	138	127	116	-8.7	126	124	-1.6	91	
Persons not in an economic family	634	650	434	-33.2*	639	449	-29.7*	438	
Seniors not in an economic family	134	128	35	-72.7*	152	51	-66.4*	57	
Non-seniors not in an economic family	500	522	398	-23.8*	487	398	-18.3*	380	

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Although the number of social assistance recipients is lower under the new environment, median social assistance amounts are higher (Table 12). This is because social assistance amounts were typically higher than the imputed amounts assigned to individuals who mistakenly responded 'yes' to the survey question. In addition, seniors' supplement amounts tended to be lower than social assistance amounts.

Table 12
Median social assistance benefits (excluding zeros) by selected family type, Canada, 2021 constant dollars

	2018		2019			2020			2021
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published	
	2021 constant dollars	2021 constant dollars	2021 constant dollars	percent	2021 constant dollars	2021 constant dollars	percent	2021 constant dollars	
Economic families and persons not in an economic family	8,800	8,800	11,200	27.3*	9,200	11,300	22.8*	11,200	
Economic families	8,800	8,800	11,400	29.5*	9,900	12,000	21.2*	11,900	
Senior families	4,800	8,000	12,000	50.0*	5,600	11,100	98.2*	11,200	
Non-senior families	9,400	9,100	11,400	25.3*	10,600	12,200	15.1*	12,000	
Couples with children	6,600	8,800	11,500	30.7*	8,600	11,100	29.1	12,200	
Lone-parent families	11,300	10,200	11,400	11.8	12,800	12,000	-6.3	11,900	
Persons not in an economic family	8,800	8,700	10,100	16.1*	9,000	10,700	18.9*	10,200	
Seniors not in an economic family	1,100	1,000	F	F	1,400	F	F	F	
Non-seniors not in an economic family	10,600	10,700	10,700	0.0	10,700	11,500	7.5	11,300	

F too unreliable to be published

* denotes differences that are statistically significant at the 95% confidence level.

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

A look at poverty estimates

In this section, we will look at the impact the previously detailed changes have on the poverty estimates.

In general, poverty estimates for Canada and most provinces tend to be slightly lower under the new environment, although none of the differences were statistically significant (Table 13). However, transitioning to the use of the APIM is consistent with better estimation of small earnings amounts, and benefits like social assistance and child benefits, which in turn produces more accurate income estimates for individuals experiencing poverty.

Table 13
Poverty rate, all persons, Canada and provinces

	2018		2019			2020			2021
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published	
	percent	percent		p.p.	percent		p.p.	percent	
Canada	11.2	10.3	10.0	-0.3	6.4	6.2	-0.2	7.4	
Newfoundland and Labrador	11.4	11.2	10.7	-0.5	7.0	6.1	-0.9	8.1	
Prince Edward Island	13.4	12.3	13.1	0.8	7.6	8.4	0.8	7.4	
Nova Scotia	13.8	12.0	11.7	-0.3	7.7	7.2	-0.5	8.6	
New Brunswick	10.8	9.9	10.7	0.8	7.6	6.8	-0.8	6.7	
Quebec	9.8	8.9	8.5	-0.4	4.8	4.6	-0.2	5.2	
Ontario	11.8	10.9	10.2	-0.7	6.8	6.6	-0.2	7.7	
Manitoba	11.1	11.5	11.3	-0.2	6.8	6.1	-0.7	8.8	
Saskatchewan	10.8	11.9	10.6	-1.3	6.7	6.1	-0.6	9.1	
Alberta	8.8	7.7	8.8	1.1	5.5	5.6	0.1	7.8	
British Columbia	13.3	11.9	12.3	0.4	7.6	8.0	0.4	8.8	

p.p. percentage points

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Additionally, the poverty rate changes show relatively small differences by family type (Table 14). A slightly lower poverty rate is observed for non-seniors not in an economic family, which could be partially attributed to higher market income, specifically other income, in the new environment.

Notably, the poverty rate for persons in male-lone parent families is significantly higher in the experimental estimate for 2020. This is the result of various factors, but sampling variability due to the small number of people in that family type is likely a key contributor.

Table 14
Poverty rate by selected family type, Canada

	2018		2019			2020			2021
	Published	Published	Experimental	Difference	Published	Experimental	Difference	Published	
	percent	percent		p.p.	percent		p.p.	percent	
All persons	11.2	10.3	10.0	-0.3	6.4	6.2	-0.2	7.4	
Persons in economic families	7.6	7.0	7.3	0.3	3.4	3.6	0.2	4.4	
Persons in senior families	4.6	4.0	3.8	-0.2	2.0	2.2	0.2	3.0	
Persons in non-senior families	8.1	7.5	7.9	0.4	3.7	3.9	0.2	4.7	
Persons in couple families with children	7.3	6.6	6.9	0.3	2.9	3.4	0.5	4.0	
Persons in lone-parent families	25.6	22.0	22.6	0.6	13.5	14.1	0.6	16.1	
Persons in male lone-parent families	14.3	11.7	19.1	7.4	7.2	14.8	7.6*	11.6	
Persons in female lone-parent families	27.8	24.7	23.6	-1.1	15.0	13.9	-1.1	17.2	
Persons not in an economic family	29.1	26.9	23.7	-3.2*	20.9	19.1	-1.8*	21.9	
Seniors not in an economic family	13.7	12.0	11.5	-0.5	7.4	8.0	0.6	13.0	
Non-seniors not in an economic family	35.8	33.8	30.1	-3.7*	27.3	24.7	-2.6*	26.2	

* denotes differences that are statistically significant at the 95% confidence level.

p.p. percentage points

Source: Statistics Canada, Canadian Income Survey, custom tabulation.

Conclusion

The 2021 reference year Canadian Income Survey estimates were produced under a new processing environment based on the Administrative Personal Income Masterfile (APIM). This paper described the key changes resulting from transitioning to the new processing system.

Overall, estimates for median after-tax income, market income, and government transfers were similar at the Canada, provincial and family type levels when comparing the new and old methods. Statistically significant differences were observed for some family types for a few income components, particularly other income and social assistance.

Likewise, the change had only a slight impact on the poverty rates, with experiments suggesting that poverty rates under the new method are only slightly lower than under the old method. At the Canada and provincial level, none of the poverty rate differences between the old and new methods were statistically significant. At the family type level, significant differences were observed for two family type categories (i.e., male lone-parent families and non-seniors not in an economic family).

In conclusion, the introduction of the new processing environment for CIS 2021 has had minimal impact on key CIS estimates and trends, while making improvements in imputation, weighting, accuracy of income components and coverage of smaller income amounts.