Technical note on February 2023 Labour Force Survey

The purpose of this document is to describe monthly changes to the Labour Force Survey and to present information on monthly survey operations and data quality assessments. It is available at 8:30 on the day of the LFS release.

Background – Labour Force Survey

The Labour Force Survey (LFS) is a monthly survey of Canadian households carried out by Statistics Canada. Since its inception in 1945, the objectives of the LFS have been to divide the working-age population into three mutually exclusive labour force status categories (employed, unemployed, and not in the labour force) and to provide descriptive and explanatory data on each of these groups.

The LFS is the source of Canada's official unemployment rates, including the rates used by Employment and Social Development Canada in the calculation of Employment Insurance (EI) eligibility and benefit criteria. Data from the survey also provide information on major labour market trends, such as shifts in employment across industrial sectors, hours worked and labour force participation.

Historical revisions of the Labour Force Survey data

On January 30, 2023, revised LFS data were released, resulting in minor changes to recent and historical LFS data.

There are three main components to the revision:

1. To align LFS data with the most recent version of the National Occupational Classification, as is done every five years;
2. To introduce enhancements to the rules and parameters used in the editing and imputation of LFS data to take full advantage of data processing and information technology systems changes made in 2019; and
3. To fine-tune the parameters used in the seasonal adjustment of LFS estimates, as is done every year.

These revisions ensure that survey estimates accurately reflect the Canadian labour market, while having minimal impact on the comparability of labour market indicators, such as employment, unemployment and participation rates, over time.

Starting with the release of the January 2023 data, LFS data will be aligned with the revised series.

Inclusion of non-permanent residents in the Labour Force Survey

The LFS target population consists of all persons whose usual place of residence is in Canada, including:

- Canadian citizens,
- Landed immigrants, or permanent residents;
- Non-permanent residents, including work, study or ministerial permit holders and refugee claimants

A non-permanent resident is a person lawfully in Canada on a temporary basis under the authority of a valid document issued to that person along with members of their family living with them.

In the Labour Force Survey (LFS), non-permanent residents are included in a group which includes all those who were not born in Canada and have never been a landed immigrant.

Changes to the Labour Force Survey in January 2023

Transition to the National Occupational Classification 2021
In January, the LFS transitioned to the National Occupational Classification (NOC) 2021 Version 1.0. The NOC 2021 overhauls the "Skill Level" structure by introducing a new categorization representing the degree of Training, Education, Experience and Responsibilities (TEER) required for an occupation. The NOC 2021 also introduces a new 5-digit hierarchical structure, compared to a 4-digit hierarchical structure in the previous versions of the classification. LFS was previously using occupational classification NOC 2016 V1.3.

Differences between the two classifications are extensive; for more information refer to the summary of changes from NOC 2016 Version 1.3 to NOC 2021 Version 1.0.

All LFS data tables for occupation have been revised back to the beginning of the series (starting in 1987 for most series) to reflect the NOC 2021 classification. A NOC 2021 labour force variant was also developed.

Methodological enhancements to data processing and imputation[1]
The methodology for detecting outliers for wages and selecting donor records during imputation were enhanced. These changes were implemented historically, starting with January 2006.

The LFS uses outlier detection to identify extremely high or low values for wages for employees. As part of the historical revision, the process used for outlier detection of wages was updated to be more responsive to wage growth over time.

The list of variables used to create the imputation groups for the donor imputation have been updated. As a result, the revised imputation system is more efficient at finding appropriate donors, preserving more respondent data. This results in more efficient imputation for respondents with lower-prevalence characteristics, such as part-time employment and those on temporary layoff.

Please refer to The 2023 Revisions of the Labour Force Survey for more information on the transition to NOC 2021 and the enhancements to data processing and imputation.

LFS sample size
In November 2021, Statistics Canada began implementing a 25% increase in the size of the LFS sample, with full implementation completed in April 2022. This increase has been paused for the last quarter for the 2022-2023 fiscal year and the sample augmentation will resume in April 2023.

Supplementary questions - January 2023
In January 2022, the LFS program was expanded to include a series of supplementary surveys to increase the range of information on quality of employment; and to allow Statistics Canada to measure emerging topics like hybrid work. These supplementary surveys have been paused for the last quarter for the 2022-2023 fiscal year and will resume in April 2023.

[1] Imputation is a standard method used by surveys to replace missing data values. Whole record imputation is used when all questionnaire data for a person in a sampled household are missing, while item imputation is used when some, but not all, data are missing. In both cases, the LFS uses donor imputation, where responses from a donor record with similar characteristics are used to replace missing values.

February 2023 Labour Force Survey Operations

Reference week
Each month, a sample of Canadian households is interviewed for LFS using a pre-defined questionnaire. This questionnaire refers to the activities of each household member during the LFS reference week, which is generally the week containing the 15th day of the month.

For February 2023, the LFS reference week was the seven-day period from Sunday February 12 to Saturday February 18.

Collection period
Interviewing for the LFS is carried out each month over the ten days immediately following the reference week.

In February 2023, interviews were conducted from Sunday, February 19 through Tuesday, February 28.

Data collection
In February, about 64,000 households were included in the LFS sample. Once selected, households remain in the sample for six consecutive months. Also, each month, approximately 1/6 of the sample is replaced with newly selected households.

Face-to-face personal interviewing resumed in November 2022. Telephone interviews continued to be conducted by interviewers working from their homes rather than Statistics Canada's call centres, as they have since March 2020.

In February, 62.0% of LFS data collection was completed by interviewers, in person or by telephone, similar to the proportion completed in January (62.4%). The remaining 38.0% of LFS collection in February was completed online without the assistance of an interviewer.

Response rate
The final response rate for the February 2023 LFS was 74.1% and the number of interviews completed was about 47,200. Additional information on final response rates, the number of interviews completed and the number of respondents after data processing can be found in Appendix A.

February 2023 Labour Force Survey Data Quality

Precision
Precision refers to the extent to which the design of a given survey, including its sample size, results in statistical variability; that is, the extent to which a theoretical set of estimates produced by the same survey would differ from each other.

The LFS sample size is designed to ensure the precision of key estimates, particularly unemployment rates. Precision is measured using coefficients of variation (CVs) and the sample size is designed to ensure that CVs are below defined targets for provinces, census metropolitan areas (CMAs), economic regions (ERs) and Employment Insurance economic regions (EIERs).

Generally, decreasing response rates and sample sizes result in an increase in the CV of a given estimate for a given geographic area or population group. Early in the COVID-19 pandemic, although the LFS response rate declined, the impact on CVs was mitigated by the fact the unemployment rates were significantly higher than was expected when the LFS precision targets were determined. Lately, with the decrease in the sample size of unemployed individuals, the number of geographic regions for which the CVs of key LFS estimates are slightly above target may increase, particularly at the provincial level.

The coefficient of variation targeted by the survey design at the provincial level (unemployment, monthly; CV of 7.0 %)[2] was exceeded in five provinces: Newfoundland and Labrador (7.1%), Prince Edward Island (10.9%, CV target 9.0%), Nova Scotia (7.8%), New Brunswick (7.8%) and Saskatchewan (8.0%, CV target 7.5%).

At the economic region level (unemployment, three-month moving average (3MMA); CV of 25.0%), target was met for 70 of 76 regions. The target was not met in: Centre-du-Quebec (Quebec; CV 37.0%), Abitibi-Témiscamingue (Québec; CV 25.4%), Côte-Nord and Nord-du-Québec (Quebec; CV 32.1%), Muskoka-Kawarthas (Ontario; CV 34.7%), Camrose-Drumheller (Alberta; CV 27.1%) and Kootenay (British Columbia; CV 35.3%).

At the employment insurance economic region level (unemployment rate, 3MMA; CV of 15.0%), target was met for 58 of 62 regions. The target was not met in: Charlottetown (Prince Edward Island; CV 15.3%), Gaspésie – Îles-de-la-Madeleine (Québec; CV 15.4%), Huron (Ontario; CV 16.7%) and Northern Manitoba (Manitoba; CV 15.7%).

Finally, at the census metropolitan area level (unemployment, 3MMA; CV of 25.0%), target was met for 33 of 35 regions. The target was not met in Peterborough (Ontario; CV 32.3%) and Barrie (Ontario; CV 26.5%).

Sample composition and bias

Bias refers to the risk that survey results are misleading or inaccurate as a result of the part of the population that is missing due to nonresponse being systematically different from the part that responds. To evaluate the risk that declines in LFS response rates have introduced bias, Statistics Canada evaluates the composition of responses received according to a range of socio-demographic characteristics, including age, education and immigration; as well as characteristics which may be correlated with labour force status, including previous month's labour force status and industry of employment, where applicable.

In addition to evaluations of the composition of the collected sample, steps are taken in the edit and imputation, weighting and calibration processes to mitigate the impact of any changes in sample composition to the greatest extent possible. For example, survey results are weighted to ensure that they match the known distribution of the population by age and sex.

Key highlights from the February collected sample:

- In February, the number of respondents by sex/age group, level of education and immigration status decreased in comparison to January. This is for the most part due to the pause in the sample increase during the last quarter of the 2022-2023 fiscal year (see "LFS sample size" on page 2).
- The share of respondents aged 15 to 24 and of lower education levels slightly increased in the last few months, coinciding with the resumption of face-to-face personal interviewing. Traditionally, these groups are harder to reach by telephone.
- Non-permanent residents contributed notably to the recent and rapid population growth in Canada. In the Labour Force Survey (LFS), non-permanent residents are included in a group which includes all those who were not born in Canada and have never been a landed immigrant. The share of respondents from this group has increased simultaneously in the collected sample.

Seasonal adjustment

The method used for seasonal adjustment at Statistics Canada (X-12-ARIMA) is designed to be robust to unexpected shocks. Outlier detection and treatment processes are included in the method to ensure that components used in seasonal adjustment are not unduly influenced by unique events. Outliers are then excluded from the calculation of seasonal and calendar-based patterns.

[2] The targeted CV increases when the unemployment rate is below 5% at the provincial level.

Verification processes in the seasonal adjustment process confirmed that effects such as the reference week or evolving seasonality were not responsible for month-to-month changes in key estimates.

Non-sampling error

Each respondent to the Labour Force Survey is assigned to one of three labour force status categories (employed, unemployed, not in the labour force) based on their responses to a series of questions within the LFS Questionnaire (see *Guide to the Labour Force Survey*, https://www150.statcan.gc.ca/n1/en/catalogue/71-543-G).

Every month, this assignment is subject to a certain level of non-sampling error to the extent that respondents misunderstand some questions or otherwise fail to respond accurately.

Several survey procedures—including thorough training and supervision of interviewers, and clear instructions to online respondents—are in place to minimize response error.

Appendix A

LFS response rates since March 2020

	Final response rate, after processing	Number of interviews completed (collection)	Number of respondents (households), after processing
Average 2019	87.0%	48,500	48,500
March 2020	79.0%	43,906	44,344
April 2020	76.4%	42,180	42,678
May 2020	73.3%	40,660	41,276
June 2020	71.6%	39,912	40,545
July 2020	70.4%	39,535	40,159
August 2020	70.4%	39,752	40,312
September 2020	69.1%	39,061	39,724
October 2020	69.9%	39,992	40,473
November 2020	69.7%	39,943	40,365
December 2020	69.0%	39,623	40,015
January 2021	70.0%	40,206	40,652
February 2021	70.9%	40,715	41,094
March 2021	71.6%	41,320	41,709
April 2021	71.8%	41,529	41,955
May 2021	71.3%	41,437	41,863
June 2021	70.0%	40,728	41,202
July 2021	69.0%	40,091	40,693
August 2021	68.7%	40,259	40,816
September 2021	67.9%	39,998	40,559
October 2021	67.8%	40,157	40,746
November 2021	67.3%	41,506	42,088
December 2021	67.5%	42,373	43,112
January 2022	69.4%	44,847	45,624
February 2022	70.7%	46,607	47,511
March 2022	71.6%	48,164	49,007
April 2022	71.6%	49,015	50,065
May 2022	71.7%	48,636	49,641
June 2022	72.2%	48,662	49,681
July 2022	73.3%	49,287	50,204
August 2022	72.8%	48,611	49,573
September 2022	73.4%	49,224	50,017
October 2022	73.4%	49,263	50,034
November 2022	72.9%	48,866	49,704
December 2022	72.9%	48,799	49,657
January 2023	73.6%	48,533	48,678

February 2023	74.1%	47,207	47,366