

Telework in Canada : Who Is Working from Home during the COVID-19 Pandemic ?

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Volume 76, numéro 4, hiver 2021

URI : <https://id.erudit.org/iderudit/1086009ar>

DOI : <https://doi.org/10.7202/1086009ar>

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Éditeur(s)

Département des relations industrielles de l'Université Laval

ISSN

0034-379X (imprimé)

1703-8138 (numérique)

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Citer cet article

Chowhan, J., MacDonald, K., Mann, S. L. & Cooke, G. B. (2021). Telework in Canada : Who Is Working from Home during the COVID-19 Pandemic ? *Relations industrielles / Industrial Relations*, 76(4), 761–791. <https://doi.org/10.7202/1086009ar>

Résumé de l'article

La pandémie de COVID-19 a créé une nouvelle réalité dans le monde du travail. Les employeurs se rendent compte que pour poursuivre leurs activités pendant la pandémie, ils doivent penser le travail différemment : comment le travail est organisé, qui fait quoi et où il est effectué. La présente étude vise à déterminer s'il existe des différences dans les caractéristiques démographiques et le capital humain des personnes qui travaillent à domicile pendant la pandémie et celles qui travaillaient à domicile auparavant. Ainsi, cette étude profite des conditions naturelles d'une pseudo-expérience pour identifier les facteurs sociodémographiques (c.-à-d., le genre [femme/homme], le statut d'immigrant, l'âge) et le capital humain (c.-à-d., le niveau de scolarité, la santé) des personnes qui ont la possibilité de faire du télétravail afin de mieux comprendre les répercussions des fermetures sur ces sous-groupes. Cette étude utilise les données de la première enquête de la Série d'enquêtes sur les perspectives canadiennes (SEPC) de Statistique Canada sur les répercussions de la COVID-19, ainsi qu'un échantillon analytique (n = 2 653). En outre, l'Enquête sociale générale de 2016, cycle 30, a été utilisée afin d'obtenir des estimations pré-pandémiques pour les comparaisons descriptives. Nous constatons que les femmes ne sont pas moins susceptibles que les hommes de faire du télétravail et que le statut d'immigrant est négativement corrélé au travail à domicile pendant la pandémie. De manière générale, la corrélation avec l'âge est confirmée, la probabilité du télétravail étant relativement plus faible à mesure que l'âge augmente. Le niveau de scolarité est positivement corrélé au télétravail pendant la pandémie (p. ex., le fait d'avoir un baccalauréat ou un diplôme universitaire supérieur est positivement corrélé au télétravail). Enfin, il n'y a pas de relation entre la santé physique ou mentale et le télétravail. La présente étude contribue à la littérature en quantifiant les répercussions d'un bref événement de télétravail de masse et ses implications sur l'accès au télétravail en fonction des caractéristiques sociodémographiques et du capital humain. Dans un monde post-pandémique, tirons-nous les leçons de cette expérience imposée par la pandémie ?

Résumé

La présente étude est axée sur les caractéristiques démographiques et sur le capital humain des Canadiens qui sont absents du travail ou qui travaillent à domicile (TAD), depuis la pandémie de COVID 19 ou qui en avait déjà l'habitude, par rapport aux Canadiens qui continuent de travailler à l'extérieur du foyer (c.-à-d. qui ne font pas de TAD). Les résultats montrent des différences significatives dans l'incidence du TAD pendant la pandémie : 1) il n'y a pas de différences significatives entre les femmes et les hommes ; 2) les immigrants sont moins susceptibles de faire du TAD ; 3) les jeunes travailleurs sont plus susceptibles de faire du TAD ; 4) l'éducation et le TAD ont une corrélation positive ; et 5) l'auto-évaluation de la santé n'est pas liée au TAD. Les résultats de cette expérience naturelle laissent sous-entendre de potentielles répercussions politiques et organisationnelles si le TAD en raison de la pandémie est poursuivi pendant une période prolongée.

Telework in Canada: Who Is Working from Home during the COVID-19 Pandemic?

James Chowhan, Kelly MacDonald, Sara L. Mann, Gordon B. Cooke

This study focuses on the demographic and human capital characteristics of Canadians that are associated with working from home (WFH), before and during the COVID-19 pandemic, or being absent from work, versus those Canadians who continue to work outside the home (i.e., who do not WFH). The results show significant differences in the incidence of WFH during the pandemic: 1) there are no significant differences between females and males; 2) immigrants are less likely to WFH; 3) younger workers are more likely to WFH; 4) education is positively associated with WFH; and 5) self-reported health is unrelated to WFH. The results from this natural experiment suggest potential policy and organizational implications if the pandemic WFH environment continues for an extended period of time.

Keywords: working from home (WFH), gender, immigrant, education level, mental health

Introduction

The COVID-19 pandemic has created a new reality in the world of work. Employers are realizing that to continue business operations during an emergency or crisis they need to think differently about work, how it is organized, who does what and where the work is done. This study focuses on who was

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working and where they were working during the pandemic (e.g., either at a work location or from home). The pandemic and the related outside the home work location shutdowns have forced most sectors, industries and occupations to think differently about the nature of work (Armour et al., 2020). The predominant pre-pandemic model of work was one where employees produced and interacted in a work environment tied to tasks and location; in it, work and home existed as separate spaces often connected by long commutes (Heisz & Larochelle-Côté, 2005). These widely accepted beliefs about the protocols and processes in our current work environments were established during the Industrial Revolution (Gajendran & Harrison, 2007). The last three decades, however, have brought rapid advances in technology and communication, the rise of globalization, and changes in the essential nature of work, all of which have facilitated new ways of working for both employers and employees (Schweitzer & Duxbury, 2006). In Canada, urban high-speed Internet access and cloud sharing substantially contribute to the distribution of work across multiple remote locations in a synchronous fashion, thus making work outside a central office location an accessible reality (Hambly & Lee, 2019); nonetheless, although rural and remote locations have relatively lower-quality broadband access, they are not substantially below census metropolitan areas in rates of working from home, likely because of differences in industry and occupation allocation, such as agriculture (Turcotte, 2010). Thus, technology has enabled a sizable proportion of the economy to make a quick shift during the pandemic to new ways of working and communicating.

Working from home and telework have grown on a mildly upward trajectory over recent decades (Schweitzer & Duxbury, 2006; Turcotte, 2010). Schweitzer and Duxbury (2006) define telework as a work arrangement where employees spend part of their work schedule away from the office, while Turcotte (2010) identifies working from home as a broader concept that can include paid employees and self-employed but is limited in terms of alternative work locations. The terms ‘working from home’ and ‘telework’ are both used throughout this paper where appropriate. Turcotte (2010) reports a 22% increase in the number of employees working from home from 2000 to 2008, although the percentage increase in the proportion working from home is small in relation to the total employee count (with working from home increasing from 17% to 19%, from 2000 to 2008, respectively). According to Statistics Canada’s 2016 General Social Survey (GSS) cycle 30 (more details presented below in the data section), 14.4% of the workforce performed telework for at least part of their working week before the pandemic; however, the survey question was addressed only to paid employees, to the exclusion of other types of employment, such as self-employment. Consequently, the rate of working from home and the rate of telework depend on the groups of workers included in calculation of the rate. Specifically, the rate of working

from home appears to be generally higher than the rate of telework partly because the latter excludes self-employed individuals, who are substantially likelier to work from home (e.g., in 2008, 11% of paid employees and 60% of self-employed were working from home) (Turcotte, 2010). Nonetheless, these patterns indicate that alternative work locations were becoming increasingly accepted before the pandemic, and this acceptance contributed in part to the rapid shift toward work from home human resource practices during the COVID-19 lockdowns of businesses (more is provided below on the Canadian context, which is the main focus of this study). In the U.S. (May 2020), 54% of workers reported they were doing some telework (14%) or exclusively telework (40%) (Armour et al., 2020).

COVID-19 is a highly contagious virus that was first reported publicly in December 2019 and has spread through every country in the world, inflicting a significant death toll worldwide (Canada, 2020). Governments responded with lockdown measures designed to contain the spread, thus bringing businesses to a standstill. Other measures included travel restrictions, cancellation of events, and limitations on the size of gatherings. There remained only essential services, including (but not limited to) grocery stores and hospitals.¹ Three million people in Canada lost their jobs, with the unemployment rate reaching 13.7% in May 2020 (Statistics Canada, 2020). The shutdown was sudden and complete. To continue their operations, employers had to meet the challenges of operating in a remote environment with an unprepared workforce who would continue by working from home.

This paper looks at this moment of crisis and analyzes the increase in the prevalence of working from home in Canada during the government-imposed lockdown. Thus, this paper has two main goals that effectively provide a benchmark for the factors associated with working from home arrangements. First, this study will quantify the increased incidence of working from home by comparing the situations before and during the lockdowns. Second, the characteristics of those who worked from home during the lockdowns versus those who did not will be explored. Thus, this paper will answer the question of whether demographic and human capital characteristics are different between those who worked from home during the pandemic and those who had worked from home previously? Finally, we will briefly explore the possible implications of this unexpected ‘experiment’ in en masse use of working from home environments.

1. The lockdown requirements in many provinces did have exemptions for “essential workers,” and the definition of essential worker was typically defined in the legislation (for Ontario, see <https://www.ontario.ca/laws/regulation/200082>). Not all essential workers needed to work on location, for example in Ontario, accountants were identified as essential, and they could work in their office or decide to work from home. Thus, some workers did have a choice, and employers could provide accommodations for these workers.

This paper contributes to the literature on working from home and telework by recording the unique moment in time when the COVID-19 lockdowns forced employers to adapt and implement procedures for working from home in order to survive. This study takes advantage of a naturally occurring experiment to identify the sociodemographic and human capital characteristics of the working-from-home population during the pandemic. It further identifies potentially vulnerable sociodemographic subgroups of the population and the impact of the lockdowns on them.

Literature Review

To understand the adoption of work from home (WFH) and telework human resource management practices, researchers have used both macro- (e.g., flexible work arrangements) and micro-theoretical approaches (e.g., social exchange theory, work-life interface, role conflict) (Zhang et al., 2020). Zhang et al. (2020) argue that the theories on telework can be grouped into two main streams: (1) interrelationships between work and family life; and (2) interrelationships between the employee and the workplace. Thus, telework is mainly explained by employer factors (e.g., organizational strategy, nature of business, types of occupations determined by structure of work) and employee factors (demographic, life characteristics, human capital) (Cooke et al., 2014). This study adopts the Zhang et al. (2020) (gendered family-) Life Stages Approach. In brief, the Life Stages Approach builds on work-life interface, balance, and conflict theories by more explicitly expanding the demographic characteristics that are explored in the model (see Zhang et al. for a detailed literature review). For example, work-life interface theories propose that individuals and family members make decisions on work and family with the goals of minimizing strains (e.g., anxiety, burnout, emotional exhaustion, stress), maximizing motivations (e.g., engagement, job satisfaction, commitment), and improving subsequent outcomes (e.g., absenteeism, intention to stay, job performance); furthermore, these choices are related to family and individual characteristics (Bakker et al., 2011; Voydanoff, 2002). In summary, workers choose to WFH or telework to optimize the full set of their predicted work, family, and individual outcomes. In line with these approaches, this study focuses on the key individual and family-life stage characteristics that are relevant and available, given the data. Thus, in this literature review, some of the broader issues that contribute to the decision to WFH are reviewed and subsequently, the focus is narrowed to concentrate on demographic and human capital factors that are associated with the incidence of WFH. Although pre-pandemic theoretical approaches and behaviour mechanisms aided in understanding worker adoption of WFH or telework, these mechanisms did not lead to mass adoption of WFH in the instances of the pandemic. Rather, COVID-19 was an external shock that resulted in

government lockdowns and imposed WFH. Thus, given the context of WFH during the pandemic, previous theoretical frameworks may be diminished in their usefulness to contribute to our understanding of the observed relationships. Exploring such relationships will be one of the goals of this study.

The onset of the pandemic made working from home a business imperative — the survival of many businesses was at stake. As a result, the rate of working from home, which was estimated to be 14.4% pre-COVID-19 (as noted above for paid employees) grew to an astounding 39% during the pandemic (see Table 1). Interestingly, this rate distinctly aligns with the ‘telework capacity’ identified by Deng, Morissette and Messacar (2020). Deng et al. (2020) drew on the 2019 Canadian Labour Force Survey and O*Net to assess the task content of occupations and used several criteria to determine when occupations cannot be performed at home (e.g., working for or with the public; working outdoors; operating/repairing machinery; inspecting equipment, structures or materials; etc.). Their findings indicate that approximately four out of ten (38.9%) Canadian jobs can feasibly be performed from home. This proportion is close to that of Dingel and Neiman (2020) who found that 37% of jobs in the U.S. can be performed at home. Deng et al. (2020) caution that the proportion varies by industry, with financial, insurance, educational, professional, scientific and technical services being easily relocated to a home environment. At the other extreme, jobs in accommodation, food services, agriculture, forestry, and fishing cannot be performed from home. The ability to telework also varies by province, mirroring in part the industrial composition of provincial economies. Provinces with a heavy focus on agriculture, mining and oil and gas extraction have a lower telework capacity than do provinces that rely on service industries, such as financial, insurance, educational, professional, scientific and technical services (Deng et al., 2020). Deng et al. (2020) also highlighted that those in the least stable employment positions, including those under the age of 25, and those with lower education levels had the least potential for telework.

The Canadian economy ended the year 2019 with an unemployment rate of 5.6% and a record low in May 2019 of 5.4% (Statistics Canada, 2020). However, there were already signs in late 2019 of a slowing of the 10-year economic expansion (Canada, 2020). On January 25, 2020, the first official case of COVID-19 was identified in Canada (Canada, 2020). Throughout January and February, as the virus began to spread among Canadians, the unemployment rate remained steady at 5.5% and 5.6%, respectively (Statistics Canada, 2020). On March 11, 2020, the World Health Organization declared COVID-19 an official pandemic, and the provinces began shutting down non-essential services over the ensuing weeks (Canada, 2020). In March and April 2020, the unemployment rate reached 7.8% and 13%, respectively, as employers laid off non-essential workers due to the lockdowns (Statistics Canada, 2020). May 2020 witnessed an unemployment rate of 13.7%, the highest ever

recorded since the Great Depression (Statistics Canada, 2020). The onset of the pandemic further weakened an already fragile economy that had been slowing after a 10-year expansion, with all but essential businesses shutting down. Despite billions of dollars in government transfers (Canadian Emergency Response Benefit CERB) to businesses and individuals, bankruptcies and mortgage defaults continued to rise (Canada, 2020). There was some respite in June and July 2020, when unemployment numbers fell to 12.3% and 10.9%, respectively (Statistics Canada, 2020), as the provinces moved into staged re-openings.

The rapidly changing economic conditions and the need for businesses to continue operating by whatever means possible during the pandemic resulted in 39% of the Canadian population working from home during the first peak of the COVID-19 crisis in 2020 (see Table 1). In this study, we mainly sought to determine the degree to which the ability to work from home varies by demographic and human capital characteristics, which are theoretically identified as having a role in the decision to work from home (Bakker et al., 2011; Voydanoff, 2002; Zhang et al., 2020). The demographic characteristics were sex (female/male), immigrant status (immigrant/Canadian Born), and age, while human capital characteristics included education level and self-reported health. Here, education level is a proxy for knowledge, skills, and abilities, and self-reported health and chronic conditions are proxies for employee health (Becker, 1994). Different demographic and human capital characteristics are expected to be associated with different levels of access to work from home. Thus, as noted above, our main research question was: what are the key sociodemographic and human capital factors that are associated with working from home during the pandemic, and how do these relationships differ from those of pre-pandemic times?

The literature on the participation of women in telework shows mixed results. Women typically make up the majority of part-time lower-paid workers in the “5 C’s: caring, clerical, catering, cashiering, and cleaning” (Moyser, 2017, p. 23). These service jobs tend to be non-portable (e.g., teaching, nursing and related health occupations, social work, clerical or other administrative positions, sales and services). Because these jobs’ sectors were hard hit by the lockdowns, it may follow that non-credentialed and modestly credentialed women are less likely to be working from home and, during the pandemic, potentially more likely to be temporarily laid off or unemployed. Furthermore, women make up the bulk of clerical workers in Canada (Moyser, 2017), and pre-pandemic research indicates that managers are more willing to allow professionals to telework in comparison with clerical workers (Bailey & Kurland, 2002; Cooke et al., 2014; Schweitzer & Duxbury, 2006). Further, previous large-sample studies show a negative relationship between the variables female and telework participation (e.g., U.S. regional (Sener & Bhat, 2011) and Europe (Ollo-López et al., 2020)). In Canada, pre-pandemic estimates,

generated for this current study from the 2016 GSS, show that 44.9% of teleworkers were female. This proportion was slightly lower than the 45.1% female composition of the labour force, the difference is not statistically significant at the 5% level. Although COVID-19 has temporarily skewed the playing field, prior research can inform our first hypothesis.

Hypothesis 1: Females are less likely to participate in working from home during the pandemic.

Statistics Canada (2016) defines the term immigrant as “a person who is, or who has ever been, a landed immigrant or permanent resident. Such a person has been granted the right to live in Canada permanently by immigration authorities. Immigrants who have obtained Canadian citizenship by naturalization are included in this group (para. 1).” Prior to the pandemic, according to the 2016 GSS, 23.7% of teleworkers were immigrants (while immigrants made up 22.9% of the population). This finding suggests that immigrants should be as likely as Canadian-born to be able to work from home. However, in Canada, immigrants aged 25-54 make up the largest group of workers in the food service and accommodation industries (about 35%) (Yssaad & Fields, 2018). Both industries were hard hit by the pandemic. Furthermore, new immigrants to Canada are three times more likely than Canadian-born workers to be in low-skilled jobs that pay less than \$20/hour (Statistics Canada, 2006). Thus, as noted by Deng et al. (2020), workers in minimum-wage or low-income jobs are likely to be in jobs that have relatively low telework capacity because the job-tasks tend to be more public-facing, require handling of objects, and/or the operational requirement to perform general physical activities. This leads us to our second hypothesis:

Hypothesis 2: Immigrants to Canada are less likely than Canadian-born workers to participate in working from home during the pandemic.

‘Telework capacity’ is defined as “the number of jobs in Canada that can plausibly be performed from home under normal circumstances” (Deng et al., 2020, p. 1). It appears that occupations held by a plurality of older workers aged 55 or over can be converted into telework positions at a rate just slightly lower (38.5 to 39.6%) than that of occupations held by workers aged between 25 and 54 (40.7 to 44.2%). This negative relationship between telework and age is consistent with Bailey and Kurland (2002), who reported that employees with an interest in telework were positively related to employee familiarity with new technologies and negatively associated with age. In contrast, the pre-pandemic Canadian data show age is positively and significantly associated with telework, suggesting that relatively older workers are more likely to telework, especially in employer-oriented telework (Cooke et al., 2014). Further, the 2016 GSS shows the following pre-pandemic proportions of teleworkers by age group: (1) 5.2% of 15 to 24 year-olds; (2) 11.1% of 25 to 34 year-olds; (3) 14.5% of 35 to 44 year-olds; (4) 12.5% of 45 to 54 year-olds;

(5) 12.1% of 55 to 64 year-olds; (6) 6.9% of 65 to 74 year-olds; and (7) 9.7% of 75 year-olds and over. The above data suggest a relatively non-linear relationship (similar to the one reported by Deng et al., 2020) with a very weak positive correlation ($r=0.03$) when only prime working ages (15 to 64) are considered. To aid in further understanding the relationship between telework and age, we will consider the distribution of age groups across occupations. For example, food service and retail trade positions have an overrepresentation of workers aged 15 to 24 (with 43% and 31% of jobs in the two sectors filled by this age group (Labour Force Survey 2019), respectively; compared to a rate of 14% sector wide) (Deng et al., 2020; Ouellet-Léveillé & Milan, 2019). These positions were mainly comprised of younger workers and were among the ones least amenable to telework. These sectors had many layoffs during the lockdowns as a result of closures of food service and retail businesses. Overall, 61.3% of businesses reported layoffs due to COVID-19, the total amounting to 50% or more of their workforce in May 2020, while in arts, entertainment & recreation, accommodation & food and retail trade sectors the percentages were 89.6%, 80.3% and 53.8%, respectively (Statistics Canada, 2020). Notwithstanding some of the mixed results in the literature, given the non-linear relationship between age and telework, and given the disproportionate allocation by age group of workers across occupations, on balance we are led to the third hypothesis:

Hypothesis 3. Age is negatively associated with participation in working from home during the pandemic.

A pre-pandemic US study concluded that telecommuters were primarily highly educated (Sener & Bhat, 2011). Schweitzer and Duxbury (2006) distinguished two distinct types of teleworkers: highly educated professionals; and long-term part-time employees. Further, Cooke et al. (2014) found that employees with education greater than high school (i.e., some postsecondary or a university degree) have a substantively higher likelihood of using either employee- or employer-oriented teleworking (from 40% to 150% more likely). Pre-pandemic data, from the 2016 GSS, show a moderate positive correlation ($r = 0.36, p < 0.05$) between education level and work from home. The rates of working from home were: 2.6% for elementary school only; 6.0% for high school only; 4.1% for trade school only; 9.3% for college only; 13.8% for below a bachelor's degree; 18.7% for a bachelor's degree only; and 25.6% for above a bachelor's. The above data lead us to our fourth hypothesis:

Hypothesis 4: Education level is positively associated with working from home during the pandemic.

Before the pandemic, the 2016 GSS showed zero correlation between health (i.e., both perceived general health and perceived mental health) and telework. This finding remained significant in a multivariate logit regression with female, age, education level and immigrant status included as control

variables (results available upon request). Notwithstanding these results for employed Canadians, the literature shows a well-established relationship between work practices and worker well-being. The Life Stages Approach (Zhang et al., 2020) used for this study draws on the work-life interface theoretical framework which was developed from theories such as Conservation of Resources (COR) (Hobfoll, 2002), the Demand Control Model (DCM) (Karasek, 1979) and Job Demand-Resource theory (JD-R) (Bakker & Demerouti, 2017). These theories identify how workers seek to protect job-related resources and minimize job demands on themselves (both physiological and psychological) to enhance well-being outcomes, such as physical health and mental health. These models suggest that workers with health concerns may prefer teleworking as a way to increase resources by reducing demands on their time and provide more flexibility to create balance between work and personal life. At the individual level, Charalampous et al. (2019) suggest that telecommuting provides distinct benefits, including reduced commuting-related stress, reduced childcare and eldercare costs, a better balance between work and personal boundaries, increased job satisfaction, improved time management and better work-life balance. Gajendran and Harrison (2007), in their review of the literature on telecommuting, state that the benefits include “improved work-life balance, heightened morale and increased productivity” while suggesting that there are also negative outcomes of “social isolation, career stagnation and family conflict” (Gajendran & Harrison, 2007, p. 1525). They concluded that the literature on telecommuting is inconclusive with regard to the impact on general wellness measures at the individual level. On balance, the theoretical and empirical research suggests that the relationship between poorer health and telework is likely to be positive, such that as health improves workers are more likely to not telework. An analogy can be made with COVID-19 mortality: individuals with co-morbidities have higher hospitalizations, intensive care unit admissions and death rates than do those with none (with co-morbidities 23.5%, 6.1% and 11.7%; compared to those with no co-morbidities 8.9%, 1.7% and 7.1%, respectively) (Ontario Agency for Health Protection and Promotion (Public Health Ontario), 2020). Thus, it can be argued that individuals with co-morbidities are more likely to prefer to work from home in an attempt to minimize strains (e.g., health risks) and maximize resources. These theoretical and empirical results, in the context of the pandemic, lead us to our fifth hypothesis:

Hypothesis 5: Self-reported physical (5a) and mental health (5b) concerns are positively associated with working from home during the pandemic.

Methodology

Data

This study used the Statistics Canada’s Canadian Perspectives Survey Series (CPSS) first survey data on the Impacts of COVID-19, collected between March 29, 2020 and April 3, 2020. The cross-sectional survey targeted all 10 provinces and individuals 15 years of age or older. The initial sample size of the survey was 4,627. The survey identified the employment status of individuals as follows: (1) employed and at work at least part of the reference week; (2) employed but absent from work for reasons not related to COVID-19; (3) employed but absent from work due to COVID-19; and (4) not employed. For this study, not employed individuals (category 4) and individuals 75 years of age or older were excluded. The remaining 2,732 were the focus of our study, being employed individuals (categories 1 to 3, which include employees and self-employed workers) and 15 to 74 years of age. Older workers were dropped to avoid issues with labour market attachment and to minimize the potential for influential observations. For most of the variables, the respondents were provided with the option of a “Not stated” response. We treated such responses as missing observations and dropped them from the sample (2.9%), leaving a sample for analysis of $n = 2,653$. The unit of analysis was the individual worker level.

For this study, pre-pandemic data from the 2016 General Social Survey cycle 30 were used. The survey had a target population which included all persons 15 years of age and older in Canada (excluding the territories and full-time residents of institutions). The sample size was $n=19,609$; however, for the estimates above we excluded item non-response missing observations and only included those respondents who were in the labour force, leaving an analytic sample of $n=10,380$. The analyses used the sample weight to adjust for representativeness of observations.

Variables

The dependent variable is ‘working from home’ status. This is a derived variable that identifies individuals as being in the following categories: (1) work location has changed from outside the home to at home (27.5%); (2) work location remains at home (11.9%); (3) work location remains outside the home (38.6%); and (4) absent from work (22%) (see Table 1). The categories are mutually exclusive. The ‘absent from work’ category includes two main groups: (1) employed but absent from work for reasons not related to COVID-19 and (2) employed but absent from work due to COVID-19. There are two main reasons for being in the second group: (1) business closure or layoff related to COVID-19 and (2) personal circumstances related to COVID-19 (such

as own or household member's diagnosis, self-isolation after recent travel, taking care of children due to school closure, etc...).

TABLE 1
Descriptive Statistics (March-April 2020)

	PROPORTION	STANDARD ERROR	LCI	UCI
Work location has changed from outside the home to at home (A)	27.5	1.3	25.0	30.2
Work location remains at home (B)	11.9	1.0	10.1	14.0
Work at home (telework= A + B)	39.4			
Work location remains outside the home	38.6	1.6	35.6	41.7
Absent from work	22.0	1.3	19.5	24.6
Female (reference Male)	47.1	1.5	44.1	50.2
Immigrant (reference Canadian-born)	23.4	1.4	20.7	26.3
15 to 24 years old	9.9	1.3	7.7	12.7
25 to 34 years old	23.3	1.4	20.7	26.1
35 to 44 years old	23.7	1.2	21.4	26.2
45 to 54 years old	22.2	1.3	19.8	24.8
55 to 64 years old (reference category)	15.9	1.0	14.0	18.0
65 to 74 years old	5.0	0.5	4.1	6.2
Less than high school	7.3	1.1	5.4	9.8
High school diploma (reference category)	22.7	1.5	20.0	25.7
Trade certificate	9.1	0.8	7.6	10.9
College diploma	22.7	1.2	20.4	25.2
University below bachelor's	2.4	0.5	1.7	3.5
Bachelor's degree	24.6	1.3	22.2	27.1
University above bachelor's	11.2	0.8	9.7	12.8
Compromised immune system	10.8	0.9	9.2	12.6
Chronic condition	11.6	0.9	9.9	13.5
Perceived health, Poor	0.4	0.2	0.2	1.1

	PROPORTION	STANDARD ERROR	LCI	UCI
Perceived health, Fair	4.3	0.6	3.3	5.6
Perceived health, Good	22.3	1.3	19.9	25.0
Perceived health, Very good	42.8	1.6	39.8	45.9
Perceived health, Excellent (reference category)	30.1	1.4	27.4	33.0
Perceived mental health, Poor	3.7	0.7	2.5	5.4
Perceived mental health, Fair	13.4	1.0	11.5	15.5
Perceived mental health, Good	30.5	1.5	27.7	33.4
Perceived mental health, Very good	30.8	1.4	28.0	33.7
Perceived mental health, Excellent (reference category)	21.6	1.3	19.3	24.2
Married or common-law (reference category is other marital status)	66.4	1.5	63.5	69.3
Child(ren) under 18	40.8	1.6	37.8	43.9
Single detached (reference category)	62.5	1.5	59.5	65.5
Low-rise apartment	11.9	0.9	10.2	13.9
High-rise apartment	8.2	0.9	6.5	10.2
Other	17.4	1.2	15.1	20.0

Several independent variables were used to explain the differences in working from home status outcomes. The main variables were included in the hypotheses: sex (female/male); immigrant status; age group; highest education level; and perceived health (including compromised immune system, chronic conditions, perceived physical health and perceived mental health). To allow for alternative explanations, additional control variables suggested by the Life Stages Approach (Zhang et al., 2020) were included: marital status; presence of children; and type of dwelling. Each of these variables is reviewed in turn below (see Table 1 for the proportions in each category).

In the survey, respondents were asked to identify as either female or male, with female coded as 1 and male as 0. The ‘immigrant status’ variable was coded as 1 if the respondent was “landed and not a landed immigrant” and 0 if the respondent was “born in Canada.” Age groups were coded as six binary variables (1/0): (1) 15 to 24 years old, (2) 25 to 34 years old, (3) 35 to 44 years old, (4) 45 to 54 years old, (5) 55 to 64 years old, and (6) 65 to 74 years

old. Highest level of education ever completed was coded as seven binary variables (1/0): (1) less than high school diploma or its equivalent, (2) high school diploma or a high school equivalency certificate, (3) trade certificate or diploma, (4) college/CEGEP/other non-university certificate or diploma, (5) university certificate or diploma below the bachelor's level, (6) bachelor's degree (e.g. B.A., B.Sc., LL.B.), or (7) university certificate, diploma, degree above a bachelor's.

Four self-reported health variables were included in this study. The 'compromised immune system' variable was coded as 1 for a "yes" response and 0 for a "no." The 'diabetes or chronic condition affecting lungs, heart or kidneys' variable was coded as 1 for a "yes" and 0 for a "no." The 'perceived health' variable was coded as 5 if "Excellent," 4 if "Very good," 3 if "Good," 2 if "Fair," and 1 if "Poor." The same response scale was used for 'perceived mental health'.

Several variables to describe the employee's household characteristics were included following the Life Stages Approach (Zhang et al., 2020). The 'marital status' variable was coded as 1 if the respondent was married or living common-law and 0 otherwise (i.e. widowed, separated, divorced, single, and never married). The 'Child(ren) under 18' variable was coded as 1 if the respondent reported "Child under 18 on March 29th, 2020 resides in dwelling" and 0 otherwise. Finally, the type of dwelling was described by four binary variables (1=yes, 0=no): single detached house; low-rise apartment less than 5 stories; high-rise apartment 5 or more stories; and other.

Analysis

Table 2 presents descriptive statistics for the main variables, and Table 3 presents the multinomial logistic regression results for the 'working from home' categories as dependent variables. This regression technique is appropriate given the non-ordered categorical nature of the dependent variable. There are four mutually exclusive categories: (1) work location has changed from outside the home to at home; (2) work location remains at home; (3) work location remains outside the home; and (4) absent from work. The multinomial logit link function was selected because it is commonly used in Human Resource Management research and because the odds ratio outputs are more readily interpreted than alternative generalized linear models. For a four-category dependent variable, the multinomial logistic model generates three logistic sets of model output where three of the categories are compared to the fourth reference category, which for this model is 'work location remains outside the home.' Using the category numbering above, column 1 in Table 3 compares category 1 to 3, column 2 compares category 2 to 3 and column 3 compares category 4 to 3. All analyses were weighted using the sample weight. Stata SE was used for all the statistical analyses.

Results

Correlations

Table 2 shows the correlations for the main dependent and independent variables. There are two substantive correlations: between education level and ‘work at home due to COVID-19’ ($r = 0.296, p < .05$); and between education level and ‘work at home normally and due to COVID-19’ ($r = 0.311, p < .05$). The remaining correlations with the dependent variables were generally weak or not significant.

Regression analysis

As noted above, Table 3 presents the multinomial logistic regression results with ‘working from home’ categories as the dependent variables (i.e., ‘work location has changed from outside the home to at home’ (with the reference group being ‘work location remains outside the home’), ‘work location remains at home’ and ‘absent from work’). Each of the five hypotheses was assessed by regression analysis. With regard to Hypothesis 1, there was no support for females being less likely than males to be working from home due to COVID-19 ($\beta = 0.117, p > 0.10$; Odds Ratio = OR = $\exp(\beta) = 1.12$). Nonetheless, it is interesting that females were already more likely than males to be working from home ($\beta = 0.463, p < 0.05$; OR = 1.59) or absent from work ($\beta = 0.982, p < 0.01$; OR = 2.67). These results were substantive when controlling for other factors. To make interpretation and comparison easier, we provide odds ratios, which compare the probability of outcomes for two groups of interest. An odds ratio greater than one implies that the outcome is more likely in the comparator group than in the referent group. If it is less than one, the outcome is less likely in the comparator group.

Immigrant status was negatively related to ‘working at home due to COVID-19’ (i.e., work location has changed from outside the home to at home) relative to Canadian-born ($\beta = -0.503, p < 0.05$; OR = 0.604). The difference is substantive with immigrants having 40% lower odds than do Canadian-born of working from home due to COVID-19. This difference supports Hypothesis 2 that immigrants in Canada are less likely than Canadian-born workers to be working from home during the pandemic. With regard to the other two outcomes--‘work location remains at home’ and ‘absent from work’- there was no significant difference between immigrants and Canadian-born.

There was a negative but non-significant relationship between age and ‘work location remains at home’ for traditional working-age individuals 15 to 54 years of age (with 55 to 64 as the reference category). Similarly, the relationship between age and ‘absent from work’ was generally not statistically significant. Furthermore, in contrast to Hypothesis 3, most age groups were more likely to be working from home due to COVID-19 in relation to the

TABLE 2
Means, standard deviations, and correlations

		MEAN	SD	1	2	3	4	5	6	7	8	9	10
1	Work at home due to COVID-19	0.275	0.447	1									
2	Work at home normally	0.119	0.324	-0.227	1								
3	Work at home normally and due to COVID-19	0.394	0.489	0.764	0.456	1							
4	Female	0.471	0.499	-0.034	0.032	-0.011	1						
5	Immigrant (reference Canadian-born)	0.234	0.423	-0.013	0.041	0.016	-0.054	1					
6	Age categories	3.260	1.368	-0.031	0.083	0.027	-0.037	0.004	1				
7	Education levels	4.088	1.913	0.296	0.060	0.311	0.032	0.151	0.075	1			
8	Compromised immune system	0.108	0.310	-0.029	-0.050	-0.059	0.023	-0.039	0.131	-0.014	1		
9	Chronic condition	0.116	0.320	0.012	-0.018	-0.001	-0.011	-0.060	0.178	-0.025	0.345	1	
10	Perceived health	3.978	0.859	0.039	0.074	0.084	-0.032	-0.026	-0.090	0.075	-0.358	-0.269	1
11	Perceived mental health	3.533	1.083	0.002	0.060	0.042	-0.103	0.054	0.170	0.081	-0.112	-0.068	0.469

Statistically significant at the .05 level (two-tailed tests) in Bold.

Note: n=2,653; Pearson correlation coefficients. The age, education, perceived health, and perceived mental health categories are presented in Table 1, for these variables the ordering of the categories is maintained for these analyses; thus, ordinal variables are treated as continuous measures for these analyses.

TABLE 3
Multinomial Logistic Regression with Work Locations as the Dependent Variables

	WORK LOCATION HAS CHANGED FROM OUTSIDE THE HOME TO AT HOME ¹			WORK LOCATION REMAINS AT HOME ¹			ABSENT FROM WORK ¹		
	(1)			(2)			(4)		
	Coef.		P> z	Coef.		P> z	Coef.		P> z
Female (reference Male)	0.117		0.445	0.463	**	0.027	0.982	***	0.000
Immigrant (reference Canadian-born)	-0.503	**	0.015	0.047		0.851	0.004		0.987
Reference (55 to 64 years old)									
15 to 24 years old	0.386		0.409	-0.205		0.729	0.528		0.183
25 to 34 years old	0.739	***	0.006	-0.319		0.316	0.339		0.206
35 to 44 years old	0.678	***	0.009	-0.325		0.325	0.321		0.231
45 to 54 years old	0.425	*	0.092	-0.037		0.907	0.136		0.584
65 to 74 years old	1.258	***	0.001	1.440	***	0.000	1.175	***	0.002
Reference (High school diploma)									
Less than high school	-1.285	**	0.023	0.272		0.573	-0.473		0.282
Trade certificate	-0.703	*	0.088	-2.260	***	0.000	0.035		0.896
College diploma	0.189		0.464	0.139		0.658	-0.504	**	0.034
University below bachelor's	0.116		0.806	-0.545		0.318	-0.998	*	0.053

	WORK LOCATION HAS CHANGED FROM OUTSIDE THE HOME TO AT HOME ¹			WORK LOCATION REMAINS AT HOME ¹			ABSENT FROM WORK ¹		
	(1)		(2)	(3)		(4)			
	Coef.	P> z	Coef.	P> z	Coef.	P> z			
Bachelor's degree	1.499	***	0.000	0.975	***	0.007	0.219	0.362	
University above bachelor's	1.580	***	0.000	1.282	***	0.001	-0.175	0.578	
Compromised immune system	0.014		0.963	-0.433		0.174	0.399	0.111	
Chronic condition	0.267		0.299	-0.002		0.995	-0.017	0.945	
Perceived health, Poor	-2.156		0.102	0.095		0.940	2.464	**	0.012
Perceived health, Fair	-0.867	*	0.066	-0.254		0.580	-0.295		0.497
Perceived health, Good	-0.075		0.769	-0.742	**	0.011	0.214		0.417
Perceived health, Very good	0.066		0.748	-0.230		0.341	0.077		0.753
Reference (Perceived health, Excellent)									
Perceived mental health, Poor	0.190		0.746	0.236		0.712	0.391		0.419
Perceived mental health, Fair	0.396		0.178	0.078		0.847	0.399		0.212
Perceived mental health, Good	0.210		0.387	-0.218		0.465	0.151		0.568
Perceived mental health, Very good	0.463	*	0.056	0.083		0.769	0.410		0.129
Reference (Perceived mental health, Excellent)									

	WORK LOCATION HAS CHANGED FROM OUTSIDE THE HOME TO AT HOME ¹		WORK LOCATION REMAINS AT HOME ¹		ABSENT FROM WORK ¹	
	(1)		(2)		(4)	
	Coef.	P> z	Coef.	P> z	Coef.	P> z
Married or common-law (Reference: Widowed/ Separated/Divorced, Single and Never married)	0.208	0.284	-0.143	0.531	-0.136	0.508
Child(ren) under 18	-0.137	0.484	-0.023	0.924	0.287	0.164
Reference (Single detached)						
Low-rise apartment	0.358	0.152	-0.296	0.337	0.099	0.701
High-rise apartment	0.538	*	0.095	-0.304	0.467	-0.436
Other	0.027	0.906	-0.171	0.543	-0.066	0.774
Constant	-1.804	***	0.000	-1.147	***	0.008
Number of observations	2653					
Wald chi2(84)	350.92	***				
Prob > chi2	0.00					
Pseudo R2	0.1046					
Log pseudolikelihood	-2E+07					

* Statistically significant at the .10 level; ** at the .05 level; *** at the .01 level (two-tailed tests).

¹Reference: Work location remains outside the home

reference group of 55 to 64 years of age. Specifically, the age categories of 25 to 34 ($\beta = 0.739, p < 0.01$; OR = 2.09), 35 to 44 ($\beta = 0.678, p < 0.01$; OR = 1.97), 45 to 54 ($\beta = 0.425, p < 0.10$; OR = 1.53) and 65 to 74 ($\beta = 1.258, p < 0.01$; OR = 3.52) were all positively related to working from home due to COVID-19. Generally, Hypothesis 3 was supported. The odds of working from home due to COVID-19 decreased as age increases (i.e., a negative relationship) within the typical 25 to 64 range of working ages. It appears that the 65 to 74 age group was unique in showing a significant positive relationship with age for each of the outcomes.

Education level categories had some of the highest positive relationships with working from home due to COVID-19. In particular, having a bachelor's degree ($\beta = 1.499, p < 0.01$; OR = 4.48) or a university degree above a bachelor's ($\beta = 1.580, p < 0.01$; OR = 4.86) was associated with substantively higher odds of working from home, while less education than high school ($\beta = -1.285, p < 0.05$; OR = 0.28) or a trade certificate ($\beta = -0.703, p < 0.10$; OR = 0.50) were negatively associated with working from home due to COVID-19, where the reference level was a high school diploma. These results support Hypothesis 4 that education level is positively associated with working from home during the pandemic. This pattern was similar to the outcome of working from home (i.e., work location remains at home), in which case the outcome of having a college diploma or university education below a bachelor's were not significantly different from the outcome of having a high school diploma. In contrast, for those with a college diploma ($\beta = -0.504, p < 0.05$; OR = 0.604) or university education below a bachelor's ($\beta = -0.998, p < 0.10$; OR = 0.369) were less likely to be absent from work.

There was no support for Hypotheses 5a and 5b, which stated that self-reported physical (H5a) and mental health (H5b) is positively associated with working from home during the pandemic. There were generally no substantive or statistically significant relationships between the outcomes of health variables (compromised immune system, chronic condition, perceived health and perceived mental health) and the outcomes of work location. Nonetheless, it is interesting to note that employees who reported their perceived health as poor had a significant and substantive positive relationship with being absent from work ($\beta = 2.464, p < 0.05$; OR = 11.75). Not surprisingly, this association is likely due to their pre-existing health condition and not to COVID-19. As for the control variables, most were generally not statistically significant. Thus, it appears that marital status, having children under 18 and type of dwelling were not generally relevant in determining the outcomes of work location or presence at work.

Given the key results that emerged from our exploration of the hypotheses, we further explored the outcomes of working from home due to COVID-19 for combinations of demographic and human capital characteristics. In

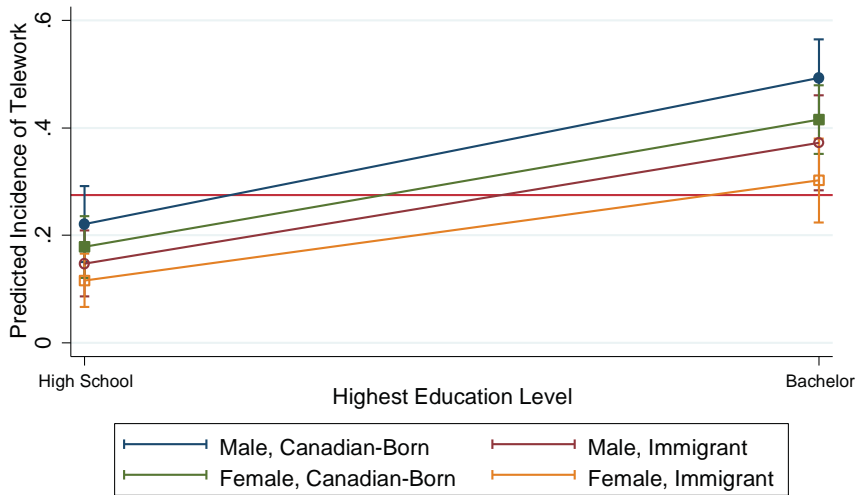
particular, Table 4 presents the predictions for incidence (proportion) of employees using the working from home due to COVID-19 human resource management practice by sex (female/male), by immigrant status and by education level. The predicted overall average proportion using working from home was 27.5% (when the model was assessed at average outcomes for the variables included in the regression). When the outcomes in Table 4 were ranked from lowest to highest, it can be seen that the rate was consistently higher for employees with a bachelor's than for those with a high school diploma. Further, with education level being held constant, the rate was higher for Canadian-born than for immigrants, and with immigrant status and education level being held constant, the rate was higher for males than for females. The lower and upper confidence intervals were included for ad hoc heuristic significance tests (where the overlap of the confidence ranges can be compared—no overlap suggests a significant difference). It can be seen that the extremely low and high outcomes were significantly different from each other. The results in Table 4 are replicated visually in Figure 1 so that the differences can be more readily assessed. Among those with only high school education, there were no significant differences between males and females or between immigrants and Canadian-born; further, for employees with a bachelor's, the only significant difference was between female immigrants (30.2%) and male Canadian-born (49.3%). Nonetheless, one could argue that there were some substantive differences between each of the groups.

TABLE 4
Predictions of Working from Home Due to COVID-19, by Sex, Immigrant Status, and Education Level

SEX	IMMIGRANT STATUS	EDUCATION LEVEL	PREDICTED PROPORTION	STD. ERR.	LCI 95 %	UCI 95 %
Female	Immigrant	with High School	0.116	0.025	0.067	0.166
Male	Immigrant	with High School	0.147	0.031	0.086	0.209
Female	Canadian-born	with High School	0.178	0.029	0.121	0.235
Male	Canadian-born	with High School	0.221	0.036	0.151	0.292
Female	Immigrant	with Bachelor's	0.302	0.040	0.224	0.381
Male	Immigrant	with Bachelor's	0.372	0.045	0.284	0.461
Female	Canadian-born	with Bachelor's	0.416	0.033	0.352	0.480
Male	Canadian-born	with Bachelor's	0.493	0.037	0.421	0.565

Notes: Predicted overall average = 0.275

FIGURE 1
Predictions of Working from Home



Data source: 2020 Canadian Perspectives Survey Series (CPSS)—Impacts of COVID-19

Discussion

The purpose of this study was to explore the degree to which access to working from home varied by demographic and human capital characteristics. This study focused on sex (female/male), immigrant status, age, education level and self-reported health. In summary, no support is found for differences between females and males, immigrants have a lower likelihood of working from home during the pandemic, in relation to 55 to 64 year-olds, all age groups have a positive likelihood that decreases as age increases, education is positively and substantively associated with work at home, and no support is found for a relationship between self-reported physical or mental health and working from home due to the pandemic. These relationships are explored separately within the regression analyses; however, prediction analysis indicates substantive differences between combinations of characteristics. with female immigrants with only high school education having the lowest rate of working from home (11.6%) and male Canadian-born with a bachelor's degree (49.3%) having the highest rate of working from home among all the category combinations we explored.

Our finding that telework is not related to sex is consistent with the Canadian results of Schweitzer and Duxbury (2006), who showed that gender was not associated with a higher likelihood of telework prior to the pandemic. They concluded that “life cycle stage” primarily determined the opportunity to telework. Thus, more experienced workers with higher tenure would be more likely to telework. Using U.S. data, Bailey and Kurland (2002) reported that 51% of teleworkers were women and 49% men; however, a deeper look suggests that the type of occupation was the major determinant of telework. Part-time employees that teleworked tended to be female (75%), older and earned less, and full-time employees that teleworked tended to be male (57%), younger and earned more). These findings are consistent with the pre-pandemic 2016 GSS numbers (presented above), which show a close match between participation in telework and participation in the labour force, with about an even split between males and females for working from home (55% and 45%, respectively). It seems that in the aggregate this even split has continued during the lockdowns. It is reasonable to assume that employers were compelled to send home all workers who could work from home, regardless of sex or type of work, as reflected in this study by the sex equivalence (with other factors held constant) for working from home during the lockdowns.

Alternatively, when controlling for immigrant status and education level, we find that females are less likely to work at home due to COVID-19 (across these demographic and human capital characteristics), as shown in Table 4. This difference may imply a link to occupational allocation differences across females versus males within the labour market. In particular, workers in lower-paying industries, of which females are still over-represented in

Canada (Pelletier et al., 2019), may be somewhat less likely to be able to work from home during the pandemic. This is an empirical question that cannot be directly tested with the data we used. The balance of the evidence we present above suggests that allocation across industries and occupations does play a role in being able to work from home (Deng et al., 2020; Moysier, 2017). Several studies using Canadian data have explored the differences in female and male allocation across industries and occupations, and the associated impact such allocation has on worker outcomes, with a specific focus on wage differentials (Moysier, 2017; Ouellet-Léveillé & Milan, 2019; Pelletier et al., 2019). From a human resource management perspective, it is interesting to note that differences by female and male groups observed in wages, due to industry and occupation allocation differences, also appear to be present in the outcomes of working from home when immigrant status and education level are considered together. It may be then that nuanced explorations of intersectionality can aid in understanding the allocation of work outcomes, including wages, telework and other work-related benefits. Nonetheless, the COVID-19 crisis, while causing a broadly based upheaval, has generally perpetuated pre-pandemic workforce allocations among females and males for working at home.

As noted above, immigrant workers made up 23.7% of teleworkers before the pandemic (while making up 22.9% of the population) and yet, during the lockdowns, immigrants have been less likely to work from home than have been Canadian-born workers. As with the above-mentioned differences for females versus males, a partial explanation may be differences in labour market allocation by industry and/or occupation. For example, Yssaad and Fields (2018) found that immigrants 25 to 54 years-old made up almost 35% of the labour force in accommodation and food services, approximately 32.5% in transportation and warehousing and 32% in manufacturing, which are all industries that would likely have a lower proportion of occupations that provide access to telework. Thus, some of the differences may be due to differences in labour market allocation.

This study shows that telework has increased in every age group during the pandemic, although the increase is negatively associated with age (with the reference group being 55 to 64 year-olds). This finding is consistent with Deng et al. (2020), who found a relatively high capacity for telework in every age group. The odds of working from home because of the COVID-19 lockdowns are lower as age increases, with workers in the 24-54 group being one-and-a-half to two times more likely to work from home as those in the 55-64 age group. Further research is required to identify the possible reasons why age is negatively associated with telework during the pandemic. Before the pandemic, those in the 64-75 age group were about four times more likely to work from home than were all other age groups, but during the pandemic their rate of working from home is three and a half times greater than that

of the 55-64 year-old reference group. For the oldest group of workers, the option of working from home during the lockdowns may be more attractive because they are more at risk of contracting the virus and dying (Brooke & Jackson, 2020).

This study confirms the relationship between education level and telework both before the pandemic (Schweitzer & Duxbury, 2006) and during the pandemic lockdowns. Having a bachelor's or a higher degree is associated with a higher rate of working from home during the lockdowns. Schweitzer and Duxbury (2006, p. 112) suggested that "teleworkers are more likely to be experienced knowledge workers" and more highly educated than non-teleworkers. During the lockdowns anyone who could work from home did, and numerous technologies facilitated that move to working from home, aligning with the conclusion of teleworkers as knowledge workers.

Before the pandemic, few studies explored the relationship between worker health and the rate of telework. Most studies focused on the reverse relationship between telework and its impact on health. Research shows that telework has both positive and negative impacts on the health of teleworkers, indicating that there are trade-offs between health and telework. The negative impacts include musculoskeletal issues from long hours of sitting at a computer, isolation and depression and stress and overwork. The boundary between work and home life is thus highly permeable (Tavares, 2017). The positive impacts include reduced commuting time, greater autonomy and flexibility and better work-life balance, all of which result in greater job satisfaction (Tavares, 2017). On balance, Tavares (2017, p. 33) suggested that there was "enough evidence to infer that the benefits [of teleworking] override the health problems." We focused on how self-reported health is related to outcomes of working from home, by using the Life Stages Approach (Zhang et al., 2020) rooted in the work-life interface theoretical framework and by arguing that workers seek to enhance their well-being by protecting job-related resources and by minimizing physiological and psychological job demands on themselves. Given specific health concerns, they may prefer working from home as a way to increase resources, reduce demands and increase well-being. Our results, however, do not support the expected association of self-reported physical and mental health with working from home. The data do not enable us to establish a causal relationship, nor can we identify the factors that contribute directly to the choices made by workers. As such, these results can be considered only exploratory.

Working from home during the pandemic has specific disadvantages for employees that were unique to this new working from home experience. When multiple family members in the same household are all working and being schooled at home, the boundary between work and home is potentially more fluid and permeable. Whereas childcare centres and schools once

oversaw younger and teenage children during the day, these institutions are no longer available, thus increasing the potential for conflicting demands on the home front. Because of the risk of contracting and transmitting the virus in a crowded home environment, parents needed to remain vigilant even when schools and daycare centres have reopened. These issues, and their longer-term physical and mental health effects, are left to future research. It is plausible that this altered home environment has created new stressors, in part due to the sudden shift from office to home, to the blurring of boundaries between work and home, to the demands of the learning curve for mastering the technological requirements of work from home and to the chronic uncertainty associated with the pandemic. Within this altered home environment, where the domestic burden has increased (including housework, meal preparation and educational instruction), the boundaries between work and home are blurred for females and males. Because the research shows that women typically carry the bulk of this responsibility (Lachance-Grzela & Bouchard, 2010), such effects are plausibly more salient for women.

Limitations

This research has several limitations. First, the relationships we found are associative and not causal (we used cross-sectional data and not panel data). Second, the data could have been more complete with the inclusion of additional measures of human capital (e.g., skills and occupation types), which were not available. Third, the datasets had information only on employees and not on employers (e.g., organizational level or supervisors). Employer level information could have provided relevant contextual information about human resource management practices, operations, and the industry in general. Fourth, the pandemic has created a situation of constant flux, beginning with the sudden complete withdrawal from the workplace to home, the gradually increasing clarity about the situation and the staged re-opening of the workplace. Accordingly, the reported results represent a moment on a timeline that has been subject to frequent intense changes in both action and reaction. Fifth, our findings may or may not be generalizable to other countries because government policies and programs implemented in Canada during the pandemic may have altered the decision calculus around the 'offering of' telework or the 'participation in' telework. For example, the Canadian government provided companies with aid/loan programs that may have prevented layoffs and termination; thus, an increase in telework may not have occurred in countries where no such programs exist.

Contributions and Future Research

This study contributes to the literature in three ways. First, it captures and quantifies the exact moment of the COVID-19 lockdowns and the resulting

impact on individuals, organizations and the economy in Canada. Second, it contributes to research on telework and work from home by quantifying the impact of a brief mass relocation of work to home and its implications. Finally, it examines the degree to which working from home is accessible across sociodemographic and human capital characteristics.

By further examining the interrelationships between the variables of sex (female/male), immigrant status and education level, we show that regardless of sex or immigrant status having a bachelor's degree is associated with a higher rate of working from home. Even during the pandemic, highly educated males who are Canadian-born are more likely to work from home—a finding in line with pre-pandemic telework research by Schweitzer and Duxbury (2006). It is worthwhile to note that during the pandemic, when anyone who could work at home typically did so, both male and female immigrants with bachelor's degrees are still less likely to work from home than Canadian-born males and females with bachelor's degrees. More research is needed to determine the source of this variance. In particular, future research should investigate the degree to which factors such as industry, occupation, wage/salary levels, work experience (and other human capital characteristics), position tenure, working conditions, employee engagement (e.g., motivation, job satisfaction commitment) and organizational characteristics (e.g., culture, strategy, structure) impact the likelihood of access to working from home during the pandemic and afterwards.

Additionally, future research should evaluate the 'success' of large-scale use of telework and working from home and, if possible, determine if these practices mitigated some of the potential financial losses sustained during the lockdowns. There are also opportunities to investigate the value of alternative work locations for both employees and employers and to quantify what wide-scale adoption of such practices would mean for the broader economy. In addition, future research should investigate the possibility of causal relationships between the variables of this study, and the possibility of generalizing the findings to other countries. It would also be worthwhile to further investigate the outcomes of working from home and telework on personal and professional outcomes, both of which are beyond the scope of this study.

Conclusion

It is impossible to predict the longer-term outcomes of this work from home 'experiment.' Plausibly, when organizations are forced to implement large-scale work-at-home practices, they may envision a future of more decentralized work environments, depending on their experiences during the pandemic. In the immediate pandemic environment, work from home preserves both employee health and the continuity of work. As we re-emerge

into a post-pandemic world, workplaces will be altered and will in the short term still be risky environments for employees. The longer term raises a more fundamental question: will we carry forward the lessons learned through the 'experiment' imposed by the pandemic? If organizations can distinguish between the effects of working from home and the negative effects of the lockdowns, they may selectively implement changes where they are viable. If the post-pandemic working world leans toward decentralization, can we look at the socio-demographic and human capital variables of those who work from home to see who will benefit in the new work environment? Do the factors that discouraged work from home before the pandemic still remain? Or did this short-term 'experiment' help organizations resolve the pre-pandemic telework issues of manager willingness, workplace interaction, trust and self-perceived job suitability (Bailey & Kurland, 2002; Tomaskovic-Devey & Risman, 1993) in determining the appropriateness of telework?

References

- Armour, P., Carman, K. G., Mullen, K. J., & Nataraj, S. (2020). *The COVID-19 Pandemic and the Changing Nature of Work Lose Your Job, Show Up to Work, or Telecommute?* RAND Corporation; Research Reports. <https://doi.org/10.7249/RRA308-4>
- Bailey, D. E., & Kurland, N. B. (2002). A review of telework research: Findings, new directions, and lessons for the study of modern work. *Journal of Organizational Behavior*, 23(4), 383–400. <https://doi.org/10.1002/job.144>
- Bakker, A. B., & Demerouti, E. (2017). Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*, 22(3), 273–285. <http://dx.doi.org.ezproxy.library.yorku.ca/10.1037/ocp0000056>
- Bakker, A. B., ten Brummelhuis, L. L., Prins, J. T., & der Heijden, F. M. M. A. van. (2011). Applying the job demands–resources model to the work–home interface: A study among medical residents and their partners. *Journal of Vocational Behavior*, 79(1), 170–180. <https://doi.org/10.1016/j.jvb.2010.12.004>
- Becker, G. S. (1994). *Human Capital: A Theoretical and Empirical Analysis with Special Reference to Education* (3rd Edition). The University of Chicago Press.
- Brooke, J., & Jackson, D. (2020). Older people and COVID-19: Isolation, risk and ageism. *Journal of Clinical Nursing*, 29(13–14), 2044–2046. <https://doi.org/10.1111/jocn.15274>
- Canada. (2020). *Economic and Fiscal Snapshot 2020* (Cat No.: F2-277/2020E-PDF). Department of Finance Canada. <https://www.canada.ca/content/dam/fin/publications/efs-peb/homepage/EFS2020-eng.pdf>
- Charalampous, M., Grant, C. A., Tramontano, C., & Michailidis, E. (2019). Systematically reviewing remote e-workers' well-being at work: A multidimensional approach. *European Journal of Work and Organizational Psychology*, 28(1), 51–73. <https://doi.org/10.1080/1359432X.2018.1541886>

- Cooke, G., Chowhan, J., & Cooper, T. (2014). Dialing it in: A Missed Opportunity Regarding the Strategic Use of Telework? *Relations Industrielles / Industrial Relations*, 69(3), 550–574. <https://doi.org/10.7202/1026758ar>
- Deng, Z., Morissette, R., & Messacar, D. (2020). *Running the economy remotely: Potential for working from home during and after COVID-19*. StatCan COVID-19: Data to Insights for a Better Canada, Statistics Canada, Catalogue no. 45280001. <https://www150.statcan.gc.ca/n1/en/pub/45-28-0001/2020001/article/00026-eng.pdf?st=XLFlr86R>
- Dingel, J. I., & Neiman, B. (2020). How Many Jobs Can be Done at Home? *White Paper: Becker Friedman Institute for Economics at UChicago*, 19. https://bfi.uchicago.edu/wp-content/uploads/BFI_White-Paper_Dingel_Neiman_3.2020.pdf
- Gajendran, R. S., & Harrison, D. A. (2007). The good, the bad, and the unknown about telecommuting: Meta-analysis of psychological mediators and individual consequences. *Journal of Applied Psychology*, 92(6), 1524–1541. <https://doi.org/10.1037/0021-9010.92.6.1524>
- Hambly, H., & Lee, J. (Donghoon). (2019). The rural telecommuter surplus in Southwestern Ontario, Canada. *Telecommunications Policy*, 43(3), 278–286. <https://doi.org/10.1016/j.telpol.2018.07.009>
- Heisz, A., & Larochelle-Côté, S. (2005). *Trends and Conditions in Census Metropolitan Areas: Low income in Census Metropolitan Areas*. Statistics Canada: Business and Labour Market Analysis Division. <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.589.220&rep=rep1&type=pdf>
- Hobfoll, S. E. (2002). Social and Psychological Resources and Adaptation. *Review of General Psychology*, 6(4), 307–324. <https://doi.org/10.1037/1089-2680.6.4.307>
- Karasek, R. A. (1979). Job Demands, Job Decision Latitude, and Mental Strain: Implications for Job Redesign. *Administrative Science Quarterly*, 24(2), 285–308.
- Lachance-Grzela, M., & Bouchard, G. (2010). Why Do Women Do the Lion's Share of Housework? A Decade of Research. *Sex Roles*, 63(11–12), 767–780. <https://doi.org/10.1007/s11199-010-9797-z>
- Moyser, M. (2017). *Women and Paid Work*. <http://www.statcan.gc.ca/pub/89-503-x/2015001/article/14694-eng.htm>
- Ollo-López, A., Goñi-Legaz, S., & Erro-Garcés, A. (2020). Home-based telework: Usefulness and facilitators. *International Journal of Manpower*, ahead-of-print(ahead-of-print). <https://doi.org/10.1108/IJM-02-2020-0062>
- Ontario Agency for Health Protection and Promotion (Public Health Ontario). (2020). *Weekly Epidemiologic summary: COVID-19 and Severe Outcomes in Ontario (COVID-19 in Ontario: January 15, 2020 to May 14, 2020)*. Toronto, ON: Queen's Printer for Ontario. <https://www.publichealthontario.ca/-/media/documents/ncov/epi/COVID-19-severe-outcomes-ontario-epi-summary.pdf?la=en>
- Ouellet-Léveillé, B., & Milan, A. (2019). Results from the 2016 Census: Occupations with older workers. *Insights on Canadian Society, Statistics Canada, Catalogue no. 75-006-X*, 17.
- Pelletier, R., Patterson, M., & Moyser, M. (2019). *The gender wage gap in Canada: 1998 to 2018*. Statistics Canada, Labour Statistics, Research Papers, Catalogue no. 75-004-M – 2019004. http://publications.gc.ca/collections/collection_2019/statcan/75-004-m/75-004-m2019004-eng.pdf

- Schweitzer, L., & Duxbury, L. (2006). Benchmarking the Use of Telework Arrangements in Canada. *Canadian Journal of Administrative Sciences / Revue Canadienne Des Sciences de l'Administration*, 23(2), 105–117. <https://doi.org/10.1111/j.1936-4490.2006.tb00684.x>
- Sener, I. N., & Bhat, C. R. (2011). A Copula-Based Sample Selection Model of Telecommuting Choice and Frequency. *Environment and Planning A: Economy and Space*, 43(1), 126–145. <https://doi.org/10.1068/a43133>
- Statistics Canada. (2006). *2006 Census of the Population*. [https://www12.statcan.gc.ca/census-recensement/2006/index-eng.cfm#:~:text=The %20census %20is %20designed %20to,May %2016th %20counted %2031 %2C612 %2C897 %20Canadians.](https://www12.statcan.gc.ca/census-recensement/2006/index-eng.cfm#:~:text=The%20census%20is%20designed%20to,May%2016th%20counted%2031%2C612%2C897%20Canadians.)
- Statistics Canada. (2016). *Definitions, data sources and methods: Immigrant*. <https://www23.statcan.gc.ca/imdb/p3Var.pl?Function=Unit&Id=85107>
- Statistics Canada. (2020, July 14). *Percentage of businesses that reported layoffs due to the COVID-19 pandemic, amounting to 50 % or more of their workforce, by sector, Canada, May 2020*. <https://www150.statcan.gc.ca/n1/daily-quotidien/200714/t001a-eng.htm>
- Tavares, A. I. (2017). Telework and health effects review. *International Journal of Healthcare*, 3(2), 30. <https://doi.org/10.5430/ijh.v3n2p30>
- Tomaskovic-Devey, D., & Risman, B. (1993). *Telecommuting innovation and organization: A contingency theory of labor process change*. Undefined. [/paper/Telecommuting-innovation-and-organization %3A-a-theory-Tomaskovic-Devey-Risman/7771de7910ff3a3887d-195b6bf4a6cca6022ad1c](https://paper/Telecommuting-innovation-and-organization%3A-a-theory-Tomaskovic-Devey-Risman/7771de7910ff3a3887d-195b6bf4a6cca6022ad1c)
- Turcotte, M. (2010). Working at home: An update. *Canadian Social Trends, Statistics Canada, Catalogue no. 11-008-X(11)*, 11. <https://www150.statcan.gc.ca/n1/en/pub/11-008-x/2011001/article/11366-eng.pdf?st=PkxZB26j>
- Voydanoff, P. (2002). Linkages Between the Work-family Interface and Work, Family, and Individual Outcomes: An Integrative Model. *Journal of Family Issues*, 23(1), 138–164. <https://doi.org/10.1177/0192513X02023001007>
- Yssaad, L., & Fields, A. (2018). *The Canadian Immigrant Labour Market: Recent Trends from 2006 to 2017*. <https://www150.statcan.gc.ca/n1/pub/71-606-x/71-606-x2018001-eng.htm>
- Zhang, S., Moeckel, R., Moreno, A. T., Shuai, B., & Gao, J. (2020). A work-life conflict perspective on telework. *Transportation Research Part A: Policy and Practice*, 141, 51–68. <https://doi.org/10.1016/j.tra.2020.09.007>

SUMMARY

The COVID-19 pandemic has created a new reality in the world of work. Employers are realizing that to continue business operations during the pandemic they need to think differently about work: how it is organized, who does what and where the work is done. This paper addresses the question of whether there are differences in demographic and human capital characteristics between those who work from home during the pandemic and those who worked from home previously. Thus, this study takes advantage of the natural conditions of a pseudo experiment to identify the sociodemographic (i.e., sex (female/male), immigrant status, age) and human capital factors (i.e., education level, health) of those with access to telework to better understand the impact of the shutdown on these subgroups.

This study uses Statistics Canada's Canadian Perspectives Survey Series (CPSS) first survey data on the Impacts of COVID-19, and an analytic sample whose $n = 2,653$; further, the 2016 General Social Survey cycle 30 was used to provide pre-pandemic estimates for descriptive comparisons. We find that females are not less likely than males to participate in telework and that immigrant status is negatively related to work from home during the pandemic. Generally, there is support for an age relationship, with the odds of telework being relatively lower as age increases. Education level is positively associated with telework during the pandemic (e.g., having a bachelor's or higher university degree is positively associated with telework). Finally, there is no relationship between physical or mental health and telework. This study contributes to the literature by quantifying the impact of a brief mass telework event and its implications for access to telework across sociodemographic and human capital characteristics. In a post-pandemic world, will we carry forward the lessons learned through this 'experiment' imposed by the pandemic?

RÉSUMÉ

La présente étude est axée sur les caractéristiques démographiques et sur le capital humain des Canadiens qui sont absents du travail ou qui travaillent à domicile (TAD), depuis la pandémie de COVID 19 ou qui en avait déjà l'habitude, par rapport aux Canadiens qui continuent de travailler à l'extérieur du foyer (c.-à-d. qui ne font pas de TAD). Les résultats montrent des différences significatives dans l'incidence du TAD pendant la pandémie: 1) il n'y a pas de différences significatives entre les femmes et les hommes; 2) les immigrants sont moins susceptibles de faire du TAD; 3) les jeunes travailleurs sont plus susceptibles de faire du TAD; 4) l'éducation et le TAD ont une corrélation positive; et 5) l'auto-évaluation de la santé n'est pas liée au TAD. Les résultats de cette expérience naturelle laissent sous-entendre de potentielles répercussions politiques et organisationnelles si le TAD en raison de la pandémie se poursuit pendant une période prolongée.

Mots clés (5 maximum): travail à domicile (TAD), genre, immigrant, niveau d'éducation, santé mentale.

SOMMAIRE

La pandémie de COVID-19 a créé une nouvelle réalité dans le monde du travail. Les employeurs se rendent compte que pour poursuivre leurs activités pendant la pandémie, ils doivent penser le travail différemment: comment le travail est organisé, qui fait quoi et où il est effectué. La présente étude vise à déterminer s'il existe des différences dans les caractéristiques démographiques et le capital humain des personnes qui travaillent à domicile pendant la pandémie et celles qui travaillaient à domicile auparavant. Ainsi, cette étude profite des conditions naturelles d'une pseudo-expérience pour identifier les facteurs sociodémographiques (c.-à-d., le genre [femme/homme], le statut d'immigrant, l'âge) et le capital humain (c.-à-d., le niveau de scolarité, la santé) des personnes qui ont la possibilité de

faire du télétravail afin de mieux comprendre les répercussions des fermetures sur ces sous-groupes. Cette étude utilise les données de la première enquête de la Série d'enquêtes sur les perspectives canadiennes (SEPC) de Statistique Canada sur les répercussions de la COVID-19, ainsi qu'un échantillon analytique ($n = 2653$). En outre, l'Enquête sociale générale de 2016, cycle 30, a été utilisée afin d'obtenir des estimations pré-pandémiques pour les comparaisons descriptives. Nous constatons que les femmes ne sont pas moins susceptibles que les hommes de faire du télétravail et que le statut d'immigrant est négativement corrélé au travail à domicile pendant la pandémie. De manière générale, la corrélation avec l'âge est confirmée, la probabilité du télétravail étant relativement plus faible à mesure que l'âge augmente. Le niveau de scolarité est positivement corrélé au télétravail pendant la pandémie (p. ex., le fait d'avoir un baccalauréat ou un diplôme universitaire supérieur est positivement corrélé au télétravail). Enfin, il n'y a pas de relation entre la santé physique ou mentale et le télétravail. La présente étude contribue à la littérature en quantifiant les répercussions d'un bref événement de télétravail de masse et ses implications sur l'accès au télétravail en fonction des caractéristiques sociodémographiques et du capital humain. Dans un monde post-pandémique, tirons-nous les leçons de cette *expérience* imposée par la pandémie ?