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IZA DP No. 13254

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ABSTRACT

The Short-Term Economic Consequences of COVID-19: Occupation Tasks and Mental Health in Canada

In this paper, we document the short-term impact of COVID-19 on labour market outcomes in Canada. Following a pre-analysis plan, we investigate the negative impact of the pandemic on unemployment, labour force participation, hours and wages in Canada. We find that COVID-19 had drastic negative effects on labour market outcomes, with the largest effects for younger, not married, and less educated workers. We investigate whether the economic consequences of this pandemic were larger for certain occupations. We then built indices for whether (1) workers are relatively more exposed to disease, (2) work with proximity to coworkers, (3) are essential workers, and (4) can easily work remotely. Our estimates suggest that the impact of the pandemic was significantly more severe for workers more exposed to disease and workers that work in proximity to coworkers, while the effects are significantly less severe for essential workers and workers that can work remotely. Last, we rely on a unique survey, the Canadian Perspective Survey, and show that reported mental health is significantly lower among the most affected workers during the pandemic. We also find that those who were absent form work because of COVID-19 are more concerned with meeting their financial obligations and with losing their job than those who remain working outside of home, while those who transition from working outside the home to from home are not as concerned with job loss.

JEL Classification: I15, I18, J21

Keywords: COVID-19, unemployment, wages, remote work, essential workers, exposure to disease

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1 Introduction

COVID-19 is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). COVID-19 has spread globally and at the end of April 2020 the total number of cases is above 3 million worldwide and more than 50,000 are infected in Canada. Social and physical distancing has been the key policy tool used by Canadian governments at federal and provincial levels to contain the COVID-19 pandemic, resulting in the indeterminate shut down of non-essential services and resulting in severe job loss. There is no doubt that COVID-19 is having unprecedented economic consequences.

In this project, we document the short-term economic consequences of the COVID-19 epidemic on labour market outcomes in Canada. As set out in our pre-analysis plan,[1] we answer the following research questions: (1) What are the short-term impacts of COVID-19 on employment, hours and wages, and how do they vary across demographic groups, union status, and immigration status? (2) Are there larger effects for occupations that are relatively more at-risk and that who cannot easily work from home? (3) What are the labour market effects on essential workers? (4) What are the impact of COVID-19 on mental health and are the effect larger among affected workers?

We are able to answer questions (1)-(3) using the Canadian Labour Force Survey (LFS). The LFS is a monthly cross-sectional survey at the household-level which provides information on hourly earnings, weekly hours worked, and labour force status at the individual-level, allowing us to examine how COVID-19 has affected labour market outcomes. To answer questions (2)-(3), we construct indices using data on exposure to disease, physical proximity to other people, essential workers, and how easily occupations can work from home using pre-COVID-19 data. Our indexes are based on occupational survey data from O*NET and we adapt these indices to the LFS.[2] To answer question (4), we use a unique survey, Canadian Perspective Survey Series (CPSS), designed to provide insights on the consequences of COVID-19.[3]

Our results show that COVID-19 had drastic impact on the labour market in Canada. In particular, we find that the pandemic led to a severe increase in unemployment, decreased in hours of work and labour force participation. To understand better the effect of the pandemic, we study in details the role of occupation tasks to investigate whether the economic consequences of this pandemic were larger for certain occupations, using

[1] Our pre-analysis plans are available here: https://osf.io/7gujs/. We are using pre-analysis plans to pre-specify and publicly archive our analysis before the labour data release. See Brodeur et al. (2018) on the importance of a pre-analysis plan for non-experimental studies. Note that we wrote a pre-analysis plan for each of our two main data sets.

[2] Beland et al. (2020) use similar indices in analyzing U.S. labour market data. Indices here are adapted to the LFS from the Current Population Survey (CPS) in the U.S. O*NET is a program sponsored by the U.S. Department of Labour which provides occupational information and description. See the Appendix for a discussion of how our indices are created and adapted to the Canadian data.

[3] The Canadian Perspectives Survey Series is an experimental project covering a variety of social topics related to COVID-19. See the Section 4 for more information.

our four indices. Our estimates suggest that the impact of the pandemic was significantly more severe for workers more exposed to disease and workers that work in proximity to coworkers, while the effects are significantly less severe for essential workers and workers that can work remotely.

We also find that the negative impact of COVID-19 are larger for younger, not married, and less educated workers, suggesting that COVID-19 increases income inequality in the short run. We also find that COVID-19 has negative labour market outcomes for both male and female, with no discernible differential effects. We further investigate the effects by gender by examining the impact of COVID-19 on labour market outcomes of women with kids and women without kids. Our results show a decrease in labour market outcomes for both subgroups. These results suggest that COVID-19 did not increase gender inequalities in labour market outcomes. Of note, both immigrants and non-immigrants seem to be equally affected by the pandemic. In addition, our results show that self-employed individuals are highly affected by the pandemic.

To study further the potential negative impact of the pandemic, we use the Canadian Perspective Survey Series and investigate the effect on reported mental health, ability to meet financial obligations, and concern for loss of employment. Our results suggest that women and less educated workers are more likely to report lower levels of mental health. Reinforcing those findings are our results showing that women and less educated workers are more concerned, than men and more educated workers, with losing their jobs. Immigrants report a compromised ability to meet financial obligations and are more concerned with losing their jobs than Canadian-born individuals.

Last, we find that those who were absent form work because of COVID-19 are more concerned with meeting their financial obligations and with losing their job than those who remain working outside of home, while those who transition from working outside the home to from home are not as concerned with job loss. These results highlight important inequities in the effects of COVID-19 on mental health, ability to meet financial obligations, and concern for loss of employment, and represent an important aspect for how policy makers efficiently allocate resources to support individuals facing the diverse impacts of COVID-19.

Our results build on the growing literature on the effect of COVID-19 such as (Alon et al. (2020); Atkeson (2020); Berger et al. (2020); Briscese et al. (2020); Beland et al. (2020); Kahn et al. (2020); Fang et al. (2020); Fetzer et al. (2020); Jones et al. (2020); Jordá et al. (2020); Gollier and Straub (2020); Ramelli et al. (2020); Stephany et al. (2020); Stock (2020)). Our paper also adds to a large literature investigating the relationship between heath and labour market outcomes (Currie and Madrian (1999); Strauss and Thomas (1998); Thirumurthy et al. (2008)). Our contribution is to document the labour market effects of COVID-19 and investigating the impact by occupations and occupations indices. Our study also contributes to a large literature documenting the

macroeconomic consequences of diseases and epidemics (Acemoglu and Johnson (2007); Ashraf et al. (2008); Barro et al. (2020); Bell et al. (2006);Bloom et al. (2014); Correia et al. (2020); Goenka and Liu (2012); Lorentzen et al. (2008); Voigtländer and Voth (2013); Well (2007)). Our paper complements this literature by studying the short-term impacts of the pandemic on the Canadian labour market, using disaggregated data on confirmed cases and deaths in Canada.

The rest of the paper is as follow: Section 2 discusses COVID-19 in Canada, Section 3 discusses the literature and the conceptual framework, Section 4 discusses the data and empirical strategy, Section 5 presents the results and Section 6 concludes.

2 Brief background on COVID-19 in Canada

COVID-19 is a novel infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). A first case of COVID-19 was identified in China in late 2019. In early 2020, the disease has spread globally and resulting in a pandemic. The majority of infected individuals have mild symptoms but for some, especially older individuals and individuals with medical conditions, COVID-19 necessities hospitalization and might lead to death. The disease has overwhelmed the health care systems in several countries in Europe, before reaching North America. This fear has lead the Canadian federal and provincial government to promote social and physical distancing. This has resulted in the indeterminate shut down of non-essential services and resulting in several job loss.

Table 1 provides a timeline of important events during the COVID-19 pandemic for Canada. It present notable information about the first case in Canada (January 25th), the first death in Canada (March 8, 2020), when provinces declared emergencies, be them state of emergencies or public health emergencies, and when closures from schools occurred.[4] As noted in Table 1, many of the provinces had their spring break during the emergency declaration, implying many Provinces have had no education services since early March. Figures 1 (linear scale) and A1 (logarithmic scale) presents cases and deaths in the largest (and more affected) provinces: Quebec, Ontario, Alberta and British Columbia. It shows a constant increase in cases and deaths in March and April and the effect is significantly larger for Ontario and Quebec, than other provinces. On April 2, Canada surpassed 10,000 confirmed cases of COVID-19. At the end of April 2020, the number of cases in Canada surpassed 50,000 and the number of deaths surpassed 3000.

3 Conceptual Framework

COVID-19 may affect labour markets in several ways. In this section, we discuss potential channels focusing first on how the pandemic may affect differently specific industries and

[4]There are other important dates such as March 18th, when the border was closed to foreign nationals

occupations.[5]

3.1 Occupation and Industry

Occupational characteristics, such as interacting with the public and being in contact with other coworkers, may increase the incidence of contracting COVID-19 (e.g. Baker et al. (2020)). We built two indices[6] to capture these dimensions: workers more exposed to disease and proximity to coworkers. One the one hand, certain occupations might receive a wage premia to compensate the increase in risk (e.g. Smith (1979)). On the other hand, the labour supply of some workers might be affected and we may observe a decrease in labour force participation due to the increase risk (e.g. Garen (1988)). These two conditions could lead a decrease in the likelihood of working and an increase in wages for individuals still employed.

Another important classification is workers deemed "essentials." We thus build an index of essential workers to investigate the impact of COVID-19 on their labour market outcomes.[7] Essential workers includes the following: medical and healthcare, telecommunications, information technology systems, defense, food and agriculture, transportation and logistics, energy, water and wastewater, law enforcement, and public works industries. Essential workers in risky occupation could be the one compensated for the increase risk (e.g. Shingler et al. (2020)). The pandemic can also affect the labour demand and supply of health care workers.

Another dimension that can affect labour market outcomes is the possibly to work remotely. The COVID-19 pandemic and the government shutdowns are forcing numerous workers to work remotely. Using pre-COVID-19 data, we built an index that measures each occupation adaptability to remote work. We then investigate the labour market effects for workers in occupations with relatively high and low scores. There is large variation accross industries. For instance, the infrastructure for remote work in high tech firms were already in place, making the adaptation easier.

3.2 Other Potential Channels

Other channels at play could lead to heterogeneous impacts by occupation and industry. COVID-19 may also increase demand for certain goods and products such as package goods, grocery stores, drug stores and other delivery companies. These companies may seek to fill numerous positions due to the increased demand. We will study the impact of COVID-19 by industry and document that in certain industries and occupations, there

[5] Goenka and Liu (2012) present a framework to study the economic impact of infectious diseases. See also Beland et al. (2020) for a through discussion of the potential channels which COVID-19 can affect the labour market outcomes.

[6] We present in the Appendix how all our indices are built.

[7] This index is built using https://www.lmiontheweb.org/more-than-half-of-u-s-workers-in-critical-occupa

is an improvement in labour market outcomes.

A potential issue for certain workers is the school and day care shutdown accros Canada, which may affect labour supply of parents (e.g. Carta and Rizzica (2018) and Müller and Wrohlich (2020)). The pandemic can also affect labour supply through mental health issues (e.g. Ettner et al. (1997)) or via the health conditions of familly members (e.g. (Currie and Madrian (1999)). Additional considerations are related to potential changes in investment behavior and the allocation of productive capital across countries. For example, the exportation and production of N95 masks and other medical equipments can lead to labour market opportunities (e.g., Whalen (2020)).

4 Data and Empirical Strategy

4.1 Data on COVID-19 Cases and Mortalities: Canada Open Data Working Group

Health variables important for our analysis, such as the total number of cases and mortalities, are collected from the COVID-19 Canada Open Data Working Group. This group collects information from publicly available sources in real-time and at daily frequency, for Canada. It contains case-level information such as age, sex, and location (province) of COVID-19 cases individual's who reporting COVID-19 and mortalities. Up-to-date daily cumulative recoveries and testing done are also included but reported at the provincial- or territorial-level.[8]

Figures 1 and A1 respectively show COVID-19 cases and deaths in the four largest provinces of Canada since between January 25 and May 9, 2020 (linear and log cases).[9] One can see that the number of cases and deaths increasing during the middle of March 2020. This coincides with the both first dates of deaths in provinces and the beginning of government policy aimed at restricting the transmission of COVID-19, as see in Table 1.

4.2 Labour Force Survey

Statistics Canada uses the Labour Force Survey (LFS) to collect monthly, household-level data to construct aggregate labour market indicators for Canada's provinces and territories, and in a lot of ways mimics the Current Population Survey (CPS) for the U.S. The publicly available dataset is a cross-section of anonymized household-level economic and sociodemographic information integral in answering our research questions. The LFS is a rotating sample, with the same observations remaining in the sample for six consecutive

[8]It should be noted at this time that datasets at the provincial-level are yet to be released officially by Statistics Canada or an equivalent.

[9]All other provinces have below 1,000 cases or deaths as of May 9. For example, both Prince Edward Island and New Brunswick have zero deaths as of May 9, 2020. We put national equivalents in our appendix figures A14 and A15 for linear and logarithmic scales, respectively.

months before exiting. Each month, interviews are conduced with approximately 56,000 households yielding approximately 100,000 observations. Observations include civilian, non-institutionalized population 15 years and older and excludes those in the Canadian Armed Forces and those living on Aboriginal settlements or reserves. The LFS includes respondent-level information on hourly earnings, weekly hours worked, and labour force status, allowing us to answer how COVID-19 has affected individuals and labour markets.

The LFS is structured with a reference week followed by a data collection week. The reference weeks is the week in the month which contains the 15th of the month, while the data collection week immediately follows the reference week. Observations answer questions referencing the reference week during the data collection week.[10] Ten days following the collection period, Statistics Canada releases the unemployment aggregates for the previous month.

Individuals are traditionally contacted *via* face-to-face interviews, over the phone, or online, during the two weeks which contain the 15^{th} of the month. Due to COVID-19, none of the interviews were conducted face-to-face, or from call centres, in March 2020 – a reduction by 19.5% and 46.1%, respectively, when compared to February 2020. Most (71.%) interviews were conducted while the interviewer was at home in March 2020, up from 5.7% in February 2020. No information is provided based on the medium through which the interview was conducted in the publicly available data. No information is provided on whether an observation is in the out-going rotation group.

In Table 2, we present summary statistics of our main outcome variables. We use monthly LFS cross-sections starting in January 2016 and ending in April 2020. Differences in counts result from different conditions placed on the data. Unemployed is a binary outcome for anyone who is unemployed but still in the labour force. Labour force participation uses all observations in our sample and is a binary variable. For real hourly wages and hours worked, observations are restricted to those aged 15 to 70 and in the labour force, and are assigned a value of zero if unemployed.[11] All indices are given to observations who have assigned to them a National Occupation Classification (NOC) major group number. This has only been kept track since January 2017 and is only assigned to those who are employed, resulting in a reduced number of observations. The average person between January 2016 and April 2020 reports being unemployed about 6.7 percent of the time and has a labour force participation rate of nearly 64 percent. Real wages of workers in the LFS is approximately $20.89 Canadian dollars per hour and they work on average 34.5 hours a week.

[10]For example, during March 2020, individuals were contacted between March 23rd and March 27th to answer questions relating to their life between March 16th and March 20th.

[11]The LFS records only wage and hours of worked information for those who are employed in the public or private sectors.

4.3 Occupational Measures of Exposure, Proximity, Critical Workers and Remote Work

In order to gauge the impact that COVID-19 has had on various occupations in Canada, we build four indices: workers relatively more exposed to disease, workers that work with proximity to coworkers, essential workers and workers who can easily work remotely. We use the Occupational Information Network (O*NET) survey data to build these measures. O*NET is sponsored by the U.S. Department of Labor and aims to gather occupational data and develop applications to help create and maintain a skilled labor force. O*NET is gathering and providing details information on occupation task and description, which can be accessed and used by researchers.

Our index of exposure to disease is defined as how often an occupation is exposed to infection or disease with responses ranging from "Never" to "Everyday". Our index of proximity to coworkers is defined as the extent to which an occupation performs tasks in close proximity to other people with answers ranging from "more than 100 feet away" to "Nearly touching". Our index of work remotely is defined as how frequently an occupation works from home. Essential workers are based on the LMI Institute index.[12] It provides a list of essential occupations in several fields: medical and healthcare, telecommunications, information technology systems, defense, food and agriculture, transportation and logistics, energy, water and wastewater, law enforcement, and public works industries.

In sum, we adapt indices on exposure and proximity from Beland et al. (2020), a work from home indicator from Dingel and Neiman (2020), and a critical workers indicator from the LMI Institute to the Canadian Labour Force Survey. There are two difficulties we overcome in order to use these measures. First, we convert O*NET and SOC codes to Canada's National Occupation Classification (NOC) system. Second, we aggregate up to a level which we can merge with observations in the LFS. The former is done with a crosswalk between O*NET and NOC codes, while the latter is done by successively aggregating indices based on their employment share. For a more detailed discussion of this procedure, see Appendix 7.1.

Canada's NOC system contains 500 unit groups which represent the smallest classification an occupation can fall within. The smallest level of aggregation that the NOC has is therefore considerably smaller when compared to either O*NET or SOC systems. Moreover, in many cases merges would be many-to-many. To simplify this conversion, we assign each unit group of the NOC all of their matched groups from O*NET using an O*NET to NOC crosswalk. In this way, we can assign each NOC multiple index values for any of the four indices of interest. We then average over the index values associated with a single NOC to give it an unit-group, average index value. No weights are applied

[12]See this link for more details: https://www.lmiontheweb.org/more-than-half-of-u-s-workers-in-critical-occupations-in-the-fight-against-covid-19/.

in this initial step since NOC employment shares would have to be matched to O*NET codes.

We merge the NOC average indices with 2016 Census employment shares by NOC, all classes of workers, found in Statistics Canada Catalogue no. $98-400-X2016291$. From here, we make two aggregations. First, we construct employment-share weighted averages from unit groups (500 in the NOC) to minor groups (140 in the NOC). We repeat this step again, constructed weighted averages of indices from minor groups to major groups (40 NOC categories). All observations who are employed in the LFS between 2017 and 2020 are assigned a unique NOC group. We can therefore assign each observation with an NOC major group their respective weighted index values.

All indices range from 0 to 100, where 100 is the occupation with the most exposure to infection, closest proximity to others, or highest frequency of remote work. We summarize these indices in two panels of figure 3. Each NOC major group is displayed as a circle and the area of the circle is proportional to the number of employees in that occupation according to Canada's 2016 census. In both graphs we use our exposure to infection or disease measure as our y-axis and physical proximity to coworkers on the x-axis. The two panels vary in how they colour the circles. In the top panel of Figure 3, orange denotes the highest ability to work from home while blue denotes the lowest ability to work from home. The NOC major group for finance, insurance and related business has a high ability to work from home (orange) while having relatively low exposure to infection and disease and relatively limited physical proximity to fellow workers. This is in contrast to professional occupations in nursing who display low-ability to work from home and relatively high exposure to disease and high physical proximity to coworkers. The bottom panel of Figure 3 shows the same placement of bubbles, but varying the colour by quartile of critical worker index. In keeping with finance and nursing, we see the level of importance of these two major groups has changed: finance is relatively non-critical while nursing is considered critical.

4.4 Canadian Perspective Survey Series

To better understand how the pandemic is affecting the mental health of individuals we use the Canadian Perspective Survey Series 1 - Impacts of COVID-19 (CPSS). The survey series is being used to understand how Canadians view contemporaneous and emerging issues that are simultaneously important to policy makers. The cross-section is constructed by inviting randomly sampled units from the Labour Force Survey who were in the out-going rotation group for any of the months between April 2019 and July 2019. Initially, there were 31,896 individuals who signed-up for the new survey. For those who agreed to participate in the CPSS, 7242 had a valid email address through which Statistics Canada could email observations information to participate online. The CPSS

1 was issued between March 29, 2020 and April 3, 2020 and collected information about the observation during the reference (previous) week. The CPSS 1 gather information regarding observations' basic demographic characteristics, labour market outcomes, health variables, and changes in consumption habits and attitudes related to the COVID-19 pandemic.

In Table 3 we provide weighted percentages for variables of interest to this study. Columns are used to denote the various ways observations are categorized into their employment status and panels represent variables that have various scale outcomes. Those who are considered employed (columns 1, 2 or 3) include all those who worked or were absent for any reason, including temporary lay-offs. Columns 2 and 3 show those who were absent for reasons not relating to COVID-19 and those absent due to COVID-19, respectively. Column 4 defines those who are unemployed – excluding temporary lay-offs. The final column shows all those who had their employment status unstated. We see that about 40% of the sample is unemployed while just under half the sample were recorded being employed at work for at least part of the reference week.

The variable being used for mental health derives from the online questionnaire which asked individuals: "In general, how is your mental health?" where they could reply with either Excellent, Very good, Good, Fair, Poor, or Don't Know. We see that just over 80% of individuals regard their mental health as being Good, Very good, or Excellent. When comparing the column 1 (At Work) to column 4 (unemployed) of Table 3, we see a similar distribution of perceived mental health.

The middle panel of Table 3 displays how COVID has impacted individuals' ability to "meet their financial obligations or essential needs". Nearly half (44.7%) of individuals report COVID-19 as having above a minor impact and about a quarter (23.8%) report that the impact is "too soon to tell".

The bottom panel of Table 3 reports how COVID–19 affects their earnings and job security. We use one variable which asks: "To what extent do you agree or disagree with the following statement? I might lose my main job or main self-employment income source in the next four weeks." Observations can answer on a scale from Strongly agree to Strongly disagree and Don't Know. This question is only valid to those who are considered employed or Not stated.

4.5 Empirical Strategy

We rely on a simple pre/post analysis at the national level. The model is:

$$Y_{i,p,t} = \alpha + \beta PostCOVID_t + X'_{i,p,t}\gamma + \theta_p + \delta_t + \varepsilon_{i,p,t}, \tag{1}$$

where $y_{i,p,t}$ is an economic outcome for individual i in province p and month t. Our four main outcomes variables characterize individuals': (1) Unemployment status; (2)

labour force participation; (3) hours of work; and (4) real hourly wages.

An individual's unemployment status is a binary outcomes which is one if an individual is unemployed and 0 if they are employed. The LFS defines someone as unemployed during the reference week who "were without work, were available for work and were either on temporary layoff, had looked for work in the past four weeks or had a job to start within the next four weeks." Individuals in the labour force were all those individuals who were employed or unemployed (as per the previous definition) during the reference period.

Hours of work are computed for civilians aged 16–69 who are considered employed, and counts only the usual number of hours worked, excluding overtime. For hours of work, we include only those working in the public or private sector (exclude self-employed) and is trimmed to exclude values above the 99th percentile. The hourly wages (constant dollars relative to the individual's given province in January 2018) is computed for civilians aged 16–69 currently employed in the public or private sector (not self-employed) and paid hourly. It excludes self-employed persons and we trim to exclude values above 99th percentile. Hours and wage are set to 0 for unemployed and in labour force individuals in all our analysis.

$Post\ COVID_t$ is an indicator equals to one for March and April 2020 and zero for all preceding months. The time period is January 2016 to April 2020. $X_{i,p,t}$ is a vector of other regressors including categorical variables for an individual's age group, gender, marital status and education level. Finally, θ_p and δ_t represent state and time fixed effects, respectively.

Only year, month and provincial fixed effects are included in the basic model. We enrich the basic model by controlling for demographic characteristics, the educational level of the respondent. Moreover, to allow for common regional shocks to a given economic outcome, we estimate specifications that include interactions between year fixed effects and the four Census regions. We report standard errors clustered at the province level.

5 Results

In this section, we present the impact of COVID-19 on labour market outcomes in Canada, using the Labour Force Survey. We first present results at the national-level, then explore the impact of Provinces with more cases per capita. We also investigate for potential heterogeneity of the effect of COVID-19 by worker characteristics such as age, education, marital status and gender. We investigate thoroughly the role of occupations using our four indices: workers relatively more exposed to disease, workers that work with proximity to coworkers, essential workers and workers who can easily work remotely.

5.1 Economic Consequences of COVID-19

We first present a graphical representation of the impact of COVID-19 on labour market outcomes. Figure 2 presents the unemployment rate (Panel 3(a)), labour force participation (Panel 3(b)), hours of work (Panel 3(c)) and hourly wages (Panel 3(d)) over the time period January 2016 to April 2020. Figure 2 shows that the unemployment rate increased drastically in April 2020, while labour force participation, hours worked and hourly wages all decreased.[13] More precisely, the unemployment rate increased by 8 percentage points from 6% to approximately 14%, hours of worked decreased from 34 hours to less than 32 hours, and labour force participation decreased from about 65% to less than 60%. Interestingly, real hourly wages decreased by slightly more than 0.50$, but remains at a higher level than throughout most of the time period January 2016 to April 2020. Of note, the pool of workers changed drastically, which could offset part of the decrease on real wages if low-income earners are more likely to have been laid off. We probe this further later in the analysis.

Table 4 presents our baseline results. This table contains estimates of equation (1) for our four outcome variables. The time period is January 2016 to April 2020. The dependent variables are respectively the unemployment rate (Panel (a), columns 1–3), labor force participation (Panel (a), columns 4–6), hours of work (Panel (b), columns 1–3) and hourly wages (Panel (b), columns 4–6). Columns 1 and 4 control for province, year and months fixed effects. Columns (2) and (5) add individual characteristics controls such as gender, age and marital status. Columns (3) and (5) add education category and a province $\times$ year fixed effects.

Table 4 confirms that the unemployment rate increased since the beginning of the pandemic, while labour force participation, hours of work and wages all decreased. Recall that our variable of interest, $Post\ COVID$ equals one for March and April 2020 and zero otherwise. Our estimates suggest that the unemployment rate jumped by about 5 percentage points, while labour force participation decreased by 3.7 percentage points. Total usual hours work and hourly wage decreased by 1.5 and 0.4 percentage points since the beginning of the pandemic, respectively. Controlling for individuals characteristics and education has no effect on the size and magnitude of our estimates.

Table 5 investigates COVID-19 related layoffs and absences from work in more details. In the top panel, the dependent variable is a binary variable which equals one if an unemployed individual said their reason for leaving work in the previous year was due to: (a) own illness or disability, or; (b) being laid off. In the middle panel, the dependent variable is a binary variable which equals one if an employed individual reported a full week of absence during the reference week due to: (a) other reasons, or; (b) own illness

[13] As discussed in the empirical strategy section, hours and wage are set to 0 for unemployed and in labour force individuals in all our analysis.

or disability. In the bottom panel, the dependent variable is a binary variable which equals one if an employed individual reported a part week of absence during the reference week due to: (a) other reasons, or; (b) own illness or disability. Our estimates provide suggestive evidence that that there is a statistically significant increase in COVID-19 related layoffs and absences from work as we find a significant increase in our three measures, including full week and part week absences.

5.2 National Impacts by Subgroups

We now investigate with graphical representations the short-term effects of COVID-19 on labour market outcomes for different subgroups of respondents. Appendix Figures A2, A3 A4, A5, A6, A7, A8 and A9 illustrate our outcome variables by gender, age groups, marital status, weekly earnings quartile, education groups, immigrants, and years since immigration, respectively. These figures also present our four labour market outcomes where applicable. In Appendix Tables A1 - A4, we also present heterogeneity analysis, as discussed below.

Appendix Figure A2 illustrates the evolution of our four outcome variables by gender. We find that COVID-19 has negative labour market outcomes for both male and female, with no discernible differential effects. This suggest that COVID-19 did not increase gender inequalities in labour market outcomes.

We further investigate the effects by gender by examining the impact of COVID-19 on labour market outcomes of women with kids versus women with no kids in Appendix Figure A3. It shows a decrease in labour market outcomes for both women with kids and women without kids, with a slightly larger (negative) impact on labour outcomes for women without kids.

We present the effect of COVID-19 by age groups (15 to 34; 35 to 54; and 55+). This is important as COVID-19 has more (less) negative health effects on older (younger) workers. This could potentially affect their labour market outcomes and in particular their labour supply. In contrast, younger workers might be more vulnerable and less likely to be protected by their union. Appendix A4 shows that COVID-19 had an impact on all age groups, with the largest effect for younger workers.

We next document the impact of the pandemic by marital status. Appendix Figure A5 shows that there was a large increase in unemployment and a decrease in labour force participation for both married and non married individuals, but the effect is larger for non married individuals.

Figure A6 shows how real hourly wages and total usual hours of work vary by income quartile. Individuals included in these graphs are employed, leading to the omission of unemployment and labour force participation. We observe those in the upper three quartiles of the income distribution seeing reduced hours of work while the lowest quartile

sees a slight increase in the hours of work. For hourly wages however, we see virtually no difference between groups.

In Appendix Figure A7, we present results by educational attainment. Individuals are classified into three educational categories: less than high school, high school degree and some college, and postsecondary degree. Appendix Figure A7 shows that the negative impact of COVID-19 is present in all education categories, but the effect appears more pronounced for less educated workers.

Appendix Figure A8 illustrates the results separately for immigrants and native born. It suggests that both native born and immigrants see a decrease in labour market outcomes due to COVID-19 and that the effect is strikingly similar.[14] We study immigrants in more details in Appendix Figure A9 by splitting the sample by year since immigrations. More precisely, we separate immigrants into two categories: less than 10 years and more than 10 years ago. We find that the negative impact is quite similar for recent or long established immigrants.

So far, we find that younger and less educated individuals seem to be the most affected by COVID-19 and government response. In contrast, there does not seem to be differential effects by gender or immigration status. We turn to our regression analysis to check whether the differential effects are statistically significant or explained by our set of controls and fixed effects.

We investigate heterogeneous effects of COVID-19 by demographic characteristics in Appendix Tables A1 - A4. In order to investigate the potential heterogeneity of the effects, we interact our variable of interest, *Post Covid*, with a dummy for female (column 1), age categories (16–34 and 35–54) (column 2), a dummy for being married (column 3) and our educational attainment (column 4). We confirm the results from the graphical representations; women and men are (mostly) equally affected and younger, unmarried and less educated individuals are more negatively affected.

5.3 Characteristics of Occupations and Jobs

We next investigate the impact of COVID-19 on different occupations, using our four indices. Tables 6 and 7 provide estimates for the differential effects of COVID-19 on workers across our exposure, proximity, essential workers and remote work indices and are structured similarly. We include $Post\ COVID$, $Index$ and the interaction of these two variables. $Index$ corresponds to one of our indices, and ranges from 0 to 100. As such, the point estimates should be interpreted as the effect of a one percentage point increase in the index value (i.e. moving to an occupation that is one percentage point more exposed to disease or infection). In Appendix Tables A5 and A6 we conduct a

[14] Studying the labor market effects of immigrants is important as been found to equilibrate local labour markets in recession (e.g., Cadena and Kovak (2016). They have also been shown to be affected differently by recessions or government policies (e.g., Guriev et al. (2019) and Beland and Unel (2018).

similar analysis replacing *Index* by *Index Dummy*, which is a dummy for whether the individual is in an occupation above the median for our indices (proximity to coworkers, exposure to disease, essential workers, remote work).

Table 6 focus on outcomes unemployment and labour force participation for our all of our indices and Table 7 focus on hourly wages and hours of work for those indices. The top panel of Table 6 shows that workers in occupations working more closely with others are significantly more likely to be unemployed (about 0.1) percentage points) while workers who are more exposed (-0.01 percentage points) and workers able to work remotely (0.06 percentage points) are significantly less likely to be unemployed. The bottom panel suggests workers who are in occupations working more closely are significantly less likely to be in the labour force while those in critical care and more able to work remotely are more likely to be in the labour force. Our estimates for more exposed workers are negative but not statistically significant at conventional levels. The results from the top panel in Appendix Table A5 also suggest that those who work more closely and are more exposed are more likely to be unemployed, while critical care workers and those more able to work from home are less likely to be unemployed. The results presented in the bottom panel reinforce the above findings: that those working more closely with others are less likely to be in the labour force while critical care workers and those more able to work from home are more likely. These results also find that more exposed workers are less likely to be in the labour force.

Moreover, the top panel in Table 7 finds that there is a statistically significant decrease in hourly wages (0.049 percentage points) for workers operating more closely to others and for more exposed workers (0.01 percentage points). It also finds that workers more able to work from home are experiencing a smaller decline in wages. It shows no statistically significant change for critical care workers. The bottom panel indicates hours worked fell more for those working more closely with others (0.025 percentage points) and critical care workers (0.006 percentage points) but fell by less for those more able to work from home (0.024 percentage points). We find no statistically significant change for more exposed workers. The analogous results from Appendix Table A6 reports findings in the same direction for hourly wages and hours worked, though finds no statistically significant change in hours worked for critical care workers.

Tables 8 and 9 investigates COVID-19 related layoffs and absences from work following guidelines from Statistics Canada as in Table 5. However, in Tables 8 and 9 we use our indices (proximity, exposure, critical workers and work from home) to classify occupations and we provide a similar analysis to Tables 6 and 7 and Appendix Tables A5 and A6. Table 8 presents our indices of exposure and proximity, and Tables 9 present our measure of essential workers and remote work indices measures. In columns 1 and 3, we include $Post\ COVID$, *Index* and the interaction of these two variables. *Index* corresponds to one of our indices, and ranges from 0 to 100. In columns 2 and 4, we replace *Index* by

Index Dummy, which is a dummy for whether the individual is in an occupation above the median for our indices (proximity to coworkers, exposure to disease, essential workers, remote work). Tables 8 and 9 show that for all occupation indices, there is a significant increase in COVID-19 absences. However, the interaction term between $COVID$, $Index$, show that occupations working in proximity or with more exposure are significantly more likely lead to COVID-19 related absences, while critical workers are less likely to have COVID-19 related absences.

We now look at additional figures for different subgroup of workers. Appendix Figure A10 present results for full-time and part-time workers for hours and hourly wages. It suggests a larger decline in hours and wages for full-time workers. This can potentially be explained by the facts that several part-time jobs are related to restaurants and grocery which are less affected by the pandemic. Appendix Figure A11 present results for part-time students, full-time students and non-student. It shows that COVID-19 had an impact on all three groups. Appendix Figure A12 present results by union status for hours and hourly wages. It suggest that the COVID-19 impact is significantly less important for union workers. This is potentially due to the fact that union workers are more likely to have some protections from layoffs in their collective bargaining agreements. Appendix Figure A13 present the impact of COVID-19 on self-employed individuals. It separates between incorporated and unincorporated. Self-employed are separated in two categories: incorporated (working for themselves in corporate entities) and unincorporated (working for themselves in other entities). The literature argues that incorporated entities is a good proxy for entrepreneurship (e.g., Levine and Rubinstein (2017); Beland and Unel (2019)). Appendix Figure A13 shows that the negative impacts of COVID-19 on labour market outcomes is present for both incorporated and unincorporated entities and the effect is important for unemployment and labour force participation. Appendix Figure A13 suggest that COVID-19 had important negative impact on entrepreneurship activities.

Finally, we present in Appendix Figures A16 to A54 for all NOC occupations major group. It shows that COVID-19 had a negative impact on the vast majority of occupation group. Some exceptions includes professional occupations in education services; Care Providers and Educational, Legal and Public Protection; and workers in natural resources, agriculture and related production.

5.4 Mental Health and COVID-19

We analyse the effects of COVID-19 on an individual's mental health, and financial and work concerns using the following ordered probit regression equation:

$$Y_i = \alpha + X_i^{'} + \beta z_i + \varepsilon_i, \tag{1}$$

where y_i is an outcome for individual i. Our three outcomes variables characterize

individuals': (1) Mental Health; (2) Financial Concerns; and (3) Employment Concerns. Mental health is a variable which takes on values ranging from 1 (Poor) to 5 (Excellent). Financial Concerns measures an individual's estimation of COIV-19's impact on their ability to meet financial obligations or essential needs and takes on values ranging from 1 (Major Impact) to 5 (Too soon to tell). Work Concerns is a variable measuring an individual's agreement with the notion that they might lose their main job or self-employment income and ranges in values from 1 (Strongly Agree) to 5 (Strongly Disagree).

X_i' is a vector of individual demographic covariates which include sex, age, marital status, and immigration status. z_i includes economic context covariates which we consider important in predicting the outcomes. These include the employment status of the individual, whether or not the workplace of an individual has changed during the reference week, whether or not COVID-19 has had an impact on observations' ability to meet financial obligations or essential needs, and whether or not the individual fears losing their job in the upcoming four weeks.

As per Table 3, we use an ordered probit to maintain the structure of the scales for these outcomes and omit any individual's who report "Not Stated".

Table 10 shows the results of our ordered probit regressions when having observations' perceived mental health as the outcome variable. Column (1) includes unemployed individuals while columns (2) and (3) use only those who are reported as employed by the CPPS 1. We first describe the relationship between our socioeconomic variables and mental health. In keeping with our predictions in the Pre-Analysis Plan, we see that females and young people report lower mental health scores. In contrast to our Pre-Analysis Plan hypothesis, older individuals also report lower mental health status. Turning to immigration status, when including unemployed individuals our results indicate that immigrants report higher mental health status than Canadian born. When restricting to employed individuals only, we are unable to detect a difference between the two groups. Last, we find that employed individuals who have less than a high school education report lower mental health status while we find no difference compared to more educated workers when including unemployed individuals.

We now turn to our main results for the CPSS. Column (1) of Table 10 shows that only those who missed worked during the reference week for reasons unrelated to COVID-19 demonstrated lower perceived mental health when compared to those who were at work for at least a part of the reference week. Those who missed work due to COVID-19 or were unemployed showed no difference in perceived mental health. This result is surprising and suggest that workers absent from work because of COVID-19, those unemployed and those working may all, on average, suffer equally from the pandemic.

Column (2) indicates that compared to those who continued to work outside of home, mental health is unaffected for those who transition to working from home. Moreover, those whose work was previously done from home report no differences in mental health

status compared to those who continued to work outside of home. Column (3) shows that those who agreed that COVID-19 had major, moderate, or minor impacts on their ability to meet financial responsibilities or essential needs have slightly lower perceived mental health.

Table 11 examines the effects of COVID-19 on the ability of individuals to meet their financial responsibilities, as in columns (1) – (3), or how they fear losing their job, as in columns (4) – (6). Females seem to have no differences with males for how COVID impacts their financial concerns but express less fear of losing their job. Immigrants, across all models, show that COVID-19 is impacting their ability to meet financial responsibilities and essential needs and are more likely than Canadian-born observations to fear losing their job in the next four weeks. Individuals with less than high school are not as impacted in meeting their financial obligations but are more concerned with losing their jobs compared to those with more than high school education.

Estimates in column (2) suggest that those who are employed but absent due to COVID-19 report being concerned for meeting their financial obligations in comparison to individuals working outside the home. Similarly, estimates in column (5) shows that this group is significantly more likely to answer that they fear losing their job than individuals working.

Column (3) indicates that those who previously worked form home and those who were absent form work are more concerned with meeting their financial obligations than those who remain working outside of home. The estimated effect is particularly large for those absent from work. Column (6) demonstrates that those who are absent from work are more likely to be concerned with losing their job while those who transition from working outside the home to from home are not as concerned with job loss.

6 Conclusion

In this paper, we document the short-term consequences of COVID-19 on labour market and mental health outcomes in Canada. Following our pre-registered pre-analysis plans, we investigate whether the economic consequences of this pandemic were larger for certain occupations. To do so, we build four indices: workers relatively more exposed to disease, workers that work in proximity to coworkers, essential workers, and workers who can easily work remotely. Our estimates suggest that the impacts of the pandemic were more severe for workers more exposed to disease and workers that work in proximity to coworkers, while the effects are significantly less severe for essential workers and workers that can more easily work remotely. We also find that the negative impact of COVID-19 are larger for younger, not married, and less educated workers suggesting a link between COVID-19 and income inequality.

We use the Canadian Perspective Survey to investigate the effect of COVID-19 on

reported mental health and financial concerns in Canada. This is because the effects of social distancing, remote work policies, and general health concerns due to COVID-19, will likely be captured in additional questions that lie beyond the scope of traditional labour surveys. The CPSS allows us to understand some of the different channels that the COVID-19 pandemic can affect individuals and its differential impacts across subgroups. Our results also suggest that those who indicate being absent from work due to COVID-19 are more likely to express fear over meeting financial obligations and losing their job. Additionally, we find that women, workers with less than high school education, and immigrants are particularly adversely affected.

It is important for policy makers to understand the trade-offs between disease prevention, employment and health. As many governments look to help displaced and affected workers, these findings highlight some of those most in need of assistance. It is more than just traditional labour market outcomes which should be the target of future policies. Policies should continue to address the present concerns about worsening mental health, precarious expectations about work, and inability to meet financial obligations and essential needs some individuals currently face. This paper attempts to get at these effects and describe the heterogeneity which exists in Canada.

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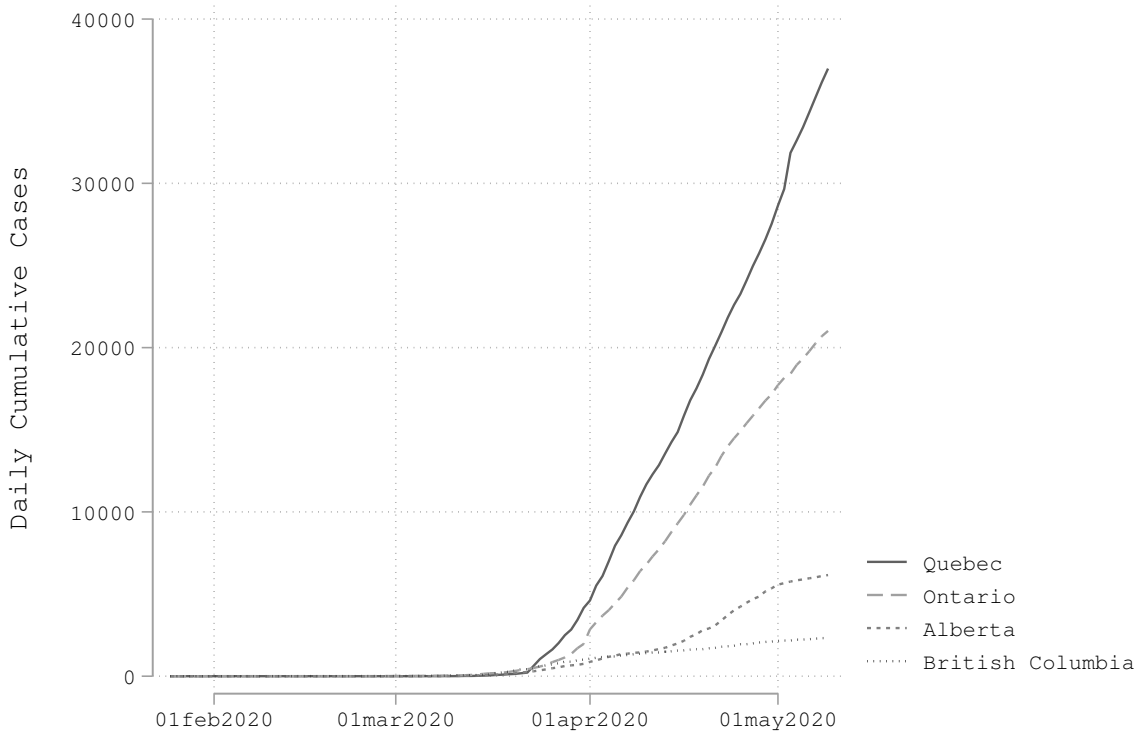
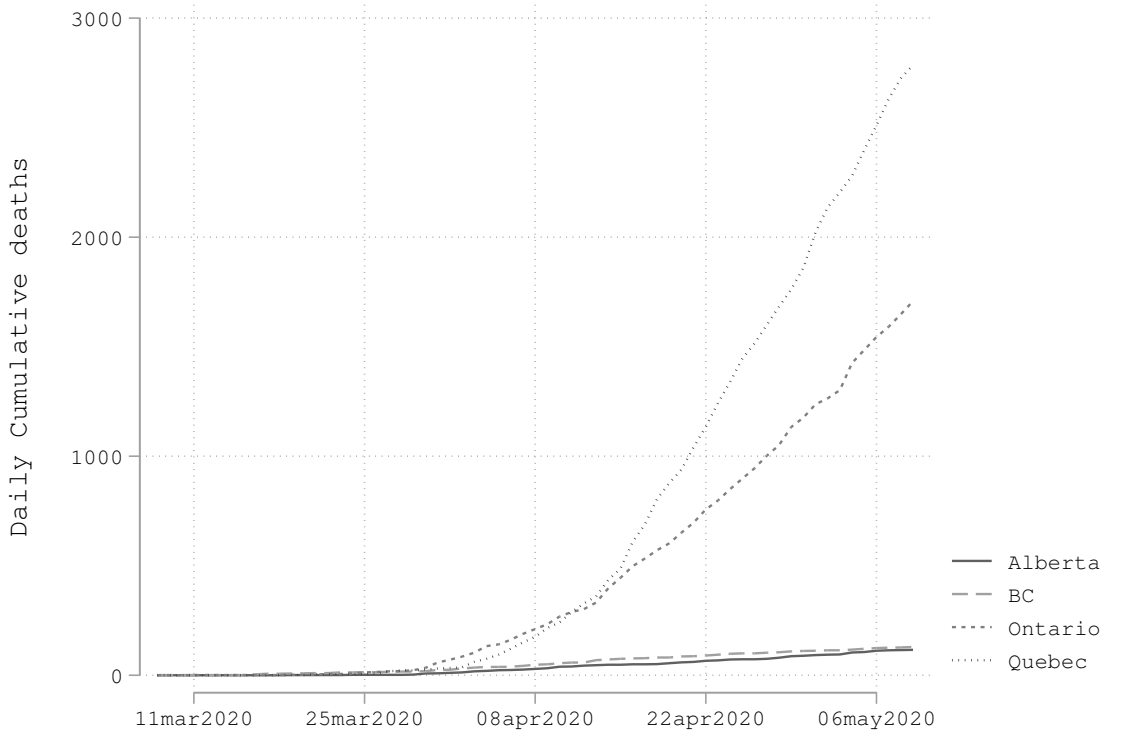
Figure 1: Cases and Deaths in Largest Four Provinces, Linear Scale.

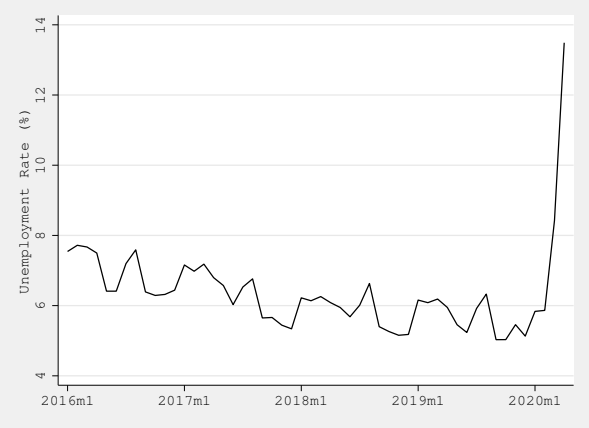


(a) Cumulative Cases, Linear

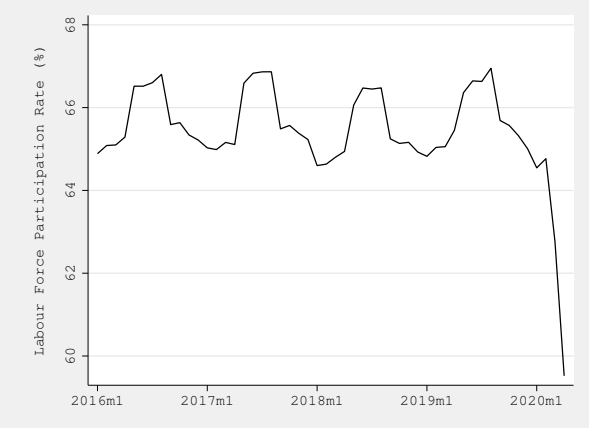


(b) Cumulative Deaths, Linear

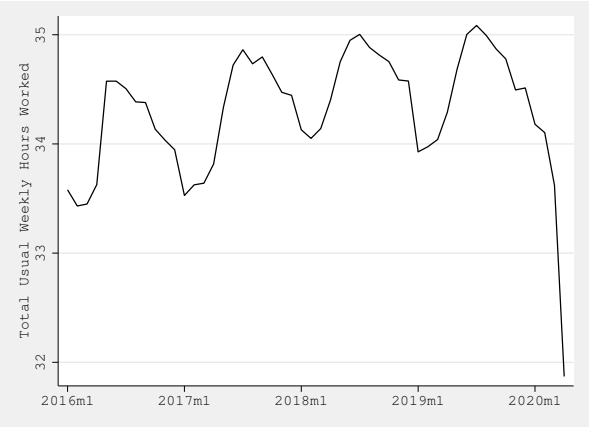
Figure 2: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for Canada.



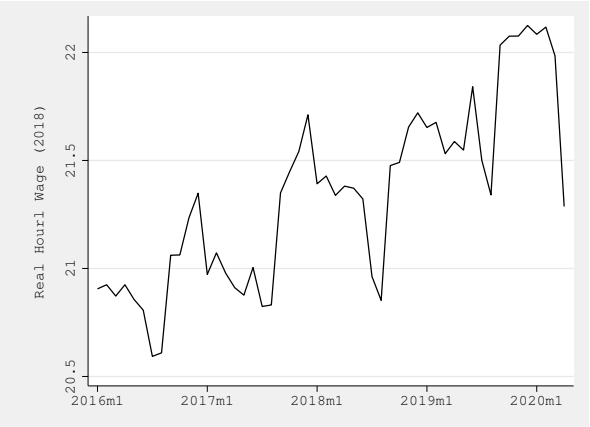
(a) Unemployment Rate.



(b) Labour Force Participation.



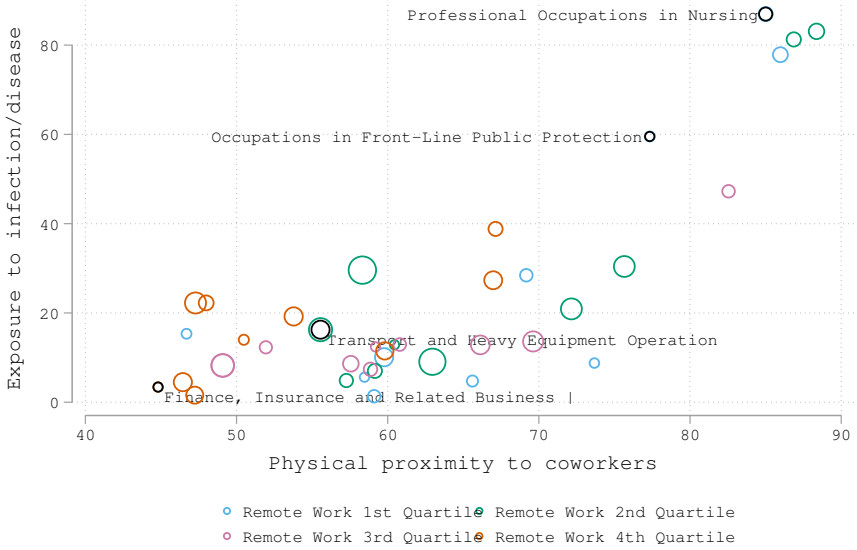
(c) Hours of Work.



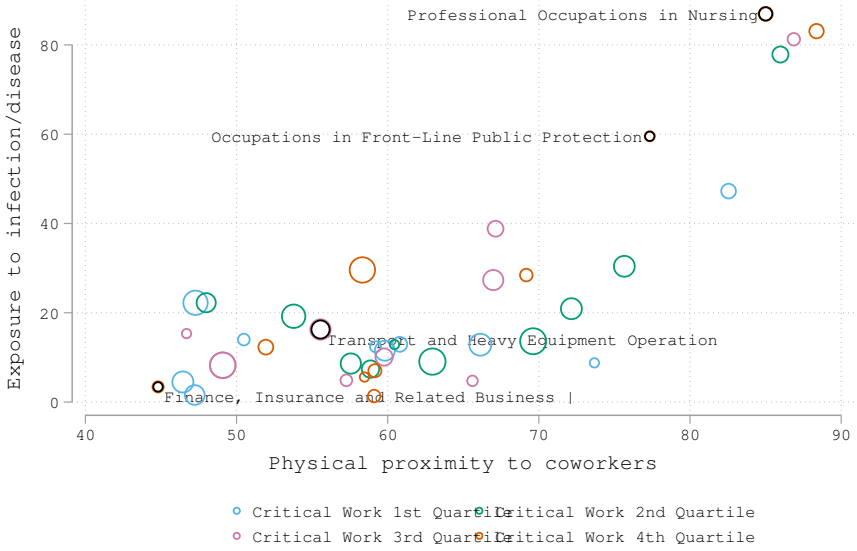
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate for Canada. Panel B plots the labour force participation for Canada. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for Canada. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual hourly wages (January 2018, provincial) for Canada. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

Figure 3: Physical Proximity and Exposure to Disease Indices by NOC Occupations.



(a) Physical Proximity, Exposure to Disease and Work from Home Indices by Occupation



(b) Physical Proximity, Exposure to Disease and Critical Worker Indices by Occupation

Each circle represents an occupation from the National Occupation Codes (2016). The size of each circle represents the number of LFS respondents employed in that occupation. The larger the circle, the greater the number of people employed in that occupation. Panels vary by index regarding the colour of the circle. In the top panel, the work from home index adopted from (Dingel and Neiman 2020) and applied to the LFS. The bottom panel adopts the critical worker index described by LMI Institute Index to the LFS. A detailed explanation can be found in our appendix on indices. The x-axis plots each occupation's physical proximity to coworkers, measured by O*NET's index. The further to the right, the closer in proximity employees in that occupation work with their coworkers. The y-axis plots each occupation's exposure to infection and disease, also measured by O*NET's index. The further up, the more frequently employees in that occupation are exposes to infection and disease. The color of the circles corresponds to the quartile of each occupation in the remote work index we constructed. Occupations in the first quartile are more commonly done from home while those in the fourth quartile are not commonly done from home.

Table 1: Major Dates for Policy Response in Canada

Province	First Reported Case	First Death	Emergency Declared	School Closures
Newfoundland and Labrador	March 14, 2020	March 30, 2020	March 18, 2020	March 16, 2020 (Public)
Nova Scotia	March 15, 2020	April 7, 2020	March 22, 2020	March 23, 2020 (Public)*
Prince Edward Island	March 14, 2020	NONE	March 16, 2020	March 23, 2020 (Public)*
New Brunswick	March 12, 2020	NONE	March 19, 2020	March 16, 2020 (Public)
Quebec	February 27, 2020	March 18, 2020	March 14, 2020	March 13, 2020 (Public and Private)
Ontario	January 25, 2020	March 11, 2020	March 17, 2020	March 16, 2020 (Public)**
Manitoba	March 12, 2020	March 27, 2020	March 20, 2020	March 23, 2020 (Public)*
Saskatchewan	March 11, 2020	March 30, 2020	March 18, 2020	March 20, 2020 (Public)
Alberta	March 5, 2020	March 19, 2020	March 17, 2020	March 15, 2020 (All)
British Columbia	January 1, 2020	March 8, 2020	March 18, 2020	March 18, 2020 (All)

* means they were coming off of March Break. ** means they were also closed for March Break. Information contained was hand-collected from official provincial news releases via their websites or from Canadian media sources.

Table 2: Summary Statistics for Labour Market Outcomes and Indices

	Mean	Std. Dev.	Max	Min	Count
Labour Market Outcomes					
Unemployed	0.0668	0.2497	1.00	0.00	3363527
Labour Force Participation	0.6368	0.4809	1.00	0.00	5282149
Real Hourly Wage	20.8826	15.9215	193.62	0.00	3302077
Total Usual Hours of Work	34.5186	15.1945	99.00	0.00	3302077
Indices					
Physical Proximity to Coworkers Index	61.4381	11.2604	88.37	44.81	2715782
Exposure to Infection/Disease Index	21.1613	20.1504	86.95	1.35	2715782
Critical Worker Index	61.6711	30.5749	100.00	0.00	2715782
Work from Home Index	37.4668	36.0783	100.00	0.00	2715782

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to March 2020. Unemployed is a binary variable which equals one if an individual is unemployed and zero otherwise. Labour for participation is a binary variable which equals one if an individual is in the labour force and zero otherwise. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Real hourly wage (January 2018, provincial) includes individuals who were: civilian; aged 16–70; employed either at work or absent from work during the survey week; worked in the public or private sector; were not self-employed; all jobs. Observations fall within the 1st percentile and 99th percentile of usual total hours worked and/or real hourly wages. Usual total hours worked across all jobs. This includes individuals who were: civilian; aged 16–70; employed either at work and/or absent from work during the survey week; worked in the public or private sector; were not self-employed. Observations fall within the 1st percentile and 99th percentile of usual total hours worked and/or real hourly wages.

Table 3: Canadian Perspectives Survey Series Summary Statistics

	Employment Status Categories					
	Employed					
	At Work	Absent, Not Covid	Absent, COVID	Unemployed	Not Stated	**Total**
	Count	Count	Count	Count	Count	Count
Perceived mental health						
Excellent	23.1	13.8	17.1	22.5	32.1	22.1
Very good	30.1	20.2	34.5	31.7	17.7	30.7
Good	29.3	38.3	29.2	25.3	12.9	27.7
Fair	12.8	15.0	14.7	14.6	0.0	13.6
Poor	3.4	10.1	3.0	3.4	11.2	3.7
Not stated	1.3	2.5	1.5	2.4	26.0	2.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
COVID-19 impacts ability meet financial obligations or essential needs						
Major impact	11.7	16.1	38.3	10.0	19.6	13.6
Moderate impact	15.0	18.2	20.8	13.4	43.4	15.4
Minor impact	17.8	10.3	11.3	15.2	2.0	15.7
No impact	32.8	24.6	8.9	35.9	18.1	31.5
Too soon to tell	22.7	30.7	20.8	25.3	15.6	23.8
Not stated	0.0	0.0	0.0	0.2	1.3	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
Scale - I might lose main job or main self-empl income next 4 weeks						
Strongly agree	14.6	20.2	46.2	0.0	27.8	11.6
Agree	14.8	7.3	14.8	0.0	2.5	8.1
Neither agree nor disagree	18.2	24.3	17.6	0.0	9.2	10.6
Disagree	26.4	13.5	12.7	0.0	2.7	13.3
Strongly disagree	26.0	34.8	8.8	0.0	1.1	13.6
Valid skip	0.0	0.0	0.0	100.0	36.2	42.4
Not stated	0.1	0.0	0.0	0.0	20.5	0.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

Data from the Canadian Perspectives Survey Series. Authors' percentages with weights applied.

Table 4: COVID-19 and Labour Market Outcomes, Canadian, National-Level

	Unemployed			Labour For Participation		
	(1)	(2)	(3)	(4)	(5)	(6)
Post COVID	0.0510	0.0517	0.0520	-0.0375	-0.0380	-0.0381
	(0.009)	(0.009)	(0.009)	(0.003)	(0.003)	(0.003)
Observations	3363527	3363527	3363527	5282149	5282149	5282149
	Real Hourly Wage			Total Usual Hours Worked		
Post COVID	-0.393	-0.483	-0.526	-1.519	-1.629	-1.656
	(0.274)	(0.253)	(0.264)	(0.254)	(0.231)	(0.233)
Observations	3302077	3302077	3302077	3302077	3302077	3302077
Indv. Char.		✓	✓		✓	✓
Educ.			✓			✓
Prov. FE	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓
Month FE	✓	✓	✓	✓	✓	✓
Prov. X Year FE			✓			✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. In the top panel, columns 1–3, the dependent variable is a binary variable which equals one if an individual is unemployed and zero otherwise. In the top panel, columns 4–6, the dependent variable is a binary variable which equals one if an individual is in the labour force and zero otherwise. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. In the bottom panel, columns 1–3, the dependent variable is the real hourly wage (January 2018, provincial). This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. In the bottom panel, columns 4–6, the dependent variable is the usual total hours worked across all jobs. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a wage value of zero. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. All columns contain fixed effects for Province, Year and Month, and are controlled for in all columns Columns (2) and (5) augment fixed effects with individual characteristics which include categorical variables for sex, marital status and ages. Columns (3) and (6) augments fixed effects and individual characteristics with a categorical variable for highest educational attainment.

Table 5: COVID-19-related Layoffs and Absences

	Related Unemployed		
	(1)	(2)	(3)
Post COVID	0.241	0.237	0.237
	(0.010)	(0.009)	(0.010)
Observations	406702	406702	406702
	Full Week Absence		
Post COVID	0.350	0.344	0.338
	(0.024)	(0.024)	(0.025)
Observations	274399	274399	274399
	Part Week Absence		
Post COVID	0.144	0.143	0.149
	(0.050)	(0.050)	(0.048)
Observations	449289	449289	449289
Indv. Char.		✓	✓
Educ.			✓
Prov. FE	✓	✓	✓
Year FE	✓	✓	✓
Month FE	✓	✓	✓
Prov. X Year FE			✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. In the top panel, the dependent variable is a binary variable which equals one if and unemployed individual said their reason for leaving work in the previous year was due to: (a) own illness or disability, or; (b) being laid off. In the middle panel, the dependent variable is a binary variable which equals one if an employed individual reported a full week of absence during the reference week due to: (a) other reasons, or; (b) own illness or disability. In the bottom panel, the dependent variable is a binary variable which equals one if an employed individual reported a part week of absence during the reference week due to: (a) other reasons, or; (b) own illness or disability. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. All columns contain fixed effects controlling for province, year and month. Column (2) augments the fixed effects with individual characteristics which include categorical variables for sex, marital status and ages. Column (3) augments the fixed effects and individual characteristics with a categorical variable for highest educational attainment.

Table 6: The Impacts of COVID-19: Proximity, Exposure, Critical Workers and Work from Home indices, Unemployed and Labour Force Participation

	Unemployed			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	-0.00390	0.0599	0.0565	0.0804
	(0.005306))	(0.010945)	(0.009682)	(0.010553)
Index	0.0000701	-0.000190	0.0000285	-0.000170
	(0.000031)	(0.000027)	(0.000015)	(0.000033)
Post COVID × Index	0.000992	-0.000182	-0.00000585	-0.000573
	(0.000144)	(0.000094)	(0.000045)	(0.000034)
Observations	2520211	2520211	2520211	2520211
	Labour For Participation			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	0.0268	-0.0478	-0.0559	-0.0670
	(0.009010)	(0.003929)	(0.005859)	(0.005516)
Index	-0.000300	-0.00000679	0.0000224	0.0000752
	(0.000059)	(0.000029)	(0.000014)	(0.000026)
Post COVID × Index	-0.00124	-0.0000372	0.000123	0.000450
	(0.000187)	(0.000057)	(0.000037)	(0.000043)
Observations	2715782	2715782	2715782	2715782
Indv. Char.	✓	✓	✓	✓
Educ.	✓	✓	✓	✓
Prov. FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. Panels vary by outcome measure used while columns vary by index measure used. In the top panel, the dependent variable is a binary variable which equals one if an individual is unemployed and zero otherwise. In the bottom panel, the dependent variable is a binary variable which equals one if an individual is in the labour force and zero otherwise. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020.Columns 1–4 vary based on the index used. Indices range from zero to 100. In columns 1 and 2, the "physical proximity to others" and "exposure to infection and disease" indices are used, respectively. In columns 3 – 4, the "critical worker" and "work from home" indices are used, respectively. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table 7: The Impacts of COVID-19: Proximity, Exposure, Critical Workers and Work from Home indices, Real Hourly Wage and Hours of Work

	Real Hourly Wages			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	2.391	-0.370	-0.270	-1.620
	(0.391227)	(0.380020)	(0.411020)	(0.250204))
Index	-0.139	0.00626	0.0151	0.0707
	(0.018477)	(0.007385)	(0.002429)	(0.007082)
Post COVID × Index	-0.0496	-0.0105	-0.00529	0.0235
	(0.004928)	(0.006096)	(0.003236)	(0.002609)
Observations	2472315	2472315	2472315	2472315
	Hours of Works			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	-0.306	-2.009	-1.452	-2.835
	(0.329702)	(0.399530)	(0.392349)	(0.266327)
Index	-0.0810	-0.0217	0.00897	0.00847
	(0.003971)	(0.002237)	(0.001209)	(0.002418)
Post COVID × Index	-0.0254	0.00863	-0.00637	0.0237
	(0.004285)	(0.008130)	(0.003729)	(0.000992)
Observations	2472315	2472315	2472315	2472315
Indv. Char.	✓	✓	✓	✓
Educ.	✓	✓	✓	✓
Prov. FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. Panels vary by outcome measure used while columns vary by index measure used. In the top panel the dependent variable is the real hourly wage (January 2018, provincial). This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. In the bottom panel, the dependent variable is the usual total hours worked across all jobs. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a wage value of zero. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. Columns 1–4 vary based on the index used. Indices range from zero to 100. In columns 1 and 2, the "physical proximity to others" and "exposure to infection and disease" indices are used, respectively. In columns 3 – 4, the "critical worker" and "work from home" indices are used, respectively. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table 8: The Impacts of COVID-19: Proximity and Exposure, Layoffs and Absence

	Related Unemployed			
	Proximity		Exposure	
	(1)	(2)	(3)	(4)
Post COVID	0.0408	0.220	0.220	0.215
	(0.029231)	(0.011127)	(0.011787)	(0.013670)
Index	-0.00151		-0.00168	
	(0.000194)		(0.000213)	
Post COVID × Index	0.00320		0.00103	
	(0.000408)		(0.000159)	
Index Dummy		0.00532		-0.0134
		(0.005516)		(0.007559)
Post COVID × Index Dummy		0.0353		0.0415
		(0.004713)		(0.009120)
Observations	306930	306930	306930	306930
	Full Week Absence			
	Proximity		Exposure	
Post COVID	0.277	0.323	0.354	0.344
	(0.023370)	(0.020547)	(0.027693)	(0.027876)
Index	0.00159		0.000295	
	(0.000168)		(0.000086)	
Post COVID × Index	0.00104		-0.000413	
	(0.000383)		(0.000094)	
Index Dummy		0.0332		0.00819
		(0.004790)		(0.006637)
Post COVID × Index Dummy		0.0335		-0.000946
		(0.017706)		(0.016236)
Observations	213211	213211	213211	213211
	Part Week Absence			
	Proximity		Exposure	
Post COVID	-0.0223	0.123	0.162	0.132
	(0.035569)	(0.046686)	(0.047604)	(0.053665)
Index	0.000982		0.000217	
	(0.000142)		(0.000041)	
Post COVID × Index	0.00307		-0.00000407	
	(0.000700)		(0.000248)	
Index Dummy		0.0277		0.0141
		(0.004857)		(0.001074)
Post COVID × Index Dummy		0.0878		0.0569
		(0.019506)		(0.013644)
Observations	345940	345940	345940	345940
Indv. Char.	✓	✓	✓	✓
Educ.	✓	✓	✓	✓
Prov. FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. Panels vary by outcome measure used while columns vary by index measure used. In the top panel, the dependent variable is a binary variable which equals one if and unemployed individual said their reason for leaving work in the previous year was due to: (a) own illness or disability, or; (b) being laid off. In the middle panel, the dependent variable is a binary variable which equals one if an employed individual reported a full week of absence during the reference week due to: (a) other reasons, or; (b) own illness or disability. In the bottom panel, the dependent variable is a binary variable which equals one if an employed individual reported a part week of absence during the reference week due to: (a) other reasons, or; (b) own illness or disability. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. Columns 1–2 and columns 3–4 vary based on the index used. In columns 1–2, the "physical proximity to others" index is used. In columns 3–4, the "exposure to infection and disease" index is used. Index Dummy is a dummy variable which is one if the individual is in an occupation above the median index measure for the respective index. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table 9: The Impacts of COVID-19: Proximity and Exposure, Layoffs and Absence

	Related Unemployed			
	Critical Workers		Work from Home	
	(1)	(2)	(3)	(4)
Post COVID	0.257	0.259	0.249	0.228
	(0.008238)	(0.010476)	(0.013638)	(0.015092)
Index	0.000163		-0.000519	
	(0.000118)		(0.000147)	
Post COVID × Index	-0.000276		-0.000271	
	(0.000108)		(0.000215)	
Index Dummy		0.0305		-0.0455
		(0.008756)		(0.008596)
Post COVID × Index Dummy		-0.0465		0.0269
		(0.007681)		(0.015190)
Observations	306930	306930	306930	306930
	Full Week Absence			
	Critical Workers		Work from Home	
Post COVID	0.414	0.370	0.349	0.326
	(0.020046)	(0.023006)	(0.021042)	(0.022617)
Index	0.000550		-0.00120	
	(0.000065)		(0.000066)	
Post COVID × Index	-0.00113		-0.000166	
	(0.000140)		(0.000336)	
Index Dummy		0.0162		-0.0900
		(0.005010)		(0.001355)
Post COVID × Index Dummy		-0.0587		0.0298
		(0.013852)		(0.015235)
Observations	213211	213211	213211	213211
	Part Week Absence			
	Critical Workers		Work from Home	
Post COVID	0.161	0.166	0.194	0.174
	(0.043986)	(0.048333)	(0.060388)	(0.059650)
Index	0.000236		-0.000334	
	(0.000012)		(0.000030)	
Post COVID × Index	0.0000148		-0.000738	
	(0.000195)		(0.000496)	
Index Dummy		0.0131		-0.0310
		(0.001398)		(0.001716)
Post COVID × Index Dummy		-0.00938		-0.0197
		(0.018097)		(0.025527)
Observations	345940	345940	345940	345940
Indv. Char.	✓	✓	✓	✓
Educ.	✓	✓	✓	✓
Prov. FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. Panels vary by outcome measure used while columns vary by index measure used. In the top panel, the dependent variable is a binary variable which equals one if and unemployed individual said their reason for leaving work in the previous year was due to: (a) own illness or disability, or; (b) being laid off. In the middle panel, the dependent variable is a binary variable which equals one if an employed individual reported a full week of absence during the reference week due to: (a) other reasons, or; (b) own illness or disability. In the bottom panel, the dependent variable is a binary variable which equals one if an employed individual reported a part week of absence during the reference week due to: (a) other reasons, or; (b) own illness or disability. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. Columns 1–2 and columns 3–4 vary based on the index used. In columns 1–2, the "critical worker" index is used. In columns 3–4, the "work from home" index is used. Index Dummy is a dummy variable which is one if the individual is in an occupation above the median index measure for the respective index. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table 10: Perceived Mental Health, Employment, Work from home, and Stressors, Ordered Probit, Canadian, National-Level

	Perceived Mental Health		
	(1)	(2)	(3)
Female	-0.220	-0.187	-0.202
	(0.060)	(0.067)	(0.067)
Married or Common Law	0.218	0.207	0.194
	(0.058)	(0.072)	(0.071)
15 to 34	-0.506	-0.429	-0.492
	(0.082)	(0.090)	(0.089)
45 to 55	-0.437	-0.358	-0.410
	(0.066)	(0.076)	(0.077)
Less than High School	0.0669	-0.380	-0.365
	(0.124)	(0.186)	(0.178)
High School Diploma or equivalent	-0.171	-0.0607	-0.0863
	(0.066)	(0.086)	(0.088)
Immigrant	0.167	0.114	0.118
	(0.073)	(0.090)	(0.087)
Employed but absent, not COVID	-0.338		
	(0.131)		
Employed but absent due to COVID	-0.00276		
	(0.085)		
Unemployed	-0.0987		
	(0.075)		
Changed from outside home to home		-0.0497	
		(0.076)	
Work remains at home		0.129	
		(0.118)	
Absent from work		-0.114	
		(0.089)	
Impact on financial obligations			-0.112
			(0.065)
Might lose job			-0.0686
			(0.070)
Observations	4509	2691	2741

Notes: Authors' calculations. Data from the Canadian Perspectives Survey Series. All regressions are estimated using an ordered probit, with weights applied and robust standard errors. The dependent variable in columns 1–3 is a ranking of perceived mental health, ranging from 5 (Excellent), 4 (Very Good), 3 (Good), 2 (Fair), 1 (Poor) All explanatory variables are dummy variables. The base category across all columns is male, single or widowed or separated or divorced, over 55 years old, has above a high school education, and was born in Canada. We omit any observations who respond "Not Stated" to the dependent variable. Observations decrease in columns (2), (3), because our subsample are only those observations which are employed. Columns (1) has explanatory variables that are demographic variables and indicators for labour force status. The omitted category in columns (1) form employment status is "Employed and at work, at least part of the week" Columns (2) has explanatory variables that are demographic variables with indicators for where observations are working. The omitted category in columns (2) is if someone continues to working outside the home. Columns (3) has explanatory variables that are demographic variables with two indicator variables. The first, Impact on Financial Obligations, equals one if respondents answered "Major Impact" or "Impact" when asked if COVID will impact their ability to meet financial obligations or essential needs. The second is variable, Might Lose Job, equals one if respondents answered "Strongly Agree" or "Agree" to if they felt they would lose their job in the next 4 weeks.

Table 11: Financial Responsibilities, Work Concerns, Employment Status and Work from Home, Ordered Probit, National

	Financial Concerns			Might Lose Job		
	(1)	(2)	(3)	(4)	(5)	(6)
Female	0.0495	0.0877	0.0934	0.216	0.122	0.140
	(0.054)	(0.056)	(0.064)	(0.058)	(0.064)	(0.064)
Married or Common Law	0.0871	0.0884	0.0873	0.0106	0.176	0.170
	(0.058)	(0.059)	(0.072)	(0.063)	(0.070)	(0.070)
15 to 34	-0.264	-0.277	-0.00941	-0.680	0.0642	0.0804
	(0.067)	(0.075)	(0.082)	(0.075)	(0.084)	(0.083)
45 to 55	-0.306	-0.324	-0.0805	-0.957	-0.0417	-0.00676
	(0.063)	(0.071)	(0.081)	(0.062)	(0.072)	(0.069)
Less than High School	0.234	0.266	0.208	0.573	-0.397	-0.378
	(0.110)	(0.113)	(0.186)	(0.138)	(0.173)	(0.172)
High School Diploma or equivalent	0.00686	0.00639	-0.115	0.201	-0.261	-0.193
	(0.063)	(0.063)	(0.083)	(0.071)	(0.085)	(0.086)
Immigrant	-0.204	-0.168	-0.245	-0.0298	-0.238	-0.222
	(0.069)	(0.070)	(0.091)	(0.071)	(0.073)	(0.074)
Employed but absent, not due to COVID		0.00228			0.0230	
		(0.138)			(0.138)	
Employed but absent due to COVID		-0.666			-0.849	
		(0.124)			(0.093)	
Unemployed		-0.0531				
		(0.067)				
Work Changed from outside home to home			0.00828			0.190
			(0.073)			(0.078)
Work remains at home			-0.281			-0.0452
			(0.102)			(0.092)
Absent from Work			-0.508			-0.554
			(0.102)			(0.092)
Observations	4618	4574	2713	4605	2749	2711

Notes: Authors' calculations. Data from the Canadian Perspectives Survey Series. All regressions are estimated using an ordered probit, with weights applied and robust standard errors. The dependent variable in columns 1–3 is a ranking of the respondents ability to meet financial obligations or essential needs. Values range from 1 (Major Impact), 2 (Moderate Impact), 3 (Minor Impact), 4 (No impact) 5 (Too soon to tell) The dependent variable in columns 4–6 is the response of the observation when asked to agree or disagree that they might lose their main job or self-employment income in the next four weeks. Values range from 1 (Strongly Agree), 2 (Agree), 3(Neither Agree nor Disagree), 4 (Disagree), 5 (Strongly Disagree) All explanatory variables are indicator variables. The base category across all columns is male, single or widowed or separated or divorced, Over 55 years old, has above a high school education, and was born in Canada. We omit any observations who respond "Not Stated" to the dependent variable. Column (1) and (3) uses only basic demographic characteristics from the regression. Columns (2) and (5) augment the demographic variables with indicators where observations are working. The omitted category in columns (2) and (5) is if someone continues to working outside the home. Columns (3) and (6) augment the demographic variables with indicators where observations are working. The omitted category in columns (3) and (6) is if someone continues to working outside the home.

7 Appendix

7.1 Index Adaptations for the Labour Force Survey

The Labour Force Survey tracks information for an individual's occupation across 40 groups of Canada's National Occupation Classification (NOC) system. This paper makes use of four different indices and adapts them for the Canadian Labour Force Survey, utilizing a cross-walk between the Canadian National Occupation Classification (NOC 2016) with O*Net-SOC codes. [15] After merging various datasets using our cross-walk, we aggregate from the NOC's 500 unit groups to the NOC 40 major groups, weighting at successive aggregations by employment share from Canada's 2016 census. This aggregation allows us to merge the index measures with the LFS. At the end of the process, each observation in the LFS, which has assigned to them one of the NOC 40 major groups, is given the weighted index value. A more detailed description is given below.

The challenge is to use the indices readily available to US surveys and apply it to Canada. The cross-walk developed by Brookfield Institute for Innovation and Entrepreneurship makes matching Canadian NOC with American O*Net data feasible.[16] The crosswalk is constructed such that at least one of every 500 unit groups in the NOC is matched to at least one of the O*net-SOC codes. A unit group is the smallest level of aggregation that the NOC system contains. This allows explicit use of indices constructed by other researchers, such as the physical proximity to other workers and disease exposure measures from Beland et al. (2020), the work from home index from O*Net used in Dingel and Neiman (2020), and the critical worker indicators from the LMI Institute.[17] For all four indices, we merge the dataset based on the NOC–O*Net crosswalk. The physical proximity and exposure indices from Beland et al. (2020), and the work from home index from Dingel and Neiman (2020), match to 484 of 500 NOC groups. The critical worker indicator from LMI Institue matches to 446 NOC unit groups. The LMI match less well because they are using 7-digit SOC codes which are not as fine as O*Net-SOC codes. We will return to these missing values when we aggregate our 500 NOC groups.

For each NOC unit group, we take the (unweighted) average index score across all matched O*Net-SOC codes. This is because there may be multiple O*Net-SOC codes which map to a single NOC unit group. This leaves us with an average measure for each matched NOC unit groups. For example, since we had 484 successful matches from Dingel and Neiman (2020)'s work from home index, we will now have an average unit group for 484 NOC unit groups. In this case, that leaves 16 NOCs without an index measure. We will solve the missing value problem using the structure of the NOC and how it aggregates into coarser classifications.

The NOC maps their 500 unit groups into 140 minor groups and maps their 140 minor groups to 40 major groups. We construct the minor groups *weighted* average using each unit groups' 2016 employment shares from Statistics Canada Table $98-400-X2016271$. This yields a complete list of weighted averages indexes for the 140 unit groups. From here, we construct an employment share weighted index average for the 40 major groups.

However, we are yet to solve the unit groups who are without index values due to the unmatched merge. To do so, we assign each unmatched unit group the *unweighted* average of their associated *minor* group, which comes from the other unit group members, with known index values, belonging to the same minor group. For example, suppose we

[15] See https://github.com/BrookfieldIIE/NOC_ONet_Crosswalk.

[16] See https://github.com/BrookfieldIIE/NOC_ONet_Crosswalk.

[17] See https://www.lmiontheweb.org/more-than-half-of-u-s-workers-in-critical-occupations-in-the-fig

have two unit groups (A and B) who make up minor group (AB), where A has an index value of 1, B has a missing value, and they both have 0.5 employment shares of AB. We do as follows: assign B a value of 1 as its index (the unweighted average from the known unit groups, A). Then we weight both A and B by their employment shares to construct the minor group index: in this case AB has an index value of 1 ($= 0.5 + 0.5$). Doing this across all minor groups yields the weighted index for a minor group.

Table A1: The Impacts of COVID-19: Heterogeneity and Unemployment

	Unemployed			
	(1)	(2)	(3)	(4)
Post COVID	0.0495	0.0623	0.0462	0.0441
	(0.009)	(0.009)	(0.012)	(0.009)
Female	-0.00712	-0.00693	-0.00692	-0.00692
	(0.002)	(0.003)	(0.003)	(0.003)
Married	-0.0261	-0.0253	-0.0260	-0.0261
	(0.004)	(0.004)	(0.004)	(0.004)
15 to 34	0.0171	0.0171	0.0160	0.0171
	(0.005)	(0.005)	(0.005)	(0.005)
35 to 54	-0.00273	-0.00273	-0.00236	-0.00270
	(0.002)	(0.002)	(0.002)	(0.002)
Less than high school	0.0658	0.0658	0.0658	0.0648
	(0.004)	(0.004)	(0.004)	(0.004)
High School or some college	0.0201	0.0201	0.0201	0.0192
	(0.002)	(0.002)	(0.002)	(0.002)
Female × Post COVID	0.00535			
	(0.001)			
Married × Post COVID		-0.0213		
		(0.004)		
15 to 34 × Post COVID			0.0289	
			(0.007)	
35 to 54 × Post COVID			-0.00992	
			(0.006)	
Less than high school × Post COVID				0.0292
				(0.007)
High school or some college × Post COVID				0.0237
				(0.003)
Observations	3363527	3363527	3363527	3363527
Province, Year, Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. The dependent variable is a binary variable which equals one if an individual is unemployed and zero otherwise. Columns vary by models. Columns 1, 2, and 3, interact Post COVID with sex, marital status, and age group, respectively. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table A2: The Impacts of COVID-19: Heterogeneity and Labour Force Participation

	Labour Force Participation			
	(1)	(2)	(3)	(4)
Post COVID	-0.0358	-0.0537	-0.0200	-0.0295
	(0.002)	(0.008)	(0.003)	(0.001)
Female	-0.0817	-0.0818	-0.0818	-0.0818
	(0.006)	(0.006)	(0.006)	(0.006)
Married	0.0215	0.0202	0.0215	0.0215
	(0.013)	(0.013)	(0.013)	(0.013)
15 to 34	0.381	0.381	0.383	0.381
	(0.011)	(0.011)	(0.011)	(0.011)
35 to 54	0.443	0.443	0.444	0.443
	(0.016)	(0.016)	(0.015)	(0.016)
Less than high school	-0.299	-0.299	-0.299	-0.298
	(0.016)	(0.016)	(0.016)	(0.016)
Female × Post COVID	-0.00465			
	(0.004)			
High school or some college	-0.104	-0.104	-0.104	-0.103
	(0.012)	(0.012)	(0.012)	(0.012)
Married × Post COVID		0.0328		
		(0.009)		
15 to 34 × Post COVID			-0.0487	
			(0.009)	
35 to 54 × Post COVID			-0.00951	
			(0.007)	
Less than high school × Post COVID				-0.0103
				(0.008)
High school or some college × Post COVID				-0.0271
				(0.004)
Observations	5282149	5282149	5282149	5282149
Province, Year, Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. The dependent variable is a binary variable which equals one if an individual is in the labour force and zero otherwise. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Columns vary by models. Columns 1, 2, and 3, interact Post COVID with sex, marital status, and age group, respectively. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table A3: The Impacts of COVID-19: Heterogeneity and Real Hourly Wage

	Real Hourly Wage			
	(1)	(2)	(3)	(4)
Post COVID	-0.569	-0.899	-0.957	-0.263
	(0.408)	(0.262)	(0.430)	(0.259)
Female	-1.754	-1.751	-1.751	-1.751
	(0.176)	(0.171)	(0.171)	(0.171)
Married	1.563	1.534	1.562	1.563
	(0.456)	(0.458)	(0.456)	(0.456)
15 to 34	-0.520	-0.520	-0.528	-0.521
	(0.348)	(0.348)	(0.359)	(0.348)
35 to 54	2.955	2.955	2.924	2.954
	(0.110)	(0.110)	(0.111)	(0.110)
Less than high school	-9.664	-9.665	-9.665	-9.631
	(0.332)	(0.331)	(0.332)	(0.338)
High school or some college	-6.557	-6.558	-6.557	-6.529
	(0.309)	(0.309)	(0.309)	(0.310)
Female × Post COVID	0.0897			
	(0.334)			
Married × Post COVID		0.775		
		(0.128)		
15 to 34 × Post COVID			0.196	
			(0.303)	
35 to 54 × Post COVID			0.824	
			(0.268)	
Less than high school × Post COVID				-1.005
				(0.222)
High school or some college × Post COVID				-0.786
				(0.179)
Observations	3302077	3302077	3302077	3302077
Province, Year, Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. The dependent variable is the real hourly wage (January 2018, provincial). This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Columns vary by models. Columns 1, 2, and 3, interact Post COVID with sex, marital status, and age group, respectively. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table A4: The Impacts of COVID-19: Heterogeneity and Usual Total Hours Worked

	Total Usual Hours of Work			
	(1)	(2)	(3)	(4)
Post COVID	-1.855	-1.840	-1.536	-1.507
	(0.292)	(0.291)	(0.418)	(0.224)
Female	-4.938	-4.922	-4.922	-4.923
	(0.259)	(0.261)	(0.261)	(0.261)
Married	1.944	1.930	1.944	1.944
	(0.272)	(0.279)	(0.272)	(0.272)
15 to 34	-1.913	-1.913	-1.890	-1.913
	(0.329)	(0.329)	(0.342)	(0.330)
35 to 54	2.058	2.058	2.050	2.058
	(0.129)	(0.129)	(0.134)	(0.129)
Less than highschool	-6.427	-6.428	-6.428	-6.422
	(0.795)	(0.794)	(0.795)	(0.800)
Highschool or some college	-2.436	-2.436	-2.436	-2.415
	(0.192)	(0.192)	(0.192)	(0.194)
Female × Post COVID	0.420			
	(0.147)			
Married × Post COVID		0.382		
		(0.226)		
15 to 34 × Post COVID			-0.616	
			(0.405)	
35 to 54 × Post COVID			0.225	
			(0.290)	
Less than highschool × Post COVID				-0.121
				(0.265)
High school or some college × Post COVID				-0.587
				(0.111)
Observations	3302077	3302077	3302077	3302077
Province, Year, Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. The dependent variable is the usual total hours worked across all jobs. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a wage value of zero. Columns vary by models. Columns 1, 2, and 3, interact Post COVID with sex, marital status, and age group, respectively. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table A5: The Impacts of COVID-19: Proximity, Exposure, Critical Workers and Work from Home indices, Unemployed and Labour Force Participation

	Unemployed			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	0.0431	0.0473	0.0583	0.0716
	(0.005998)	(0.009177)	(0.009999)	(0.010060)
Index Dummy	0.00473	0.00432	0.000669	-0.0119
	(0.000974)	(0.000911)	(0.001417)	(0.002299)
Post COVID × Index Dummy	0.0282	0.0176	-0.00521	-0.0255
	(0.007098)	(0.002642)	(0.002010)	(0.002780)
Observations	2472315	2472315	2472315	2472315
	Labour Force Participation			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	-0.0327	-0.0316	-0.0527	-0.0585
	(0.003387))	(0.002669)	(0.005079)	(0.004378)
Index Dummy	-0.00848	-0.0214	-0.00246	0.00463
	(0.001359)	(0.000630)	(0.000558)	(0.001794)
Post COVID × Index Dummy	-0.0332	-0.0326	0.0101	0.0168
	(0.003496)	(0.003759)	(0.003546)	(0.003307)
Observations	2472315	2472315	2472315	2472315
Indv. Char.	✓	✓	✓	✓
Educ.	✓	✓	✓	✓
Prov. FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. Panels vary by outcome measure used while columns vary by index measure used. In the top panel, columns 1–4, the dependent variable is a binary variable which equals one if an individual is unemployed and zero otherwise. In the bottom panel, columns 1–4, the dependent variable is a binary variable which equals one if an individual is in the labour force and zero otherwise. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. Columns 1–4 vary based on the index used. Index Dummy is a dummy variable which is one if the individual is in an occupation above the median index measure for the respective index. In columns 1 and 2, the "physical proximity to others" and "exposure to infection and disease" indices are used, respectively. In columns 3 – 4, the "critical worker" and "work from home" indices are used, respectively. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table A6: The Impacts of COVID-19: Proximity, Exposure, Critical Workers and Work from Home indices, Real Hourly Wage and Hours of Work

	Real Hourly Wages			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	-0.0940	-0.273	-0.553	-1.506
	(0.197163)	(0.312223)	(0.321831)	(0.236842)
Index Dummy	-2.668	-1.604	1.750	3.184
	(0.263427)	(0.172136)	(0.185615)	(0.449519)
Post COVID × Index Dummy	-1.111	-0.641	-0.0900	1.508
	(0.165417)	(0.141703)	(0.192301)	(0.185887)
Observations	2472315	2472315	2472315	2472315
	Hours of Works			
	Proximity	Exposure	Critical Workers	Work from Home
Post COVID	-1.440	-1.818	-1.730	-2.692
	(0.141120)	(0.304690)	(0.315824)	(0.259745)
Index Dummy	-1.405	-3.051	1.068	0.139
	(0.080348)	(0.176095)	(0.081123)	(0.195021)
Post COVID × Index Dummy	-0.872	-0.0690	-0.257	1.430
	(0.265629)	(0.203949)	(0.217344)	(0.163159)
Observations	2472315	2472315	2472315	2472315
Indv. Char.	✓	✓	✓	✓
Educ.	✓	✓	✓	✓
Prov. FE	✓	✓	✓	✓
Year FE	✓	✓	✓	✓
Month FE	✓	✓	✓	✓
Prov. X Year FE	✓	✓	✓	✓

Post COVID
Index Dummy
Post COVID × Index Dummy

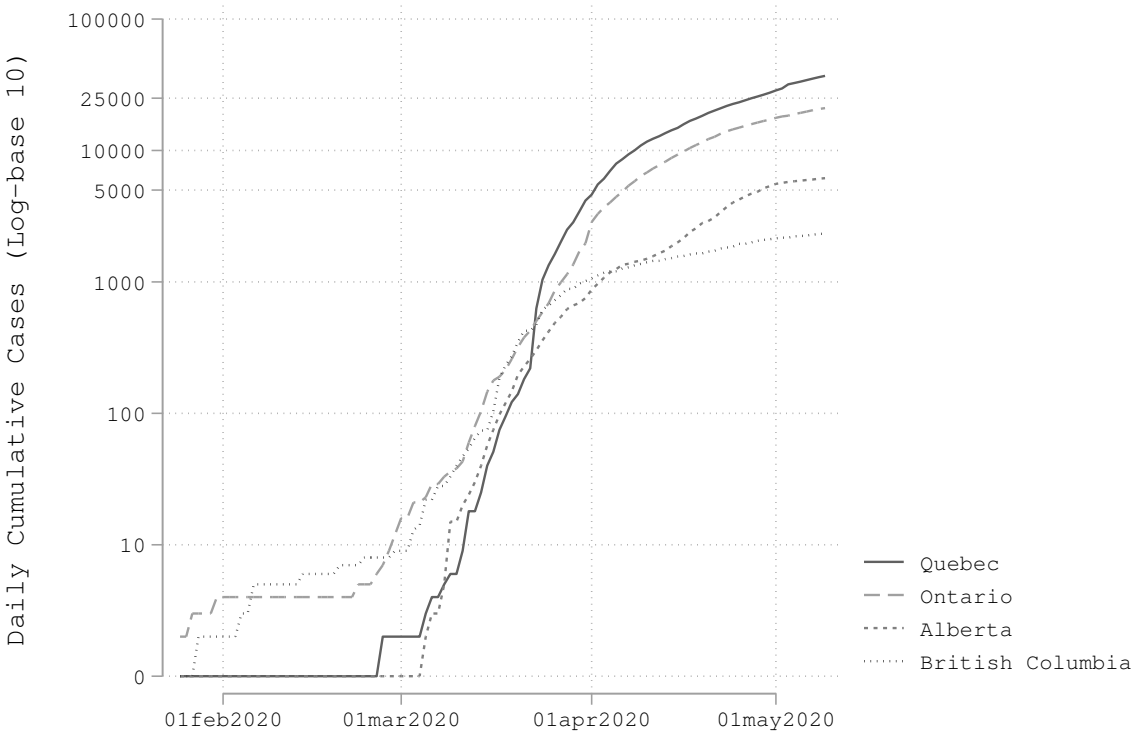
Notes: Authors' calculations. Notes: Authors' calculations. Data from the Canadian Labour Force Survey. The time period is January 2016 to April 2020. All regressions are estimated using OLS, with weights applied. Standard errors are clustered by province. Panels vary by outcome measure used while columns vary by index measure used. In the top panel the dependent variable is the real hourly wage (January 2018, provincial). This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. In the bottom panel, the dependent variable is the usual total hours worked across all jobs. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a wage value of zero. Post COVID is a binary variable which equals one if the observation occurs during or after March 2020. Columns 1–4 vary based on the index used. Index Dummy is a dummy variable which is one if the individual is in an occupation above the median index measure for the respective index. In columns 1 and 2, the "physical proximity to others" and "exposure to infection and disease" indices are used, respectively. In columns 3 – 4, the "critical worker" and "work from home" indices are used, respectively. All columns control for individual characteristics (categorical variables for sex, marital status and ages), a categorical variable for highest educational attainment, and fixed effects for province, province × year, year and month.

Table A7: Perceived Health, Employment, Work from home, and Stressors, Ordered Probit, Canadian, National-Level

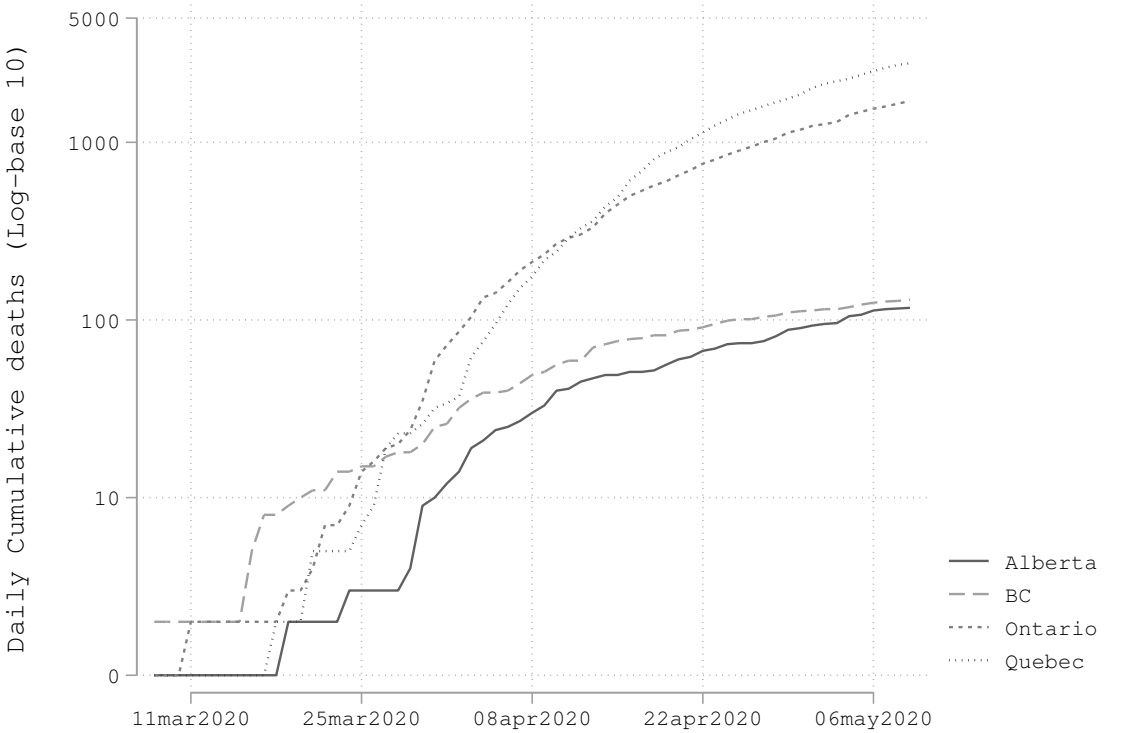
	Perceived Health		
	(1)	(2)	(3)
Female	-0.0497	-0.0821	-0.0854
	(0.057)	(0.066)	(0.064)
Married or common-law	0.104	0.0457	0.0415
	(0.060)	(0.071)	(0.070)
15 to 34	0.450	0.268	0.229
	(0.085)	(0.092)	(0.092)
45 to 55	0.144	0.0985	0.0805
	(0.065)	(0.079)	(0.081)
Less than high school	-0.154	-0.354	-0.370
	(0.121)	(0.144)	(0.149)
High school diploma or equivalent	-0.106	-0.0159	-0.00631
	(0.062)	(0.087)	(0.085)
Immigrant	-0.0479	-0.0856	-0.0448
	(0.068)	(0.080)	(0.080)
Employed but absent, not COVID	-0.435		
	(0.149)		
Employed but absent due to COVID	-0.103		
	(0.086)		
Unemployed	-0.170		
	(0.069)		
Work changed from outside home to home		0.00771	
		(0.077)	
Work remains at home		0.214	
		(0.107)	
Absent from work		-0.160	
		(0.092)	
Impact on financial obligations			-0.139
			(0.069)
Might lose job			0.0277
			(0.075)
Observations	4572	2712	2765

Notes: Authors' calculations. Data from the Canadian Perspectives Survey Series. All regressions are estimated using an ordered probit, with weights applied and robust standard errors. The dependent variable in columns 1–3 is a ranking of perceived health, ranging from 5 (Excellent), 4 (Very Good), 3 (Good), 2 (Fair), 1 (Poor) All explanatory variables are dummy variables. The base category across all columns is male, single or widowed or separated or divorced, over 55 years old, has above a high school education, and was born in Canada. We omit any observations who respond "Not Stated" to the dependent variable. Observations decrease in columns (2), (3), because our subsample are only those observations which are employed. Columns (1) has explanatory variables that are demographic variables and indicators for labour force status. The omitted category in columns (1) form employment status is "Employed and at work, at least part of the week" Columns (2) has explanatory variables that are demographic variables with indicators for where observations are working. The omitted category in columns (2) is if someone continues to working outside the home. Columns (3) has explanatory variables that are demographic variables with two indicator variables. The first, Impact on Financial Obligations, equals one if respondents answered "Major Impact" or "Impact" when asked if COVID will impact their ability to meet financial obligations or essential needs. The second is variable, Might Lose Job, equals one if respondents answered "Strongly Agree" or "Agree" to if they felt they would lose their job in the next 4 weeks.

Figure A1: Cases and Deaths in Largest Four Provinces, Logarithmic Scale.

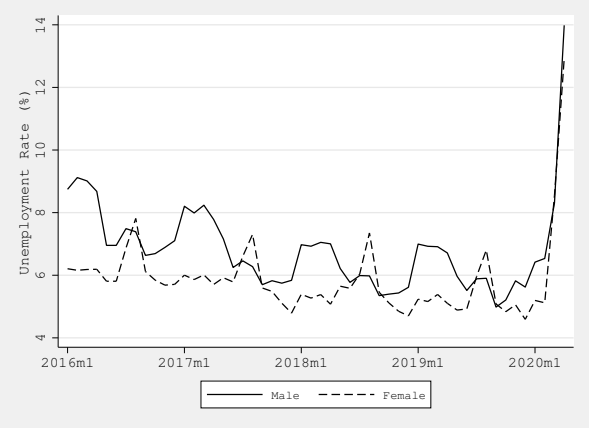


(a) Cumulative Cases, Log (base 10)

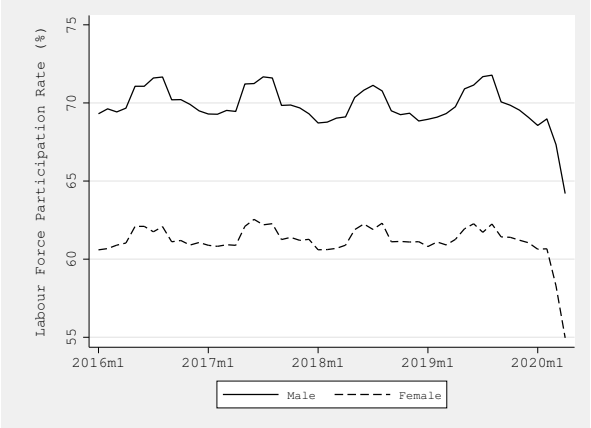


(b) Cumulative Deaths, Log (base 10

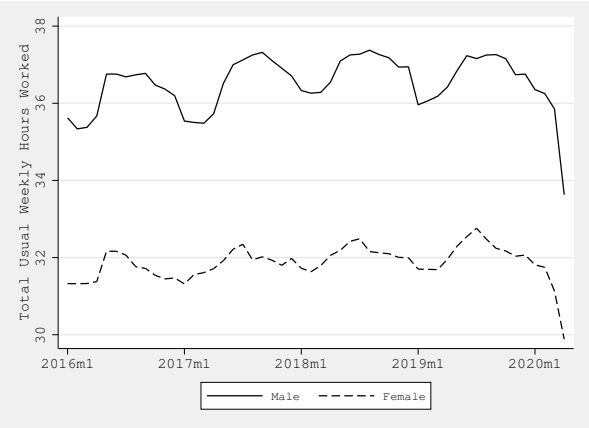
Figure A2: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Sex.



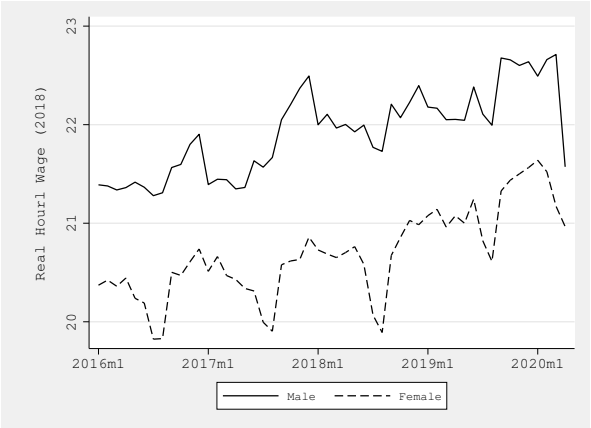
(a) Unemployment Rate.



(b) Labour Force Participation.



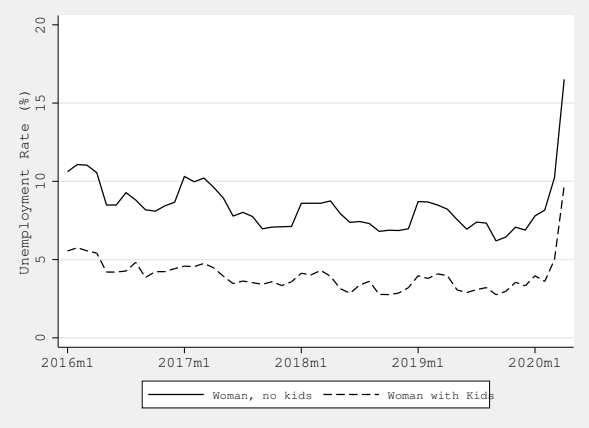
(c) Hours of Work.



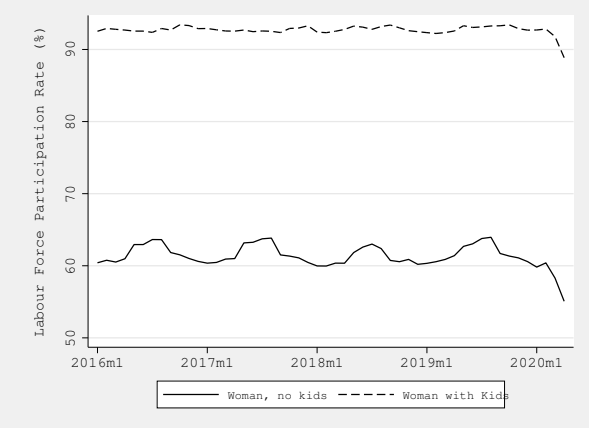
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate by sex. Panel B plots the labour force participation by sex. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by sex. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual hourly wages (January 2018, provincial) by sex. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

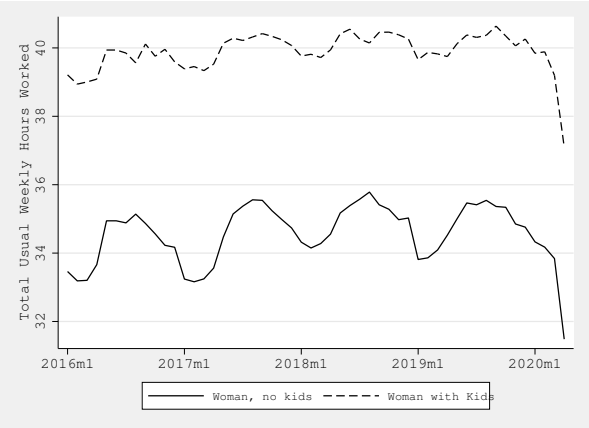
Figure A3: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for Women with and without children.



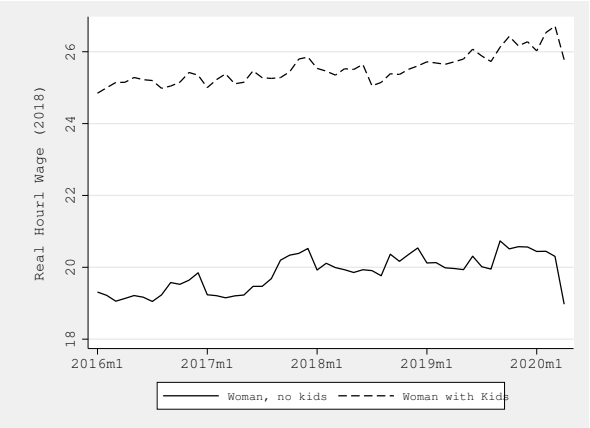
(a) Unemployment Rate.



(b) Labour Force Participation.



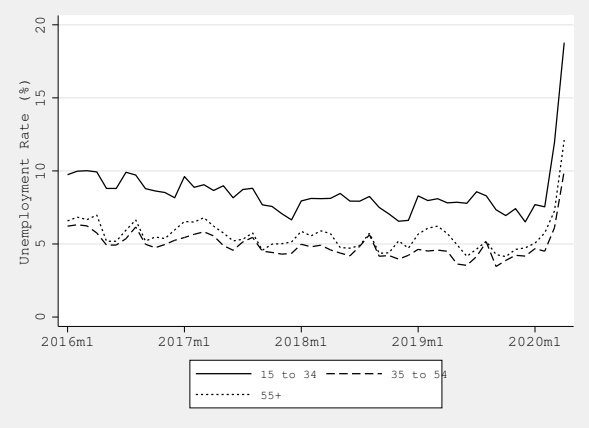
(c) Hours of Work.



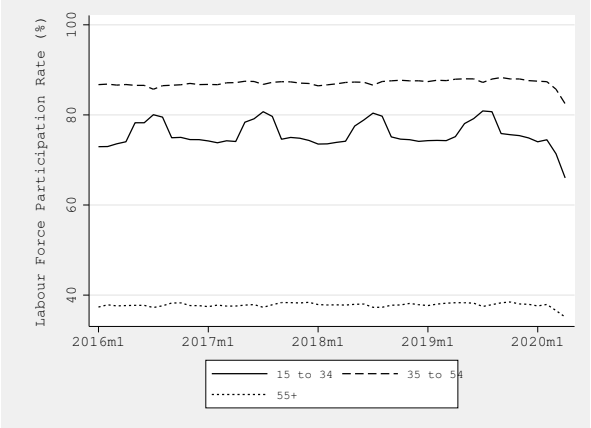
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate for women with and without children. Panel B plots the labour force participation for women with and without children. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for women with and without children. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for women with and without children. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

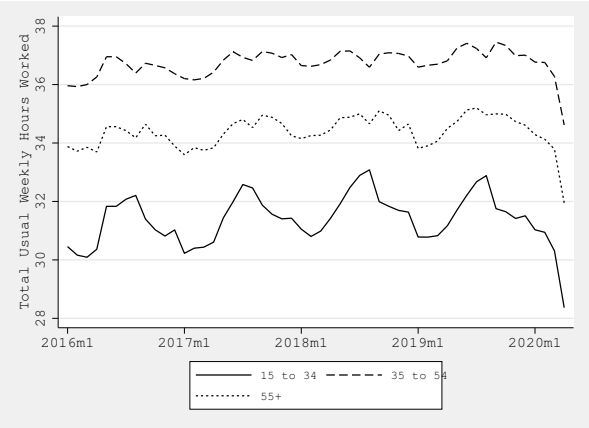
Figure A4: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Age Group.



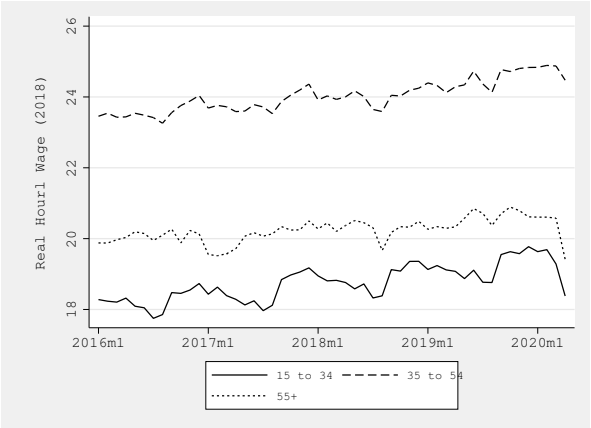
(a) Unemployment Rate.



(b) Labour Force Participation.



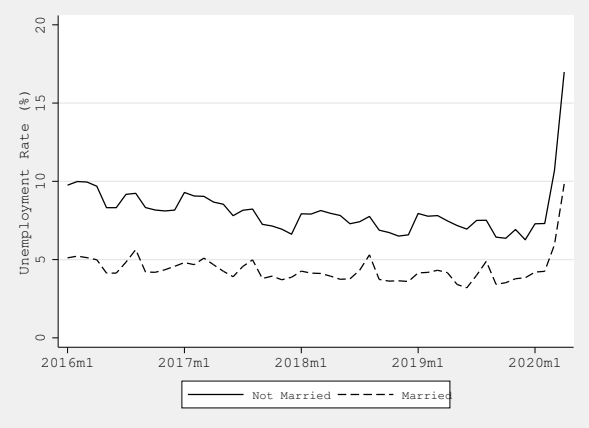
(c) Hours of Work.



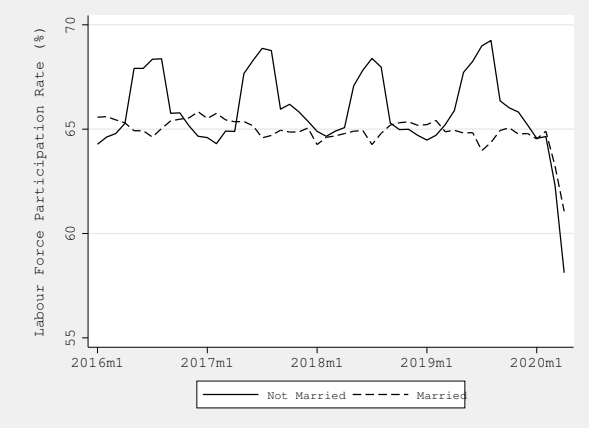
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate by age group. Panel B plots the labour force participation by age group. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by age group. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) by age group. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

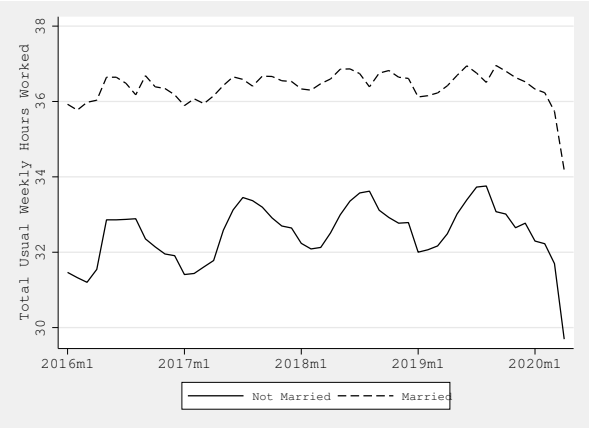
Figure A5: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Marital Status.



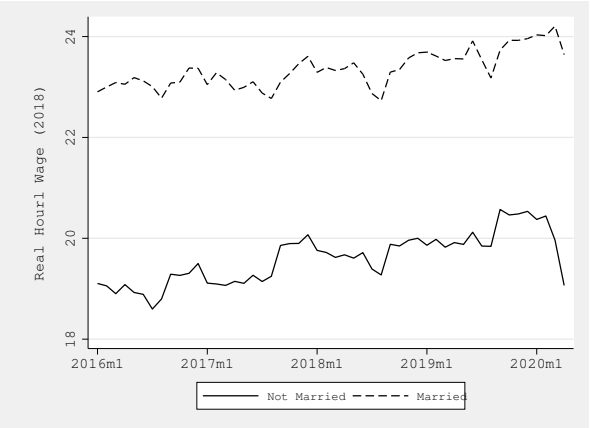
(a) Unemployment Rate.



(b) Labour Force Participation.



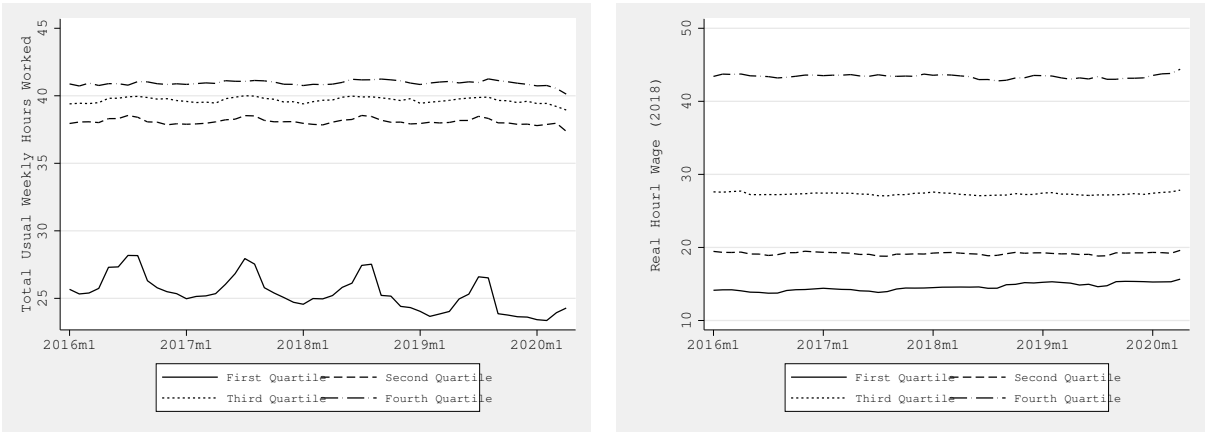
(c) Hours of Work.



(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate by marital status. Panel B plots the labour force participation by marital status. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by marital status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) by sex. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

Figure A6: Hours of Work and Hourly Wages by Weekly Earnings Quartile.

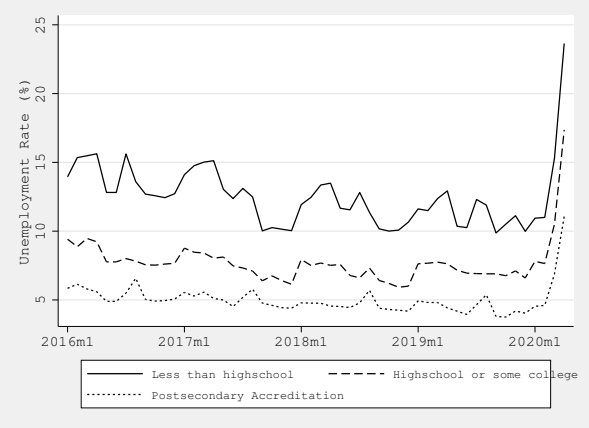


(a) Hours of Work.

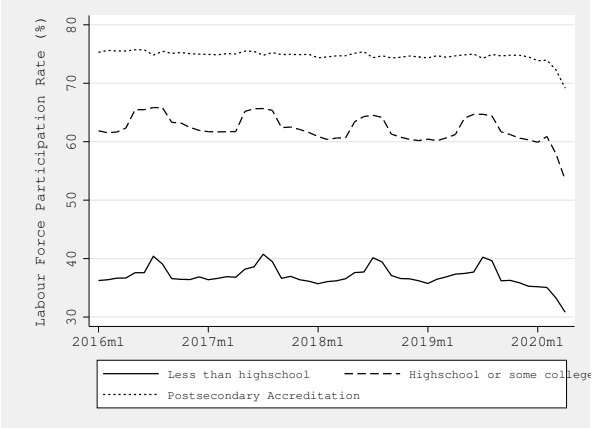
(b) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. We do not include Panel A plots the usual total hours work by weekly earnings quartile. Weekly earnings is calcualated as the real hourly wage (January 2018, provincial) multiplied by the total usual hours of worked in a week. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed earned zero income and were omitted. Panel B plots the usual hourly wages (January 2018, provincial) by weekly earnings quartile. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed earned zero income and were omitted.

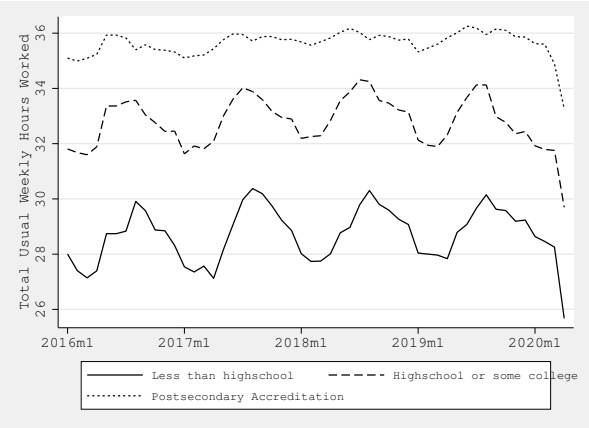
Figure A7: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Education Status.



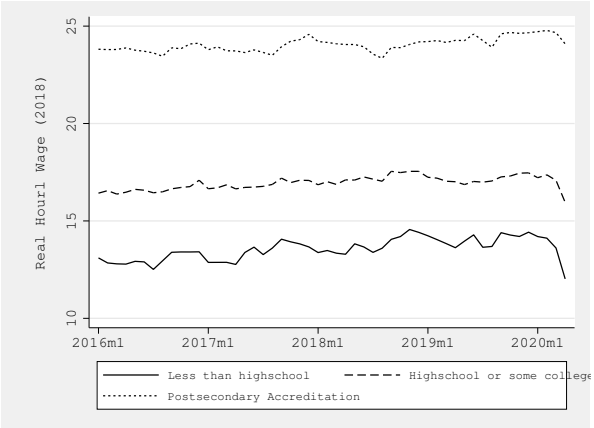
(a) Unemployment Rate.



(b) Labour Force Participation.



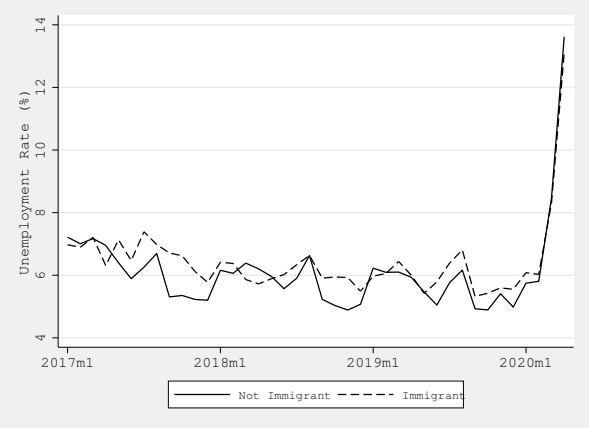
(c) Hours of Work.



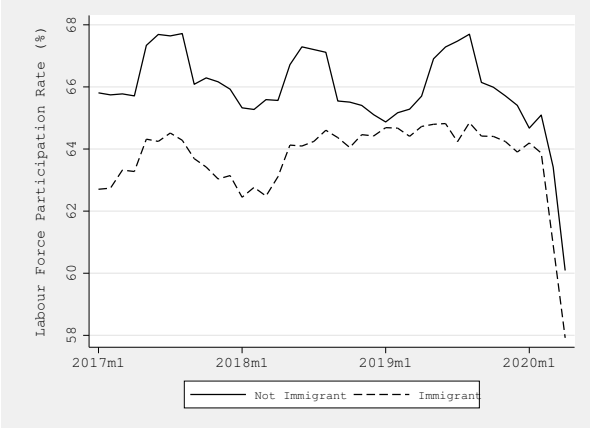
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate by education status. Panel B plots the labour force participation by education status. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by education status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) by education status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

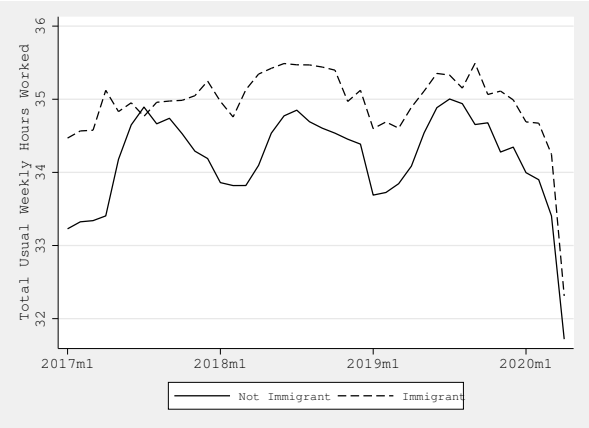
Figure A8: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Immigration Status.



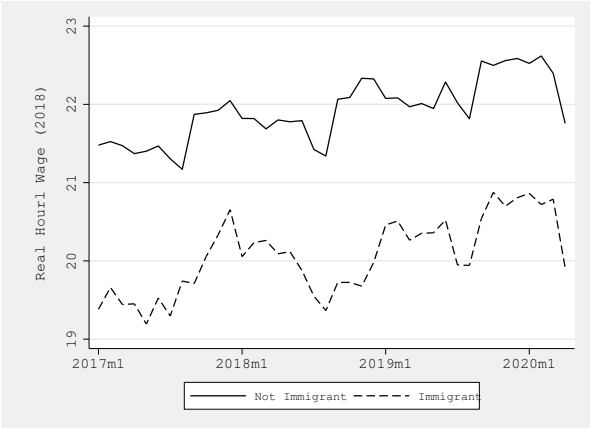
(a) Unemployment Rate.



(b) Labour Force Participation.



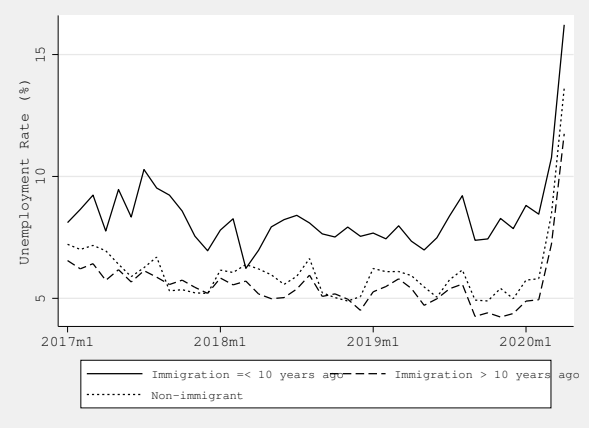
(c) Hours of Work.



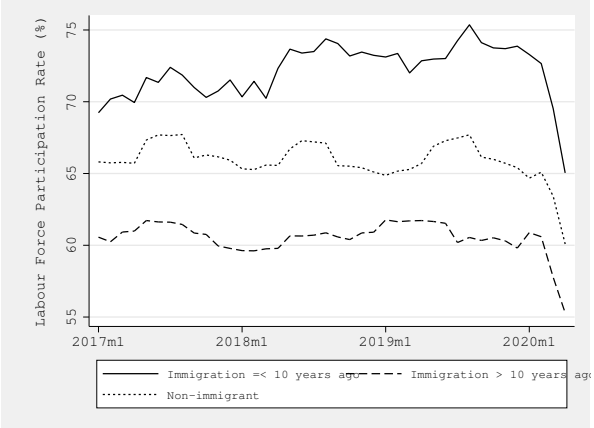
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate by immigrant status. Panel B plots the labour force participation by immigrant status. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by immigrant status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) by immigrant status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

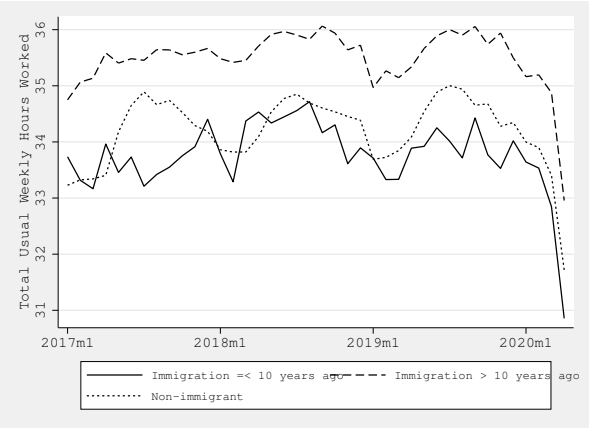
Figure A9: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Years Since Immigration.



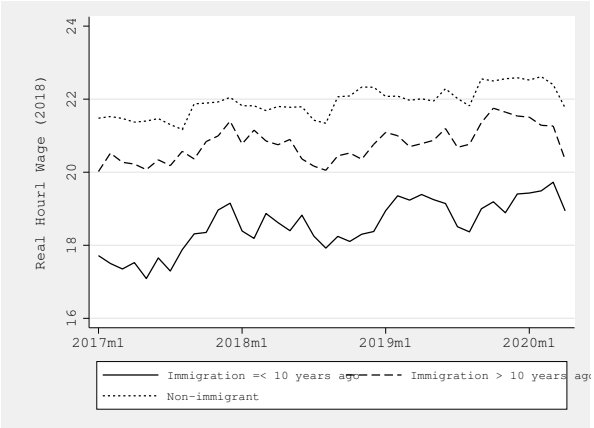
(a) Unemployment Rate.



(b) Labour Force Participation.



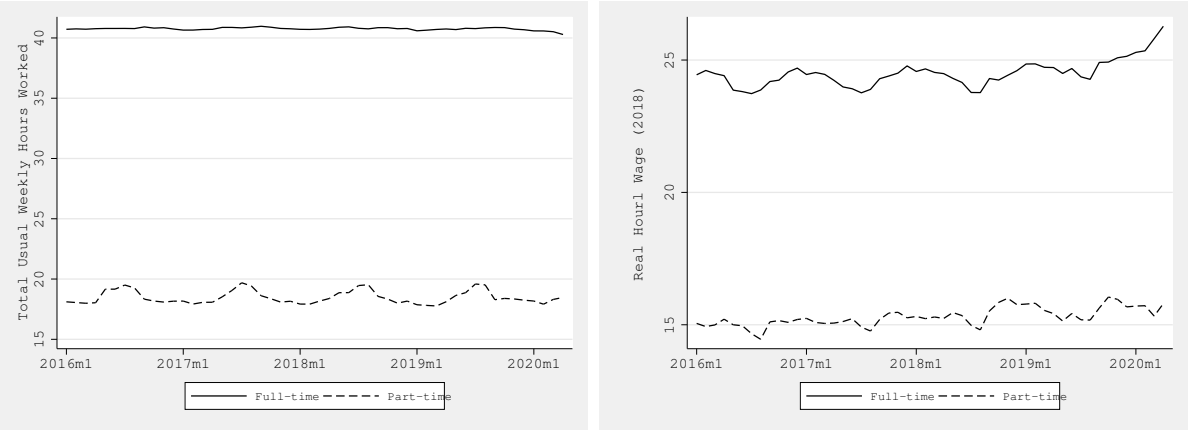
(c) Hours of Work.



(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate by years since immigration. Panel B plots the labour force participation by years since immigration. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by years since immigration. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) by years since immigration. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

Figure A10: Hours of Work and Hourly Wages by Full-Time or Part-Time Worker Status.

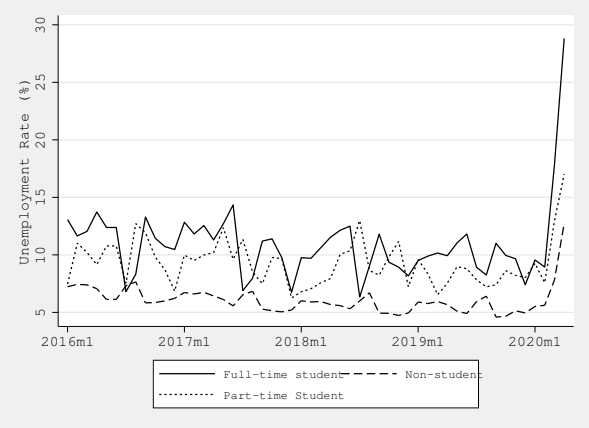


(a) Hours of Work.

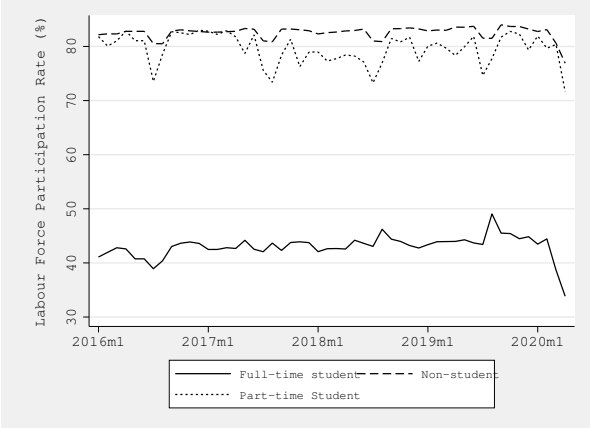
(b) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the usual total hours work by full-time or part-time worker status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel B plots the usual real hourly wages (January 2018, provincial) by full-time or part-time worker status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

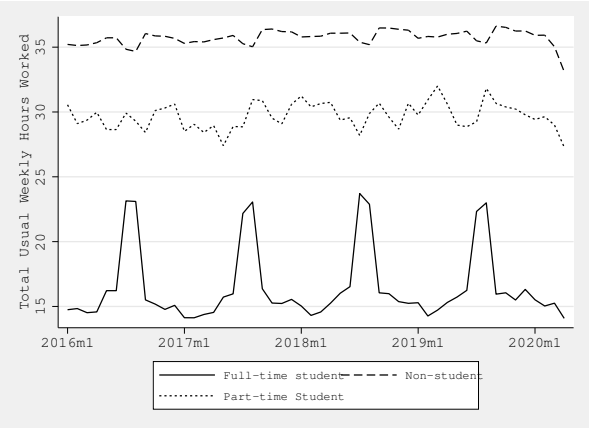
Figure A11: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Full-Time or Part-Time Student Status.



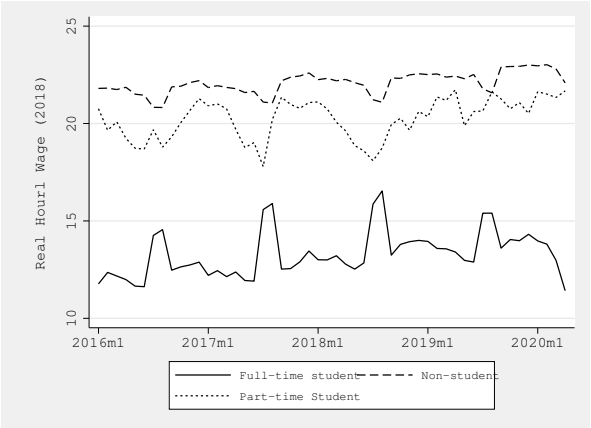
(a) Unemployment Rate.



(b) Labour Force Participation.



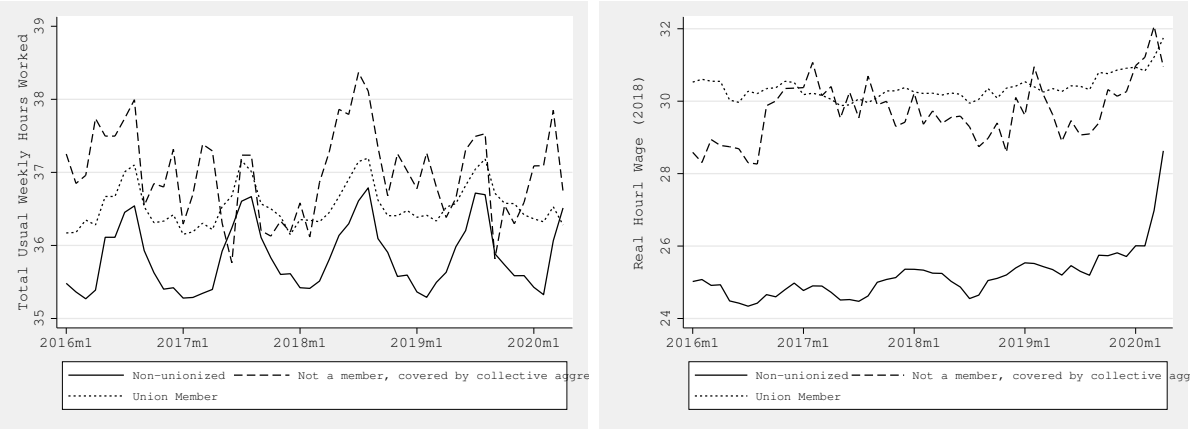
(c) Hours of Work.



(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate by full-time or part-time student status. Panel B plots the labour force participation by full-time or part-time student status. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by full-time or part-time student status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) by full-time or part-time student status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

Figure A12: Hours of Work and Hourly Wages by Union Status.

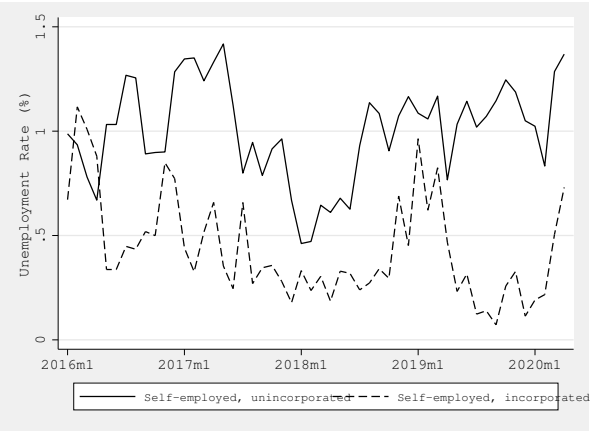


(a) Hours of Work.

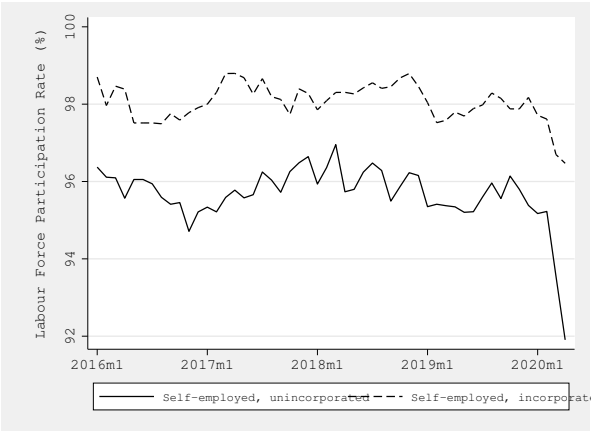
(b) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020.Panel A plots the usual total hours work by full-time or part-time union status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel B plots the usual real hourly wages (January 2018, provincial) by union status. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

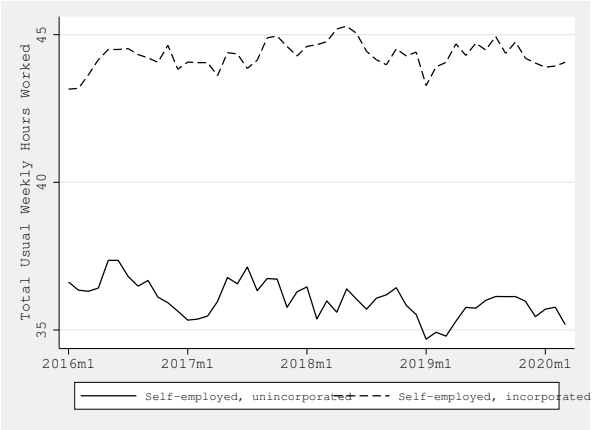
Figure A13: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages by Self-Employment Incorporated and Unincorporated.



(a) Unemployment Rate.



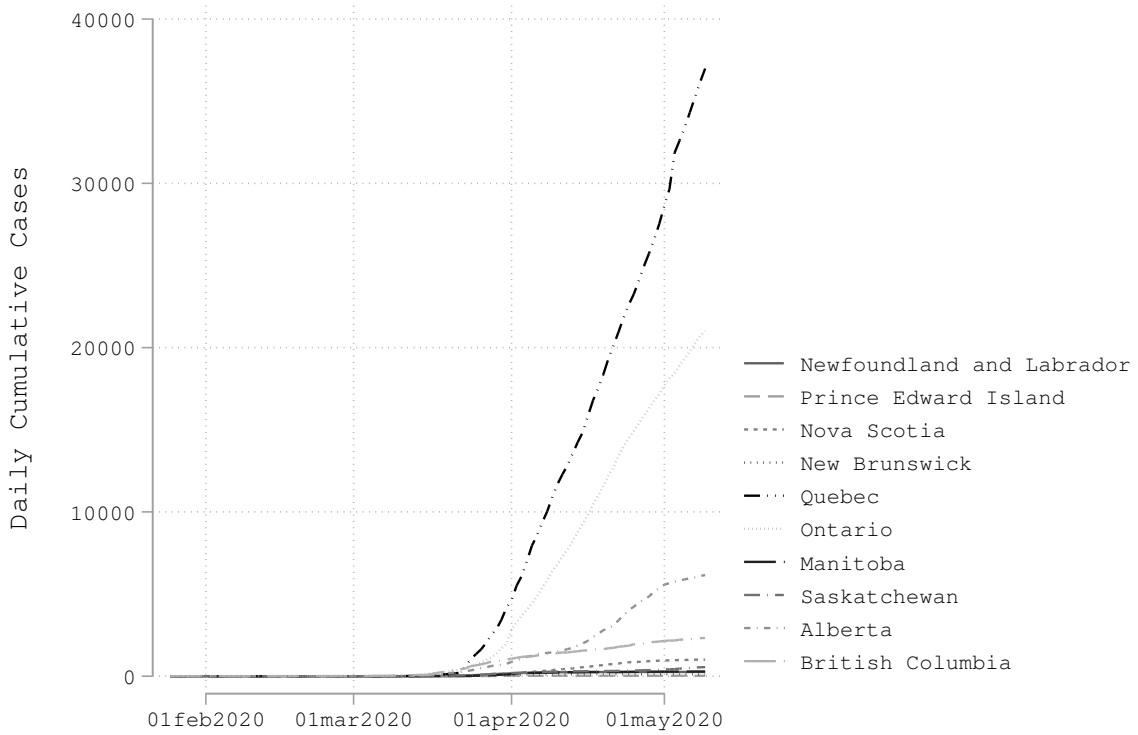
(b) Labour Force Participation.



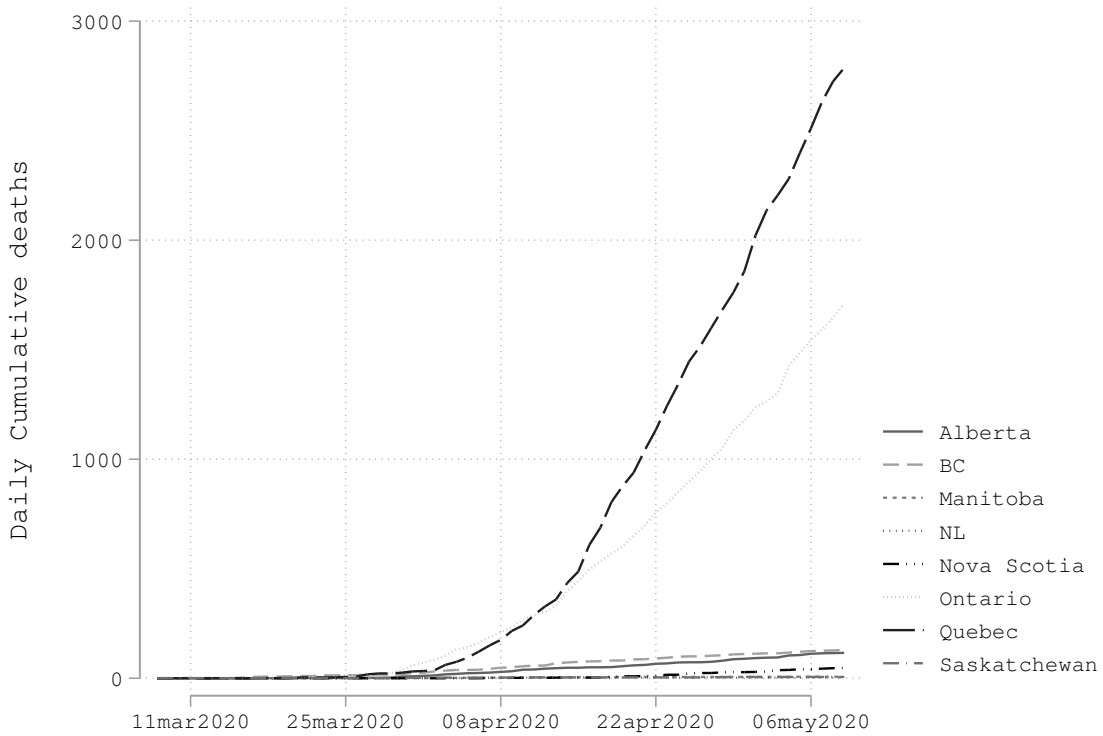
(c) Hours of Work.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2016 to April 2020. Panel A plots the unemployment rate incorporated or unincorporated self-employment. Panel B plots the labour force participation by incorporated or unincorporated self-employment. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work by incorporated or unincorporated self-employment. This includes individuals who were: civilian; aged 16–70; employed either at work and/or absent from work during the survey week; includes only those who were self-employed; were not self-employed; all jobs.

Figure A14: Cases and Deaths in All Provinces, Linear Scale.

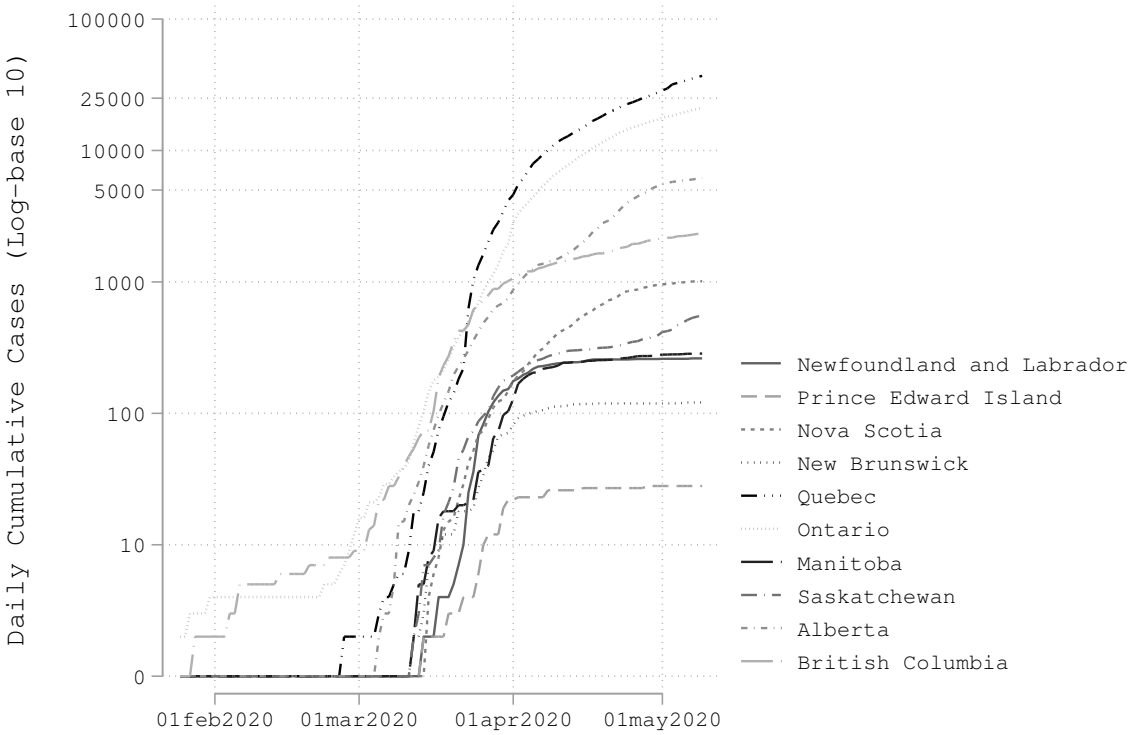


(a) Cumulative Cases, Linear

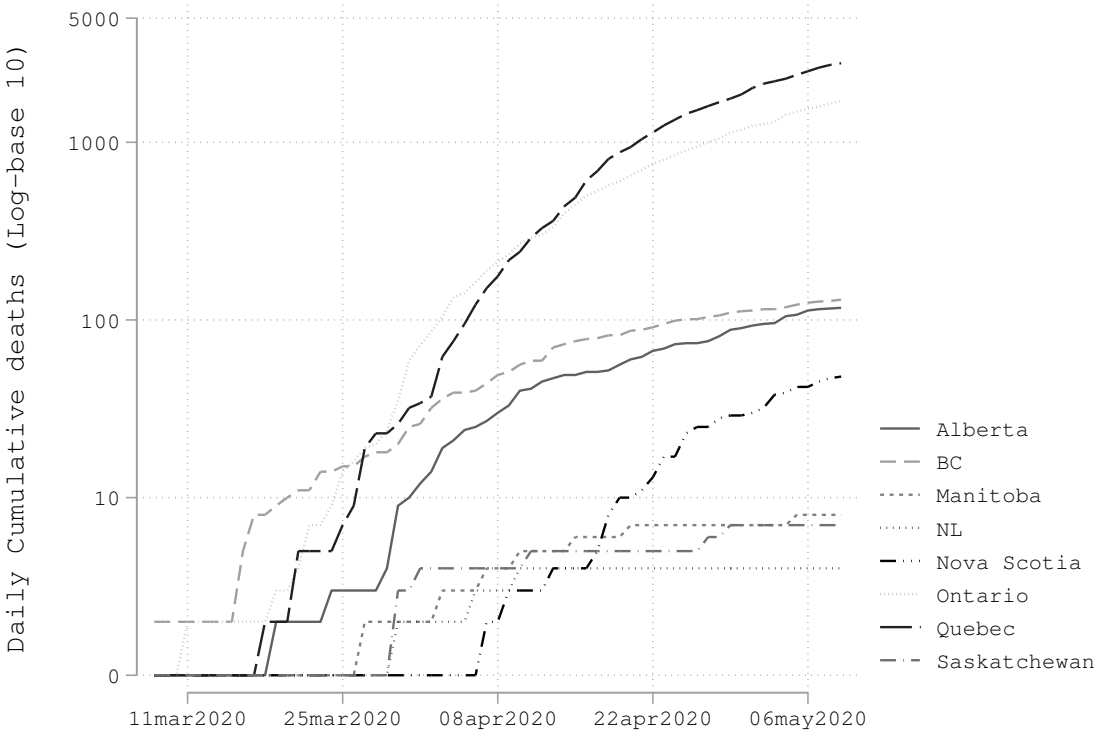


(b) Cumulative Deaths, Linear

Figure A15: Cases and Deaths in All Provinces, Logarithmic Scale.

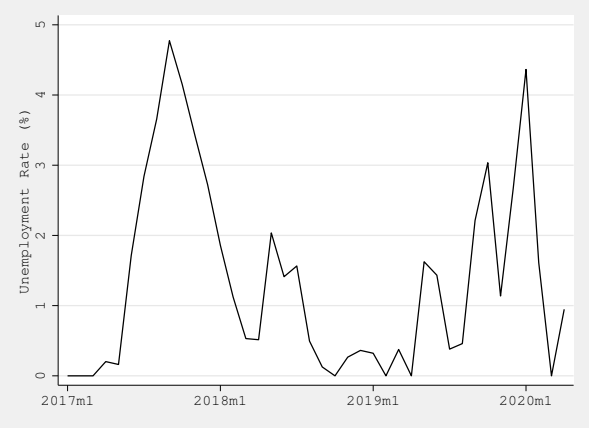


(a) Cumulative Cases, Log (base 10)

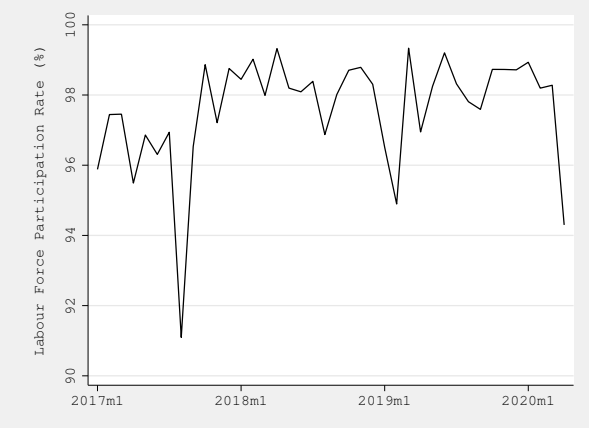


(b) Cumulative Deaths, Log (base 10

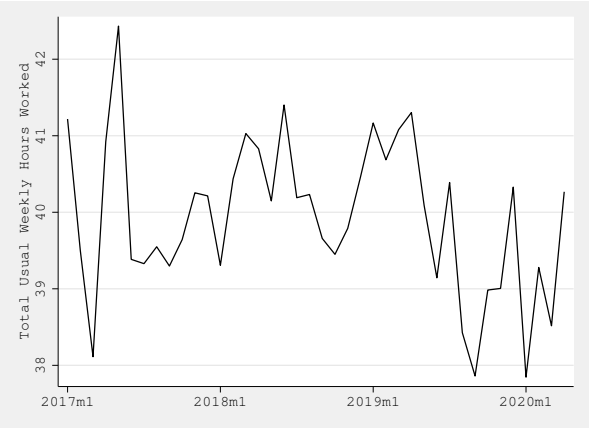
Figure A16: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 00, Senior Management Occupations.



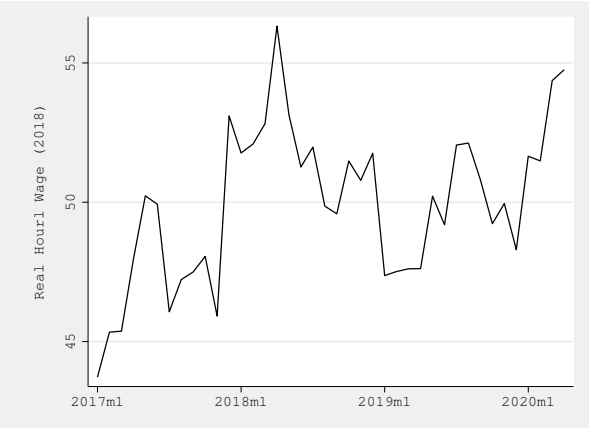
(a) Unemployment Rate.



(b) Labour Force Participation.



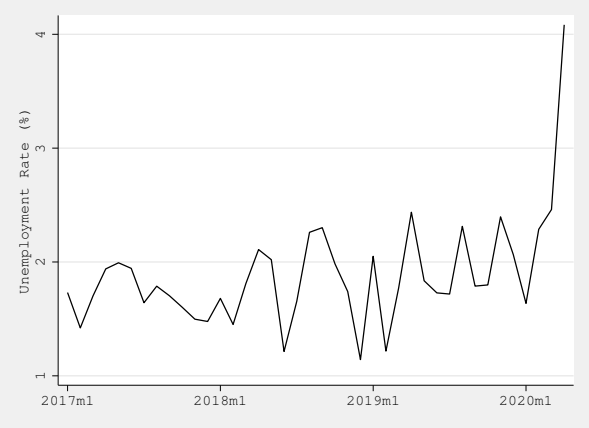
(c) Hours of Work.



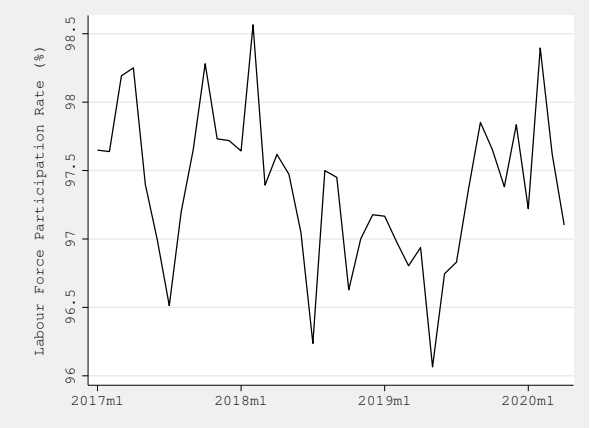
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 00. Panel B plots the labour force participation for NOC major group 00. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 00. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 00. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

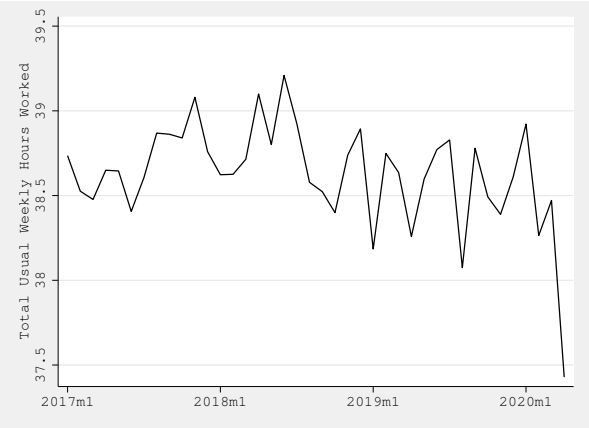
Figure A17: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major groups 01-05, Specialized Middle Management Occupations.



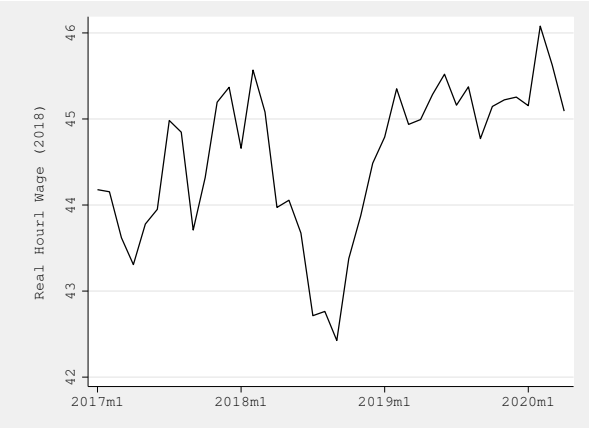
(a) Unemployment Rate.



(b) Labour Force Participation.



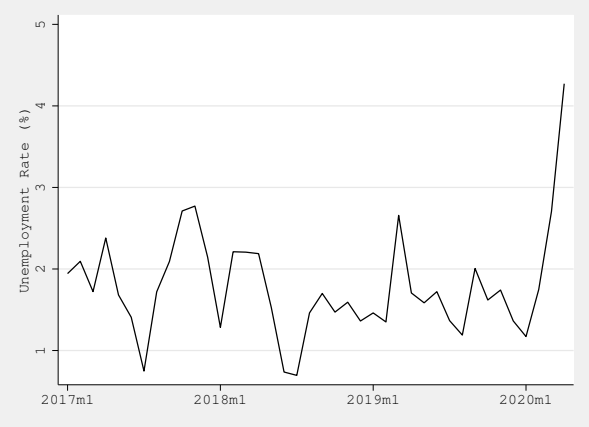
(c) Hours of Work.



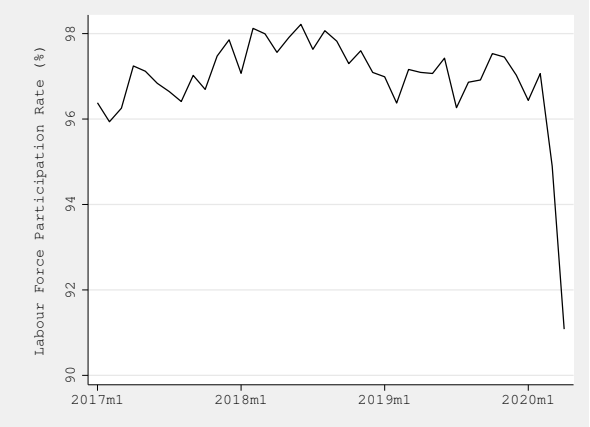
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major groups 01-05. Panel B plots the labour force participation for NOC major groups 01-05. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major groups 01-05. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major groups 01-05. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

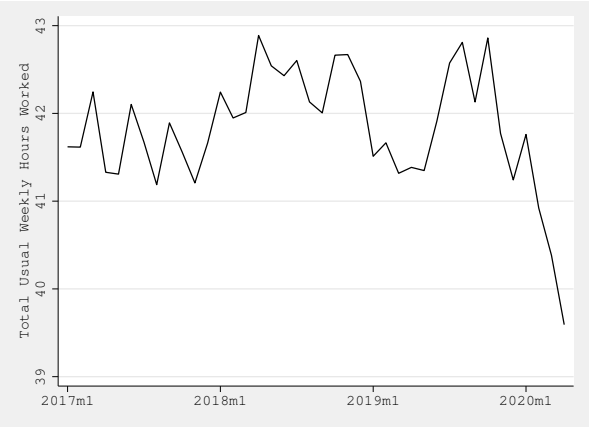
Figure A18: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 06, Middle Management Occupations in Retail and Wholesale Trade.



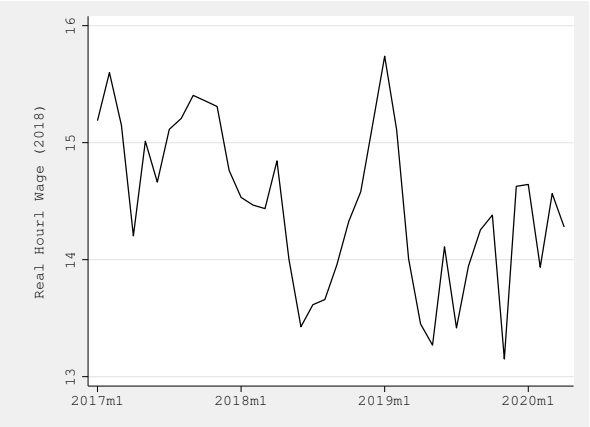
(a) Unemployment Rate.



(b) Labour Force Participation.



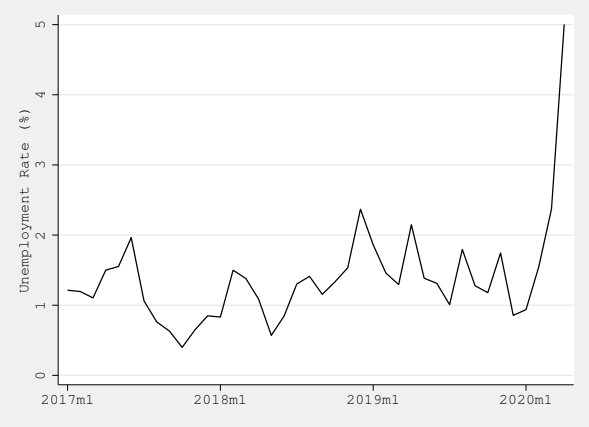
(c) Hours of Work.



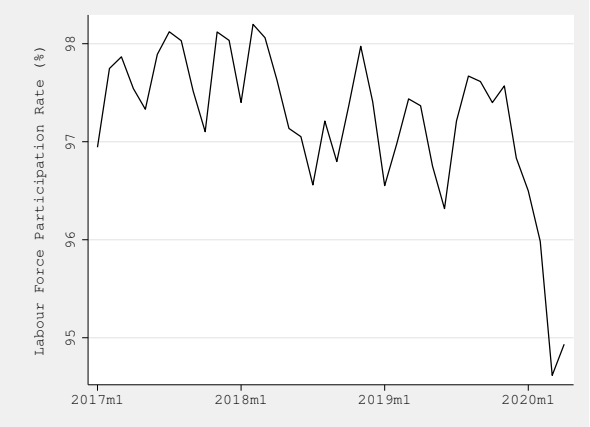
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 06. Panel B plots the labour force participation for NOC major group 06. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 06. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for for NOC major group 06. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

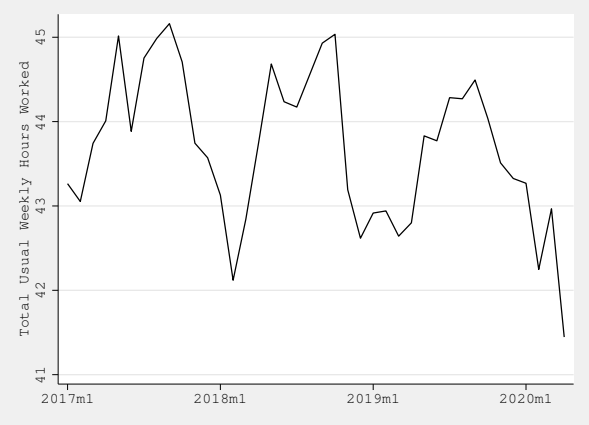
Figure A19: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major groups 07-09, Middle Management Occupations in Trades, Transportation, Production and Utilities.



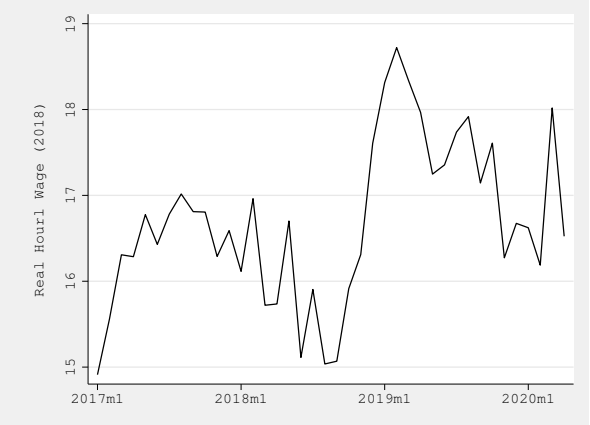
(a) Unemployment Rate.



(b) Labour Force Participation.



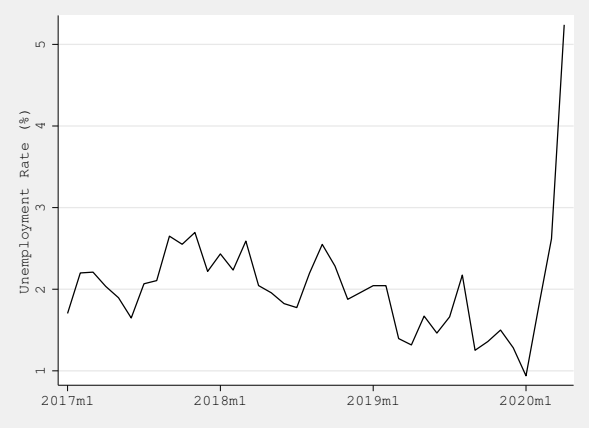
(c) Hours of Work.



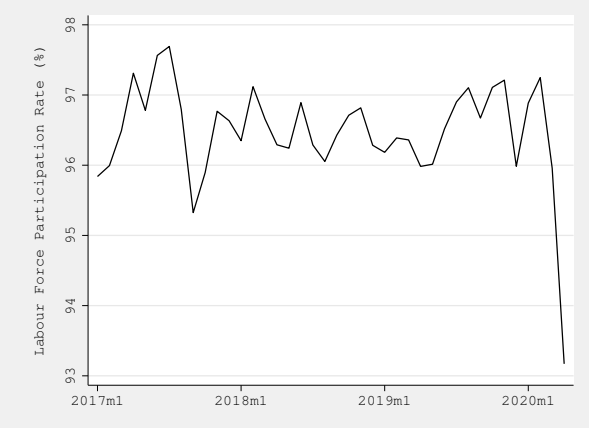
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major groups 07-09. Panel B plots the labour force participation for NOC major groups 07-09. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group2 07-09. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for for NOC major groups 07-09. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

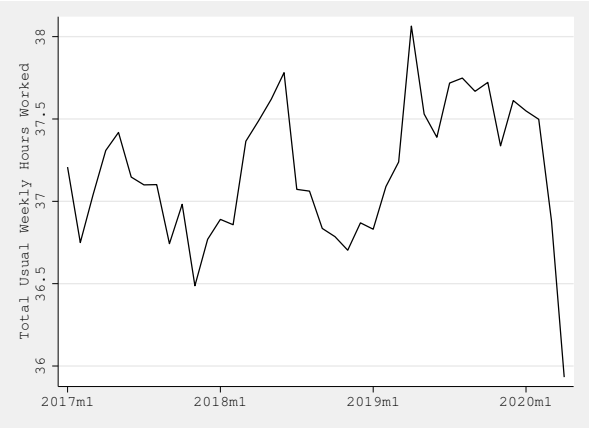
Figure A20: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 11, Professional Occupations in Business and Finance.



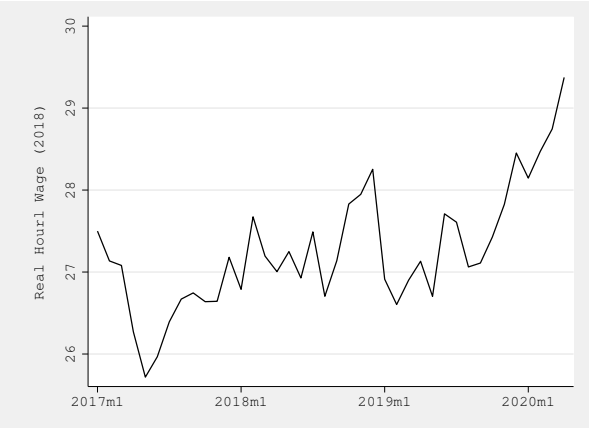
(a) Unemployment Rate.



(b) Labour Force Participation.



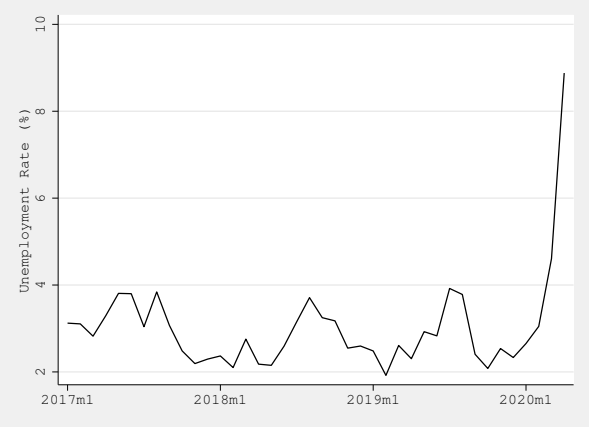
(c) Hours of Work.



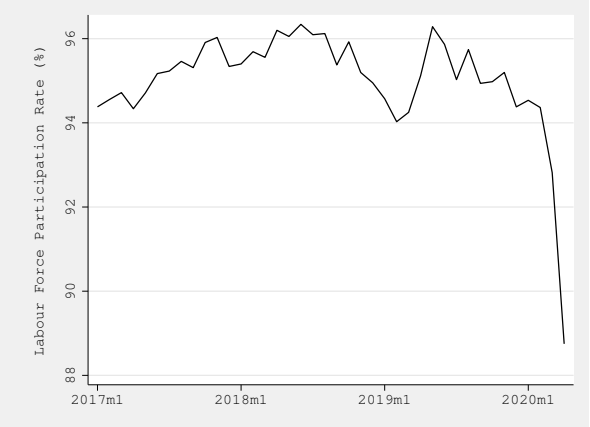
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 11. Panel B plots the labour force participation for NOC major group 11. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 11. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 11. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

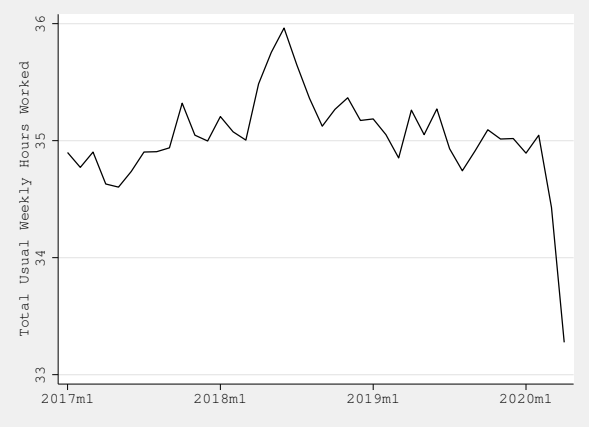
Figure A21: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 12, Administrative and Financial Supervisors and Administrative Occupations.



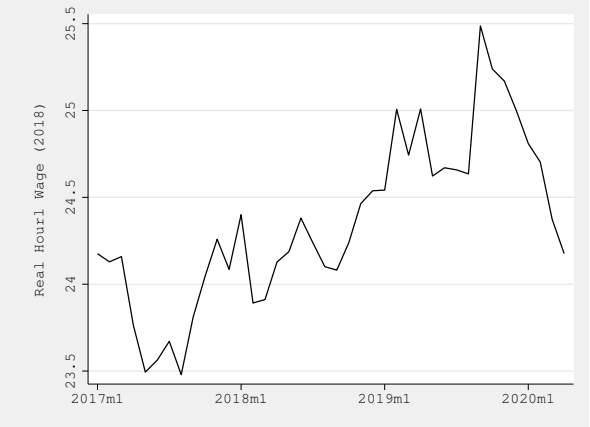
(a) Unemployment Rate.



(b) Labour Force Participation.



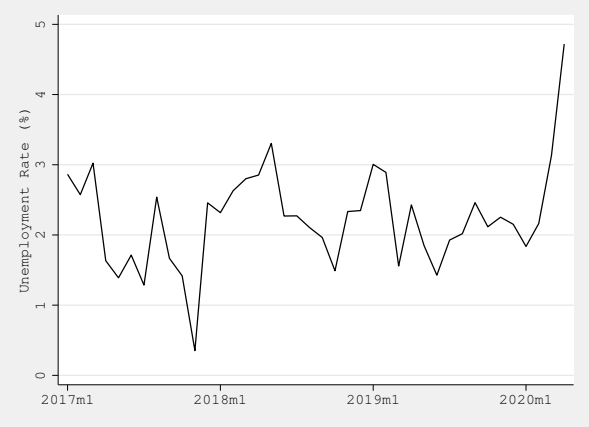
(c) Hours of Work.



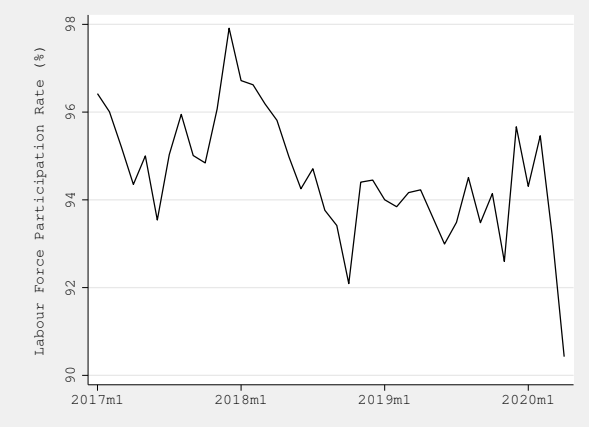
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 12. Panel B plots the labour force participation for NOC major group 12. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 12. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 12. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

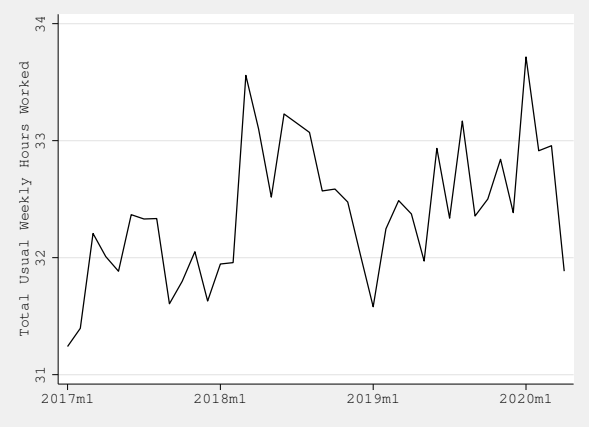
Figure A22: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 13, Finance, Insurance and Rrelated Business Administrative Occupations.



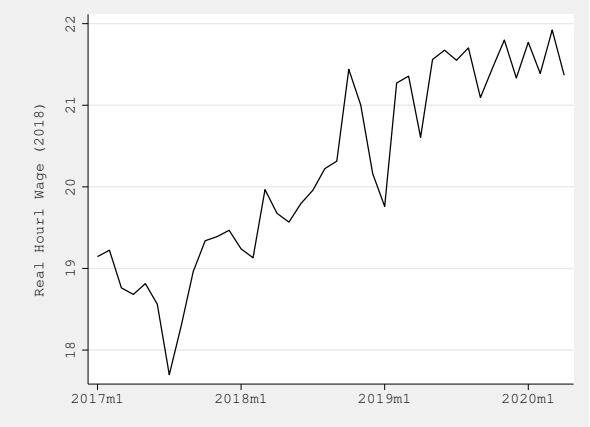
(a) Unemployment Rate.



(b) Labour Force Participation.



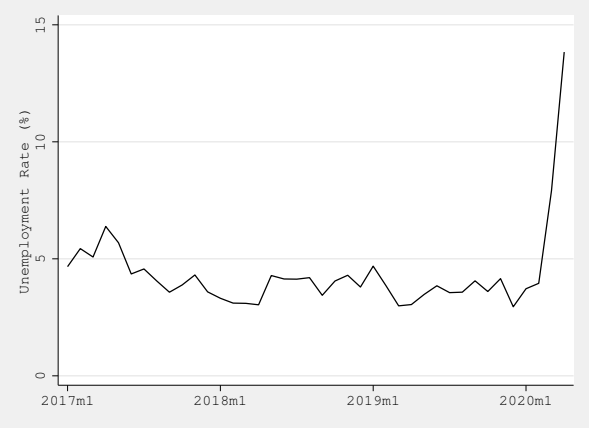
(c) Hours of Work.



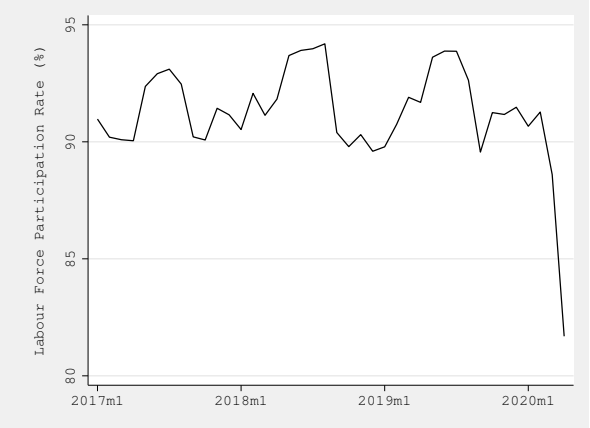
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 13. Panel B plots the labour force participation for NOC major group 13. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 13. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 13. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

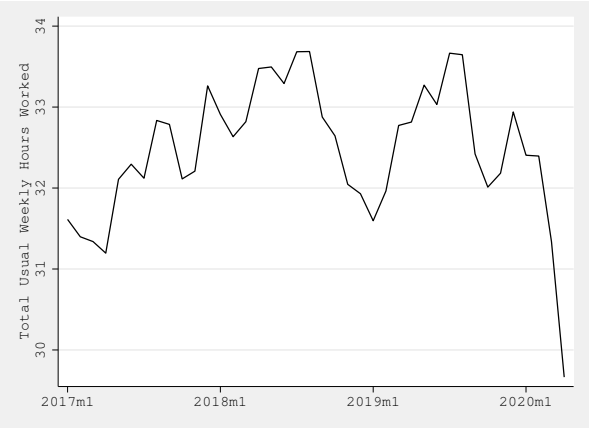
Figure A23: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 14, Office Support Occupations.



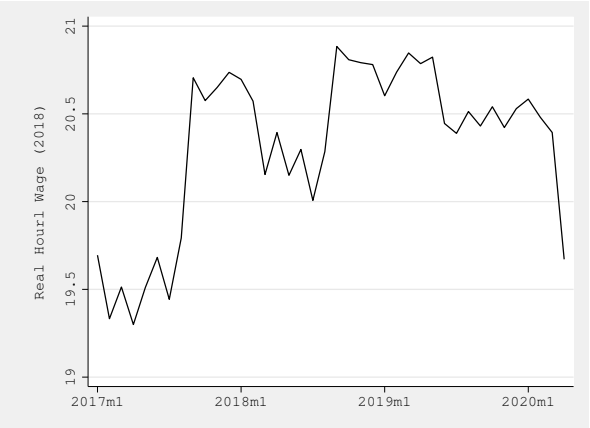
(a) Unemployment Rate.



(b) Labour Force Participation.



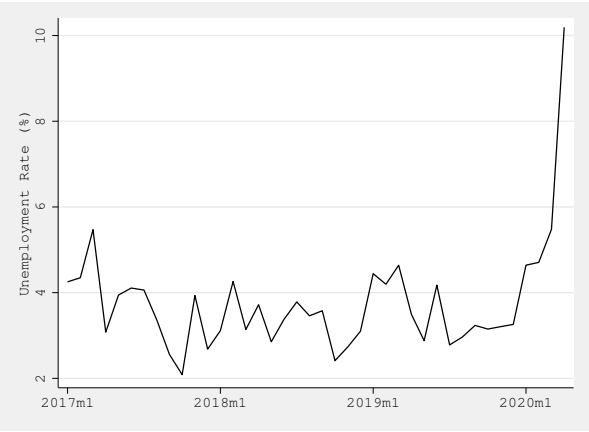
(c) Hours of Work.



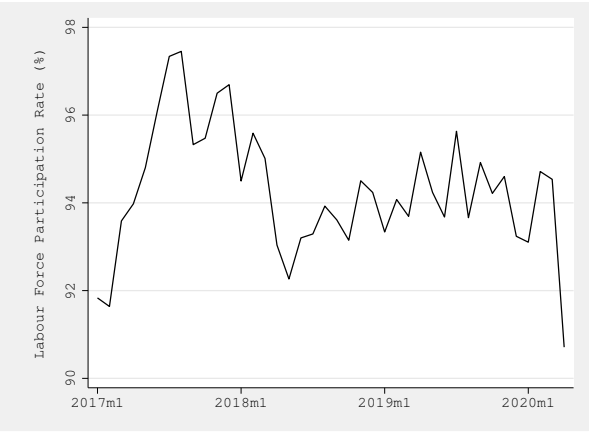
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 14. Panel B plots the labour force participation for NOC major group 14. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 14. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 14. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

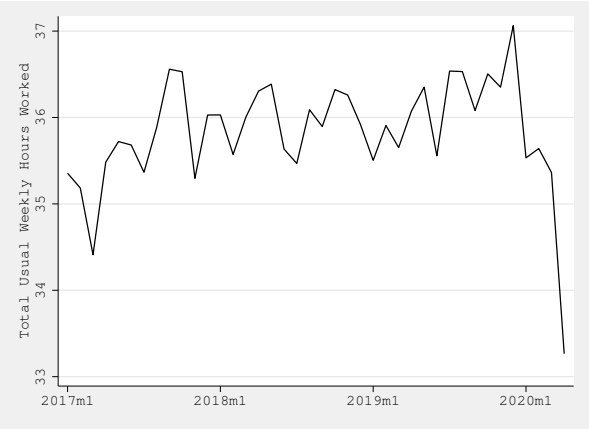
Figure A24: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 15, Distribution, Tracking and Scheduling Co-ordination Occupations.



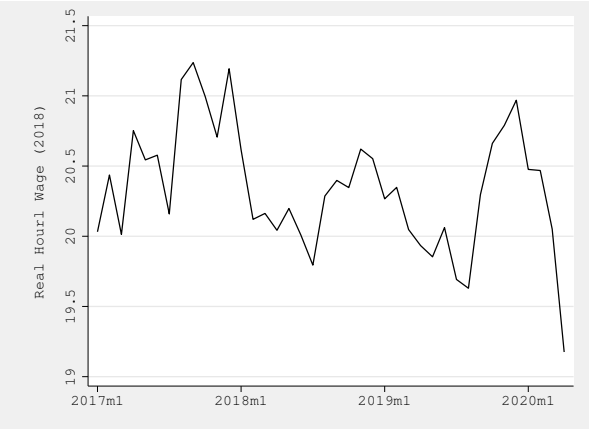
(a) Unemployment Rate.



(b) Labour Force Participation.



(c) Hours of Work.



(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 15. Panel B plots the labour force participation for NOC major group 15. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 15. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 15. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

Figure A25: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 21 Professional Occupations in Natural and Applied Sciences

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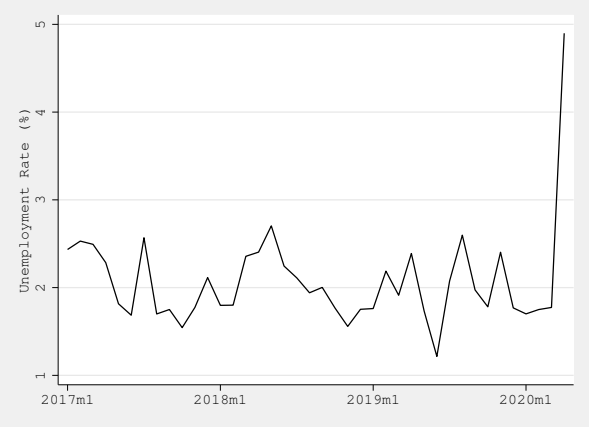
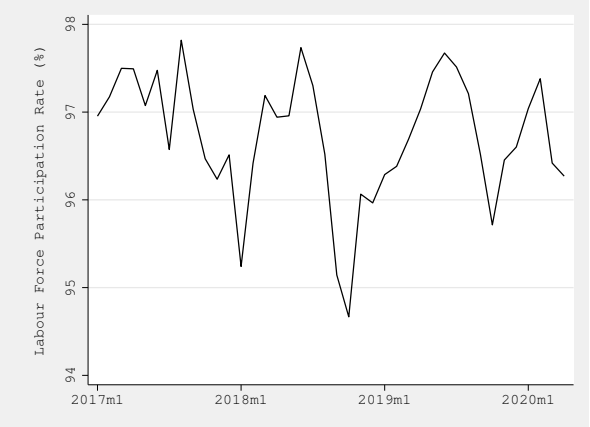
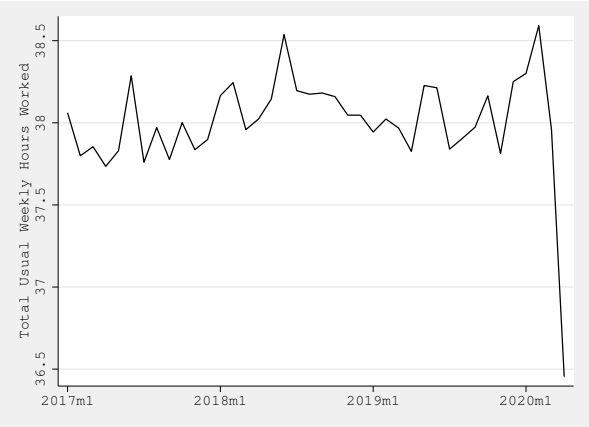


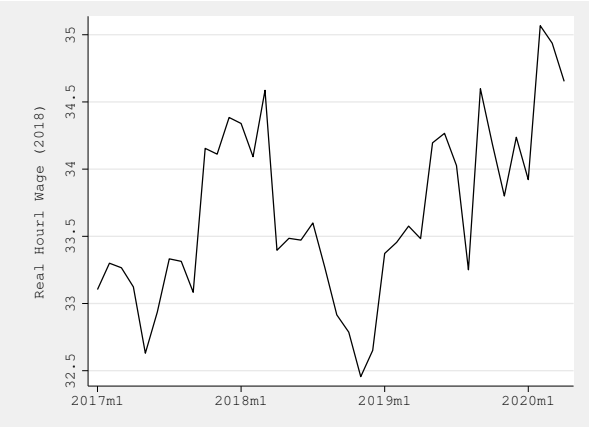
(a) Unemployment Rate.



(b) Labour Force Participation.



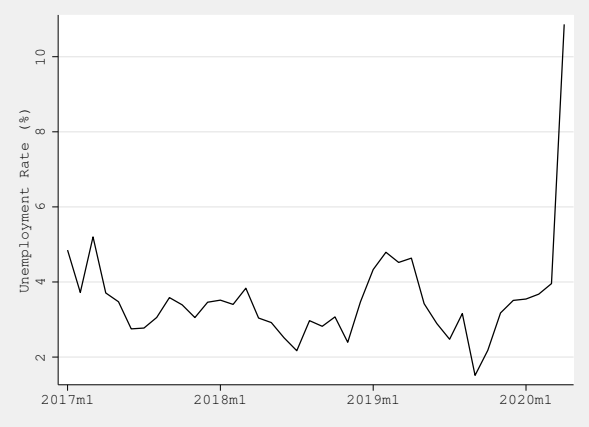
(c) Hours of Work.



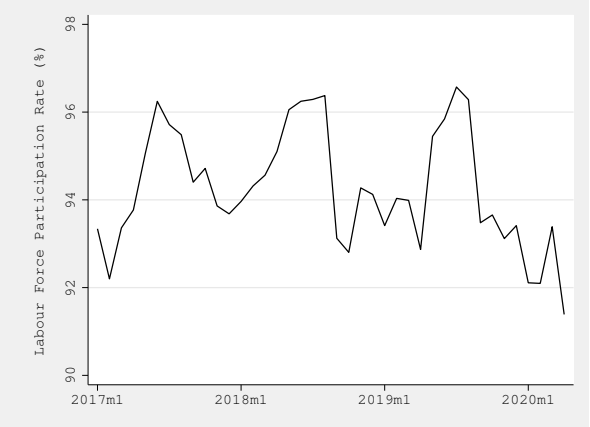
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 21. Panel B plots the labour force participation for NOC major group 21. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 21. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 21. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

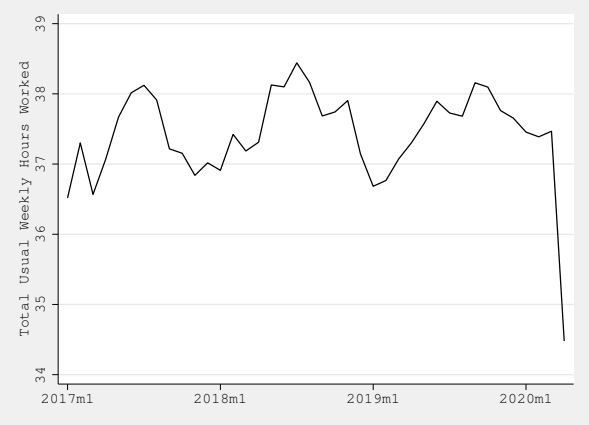
Figure A26: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 22, Technical Occupations Related to Natural and Applied Science.



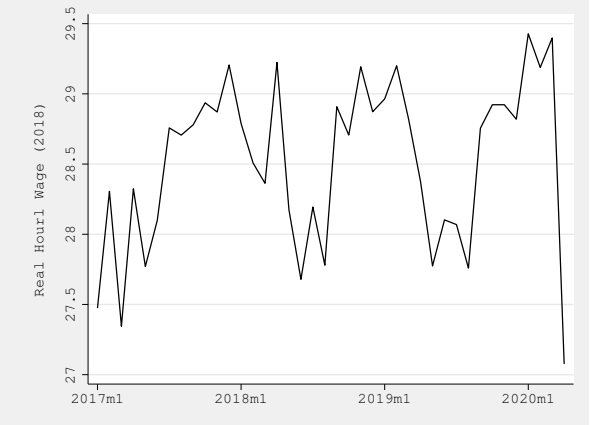
(a) Unemployment Rate.



(b) Labour Force Participation.



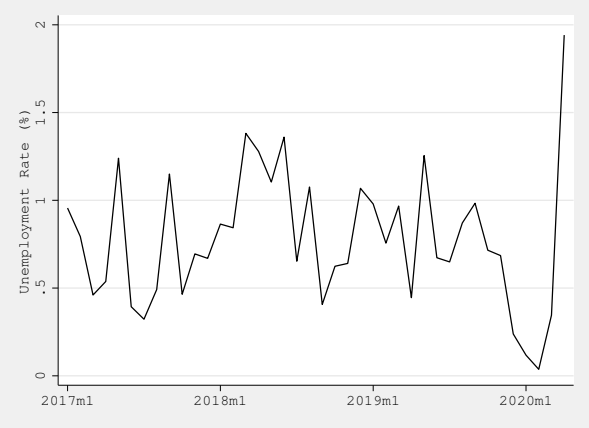
(c) Hours of Work.



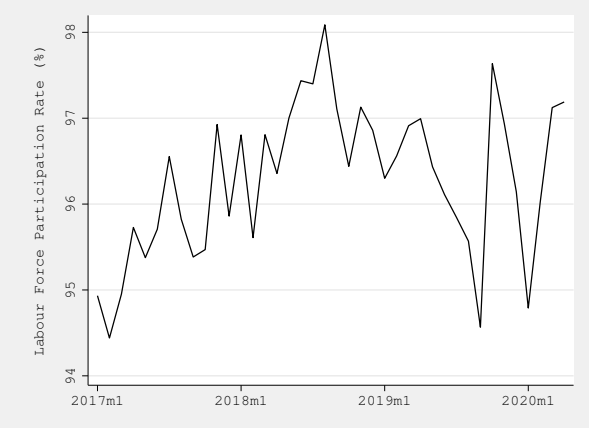
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 22. Panel B plots the labour force participation for NOC major group 22. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 22. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 22. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

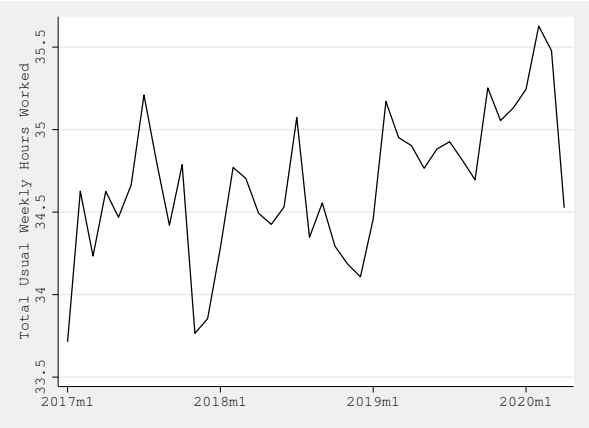
Figure A27: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 30, Professional Occupations in Nursing.



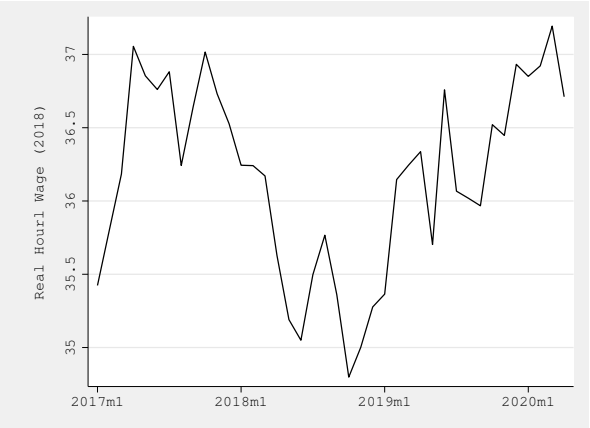
(a) Unemployment Rate.



(b) Labour Force Participation.



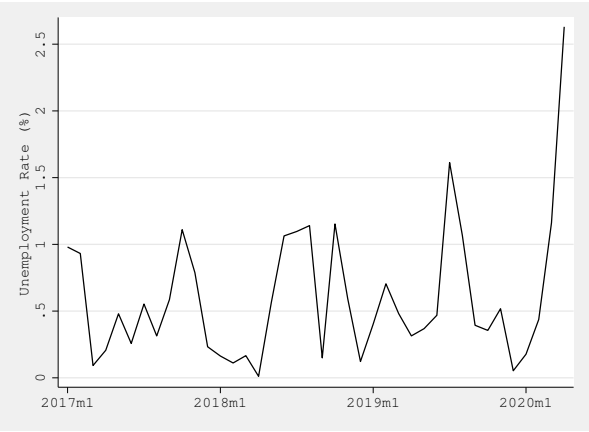
(c) Hours of Work.



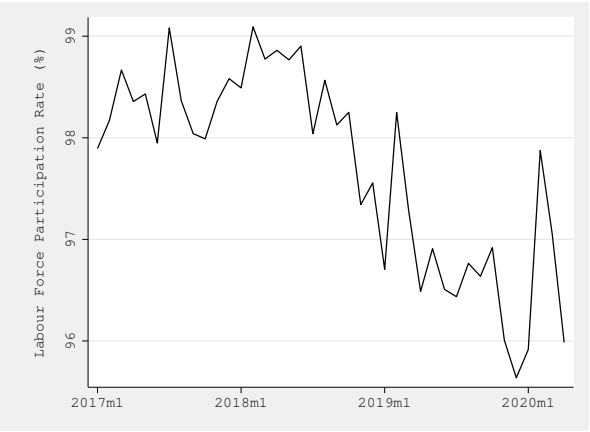
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 30. Panel B plots the labour force participation for NOC major group 30. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 30. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 30. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

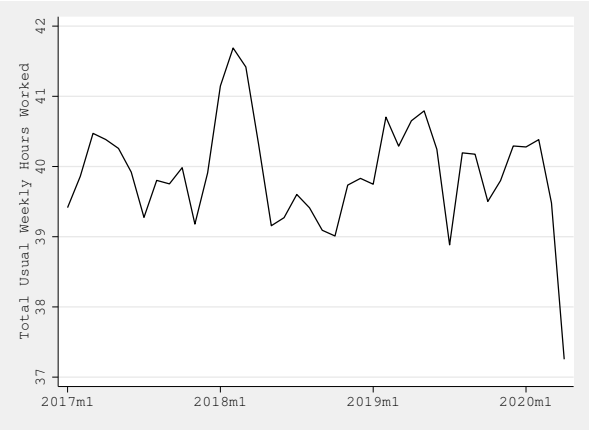
Figure A28: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 31, Professional Occupations in Health (except nursing).



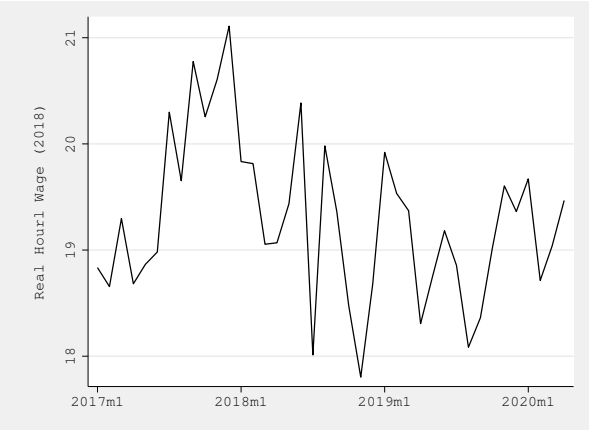
(a) Unemployment Rate.



(b) Labour Force Participation.



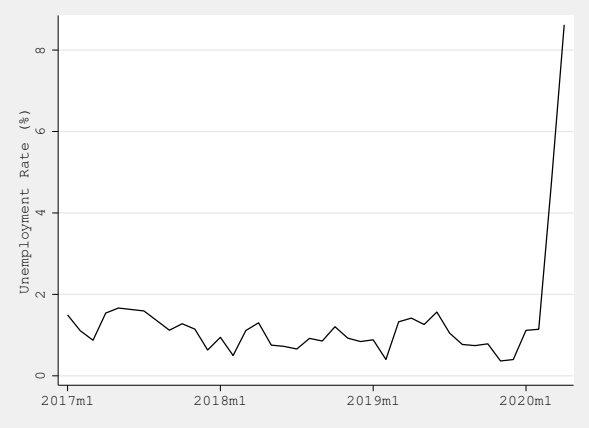
(c) Hours of Work.



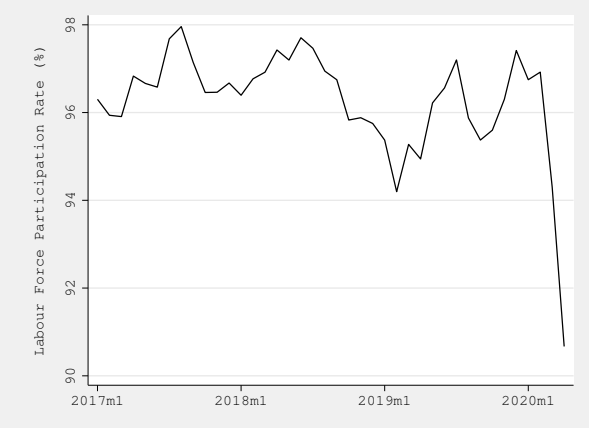
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 31. Panel B plots the labour force participation for NOC major group 31. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 31. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 31. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

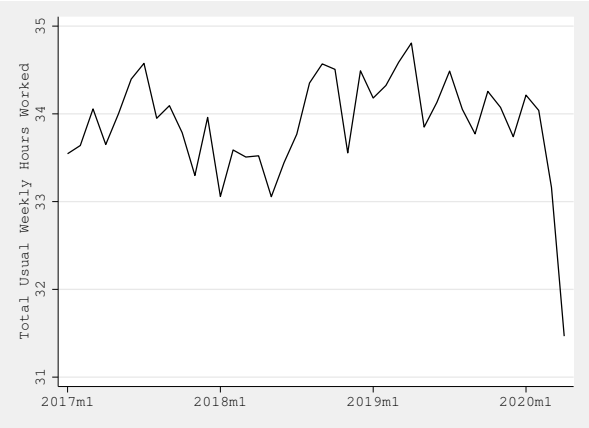
Figure A29: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 32, Technical Occupations in Health.



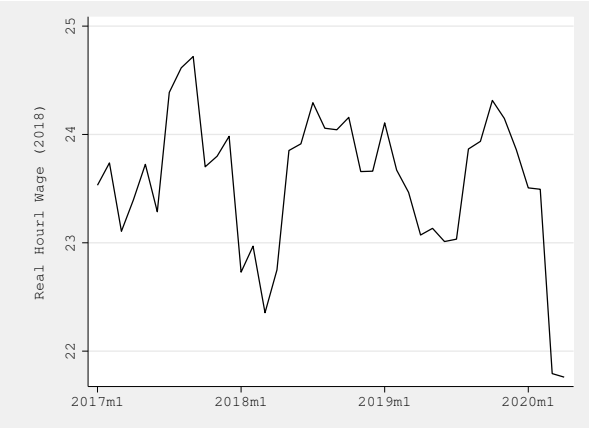
(a) Unemployment Rate.



(b) Labour Force Participation.



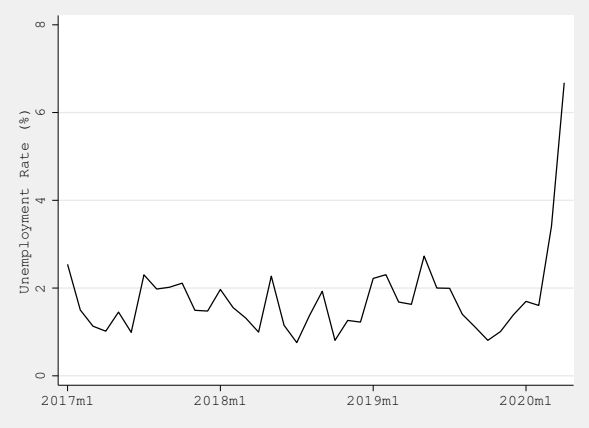
(c) Hours of Work.



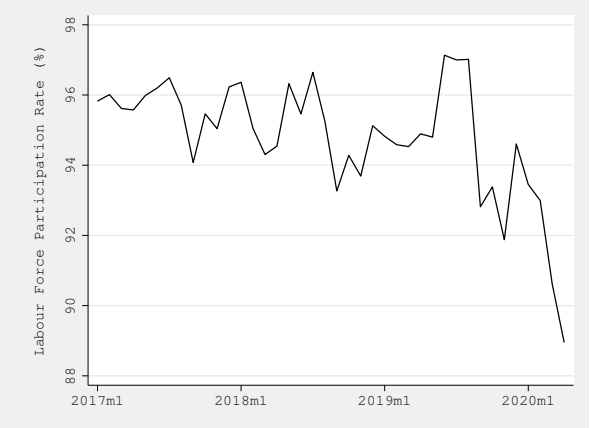
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 32. Panel B plots the labour force participation for NOC major group 32. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 32. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 32. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

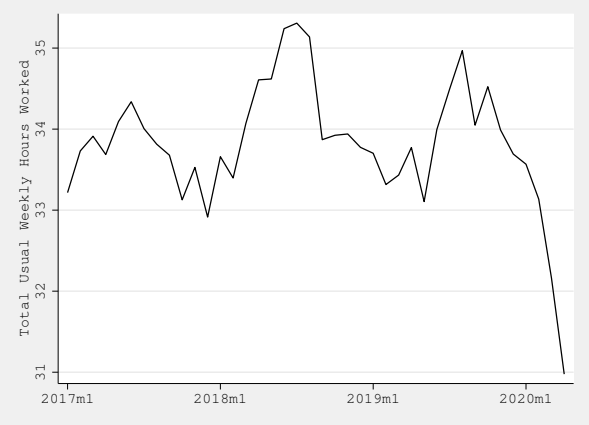
Figure A30: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 34, Assisting Occupations in Support of Health Services.



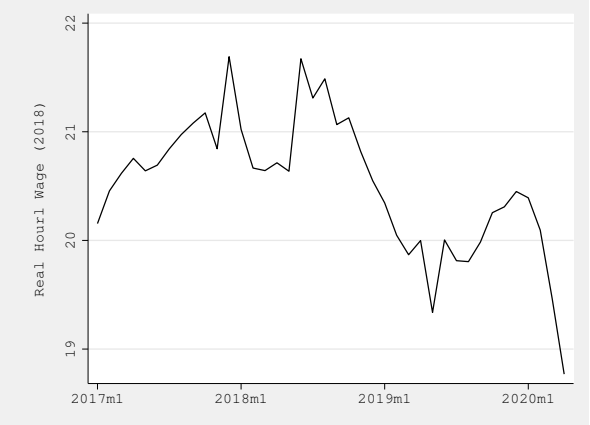
(a) Unemployment Rate.



(b) Labour Force Participation.



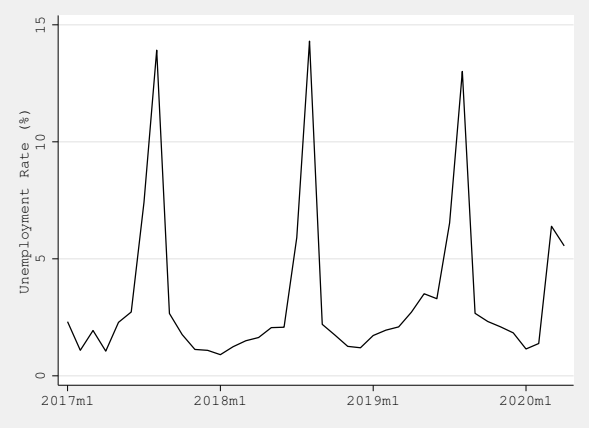
(c) Hours of Work.



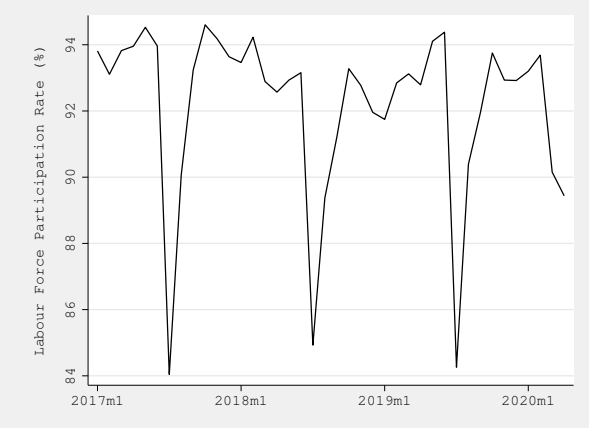
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 34. Panel B plots the labour force participation for NOC major group 34. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 34. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 34. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

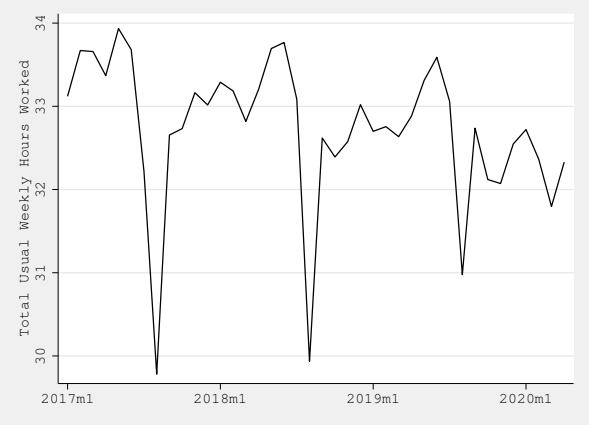
Figure A31: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 40, Professional Occupations in Education Services.



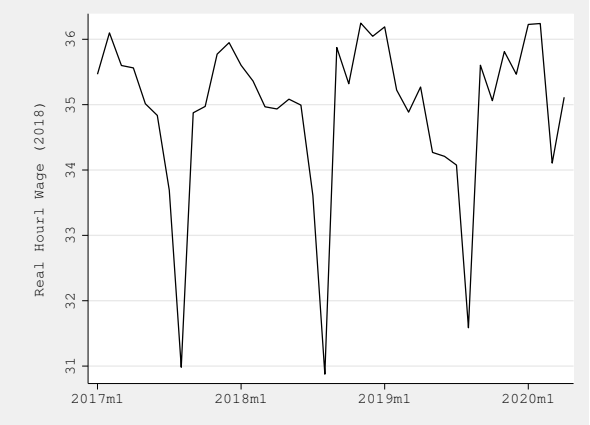
(a) Unemployment Rate.



(b) Labour Force Participation.



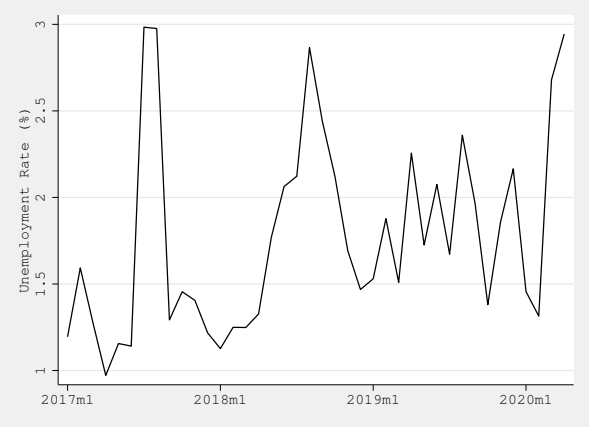
(c) Hours of Work.



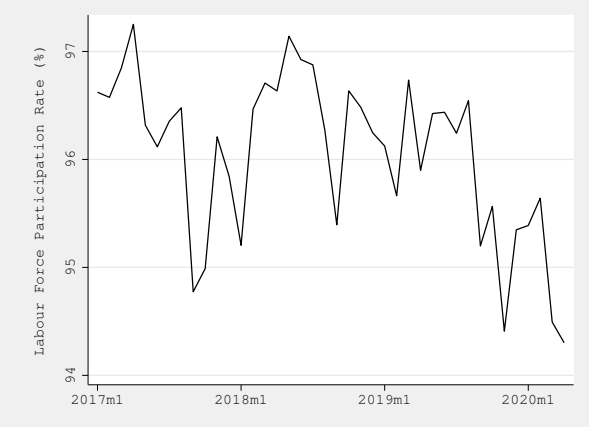
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 40. Panel B plots the labour force participation for NOC major group 40. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 40. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 40. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

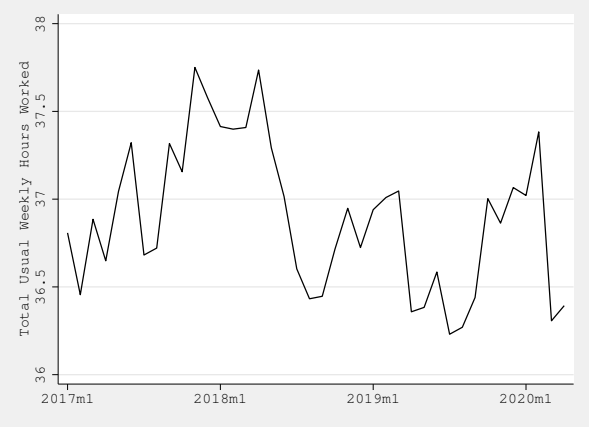
Figure A32: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 41, Professional Occupations in Law and Social, Community and Government Services.



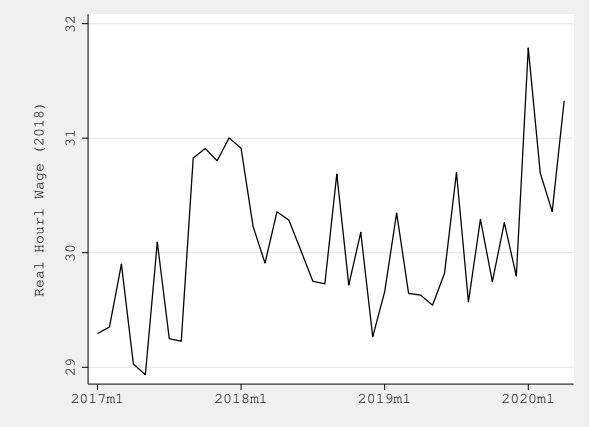
(a) Unemployment Rate.



(b) Labour Force Participation.



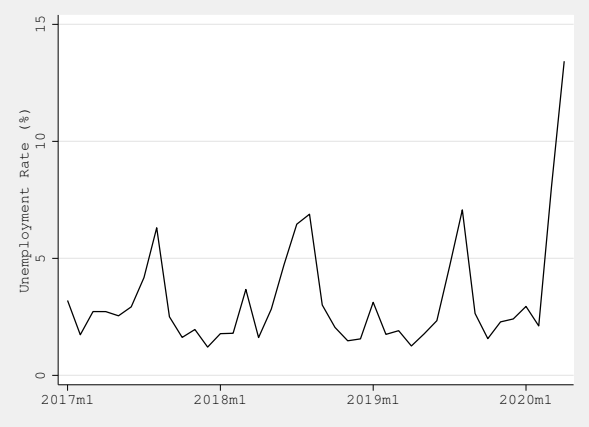
(c) Hours of Work.



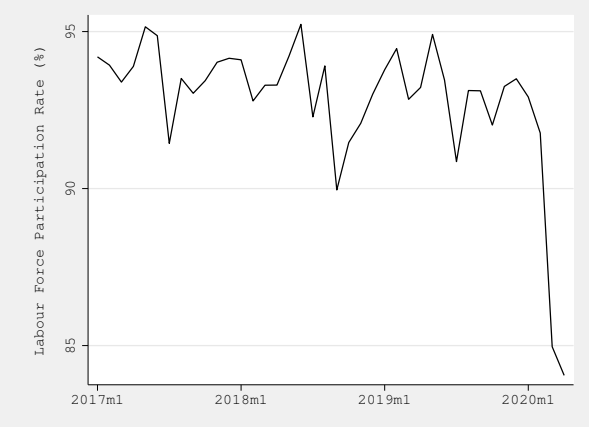
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 41. Panel B plots the labour force participation for NOC major group 41. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 41. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 41. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

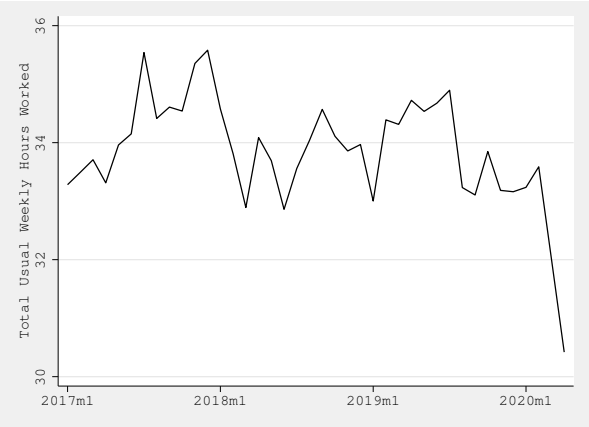
Figure A33: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 42, Paraprofessional Occupations in Legal, Social, Community and Education Services.



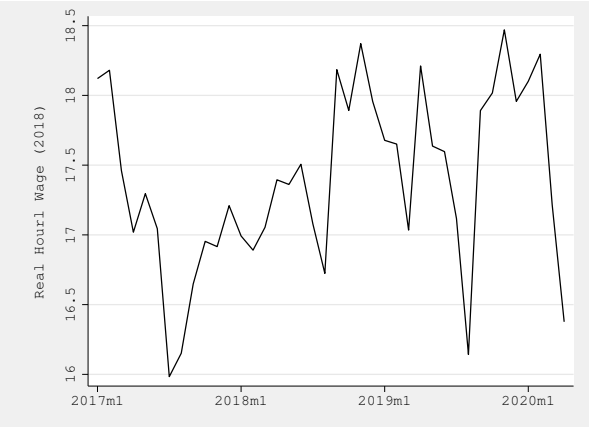
(a) Unemployment Rate.



(b) Labour Force Participation.



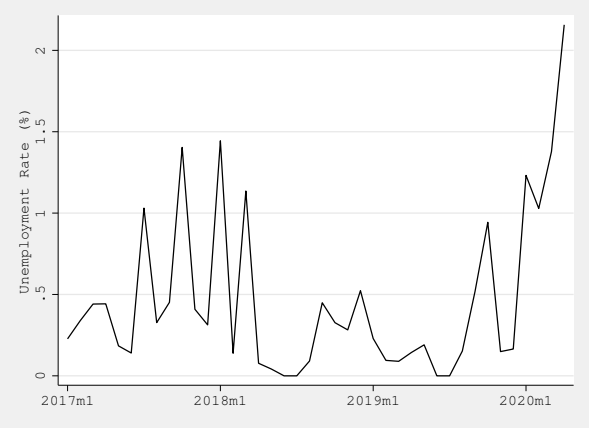
(c) Hours of Work.



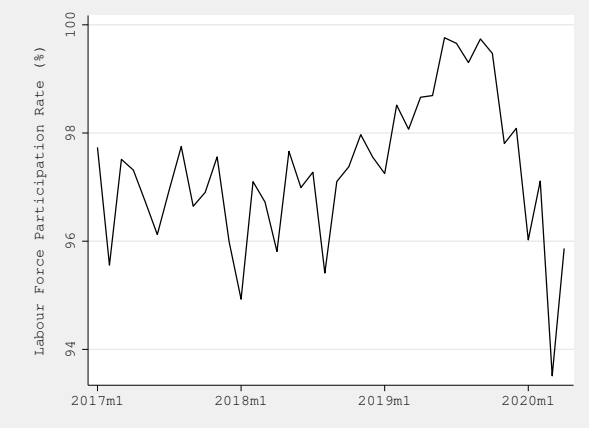
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 42. Panel B plots the labour force participation for NOC major group 42. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 42. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 42. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

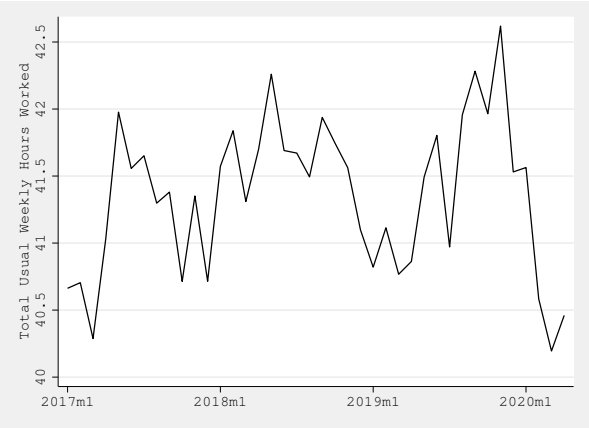
Figure A34: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 43 Occupations in front-line public protection services.



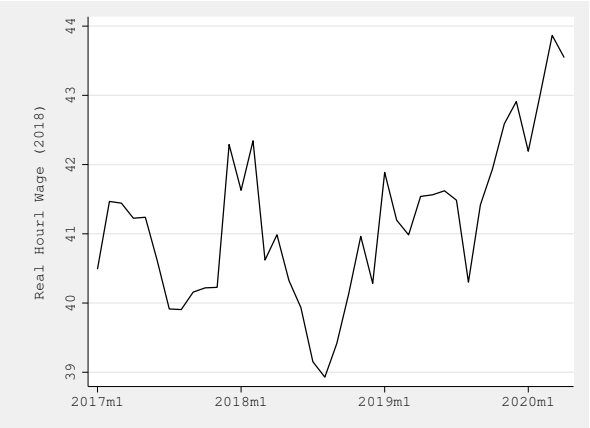
(a) Unemployment Rate.



(b) Labour Force Participation.



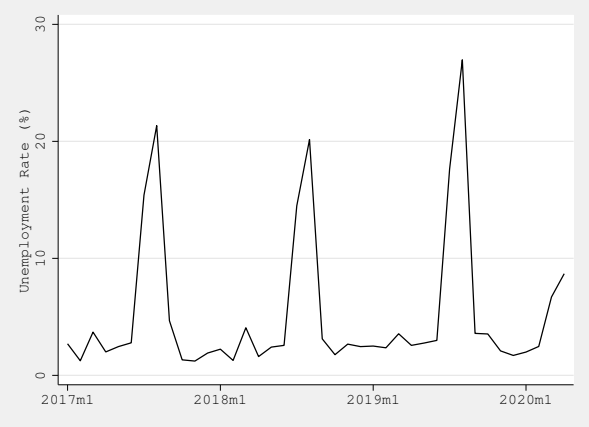
(c) Hours of Work.



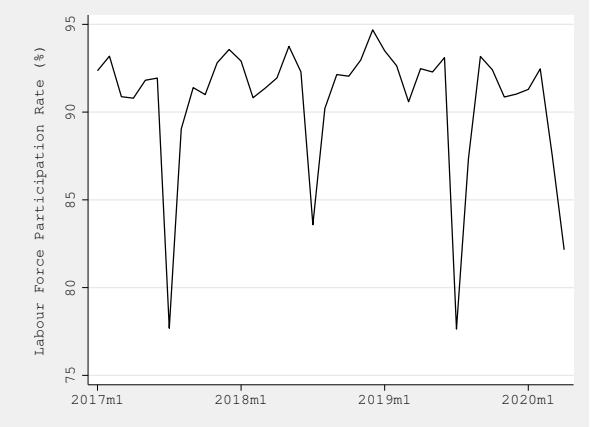
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 43. Panel B plots the labour force participation for NOC major group 43. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 43. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 43. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

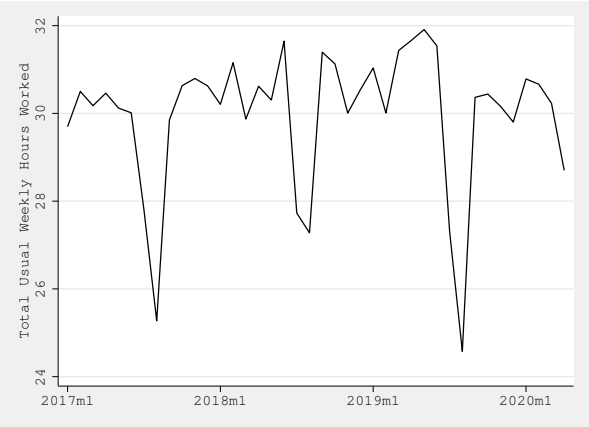
Figure A35: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 44, Care Providers and Educational, Legal and Public Protection.



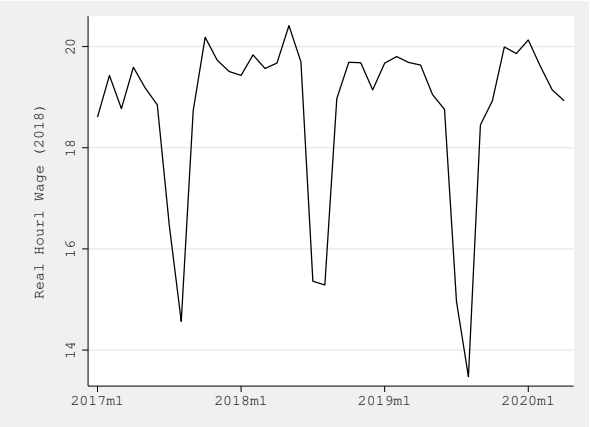
(a) Unemployment Rate.



(b) Labour Force Participation.



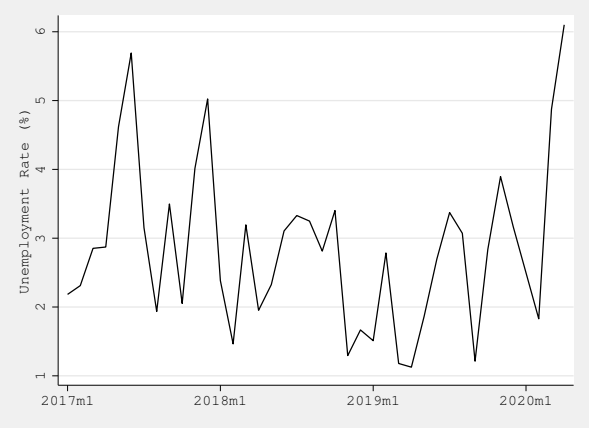
(c) Hours of Work.



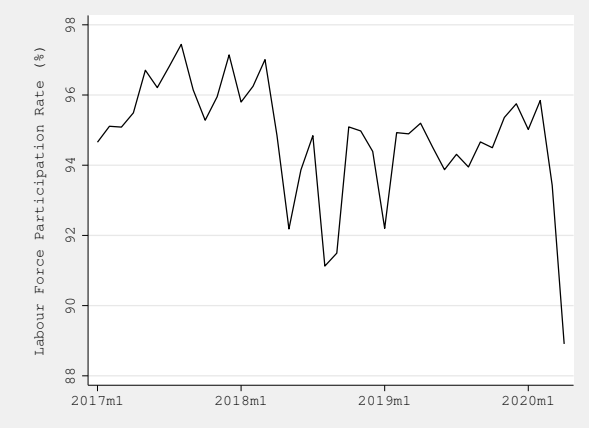
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 44. Panel B plots the labour force participation for NOC major group 44. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 44. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 44. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

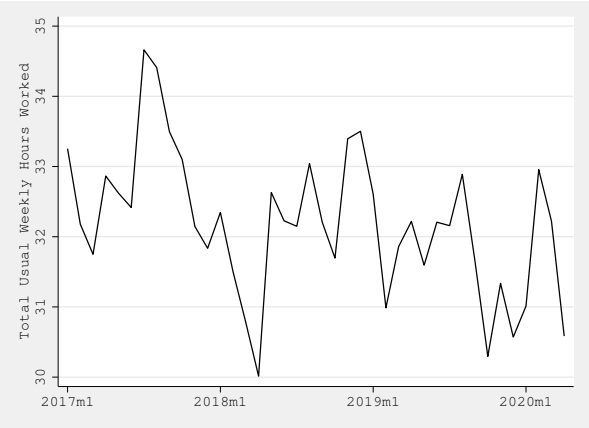
Figure A36: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 51, Professional Occupations in Art and Culture.



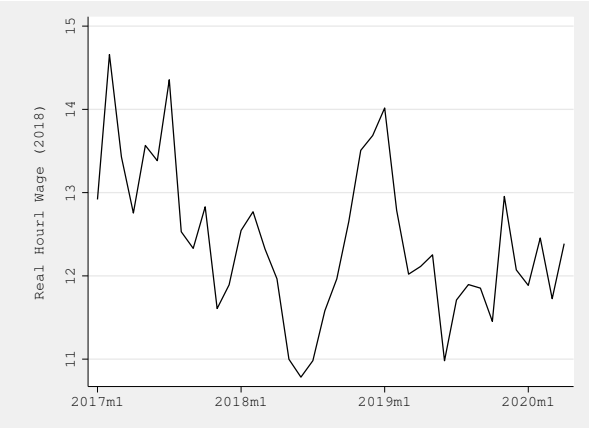
(a) Unemployment Rate.



(b) Labour Force Participation.



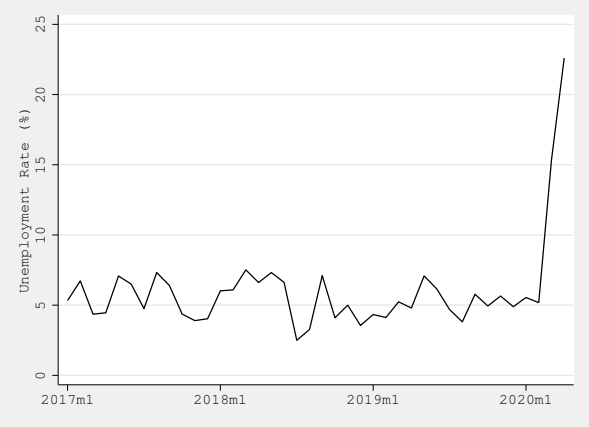
(c) Hours of Work.



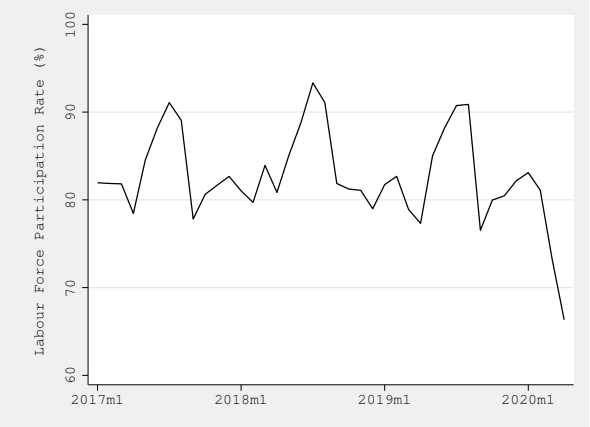
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 51. Panel B plots the labour force participation for NOC major group 51. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 51. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 51. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

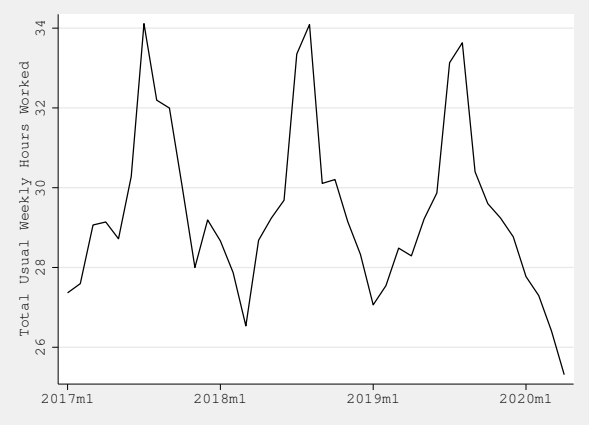
Figure A37: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 52, Technical Occupations in Art, Culture, Recreation and Sport.



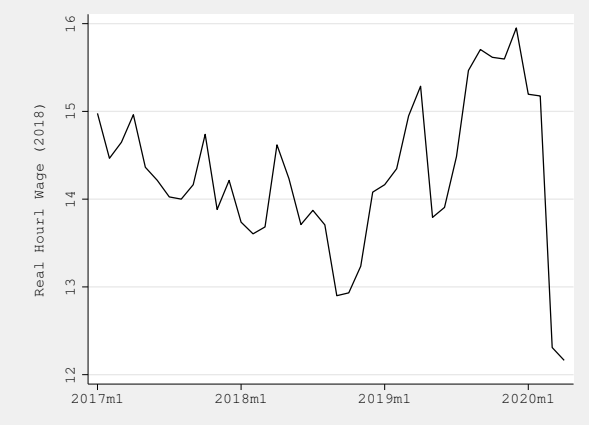
(a) Unemployment Rate.



(b) Labour Force Participation.



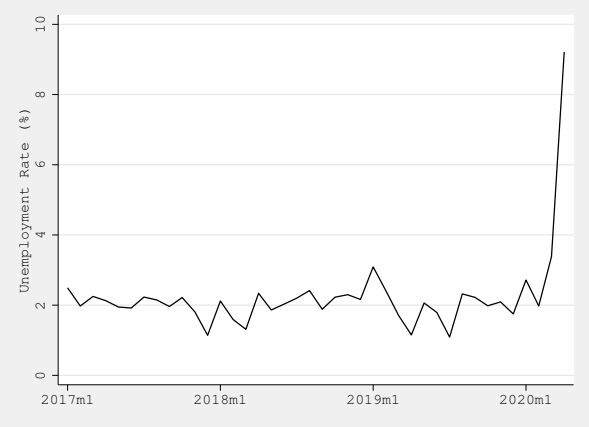
(c) Hours of Work.



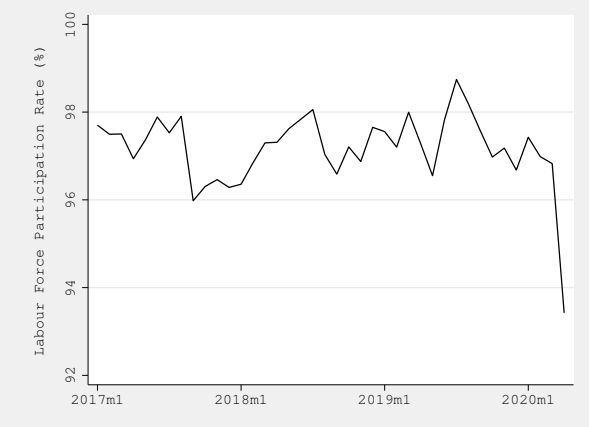
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 52. Panel B plots the labour force participation for NOC major group 52. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 52. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 52. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

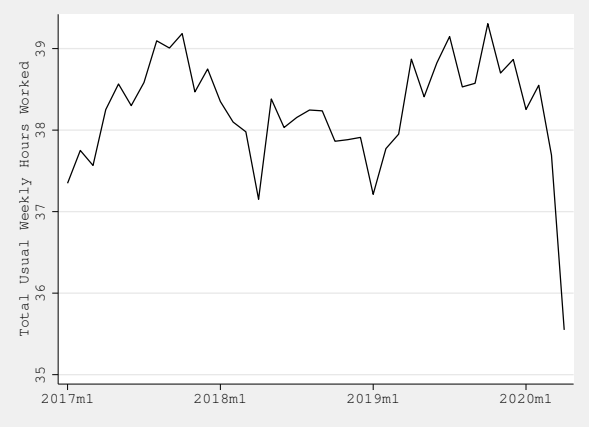
Figure A38: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 62, Retail Sales Supervisors and Specialized Sales Occupations.



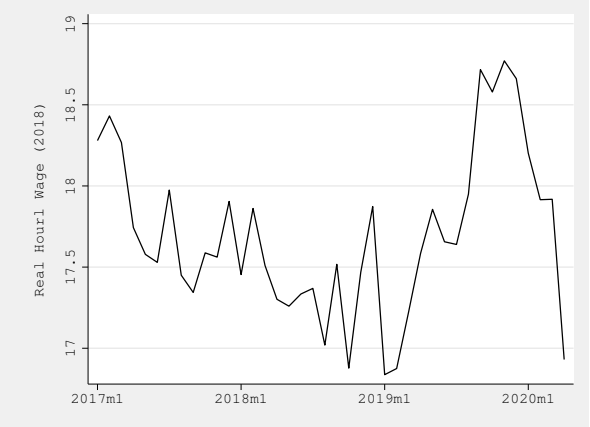
(a) Unemployment Rate.



(b) Labour Force Participation.



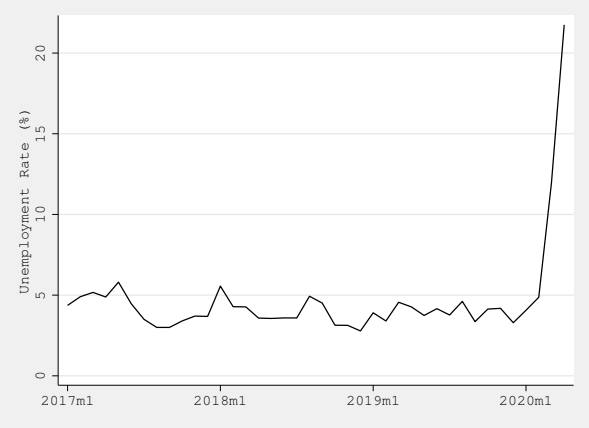
(c) Hours of Work.



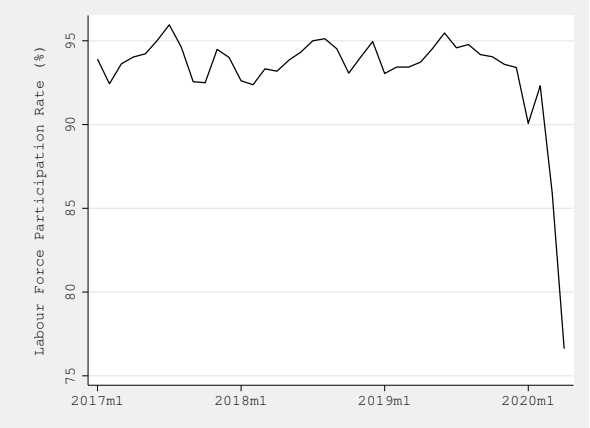
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 62. Panel B plots the labour force participation for NOC major group 62. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 62. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 62. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

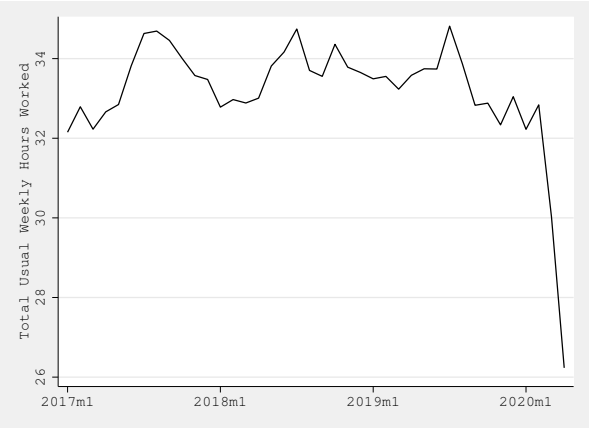
Figure A39: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 63, Service Supervisors and Specialized Service Occupations.



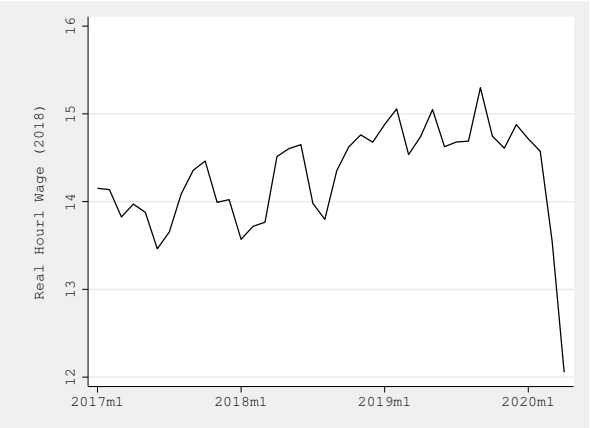
(a) Unemployment Rate.



(b) Labour Force Participation.



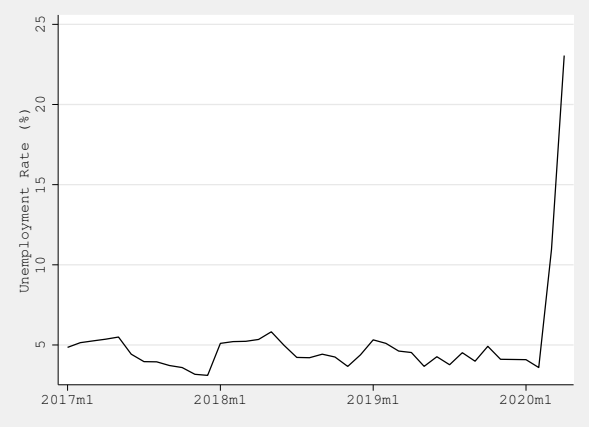
(c) Hours of Work.



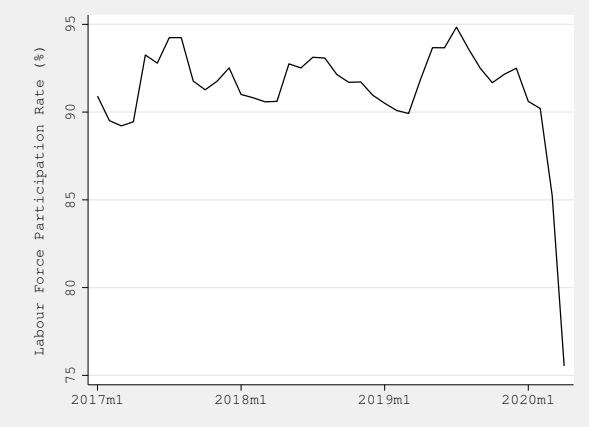
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 63. Panel B plots the labour force participation for NOC major group 63. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 63. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 63. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

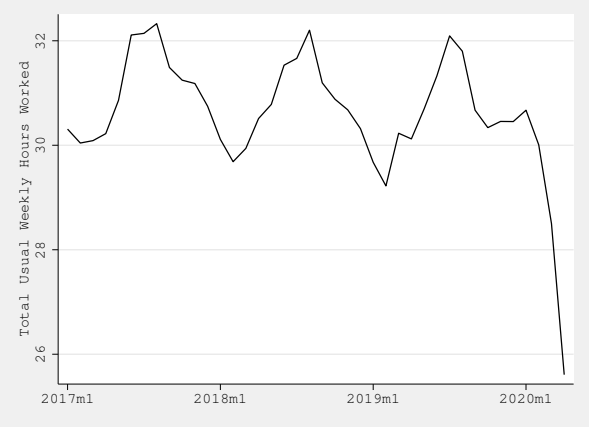
Figure A40: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 64, Sales Representatives and Salespersons - Wholesale and Retail Trade.



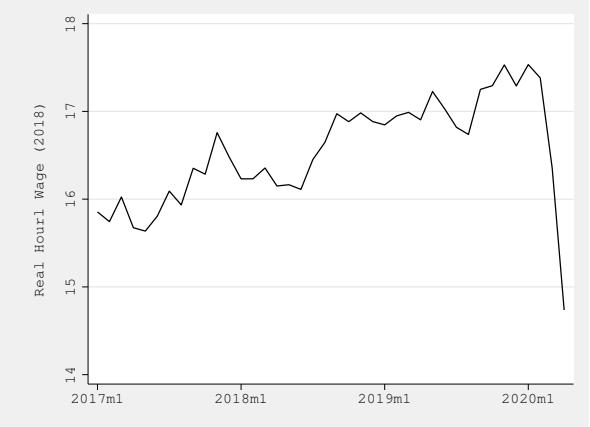
(a) Unemployment Rate.



(b) Labour Force Participation.



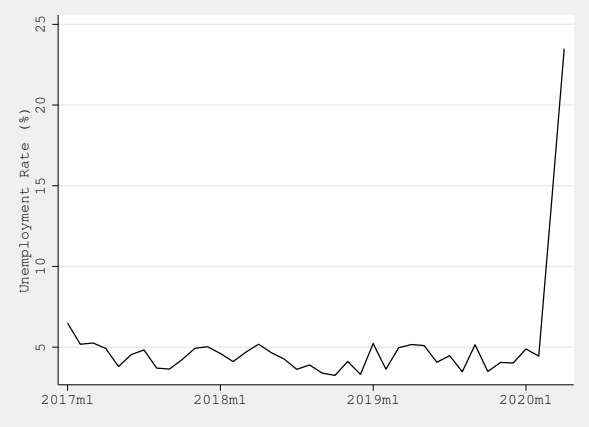
(c) Hours of Work.



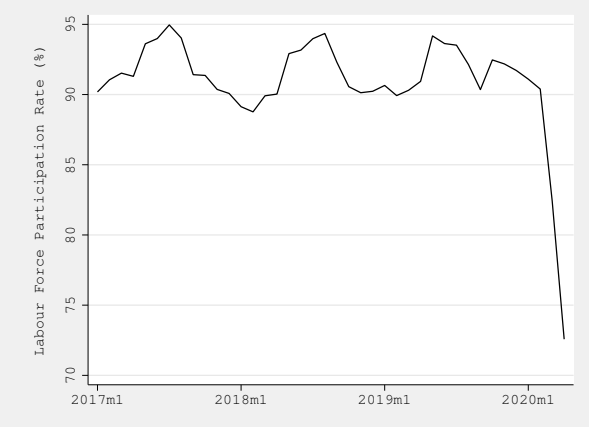
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 64. Panel B plots the labour force participation for NOC major group 64. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 64. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 64. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

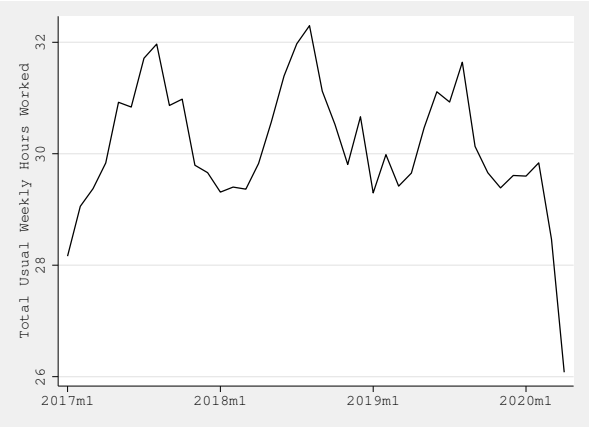
Figure A41: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 65, Service Representatives and Other Customer and Personal Services Occupations.



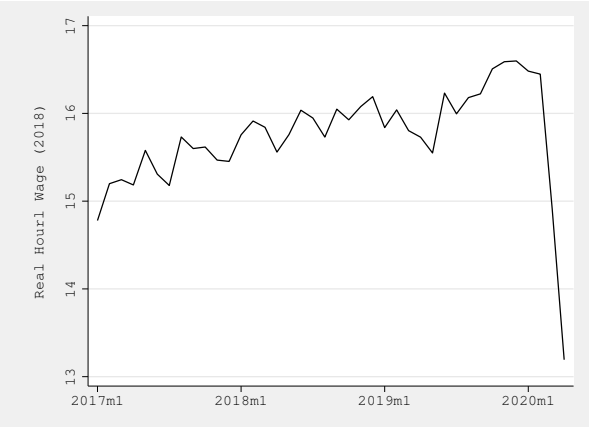
(a) Unemployment Rate.



(b) Labour Force Participation.



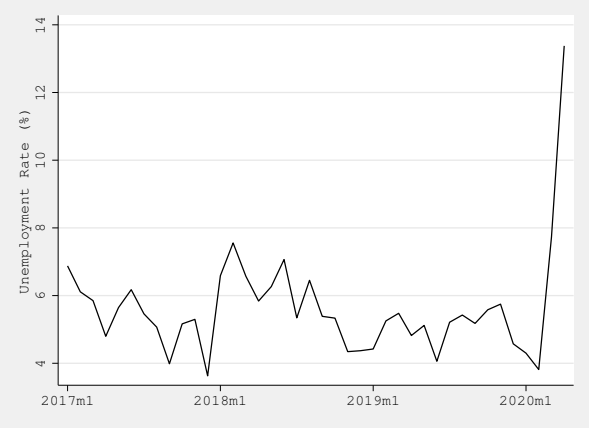
(c) Hours of Work.



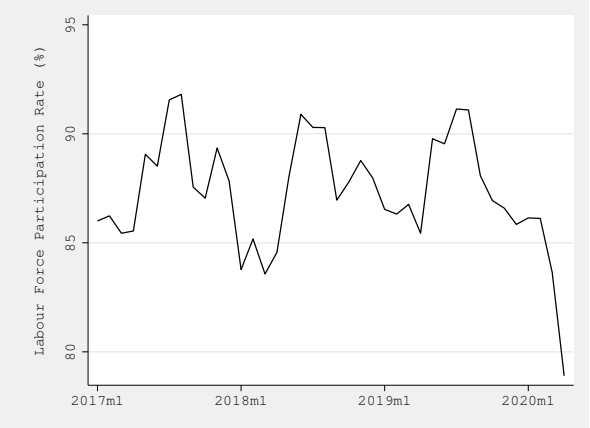
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 65. Panel B plots the labour force participation for NOC major group 65. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 65. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 65. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

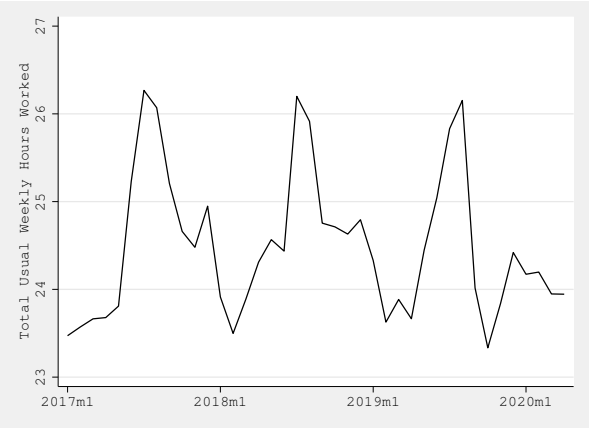
Figure A42: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 66, Sales Support Occupations.



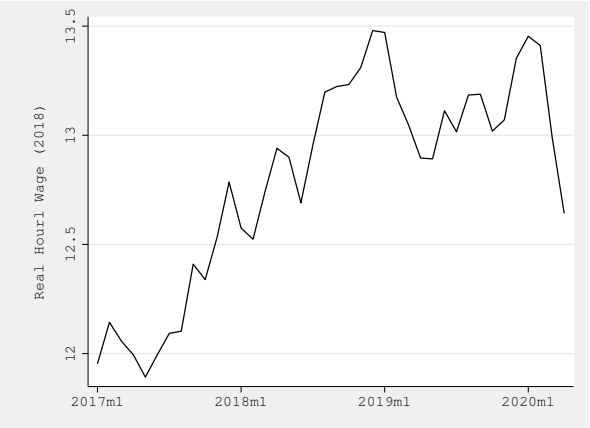
(a) Unemployment Rate.



(b) Labour Force Participation.



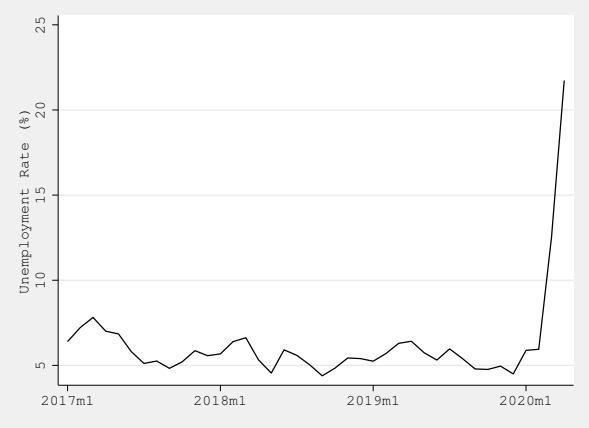
(c) Hours of Work.



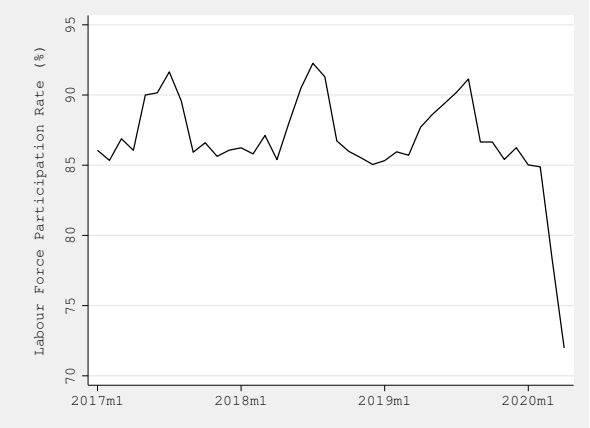
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 66. Panel B plots the labour force participation for NOC major group 66. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 66. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 66. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

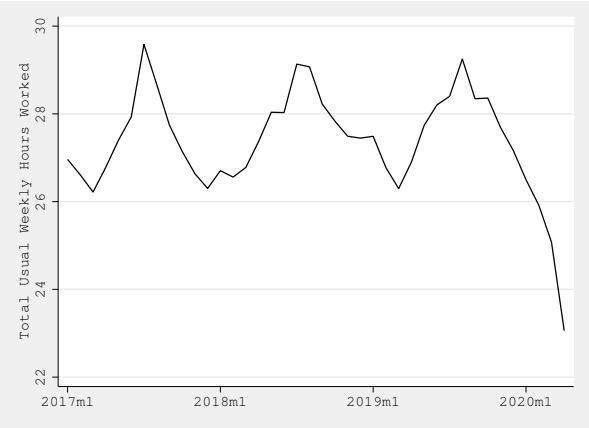
Figure A43: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 67, Service Support and Other Service Occupations, n.e.c..



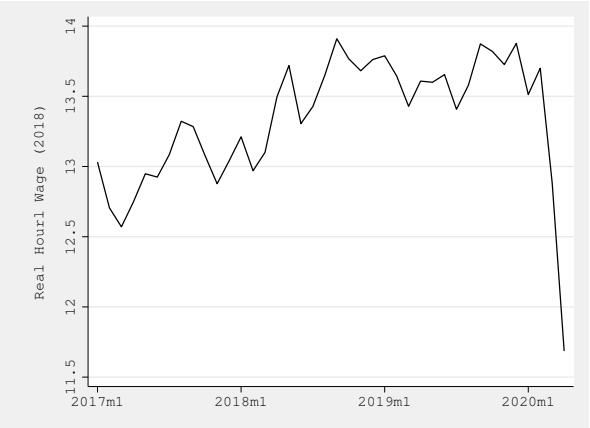
(a) Unemployment Rate.



(b) Labour Force Participation.



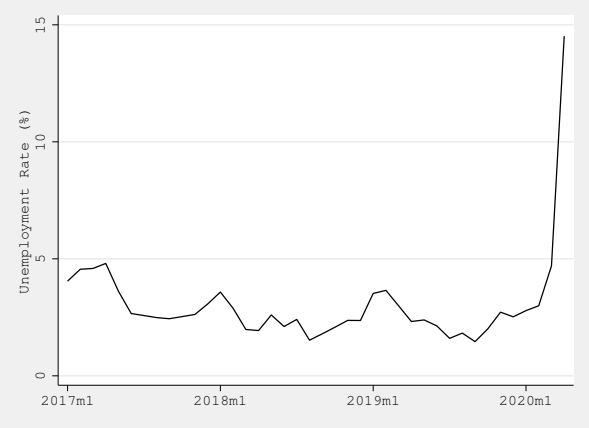
(c) Hours of Work.



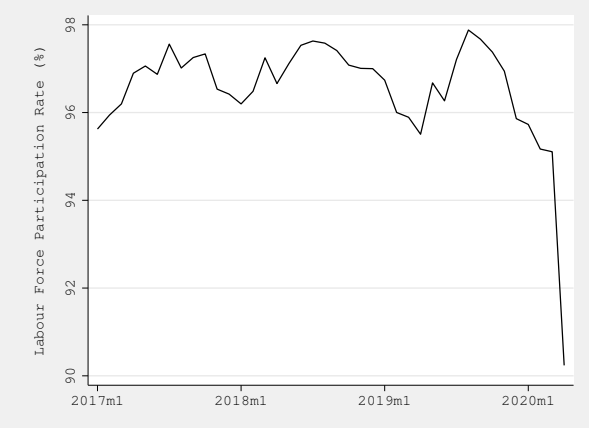
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 67. Panel B plots the labour force participation for NOC major group 67. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 67. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 67. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

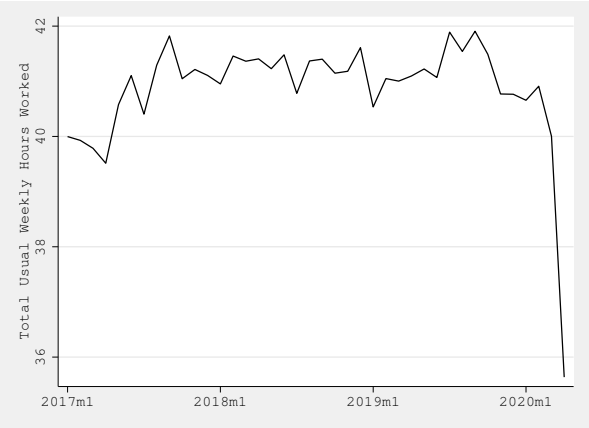
Figure A44: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 73, Maintenance and Equipment Operation Trades.



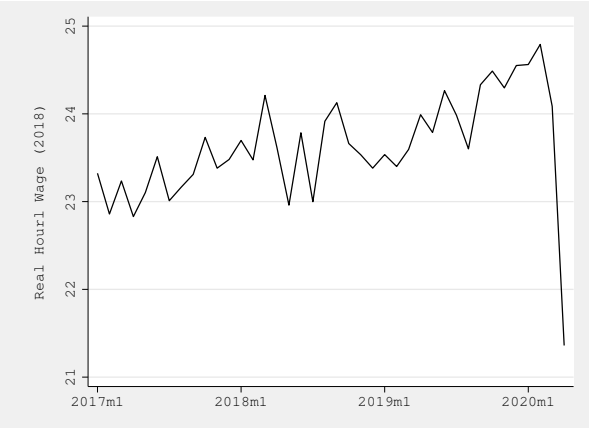
(a) Unemployment Rate.



(b) Labour Force Participation.



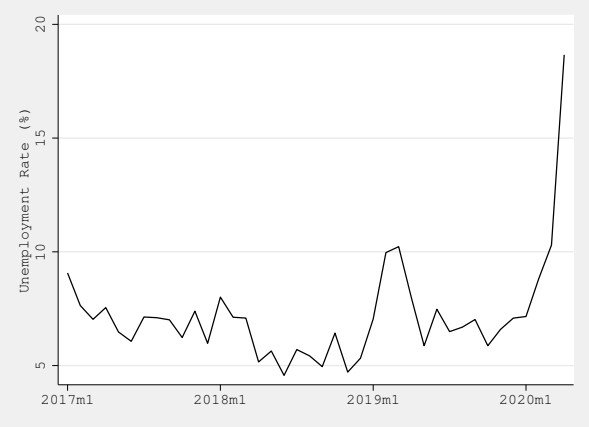
(c) Hours of Work.



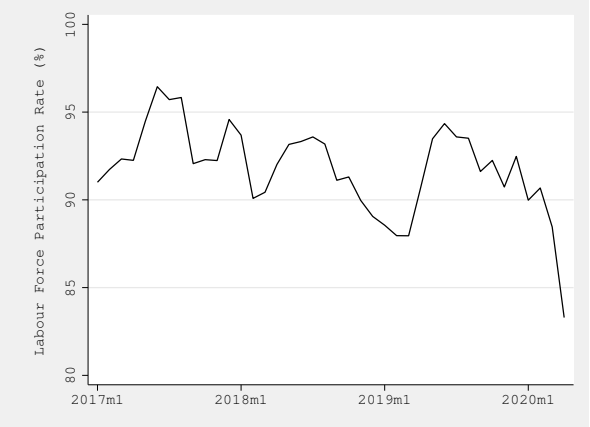
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 73. Panel B plots the labour force participation for NOC major group 73. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 73. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 73. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

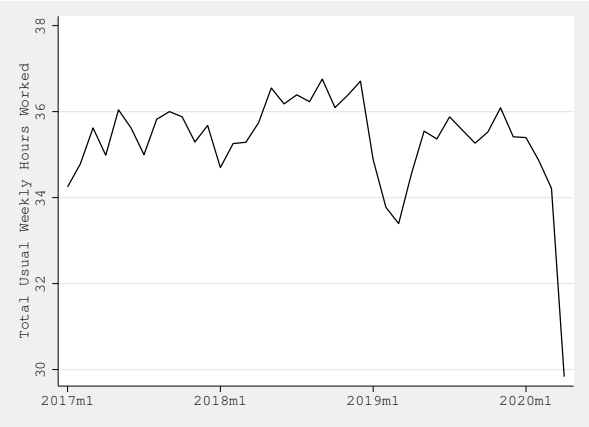
Figure A45: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 74, Other Installers, Repairers and Servicers and Material Handlers.



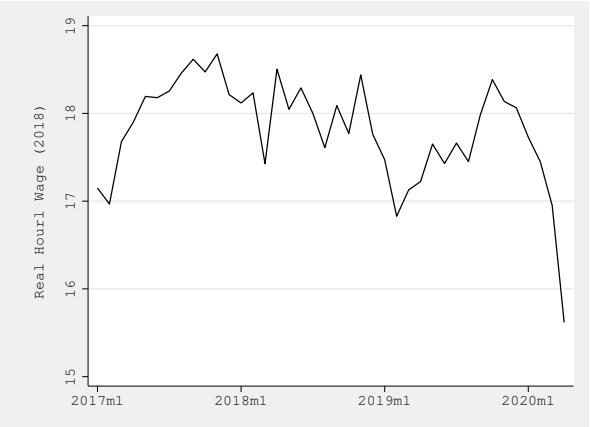
(a) Unemployment Rate.



(b) Labour Force Participation.



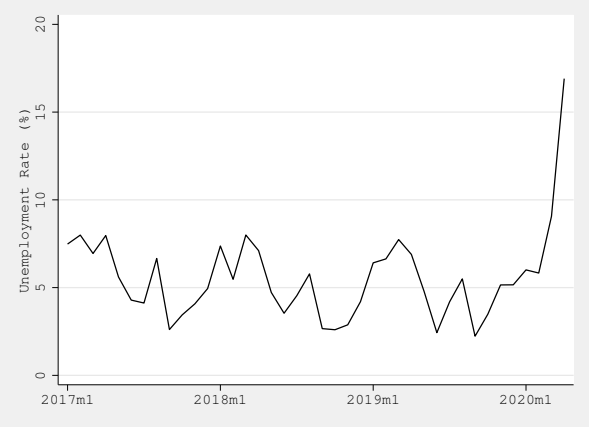
(c) Hours of Work.



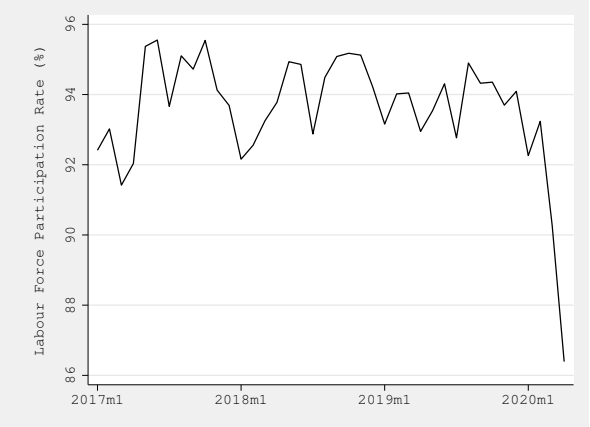
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 74. Panel B plots the labour force participation for NOC major group 74. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 74. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 74. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

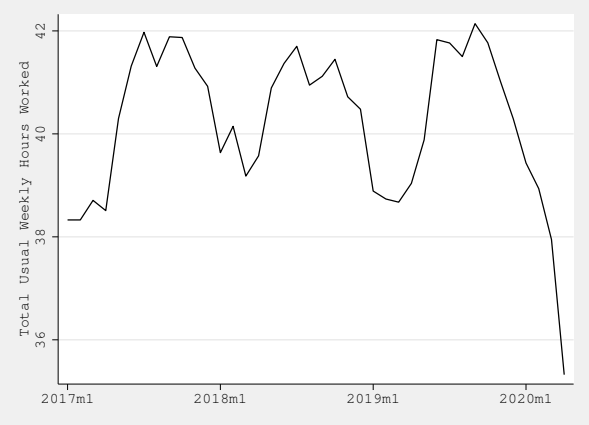
Figure A46: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 75, Transport and Heavy Equipment Operation and Related Maintenance Occupations.



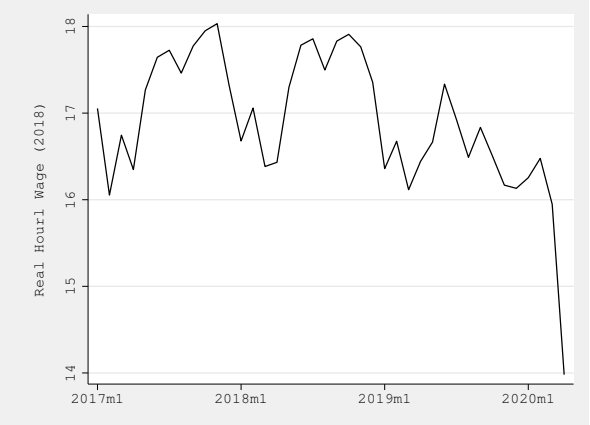
(a) Unemployment Rate.



(b) Labour Force Participation.



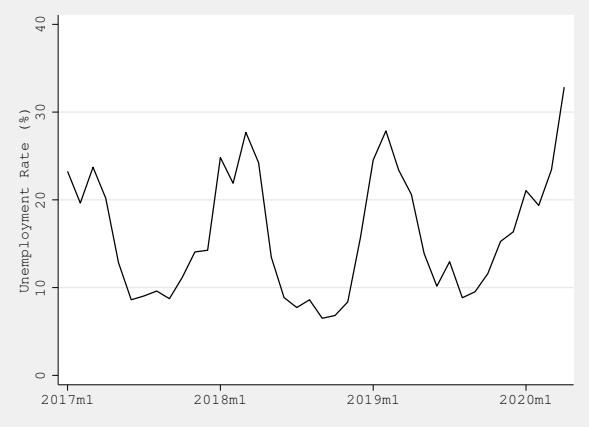
(c) Hours of Work.



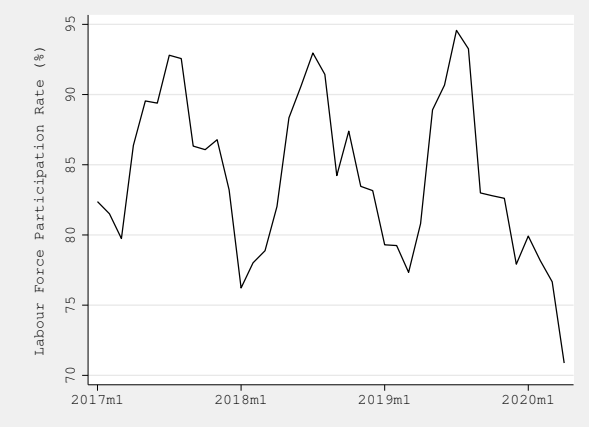
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 75. Panel B plots the labour force participation for NOC major group 75. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 75. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 75. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

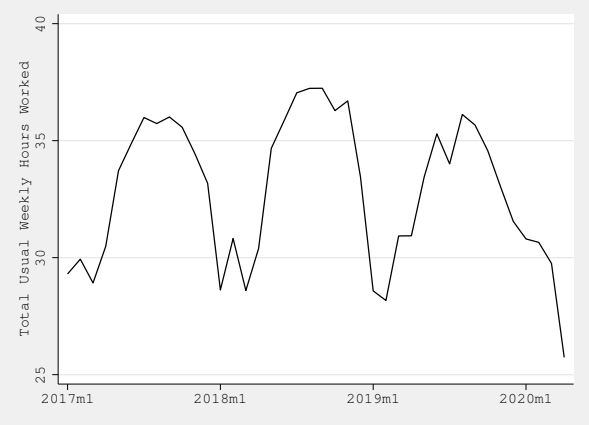
Figure A47: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 76, Trades Helpers, Construction Labourers and Related Occupations.



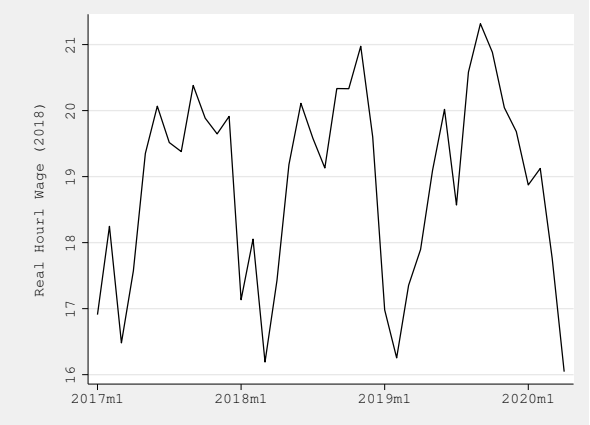
(a) Unemployment Rate.



(b) Labour Force Participation.



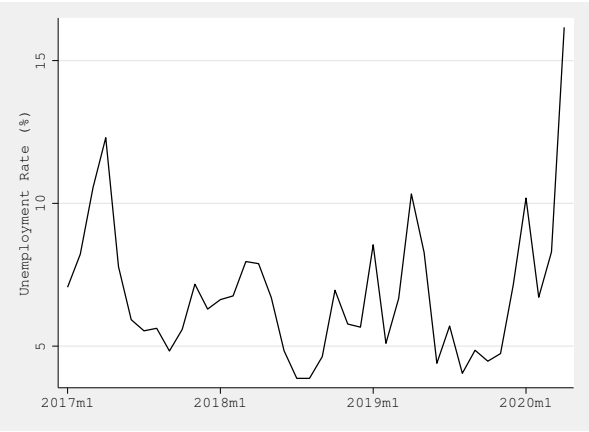
(c) Hours of Work.



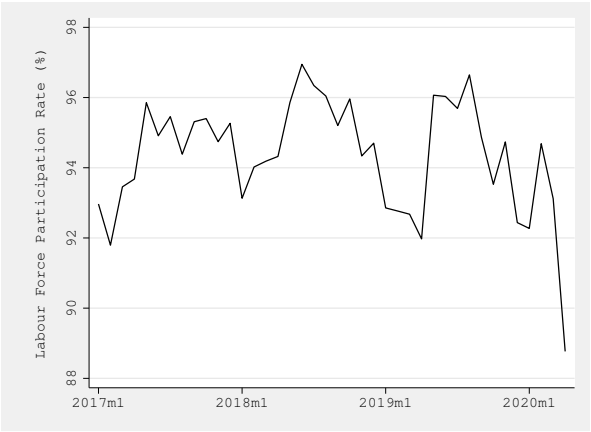
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 76. Panel B plots the labour force participation for NOC major group 76. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 76. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 76. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

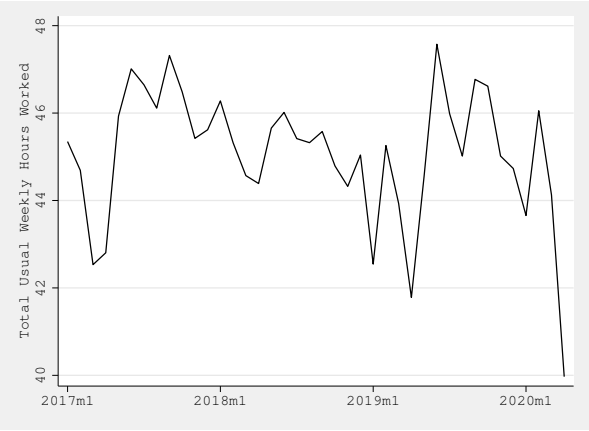
Figure A48: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 82, Supervisors and technical occupations in natural resources, agriculture and related production.



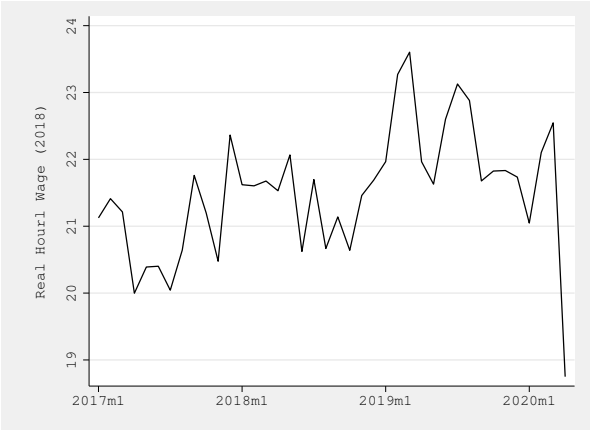
(a) Unemployment Rate.



(b) Labour Force Participation.



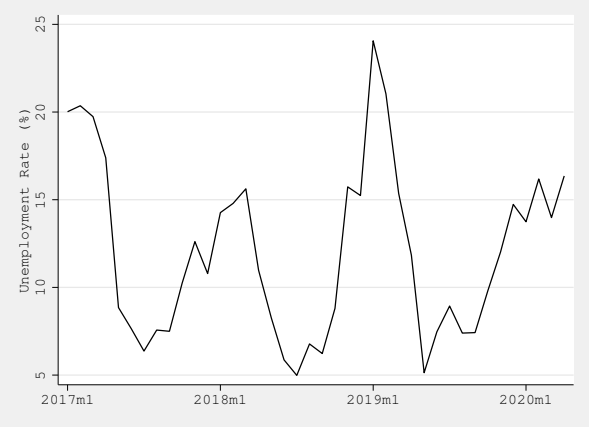
(c) Hours of Work.



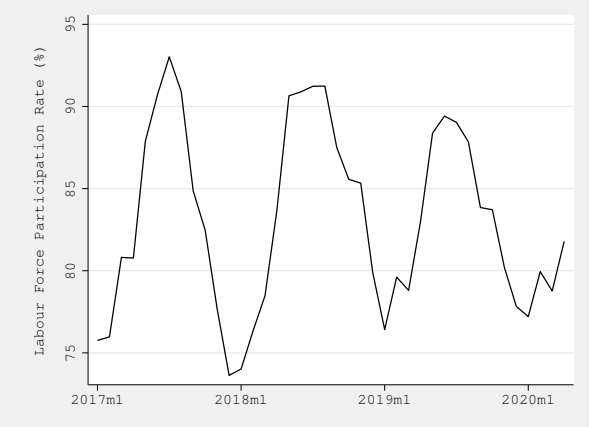
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 82. Panel B plots the labour force participation for NOC major group 82. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 82. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 82. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

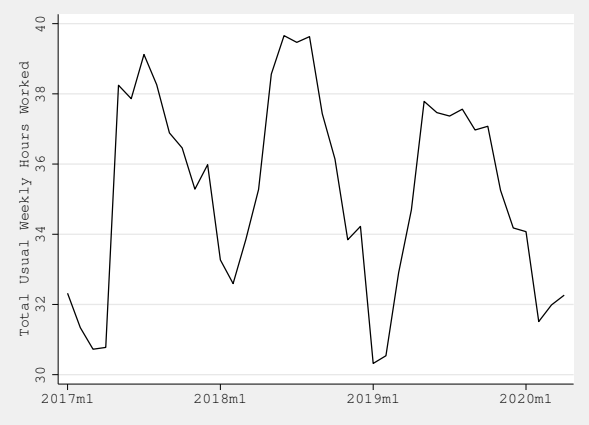
Figure A49: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 84, Workers in Natural Resources, Agriculture and Related Production.



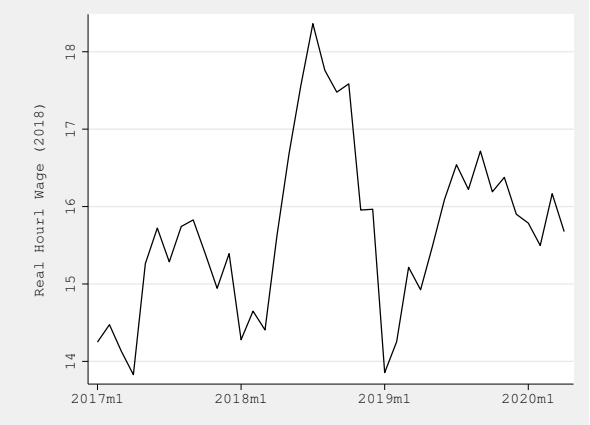
(a) Unemployment Rate.



(b) Labour Force Participation.



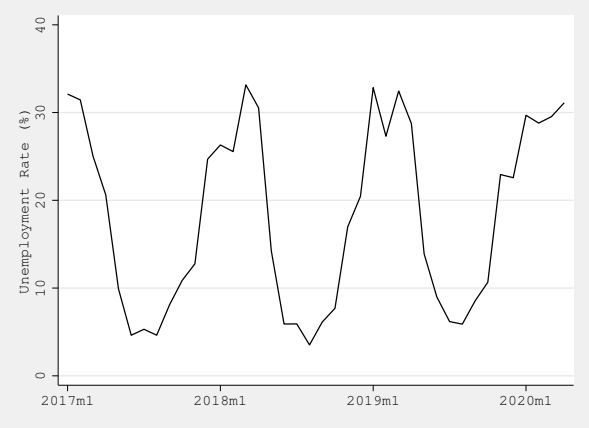
(c) Hours of Work.



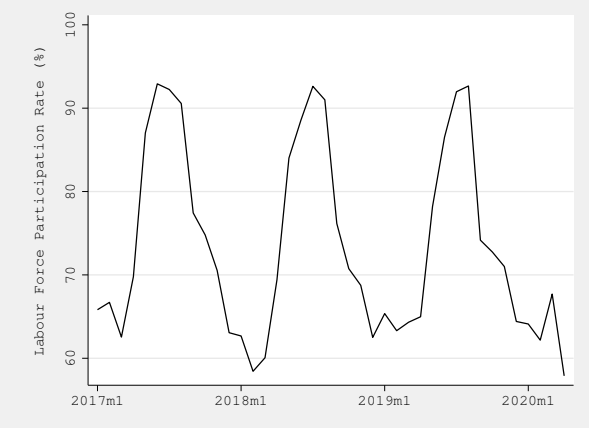
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 84. Panel B plots the labour force participation for NOC major group 84. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 84. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 84. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

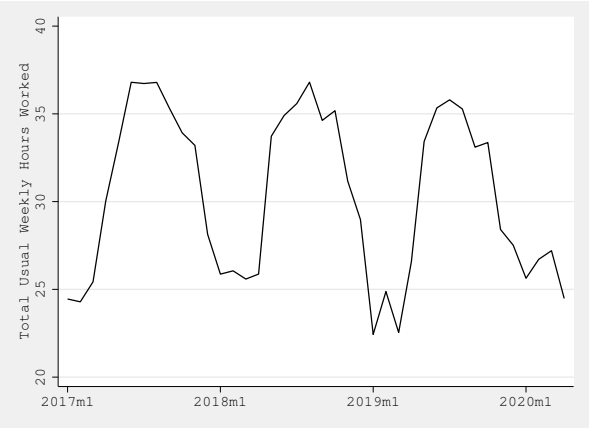
Figure A50: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 86, Harvesting, landscaping and natural resources labourers.



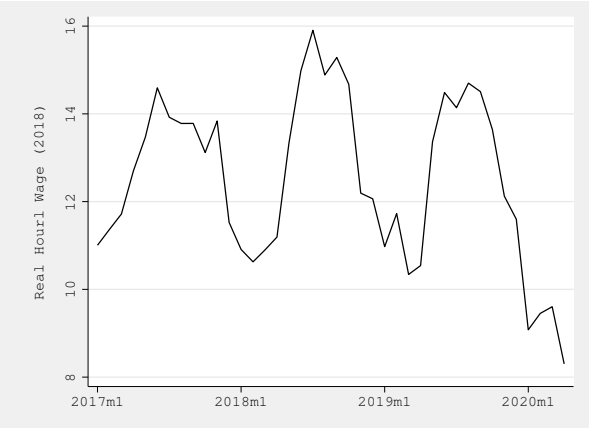
(a) Unemployment Rate.



(b) Labour Force Participation.



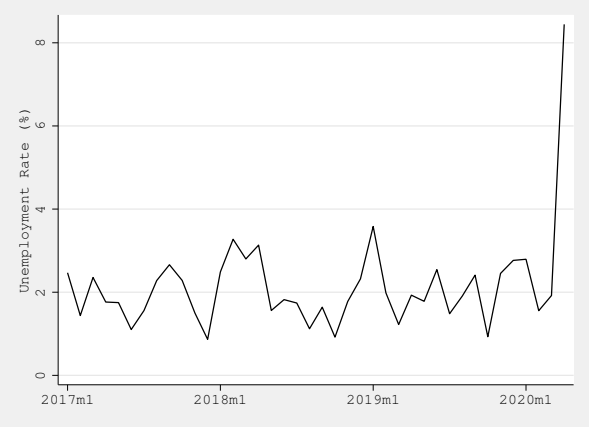
(c) Hours of Work.



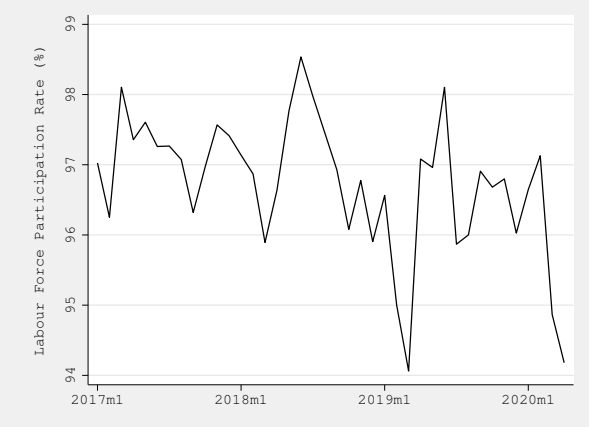
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 86. Panel B plots the labour force participation for NOC major group 86. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 86. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 86. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

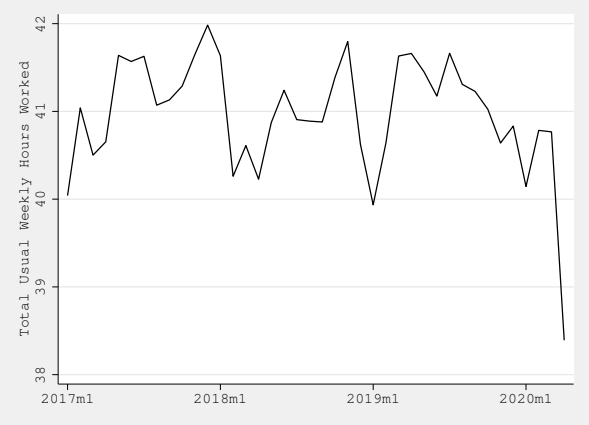
Figure A51: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 92, Processing, Manufacturing and Utilities Supervisors and Central Control Operators.



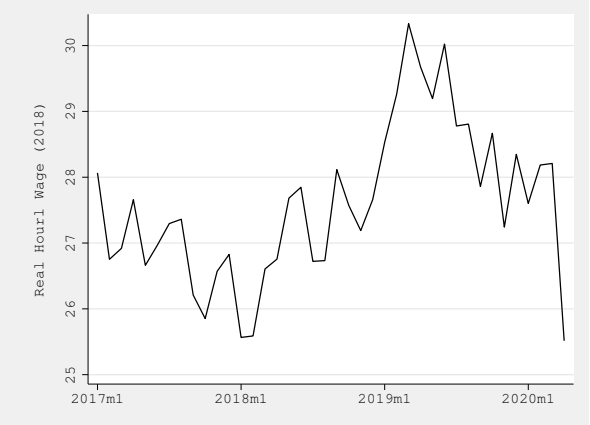
(a) Unemployment Rate.



(b) Labour Force Participation.



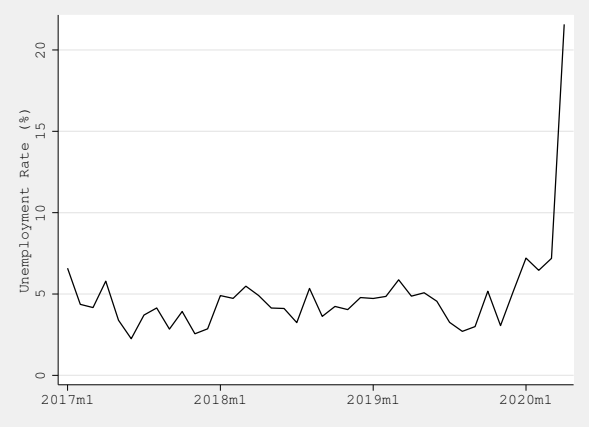
(c) Hours of Work.



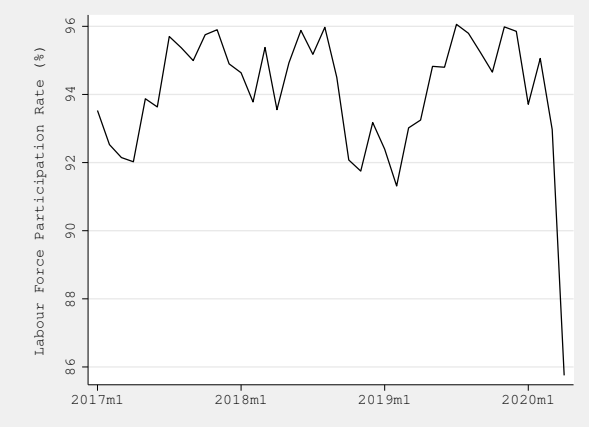
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 92. Panel B plots the labour force participation for NOC major group 92. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 92. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 92. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

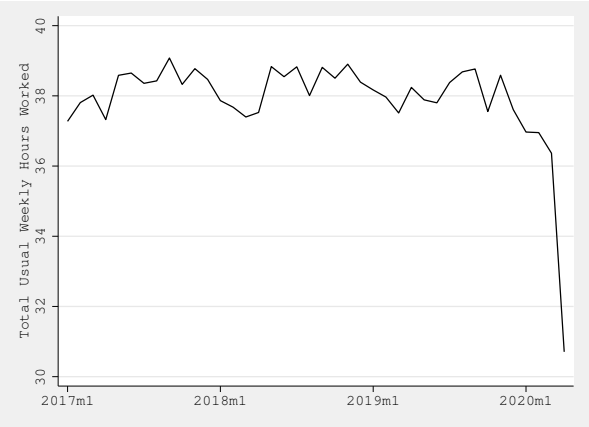
Figure A52: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 94, Processing and manufacturing machine operators and related production workers.



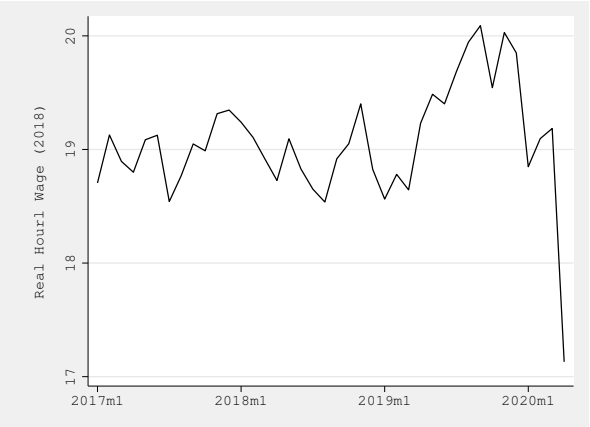
(a) Unemployment Rate.



(b) Labour Force Participation.



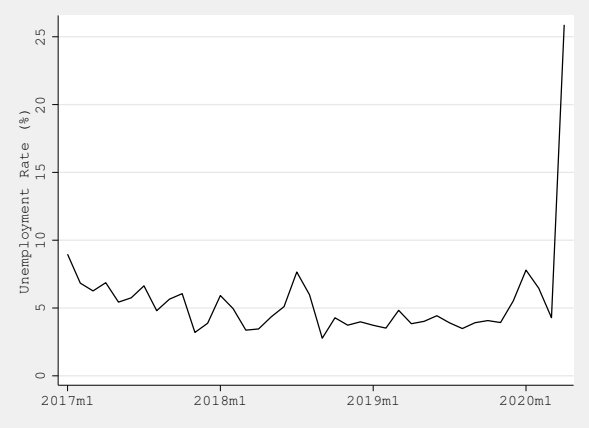
(c) Hours of Work.



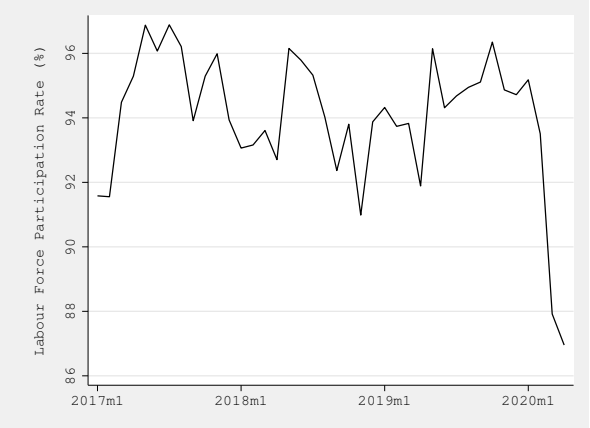
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 94. Panel B plots the labour force participation for NOC major group 94. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 94. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 94. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

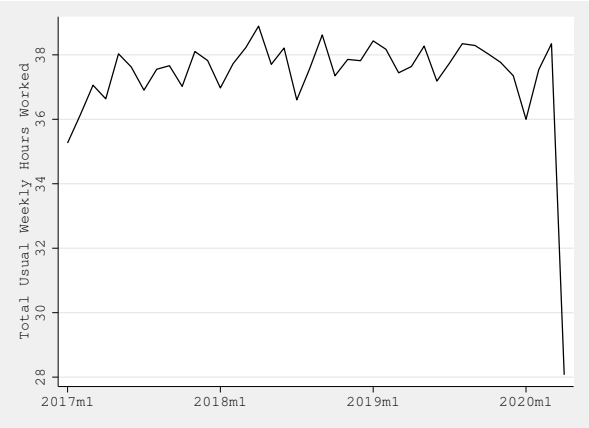
Figure A53: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 95, Assemblers in Manufacturing.



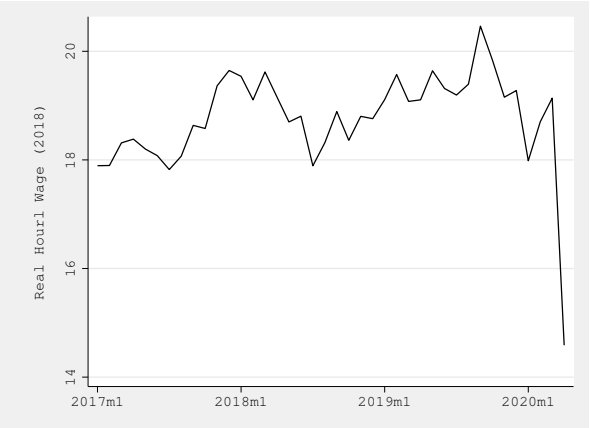
(a) Unemployment Rate.



(b) Labour Force Participation.



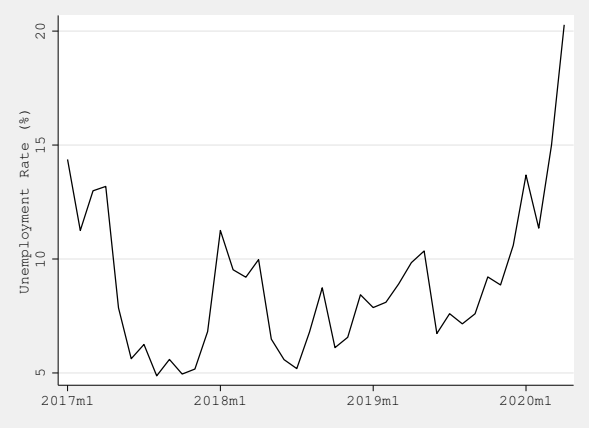
(c) Hours of Work.



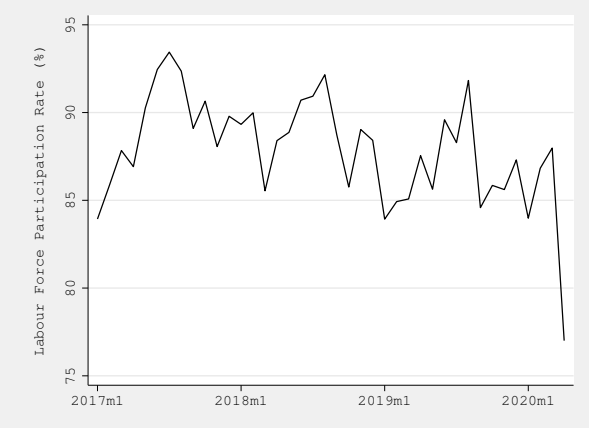
(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 95. Panel B plots the labour force participation for NOC major group 95. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 95. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 95. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.

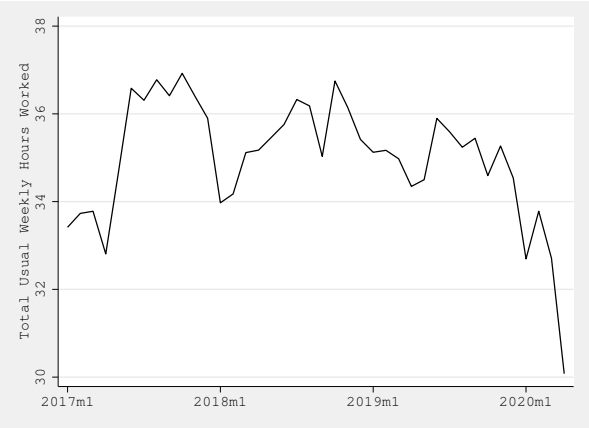
Figure A54: Unemployment Rate, Labour Force Participation, Hours of Work and Hourly Wages for NOC major group 96, Labourers in processing, manufacturing and utilities.



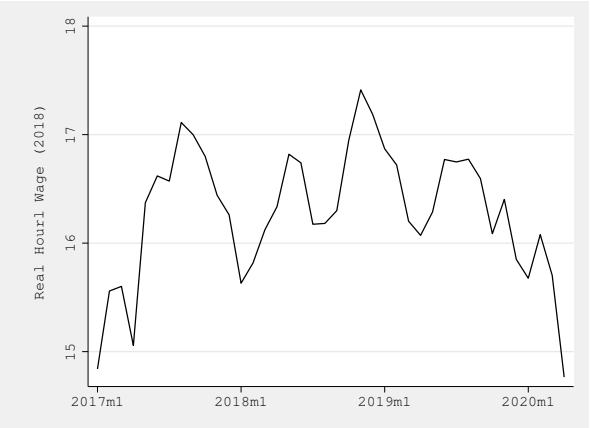
(a) Unemployment Rate.



(b) Labour Force Participation.



(c) Hours of Work.



(d) Hourly Wages.

Notes: Authors' calculations. Data from the Canadian Labour Force Survey with final weights applied to all subgraphs. The time period is January 2017 to April 2020. Panel A plots the unemployment rate for NOC major group 96. Panel B plots the labour force participation for NOC major group 96. Individuals in the labour force were employed at work, employed but absent from work, or unemployed during the survey week. Panel C plots the usual total hours work for NOC major group 96. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero. Panel D plots the usual real hourly wages (January 2018, provincial) for NOC major group 96. This includes individuals who were: civilian; aged 16–70 and in the labour force. Those who were unemployed were assigned a value of zero.