

RUNNING HEAD: STRESS DURING COVID-19

A Longitudinal Mixed Methods Examination of Stress During The COVID-19 Pandemic in a  
Canadian Sample

by

Lily Pankratz

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### Abstract

**Background:** Stress is a universal experience, which has been exacerbated for many during the COVID-19 pandemic. The overarching goal of this work was to examine the experiences of stress among Canadians over a one-year period during the COVID-19 pandemic. Within this, I aimed to qualitatively understand the greatest stressors Canadians were experiencing at each time point and contextualize their experiences longitudinally. I also aimed to quantitatively understand the prevalence of stress at each time point and over time. Lastly, I used a mixed methods approach to gain a rich understanding of the main stressors qualitatively identified by participants across all time points. **Methods:** The COVID Survey Canada data were collected between May 2020 and July 2021. Participants ( $N = 1,074$ ) were recruited via social media platforms and were invited to complete an online baseline survey and two follow-up surveys at six months ( $n = 484$ ) and one-year ( $n = 406$ ) following their initial survey completion. I used an exploratory sequential mixed methods approach for data analysis, where I first analyzed the open-ended responses to, “what are you most stressed/concerned about right now?” using reflexive thematic analysis (Braun & Clarke, 2006; 2019; 2023 for three time points individually, and then completed a qualitative longitudinal analysis using interpretative phenomenological analysis (Smith & Osborn, 2007). I quantitatively analyzed the prevalence of both perceived stress and COVID stress at each time point. Guided by the qualitative longitudinal framework, I chose several variables that mapped on to the qualitative longitudinal framework (COVID impact, income change, job loss, and social support) and completed descriptive analyses to provide the prevalence for each variable at all time points. **Results:** Participants qualitatively identified many stressors at each time point, and five main themes were identified in the longitudinal qualitative framework: the impact of COVID-19, health and wellbeing, economic

instability, social connection, and pandemic related guidelines and restrictions. Quantitative analyses supported qualitative findings and demonstrated high rates of perceived stress across each time points, with the highest level of perceived stress at time 1 (76.4%, 71.5%, and 71.5%, respectively). **Discussion:** These findings highlight the difficult experiences many Canadians went through during COVID-19 and can be used to inform policies, supports, and interventions for both current Canadians experiencing chronic stress due to COVID as well as for future pandemic supports and interventions.

*Keywords:* Canada, COVID-19, perceived stress, longitudinal, mixed methods

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## **A longitudinal mixed methods examination of stress during the COVID-19 pandemic in a Canadian sample**

In a year marked by uncertainty and stress, Google Trends indicated that people worldwide searched “how to maintain mental health” in 2021 more than ever before (~2045 times in 2021, compared to 1884 in 2020 and 688 in 2019; Google Trends, n.d.). COVID-19 has shone a light on mental health; particularly, on experiences of uncertainty, fear, and stress, in a global manner. COVID-19 has created a world where everyone has experienced shared vulnerability from its impacts. Stress has been highlighted as a pervasive experience among adults during this time, with over 85% of Canadians experiencing moderate to high levels of stress during COVID-19 (Chima et al., 2022). Prior to COVID-19, stress was already a major concern, demonstrated by the fact that it was labelled the “Health Epidemic of the 21<sup>st</sup> Century” by the World Health Organization (Fink, 2016, p. 5). In 2014, nearly ¼ (23%) of Canadians aged 15 years or older reported feeling “quite a bit” or “extremely stressed” most days (Statistics Canada, 2014). COVID-19 has exacerbated the prevalence and experience of stress, having been characterized as a “universal and chronic stressor affecting people worldwide and across all sections of society” (Pfeifer et al., 2021, p. 581). Stress, and particularly, chronic stress (i.e., stress that is persistent for at least several weeks; U.S. National Library of Medicine. N.d.), has been associated with a host of deleterious effects including the development of mental health problems and physical disease (Boardman & Alexander, 2011; Lloyd et al., 2005; Schneiderman et al., 2005).

The current study aims to examine the experiences of stress during COVID-19 among a sample of Canadians across three different time points spanning May 2020 to July 2021 using qualitative, quantitative, and mixed methodologies. This study provides a significant novel

contribution to the literature, as there has not been any longitudinal mixed methods research on the experiences of stress during COVID-19 among a general Canadian sample. In the following pages of this thesis, I will present relevant literature surrounding stress, with a specific focus on the history, relevant theoretical models, and impact of chronic stress, followed by a summary of pandemics, an overview of key components and experiences during COVID-19, as well as a summary of the current qualitative, quantitative, and mixed methods research, examining stress during this pandemic. I will then summarize the gaps that currently exist in the literature and the purpose and novelty of this research. The following sections will then describe the methods and analytic strategy. The last sections will provide the results, followed by a discussion section including implications, limitations, and future directions.

## **Stress**

Stress is a term that has been around for centuries and experts in the field are still unable to land on a consensus for the origination of the term. Over time, stress has taken on vast meanings such as the impact or pressure on buildings, where stress in this situation refers to the amount of strain or weight that a building can withstand. Stress is also used to describe the experience felt by individuals engaging in various experiences, such as public speaking, where stress in this situation refers to an emotional and physiological response in the body that may include symptoms such as nervousness and increased heart rate. With a term that can describe so much, there has been significant discussion and controversy over the best definition for this term. For the purpose of my thesis, I will be using an amalgamated definition of stress, predominantly from the most common psychological definition of stress by Lazarus and Folkman (1984), with several newer components discussed by Koolhaas et al. (2011). The definition I will be using refers to stress as a full-body experience when a stimulus is unpredictable and uncontrollable and

is appraised as exceeding the individual's current resources for coping. I will now go into background information and provide a more concrete understanding of the elusive term that is stress.

### *History*

The discussion of the concept of stress may date back to the 14<sup>th</sup> century, where it reflected the experience of hardship and adversity (Lazarus, 1993). However, it started to gain importance during the seventeenth century by Robert Hooke, a prominent scientist who used the term stress to describe the strain and load on manufactured structures (Lazarus, 1993). While the term stress has changed since this time, his work was influential in our current models as the theme of stress as an external load or demand remains central in many definitions. Hans Selye moved the term stress over to the sciences domain and changed the trajectory of this term forever. He first published using this term in 1936, and although he received some backlash for using a term already defined in a different context, it quickly took hold and now has been a widely studied phenomena in psychological sciences (Selye, 1956). Hans Selye, defined stress as “the state manifested by the specific syndrome which consists of all the non-specifically induced changes within a biologic system” (Selye, 1956, p. 311). A second researcher, psychologist Richard Lazarus, was also foundational in the development and research of stress in the mid-to-late 20<sup>th</sup> century. His concepts of stress and coping gained traction and influenced our current view of the importance of one's *appraisal* or perception of the stressor at hand impacting how we react to stress. Lazarus and Folkman defined stress as “a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being” (1984, p. 19).

Over time, researchers have created adaptations to these definitions, and some have critiqued the original definition for being too broad, arguing that because it encompasses so much, it has become meaningless (Koolhaas et al., 2011). Currently, researchers vary on the definition they choose to use based on what fits their models or beliefs best. Koolhaas et al. (2011) have argued that for stress research to continue to be meaningful, researchers must be specific and direct in their definition of stress so that everyone can have a better understanding and focus on key factors of stress.

### *Theoretical Models of Stress*

**General Adaptation Syndrome Model.** Researcher Hans Selye created a stress theory regarding response patterns to stressful stimuli called the “General Adaptation Syndrome” (GAS; 1956). This theory suggests we respond to stress in three stages: 1) *alarm* reaction encompasses an initial shock phase where one exhibits autonomic excitability, adrenaline discharge, and gastro-intestinal ulcerations. This is followed by a countershock phase marked by operation of defensive processes. 2) If the stimulation continues, one enters the stage of *resistance*, which results in the departure of alarm reaction symptoms but also results in the decrease to resistance of other kinds of stressors. Lastly, 3) if the aversive stimulation persists, one experiences the stage of *exhaustion*, which occurs when one no longer has the capability of adapting to the stressor. During this stage, symptoms from stage one reappear, but one is no longer capable of resisting. Within organisms, the exhaustion stage can result in irreversible tissue damage and other detrimental mental and physical health concerns.

### *Current Views of Stress*

Current views of stress vary widely based on who you ask and what discipline they are from. Even in the psychological field, there are numerous definitions and ways to measure stress.

The controversy of stress being ambiguous and meaning different things to different people has been noted for decades (Koolhaas et al., 2011; Selye, 1956), however, due to the acceptance and global popularity of the term, trying to redefine this term would likely cause more confusion. An influential article published by Koolhaas et al. (2011) critiqued the current approach to the use of the term stress in scientific research and argued for restricted use of the term stress and stressors, for when the stimulus results in both uncontrollability and unpredictability. A central factor pushing their argument forward is their belief that a narrower definition will help to avoid confusing stress with normal physiological reactions. A recent article by O'Connor et al. (2021) discussed the discrepant views many experts in the field hold regarding stress but argued that despite these issues, stress is critical to our understanding of health more broadly, and the fact that we still see the significant relationship between stress and health substantiates the importance of continuing to research stress in a similar manner.

### ***Chronic Stress***

While stress can be an adaptive reaction that provides a positive outcome in response to a negative stimulus, that is often limited to stress that is not acute or long-term (Johnson et al., 1992). In fact, there has been a robust association between chronic stress and negative mental and physical health outcomes. Chronic experiences of mental health symptoms, particularly chronic expressions of stress have previously been shown to have deleterious effects on people. There are at least two hypotheses for why chronic stress may have a stronger impact on mental and physical health compared to acute stress. First, there is evidence that suggests the human body may not habituate to chronic stressors in all situations (i.e., it will remain novel, unpredictable, or uncontrollable; Avey, 2007). Second, chronic stress will deplete available

resources which may result in increased psychological or physiological vulnerability to acute stressors or other illnesses (Lepore, 1997).

### **Pandemics**

All epidemics and pandemics have some overlapping patterns and reoccurring challenges, and it is helpful to examine past experiences to place the response and context of our experience with COVID-19. Researcher Amy Forbes (2021) provides a strong contextual understanding of COVID-19 in relation to prior pandemics. She argues that there are three components that all historical pandemics have had in common. First, all pandemics or disease crises have had implications for civil liberties and government authority. Second, they have acted as a test of ability on society, as they can reveal or exacerbate existing social and health disparities. Lastly, they have forced people to endure and cope with uncertainty pertaining to the nature of the disease, best treatment, and one's future (Forbes, 2021).

### **COVID-19**

The COVID-19 pandemic has impacted everyone globally in an unprecedented manner. To date, there have been nearly 690 million reported cases of COVID-19 (Worldometers, 2023), with over 4.68 million of these cases in Canada. (Ritchie et al., 2023). A major mechanism to protect the health of citizens was to implement restrictions such as physical distancing. Unfortunately, there are significant negative consequences associated with prolonged isolation, as well as other pandemic-related stressors (Best et al., 2021). Furthermore, the impact of COVID-19 has been shown to far exceed solely its health threat, as false news and information about the virus was disseminated online at uncontrollable rates, leaving many worried and confused (Cheng et al., 2021; Moran, 2020). Early in the pandemic, we saw panic buying lead to price gouging and unavailability of critical medical supplies (Ho et al., 2020). The stock market

crashed in February and March of 2020 due to panic sell-off (Baker et al., 2020). Further, there has been stigmatization and discrimination against certain social and racial groups, particularly, anti-Asian and anti-Semitic rhetoric and hate crimes have soared (Bieber, 2022). All of these factors suggest that COVID-19 has impacted most, if not all, domains of everyday life and the experiences of stress during COVID-19 are multifaceted.

### **Stress during COVID-19**

#### ***Qualitative Findings***

Most of the qualitative research examining experiences of stress during COVID-19 has been conducted with specific populations, such as frontline workers including doctors, nurses, and long-term care workers (Haq et al., 2021; Reynolds et al., 2021; Shahbaz et al., 2021), young adults and undergraduate students (Fawaz et al., 2021), older adults (Fiocco et al., 2021) and people with disabilities and chronic health conditions (Tsui et al., 2023). Regarding frontline workers, researchers found themes of stress related to increased workload, issues communicating with patients and other staff members, and worry about contracting and/or spreading COVID-19. Fawaz et al (2021) conducted a qualitative study with Lebanese students examining COVID-19 stressors and found themes related to overwhelming workload, technical issues and concerns with learning, confinement, and coping with problems. Researchers Fiocco et al., (2021) conducted interviews with Canadian older adults to examine their experience with stress during COVID-19. They completed an inductive thematic analysis and found themes including social isolation, contracting COVID-19, and financial insecurity. Maison et al., (2021) completed a qualitative longitudinal study examining challenges arising during COVID-19 among a Polish sample. They completed six interviews with each participant over a 6-month period and analyzed all transcripts with thematic analysis. They found several main challenges identified by

participants including, limitation of direct contact with people, restrictions on movement and travel, having to change one's lifestyle, feeling bored, and uncertainty about the future. While there is rich qualitative research examining the experiences and impacts of COVID-19 among a variety of populations such as the ones identified above, to my knowledge, there has been no longitudinal qualitative research examining the experience of stress during COVID-19 among a Canadian sample.

### *Quantitative Findings*

There has been robust research identifying high rates of stress globally during the pandemic (Boluarte-Carbajal et al., 2021; Chima et al., 2022; Cooke et al., 2020; Limcaoco et al., 2020; Parvar et al., 2022). High stress indicates strong feelings of worry and overwhelm, with individuals likely reporting spending a lot of time worrying and difficulty coping (Bhandari, 2022). However, most of this work has been cross-sectional in nature and demonstrates a wide range of variability in prevalence of stress (5.8% - 90.2%). This wide range in rates of stress is likely due to a combination of factors such as the use of different measurement instruments, geographical factors, sample demographic factors, and different timepoint during the pandemic. Longitudinal studies examining the psychological impact of COVID-19 have predominantly focused on mood and anxiety disorders (Armour et al., 2020). Additionally, there has been a heavy focus on perceived stress, measured with the Perceived Stress Scale, during COVID-19 among university students and young adults, with both cross-sectional (Awoke et al., 2021) and longitudinal data (Benatov et al., 2022). Both longitudinal and cross-sectional data examining the prevalence of stress during COVID-19 has shown high rates of stress at many time points throughout the pandemic. For example, a longitudinal study conducted by Planchuelo-Gòmez et al (2020) examining stress (stress was measured with the Depression Anxiety Stress Scale)

among an adult population living in Spain found 37.1% of participants endorsed high levels of stress symptoms in March 28 – April 5, 2020, which increased to nearly 50% of the sample on April 28 – May 15, 2020. A cross-national study conducted by Benatov et al., (2022) found that 83% of their sample experienced high levels of perceived stress (measured with Perceived Stress Scale) during February 19 – 26, 2021, which decreased to 78% during May 26 – June 9, 2021.

An additional important area of stress during COVID-19 is specific COVID-19 related stress. COVID related stress was examined by several researchers, including Taylor and Asmundson (2020), who created COVID Stress Scales (CSS) to measure several dimensions of COVID related stress. These domains include danger and contamination, socioeconomic consequences, xenophobia, traumatic stress, and compulsive checking. These researchers examined all of these domains among a large, North American sample at two time points (March – April 2020 and March – May 2021). They found that, across all CSS domains, scores decreased in their community sample from time one to time two, suggesting that COVID stress may have stabilized over time during the pandemic (Asmundson et al., 2022). Overall, these findings demonstrate elevated rates of stress among many people during the COVID-19 pandemic, which call for more detailed understanding of how people are experiencing stress, through qualitative and mixed methods approaches.

### ***Mixed Methods Findings***

Mixed methods analyses are beneficial as they incorporate the advantages of both quantitative and qualitative methodologies into one study, providing a more fulsome, meaningful interpretation of the phenomenon under investigation (Hughes, 2016). There has been limited English-written mixed methods research examining stress during COVID-19, with most research

being cross-sectional in nature, examining certain populations (i.e., university students), or in different countries (i.e., Iran, European countries).

Researchers Faghankhani et al. (2021) conducted a study that examined the experience of perceived stress among Iranians during COVID-19, followed by a qualitative examination of key stressors among three groups identified in the quantitative analyses that had high levels of stress (*university students, female homemakers, and health care providers*) and one group who had low levels of stress (*males*). Researchers asked the following open-ended question via private text message or voice chat to those from a high stress group: “what are the sources of stress among [group name] during the COVID-19 pandemic?” They asked *males* “What are the reasons the male participants showed a lower level of stress compared to the total population and female participants during the COVID-19 pandemic?”. Researchers analysed qualitative findings through content analysis, which demonstrated that each group with high stress levels reported different reasons for experiencing stress. For example, students highlighted school issues as their current biggest stressors, with many noting how virtual education was inefficient. *Female homemakers* endorsed family issues as their biggest source of stressor, with most having concerns about the health of the family. Lastly, *healthcare providers* noted COVID-19 was their biggest stressor, with most participants specifying they were fearful of contracting and/or spreading the disease.

Other researchers also examined university students, including Hoyt et al. (2020) who conducted a longitudinal convergent mixed method study examining stress and anxiety among U.S. college students during two time points in the COVID-19 pandemic. Their quantitative findings demonstrated that undergraduate students were experiencing high rates of both stress and anxiety at both time points (Perceived Stress Scale mean score = 22.72 at baseline).

Additionally, their qualitative findings provided insight into the ways that COVID-19 impacted students' wellbeing, as many participants described specific stressors related to public health restrictions and not having access to adequate technology or a private environment to complete university online. These students also qualitatively described being impacted by multiple factors, including academic, financial, and social stressors. The researchers also demonstrated through qualitative findings how the COVID-19 pandemic has created educational, economic, and environmental stressors that have impacted their wellbeing.

Researchers Zrnić Novaković et al., (2023) conducted a longitudinal mixed methods study to examine psychological responses and subjective experiences of COVID-19 in five different European countries. This study had two time points, the first was in the summer of 2020, and then a follow-up was conducted 12 months later. They quantitatively examined mental health outcomes such as depression, PTSD, and general wellbeing and qualitatively analyzed open-ended responses to questions about stressful events through content analysis. Their quantitative findings demonstrated varying rates in probable mental health disorders, ranging from 5.8% - 35.4% for adjustment disorder, 0% - 56.3% for posttraumatic stress disorder, and 12.3% - 26.1% for depression, due to differences in time points and Country the participants are residing in. Qualitatively, the researchers used content analysis for time 1, and then used a deductive approach to content analysis at time 2, by using the framework created at time 1 to complete the analyses at time 2. However, they noted a new theme, regarding vaccination, emerged at time 2, where participants discussed wanting themselves and others to get vaccinated and issues related to vaccination such as, "*The fact that despite the population's great willingness to be vaccinated, there are still very many anti-vaxxers*" (p.19). The other most stressful themes that were identified included restrictions and changes to daily life, COVID-19

and other health issues, work and finances, emotional distress, being a burden on loved ones, societal impacts, pandemic management and communication, other burdens, and reporting no stressful events.

### ***The Impacts of Stress During COVID-19***

As discussed earlier, the impacts of stress, particularly chronic stress, are vast and are associated with mental and physical health problems, poorer psychological wellbeing, and reduced quality of life (Crosswell & Lockwood, 2020; Hammen et al., 2009; Loyd et al., 2005; Scheiderman et al., 2005; Sinha 2008). Within the context of COVID-19, research has demonstrated that perceived stress, financial stress, and chronic stress, can worsen people's COVID-19 symptoms and are associated with a greater likelihood of developing COVID-19 (Durstefeld et al., 2023; Frontera et al., 2022; Wang et al., 2022). Specifically, these researchers found that US residents who experienced financial insecurity prior to having COVID-19 had a greater likelihood of experiencing long COVID symptoms (Durstefeld et al., 2023). Additionally, Wang et al., (2022) found that perceived stress prior to developing COVID-19 acted as a risk factor for developing long COVID among a sample of nearly 55,000 adults. These findings highlight the need to better understand current experiences of stress among Canadians in order to help mitigate negative health consequences.

### **Summary of Gaps in the Literature**

The existing literature on stress during the COVID-19 pandemic has primarily relied on cross-sectional quantitative measures to estimate the prevalence of stress, most commonly using the Perceived Stress Scale, the posttraumatic stress disorder screen for DSM-5 (to assess posttraumatic stress symptoms), the Depression, Anxiety, and Stress Scale (DASS-21), Impact of Events Scale, and the COVID Stress Scales (Cooke et al., 2020; Kar et al., 2021; Limcaoco et al.,

2020; Park et al., 2020; Taylor et al., 2020). This approach has provided a wide range of prevalence estimates for stress, with its wide ranges likely due to differences in the measurement of stress, time of measurement, and location of the sample. A systematic review found that perceived stress ranged in studies from 8.1 – 81.9% (Xiong et al., 2020). This review highlights the importance of longitudinal work to demonstrate prevalence rates across different time points of the pandemic. Additionally, although qualitative examinations of stress have been conducted, they have mainly focused on specific populations, such as frontline workers (Galehdar et al., 2020; Norful et al., 2021; Reynolds et al., 2021) or college students (Fawaz et al., 2020; Hoyt et al., 2020). There is a notable gap in the literature when it comes to examining stress during COVID-19 using longitudinal datasets among a general population. Furthermore, there is a dearth of studies that employ mixed methods to gain a comprehensive understanding of stress experiences during the pandemic. Therefore, there is a need for further research that combines longitudinal data and mixed methods approaches to better understand stress among the general population during the ongoing COVID-19 crisis.

### **Current Investigation**

While there has been mixed method research examining perceived stress during COVID-19, this study adds to the literature by using a mixed method longitudinal design to provide a deeper perspective of the experiences of and changes in stress over several stages in the pandemic by providing both qualitative and quantitative data at three time points. This study includes participant data collected at three time points over a one-year period, whereas other longitudinal projects in this area have typically been shorter in duration (e.g., 2- 6 months), and/or with only two time points (Andersen et al., 2021; Hoyt et al; LaCaille et al., 2021; Zrnić Novaković et al., 2023). Lastly, this study will add to the extant literature by examining a

Canadian sample, as most research has used niche populations such as students or healthcare workers or has been conducted in other countries (Faghankhani et al., 2021; Hoyt et al., 2020; Validabady et al., 2021; Zrnić Novaković et al., 2023).

This project will provide novel insights into how the experience of stress changes over three time points during the COVID-19 pandemic (May – July 2020, November 2020 – January 2021, May – July 2021) from both a qualitative and quantitative perspective. Using a mixed methods approach is imperative to better capture the complexity of the experience of stress during COVID-19. Using both types of analyses at each of the same time points provides a more holistic understanding of the experience of stress. Additionally, using a large Canadian sample will help highlight how the general population is experiencing stress, rather than constraining to a specific population, which is important because of the way that restrictions were implemented to a general population and impacted all Canadians. As we continue to settle into the reality that COVID-19 may be among us in some form for an indefinite amount of time, we must explore the experience of stress, and the ways in which it has changed and stayed the same during the pandemic so that we can provide insight on the biggest stressors and possible unmet needs of Canadians. Researchers Cooke et al., (2020) conducted a rapid review and meta-analysis early in the pandemic and made a call for longitudinal studies to better understand the experience of stress over time during pandemic. The overall objective of my research project is to provide a rich understanding of the experience of stress among a Canadian population. Within this objective, I utilized an exploratory sequential method to examine qualitative and quantitative data. Specifically, I qualitatively examined Canadians' greatest stressors through an open-ended survey question and quantitatively examined the prevalence of perceived stress as well as COVID related stress. Additionally, based on the longitudinal qualitative findings, I examined

several quantitative variables to provide additional context and support for the qualitative findings.

## **Methods**

### **Participants**

Participants ( $N = 1,260$ ) completed the baseline survey of COVID Survey Canada between May – July 2020. Participants were required to be 18 years and older, have access to Internet, capable of reading and understanding English, and hold Canadian citizenship and/or permanent residency. Participants ( $n = 186$ ) who completed the survey within less than 10 minutes (suggestive of invalid responding) were excluded, yielding a final sample of 1,074. Participants who completed the first time point were then sent emails to complete surveys at time 2 (November 2020 – January 2021;  $N = 484$ ) and 3 (May – July 2021;  $N = 406$ ). The University of Manitoba Health Research Ethics Board provided ethical approval for the data collection. The University of Manitoba Research Ethics Board also provided ethical approval for this current study under ID HE2022-0105.

### **Data Collection Procedure**

Researchers created a Qualtrics-hosted survey that was distributed and administered online, via platforms such as academic listservs and social media, to a convenience sample of Canadian citizens and residents. The survey took approximately 30-45 minutes to complete. All agreeing individuals were sent two follow-up surveys at 6 months (November 2020 – January 2021) and 1-year post-baseline (May – July 2021) survey to collect repeat and additional measures. Consent was requested at each time point. During baseline data collection (time one), Canada was experiencing the end of its first wave of COVID-19, with COVID-19 cases peaking in late April 2020 but staying high throughout most of May 2020 (Ritchie et al., 2023).

Additionally, mass shutdown of schools, workplaces, and other institutions had happened mere months prior (The Canadian Press [TCP], 2021). Although some provinces began to lift some restrictions in May 2020, many restrictions remained (TCP, 2021). During the period when time two data were collected, Canada was in the midst of wave two for COVID-19, with daily cases peaking in early January 2021 with over 8,000 new cases per day (Ritchie et al., 2023). In November 2020, many Canadian provinces enacted tighter restrictions closing non-essential stores and banning social gatherings of any kind (TCP, 2021). In mid-December 2020, Canada received its first doses of the COVID-19 vaccine which were slowly rolled out over the coming months based on priority (i.e., healthcare workers, individuals deemed high risk, which include older adults, those with a chronic medical condition and those who are immunocompromised; Government of Canada, 2023; Wooding & Mah, 2022). Additionally, in late December 2020, Canada confirmed cases of the Delta variant, leading to more restrictions such as curfews and stay-at-home orders (TCP, 2021). During the period when time three data were collected, Canada was just coming out of its third wave, experiencing high rates of cases until mid-June 2021 (4,000-6,000 new cases daily; Ritchie et al., 2023). During this time, many provinces still had strict restrictions in place, with non-essential stores being closed, limited social gatherings, and many schools doing remote learning. During this time, COVID-19 vaccines become available to nearly all Canadians. Figure 1 provides a visual depiction of major COVID-19 events to provide context for each of the three time points.

## **Measures**

In the following section, I only included measures that pertain to my thesis. The COVID Canada Survey Canada examined a variety of measures, including questions pertaining to

physical health, mental health, experiences in the perinatal period (as applicable), and COVID-19-related factors such as being tested for COVID-19 or required to quarantine.

### *Qualitative Measure*

I analyzed the following open-ended text-based question: “What are you most stressed/concerned about right now?” A total of N = 1858 responses were analyzed across all three time points (time 1 = 1013, time 2 = 467, time 3 = 378). These numbers are slightly lower than the sample size noted above, as some survey participants chose not to answer the open-ended questions.

### *Quantitative Measures*

#### **Sociodemographic Characteristics**

Participants’ demographic variables were measured in the baseline survey. Participants self-reported their gender (male, female, gender diverse, transgender, non-binary, other), marital status (married/common-law, widowed), race/ethnicity (Indigenous, Black, White, Latin American, Arab, Pacific Islander, West Asian, South Asian, Chinese, Filipino, Southeast Asian, Korean, Japanese, Other), household income (less than \$20,000, \$20,000 to \$49,999, \$50,000 to \$74, 9999, \$75,000 - \$99,999, \$100,000+), education (less than high school, high school, college certificate/diploma, university undergraduate degree, masters or doctoral degree, other certificate or degree), and age (18-20, 21-29, 30-39, 40-49, 50-59, 60-69, 70-79, 80+). Additionally, I examined changes in household income and job status. Change in household income was measured at all time points with the question “Has your income changed due to COVID?”. Participants could respond with “Yes” or “No”. If they responded “Yes”, they would then be prompted with a question of if their income increased or decreased. Participants were also asked at each time point, “Were you laid off from your job because of COVID-19?”.

### **Perceived Stress**

Stress has been defined and measured in various ways which can lead to discrepant and ambiguous views on and understanding of the concept. However, there is robust evidence indicating the importance of perceived stress – examining the subjective experience of stress – as it has been well documented to accurately measure the unique experience a person is having (Birk, 2021; Cohen et al., 1983; Taylor, 2015). As such, the Perceived Stress Scale (PSS-10; See Appendix A) was measured at all three time points. The PSS-10 is a valid and reliable self-report measure of perceived stress in the past-month ( $\alpha = 0.82 - 0.85$ ; Cohen et al., 1983, Cohen & Williamson, 1988; Roberti et al., 2006). Items (e.g., “In the last month, how often have you felt that you were unable to control the important things in life?”) are rated on a scale from 0 (Never) to 4 (Very). Higher scores indicate higher levels of perceived stress. Scores were also dichotomized to portray low perceived stress and moderate/high perceived stress, following prior work which has identified low stress is represented by scores ranging from 0-13, moderate stress ranges from 14 – 26, and high stress ranges from 27 – 40 (Swaminathan et al., 2016). As such, scores for this study between 0 – 13 were categorized as low stress, while scores ranging from 14 – 40 were categorized as moderate/high perceived stress.

### **COVID Stress Scales**

The COVID Stress Scales (CSS) are measures of COVID-19 related stress, which were given to participants on surveys in times two and three. The CSS consist of 36 items that examine several domains of stress related to COVID-19 which are distributed over five scales: fears of danger and contamination, fears of socioeconomic consequences, xenophobia, reassurance seeking and compulsive checking, and traumatic stress symptoms. Each scale consists of six items, except for danger and contamination fears, which is comprised of 12 items.

Three of the scale items (danger and contamination, socioeconomic consequences, and xenophobia) are scored on a 5-point Likert scale ranging from 0 (Not at All) to 4 (Extremely). Reassurance seeking and compulsive checking as well as traumatic stress symptoms were also rated on a 5-point Likert scale, however, 0 indicated Never and 4 indicated Almost Always. Higher scores on all scales of the CSS indicate greater levels of that COVID-19 related stress. All scales of the CSS have shown good to excellent internal consistencies ( $\alpha = .83$  to  $\alpha = .95$ ; Taylor et al., 2020).

### **COVID Impact**

Participants were asked to respond to the following question “To what extent has your life been impacted by COVID-19?” at each time point. This question was based on a 5-point Likert scale where 1 = Not at all and 5 = Extremely.

### **Social Support**

The PROMIS Emotional Support short form was given at times 1 and 3 to all participants, which is a valid and reliable self-report measure of perceived social support ( $\alpha = 0.92$ ; Cella et al., 2010; Greenberg et al., 2020). Items (e.g., “I have someone to talk with when I have a bad day”) are rated on a 5-point Likert scale ranging from 1 (Never) to 5 (Always). Higher scores indicate greater social support. Scores were dichotomized into either people endorsing having social support (“Yes”) or not having social support (“No”), based on those having a T score of less than or equal to 39.

### **Analytic strategy**

Given that the primary objective of this project was to examine stress among Canadians at three time points during COVID-19, the project employed a longitudinal mixed methods design as it allowed me to delve deeper into my understanding of participants’ experiences and

changes in their stress. Specifically, a mixed methods approach provided numerical prevalence and a qualitative understanding of what types of stressors were most concerning for participants at different times during COVID-19. Following qualitative analyses for each time point individually, I created a longitudinal qualitative framework to examine the similarities and changes in stress over time. Lastly, I utilized an exploratory sequential approach complete quantitative analyses based on the findings from the longitudinal framework. This was completed to complement the qualitative themes and provide additional context to the qualitative findings. Figure 2 portrays my analytic plan, and a more detailed description of all components of the analyses are provided below.

***Missing Data.*** Missing data is a problem that many researchers face when collecting and analyzing cross-sectional and longitudinal datasets (Clara, 2009). In longitudinal research, missing data can occur due to wave nonresponse, when a participant drops out or is unavailable for one more of the data collection periods (Schafer & Olsen, 1998). Missing data can provide us with useful information about our hypotheses and/or dataset that impact both qualitative and quantitative analyses. Choosing not to address the missing data in an appropriate matter can lead to biased results, which is a particular concern for studies with longitudinal designs (Cox et al., 1977). The COVID Survey Canada had high rates of attrition between Time 1 (N = 1,078) and Time 2 (N = 488), due to several factors including many participants identifying that they did not want to be included in any follow up surveys (n = 169 at time 1) However, there was very low missing data cross-sectionally for the qualitative open-ended responses, with 65 people not responding to the open-ended question at time 1, 17 at time 2 and 28 at time 3. Given the high rate of attrition longitudinally, it is important to address missing data for its implications both qualitatively and quantitatively.

As this survey experienced both typical attrition and individuals who did not agree to follow-up (i.e., individuals who denied follow-up surveys at time one), I examined attrition between both groups separately; Eisner et al., 2019). Specifically, I conducted unadjusted and adjusted logistic regression analyses (adjusted for sociodemographic characteristics) in SPSS (Version 26) with both groups; individuals who did not agree to follow-up (“time one only group”) and individuals who agreed to do future surveys but did not complete later time points (“attrition”). These groups were assessed separately as the nature of their attrition is different. I used regression analyses to assess what, if any, variables from the baseline questionnaire (i.e., sociodemographic variables, being a frontline worker, and perceived stress score) predict attrition. Gender was the only significant predictor of attrition in the unadjusted models, where men were more likely to drop out of the study. Gender was no longer significant in the adjusted models. All analyses demonstrated that the missing data were missing at random. This indicates that we were able to complete both qualitative and quantitative analyses as planned since there were no significant predictors of attrition to address.

### ***Mixed Methods Analysis***

I followed an exploratory sequential mixed methods design with the aim of having my qualitative findings inform subsequent quantitative analyses to provide a deep understanding of Canadians’ experiences with stressors at, and across, each of the three time points (Edmonds & Kennedy, 2017). This approach is comprised of three phases; 1) exploring the qualitative data and analysis, 2) using the findings from the qualitative analyses to inform quantitative analysis, and 3) quantitative analysis (Creswell & Creswell, 2018). Lastly, this approach ends with the interpretation and reporting of both quantitative and qualitative data. While there is limited prior literature using this design with longitudinal data, and even less using secondary data from the

same dataset for both quantitative and qualitative data analyses, the reasoning, procedure, and interpretation remain the same. The details of the qualitative, quantitative, and mixed methods integration analyses are provided in more detail below.

### *Qualitative Analysis*

Data were first examined at each of the three time points using reflexive thematic analysis (RTA; Braun & Clarke; 2006; 2019; 2023). RTA was chosen rather than other methods such as content analysis because the goal of this analysis was to interpret the findings as “themes” rather than “content” to provide a more nuanced perspective. Furthermore, RTA is theoretically flexible, which allows for multiple theories to be integrated, the extent of the use of theories to vary, and for the researchers to knowingly and actively impact the themes (Braun & Clarke, 2020). This analysis involves “identifying, analyzing, and interpreting patterns of meaning (“themes”) within qualitative data” (Clarke & Braun, 2017, p. 297). RTA strives to identify and make sense of commonalities in the way a topic is talked about (Braun and Clarke, 2012). A central aspect of RTA is the belief that themes are created by the individuals analyzing the data, making them subjective (Braun & Clarke, 2019). Braun and Clarke view this as a strength rather than a potential threat to the data, as it allows researchers to work through the data in an active process, acting in a thoughtful, reflective, and flexible manner (2019).

In the spirit of reflexivity, a foundational component of RTA, I acknowledge my standpoint as a young Canadian woman in post-secondary education. Additionally, I lived through the pandemic and therefore have had my own experiences and stressors related to the pandemic. As authors Braun and Clarke (2019) describe how RTA enables researchers to actively influence the data analysis process, I want to recognize the privilege that comes with my position and acknowledge the potential influences from my own experiences. My findings offer

one possible interpretation of the experiences shared in this project. In order to ensure that I was staying close to the data, I used the methods described above such as including a second coder and taking notes on any preconceptions about the study population before I started working with the data (Lincoln & Guba, 1985). Additionally, I reviewed a COVID diary, created by researchers in the Health Information Exchange lab, which outlined major COVID updates and events relevant to Manitoba and Canada, as well as Canadian news articles to ground myself in the context of the COVID-19 prior to reviewing data.

The development of themes was guided by Braun and Clarke's (2019, 2021, 2023) guidelines for using RTA, which consists of an open process to coding, as discussed above. Each stage of the coding and theme development process was clearly documented to ensure the evolution of themes was clear and identifiable. My approach consisted of developing codes through continual interpretative engagement with the data, which evolved and changed throughout the coding process because of the coder's understanding of the data (Braun and Clarke, 2023). Good practice for RTA, as defined by Braun and Clarke (2023) is evidenced by "reflexive and thorough data engagement" (p. 7), which I ensured by closely reviewing and re-reviewing the data throughout the coding process. Additionally, Braun and Clarke highlight the importance of developing codes that are detailed enough to separate relevant meanings from the data, which was achieved in this coding process by having continual meetings between the two coders to discuss the coding process and reaching consensus on our understanding of the meaning making process. Additionally, there were two coding meetings with the entire research team, including committee members to review initial drafts of the framework to help deepen everyone's understanding of the data and ensure consensus with the coding process among all researchers. All of these steps supported the development of strong resulting frameworks for all

time points. A research assistant and I completed the coding for all three time points and met regularly to discuss our coding process and reaching consensus of theme development at every stage of coding. We used NVivo Qualitative Research Software (released March 2020) for data organization.

Two coders completed five of the six phases of reflexive thematic analysis, per Braun and Clarke (2023): 1) familiarization, 2) coding, 3) initial theme generation, 4) reviewing and developing themes, 5) refining, defining, and naming themes. The sixth phase is producing the report, which will be discussed later. First, familiarization is completed by coders familiarizing themselves with the data by reading and re-reading text responses and making notes of comments that were particularly interesting or stuck out to them. Second, coding was completed by coders reviewing the data very closely, tagging all the data that capture the idea of the research question with code labels, which stick very closely to the original content of the response. The two coders completed coding 50 open-ended responses and then met to review coding responses to discuss consistency and consensus among our coding process. The remainder of the coding was then completed independently by the two coders. Third, the coders clustered similar codes to examine possible shared meanings that were united around a core concept. Fourth, the coders reviewed and developed themes to ensure they accurately and meaningfully captured patterns based on the original dataset. Fifth, themes were then refined further by defining names and writing short definitions to describe each theme. This process was completed separately for each of the three time points.

### *Longitudinal Qualitative Analysis*

Longitudinal qualitative research (LQR) is LQR an emerging, yet underdeveloped approach, with ambiguous and often contradicting views among researchers. For instance, there

is a lack of agreement on whether LQR is a methodological approach in itself, or a design element that is contextualized within a traditional methodological approach (Auduly et al., 2022). Concerningly, a recent systematic review, conducted by Auduly et al., (2022) examining LQR in health research found 299 studies that claimed to use LQR in their study, however, only 20% of the articles referred to LQR methodology literature. Furthermore only 24% of the articles in this review set out to investigate change across time, which has been argued to be the main goal of LQR. These findings clearly demonstrate the lack of clarity and understanding of LQR among researchers. Future work is needed in this field to promote unity and clarity for using LQR. Specifically, methodology papers are needed for researchers to refer to, and researchers should currently include a detailed, transparent, outline of their LQR approach, to allow researchers to understand, and potentially replicate, their approaches.

As mentioned, LQR focuses on the *change* between time points, rather than just describing each time point. As such, the analysis started with a cross-sectional thematic analysis of each time point, followed by a longitudinal analysis of the three frameworks to examine the change in time (Calman et al., 2013). As discussed earlier, given the significant changes of COVID-19 across the time points collected in this study, understanding the changes in stress was critical. QLR occurs through an iterative process of going back and forth between the different points in time in the dataset of interest, to better understand the nuanced changes in similarities over time (Calman et al., 2013). In line with Van Ness et al., 2011, I completed a fully longitudinal mixed methods design, as we examined both qualitative and quantitative data at each time point, rather than completing only one type of analysis at each time point. Plano-Clark et al., (2015) completed a systematic review of longitudinal mixed methods research and provided many recommendations for completing this methodological design, which we followed.

Specifically, I developed a figure (see Figure 2). that clearly outlines the sample and data collection at each time point, along with analyses. Furthermore, I ensured to articulate how time was conceptualized and measured and we incorporated time into our analyses.

As discussed earlier, while there is controversy over whether LQR is in itself its own methodological approach or a design element that can be used in conjunction with a methodological approach, I chose to conceptualize it as a design element and chose a methodological approach that fits well with the goals of LQR (i.e., examining change over time). Specifically, to complete the longitudinal qualitative analysis, I chose to use an inductive interpretative phenomenological analysis (IPA), rather than RTA as was done for each individual time point. Phenomenology refers to understanding the meanings of an individual's experience (McCoy, 2017). Phenomenology takes into account time and context, which is critical for the examination of longitudinal research This approach also recognizes that change is an innate component of the human experience and, therefore, personal contexts are constantly changing (McCoy, 2017). As such, some researchers have argued that using a phenomenological approach requires actively looking for both the presence and absence of change when conducting longitudinal work (McCoy, 2017).

IPA was chosen for the longitudinal analysis, rather than RTA, because of several important reasons and differences between thematic analysis and phenomenology. Braun and Clarke (2020) identified two important differences between RTA and IPA; first, IPA incorporates a focus on both a thematic orientation, similar to RTA, as well as an idiographic approach, which is a focus on the particular and unique details of each case. This was important for the longitudinal component as I was particularly interested in the unique experience of change in stressors over time. Secondly, the procedure for IPA is different than RTA, as IPA

involves a detailed focus on the analysis of each case, before developing themes across cases.

Additionally, IPA goes deeper with each data item, before developing themes across the dataset.

I followed the IPA process, as guided by Smith and Osborn (2003). First, I started with ‘initial noting’ which is comprised of writing detailed notes of the data, with a focus on language use. My initial noting focused on shifts in language across the time points in each case. This approach is similar to the first phase of RTA, but generally are comprised of more detailed, systematic notes. I completed initial noting by examining all cases among each individual framework in NVivo and wrote all notes in a Word Document. The next step is the development of ‘emergent/inductive’ themes, which is similar to codes in RTA. This process is comprised of searching for connections across emergent themes, to develop ‘super-ordinate’ themes that have shared meaning. I completed this process by reviewing all notes at each time point and identifying the changes and similarities in language, with a focus on what themes remained the same and changed. If the themes changed, I made particular note of the type of language, and how the theme shifted over time.

### ***Quantitative Analyses***

Descriptive statistics were analyzed for perceived stress at each of the three time points, and COVID stress scales were only measured at the last time points, due to the later development of this measure. Following the qualitative analyses, quantitative findings, with variables based on the longitudinal qualitative framework, were analyzed using descriptive statistics at each time point, using SPSS Version 28.

### ***Mixed methods data integration***

The mixed methods integration was completed through a narrative contiguous approach, which involves presenting the qualitative and quantitative results separately (Fetters et al., 2013).

This approach was chosen given the ability to present and explain both methods. This was important to this research project given the richness of the qualitative data, as well as the complementary nature of the quantitative analyses. Specifically, as this was an exploratory sequential approach qualitative analyses were completed first and guided the quantitative analysis process. As such, analysis of the results had to be completed separately. Lastly, I also used a narrative joint display to provide a visual description of how the qualitative framework was used to choose quantitative variables that mapped onto each main theme. I chose to provide a visual display as a way to help orient readers to understand the process more easily (Fetters, 2021; see Figure 3).

## **Results**

Participants (N = 1,074 at baseline, 484 at time 2, and 406 at time 3) provided responses to the open-ended text question exploring what they were currently most stressed about. At baseline, the majority of the sample identified as female (77.9%), White (83.5%), and reported having an undergraduate degree or higher (87.8%). Furthermore, 62.4% of participants were between the ages of 18-39, 24.7% were 40-59, and 12.9% were aged 60 or older. Lastly, 18.7% of participants reported a yearly household income of less than \$50,000 per year, 38.4% reported a household income of \$50,000 - \$99,999, and 42.9% reported a household income of over \$100,000.

### **Qualitative Results**

Participants responded to an open-ended text-based question asking about what they were currently most stressed about at each time point. Thematic analysis was completed for each time point individually, and revealed similar main themes, however, these differed slightly at each time point, as seen below. See Figure 1 for a visual depiction of major COVID-19 events at each

of the three time points, to provide context for responses. A description of all themes and subthemes for each time frame are provided below and Tables 1-3 present the individual thematic frameworks with additional quotes. Lastly, qualitative longitudinal analysis was completed to contextualize participants' responses to stressors and the potential changes and similarities seen across time points. Figure 4 provides a visual depiction of the qualitative longitudinal framework.

***Time 1 (May 2020 – July 2020): “The Unknown”***

Unknowns and uncertainties characterized participant descriptions of stressors during this time point, which is contextualized as falling at the beginning of a global pandemic without much information or understanding of the virus and no vaccines in sight. Additionally, Canada had some of the strictest restrictions at this time and COVID-19 cases were increasing exponentially. Within my analysis of time one “The Unknown,” six main themes were identified: the health of myself and my friends and family, the future of our society, changes in finances, work, and university, experiencing isolation and the loss of contact with loved ones, parenting stress, and uncertainty of the future. Below, I describe each of these main thematic areas in more depth, and additional quotes for each theme in this framework can be found in Table 1.

**Theme 1. My Health and the Health of my Friends and Family.** A central theme that was identified for many participants included worries surrounding their health and the health of their loved ones. One participant shared, *“I am concerned about the health of friends and family members; I am concerned about my own health”* #301. Within discussions of health, subthemes included getting COVID-19, general wellbeing, and navigating the healthcare system.

**“Getting COVID-19”.** Expectedly, within discussions of health, many participants described that their greatest stressor was either themselves or a loved one contracting COVID-

19. Within this, participants wrote about being worried about getting COVID-19 and having a gruesome and painful death or being exposed to COVID-19 and unknowingly spreading the virus to others. Lastly, many participants noted being stressed about certain groups of loved ones getting COVID-19, including older adults and those who were immunocompromised or at a higher risk of developing a severe outcome from COVID-19. One participant responded, *“Getting very ill, or family members getting ill, friends getting very ill, being asymptomatic and making others very ill”* #156.

***General Health and Wellbeing.*** In addition to fears regarding contracting COVID-19, participants also described stress related to overall health and wellbeing of themselves and others. For example, several people shared sentiments similar to, *“Wellbeing of family and friends”* #667 and *“The health of my family”* #334, 576, 634. Within the subtheme of health and wellbeing, many participants also discussed being stressed about managing their chronic or new health conditions during the COVID-19 pandemic, including mental and physical health problems.

***Navigating the Healthcare System for Myself or Those Close to Me.*** Similar to participants sharing their experience managing mental and physical health conditions, participants also discussed the challenges of navigating the healthcare system and accessing adequate services during this time, both for themselves and as a caregiver to others. Within this, participants noted the impact restrictions had on their ability to access the services they needed, including delays and cancellations of necessary healthcare appointments as well as the impact of visitor restrictions on getting support and being able to provide adequate support to others. For instance, one participant shared, *“My mother was just diagnosed with cancer during this*

*pandemic, so it is really hard to not be able to visit her or help her through her treatments, and we feel her medical care has been delayed due to the pandemic” #20.*

**Theme 2. “Future of Our Society”.** The second main theme of this framework was the “Future of Our Society”, where participants discussed the ways in which the pandemic, and its accompanying restrictions, have negatively impacted Canadian society and both the Canadian and global economy. Specifically, two subthemes were identified: the impact on the economy and society and the impacts of and reactions to restrictions. When describing their biggest stressors at the time, one participant stated, *“Longer term, the political, economic and social impact of the pandemic on Canada and the world especially our neighbour, the USA” #37.*

***Impact on the Economy and Society.*** Within general discussions of the uncertainty of the future of society and the economy, many participants specifically discussed being stressed about the government response to the pandemic, and the resulting impacts of the government’s response on the economy and society, ranging from personal factors to global concerns. These personal factors included concerns related to financial instability and lack of access to necessities such as the increasing cost of food, to larger scale concerns including future societal changes and the global economy. One participant responded, *“The long term effect that the shutting down of everything will have on the global economy” #167.*

***Impacts of and Reactions to Restrictions.*** While participants talked about the government’s response and the impact on society, participants also described how the government’s restrictions have impacted themselves and others in their ability to do their normal activities. Within this, participants shared their emotional reactions to the restrictions, including frustrations about others not following restrictions and being stressed about possible re-opening or lifting of restrictions. For example, one participant stated, *“Opening of everything and the*

*borders reopening or fight travel without vaccines or treatments or hospital space and equipment to handle the massive COVID-19 infections about to be spread to every Canadian” #277.*

**Theme 3. Changes in Finances, Work and University.** A third main theme participants noted as a main stressor was related to detrimental changes in their work, finances, or completing university. Specifically comments like “*Work*” #271, 304, 331, #457 were seen many times, along with similar comments such as, “*education and income*” #501. These experiences were often interconnected, with one participant stating, “*I lost my source of employment for the summer and was going to go to graduate school in the fall but don't think I can because I can't pay for it with only \$5000 from government student program and \$8000 in tuition + living expenses of a city. I feel like a failure because I am seen as unemployed even after getting a degree*” #480. Within this main theme, subthemes included worries about job and finances, shifting to working from home, the impact of being or living with a frontline worker, and navigating online university.

***Worries about Job and Finances.*** Understandably, many participants disclosed feeling most stressed about current or potential financial and job loss and experiencing financial and job insecurity. Some participants also noted being stressed about their adult children experiencing job loss and financial struggles. Lastly, participants discussed being worried about future job prospects, and what their future would hold concerning potential future work. One participant described “*Money - lack of funds to pay the bills. I have lost my 2nd job, (part time job), and since I still have full time job I'm worried about how to pay my bills as I don't qualify for any government rebate. I'm screwed by September. My full time job is also looking at cutback due to provincial government*” #28.

***Shift to Working from Home.*** In addition to described stressors surrounding job and financial security, participants who were working identified being stressed about the shift from working outside of the home to working from home. Many participants discussed working from home during COVID-19, with particular attention to challenges such as increased workload and feeling unsupported by their workplace. Within increased workload, participants highlighted both experiencing higher work demands, as well as no longer having the same work-life boundaries, given the loss of physical distance from work-related matters. Some participants also discussed being stressed about the possibility of having to return to in-person work in the future.

***The Impacts of Being or Living with a Frontline Worker.*** Within discussions of stressors related to work and job security, several participants described the unique stressors associated with being or living with a frontline worker. These participants often discussed the impacts of being or living with frontline workers, such as physically separating from their family members, the psychological impacts of their work, and having to live with frontline workers. For instance, one participant said, *“Seeing people a lot less, and the guilt of when I do see people I feel as if I am putting others at risk because I am a nurse”* #512.

***Navigating Online University.*** In line with participants discussing how COVID-19 impacted their work, other participants identified the stressors associated with completing university online. Most participants noted being stressed about having to complete online schooling, with one participant sharing, *“Continuing to be motivated during online learning”* #871. Additionally, participants also discussed the reduced quality of online education. Several participants noted worries, particularly about the quality of their education and missing out on critical components of their degrees due to online learning.

**Theme 4. Experiencing Isolation and the Loss of Contact with Loved Ones.** The fourth main theme identified in the framework was experiencing isolation and the loss of contact with loved ones. Within this main theme, subthemes encompassed isolation and accompanying stress attributed to not getting to see family and friends and having to rely on virtual socialization. Additionally, many participants' responses highlighted the compounding losses of being unable to currently see many family members, as well as the uncertainty of when they can connect again. For example, one person shared, "*Not being able to get together with my family here and not knowing when I would be able to get together with my out of province family*" #111.

***Not Getting to See Family or Friends.*** Being unable to see loved ones was a major source of stress for many participants, and within this, many participants talked about being stressed due to not getting to spend time with their family and friends. One person shared, "*Not being able to spend time with my family in person*" #331. As participants talked about being unable to see loved ones, some participants specifically mentioned the impact of travel restrictions on their inability to see loved ones. One participant stated, "*How I am going to be able to travel to see my family, how I wasn't able to go see my Gram before she passed*" #104.

***Virtual Socialization.*** Several participants discussed being most stressed about virtual socialization, sharing that virtual connection has become exhausting and does not make up for physical socialization. One participant noted, "*Virtual Socialization is exhausting and no replacement for real human interaction*" #628. Within the stress of virtual contact, participants identified missing the physical aspects of typical socialization, such as getting to hug others. Participants also noted the impacts of being isolated; specifically, participants talked feeling

extremely lonely, living alone, and feeling isolated. One participant noted, *“Feeling a part of a group, having connections with my friends, loneliness”* #509.

**Theme 5: Parenting Stress: “I feel like I cannot catch a break”.** The fifth main theme of this framework related to participants who identified as parents, particularly in the context of experiencing stress related to their children, being a parent, and increased demands on their role as a parent. Within this main theme, subthemes include keeping family safe and the impacts of their children not being in school. For example, one person shared *“Managing the household and keeping my family on track; meals, emotionally, physically, learning, quality time, every topic under the sun. I feel SO busy because I have two young kids (1 year old and 3 year old). Amazing times and lots of quality time with the family, but also very overwhelmed. I miss child care, “self-care” time and date nights with my husband”* #478.

***Keeping family “safe”.*** As a parent, many of these participants noted being stressed about being able to keep their family safe. Participants’ responses focused on feeling responsible for their family’s wellbeing and health, and being stressed about making sure everyone is safe and healthy. For example, one participant said, *“Keeping children and family safe and healthy”* #49.

***“My Children Not Being in School”.*** Some participants described that a major source of stress was due to school and daycare closures. Participants shared the detrimental impact of the loss of childcare and other supports on their wellbeing. Furthermore, these closures forced many parents to take on additional care roles to make up for lack of childcare. Participants discussed the challenges of having to balance work and home life, particularly with these additional roles while their children were out of school. One person shared, *“Because of school closures, I am required to keep my child home. Trying to juggle a work schedule with two kids at home, trying*

*to get complete school and work has been problematic” #699. Additionally, parents reported being stressed about how much their children are missing out on because of the school closures. One participant stated, “Schools being closed. Having to work full time in addition to being a teacher before and after work is very stressful. I’m concerned that the children aren’t getting what they need from the school resources we are supplied with” #312.*

**Theme 6. “Uncertainty of the Future”.** The final theme of this framework is the “uncertainty of the future”, which is characterized by subthemes including questioning “when will it end”, the unknown effects of the disease, and a desire for a return to normalcy. One participant shared, *“The unknowns of this virus and disease - how much is actually around (lack of testing), long term effects of illness and recovery, long term immunity, vaccine ability, etc” #205.*

**“When Will it End?”** Participants discussed worries about the future of the pandemic, with many participants reporting being most stressed about how long the pandemic will last. One participant said, *“The unknown of how long it will continue and how it will effect life long term” #325.* Within this discussion, participants talked about the next phase and possible second wave of COVID-19. One participant shared, *“I guess it would be preparing for the 2nd wave of COVID, and the unknown of all that” #78.* Several participants also discussed stressors surrounding the vaccine including availability of the vaccine, such as if or when there will be a vaccine available. A few participants also discussed worries about the vaccine, including potential side effects and testing procedures for the vaccine. For example, one person shared *“Will the vaccine be available and what aftereffects will be present” #65.*

**“Unknown Effects of the Disease”.** While many participants described being stressed about when the pandemic would end, there was also several participants who identified being

stressed about the unknown, poorly understood effects of the disease. Specifically, participants discussed the unknown impacts and details of COVID-19. One person stated, *“The hidden impact of the disease – there’s so much we don’t know yet – and mutations of the virus”* #202.

**“Return to Normalcy”.** Participants also discussed being most stressed about *“Being able to go back to normal”* #52, and what that timeline would be. This resonated with the first subtheme of wanting the pandemic to end and desiring certainty surrounding the timing for which this could occur. Additionally, participants also discussed being stressed about *“Never going back to normal”* #707, with participants fearing that things will never go back to normal and wondering, *“What the new “normal” will look like and when we might get to that point”* #268.

### ***Time 2 (November 2020 – January 2021): “No End in Sight”***

Feeling unable to see an end in sight was a predominant message seen within participant descriptions of stressors during this time point, which aligns with significant and strict lockdowns for the third time in Canada, spanning across many Winter holidays and lasting until after January 2021. Additionally, this time period saw high rates of COVID cases and, although a vaccine was emerging, Canada saw a slow roll out in 2021 and no one in the general population was eligible to receive the vaccine at this time. Within my analysis of time two “No End in Sight,” five main themes emerged: the health of myself and loved ones; public health guidelines; the future of the pandemic; daily responsibilities; and global factors. Below, I describe each of these main thematic areas in more depth, and additional quotes for each theme in this framework can be found in Table 2.

**Theme 1. “Health of Myself and Loved Ones”.** The first theme of this framework is comprised of participants experiences with both the health of themselves and their loved ones.

Participants described being most stressed about the overall health and wellbeing, both for themselves and loved ones. Within this, several subthemes emerged, including getting COVID-19, navigating other physical and mental health challenges, worries about pregnancy, and the strain on the healthcare system. These experiences were complex and often interconnected, with many participants reporting stress related to multiple health and wellbeing challenges at once. For example, one participant noted *“I’m a frontline health care worker worried about increasing demands on our health care system and my risk for catching COVID at work. Plus, my husband has been sent to work overseas in a dangerous region and his safety concerns me”* #87.

**“Getting COVID”.** Contracting COVID-19 remained a concern for many participants, as similar sentiments were shared regarding worries of contracting COVID-19 themselves or a loved one getting COVID-19 during this time point. Several participants also noted worries about getting COVID-19 and spreading it to loved ones. One participant stated *“I have to go in for surgery in December, and I’m worried about catching COVID-19 in the hospital. To make things worse, my 64-year-old husband is immune-compromised, so I’m worried about bringing the virus home from the hospital to him”* #171. Among people discussing being stressed about getting COVID-19, several participants identified being most stressed about family or friends dying from COVID-19. Participants noted either the real or potential loss of a loved one due to COVID-19. For example, one participant shared, *“My Grandma died from COVID. Planning her funeral. Limits of who can come. Not being able to say goodbye”* #109. Additionally, some participants shared being stressed about unknowingly spreading COVID-19 to others. For instance, one person said, *“Getting infected with COVID and then giving it to a loved one”* #95.

**Navigating other Physical and Mental Health Challenges.** Similar to time one, participants continued to discuss the general health of themselves and their loved ones. This

included both physical health, such as chronic and new medical conditions, broken bones, cancer diagnoses, and mental health problems such as substance misuse and depression. Additionally, many participants discussed general health vaguely, surrounding worries of general physical and mental health. For example, one person shared *“the health and wellbeing of my parents”* #57, while another person said, *“Not being able to manage my mental health issues”* #889.

***Worries About Pregnancy.*** While some participants shared navigating various health conditions, another unique avenue of one’s health was among those who identified themselves or their partner being pregnant, and the stress associated with their pregnancy. This included stress related to getting sick while pregnant, delivering in a hospital or accessing services, and having a lack of support while pregnant. Specifically, one person stated, *“Getting Covid and losing my baby”* #149.

***“Strain on Healthcare System”.*** Within the conversation of managing various health problems and managing one’s pregnancy, participants discussed being most stressed about having to navigate the healthcare system during this time and inability to access adequate and appropriate care. For example, one participant shared, *“Having to go to the hospital due to a non-covid related emergency and being unable to get adequate and timely care”* #482. Another participant wrote, *“Waiting for a pathology report back and possible tumor diagnosis, and labs are taking 3x as long because of COVID”* #780.

**Theme 2. Public Health Guidelines.** The second main theme of this framework was related to participants’ reactions to public health guidelines. Specific subthemes included stress surrounding others not following guidelines, navigating emotional responses to restrictions, missing leisure activities, not getting to see family and friends, and isolation. One person shared,

*I want to go places and not feel like I'm taking a risk. My dad is a transplant recipient, so I worry about my contacts. I want to go places – even a store or to browse. I actually miss going to restaurants which I usually dislike. I want to be able to take the bus and not be in fear I'll get sick. I want to not wear a mask. I want to wear lipstick again. I want to plan a vacation. I want normal again. Everyone else is acting like things are normal and are raising cases. I'm sacrificing and I'm sick and tired of it. I feel like the only one who gives a damn and has the fortitude to do this. #959*

**Others Not Following Guidelines.** Within discussions of public health guidelines, Participants noted the stress they experienced related to others not following public health guidelines. Particularly, participants reported feeling stressed about others going against the rules and the possibility of seeing rising cases as a result or prolonging the pandemic. For instance, one person shared, *“I am continually stressed about people not following current health regulations and anti-vaccination ideology” #22.*

**Navigating Emotional Responses Due to Restrictions.** Some participants identified being stressed by the public health guidelines, with several participants not agreeing with the restrictions and having to navigate and manage their emotional responses from the restrictions. For example, one person stated, *“Unnecessary restrictions placed on myself as well as mental and economic hardship on my family as a result of restrictions” #167.*

**Missing Leisure Activities.** Due to the public health restrictions, many participants noted missing leisure activities, entertainment, and socializing with others. For example, one participant said, *“I miss cultural events. I miss my church community. I miss my in-person volunteer work” #117.*

*Not Getting to See Family and Friends.* Many participants continued to identify that they were most stressed about being unable to see family and friends at time two. Within this, participants also shared changes to family relationships and the impact of travel restrictions on being able to see loved ones. One person said, *“Hardest is not seeing my children, spending time with them and hugging them. Miss seeing friends in person and making plans with friends, family and other couples”* #156. Several participants also identified that they were currently most stressed due to relationship issues. For example, one participant said, *“I am having marital discord”* #301. Lastly, participants also continued to note being unable to travel and visit family and friends due to travel restrictions. Specifically, one person said, *“Not seeing family in the US since the pandemic started – I have a 2-year-old nephew that I would have visited 2-3 times; I feel that I am missing out”* #18.

**“Isolation”.** With participants noting being unable to see family and loved ones, several participants responded with the single word *“isolation”* #223, 410, while others identified with feeling isolated because of living alone and not interacting with others. Some participants reported being stressed about their older parents who are living alone or in long-term care homes and are unable to socialize or visit. For example, one participant said, *“The restrictions for # to visit my 87 year old father in-law. I have seen his mental decline progress rapidly due to social isolation”* #172.

**Theme 3. The Future of the Pandemic.** The third theme of this framework was characterized by participants thoughts on the future of the pandemic. Specifically, subthemes included the anticipation of a second lockdown and the negative implications of a lockdown around December holidays, rising COVID-19 case numbers, the development and availability of the vaccine, and how long the pandemic will continue to last. One participant said, *“Rising case*

*numbers and the health risk (physical and mental) to my community and loved ones, the impacts of COVID and related restrictions on my children” #636.*

***Second Lockdown.*** When discussing the future of the pandemic, participants noted the possibility of having a second lockdown in the near future and the impacts this would have, specifically related to being unable to see family and loved ones during holidays and the impact of a lockdown during winter. One person said,

*Having a second lockdown and being stuck at home again. Especially now that the weather is cold and we won't be able to go outside as much. I don't know what we will do... Especially if we can't see family for Christmas it will be extremely upsetting and I am trying to prepare myself for that but I worry about my depression getting bad again.*  
#70

Within the discussion of a second lockdown, participants noted being stressed about being unable to see family for upcoming holidays. For example, one person said, “*Not seeing family for Christmas*”. #3 Participants also discussed the impact of having restrictions and a possible lockdown during winter, with it getting dark very early and being unable to spend as much time outdoors. One person shared, “*The dark winter months of being unable to see my family in person*” #187.

***“The Rising Case Numbers”.*** With participants being uncertain of the future of the pandemic, participants also discussed the increasing cases and spreading of COVID-19 in their communities. For example, one person said, “*The huge increase in the number of new cases*” #327.

***The Development and Availability of the COVID-19 Vaccine.*** While participants talked about the future of the pandemic, many participants discussed the new vaccine that was being

developed and talked about worries of the availability of the vaccine as well as concerns for others who are hesitant to the vaccine or “anti-vaxx”. One person said, *“How long until able to see the vaccine and how effective it will be on the population. Can the vaccine cause allergies or other symptoms”* #65. The availability of vaccines was discussed by participants, with many individuals being worried about when they will be eligible to receive the vaccine. For instance, one person stated, *“Please just give me a vaccine for the love of god....”* #918. Lastly, several participants identified stressors related to others having “anti-vaxx” views and the impact on herd immunity and safety. One person said, *“Seeing the numbers increase while anti-maskers + anti-vax people become more vocal is extremely demoralizing. Those sorts of people are just prolonging the suffering for us all”* #300.

**“How Long the Pandemic will Last”.** Lastly, within the theme of the future of the pandemic, participants discussed the stress related to the unknown of the pandemic and how long the pandemic will continue. One person shared, *“The duration of the pandemic – “no end in sight”* #207.

**Theme 4. Daily Responsibilities.** The fourth main theme in this framework was stressors related to their daily responsibilities and the way the pandemic has impacted their ability to complete all responsibilities. Specifically, subthemes included stress surrounding parenting, work, completing university, and worries about “making ends meet”. One participant shared, *“Resilience, trying to continue working and taking care of family members with no break in sight”* #1030.

**Parenting stress.** Participants discussed the stress they experienced as parents trying to navigate school closures and reopening, providing childcare, or navigating personal boundaries with changing restrictions. For example, one person shared, *“Whether I am making the right*

*decision in continuing to send my young children to school when I have the option and flexibility to keep them home for remote learning. My husband and I believe that attending school, in person, is best for their mental health” #279.* Participants also discussed being most stressed about school closures and the impacts of having kids at home, such as increased workload. Some participants noted the schools were open and they were worried about the safety of their children at school and possible future school closures again. One participant said, *“Uncertainty over my children not being able to attend school/daycare. Just how uncertain everything is from day to day, how it everything is” #71.* Several participants also noted stressors surrounding the lack of social interaction their children have and the impact that is having on their development. For instance, one person said, *“The impact of this on my kids’ emotional social and educational development” #774.*

**“Work”.** Many participants discussed stressors related to their work, such as being a frontline worker, navigating working from home, and experiencing an increased workload. For example, several participants stated *“work” #955,* while another participant said,

*My current caseload as a therapist within the WRHA is very heavy. My emotional drain is largely hearing about others stress due to Covid. In that sense, I can’t escape the talk about it – it’s in my professional life front and centre as much as in my own life. I find people talk about it as though I’m not also living in it.” #274*

**“My degree”.** Several participants identified being in university and discussed experiencing stress related to completing their assignments and projects on time, as well as managing university online. For example, one participant said,

*I am in graduate school, so most of my stress revolves around that and not being able to meet up with others from my program to discuss projects. My program is very group oriented and learning online does not do a very good job at facilitating that. #480*

While participants discussed navigating completing their degree, some participants shared the stress of completing all assignments and required projects for their degrees. One person said, “*University school work. Constant due dates on projects and assignments*” #123. Some participants identified being stressed about online university, with several participants mentioning the challenges with online courses. For example, one person said, “*Graduating university in Spring 2021. Online courses are extremely difficult and have lowered my GPA*” #828.

“***Making Ends Meet***”. Many participants reported being stressed about “*money*” #568 and “*finances*” #691, 795, 823, 887, 1035. Specifically, some participants noted being stressed about finances due to loss of work and some were worried about getting sick and having to take unpaid leave. One person said,

*Not having a job after next month — I was laid off from my job of 4 years and now only work 1.5 hours a week for another job. Most of my time is spent doing completely unpaid volunteer work. I don't know how I'll be able to continue to afford to live; I'm living off of savings now. #614*

**Theme 5. Global Factors.** The fifth and final theme of this framework was global factors, where participants discussed being stressed about global factors, with one emergent subtheme: the economy. A few participants also discussed climate change, societal impacts, global unrest, and injustice, however, the data related to these topics were not substantive enough to warrant subthemes. For example, one person said, “*Global unrest, social injustice,*

*systemic racism, illness and suffering” #761, while another participant shared, “factory farming (I’ve recently stopped buying meat)” #396.*

**“The Economy”.** Within large global concerns, several participants responded with being most worried about the state of the economy; more specifically, if the economic situation can recover, what the economy will look like in the future, and the future implications of the financial burden that governments have taken on due to COVID-19. One participant said, *“The recovery of the economy for the younger generation” #657.*

### ***Time 3 (May – July 2021): “This is Never Going Away”***

Feeling as though “This is Never Going Away” was a characteristic of this framework that was seen throughout many participant responses at this time point. During this time period Canada saw very high rates of cases and, while some provinces were starting to see some lifting of restrictions, many provinces were still experiencing strict guidelines on visitations and school closures. Within my analysis of time 3 “This is Never Going Away,” seven main themes were identified: the health and wellbeing of self and others; COVID-19 and the related restrictions and public health measures; navigating parenthood during the pandemic; unable to spend time with loved ones; managing work and financial uncertainty; daily life; and global issues. Below, I describe each of these main thematic areas in more depth, and additional quotes for each theme in this framework can be found in Table 3.

**Theme 1. Health and Wellbeing of Self and Others.** The first theme of this framework relates to the overall health and wellbeing of both oneself and others, which has continued to be a major stressor for many participants, as discussed earlier in both time 1 and 2 frameworks. Several people wrote *“health” #597, 790*, as their main stressor. Within this main theme, subthemes included navigating physical and mental health challenges and diagnoses, feeling as

though they received inadequate healthcare treatment and management, and being stressed about getting COVID-19.

***Navigating Physical and Mental Health Challenges and Diagnoses.*** Within their discussions of health and wellbeing, participants shared current and recent physical and mental health difficulties that were a main source of stress for them at this time. Several participants discussed navigating recent physical health diagnoses such as, “*Worried about my medical future concerning having prostate cancer now*” #382. Additionally, some participants noted challenges with mental and/or physical health due to lockdowns, such as, “*My mental and physical health with the lockdowns*” #915.

***Inadequate Healthcare Treatment and Management.*** Alongside having to navigate various health conditions, several participants discussed being unable to manage their health problems and receive adequate treatment. For example, one participant said,

*I have complicated physical problems related to breaking my neck 17 years ago and residual pain. My pain management has always been excellent if I remain active through swimming. Due to closures, this has not been an option for me for over half a year. My pain is becoming very hard to manage* #186.

***“Getting COVID-19”.*** COVID-19 remained a point of stress for many participants at time three, in line with the first two time points. Specifically, participants were concerned about spreading COVID-19 to vulnerable people and the new variants. Additionally, a few participants discussed worries about the impact of long COVID. One participant responded, “*Still covid and maybe a fourth wave with the delta variant. I get distressed quite easily about all the world and local situations of covid*” #153. Other participants described being stressed about possibly spreading COVID-19 to vulnerable people in their lives, such as immunocompromised family

members and young children. One person said, “*Returning to work in an office space where others might not be vaccinated. I have a child who is 4 and unable to receive vaccination, I do not want her to get covid, especially the delta variant*” #482. People discussed the new variants at the time of the survey, including Delta. Specifically, individuals noted the unknown of new variants, related to symptoms, being easier to contract, and the possibility of vaccines not being effective for them. One person said “*Being at risk for the Delta variant, despite vaccines. The possibility of an even more virulent strain that the COVID vaccine is not effective against*” #555.

**Theme 2. COVID-19 and the Related Restrictions and Public Health Measures.** The second main theme of this framework was characterized by stress related to COVID-19 and the restrictions and public health measures being rolled out as precautionary measures. Within this main theme, subthemes included being stressed about the length of the pandemic, the availability, efficacy, and long-term impacts of the vaccines, and the Canadian – US border re-opening. One participant said, “*When this will end, what life will look like after covid, what repercussions may arise from the immunizations that we are at present unaware of*” #156.

***The Length of the Pandemic.*** In line with discussions of COVID-19 and its repercussions, participants discussed the length of the pandemic and its’ accompanying restrictions, with one participant saying, “*When this will end*” #689. Several participants talked about additional waves of infections, “*a 4<sup>th</sup> wave*” #256, and highlighted the new variants that may lead to a fourth wave. Several participants also shared similar sentiments related to “*returning to normal*” #612. Additionally, some participants discussed worries about never returning back to normal. For example, “*I am worried about whether we will ever get back to “normal”*” #945.

***Availability, Efficacy, and Long-term Impacts of the Vaccine.*** Alongside discussions of the length of the pandemic, participants discussed the COVID-19 vaccine, with many stressors related to being able to receive the second dose of the vaccine, the vaccine not being available for children, how efficacious the vaccine will be against new variants, and the potential long-term effects of the vaccine. Specifically, participants talked about the timeliness of getting the second dose and wanting to receive it as quickly as possible. Other participants discussed the stress they experienced associated with others choosing not to receive the COVID-19 vaccine. For example, one person stated, *“That those that refuse to get vaccinated for different reasons will cause the pandemic to continue”* #830. Some participants noted being stressed regarding how children were still unable to receive the vaccine, and the stressors associated with their kids at a greater risk of getting COVID-19, while restrictions are starting to loosen. One participant described, *“My child that can’t get vaccinated being in daycare and Alberta stopping quarantine requirements and testing”* #941. Other participants discussed being worried about how well the COVID-19 vaccine will work against the new variants. One person said, *“I’m concerned that the vaccine will not protect me/my family from the variants”* #85. Lastly, several participants discussed the long-term effects of the vaccine. For instance, one participant shared, *“Long term side effects from the vaccine”* #286.

***The Border Re-opening.*** Within stressors of the restrictions from COVID-19, participants discussed the impact of the borders possibly reopening. While some participants indicated being stressed about the border re-opening due to COVID-19 cases being higher in certain areas, other participants noted feeling stressed about the lack of clarity of when the border would re-open, given their inability to see family or become permanent residents. For example, one person said, *“Canada-US border opening with the COVID cases high in the US”* #1016,

while another person shared, *“Timeline of border reopening for easier travel (I am an American citizen, wife is not)” #1016.*

**Theme 3. Navigating Parenthood During the Pandemic.** The third theme in this framework was characterized by participants sharing their experiences navigating parenthood during the pandemic. Specifically, subthemes within this main theme included experiencing stressors related to having a lack of childcare and support, navigating pregnancy and having a new baby, and the impacts of remote learning on their kids. One participant shared,

*My kids not being in school. My kids’ wellbeing due to school closures. The impact on my work and my partner’s work due to remote ‘learning’. The fact it doesn’t seem to bother ANYONE as much as patios being closed or people going to hockey games that kids are not doing well being home from school. #71*

**Lack of Childcare and External Support.** Participants discussed not having childcare and having to balance work and caring for their children. Specifically, participants shared feeling stressed by the lack of support and having to manage their children, schooling, and other demands on their own. One such response included, *“Having no outside family support due to covid restrictions” #762.*

**Navigating Pregnancy and Having a New Baby.** Similarly to participants discussing the lack of support, several participants also discussed feeling isolated with a new baby or having to navigate pregnancy and preparing for a newborn, particularly in a more isolated manner with less supports than anticipated. One participant said, *“Preparing for delivering my baby” #833,* and another participant shared, *“Spending the winter cooped up with a baby as a first time mom” #528.*

***Impact of Remote Learning.*** With schools predominantly remaining closed, participants discussed stressors related to their children's schooling. Specifically, many parents noted their children being out of school and the impact of school closures on their children as well as themselves. One participant said, "*Impact of remote school on teenaged son's progress in school and social life*" #494.

**Theme 4. Unable to Spend time with Loved Ones.** The fourth main theme of this framework was participants sharing that they were unable to spend time with loved ones. Specifically, subthemes included feeling isolated, navigating comfort level with changes in restrictions, and loss of contact due to the continued travel restrictions. One participant said, "*Missing funerals of loved ones, not physically connecting to loved ones or friends who live out of my jurisdiction*" #207.

***Feeling Isolated.*** As seen in time two, participants continued to discuss feelings of isolation, and also shared the impacts of this prolonged isolation including difficulties maintaining a healthy lifestyle, negative mental health impacts, and losing connections with others. One participant stated, "*I am most concerned about feeling isolated and becoming accustomed to a more hermit style life. I worry that I will have a hard time adjusting to gatherings in the future*" #875.

***Navigating Comfort Level with Changes in Restrictions.*** As restrictions were changing during this time, participants discussed navigating their personal comfort level with the changing restrictions and balancing their desire to see people and their feelings of safety. For example, one person said,

*Not being able to have stress free interactions and gathering with family and friends.*

*Now that we are in phase 1, am able to spend time with immediate family outdoors as*

*weather permitting but still have the caution and uncomfortable feeling that other family, other grandparents, may arrive when we're visiting. #111*

**Travel Restrictions.** Another way that participants discussed being unable to see loved ones was through travel restrictions. Participants shared being stressed about the continued travel restrictions due to the impacts of these restrictions and being separated from family for a prolonged period. One participant shared,

*Not being able to see family due to travel restrictions/isolation requirements. My mom has cancer and I haven't been able to see her or support her in how I would like. I worry I am missing out on precious time with her. #20*

**Theme 5. Managing Work and Financial Uncertainty.** The fifth theme in this framework is managing work and financial uncertainty. Understandably, many participants continued to discuss stressors related to work and finances. Subthemes within this larger main theme included financial insecurity, finding employment, returning to work in-person, managing workload, and completing university. For example, one person shared, *"Completing my degree program and finding employment"* #829.

**Financial Insecurity.** In line with discussions at both time one and two, participants responded by noting their greatest stressor was *"money"* #695, 739, 790, and *"finances"* #249, 592. One person shared, *"My business (personal care services) has been consistently targeted to close despite our ability to manage and our skill set. I have personally lost thousands in revenue and have been forced to tap into my retirement funds"* #561.

**"Finding Employment"**. Alongside financial insecurity, participants also discussed worries about finding employment in the future. For example, one participant shared, *"Finding a new job as my academic program will end in August"* #878.

***Returning to Work In-Person.*** Similar to worries of work and job security, several participants discussed being stressed about returning to work in person, with some participants also noting stress due to a lack of support from their workplace. For instance, one person shared, “*My boss not truly believing the extreme effects of COVID and making light of the situation. The arm twisting I have to do to be able to work from home. Very little support at work due to differing opinions*” #587.

***Managing Work Demands.*** While participants noted that their work was a stressor generally, some participants also discussed being stressed due to an increase in their workload and trying to manage work demands along with personal life factors like childcare or coursework. One person shared, “*Workload in the mental health field while doing a PhD and grieving the loss of 3 important people*” #115.

***University.*** Lastly, several participants continued to discuss the challenges they faced in university. Specifically, some participants noted stressors related to graduate school and completing their doctoral degrees, while others discussed challenges with online classes and worries about safety returning to in-person classes. One person described, “*My grades dropping due to bad online classes*” #936.

**Theme 6. Daily Life.** The sixth theme of this framework was related to daily life, where participants noted various stressors in their life that they identified were part of their daily life and circumstances, rather than because of COVID-19. For example, one person shared “*My job experience prior to graduate school (not related to COVID-19)*” #66. Another person stated, “*Personal issues not related to COVID but potentially impacted by restrictions*” #515. Other people indicated stressors related to relationship issues, moving, and implementing routines. Due to the unique nature of each of the responses, no subthemes were identified.

**Theme 7. Global Issues.** The seventh and final theme of this framework was related to global issues, where subthemes such as large-scale issues including climate change as well as economic and societal stability were identified. One person shared, “*All the sadness in the world*” #184.

“*Climate Change*”. In line with many global issues, several participants identified being most stressed about climate change, with a few participants sharing the exact same response, “*climate change*” #539, 619, or “*climate crisis*” #127

***Economic and Societal Stability.*** Lastly, participants discussed being stressed about the “*economy*” #734, and “*general societal issues*” #223. Within this, participants discussed the current and long-term implications of economic instability, with responses focused on the impact of COVID-19 and response efforts on the economy. Responses also included stressors related to the recovery and outlook of the economy in the future. One person said, “*Impacts of the pandemic on Canada and the world’s economic and social stability and changing behaviors and policies based on lessons learned*” #37.

**Longitudinal Framework (May – July 2020, November 2020 – January 2021, May – July 2021): Navigating the “new normal(s)”**

Across all time points, phrases such as the desire for “*returning to normal*” questioning what the “*new normal*” would look like, and stressors related to the possibility of “*never going back to normal*”, were common. These comments were marked by the uncertainty that although things had changed throughout the pandemic, COVID-19 was still impacting them and controlling their ability to live life “normally.” Five main themes were identified in this longitudinal framework, including the impact of COVID-19; overall health and wellbeing of oneself and others; household economic instability; interpersonal and social connection; and

pandemic-related guidelines or “restrictions”. Additionally, it is important to note that across all time points, there were a few participants that reported, “not being stressed” or denying any major stressors. I did not want this small theme of not being stressed to get lost in the story, however, it was a small part of this overall picture, and as such, it is not seen in the main framework. Figure 4 provides a visual display of the longitudinal qualitative framework, and a detailed discussion of each main theme and subtheme is below.

**Theme 1. The Impact of COVID-19.** Across all time points, participants commonly discussed the vast impacts of the COVID-19 pandemic, such as the impact on the future, the availability and efficacy of vaccines, and getting COVID-19. While these were common themes across all time points, there were changes across experiences of what these impacts looked like and what types of stressors people reported at each time point. Within this main theme, several subthemes were identified, including participants wondering “what will the future look like”, discussions surrounding the availability and efficacy of vaccines, and being stressed about contracting COVID-19.

*“What Will the Future Look Like?”* As seen across all individual frameworks, many participants discussed this common theme of stress surrounding “returning to normal” and being unsure of what the future may hold, what the “new normal” may look like, and when that “normal” would start to unfold.

*Availability and Efficacy of Vaccines.* In line with the emergence of a vaccine in late 2020, a storyline emerged from the data surrounding discussions of vaccines, particularly at time two and time three. In time one, only several people noted vaccines, and these comments were often along the lines of worries that a vaccine would not be able to be made in time. At time two, the narrative shifted to stress surrounding when people would be able to receive the vaccine. At

this time, there were also some participants noting worries about possible long-term effects and the impact of “anti-vax” opinions. At time three, there was another shift surrounding the discussion of vaccines as many people had already received the first dose and were now citing that a major stressor was waiting to receive the second dose of the vaccine. Additionally, some participants also discussed stressors related to children not being able to receive the vaccine as well as stressors about the effectiveness of the vaccine on new variants that were emerging at the third time point.

***Contracting COVID-19.*** Unsurprisingly, at all time points participants discussed experiencing stress surrounding contracting COVID-19. However, it was very clear in the data that this was a dominant stressor in time one, with a significant amount of people endorsing that themselves or a loved one contracting COVID-19 was their current greatest stressor. This became much less of a focal point at the following two time points, and at time three it was particularly not part of the narrative for many people.

**Theme 2. Our Overall Health and Wellbeing.** A common storyline that emerged at all time points was an overall discussion of the health and wellbeing of themselves and others. Several subthemes were noted within this main theme including having to navigate experiencing pre-existing health conditions and navigating mental health changes.

***Navigating Pre-Existing Health Conditions during COVID-19.*** Across all time points, participants discussed managing pre-existing health conditions. During the first time point, many participants noted stress related to the possibility of contracting COVID-19 and having a worse outcome due to a health condition. Across time two and three, participants shifted the discussion of stress related to their health condition away from it impacting their outcomes with COVID-19

towards the lack of care they have been able to receive within the healthcare system due to restrictions and the strain on the Canadian healthcare system.

*Navigating Mental Health Changes During COVID-19.* Similarly, participants also consistently discussed worries about their mental health during the three time points during COVID-19, however, the discussion of mental health shifted at each time point. Specifically, at time one, many participants noted stress related to their mental health generally, and typically did not provide any context to their mental health challenges. At time two, there was more discussion of stressors associated with loved ones' mental health. In fact, many participants identified their greatest stressor was their children's mental health. At time three, we saw a discussion of stressors related to both one's own mental health challenges as well as loved ones at the forefront of the narrative. Moreover, there was more of a discussion surrounding the context impacting their mental health, with many people attributing their negative or deteriorating mental health to restrictions and having been unable to see people for a prolonged period.

**Theme 3. Household Economic Instability.** Expectedly, a major stressor across all time points was economic instability at an individual level. Within this main theme, the following subthemes were identified: personal finances, job security, and completing university.

*Personal Finances.* Being most stressed about personal finances was another subtheme that emerged for many participants at all time points. This was seen as a common theme where the narrative did not change over time, with many participants sharing similar sentiments related to financial loss and insecurity regardless of the time of the survey.

*Job Security.* Similarly, participants discussed worries about job insecurity at all three time points. However, there were some shifts in the discussion, particularly at time one where

many people were worried about real and potential layoffs, which moved to participants discussing worries about reduced work at time two, and finally, to more general worries of future job prospects and having to return to work in-person at time three.

*Completing University.* Across all time points, several participants noted stressors related to completing university online and the impact that online courses were having on the quality of their education.

**Theme 4. Interpersonal and Social Connection.** Interpersonal and social connection was a major theme that emerged as a stressor for many participants across all time points. Within this, subthemes included the impact of restrictions on relationships, feeling isolated, changes in socialization and ways of connecting, and parenting stress. The major emotions of loneliness, feeling overwhelmed, and isolated predominantly stayed consistent over time, however, there were nuances in the differences of how people were experiencing stress at different time points, as described in more detail below.

*Impact on Relationships.* Discussions surrounding changes or impacts on relationships were not seen in time one or three, however, this type of discussion did appear at time two. Specifically, there were discussions of tension with family members, particularly surrounding making difficult decisions about seeing others during the holidays and having to navigate those discussions with family members. Additionally, several participants identified stressors associated with their marriage during this time point.

*Isolation.* Many people brought up the term “isolation” and the stress associated with feeling so isolated. This was seen particularly in time one and three, where people in time one identified feeling very isolated, and time three people noted experiencing stress from prolonged isolation. Additionally, at time two there were several comments surrounding worries of

potential isolation, particularly with the upcoming holidays during that time point and people being worried about feeling isolated during that time.

*Changes in social contact.* At both time one and three participants discussed the ways in which they had to change their approaches to maintain social contact. At time one, several participants talked about using virtual methods to socialize, the fatigue associated with using virtual methods, and the fact that it does not replace physical interactions. At time three, there was a shift towards discussions surrounding having to change their ways of connection as the restrictions started to lift. Specifically, participants noted experiencing stress related to having to return to see people at events, worries about safety, and not being emotionally ready to return to more in-person activities and socialization.

*Parenting stress.* Across all time points, many participants discussed stressors associated with being a parent, navigating work and taking care of kids, the changes and impacts of school closures, and the loss of childcare. At time one, there was a dominant trend among many parents related to keeping their family safe and protecting their children and family, which was not seen in the later time points. Secondly, there was a pervasive theme of increased workload at time one among parents, with participants noting stressors related to balancing working and having children at home, which was no longer a dominant trend in times two and three. Lastly, at time one, many participants talked about being stressed due to school closures. At time two, the worries of school closures were still present, however several participants noted that some schools were currently open and they were most stressed about the possibility of future closures. At time three, the discussion returned to similar responses to time one, surrounding the impacts of schools being closed.

**Theme 5. Pandemic-related Guidelines or “Restrictions”.** Across all time points, a main theme was identified regarding pandemic-related guidelines or restrictions. Within this main theme, subthemes included stress concerning travel restrictions, lockdowns, and others not following restrictions.

*Travel restrictions.* Participants discussed travel restrictions at all time points, with most comments noting travel restrictions impeding their ability to see loved ones, however, the discussion of travel restrictions appeared very predominantly at time three. Specifically, many participants identified travel restrictions as a stressor and highlighted the length of time they had been away from loved ones because of these restrictions.

*Lockdowns.* At time one, the discussion of lockdowns was predominantly related to many people identifying they felt it was too early for things to re-open and a desire to continue to stay in the lockdown to ensure safety and reduce the potential of a second wave. At time two, there was a unique discussion to the time point related to being stressed about a possible second lockdown during the holidays. Many people identified their main stressor as the possibility of going into lockdown and, as a result, being unable to see family for the upcoming holidays. Similar to time two, at time three many participants discussed stress related to a future potential lockdown and further tightening of restrictions again.

*Others Not Following Restrictions.* At all time points, participants noted being stressed by others not following the restrictions. Towards time two and three, these discussions were seen more predominantly, which is not surprising given the length of time the restrictions were in place. Additionally, at time three, several participants began to discuss their personal dislike and disagreements with the restrictions in place.

## Quantitative Results

### *Prevalence of Stress*

Given that the aim of this project was to examine stress over time, the PSS and CSS were used to assess the rates of both perceived stress and COVID-19-related stress at each time point. At all time points, most participants endorsed experiencing moderate or high levels of perceived stress (76.4% at time 1, and 71.5% at times two and three), compared to low levels of perceived stress. The CSS was only measured at times two and three and is comprised of five scales: danger and contamination, socioeconomic consequences, xenophobia, reassurance seeking and compulsive checking, and traumatic stress symptoms. As seen in Table 4, scores for all scales decreased from time two to time three.

### *Quantitative Variables for the Longitudinal Qualitative Framework*

As discussed earlier, with the aim of gaining a deeper understanding of the experiences of stressors and changes of stressors among Canadians during COVID-19, several quantitative variables were examined to assess quantitative domains that mapped onto the qualitative longitudinal framework. See Figure 2 for a joint display of the longitudinal qualitative framework and the chosen quantitative variables that map on to each theme. Additionally, Table 5 provides descriptive statistics for four variables at each of the three time points, which map onto three of the five domains from the qualitative longitudinal framework (job status and income change both represent the household economic instability theme).

**Theme 1: Impact of COVID-19.** The first theme from the qualitative longitudinal framework was the *Impact of COVID-19*, which mapped on to the quantitative variable which asked participants to rate the level they believed the COVID-19 pandemic has impacted their life. As seen in Table 5, few participants reported that COVID-19 has not impacted them at all.

In fact, time two and three numbers are not provided in the table given the small cell size at both these time points, indicating very few participants endorsed this option. Rather, most participants endorsed that COVID-19 impacted their life moderately or a lot at all three time points, with minimal variability across the time points.

**Theme 3: Household Economic Instability.** The third qualitative theme was Household Economic Instability, which was represented by the variables income change and job status. Importantly, this showed that nearly 40% of our sample (39.2%) endorsed that their income had decreased because of COVID-19 at the time of the first survey. After this, fewer participants reported that their income had decreased (8.2% at time two, and 15.5% at time 3). At both time two and three, over a quarter of the sample (25.2% at time two and 28.4% at time three) reported that their income had increased since the time of the last survey. Similar to the decrease in income, the highest percentage of participants reported being laid off at the first time point (14.5%, compared to 9% at time two and 7% at time three).

**Theme 4: Interpersonal and Social Connection.** The fourth qualitative theme was Interpersonal and Social Connection which was examined quantitatively with the PROMIS Emotional Support questionnaire and was only measured at times one and three. The vast majority of the sample reported having social support at both times one and three (90.7% and 93.2%, respectively).

## Discussion

This project, aimed at examining stress over time, through a longitudinal mixed methods approach, demonstrated stable high perceived stress quantitatively, as well as five main themes of greatest stressors qualitatively. While there were qualitative frameworks for all individual time points, the discussion will focus on the longitudinal qualitative findings. This framework

showed that the five main greatest stressors during the COVID-19 pandemic over time among Canadians are: the direct impacts of the COVID-19 virus, the overall health and wellbeing of oneself and others, household economic instability, interpersonal and social connection and pandemic related guidelines and “restrictions”. The spectrum of stressors resulting from the pandemic are vast and impact functioning in both daily life as well as psychological wellbeing. This was the first Canadian study to use a longitudinal mixed methods approach to examine stress among a Canadian sample, which provided a rich and detailed understanding of stress over time, through both quantitative and qualitative findings.

### **Quantitative Findings of Stress**

The quantitative findings related to perceived stress and covid stress demonstrated high rates of perceived stress at time one, which decreased slightly at time two, and stayed stable at time three. As previously identified, the range for perceived stress among any study sample has been vast (i.e., 5 – 90% Benatov et al., 2022; Boluarte-Carbajal et al., 2021; Chima et al., 2022; Cooke et al., 2020; Limcaoco et al., 2020; Parvar et al., 2022), due to differences in the sample population, the measure of stress, and time point during the pandemic. However, the prevalence of participants experiencing moderate to high stress is slightly lower, but similar to Benatov et al., (2022), who examined perceived stress across participants in Germany, Israel, Poland, and Slovenia at two time points during the COVID-19 pandemic: February 2021 and May-June 2021. They found 83% of participants reported moderate to high levels of perceived stress at time 1, followed by 78% at time 2. Additionally, the rates in our sample were slightly lower than other findings among Canadian samples, with one study finding 85% of an Albertan sample reported moderate to high levels of stress in March 2020 (Chima et al., 2022). It is possible that these rates are different because of differences with the sample population, as Chima et al., (2022)

used a sample comprised of participants who had accessed and used Text4Hope, a supportive texting service to promote mental health. As such, this sample may have been more likely to be experiencing higher rates of mental health symptomology and stress. Benatov et al., (2022) examined stress among participants in four different countries, which may have been experiencing different restrictions and rates of cases at the time of data collection than seen in Canada.

Scores on the CSS in this study were similar to that of Asmundson et al (2022), who examined CSS scores among Canadians and US residents at time two time points (March – April 2020 and March – May 2021). Consistent with their findings, rates on all scales of the CSS decreased from time one and time two. All scale items were similar to, or slightly higher than, those of Asmundson’s et al (2022) findings. These slight discrepancies may be because they recruited from Canada and the US, and their first time point was 6 months earlier than ours. Overall, these findings highlight the prolonged rates of stress experienced by many Canadians over the course of one year during the pandemic.

### **Longitudinal Qualitative Findings of Stress**

The longitudinal qualitative thematic framework bears some resemblance to a framework created by Maison et al., (2021) who completed interviews with 20 participants from Poland at six time points within the first six months of the COVID-19 pandemic. Their study sought to investigate what were the “biggest challenges connected to the COVID-19 pandemic and the resulting restrictions” (p. 4). Their thematic analysis identified the five greatest challenges reported by participants; “1) limitation of direct contact with people, 2) restrictions of movement and travel; 3) necessary changes in active lifestyle; 4) boredom and monotony, and 5) uncertainty about the future” (p. 1). Similarities in these frameworks support that some major

stressors and challenges have been a universal experience for many people, even in different countries, which has important implications for the recommendations for future pandemic planning, as these findings suggest many countries could follow similar recommendations to support their residents.

### ***Theme 1. The Impact of COVID-19***

The first longitudinal theme of this framework is *the impact of COVID-19*, which focuses on impacts of the virus directly, including contracting COVID-19, worries about the eligibility, availability, and efficacy of the vaccine, as well as broader worries about the uncertainty of the future. Expectedly, many participants talked about experiencing stress related to either themselves and/or their friends and family contracting COVID-19. This was a discussion seen at all time points; however, it was very predominant at time one, and gradually became less of a focal point at times two and three. This finding is consistent with other literature examining worries about contracting COVID-19 among Canadians, which found that 67% of respondents were moderately/very anxious about themselves getting COVID-19, and 88% were anxious about loved ones getting COVID-19 during the first four months of the pandemic (Turna et al., 2021).

Many participants in our study discussed the eligibility and availability of a COVID-19 vaccine, which was seen to shift in the story based on the timeline of vaccine availability (i.e., at time one, people were hopeful for a vaccine, at time two people were waiting for eligibility to be announced for people to receive their first dose, and at time three, people were waiting to be eligible to receive their second dose). Contrary to research examining hesitancy of COVID-19 vaccines among Canadians, which found that 40- 60% of Canadians reported some vaccine hesitancy (Benham et al., 2021; Lavoie et al., 2022), very few participants in our study discussed

not wanting to receive the vaccine. However, several participants did discuss worries about potential side effects and the possible efficacy against new variants at time 3. This discrepancy may be due to the fact that participants in this study were not asked directly about their thoughts on the vaccine. Additionally, Benham et al., 2021 found that vaccine hesitancy was associated with lower education and Lavoie et al., (2022) found that people of colour and those with household incomes below the poverty line were more likely to report vaccine hesitancy. The majority of participants in our sample reported some undergraduate training or more, household incomes over \$100,000, and were predominantly White. Additionally, Zrnić Novakovic et al., (2023) found that when coding open-ended questions about stressful events during COVID-19, there was a significant increase in discussion surrounding vaccinations at the 12-month follow-up, compared to their first-time point. Furthermore, their quotes showed similar discussions surrounding worries of others not getting vaccinated and the availability of the vaccines.

Similar to findings by Maison et al., (2021), there were discussions surrounding uncertainty of the future during the pandemic. Furthermore, participants in both studies responded with more hope about the pandemic ending soon at earlier time points, while towards the later time points (Maison's 6<sup>th</sup> stage, our one-year follow-up), participants were responding with more confusion, loss of hope, and shifted to some disagreements with restrictions. This has important implications for future knowledge translation (a dynamic and iterative process that is comprised of synthesis and exchange of evidence-based information between researchers and knowledge users; Canadian Institute of Health Research, 2016) and mobilization efforts when trying to promote buy-in from residents over a long-term period.

***Theme 2. Overall Health and Wellbeing of Oneself and Others***

The second theme is *overall health and wellbeing of oneself and others*. This theme captured many common discussions surrounding managing both their own and other's overall health and wellbeing. Comments related to navigating pre-existing health conditions, mental health changes, and accessing adequate services, were discussed across time points. These findings suggested a lack of adequate resources and support for many people, who identified losing services or being unable to access services. These findings map on to a study conducted by Halley et al., (2021) which examined the impacts of the pandemic on people living with rare or undiagnosed diseases during the COVID-19 pandemic. Specifically, they used "thematic content analysis" (p. 2) to identify key themes. These themes included experiencing significant barriers to accessing essential healthcare, fear related to their risk if they caught COVID-19, and having their physical and mental health difficulties exacerbated because of the pandemic. Additionally, many participants in our study discussed navigating both their own and loved one's mental health challenges at all three time points, which is supported by robust evidence demonstrating mental health symptoms increased among Canadians during the first year of the pandemic (Lowe et al., 2023a; Zajacova et al., 2020).

***Theme 3. Household Economic Instability***

The third theme, *household economic instability*, brought up discussions related to worries of financial and work security, as well as university students navigating online courses. Many participants noted being worried about their finances and real or potential job loss. This is consistent with the quantitative findings, which found that nearly 40% of participants experienced a decrease in their income at time one, and 8% and 15% of participants also reported income decreases at time 2 and 3 as well. Although most participants reported not being laid off

at all time points (85.5% at time one, 90.9% at time two, and 92.8% at time three), 15% of our sample did report having lost their job at time one, which is consistent with unemployment rates during this time (Razak et al., 2022). Additionally, Zhou & Kan (2021) conducted a longitudinal study using UK Household Longitudinal Survey (UKHLS) to examine variables including changes in income, work hours, childcare, and distress levels during three lockdown and re-opening periods (April 2020 – March 2021). They found that, compared to pre-COVID-19, participants experienced a decrease in income, which increased slightly over time, but did not return to pre-COVID levels.

#### ***Theme 4. Interpersonal and Social Connection***

The fourth theme, *interpersonal and social connection*, demonstrated the common experience of relationships being impacted due to restrictions, feelings of isolation and loneliness, having to change ways of socialization, and parenting stress. These sub-themes are consistent with findings from Lowe et al., (2023b), who qualitatively examined the impacts of the pandemic on social connection in a Canadian sample. Specifically, their results found themes including weakened relationships, loss of social connection, changing ways of connecting, and navigating emotional consequences from these impacts on social connection. Interestingly, while many participants in our sample qualitatively reported feeling lonely and isolated, with a significant loss of social connection, the responses to the quantitative examination of social support suggested that the vast majority of participants reported having positive social support. This inconsistency may be due to the type of quantitative questions asked, as the questionnaire focused on having at least one person they can turn to, where qualitatively, participants may be discussing the loss of getting to see multiple friends and extended family.

One common subtheme within this theme was parenting stress. Specifically, parents in our study reported being stressed about school closures and the impacts on their children's learning and cognitive skills. Other researchers have examined the possible implications of school closures and Di Pietro et al., (2020) completed a review of current literature examining the impacts of COVID-19 on education and children's learning. They highlighted robust research that demonstrates that spending less time learning can lead to learning loss. This finding is concerning in the context of many studies suggesting students reported spending less time studying and learning in online school, compared to in-person learning. Parents also discussed worries of their children's wellbeing because of school closures, with many parents describing being stressed that their children's mental health were being negatively impacted. In line with these worries, other research has found parents reporting worse mental health of their children during the pandemic (Gadermann et al., 2020). Lastly, participants in this study described parenting stressors related to finding work-life balance, losing childcare, and navigating parenthood while having increased workloads. These stressors are consistent with research by Carroll et al., 2020, who conducted a mixed methods study examining the impacts of COVID-19 on Canadian families. Specifically, their qualitative analyses identified key family stressors including balancing work with childcare and working longer hours.

#### ***Theme 5. Pandemic-related Guidelines and Restrictions***

Many of our participants noted that their greatest stressors were associated with the restrictions and the impacts of loss of physical contact with people. At all time points during our study, some restrictions were in place across Canada. This meant that participants had some level of restrictions on seeing others, ranging from being unable to see anyone, even outdoors, to being allowed small gatherings indoors. While restrictions varied across provinces and at each of the

time points, the stress related to limiting direct contact with people was discussed by many people. This finding is consistent with qualitative research by Maison et al., 2021, where many participants discussed feeling stressed due to loss of contact. On the contrary, Maison reported many participants becoming non-compliant over time, and towards the end of their study (stage 5 and 6; June 2020, October/November 2020, respectively), nearly everyone breaking isolation requirements to some extent. This does not align with our findings, where participants discussed the impacts of being isolated for prolonged periods of time at time three. Additionally, Maison et al., (2021) identified a turning point in compliance during public holidays in May 2020, where participants broke isolation to spend time with friends and family, meanwhile, our study found that many participants reported pre-emptively deciding to isolate or worried about being isolated during Winter Holidays at time 2.

Many participants discussed the impacts of travel restrictions, particularly at time one and three. The discussion shifted over time to the impact of prolonged inability to see loved ones. These findings were similar to quotes seen by Zrnić Navokovi et al., (2023), where participants noted being unable to see new grandchildren or nieces and nephews for months or even years.

By examining the greatest stressors faced by Canadians during the COVID-19 pandemic through a longitudinal mixed methods approach, we were able to gain a deep understanding of stressors and how these stressors changed and stayed the same at three time points over a one-year time period during the pandemic. Our findings demonstrate major stressors experienced by Canadians over one year, amidst all of the changes of COVID-19. These findings provide many similarities to a wide array of prior literature conducted internationally, and among more specific populations (i.e., parents, older adults, or young adults). This project identified the greatest

stressors over a one-year time period among Canadians and they provide important implications for future pandemic policies to better support Canadians.

### **Collective Trauma**

COVID-19 has been deemed a collective trauma by many researchers, which is defined as “the psychological reactions to a traumatic event that affect an entire society” (p. 1, Hirschberger, 2018; Stanley et al., 2021). Other collective traumatic events include mass shootings or natural disasters such as tsunamis or earthquakes, which leave lasting impacts on the members of its society. Larger scale collective traumas include mass genocides including Indigenous peoples across Canada, the United States, and Australia, and the Holocaust (Hirschberger, 2018). While these traumatic events vary considerably, they have all impacted a group of people and have left lasting impacts, some of which are similar impacts, despite being different events. Many researchers have discussed how collective traumas force generations to learn from the experience and evolve and adapt, and inform future generations (Hirschberger, 2018). COVID-19 is a collective trauma that can be learned from to inform preventative measures in the wake of a future collective traumatic event. From these findings, it is clear that many Canadians experienced high levels of persistent stress. Interestingly, one study found that 20% of individuals in the World Trade Centre Health Registry reported new symptoms consistent with PTSD five years after 9/11 (Springer, 2020). This finding highlights how impacts from collective traumas can be long-lasting and may not surface for years. This is particularly important in the context of COVID-19, as we have seen high rates of perceived stress, and based on these findings, we may expect to see these rates continue to rise over the coming years. As such, mental health professionals and various government organizations should be prepared for

the likelihood of additional mental health services needs for residents experiencing symptoms consistent with chronic stress.

### **Limitations**

This study has several limitations that should be addressed. First, all participants were required to have access to the Internet to participate in the study. Therefore, the results are not generalizable to those without access to the Internet. It is also important to point out the sample used in this study was a convenience sample that comprised of individuals predominantly identifying as female, White, and with a high household income (Over 40% reported <\$100,000), and, as such, these results are not reflective of all Canadians experiences of stress during the pandemic, such as people of colour, those with diverse gender identities, and those from lower socioeconomic statuses.

### **Conclusions**

#### **Implications**

This study demonstrated that Canadians experienced many prolonged stressors during COVID-19, over a one year period during COVID-19, demonstrating the need for more supports, policies, and interventions that can both help Canadians manage their current stress and impacts of the COVID-19 pandemic, as well as help mitigate stressors in future pandemics. There are several recommendations for interventions to reduce stress currently and policies and supports for future pandemics that can be found through these findings.

#### **Knowledge Translation**

This study's findings highlighted the vast, long-lasting impacts of COVID-19 among Canadians. Similarly, recent research has examined and identified the impacts of COVID-19 on

a wide variety of behaviours including travel and transportation, health, racism/oppression, and consumerism, and sectors including local and global economies, education, and agriculture (Aaditya & Rahul, 2023; Arora et al., 2020; Elias et al., 2021; Chauhan et al., 2021; Habib & Anik, 2023; Peterson & Thankom, 2020; Tang, 2022; Sridhar et al., 2022). These findings highlight the extensive ramifications and changes because of COVID-19. However, within mainstream media, several journalists have noted that many Canadians and Americans are no longer worried about COVID-19, with many wanting to forget or naturally losing some memories of the pandemic (Sima, 2023; Tayag, 2022; Walther, 2021). While this study did not explicitly examine behavioural changes during COVID-19, responses indicated the vast impacts on participants' ability to complete day-to-day activities and shifts in their "normal behaviours". One knowledge translation activity that could stem from this project is an online movement to highlight "#COVIDleftovers"; the experience of behaviour changes or lasting impacts of COVID-19 to help people feel able to share their experiences and normalize behaviour changes since COVID-19 or still being impacted by various consequences of COVID-19, such as chronic stress. This movement will allow Canadians to share their experiences online through social media platforms like Reddit, Twitter, and Instagram. Based on the types of responses to this movement, future knowledge translation efforts could be made to promote specific resources or supports with various community organizations, such as peer support groups.

### **Current Recommendations**

Our findings clearly demonstrated high rates of stress at all time points during the COVID-19 pandemic, as well as constant stressors across the one-year period. These findings are particularly concerning, given the negative effects of chronic stress, the association of stress and comorbid mental health problems, as well as the increased likelihood of developing long COVID

when experiencing stress prior to getting COVID-19 (Boardman & Alexander, 2011; Goeders, 2003; Schneiderman et al., 20025; Sinha, 2008). As discussed earlier, the GAS model suggested that individuals who are exposed to chronic stress may enter an “exhaustion” phase, where they no longer have the ability of managing and adapting to the stressor. This theory also posited that during this stage, organisms can experience detrimental mental and physical health concerns. Both current research and theory have highlighted the deleterious impacts of chronic stress and highlight the critical nature of providing adequate supports to mitigate these impacts. Based on findings from this study, it is evident that Canadians were experiencing high rates of stress, and prolonged exposure to multiple stressors, such suggests that participants in this sample were likely in the “exhaustion” phase of the GAS model towards time two and three of data collection (Selye, 1956).

This study clearly documented the experiences of stress among Canadians and the findings call for urgent interventions to help mitigate levels of stress among Canadians to mitigate the deleterious effects discussed above. Specifically, it is important for healthcare professionals to be aware of signs of chronic stress, which can include physical symptoms such as headaches, body pain, difficulty sleeping, and an increase or decrease in appetite (World Health Organization, 2023). Additionally, chronic stress can exacerbate physical and mental health conditions (World Health Organization, 2023). Having health care professionals knowledgeable of common signs of chronic stress can help mitigate the long-term impacts of chronic stress if provided with adequate support and intervention. Several interventions that have been shown to be beneficial in reducing chronic stress among various populations are mindfulness-based stress reduction (MBSR; Khoury et al., 2015) and cognitive behavioural therapy (CBT; Lindsäter et al., 2018; Navarrete-Navarrete et al., 2010). Clinical psychologists

and other mental health professionals can receive formal training and expertise for these therapeutic approaches and the Canadian government should provide funding for accessible mental health services, such as MBSR and CBT to all Canadians, to help address and mitigate the impacts of chronic stress.

### **Recommendations for Future Pandemics**

Recommendations for policy changes and support for future pandemics can be identified from the qualitative and quantitative longitudinal findings.

#### ***Theme 1: COVID impact – Recommendation: Consistent, Clear Messaging.***

As shown in prior literature, participants were worried about the direct impacts of COVID-19, such as contracting COVID-19, at all time points (Turna et al., 2021). However, within these discussions, people also often discussed “the unknown” of the virus, of possible vaccines, and how best to protect oneself. Other researchers have already advocated for strong, consistent messaging from government and medical institutions at the beginning of the pandemic (Saqr & Wasson, 2020), and these findings support the need for clear, consistent messaging to help reduce the stress of “the unknown”. Within this recommendation, funding research is imperative to ensure experts are able to prepare for future pandemics and provide clear, thorough data to the public. The last component of this recommendation is ensuring that we are using knowledge translation to distribute research and share information to the general public. Initiatives for knowledge translation and providing data to the public are crucial to foster trust and build community, engagement, and buy-in.

***Theme 2. Overall Health and Wellbeing of Oneself and Others – Recommendation: Improve and Invest in Canada’s Healthcare System.***

As seen across Canada, the Canadian healthcare system was strained during COVID-19, and many healthcare workers reported high levels of mental health problems and burnout (Bates et al, 2021; Reynolds et al., 2022). Understandably, many participants in this study reported being most worried about themselves and loved ones accessing adequate services. Participants described delays and cancellations in their necessary healthcare treatments and other participants reported worries of being unable to receive emergency care if they needed to attend the hospital due to capacity limits. Hospitals need to address these significant delays in care by increasing service availability. Specifically, Canada should increase funding to hospitals and provinces and implement additional screening at all family physician offices to identify chronic stress or impacts from chronic stress, as well as to help identify any health problems that may have been missed during the closures of in-person services.

***Theme 3: Household Economic Instability – Recommendation: Use Existing Infrastructure to Protect Workers.***

Within this sample, participants continually discussed being worried about financial and job security. Quantitatively, nearly 15% of participants reported losing their job in March – May 2020. Furthermore, participants who identified as frontline workers qualitatively reported fearing for their safety due to a lack of PPE and support from workplaces. In future pandemics, the Canadian government should prioritize providing immediate support to essential workers, such as providing PPE. Additionally, given the move to remote work and the infrastructure for remote work that was built during COVID-19, institutions and companies should revert back to online

work in the event of future pandemics, while providing clear support and necessary resources to employees.

***Theme 4: Interpersonal and Social Connection – Recommendation: Recognize the Mental and Physical Health Impacts of Restrictions.***

One of the major responses to COVID-19 was the implementation of restrictions and lockdowns globally. There is a wealth of research that has examined the impact and perception of restrictions among many populations, as well as documentation of the length of restrictions in various countries and provinces (e.g., Bruinen de Bruin et al., 2020; CIHI, 2022; Murphy et al., 2021; Panchal et al., 2023). Within Canada, there were strict and long-lasting restrictions that, while resulting in less hospitalization and death rates compared to the United States and Europe, left many people reporting loneliness and isolation (McQuaid et al., 2021). Consistently, our qualitative findings highlighted feelings of isolation and loneliness, with many participants reporting being most stressed about being unable to see family and friends. For future pandemics, it is important to recognize the physical and mental health impacts of restrictions. Providing policies and support for people during lockdowns should be an important component of future pandemic response.

A distinct component of social connection that was seen at all time points was parenting stress, and, particularly, the impact of school closures. Many participants identified this as something they were most stressed about and highlighted the difficulty of having their kids home on their own ability to balance work and childcare, as well as worries about their children's education and social wellbeing. Towards later time points, participants also noted being upset that restrictions in various parts of Canada allowed for small gatherings and restaurants to re-open, while schools remain closed. Future pandemics could learn from these findings by

investing to create high quality online educational resources, making surveys early on in the pandemic to receive feedback from parents and teachers regarding what is working and what supports are still needed, and having transparency when implementing and changing restrictions towards the general public.

***Theme 5. Pandemic-related Guidelines or “Restrictions” – Recommendation:***

As noted, participants in this study began to voice some discontentment with the restrictions and their perceived usefulness of them towards the later time points. This is consistent with previous literature, that found Canadians’ perceptions of importance and compliance with public health guidelines and government response significantly decreased over the 5 time points in their study (Levitt et al., 2022, Time 1: April 2020 – Time 5: April 2021). Furthermore, our study also found that people were continually stressed about others not following the restrictions and jeopardizing their safety as well as the timeliness to “return to normal”. Given these findings, policies could be implemented to promote general public buy-in and involvement in restriction decisions. Manitoba did create several surveys for Manitobans to fill out and provide their feedback and perception on what type of restrictions they wanted lifted (Manitoba, 2021), however, these could have been provided to all provinces, and provided earlier and more frequently. Additionally, and similar to Theme 1 Recommendation, providing clear, transparent, evidence-based messaging to the public could help promote buy-in.

**Future Directions**

COVID-19 has changed immensely over the course of three years, starting with high levels of uncertainty, many waves of rising and decreasing cases globally and nationally, to more recently, on May 5<sup>th</sup>, 2023, when WHO declared an end to COVID-19 as a global public health emergency (Wise, 2023). While COVID-19 may no longer be a global emergency, the

repercussions of the pandemic are vast and will be impacting most people to some extent for decades to come. Additionally, experts have warned that it is not a matter of if, but when, another global pandemic will occur (Hodson, 2022). As such, it is imperative for research to continue to highlight the longitudinal impacts of COVID-19 to prepare future policy and supports for future pandemics.

Large, nationally representative, longitudinal datasets would be beneficial to better understand the experience of stress among all Canadians. Additionally, qualitative research examining the experience of stress during COVID-19 among a more diverse Canadian sample would be important to gain a better understanding of how all Canadians experienced stress and the potential unique and unmet needs of certain groups of Canadians. Lastly, it is imperative to continue research related to COVID and the continued impacts of COVID-19, including long COVID, chronic pain, chronic stress, and the general extended impacts that Canadians have gone through. Specifically, long COVID-19 has been identified as a major concern, with 1 in 10 infections of COVID-19 leading to long COVID (Davis et al., 2023), which is exacerbated by the fact that individuals who experience stress prior to COVID-19 are more likely to develop long COVID (Durstfeld et al., 2023; Frontera et al., 2022). Future research could examine the experience of those with long COVID and the experience of stress among this population. This research would provide a better understanding to support people with long COVID and could inform policy for supporting those with long COVID as well as for future pandemics to support those experiencing long-term symptoms.

Overall, the results of this research demonstrated the many stressors that Canadians faced, and highlighted long-term stressors that were present over a one-year time period during the COVID-19 pandemic. Qualitative responses sharing what participants were most stressed

about informed quantitative data analysis, which supported qualitative findings and highlighted the high prevalence of Canadians experiencing moderate to high levels of stress at all time points during the pandemic. These findings can be used to inform policy for future pandemic intervention and prevention planning. Future research should identify current and additional stressors faced by Canadians, given the rapidly changing COVID-19 context, which could include long COVID. Conducting this type of research would allow for future supports, policies, and interventions to best support Canadians in this “post-pandemic” world.

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**Appendix A: PROMIS Emotional Support-Short Form 4a**

**Please respond to each item by marking one box per row.**

	<b>Never</b>	<b>Rarely</b>	<b>Sometimes</b>	<b>Usually</b>	<b>Always</b>
I have someone who will listen to me when I need to talk.	1	2	3	4	5
I have someone to confide in or talk to about myself or my problems.	1	2	3	4	5
I have someone who makes me feel appreciated.	1	2	3	4	5
I have someone to talk with when I have a bad day.	1	2	3	4	5

### Appendix B: Perceived Stress Scale

The questions in this scale ask you about your feelings and thoughts during the last month. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

0 = Never      1 = Almost Never      2 = Sometimes Often      3 = Fairly Often      4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in life?	0	1	2	3	4
3. In the last month, how often have you felt nervous and “stressed”?	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way?	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life?	0	1	2	3	4
8. In the last month, how often have you felt that you were on top of things?	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control?	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	0	1	2	3	4

The PSS Scale is reprinted with permission of the American Sociological Association, from Cohen, S., Kamarck, T., and Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 386-396. Cohen, S., and Williamson, G. Perceived Stress in a Probability Sample of the United States. Spacapan, S., and Oskamp, S. (Eds.) *The Social Psychology of Health*. Newbury Park, CA: Sage, 1988.

### Appendix C: COVID Stress Scales

The following asks about various kinds of worries that you might have experienced *over the past seven days*. In the following statements, we refer to COVID-19 as "the virus".

	Not at all	Slightly	Moderately	Very	Extremely
I am worried about catching the virus					
I am worried that I can't keep my family safe from the virus					
I am worried that our healthcare system won't be able to protect my loved ones					
I am worried our healthcare system is unable to keep me safe from the virus					
I am worried that basic hygiene (e.g., handwashing) is not enough to keep me safe from the virus					
I am worried that social distancing is not enough to keep me safe from the virus					
I am worried about grocery stores running out of food					
I am worried that grocery stores will close down					
I am worried about grocery stores running out of cleaning or disinfectant supplies					
I am worried about grocery stores running out of cold or flu remedies					
I am worried about grocery stores running out of water					
I am worried about pharmacies running out of prescription medicines					
I am worried that foreigners are spreading the virus in my country					
If I went to a restaurant that specialized in foreign foods, I'd be worried about catching the virus					
I am worried about coming into contact with foreigners because they might have the virus					

If I met a person from a foreign country, I'd be worried that they might have the virus					
If I was in an elevator with a group of foreigners, I'd be worried that they're infected with the virus					
I am worried that foreigners are spreading the virus because they're not as clean as we are					
I am worried that if I touched something in a public space (e.g., handrail, door handle), I would catch the virus					
I am worried that if someone coughed or sneezed near me, I would catch the virus					
I am worried that people around me will infect me with the virus					
I am worried about taking change in cash transactions					
I am worried that I might catch the virus from handling money or using a debit machine					
I am worried that my mail has been contaminated by mail handlers					

Please read each statement and indicate how frequently you have experienced each problem ***during the past seven days.***

	Never	Rarely	Sometimes	Often	Almost Always
I had trouble concentrating because I kept thinking about the virus					
Disturbing mental images about the virus popped into my mind against my will					
I had trouble sleeping because I worried about the virus					
Reminders of the virus caused me to have physical reactions, such as sweating or a pounding heart					
I had bad dreams about the virus					

The following items ask about checking behaviours. ***During the past seven days,*** how much have you done the following because of concerns about COVID-19?

	Never	Rarely	Sometimes	Often	Almost Always
Searched the Internet for treatments for COVID-19					

Asked health professionals (e.g., doctors or pharmacists) for advice about COVID-19					
Checked YouTube videos about COVID-19					
Checked your own body for signs of infection (e.g., taking your temperature)					
Sought reassurance from friends or family about COVID-19					
Checked social media posts concerning COVID-19					

Found in: Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D. & Asmundson, G. J. G. Development and initial validation of the COVID Stress Scales. *Journal of Anxiety Disorders*.

**Table 1. Time 1 (May – July 2020) Framework and Quotes**

<b>Theme Title</b>	<b>Quote</b>
<b>The Health of Myself and my Friends and Family</b>	Health of my parents and family, health of my children and husband, potential exposure at work. #688
Getting COVID-19	Worried about myself or someone I love getting COVID and either dying or being permanently impacted by it. #319
Getting COVID-19 and having a severe outcome	Catching COVID and dying #980
Getting COVID-19 and spreading it to others	Spreading the virus as an asymptomatic carrier to loved ones who have a compromised immune system. #860
The health and vulnerability of loved ones	My oldest child has several health complications and I am most worried about him getting it. He would not survive COVID-19 so I am doing everything possible to keep him safe. #714
General Health and Wellbeing	Health of my family (currently living out of province and would be unable to be there if something happened) #276
Managing my health problems	Constantly looking out for any relevant symptoms. This has led to panic and anxiety attacks. #756
Navigating the Healthcare System for Myself or Those Close to Me	My husband had a serious medical illness arise during Covid-19. He now has to have infusion therapy which lowers his immune system. I am worried about his health and my inability to attend appointments with him. #884
Visitor restrictions	Grieving the loss of my oldest sister (90 yrs - not covid related) and the state of health of 3 other siblings all in their 90s. One is a cancer patient in his last days and I can't visit. #64
Delayed and Cancelled healthcare services	Family member is fighting cancer during the crisis in Montreal. Treatments are harder to get by and put her at risk of contracting COVID. #391
<b>Future of Our Society</b>	I am concerned about the lack of trust I have in those in power to make decisions which prioritize public health, rather than economic factors. This makes me scared that these greed based decisions will lengthen the effects of the pandemic. #230
Impact on the Economy and Society	That there will be a global recession that will impact life as we know it. #32
Impact of restrictions	The continued restrictions on my work, social activities and entertainment. #261
Others not Following Restrictions	The shocking lack of concern from the greater population around social distancing measures. #87
Re-opening or Lifting of Restrictions	<i>"I am concerned about how quickly the government is returning us back to business as usual". #183</i>

<b>Changes in Finances, Work, and University</b>	Going back to work, not knowing how my employer is going to protect me and the clients our business serves, being laid off again because my employer will have a reduced case load. Loss of 50% of my retirement funds due to stock market losses with very little chance of recovering. #76
Worries about Job and Finances	That my job won't call me back even though they said the lay off was temporary. And what it will be like when I go back. And making ends meet while I'm off. And how it will affect our plans for the future financially. #379
Job Loss and Loss of Income and Finances	Loss of some income as I am unable to pick up shifts at work due to the people who work more than 1 job now being given the extra shifts despite having less seniority than me because I don't have a second job. #652
Facing Financial and Job Insecurity	Income and if I will still have a job at the end of all this. #697
Adult Children Experiencing Job Loss and Financial Struggles	Son completing his program at Polytech (currently "on hold") #162
- Future Job Prospects	Finding a full time job once this is over. #935
Shift to Working from Homes	Work. Teaching online has been difficult. #149
Increased Workload	The workload generated due to now working from home. #8
Returning to Work	Returning to work at a hospital (currently working from home). #674
Being Unsupported by my Workplace	Going back to work, not knowing how my employer is going to protect me and the clients our business serves. #76
The Impacts of Being or Living with a Frontline Worker	Because I work in a hospital I will take something home to my husband and make him sick. That is the biggest worry. Not being able to spend time with him. Also I feel non-compliant, my Prime Minister is telling me stay at home, my Premier is saying stay at home - and off I go everyday out in the world....scared! #259
Impacts of having frontline workers at home	I am living away from my home. My wife is a long term care worker and we felt it was safest I live with my daughter due to high probability of wife being exposed (has happened with co workers and residents she cares for) With embolism, age and other issues we felt my exposure could be fatal. It is very stressful not living with her, and very anxiety ridden. When will it end??? #45
Navigating Online University	Completing my PhD and how I will be able to complete this within a reasonable time without access to the lab. #335
Quality of online education	How this will affect the quality of my education when I return in the fall. #79
<b>Experiencing Isolation and the Loss of Contact with Loved Ones</b>	How long it will be to be able to "freely" be around loved ones. And not having those social connections that I'm used to having every day. #573

Not getting to see Family or Friends	Not being able to see my partner (we don't live together and visits aren't allowed here right now). #709
Travel restrictions	Not being able to travel to see family members in another province - especially a sibling who is terminally ill. #494
Virtual Socialization and Lack of Physical Contact	Not being able to hug family and friends. #67
Being alone	How much I miss people. I feel so disconnected. #308
<b>Parenting Stress</b>	That I have to work as a nurse, parent, and teach my kids their schooling. It's too much. The village that it takes to raise children is no longer available to meet our needs. #157
Keeping family "safe"	Making sure all family members are OK. #382
"My children not being in school"	My children staying occupied out of school. #74
Challenges "balancing work and home life"	Balancing work at home while caring for 4 children, 3 pets, keeping up with household demands, grocery shopping, preparing meals, helping the kids with their school work ... #121
"Everything my Child is Missing Out on"	I'm most concerned about the quality of education my children are receiving while at home. #279
Lack of Childcare	Childcare, as my husband and I are both considered essential workers. My daughter has had to be shuffled between family members for care. #643
Worries about Kids Returning to In-person school	When schools will be able to reopen safely. #1025
<b>Uncertainty of the Future</b>	The unknown. What is the world going to look like after? #115
"When Will it End?"	When will this end?! Because I can't see how this is sustainable! #324
"A second Wave"	A second wave occurring as a result of reopening. #701
Vaccines	It will take too long to come up with treatment/vaccine. #12
"Unknown Effects of the Disease"	The unknowns of this virus and disease - how much is actually around (lack of testing), long term effects of illness and recovery, long term immunity. #205
"Return to Normalcy"	When things will return to normalcy. #995

**Table 2. Time 2 (November 2020 – January 2021) Framework and Quotes**

<b>Theme Title</b>	<b>Quote</b>
<b>Health of Myself and Loved Ones</b>	I am worried about my loved ones' health, especially my mom who developed a cancer diagnosis at the exact same time that the pandemic hit. #20
“Getting COVID”	That eventually someone I know will have COVID. How long can our luck hold? #155
Losing a Loved One to COVID-19	The possibility of my parents catching and dying of Covid. #288
Spreading COVID-19 to Others	I am stressed about someone in my household getting Covid or me getting Covid and giving it to someone else unknowing. #1008
Navigating other Physical and Mental Health Challenges	I have a new medical condition that causes extreme pain and makes it difficult to work. #301
Worries About Pregnancy	Going and staying in a hospital to deliver baby. #94
“Strain on Healthcare System”	The stress on our health care system as a result of the inconsistency between government “orders” and health officials’ recommendations which is subject to interpretation. #186
<b>Public Health Guidelines</b>	Working with students who do not need to wear a mask and do not remember to practice social distancing, while I am instructed to wear a medical mask and a face shield. I can not fathom why I can go into a building with over 100 people everyday, but I can not see my son who doesn't live with me. #711
Others Not Following Guidelines	How many people I’ve heard are going ahead with their holiday plans as usual and not following the restrictions in my area. #968
Navigating Emotional Responses Due to Restrictions	Our diminishing rights and freedoms: Increasing lack of freedom of speech and autonomy to make health decisions for ourselves. #143
Missing Leisure Activities	Not having the social activities anymore. #85
Not Getting to See Family and Friends	Time passing and missing out on time with friends and family. #112
Relationship Challenges	My dad being unhappy about me not coming for Christmas dinner. #863
Travel Restrictions	Inability to visit immediate family internationally due to practicality of travel and quarantine. #136
“Isolation”	Being isolated. Not enough interaction with others. Not enough exercise. #597
<b>The Future of the Pandemic</b>	
Second Lockdown	Going into restricted living or lockdown again. #364
Not being able to see family for the holidays	Code red, not being able to see loved ones on the holidays, being shut in at home during winter. #395

Restrictions during Winter	Spending the winter cooped up with a baby as a first time mom. #528
“The Rising Case Numbers”	The numbers increasing in this province. #1020
The Development and Availability of the COVID-19 Vaccine	Vaccines and if they will be mandatory. #852
Availability	An unclear roadmap to vaccination. #907
“Anti-vaxxers”	People actively NOT getting the vaccine. Antivax propaganda making it harder to build herd immunity. #465
“How long the pandemic will last”	Not knowing when it will « end » (or that it may never end completely). #693
<b>Daily Responsibilities</b>	
Parenting Stress	Keeping my job if my children are unable to attend school/daycare as a result of Covid. #832
Navigating school closures and reopening	My children's education - I feel they are safe on the days they are at school (the schools they attend have been amazing through all of this) but the constant changes and inconsistencies are getting to all of us. #705
Socialization of children	My child's social development, since they don't see anyone outside their class to play, have no organized activities, and are on the iPad too much. #486
“Work”	Managing school and work while isolated and dealing with mental illness. #1012
Frontline workers.	I'm a frontline health care worker worried about increasing demands on our health care system and my risk for catching COVID at work. #87
“Increased workload”	Not being able to finish specific work tasks before their due date (this has been influenced by COVID-19 due to the increase in difficulty related to scheduling with COVID restrictions). #472
Working from home	Working from home all day and lack of human connection. #473
“My degree”	My professional future -- my graduation date is now uncertain, my research data was impacted by COVID-19, my productivity is bad due to stress and this may impact my future in my career. #712
Completing school work	finishing my graduate studies- this whole year has felt like a write off of my phd. #691
Online classes	Increased course loads due to online courses. #55
“Making ends meet”	Financially will I make enough on a reduced salary in the new year. #18
<b>Global factors</b>	Climate change - the pandemic is much lower on my list of concerns. #629
“The Economy”	future financial implications for our province and country. #369

**Table 3. Time 3 (May - July 2021) Framework and Quotes**

<b>Theme Title</b>	<b>Quote</b>
<b>Health and Wellbeing of Self and Others</b>	“Health of myself and my family”. #29
Navigating Physical and Mental Health Challenges and Diagnoses	My physical and mental health (depression, anxiety, overweight, digestive health issues, other internal biological health issues, etc). #794
Inadequate Healthcare Treatment and Management	Unable to see a doctor, unable to get prescriptions filled, was turned away at urgent care. #831
“Getting COVID-19”	Myself, family members and friends contracting covid. #599
Spreading to vulnerable loved ones	Exposing my baby to COVID-19 through visitors. #391
New variants	New variants of concern are easier to get. #167
<b>COVID-19 and the Related Restrictions and Public Health Measures</b>	My province lifting mask mandates before cases are reduced and a higher percentage on vaccines are available. I am clinically extremely vulnerable and Sask health has not prioritized our group for 2nd vaccine doses so restrictions are being lifted before I can be fully vaccinated. It's terrifying and bull****. #429
The Border Re-Opening	Immigration - border closures meant that my husband and I had to file a whole new application, which means it will take longer for me to become a permanent resident and has involved a lot of stress and complication. (I moved from Canada to the US in October 2020.) #51
The Length of the Pandemic	How long the pandemic will last. #301
A Fourth Wave	A fourth wave shutting things down again in my area. #136
“Returning to Normal”	what/when will there be a return to normalcy. #178
Availability, Efficacy, and Long-term Impacts of the Vaccine	
Being able to receive the second dose of the vaccine	I had my second vaccine yesterday (Yay!) I'm still using masks etc., but I cautiously hopeful right now. #1050
Others choosing not to vaccinate	People who do not want to be vaccinated. #143
Availability of vaccines for children	That my 10 year old can't be vaccinated yet and everyone is acting like covid is over. #258
Vaccine efficacy against variants	New variants that respond to vaccines differently. #60
“Long-term effects from the vaccine”	What the vaccines long term affects are going to be in 5,10, or 15 years. #121
<b>Navigating Parenthood During the Pandemic</b>	Parenting 2 small children while working full time and having a partner who works in the ICU with extremely increased work hours. #1063
Lack of Childcare and External Support	I am concerned about childcare. #46

Navigating Pregnancy and Having a New Baby	Isolation with my new baby. #515
Impact of Remote Learning	My kids having to do remote learning and not having in-person classes as well as lack of social opportunities for them with respect to extracurricular activities. #244
<b>Unable to Spend time with Loved Ones</b>	Not being able to have stress free interaction and gathering with family and friends. Now that we are in phase 1, am able to spend time with immediate family outdoors as weather permitting but still have the caution and uncomfortable feeling that other family, other grandparents, may arrive when we're visiting. #530
Feeling Isolated	Social isolation cause less healthy lifestyle choices. #297
Navigating Comfort Level with Changes in Restrictions	I am not emotionally ready to interact with people outside my home or go back to the office. Back to work is planned for this summer and fall and I am extremely upset and am not coping well. #220
Travel Restrictions	I'd like to visit my grandmother in another province who is ill. #413
<b>Managing Work and Financial Uncertainty</b>	Balancing work, personal care... Also thinking about the future and how I will find work or be able to get into a grad school program. #72
Financial Insecurity	Not completing my degree before my money runs out. #715
"Finding Employment"	Finding a job for the fall after my summer job ends. #118
Returning to Work In-Person	Returning to work in unsafe environments (no open windows, no updated HVAC system, doesn't require staff to get vaccinated etc.). I might be laid off because I don't want to go into the office knowing these unsafe conditions but corporate requires staff to attend work 2-3 times a week. #196
Managing Work Demands	Conditions of my workplace. Staff shortages due to covid have increased workload on remaining staff. #67
University	in-person classes returning without appropriate safeguards/either a mask or vaccine mandate. #197
<b>Daily Life</b>	Something related to my youngest son. #127
<b>Global Issues</b>	Housing affordability... and the unsustainable path society is on. #332
"Climate Change"	Climate Change and collapse. #820
Local and Global Economic Instability	Impacts of the pandemic on Canada and the world's economic and social stability and changing behaviors and policies based on lessons learned. #17

**Table 4. Prevalence of Perceived Stress and COVID-19 Related Stressors at Each Time Point**

	Time 1	Time 2	Time 3
<b>Perceived Stress</b>			
Low Stress	245 (23.6%)	133 (28.5%%)	108 (28.5%)
Moderate/High Stress	791 (76.4%)	333 (71.5%)	271 (71.5%)
<b>COVID Stress Scales</b>			
Danger and Contamination	X	22.17 (13.43)	16.16 (10.72)
Socioeconomic Consequences	X	6.62 (4.06)	6.07 (2.49)
Xenophobia	X	6.32 (3.21)	6.21 (3.30)
Compulsive Checking and Reassurance Seeking	X	10.21 (3.91)	8.71 (3.26)
Traumatic Stress Symptoms	X	10.62 (4.92)	9.23 (4.08)

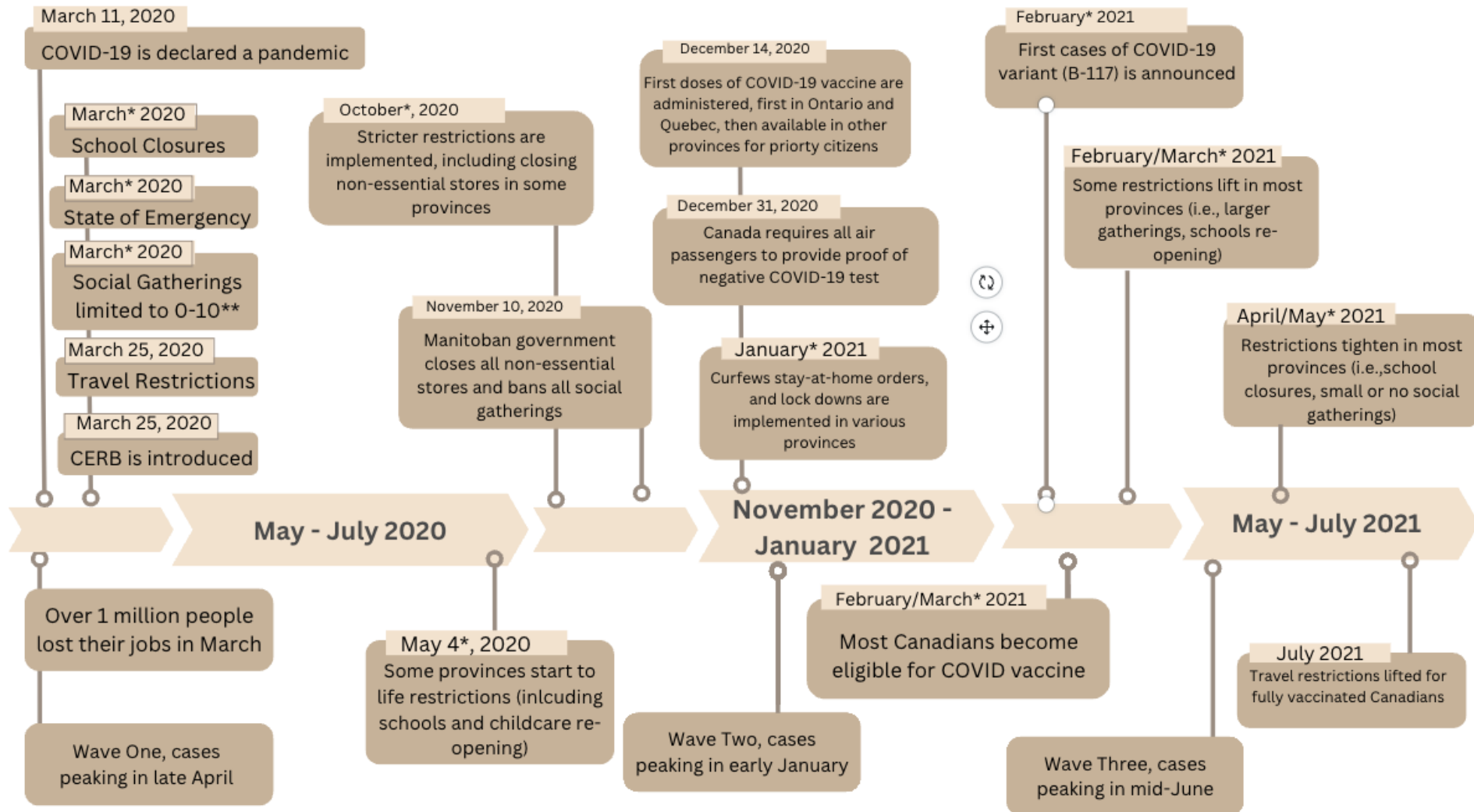
Note. X indicates that the measure was not given to participants in the survey at that time point.

**Table 5. Descriptive Statistics of Quantitative Variables for the Longitudinal Framework**

	<b>Time 1</b>	<b>Time 2</b>	<b>Time 3</b>
<b>COVID impact</b>			
Not at all	7 (0.6%)	-	-
A little	114 (10.3%)	38 (7.8%)	30 (7.5%)
Moderately	444 (40.2%)	176 (36.1%)	156 (39.2%)
A lot	390 (35.3%)	190 (38.9%)	155 (38.9%)
Extremely	149 (13.5%)	82 (16.8%)	56 (14.1%)
<b>Income Change</b>			
Increased	48 (4.2%)	126 (25.2%)	118 (28.4%)
Decreased	445 (39.2%)	109 (8.2%)	64 (15.5%)
<b>Job Status</b>			
Fully Laid off with security	85 (7.7%)	16 (3.3%)	6 (1.5%)
Fully Laid off without security	55 (5.0%)	25 (5.1%)	6 (1.5%)
Partially Laid off	20 (1.8%)	3 (0.6%)	16 (4.0%)
Not Laid off	945 (85.5%)	442 (90.9%)	374 (92.8%)
<b>Social Support</b>			
Yes (has social support)	904 (90.7%)	X	340 (93.2%)
No (no social support)	93 (9.3%)	X	25 (6.8%)

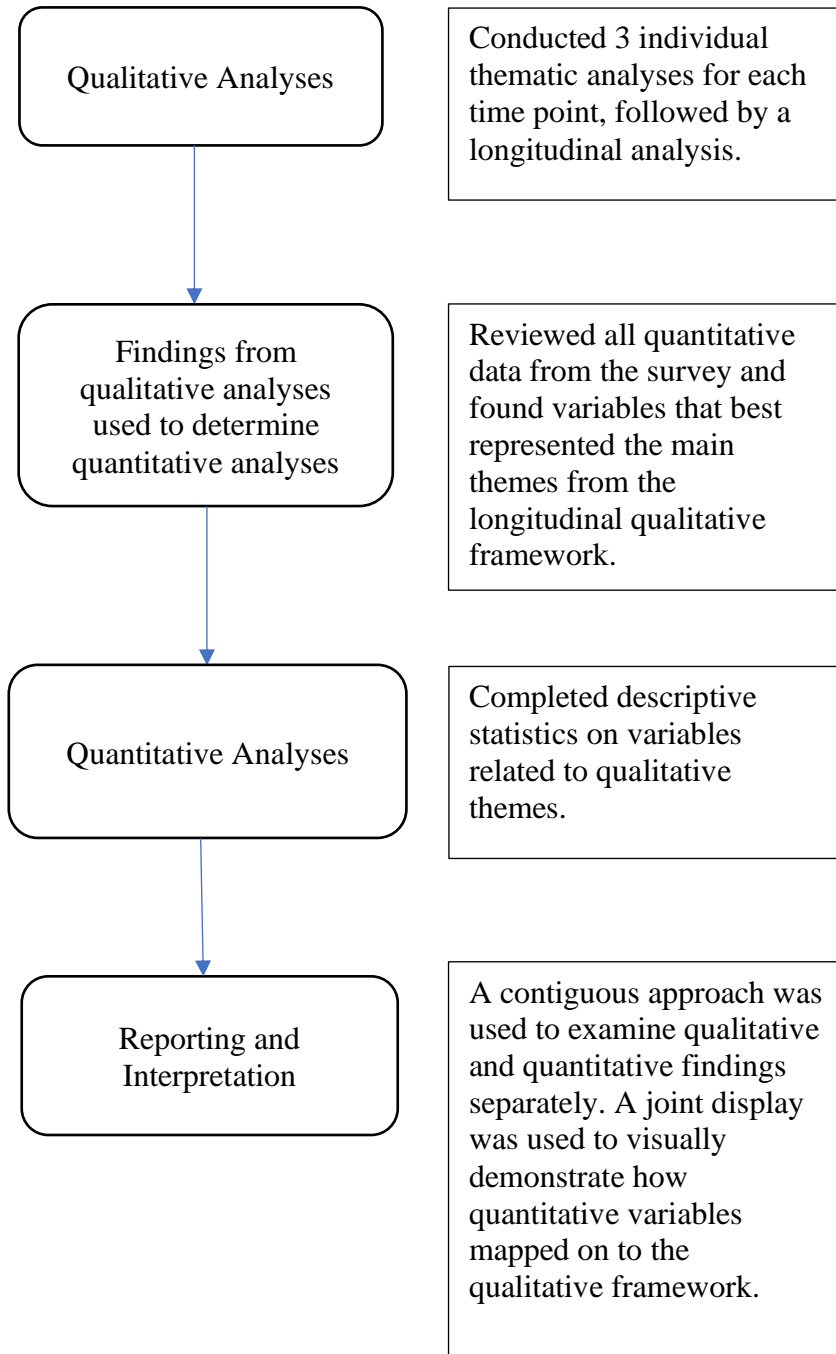
Note. X indicates that the measure was not given to participants in the survey at that time point. – indicates cell size was too small to report

**Figure 1. Timeline of Major COVID-19 Events in Canada, Corresponding with the Three Time Points for Data Collection**



\*Exact date varied by province, \*\* Exact amount varied by province

**Figure 2. Exploratory Sequential Mixed Methods Design**



**Figure 3. Narrative Joint Display of Qualitative and Quantitative Analyses**

Qualitative Theme	Quantitative Measure
Impact of COVID-19	COVID Impact
Overall Health and Wellbeing	-
Household Economic Instability	Income Change Job Status
Social Connection	PROMIS Emotional Support Short Form 4a
Pandemic Restrictions	-

**Figure 4. Longitudinal Qualitative Framework: Navigating the “new normal(s)”**



