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Working Most Hours from Home: New Estimates for January to April 2022

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Working Most Hours from Home: New Estimates for January to April 2022

by

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Abstract

Using Statistics Canada's COVID-19 Restriction Index and estimates of telework feasibility, this study models, for the period from January 2020 to July 2022, the percentage of Canadian workers who worked most of their hours from home in a given province during a given month. Along with descriptive evidence from public transit data and Statistics Canada's COVID-19 Restriction Index, predicted values from the model indicate that the percentage of Canadians working most of their hours from home was likely overestimated from January 2022 to April 2022. New estimates are offered at the provincial and national levels for these four months. A simple adjustment procedure is also proposed for revising estimates of work from home by other dimensions for these four months.

1 Introduction

The percentage of Canadians working most of their hours from home has more than tripled since the mid-2010s, increasing from 7.4% in May 2016 to 24.3% in May 2021 (Statistics Canada, 2022). This massive change in work arrangements has led to a demand for timely information on the number and percentage of Canadians working most of their hours from home.

To satisfy this demand for new information, Statistics Canada has introduced in the Labour Force Survey (LFS) a series of questions aimed at estimating the number and percentage of Canadians working most of their hours from home during the LFS reference week, as well as their usual work location. These questions were fielded from April 2020 to December 2021. Starting in January 2022, a new set of questions was introduced. These questions were aimed at better measuring the prevalence of hybrid work—a work arrangement where the worker usually works some hours at home and some hours at locations other than home—to track more precisely the growing diversity of work location arrangements within the Canadian labour market.

As shown below, data on public transit, data on COVID-19 restrictions and regression analyses all suggest that estimates of the percentage of individuals working most of their hours from home are biased upwards for the months from January to April 2022. To remove this bias, the study offers new estimates for these four months at the provincial and national levels. A simple adjustment procedure is also proposed for revising estimates of work from home by other dimensions for these four months.

The study is structured as follows. Section II compares the different questions used in the LFS from April 2020 to December 2022 to produce statistics on work from home. It also offers potential explanations for the likely overestimation of the percentage of Canadians working most of their hours from home during the first four months of 2022. Section III provides descriptive evidence that the estimates from January to April 2022 likely overestimate the true percentage of Canadians working most of their hours from home during this period. Section IV models the percentage of Canadians working most of their hours from home as a function of telework feasibility and Statistics Canada's COVID-19 Restriction Index. Along with the descriptive evidence offered in Section III, the numbers shown in Section IV suggest some overestimation for the period from January to April 2022. Section V provides new estimates for this period at the provincial and national levels and a simple adjustment procedure for revising estimates of work from home by other dimensions for these four months. Concluding remarks follow.

2 Questions used to measure work from home: April 2020 to December 2022

While Statistics Canada previously collected information on work location through the Census of Population and other surveys,[1] fast-changing labour market conditions during the COVID-19 pandemic required more timely and regular data collection on this topic. In response to this need, Statistics Canada introduced two new questions on work location in a supplement to the LFS in April 2020. Based on the existing data collection parameters for LFS supplements, the universe was restricted to the non-institutionalized population aged 15 to 69 living in the provinces.

The questions had two main objectives. The first was to provide estimates of how many Canadians were working mainly from home during the LFS reference week.[2] The second was to identify, among those who were working from home, how many had transitioned to remote work in the context of the COVID-19 pandemic.

To establish how many workers had started to work from home because of the pandemic, the supplement first asked all employed workers (including those who were absent from their job or business) about their usual work location, excluding recent changes related to the COVID-19 pandemic (Question U1). Then, employed respondents who had worked during the LFS reference week were asked to indicate in which location they had worked most of their hours during that week (Question C1). For both questions (U1 and C1), the response categories were based on concepts from the Census of Population and covered three types of work location: at home, at a fixed location outside the home and no fixed location.[3] The main indicator used to track changes in work location during the COVID-19 pandemic was the share of workers who worked most of their hours at home during the LFS reference week (based on C1).

The two questions continued to be collected until December 2021, but, starting in January 2022, they were replaced by questions designed to better capture medium- and long-term trends in the evolution of work location arrangements in the Canadian labour market, including the growing presence of hybrid work. The first change involved replacing the question on usual work location before the pandemic (U1) with a question on usual work location at the present time (U2). This new question used a mark-all format, allowing respondents to indicate that they usually worked both at home and at locations other than home. At the same time, the question on the location where the respondent worked most of their hours during the LFS reference week (C1) was changed to a question on the proportion of hours they had worked at home during that week (C2).

While the second version of the question on current work location (C2) was designed to produce an estimate of the main work location of respondent during the LFS reference week that would be comparable to the question from April 2020 to December 2021 (C1), a challenge encountered during the implementation of the supplement affected the comparability of estimates for the period from January to April 2022.

All new Statistics Canada survey questions must undergo a process of qualitative questionnaire testing prior to collection. This testing ensures that the questions are clear and accurately measure the intended concepts. The new question on current work location (C2) did not raise any concerns during qualitative testing and was well understood by all participants. However, one cannot be certain that survey respondents in the field read and interpreted the question in the

1. Examples of such surveys include the 2016 and 2018 cycles of the General Social Survey and the 2018 Canadian Internet Use Survey.
2. The LFS follows the International Labour Organization's statistical standard on the measurement of employment, by identifying a person's labour force status based on whether they have worked for pay or profit or maintained attachment to a job or business during a seven-day period. In the Canadian LFS, this "reference week" typically includes the 15th of the month.
3. See Appendix 1 for the exact wording of the various LFS questions on work from home.

same way as test participants.[4] The analysis below suggests that the new question (C2) yields an overestimation of the number of Canadians who work most of their hours at home. Two interrelated issues may have contributed to this overestimation.

First, some respondents may have read the question too quickly and focused on the response categories instead of the body of the question. While the body of the question asked respondents about the share of actual hours they worked from home during the LFS reference week, the response categories did not include a reference to hours worked from home. Therefore, some respondents may have interpreted Question C2 as asking them,

A) "What share of your usual hours did you actually work last week?"

instead of,

B) "What share of your actual hours did you work from home last week?"

A factor that may have primed respondents to interpret Question C2 in this way was the presence of a question on the number of hours lost because of the COVID-19 pandemic from the LFS "Disaster/Catastrophe Effects" module. This module was collected from April 2020 to December 2022 and immediately preceded the collection of data on work location. The reference to hours worked may have led respondents to interpret Question C2 in an erroneous way (i.e., as asking them about the share of usual hours they actually worked during the LFS reference week).

An adjustment was applied to the current work location question in May 2022, adding a reference to the home in the response categories (C3). As illustrated in the remainder of the paper, this adjustment brought the series back in line with the rest of the data series.

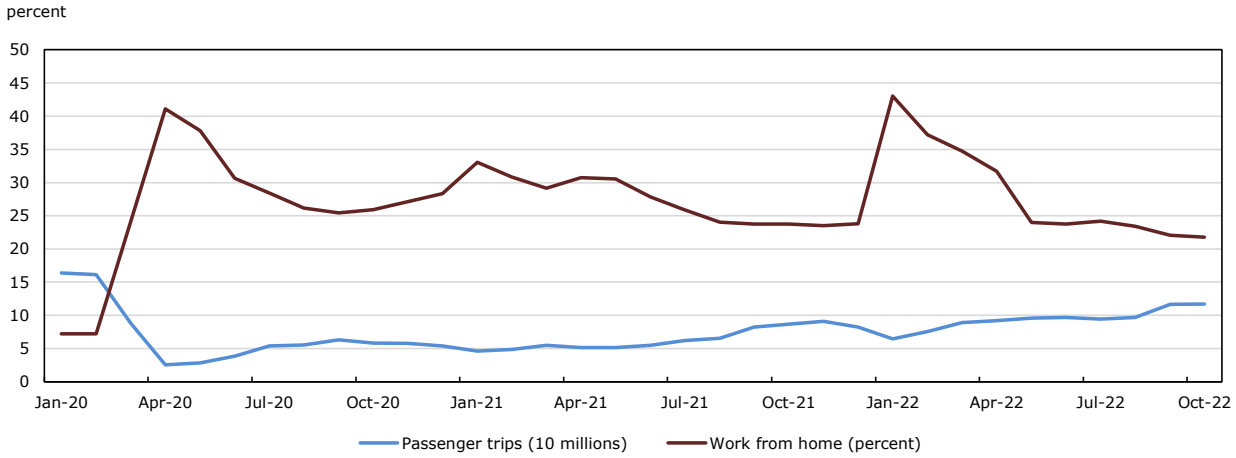
With the easing of public health restrictions and the waning impact of COVID-19 on the labour market, Statistics Canada will reduce the frequency of data collection on work location. Starting in 2023, supplementary LFS questions on work location will be collected less frequently, while ensuring that a comparable data series on work location is available going forward.

3 Descriptive evidence

Chart 1 plots the percentage of Canadian workers—employees and self-employed—working most of their hours from home, along with the number of Canadians (in tens of millions) using public transit. These monthly data cover the period from January 2020 to October 2022.[5]

4. One reason is that qualitative tests are usually based on a relatively small number of participants. As a result, a question that appears to be working well during qualitative testing may turn out to be problematic when asked to a large sample of respondents.
5. For January and February 2020, estimates of the percentage of workers working most of their hours from home are drawn from the 2016 Census of Population. Estimates from April 2020 onwards come from the LFS. The March 2020 value is constructed by interpolating the February and April 2020 values. The use of estimates from the 2016 Census of Population to approximate work from home in January and February 2020 is motivated by the fact that the incidence of work from home was fairly stable from 2016 to the years preceding the onset of the COVID-19 pandemic. For example, the 2016 and 2018 cycles of the General Social Survey—which measure telework only for employees—indicate that the percentage of employees aged 15 to 69 working most of their hours from home amounted to 3.6% in 2016 and 4.0% in 2018.

Chart 1
Percentage of workers working most of their hours from home and number of passengers using public transit, Canada, January 2020 to October 2022



Notes: Workers aged 15 to 69 working during the Labour Force Survey reference week. Full-time members of the Armed Forces are excluded.
Sources: Statistics Canada, Table 23-10-0251-01, 2016 Census of Population and Labour Force Survey.

The first thing to note is that estimates of the percentage of Canadians working most of their hours from home are at least as high in January 2022 as they are in April 2020. This finding is inconsistent with the fact that the COVID-19 restrictions implemented at the end of 2021 and the beginning of 2022 in response to the emergence of the Omicron variant were not as stringent as in previous COVID-19 waves (Dekker and Macdonald 2022).

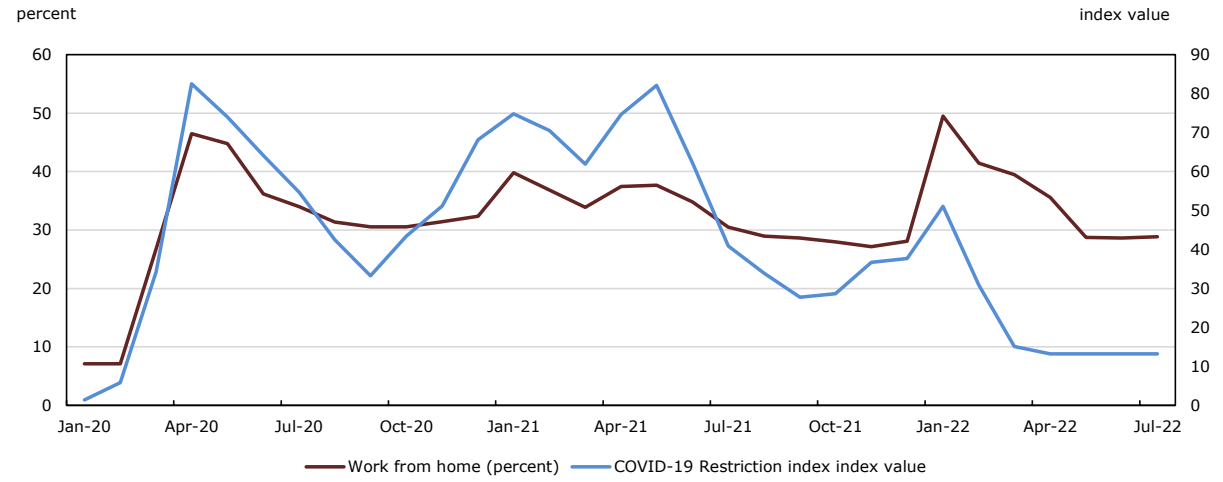
As expected, the large increase in work from home that took place from February to April 2020 was associated with a substantial reduction in the number of passengers using public transit. During that period, the number of passengers using public transit fell by 13.5 units (where a unit equals 10 million passenger trips) while the percentage of Canadians working from home increased by 33.9 percentage points. Thus, each percentage point increase in work from home was associated with a reduction of 0.40 units (-13.5 divided by 33.9) in demand for public transit. Subsequent periods during which the wording of the current work location question remained unchanged also display a sizable reaction (in absolute value) of the demand for public transit to movements in work from home. For example, this responsiveness equals -0.24 from April to September 2020 and -0.39 from January to September 2021.

In contrast, a much smaller responsiveness of the demand for public transit is observed from December 2021 to January 2022, a period during which the LFS transitioned to the second version of the current work location question (C2). During this period, the number of passengers using public transit fell marginally (by 1.7 units) even though work from home appears to have increased by 19.2 percentage points. Therefore, each percentage point increase in work from home was associated with a reduction of only 0.09 units (-1.7 divided by 19.2) in demand for public transit. This responsiveness of the demand for public transit to work from home (-0.09) is more than four times lower—in absolute value—than that recorded from February to April 2020 (-0.40) and that recorded from January to September 2021 (-0.39). Along with the counter-intuitive finding that the incidence of work from home was as high in January 2022 as it was in April 2020, this pattern suggests that the January 2022 estimate of the percentage of Canadians working most of their hours from home is biased upwards.

The responsiveness of the demand for public transit to work from home is even lower in absolute value (-0.05) from April to May 2022, a period that corresponds to the transition to the third version of the question on current work location (C3) and during which the incidence of work from home appears to have fallen by almost 8 percentage points. The large reduction in the incidence of work from home observed between these two months is inconsistent with the fact that the demand for public transit barely changed during this period.

Taken together, the patterns observed in Chart 1 are consistent with the hypothesis that estimates of the incidence of work from home are biased upwards from January to April 2022.

Chart 2
Work from home and COVID-19 Restriction Index, Ontario, January 2020 to July 2022



Sources: Statistics Canada, Table 33-10-0497-01, 2016 Census of Population and Labour Force Survey.

Chart 2 provides additional evidence supporting this hypothesis. From February to April 2020, the COVID-19 Restriction Index in Ontario increased by 76.7 points. Meanwhile, the percentage of workers working most of their hours from home in this province increased by 39.4 percentage points, thereby implying a responsiveness of work from home to COVID-19 restrictions of 0.51 (39.4 divided by 76.7).

In contrast, the responsiveness observed from December 2021 to January 2022 (1.60) and from March to May 2022 (5.77) is much higher. Furthermore, the incidence of work from home in Ontario fell substantially from April to May 2022 (-6.8 percentage points) even though the COVID-19 Restriction Index remained unchanged during these two months. Similar patterns are observed in Quebec.

In sum, the changes in the incidence of work from home observed from December 2021 to January 2022 and from April to May 2022—two pairs of months associated with transitions to new questions on work location—are not consistent with either data on public transit ridership or data on COVID-19 restrictions. These changes suggest that the percentages of Canadians working most of their hours from home are biased upwards from January to April 2022. This hypothesis is investigated more formally in the next section.

4 Regression results

The percentage of Canadian workers working most of their hours from home in province p during month m of year t, WFH_{pmt}, is modelled as

$$WFH_{pmt} = \theta_r + \beta_1 FEASIBILITY\_pmt + \beta_2 COVID_{mt} + \beta_3 RESTRICTIONS_{pmt} +$$

$$\beta_4 RESTRICTIONS_{pmt} * D_{pmt} + u_{pmt} \quad (1)$$

Where $FEASIBILITY\_pmt$ denotes the percentage of workers who hold jobs that can be done from home (Deng et al. 2020) and $COVID_{mt}$ is a binary indicator that equals 1 from March 2020 onwards or 0 otherwise. The term $RESTRICTIONS_{pmt}$ is Statistics Canada's COVID-19 Restriction Index for the whole population of a given province during month m or year t. Clarke et al. (2022) argue that,

> "At a value of 41, restrictions tend to go from being an inconvenience (e.g., wear a mask and gather only in smaller groups) to being a burden (e.g., in-person schooling is cancelled, nonessential retail and personal services are closed, or stay-at-home orders are issued). The value of 41, therefore, represents a point at which restrictions tend to become more binding for personal and business activities, and thus represents a level above which increases in restrictions can lead to more noticeable changes in activity."

For this reason, equation (1) allows the effect of COVID-19 restrictions on work from home to increase when $RESTRICTIONS_{pmt}$ is equal to or greater than 41, in which case the binary indicator D_{pmt} is equal to 1. Last, θ_r is a vector of region fixed effects that allows for the possibility that workers in the Atlantic provinces—the reference group in this vector—might have weaker preferences for work from home than their counterparts in large provinces (Mehdi and Morissette 2021), possibly because of shorter commuting distances.

The first column of Table 1 shows the results obtained when estimating equation (1) over the period from January 2020 to July 2022 (N=310=10 provinces times 31 months). In this model, the parameter estimate for $RESTRICTIONS_{pmt}$ is not statistically significant. Neither Quebec nor British Columbia appears to differ significantly from the Atlantic provinces regarding the incidence of work from home. The adjusted R-squared of the model equals 0.70.

Table 1
Regression results

	Work from home and period							
	Model 1		Model 2		Model 3		Model 4	
	Initial estimates January 2020 to July 2022		Initial estimates January 2020 to July 2022		New estimates January 2020 to July 2022		Initial estimates January 2020 to July 2022 except January to April 2022	
Variables	Parameter estimates	Significance level	Parameter estimates	Significance level	Parameter estimates	Significance level	Parameter estimates	Significance level
	number							
Intercept	-29.00	<0.0001	-12.63	<0.0001	-11.17	<0.0001	-10.73	0.0003
FEASIBILITY_pmt	0.96	<0.0001	0.47	<0.0001	0.43	<0.0001	0.42	<0.0001
COVID_mt	13.48	<0.0001	8.80	<0.0001	8.85	<0.0001	9.20	<0.0001
RESTRICTIONS_pmt	0.03	0.3309	0.15	<0.0001	0.15	<0.0001	0.13	<0.0001
RESTRICTIONS_pmt*D_pmt	0.07	0.0010	0.03	0.0227	0.04	0.0033	0.05	0.0005
Provinces								
Atlantic provinces (reference group)	...	...	...	...	...	...	...	...
Quebec	0.82	0.4823	3.58	<0.0001	3.43	<0.0001	3.48	<0.0001
Ontario	2.87	0.0386	6.85	<0.0001	6.90	<0.0001	6.98	<0.0001
Manitoba	-1.60	0.0868	-0.98	0.10	-1.33	0.0168	-1.36	0.0335
Saskatchewan	0.27	0.7742	0.18	0.77	0.35	0.5322	0.24	0.7131
Alberta	2.09	0.0348	4.07	<0.0001	4.26	<0.0001	4.22	<0.0001
British Columbia	0.95	0.4010	4.12	<0.0001	4.51	<0.0001	4.52	<0.0001
Month and year								
December 2021	...	...	-2.14	0.0238	-1.98	0.0279	...	...
January 2022	...	...	13.34	<0.0001	-0.02	0.9846	...	...
February 2022	...	...	11.41	<0.0001	-0.07	0.9399	...	...
March 2022	...	...	11.88	<0.0001	0.10	0.9127	...	...
April 2022	...	...	8.36	<0.0001	0.17	0.8585	...	...
May 2022	...	...	1.15	0.2545	1.18	0.2185	...	...
Number of observations	310	...	310	...	310	...	270	...
Adjusted R-squared	0.70	...	0.88	...	0.87	...	0.86	...

... not applicable

Notes: FEASIBILITY_pmt denotes the percentage of workers who hold jobs that can be done from home. COVID_mt is a binary indicator that equals 1 from March 2020 onwards or 0 otherwise. RESTRICTIONS_pmt is Statistics Canada's COVID-19 Restriction Index for the whole population of a given province during month m or year t. RESTRICTIONS_pmt*D_pmt: Equation (1) allows the effect of COVID-19 restrictions on work from home to increase when RESTRICTIONS_pmt is equal to or greater than 41, in which case the binary indicator D_pmt is equal to 1.

Sources: Statistics Canada, authors' calculations from Table 33-10-0497-01, 2016 Census of Population and Labour Force Survey.

The second column of Table 1 adds to equation (1) a vector of monthly indicators for the six months covering the period from December 2021 to May 2022. Adding this vector substantially improves the fit of the model: the adjusted R-squared increases from 0.70 to 0.88. The parameter estimate for $RESTRICTIONS_{pmt}$ increases from 0.03 to 0.15 and now becomes statistically significant. Both Quebec and British Columbia now display, all else equal, a greater incidence of work from home than the Atlantic provinces.[6] The binary indicators for the months of January to April 2022 are all statistically significant and suggest that—even after controlling for telework feasibility and COVID-19 restrictions—the incidence of work from home during these months was between 8 and 13 percentage points higher than during the months outside the period from December 2021 to May 2022. This finding indicates that the transition to the second version of the LFS questions on work from home (from U1 and C1 to U2 and C2) led to overestimating the percentage of Canadians working most of their hours from home. In contrast, the binary indicator for May 2022 is not statistically significant, thereby suggesting that the transition to the third version (U3 and C3) of the LFS questions on work from home appears to have solved this problem.

In light of this evidence, a sensible approach is to re-estimate equation (1) for the period from January 2020 to July 2022 with the exception of the four months (January, February, March and April 2022) for which the percentages of Canadians working most of their hours from home are assumed to be overestimated. This yields a total of 270 observations (i.e., 10 provinces times 27 months).

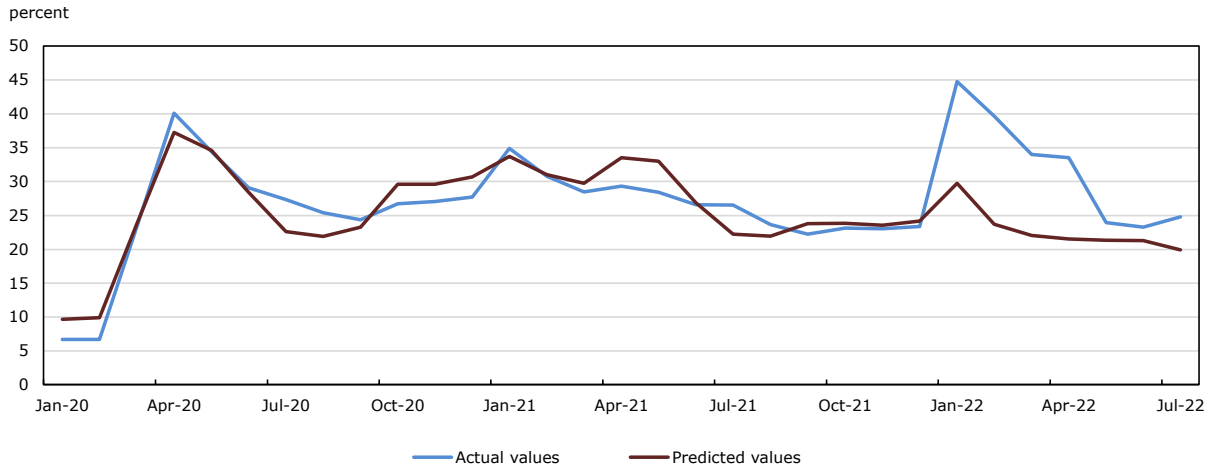
6. The same is true for Ontario and Alberta.

The results are shown in the fourth column of Table 1. As expected, greater telework feasibility and more stringent COVID-19 restrictions are associated with a greater incidence of work from home, especially when these restrictions equal 41 or more. The COVID-19 binary indicator also suggests, all else equal, a greater incidence of work from home starting in March 2020. Lastly, the four largest provinces (Quebec, Ontario, Alberta and British Columbia) all display—as expected—larger percentages of individuals working most of their hours from home than the Atlantic provinces, even after controlling for telework feasibility. Along with the adjusted R-squared, all parameter estimates are similar to those of the second column, in which equation (1) augmented with monthly indicators for the six months of December 2021 to May 2022 was estimated for the entire period from January 2020 to July 2022.

To assess the predictive performance of the model, the parameter estimates shown in the fourth column of Table 1 are multiplied by the regressors of equation (1). This exercise is done for all 310 observations associated with the period from January 2020 to April 2022, **including the months of January to April 2022**. The predicted values of WFH_{pmt} are then compared with its actual values for each province.

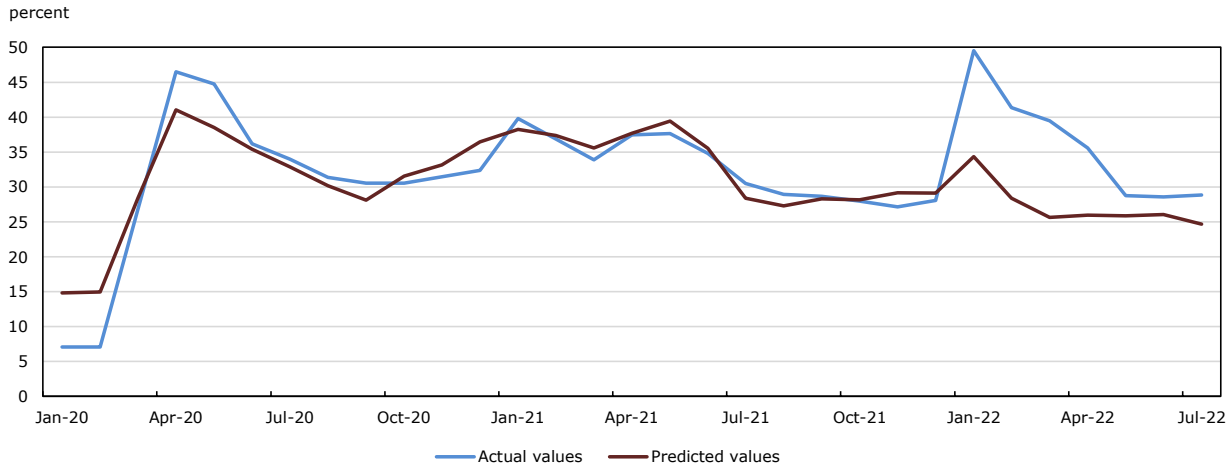
Charts 3 and 4 show the results of this exercise for Quebec and Ontario. For both provinces and most months of the period from January 2020 to July 2022, predicted values of WFH_{pmt} track reasonably well its actual values. This is not the case, however, for the months of January to April 2022. For these four months, predicted values of WFH_{pmt} substantially underestimate its actual values. For example, the predicted value of WFH_{pmt} for Ontario in January 2022 equals 34.4%, which is 15.1 percentage points lower than the actual value of 49.5%. In contrast, predicted values of WFH_{pmt} are fairly similar to its actual values from May to July 2022, a period during which the third version of the current work location measure (C3) was administered.

Chart 3
Percentage of workers working most of their hours from home, predicted values and actual values, Quebec



Sources: Statistics Canada, authors' calculations from Table 33-10-0497-01, 2016 Census of Population and Labour Force Survey.

Chart 4
Percentage of workers working most of their hours from home, predicted values and actual values, Ontario



Sources: Statistics Canada, authors' calculations from Table 33-10-0497-01, 2016 Census of Population and Labour Force Survey.

The patterns shown in charts 3 and 4 are observed for all provinces. They confirm the hypothesis that the percentages of workers working most of their hours from home are overestimated for the months of January to April 2022.[7]

Last, the third column of Table 1 replicates the second column but uses a new series of estimates of the incidence of work from home, instead of the initial estimates. The new series corresponds to the predicted value of WFH_{pmt} for the four months of January to April 2022 and to the initial estimates for other months. Parameter estimates from the third column are similar to those of the second and fourth columns with an important exception: all binary indicators for the four months of January to April 2022 are now close to zero and statistically insignificant. This finding shows that after controlling for telework feasibility and COVID-19 restrictions, the new estimates do not generate—contrary to initial estimates—unexpected differences in the incidence of work from home for these four months.

5 New estimates

5.1 New estimates by province

To help users assess the evolution of work from home from 2020 to 2022, the upper panel of Table 2 provides, for each province, estimates of the percentage of workers working most of their hours from home for the period from January 2020 to December 2022. The values for January and February 2020 are drawn from the 2016 Census of Population, while the values from April 2020 onwards come from the LFS. The values for March 2020 are a simple average of the February and April 2020 values. In all cases, the sample consists of individuals aged 15 to 69 who were working (i.e., who were not absent) during the census or LFS reference week and who were not full-time members of the Armed Forces. Both employees and self-employed individuals are included in the estimates.

7. This conclusion holds when the March 2020 observations—which are based on an interpolation of the February and April 2020 observations—are excluded from the estimation of equation (1).

Table 2

Percentage of workers working most of their hours from home, by province, January 2020 to December 2022

Month and year	Province										
	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Burnswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	All provinces
	percent										
2020											
January 2020	4.6	6.7	6.5	5.6	6.7	7.1	6.6	10.2	7.5	8.3	7.2
February 2020	4.6	6.7	6.5	5.6	6.7	7.1	6.6	10.2	7.5	8.3	7.2
March 2020	16.0	21.3	20.6	21.2	23.4	26.8	19.2	22.4	23.1	22.4	24.2
April 2020	27.3	36.0	34.7	36.8	40.1	46.5	31.8	34.7	38.6	36.6	41.1
May 2020	28.3	30.7	31.1	32.2	34.5	44.8	28.4	30.0	33.0	35.4	37.8
June 2020	18.6	23.6	26.6	19.6	29.1	36.2	20.6	22.1	27.8	29.0	30.6
July 2020	15.7	21.1	22.5	17.6	27.3	34.0	18.2	16.8	26.1	25.6	28.4
August 2020	13.1	18.8	22.8	16.8	25.4	31.4	16.8	15.5	21.9	24.3	26.2
September 2020	12.6	15.9	18.9	17.3	24.3	30.5	16.1	13.7	22.6	23.9	25.4
October 2020	12.2	18.4	19.5	17.5	26.7	30.5	16.5	15.0	21.4	24.1	25.9
November 2020	11.8	16.5	18.7	18.7	27.1	31.5	20.9	15.5	23.6	26.4	27.2
December 2020	12.4	19.8	20.0	18.8	27.7	32.4	23.7	18.4	27.1	26.5	28.3
2021											
January 2021	14.0	16.5	19.6	20.3	34.9	39.8	23.8	19.2	28.2	27.5	33.1
February 2021	26.8	16.6	20.2	20.5	30.8	36.9	22.5	19.9	25.6	27.0	30.9
March 2021	23.0	15.8	20.4	17.8	28.5	33.9	21.9	19.2	25.2	28.0	29.1
April 2021	15.5	17.5	20.7	17.5	29.3	37.5	21.2	20.7	25.8	29.4	30.7
May 2021	18.3	15.4	30.3	16.8	28.4	37.7	21.0	17.7	28.2	25.4	30.6
June 2021	15.0	15.1	23.6	14.6	26.6	34.8	20.7	16.1	22.4	24.0	27.9
July 2021	17.0	14.4	20.0	16.3	26.5	30.5	16.9	14.1	22.4	23.1	25.9
August 2021	16.6	13.6	20.4	14.8	23.6	29.0	16.9	13.3	19.5	21.7	24.1
September 2021	12.9	16.8	18.5	16.1	22.2	28.6	15.7	12.6	21.7	21.8	23.8
October 2021	11.6	17.1	16.9	18.5	23.1	28.0	15.0	11.6	22.3	21.8	23.7
November 2021	10.8	15.0	17.6	21.1	23.0	27.2	16.8	12.9	21.3	22.2	23.5
December 2021	11.1	17.0	18.7	18.0	23.4	28.1	17.7	12.4	21.1	21.4	23.8

Notes: Includes workers aged 15 to 69 working during the Labour Force Survey reference week. Full-time members of the Armed Forces are excluded. Values for January and February 2020 are drawn from the 2016 Census of Population. Values from April 2020 onwards are from the Labour Force Survey. March 2020 values are a simple average of the February and April 2020 values. Both employees and self-employed are included.

Sources: Statistics Canada, 2016 Census of Population and Labour Force Survey.

Table 2

Percentage of workers working most of their hours from home, by province, January 2020 to December 2022 (continued)

	Province										
Month and year	Newfoundland and Labrador	Prince Edward Island	Nova Scotia	New Brunswick	Quebec	Ontario	Manitoba	Saskatchewan	Alberta	British Columbia	All provinces
						percent					
2022											
January 2022	37.1	35.8	36.3	34.6	44.8	49.5	34.1	27.2	35.6	37.5	43.0
February 2022	26.1	31.3	30.3	33.1	39.7	41.4	32.2	27.0	31.5	32.4	37.2
March 2022	23.3	32.8	34.1	27.5	34.0	39.5	28.5	22.2	32.1	31.5	34.7
April 2022	19.3	25.9	25.0	23.0	33.5	35.6	25.4	20.5	27.5	28.8	31.7
May 2022	13.9	16.4	16.3	16.0	23.9	28.7	16.1	13.1	20.4	21.4	24.0
June 2022	14.7	15.4	19.2	16.3	23.3	28.6	15.1	12.9	19.3	22.1	23.8
July 2022	14.0	17.4	17.6	18.1	24.8	28.8	16.1	13.5	18.2	22.5	24.2
August 2022	12.9	17.6	18.6	17.2	23.0	28.0	16.9	12.6	18.0	22.3	23.4
September 2022	12.0	19.7	16.7	16.2	22.6	26.7	13.7	11.1	16.4	20.6	22.1
October 2022	13.1	19.7	15.6	15.3	21.4	26.3	13.8	11.5	16.5	21.5	21.8
November 2022	12.9	17.2	18.1	18.5	21.1	26.3	14.8	13.3	17.1	20.5	21.9
December 2022	13.2	19.6	19.0	17.9	22.5	26.4	15.0	11.6	17.2	19.7	22.1
New estimates for January to April 2022											
January 2022	23.4	22.8	22.6	23.7	29.8	34.4	18.6	15.7	22.8	24.8	28.8
February 2022	21.2	19.0	19.2	19.3	23.7	28.4	16.9	15.1	22.9	23.0	24.6
March 2022	15.3	17.2	16.8	17.3	22.1	25.6	15.3	15.2	20.2	21.6	22.4
April 2022	13.8	15.9	16.4	16.2	21.5	26.0	14.7	15.5	20.0	21.8	22.4

Notes: Includes workers aged 15 to 69 working during the Labour Force Survey reference week. Full-time members of the Armed Forces are excluded. Values for January and February 2020 are drawn from the 2016 Census of Population. Values from April 2020 onwards are from the Labour Force Survey. March 2020 values are a simple average of the February and April 2020 values. Both employees and self-employed are included.

Sources: Statistics Canada, 2016 Census of Population and Labour Force Survey.

The lower panel presents new provincial estimates for the months of January to April 2022. These new provincial estimates simply equal the predicted values of WFH_{pmt} obtained from the fourth column of equation (1) for these months. New estimates are also presented for all provinces taken together. For a given month, these new national estimates equal a weighted average of the new provincial estimates, where the weights equal the share of workers of a given province in the overall workforce during a given month. For the period from January to April 2022, users are advised to use the new estimates instead of the initial estimates.

5.2 New estimates by other dimensions

The model-based estimates obtained from equation (1) use telework feasibility estimates developed by Deng et al. (2020) and Statistics Canada's COVID-19 Restriction Index. While telework feasibility estimates can be disaggregated by other dimensions (such as age, sex, education or industry), this is not the case for Statistics Canada's Restriction Index, which is built only at the provincial level. As a result, the modelling approach used in Section IV cannot be replicated for these other dimensions.

Nevertheless, it is possible to produce new estimates of the incidence of work from home for the period from January to April 2022 for other dimensions (such as age, sex, education or industry), using a simple adjustment procedure outlined in Appendix 2.

Last, users should be aware that the work location questions introduced from 2020 to 2022 by Statistics Canada in the LFS were asked only to a subset of the LFS sample. As a result, the ability to disaggregate data on work from home by various dimensions is more limited than it would be with the entire LFS sample.

6 Concluding remarks

The substantial increase in work from home triggered by the COVID-19 pandemic has led to growing demand for information on the incidence of telework. Using public transit data and multivariate analyses that take advantage of estimates of telework feasibility and of Statistics Canada's COVID-19 Restriction Index, this study shows that the percentage of Canadians working most of their hours from home was likely overestimated during the months of January, February, March and April 2022. New estimates are offered at the provincial and national levels for these four months. In addition, a simple adjustment procedure is proposed for disaggregating numbers by other dimensions such as age, sex, education or industry.

Users should keep in mind that the issues documented in this study affect only the concept of "working most hours from home." They do not affect the concepts of "hybrid work arrangements" and "working exclusively from home," two useful concepts that have been measured by the LFS since January 2022. With the updated estimates provided in this study and the data that will be collected by the LFS going forward, users will be able to assess the evolution of the percentage of Canadians working most of their hours from home from 2020 onwards.

7 Appendix 1: Labour Force Survey questions on work from home

First set of questions: April 2020 to December 2021

U1. Which of the following best describes #{__DT_NAMEE}'s **usual place of work** at #{__DT_HIS_HER} main job or business?

Exclude any recent changes related to COVID-19.

Would you say:

1) Work at a fixed location outside the home
2) Work outside the home with no fixed location e.g., driving, making sales calls
3) Work at home

C1. **Last week**, in which of these locations did #{__DT_NAMEE} **work the most hours**?

Last week is from #{__DT_REFWEEK_E}.

Would you say:

1) At a fixed location outside the home
2) Outside the home with no fixed location e.g. driving, making sales calls
3) At home
4) Absent from work

Second set of questions: January to April 2022

U2. **At the present time**, in which of the following locations does #{__DT_NAMEE} **usually** work as part of #{__DT_HIS_HER} **main** job or business?

Select all that apply.

1. At a fixed location outside the home
2. Outside the home with no fixed location
    a. e.g., driving, visiting clients
3. At home
    a. Include all work done at the same address as home, including farm work

C2. **Last week**, what proportion of #{__DT_HIS_HER} work hours did #{__DT_NAMEE} work **at home** as part of #{__DT_HIS_HER} **main** job or business?

Last week is from #{__DT_REFWEEK_E}

Include all work done at the same address as home, including farm work.

Would you say:

1. All hours
2. More than half, but not all
3. One quarter to half

4. Less than a quarter
5. No hours

8 Appendix 2: Approximating the incidence of work from home for other dimensions

It is possible to produce new estimates of the incidence of work from home for the period from January 2022 to April 2022 for other dimensions (e.g., age, sex, industry and education), using a simple adjustment procedure. For example, one can approximate the percentage of individuals working most of their hours from home by industry in January (April) 2022 by using the following steps:

Step 1: Compute $\Delta NWFH_t$, the overall change in the number of individuals working most of their hours from home observed from December 2021 to January (April) 2022, based on the new estimates for the first four months of 2022. Table 3 shows that the overall change observed from December 2021 to January (April) 2022 amounts to 567,800 (-282,700) workers.

Table 3
Estimated number of individuals working most of their hours from home, Canada, December 2021 to April 2022

Month and year	Number (thousands)	Change from December 2021 to month m (thousands)
December 2021	4,198.2	...
January 2022	4,766.0	567.8
February 2022	4,297.2	99.0
March 2022	3,836.7	-361.5
April 2022	3,915.5	-282.7

... not applicable

Notes: Includes workers aged 15 to 69 working during the Labour Force Survey reference week. Full-time members of the Armed Forces are excluded. Numbers from January to April 2022 and the resulting changes from December 2021 to month m are based on new estimates. Both employees and self-employed are included.
Source: Statistics Canada, authors' calculations from the Labour Force Survey.

Step 2: Disaggregate $\Delta NWFH_t$, the overall change in the number of individuals working most of their hours from home, by industry, using the industry shares of work from home observed in December 2021. For example, to compute the change in the number of workers working from home in industry i from December 2021 to January (April) 2022, use the following equation:

$$\Delta NWFH_{it} = \Delta NWFH_t * SHARE_{i\_Dec\,2021} \quad (2)$$

Where $\Delta NWFH_{it}$ equals the change in the number of workers working from home in industry i from December 2021 to January (April) 2022 and $SHARE_{i\_Dec\,2021}$ equals the percentage of workers working from home employed in industry i in December 2021.

Step 3: Add $\Delta NWFH_{it}$ to the number of workers working from home in industry i in December 2021 ($NWFH_{i\_Dec2021}$) to obtain $NWFH_{it}$, the estimated number of workers working from home in industry i in January (April) 2022:

$$NWFH_{it} = \Delta NWFH_{it} + NWFH_{i\_Dec2021} \quad (3)$$

Step 4: Divide $NWFH_{it}$ by the number of individuals working in industry i in January (April) 2022, to obtain the estimated percentage of workers working from home in industry i in January (April) 2022.

This four-step procedure ensures that the sum of disaggregated numbers equals the overall numbers. It can be used for other dimensions such as age, sex or education. Its main limitation is that it assumes if, for example, 10% of all teleworkers worked in industry A in December 2021, then the change in the number of teleworkers observed from December 2021 to January (April) 2022 in industry A will equal 10% of the overall change in the number of teleworkers during that period. This assumption may provide a good approximation in some cases but a poor one in other cases. Users should keep this limitation in mind.

References

Clarke, S., J. Dekker, N. Habli, R. Macdonald and C. McCormack, C. 2022. Measuring the Correlation Between COVID-19 Restrictions and Economic Activity. *Analytical Studies: Methods and References*, no. 40. Statistics Canada Catalogue no. 11-633-X. Ottawa: Statistics Canada. https://www150.statcan.gc.ca/n1/en/pub/11-633-x/11-633-x2022003-eng.pdf?st=bOzLbU1b

Dekker, J., and R. Macdonald. 2022. "COVID-19 restrictions index update," *Economic and Social Reports,* Statistics Canada Catalogue no. 36-28-0001. https://www150.statcan.gc.ca/n1/pub/36-28-0001/2022008/article/00002-eng.htm.

Deng, Z., D. Messacar, and R. Morissette. 2020. "Running the Economy Remotely: Potential for Working from Home During and After COVID-19." *StatCan COVID-19: Data to Insights for a Better Canada*, no. 26. Statistics Canada Catalogue no. 45280001. Ottawa: Statistics Canada.

Mehdi, T., and R. Morissette. 2021. "Working from Home: Productivity and Preferences." *StatCan COVID-19: Data to Insights for a Better Canada*, no. 12. Statistics Canada Catalogue no. 45280001. Ottawa: Statistics Canada.

Statistics Canada. 2022. "*Commuting in Canada during the COVID-19 pandemic: What changed from 2016 to 2021?*", https://www150.statcan.gc.ca/n1/pub/11-627-m/11-627-m2022081-eng.htm