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SAFETY AND HEALTH.
Remote versus On-Site Challenges during a Pandemic.

FINAL REPORT

MEMORIAL UNIVERSITY

NEWFOUNDLAND & LABRADOR, CANADA

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Safety and Health:
Remote versus On-site challenges during a pandemic.

Final report.

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EXECUTIVE SUMMARY

The goal of this project was to examine how the workplace policies and practices used to protect workers during the COVID-19 pandemic (isolating workers from risk by encouraging them to work from home and introducing protective measures for workers remaining at work) impacted the workers' health and ability to work both safely and effectively. The research was a three-phase mixed methods study to identify "best practice" recommendations for use in practice, planning, and policymaking. The objective was to provide new knowledge and the ability to raise awareness on the health, productivity and safety consequences associated with working during these unprecedented times in order to generate action through the development of practice recommendations. The three phases included Phase I (three online surveys administered over a period of a year), Phase II (qualitative interviews for more in-depth examination of experiences), and Phase III (Delphi Study with expert panel to examine best practice statements for final recommendations).

Phase I results highlight the need for certain occupational health and safety initiatives during a pandemic, but some had more positive effects on employees' attitudes and physical and mental health than others. Many of the results from the model analyses were predictable from the literature, such that the results were similar to pre-pandemic research results. However, several factors were unique to the pandemic that had statistically significant relationships with commitment, engagement, quality of work and general health. Some had small effects, but others had a large effect in terms of the number of attitudes, health factors and key outcomes.

Two attitudinal factors, specific to the pandemic, are relevant and important for any future pandemics: return-to-worksite self-efficacy (RTWS-SE), and vulnerability to personal protective equipment (PPE) failures. RTWS-SE had significant indirect effects on commitment and engagement through its positive relationship on perceptions of job characteristics, trust of management, and its negative relationship with job insecurity. Whereas, vulnerability to PPE

failures was deemed to be a "sledgehammer effect," such that it had significant relationships with the most attitudinal, health and outcome variables. It had significant indirect effects on engagement, general health, and quality of work, and direct effects on 13 other factors. Specifically, it had a positive relationship with the following health outcomes (i.e., higher vulnerability scores were associated with increased levels of): burnout and stress, cognitive stress, depressive symptoms, ear/nose/throat health issues, headaches and fatigue, and musculoskeletal issues. It was also positively associated with perceptions of emotional demands, workload demands, work pace, and work-family conflict, and negatively associated with perceptions of job characteristics, quality of leadership, and perceptions of social support and community.

Given vulnerability to PPE failures had such a broad range of relationships, it is critical organizations understand what may be related to the formation of this perception. The following organizational practices may help reduce the feelings of vulnerability: PPE use, e-signatures and no-touch sensors, occupancy limits and social distancing, and the use of physical barriers.

With regard to organizational intervention practices, there were two that were related to a lot of attitudes and outcomes: the use of e-signatures and no-touch sensors, and HVAC and air quality. The use of e-signatures and no-touch sensors not only helped with vulnerability, but also were positively associated with commitment and general health outcomes. Interestingly, the rate of workplace interpersonal mistreatment was also positively associated with e-signatures / no-touch sensors. HVAC and air quality practices did not directly relate to any key outcomes but were positively related to a host of perceptions and attitudinal outcomes: job characteristics, work pace, emotional demands, job satisfaction, justice, possibilities for development, and trust of management.

Organizational policies were relevant to employee outcomes during the pandemic. Again, some had small effects, but there were two that were deemed "sledgehammer effects." Timeliness of policies had a small effect on outcomes as it only had an indirect effect on engagement. Contact

tracing policies had indirect effects on general health and quality of work; whereas, policies regarding the prevention of transmission of COVID-19 were directly related to commitment and indirectly related to engagement. Thus, these two types of policies complement each other on the effects for the employee outcomes and one cannot substitute the other. In addition, contract tracing was more relevant for employees in rural/remote areas, and less so for those in urban settings.

However, policy comprehensiveness and policy transparency, each, had indirect effects on all four key outcomes. Given timeliness had a small effect on only one outcome, it appears to be more important that organizations are comprehensive and transparent in their policies more so than very timely. However, it would be inappropriate to say that late policies would not do harm.

Vaccination status was associated with improved general health, lower depressive symptoms and lower burnout and stress. Vaccination status also was positively related to perceptions of social support and community, better job characteristics, and perceptions of development possibilities, but it was also positively related to emotional demands and work-family conflict.

Distraction due to dependent care (elder-care and child-care) was positively related to depressive symptoms, burnout, and stress, and had indirect effects on general health (negatively). While the media and some research have focused on how women were burdened more with dependent care workload during the pandemic (e.g., Yildrim & Eslen-Ziva, 2020), the research also shows men experienced an increase in dependent-care and house-care duties (and more work-family conflict) (e.g., Del Boca, et al., 2020; Biroli, et al. 2021). Our results show that the relationship between distraction by dependent care and the health outcomes was not gender based. Anyone tasked with dependent care and felt distracted by it (regardless of gender) had these effects.

However, an interesting gender-based result indicated that remote work helped reduce work-family conflict for females, but increased it for males. In addition, remote work helped reduce

emotional demands on female workers, and males had no relationship between remote work and emotional demands.

Phase II (interview) results supported the findings from the Phase I. In particular, participants highlighted the importance of feeling safe while working during the pandemic and the fairness of the decisions implemented by the organization. Frustrations regarding fast, unilateral decisions of returning to the worksite or frustrations over insufficient training, resources (ergonomic chair/set-up), or too much or too little to do during lockdowns were associated with dissatisfaction or increase of stress. However, the lockdowns were associated with a reduction of fear for personal safety. To that end, remote work helped protect employee mental and physical health (in general). A key theme that arose from the interviews was the idea that a one-size-fits-all approach is not the best approach to work arrangements. For example, remote work during lockdowns was appropriate for most, but some might be in dangerous home situations so onsite may be safer for some individuals. Given organizations are responsible for occupational health and safety for all employee worksites, and in Canada domestic violence within the workspace is included in that consideration, organizations may need to provide accommodations to ensure workplace safety.

Interviewees noted the tension between what the organization could logistically do (financially and operationally) and what was being asked of the organization in response to the pandemic. Earnest efforts to protect the employees and do the right thing was appreciated. To that end, comprehensive and transparent policies helped with this assessment.

Finally, working while sick was discussed by participants. Most noted they were sick less often (or not at all) during lockdowns, and if/when they caught COVID-19, it "wasn't so bad" as they were well vaccinated by that time. The pressure to work while sick shifted with remote work, because they were able to work from home and tend to physical discomfort more easily; however, this created sources of stress for some participants, particularly when management engaged in

surveillance tactics to micromanage their productivity and/or workload, as this created a perception that workers needed to be working 'all the time' and not take the time needed to recover when feeling unwell. This was particularly relevant for those with less sick leave protection, as public health guidelines around quarantine procedures changed in the later phases of the pandemic.

Phase III (Delphi Study) results further substantiate the results from the first two studies. The following recommendations were supported as important by the panel experts.

Considerations for day-to-day operations. It is important to:

1. Ensure full transparency of organizational policies to all employees.
2. Have timely organizational policies.
3. Have comprehensive organizational policies to cover all aspects of the pandemic. to address changes in the pandemic.
4. Have organizational policies regarding how to reduce risk of transmission in place.
5. Reduce employees' concerns about vulnerability for exposures in the workplace,
   - to help employees feel safe.
   - to reduce uncertainty as much as possible by providing employees with access to valid and accurate information on the pandemic itself, and risks associated with it.
6. Adjust employee responsibilities to ensure workloads do not increase (or decrease) significantly in response to pandemic requirements.
7. Provide access to counselling and make stress management tools available to employees and managers.
8. Promote social connection amongst coworkers.
9. Promote social connection between employees and their managers.
10. Actively promote not working while sick <u>and</u> ensure that adequate sick leave time is available to support this policy.

Considerations for protecting human rights. It is important to:

1. Consider family considerations (e.g., children, elder care) when establishing safety initiatives and employee needs.
2. Ensure work arrangements can accommodate individualized needs as much as possible.
3. Consider employee gender for safety initiatives and employee needs in specific circumstances (e.g., exposure during pregnancy; adequate fit of PPE) while respecting contracts, collective agreements, and other relevant legislations.

Not important. It is likely not important to:

1. Require work arrangements that are the same for everyone.

2. Increase surveillance of employees when they work remotely.

Industry and/or context specific. The following recommendations may be specific to the industry or other contexts:

1. Have contact tracing processes in place and working well.
2. Offer remote work to protect worker health, safety, and productivity.
   - However, when remote work is provided, it is important to:
     - Provide training and assistance in developing new skills when transitioning employees to remote work; and
     - Help employees feel ready to return to onsite work.
3. To provide workers with pandemic-specific PPE measures.
   - However, if PPE is provided, it is important to:
     - Ensure provided PPE is proper quality and fit.
     - Provide training on appropriate PPE usage.
4. Consider the industry for other context-specific safety initiatives and employee needs in policy planning.

In terms of recommendations for the implementation of organizational practices to protect worker health, safety, and productivity, the following recommendations are noted.

Important. It is important to incorporate the following to protect worker health and safety:

1. Increase sanitization (hand-washing stations).
2. Increase ventilation (open windows).

Not important or feasible. It is likely not important or always feasible to incorporate the following to protect worker health and safety:

1. Improve indoor air quality through comprehensive HVAC systems.
2. Implement mandatory PPE.
3. Provide no-touch sensors in workspaces.

Industry or context-specific. It may be industry and/or context specific as to whether the following are important to protect worker health and safety:

1. Introduce physical barriers between workers.
2. Use virtual meetings.
3. Practice social distancing / limited occupancy, including the use of staggered shifts to reduce worker density.
4. Offer remote work arrangements to employees.

- However, if remote work is offered, it is important to provide ergonomic equipment to workers when working from home.

The results of our study provide empirical evidence regarding the impacts of working conditions on worker health, safety and productivity. In addition, the results of our study further substantiate gender differences in the implications of workplace safety initiatives.

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BACKGROUND

Under federal and provincial legislations, employers across Canada have a responsibility to reasonably protect the health and safety of their workforce. The COVID-19 pandemic created many challenges for employers to meet these responsibilities.

There were two main approaches workplaces enacted to protect workers from exposure to the virus throughout the pandemic: 1) isolating workers from risk by encouraging them to work from home (i.e., remote work arrangements); and 2) introducing protective measures for workers remaining at work (i.e., standard work arrangements). These strategies were designed specifically to protect workers from exposure to the COVID-19 virus. However, little was known about whether there were unintended consequences associated with these organizational policies and programs on workers' health and their ability to work effectively during the pandemic.

While pre-pandemic research shows there are some benefits to working from home, remote work has been associated with musculoskeletal symptoms linked to poor ergonomic set-ups, and prolonged working hours, increased rates of burnout, anxiety, and depression, feelings of isolation, and increases in work-family conflict. And, for those workers remaining at the workplace, concerns have been raised with the supply, fit, comfort, and performance of PPE and workers' perceptions of safety while at work. These factors are connected to workers' physical and psychological health, safety, and ability to work effectively.

It is critical to understand the role and perceptions of workplace policies and practices to protect the health and productivity of Newfoundland and Labrador's workers during the COVID-19 pandemic. This information is essential to bridge the current knowledge-to-practice and knowledge-to-policy gaps in occupational health and safety (OHS) related to working during an ongoing pandemic.

RESEARCH OBJECTIVES

The goal of this project was to examine how the workplace policies and practices used to protect workers during the COVID-19 pandemic (isolating workers from risk by encouraging them to work from home and introducing protective measures for workers remaining at work) impacted the workers' health and ability to work both safely and effectively. The research was a three-phase mixed methods study to identify "best practice" recommendations for use in practice, planning, and policymaking. The objective was to provide new knowledge and the ability to raise awareness on the health, productivity and safety consequences associated with working during these unprecedented times in order to generate action through the development of policy and practice recommendations.

Our aim was to examine whether differences in experience exist among workers across several key factors, including industry, sex and gender, and jurisdiction (urban vs. rural/remote settings). Much attention has been raised in the media regarding the gendered impacts of the pandemic. The results of our study provide empirical evidence regarding the impacts of working conditions on worker health, safety and productivity. In addition, the results of our study further substantiate gender differences in the implications of workplace safety initiatives.

Our research involved four stakeholder groups, involving different industries within the province of Newfoundland and Labrador: two were in education industry, one was oil/gas/energy industry, and one involved unionized workers in private, public and municipal sectors across a broad range of industries. All four stakeholder groups were involved in each of the three phases of the research: longitudinal (repeated measures) surveys, qualitative interviews, and a Delphi panel examining final recommendations for organizational policy and practice.

The methods and results of each of these phases shall be presented next.

METHODS

Phase I: Longitudinal Survey

The first phase of this research study consisted of a longitudinal survey conducted over the course of a year (2022-2023). Participants were recruited via an email recruitment program, which was administered through the stakeholder groups. Three surveys were conducted in late spring / early summer 2022, late fall 2022, and late winter 2023. New and returning participants were recruited for each round, and participants were invited to make a unique identifier code which they could use to link their survey responses together. During each round, the survey link was open for two weeks and participants were given two communications from their stakeholders' representative telling them about the opportunity to participate in the study, once on the first day of the link being open, and the second at the beginning of the second week. The survey was hosted by Qualtrics, and participants were invited to submit their contact information into a separate survey link for a prize draw ($20 gift card for every 50 participants per stakeholder group).

The surveys examined the relationship among employer policies and practices to protect workers from exposure to COVID-19, changing workplace conditions, workers' job-related attitudes and workers' physical and mental health during the pandemic.

Sample

Working with our stakeholder organizations, we employed a purposive sampling strategy to ensure broad representation of workers by age, region, education level, sex/gender, employer size, occupation, industry, employer size, and geographical regions within the province.

For each survey, the same target population (members/employees of the four stakeholder organizations) were sent recruitment emails each time. The recruitment email was circulated to potential participants by members of the research team using the stakeholder organization

distribution lists. For ethical considerations, at no point could any employer, supervisor, human resources employee, or research team member track who did or did not choose to participate in the study.

In the recruitment email, potential participants were informed that the research was examining how workplace policies and working environments influence worker physical and mental health, safety, and productivity during the COVID-19 pandemic. When a potential participant clicked on the URL link for each of the surveys, they saw the Letter of Informed Consent first. After providing informed consent, participants continued to the survey questions. If the potential participant declined participation, they were thanked for their initial interest and provided with contact information of the primary investigator.

Each survey had some participants who were new to the study (in Surveys 1, 2, and 3), and some who had completed a previous survey (in Surveys 2 and 3). Demographic characteristics for participants from each survey are presented in the results section below.

Survey Instrument

The questionnaire was pre-tested to ensure that it had a logical smooth flow, was clear and easy to understand, and covered all the domains necessary to address the project objectives. The questionnaire was also iteratively updated at each follow-up time-period to include any emerging pandemic-related factors during the three time-periods of the study.

Measures

All measures were adopted from the literature and were chosen based on excellent psychometric properties. Some additional items were included (as noted below) to capture new nuances due to the pandemic.

Demographic information. The demographics questionnaire included age, sex/gender identity, education, marital status, dependents, employment (including status, industry, and union status, among others), comorbidities, and whether they identified with a vulnerable population. Participants were also asked to disclose their COVID-19 vaccination status.

Workplace OH&S response to the pandemic. The questionnaire draws 5 items from a recent Chinese study by Wong and colleagues (2020), which examines worker perceptions of their workplace's COVID-19 response. These questions include 2 items assessing whether participants' workplaces have taken steps to protect workers from the pandemic and 3 separate ratings on how well these steps score on comprehensiveness, timeliness, and transparency.

Items specific to remote working arrangements. The questionnaire draws 8 items from the Rapid Office Strain Assessment (ROSA; Sonne, Villalta & Andrews, 2012) to capture information about the remote office work environment. The ROSA has been shown to have good reliability for the overall measure (IIC > 0.5). In this section, we have included 4 additional items on care responsibilities, pertaining to childcare (2 items) and eldercare (2 items) to assess their impact on participants' remote work-life balance.

Items specific to standard work arrangements. These items were presented to participants who indicated that they worked in person (either continuously or have since returned to in-person work). We developed specific items to assess the types of protective measures that workplaces have implemented (4 questions). We also examined workers' perceptions of the personal protective equipment (PPE) available to them, 2 items each on PPE fit, comfort, performance, and safety. We also captured details on PPE usage, PPE provisions (employer vs. employee), and the duration of time that PPE has been worn (1 item each).

Items specific to psychosocial working conditions. The Copenhagen Psychosocial Questionnaire (COPSOQ) III (Burr, et al., 2019) core items were used to generate items to collect

information on the psychosocial working conditions experienced by workers during the pandemic. The COPSOQ core includes 26 psychosocial domains including, but not limited to, work engagement (4 items), meaning of work (1 item), role clarity (1 item), social support from supervisor (1 item) and from team (1 item), and job satisfaction (1 item), among others. This tool has been shown to have acceptable levels of reliability ($\alpha \geq 0.7$, citation).

Items on worker physical health. To assess workers' physical health, we used 12 items from the World Health Organization's Health and Work Performance Questionnaire (HPQ, Kessler, et al., 2003). These 12 items are specific to the frequency that participants had experienced different physical symptoms related to health concerns (e.g., back or neck pain, headaches, among others).

Items on worker psychological health. To assess workers' psychological (mental) health during the pandemic, we used the following COPSOQ III optional modules (15 items): burnout (4 items), stress (3 items), cognitive stress (4 items), self-rated psychological health (1 item), and depressive symptoms (4 items). This tool has been shown to have acceptable levels of reliability ($\alpha \geq 0.7$, Burr, et al., 2019).

Analyses

Several analyses were conducted with each survey independently. First descriptive statistics using R (statistical software) (R Core Team, 2021) were completed to examine general trends in responses (e.g., perceptions on the timeliness/comprehensiveness of policies, experiences of workplace mistreatment, health measures, performance measures, job attitudes). These results were presented to the stakeholders throughout the term of the research. For normal, continuous data, mean and standard deviations were used, for non-normal continuous data, medians and interquartile ranges were used, and for non-continuous data, frequency counts within categories were used.

Exploratory data analyses (EDA) using data visualization were employed to understand the nature of data and the relationship between the work environment and the physical and psychological health of workers during the pandemic. The data was then analyzed using Partial Least Squares structural equation modeling (PLS-SEM) using SmartPLS software (Ringle, Wende & Becker, 2015) to provide further insight into the relationships among perceptions of organizational policies and practices with the outcomes of interest (e.g., job-related attitudes and perceptions, employee health, and organizational behaviours like quality of work performance). An inductive method was used for modeling the potential relationships, with the following guidelines in modeling: organizational initiatives and perceptions regarding policies were modeled as antecedents to the remaining outcome variables; perceptions of workplace conditions (e.g., demand, work pace) were modelled as antecedents to attitudes, health and other outcome variables; and final outcome variables were quality of work, work engagement, organizational commitment, and employee general health. Individual factors (vaccine status, distractions due to dependent (child- and elder- care) were modeled onto perceptions of policies and all outcome variables. (See Figure 1 for an illustration of the general model.) The PLS-SEM analyses permits the researcher to identify significant relationships and provides information on how much of the outcome variable is explained by the predictor variables. It is similar to a regression, but it reduces the risk of Type II Error (falsely concluding there is no relationship) (e.g., Jagpal, 1982; Hair, et al., 2017) and can disattenuate the path coefficient by estimating measurement error (Hair, et al., 2021; Ramayah et al., 2017).

The analysis was completed with the complete data set, and then again with Multi-Group Analysis for (1) gender (male vs. female), (2) region (urban vs. other regions), and (3) industry (Education versus Energy/Technical) to identify if the relationships differed on these contexts.

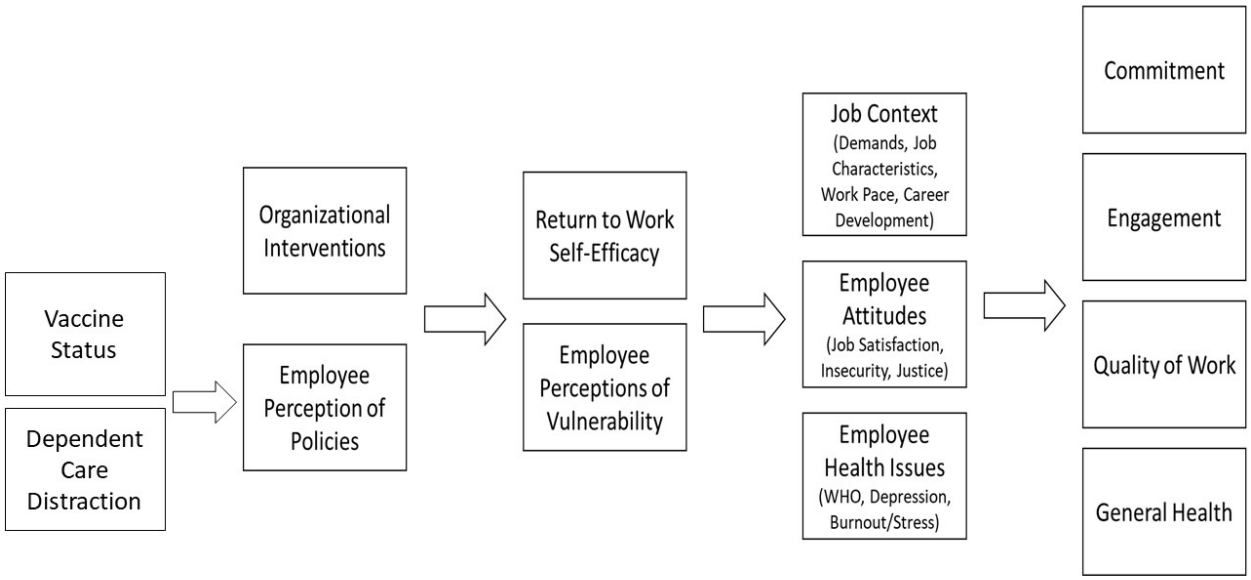

Figure 1: General Model Design for Phase I Survey Analyses

Phase II: Qualitative Interviews

The second phase of this research aimed to explore individuals' perceptions of their workplace policies and their impacts on employees' health, performance, and wellbeing during different phases of COVID-19. To this end, we implemented a qualitative research design. Using a qualitative method for the second phase/round while taking a quantitative method for the first phase/round of the study allows for data triangulation, collecting more diverse views on the intended topic. Using the results from the baseline survey administration from Phase I as an initial guide, we conducted semi-structured qualitative interviews with workers to further elucidate workers' perceptions of their workplace's pandemic policy effectiveness and related facilitators and/or barriers to maintaining health, safety, well-being productivity and organizational trust and commitment throughout the COVID-19 pandemic.

Sample

To identify potential participants for the interview phase of the study (Phase II), survey participants (Phase I) were given the option to submit their contact information if they were interested in participating in the interview portion of this study. Interested participants were contacted by a member of the research team.

Interviewees were purposively sampled, targeting individuals who possessed relevant experiences with either remote work or standard work arrangements during the COVID-19 pandemic. We used a maximum variation recruitment strategy with attention given to balance participant sex/gender, working arrangements (i.e., remote or standard), age, occupation, and geographic location (urban/rural/remote settings) within Newfoundland and Labrador.

As interviews progressed, research team members continuously analyzed the collected data, identifying emerging themes, patterns, or information gaps. This analysis informed the subsequent

recruitment process, allowing for the selection of participants who could contribute to the evolving understanding of how working conditions during the pandemic affected worker health, safety and productivity outcomes. Recruitment of interviewees continued until new interviews failed to offer substantial additional insights, indicating that saturation had been reached and data collection could be concluded.

Interview Schedule

Interviews were conducted from September 2022 to March 2023 and ranged in length from 39 minutes to 2 hours and 23 minutes. The interviews were conducted over WebEx, and participants could choose to enter the videoconferencing platform via phone or video call. Interviews were audio recorded with participant consent and transcriptions were generated by WebEx and edited by members of the research team for accuracy.

The design of the interviews followed the Consolidated Criteria for Reporting Qualitative Framework (COREQ, Tong, Sainsbury & Craig, 2007). Initial results from Survey 1 from Phase I were used in the development of the interview schedule. The interviews consisted of questions about the participants' workload, work location, PPE usage, essential worker status, fairness/justice perceptions, perceptions of physical and mental safety, as well as the perceived safety of their employment status. These questions were asked in relation to four timeframes: (1) before the pandemic, (2) initial phase of the pandemic (lockdown, unknown epidemiology), (3) second phase of the pandemic (vaccinations available and removal of some public health measures, (4) third phase of the pandemic (Omicron lockdown), and (5) the final phase of the pandemic (BA.2, removal of mandatory masking and most public health measures). This repeated-measures approach was used to capture the change over time of participants' experiences as they related to each significant phase of the pandemic.

Analyses

Anonymized data were reviewed and analyzed for content using a directed approach to content analysis (Hsieh & Shannon, 2005) starting with relevant research findings from Phase I as a guide for initial codes and organized into intermediary matrices (Guest, MacQueen & Namey, 2012). For analysis, a qualitative description approach was used. A qualitative description approach is especially well suited to research focused on gathering firsthand knowledge of individuals' experiences with a particular issue, in this case, working during the COVID-19 pandemic (e.g., Colorafi & Evans, 2016; Neergaard et al, 2009; Sandelowski, 2000).

Using this approach, the interview transcriptions were first checked and edited for accuracy, after which the interview recordings were destroyed for preserving the privacy and confidentiality of the participants. Then the entire research team (five individuals) coded one transcript using inductive thematic analysis and compared notes and process. From that discussion, a directed approach to content analysis was determined, which would enable capturing themes from each phase of the pandemic for each of the experiences discussed by the interviewees. Two levels of themes were derived for each transcript: one was directly derived from the data and was descriptive in nature; the other described the overarching theme of the interviewee's experiences during that particular phase of the pandemic. Each transcript was analysed by two independent coders. Upon completion, the two coders met and compared the codes. To resolve any disagreements in the individual codes provided by each coder, a constant comparative approach was taken for coding the interviews in which two coders met several times to discuss about disagreements and reach to a consensus in terms of the coding.

Phase III: Development of Policy and Practice Recommendations using a Delphi Panel

The third phase of this project utilized a Delphi technique to build consensus on specific recommendations to guide policy and practice arising from this study that are aimed to protect and support worker health, safety, and productivity. The Delphi technique is a structured method for achieving consensus or gathering expert opinions on a particular topic or problem. It involves a multi-round iterative process that aims to reach a group consensus through anonymous feedback and controlled communication (Hsu & Sandford, 2007; Landeta, 2006; Okoli & Pawlowski, 2004).

Policy and practice recommendations were derived from the results of both the quantitative surveys (Phase I) and qualitative interviews (Phase II). These findings were integrated using an explanatory approach, where comparable findings from both data sources were matched in a joint display analysis, and related to one another, allowing for a more nuanced and comprehensive understanding of the findings as a whole (Creswell, 2014; Guetterman, Fetters & Creswell, 2015). Results from this analysis, formed the basis of the material for the development of policy and practice recommendations to be validated by the Delphi Panel of OHS experts in the final phase of this mixed methods study.

Delphi Procedure

The Delphi Procedure (Hsu & Sandford, 2007; Landeta, 2006; Okoli & Pawlowski, 2004) used to build consensus on policy and practice recommendations in this study, involved the following steps: 1) selection of panelists, 2) round 1 – structured questionnaire, 3) round 2 – structured questionnaire, 4) feedback and revision.

Selection of Panelists. A panel of 19 industry experts was carefully selected based on their knowledge, expertise, and experience in workplace policy development and/or occupational health and safety. The panelists were identified with the assistance of the stakeholder advisory panel made up of our 4 industry partners. Panel members were purposively identified for their ability to provide content-specific expertise with attention to ensuring gender and industry diversity. These individuals included OHS practitioners and other senior leaders in managerial, human resources and union executive roles.

Round 1 – Structured Questionnaire. The research team prepared an online questionnaire containing policy and practice statements derived from Phase I and 2 findings. The questionnaire was then distributed to the panelists, who provide their individual responses independently and anonymously. Panelists were asked to rate their agreement with each statement using a 9-point Likert scale (1-3 = strongly disagree with the recommendation, 4-6 = neutral with the recommendation, 7-9 = strongly agree with the recommendation).

The responses from Round 1 were compiled and examined for consensus by the research team. Consensus on a recommendation was considered achieved when greater than 70% of participants' ratings matched either 'strongly disagree with the recommendation' or 'strongly agree with the recommendation' with less than 15% endorsing the opposite.

Round 2 – Structured Questionnaire. Recommendations that did not meet consensus criteria in Round 1 were presented again to Delphi panel in a second structured questionnaire. In this round, the panelists were given the opportunity to revise their initial responses. Again, following this round, the research team compiled the responses and examined whether further consensus had been reached using the same criteria noted above.

Round 3 – Feedback & Revision. The responses from both Rounds were compiled and summarized by the research team and then shared with the panelists in a virtual (audio only) Focus Group, without disclosing the identities of the respondents. The iterative process of feedback, revision, and re-evaluation was continued until consensus was achieved among the panelists. Recommendations were classified into three final categories: Important, Not Important/Feasible and Industry/Context-specific. Recommendations that did not meet consensus were not carried forward.

Recruitment materials were sent by email to the selected Delphi Panel members along with an invitation to participate in this phase of the study. After the initial contact, panelists were then contacted through Qualtrics (the survey host) with a link to the structured questionnaire for the round currently being completed (i.e., received a link for the first round during that period and received a separate link for the second round subsequently). Each round ran for two weeks, with five days in between rounds.

Panelists were invited to the focus group during Round 2. Panelists who indicated an interest in participating in the focus group were asked to provide informed consent to participating and being audio-recorded. The focus group was held online over WebEx and was audio-recorded to ensure accuracy of the data collected.

FINDINGS AND OUTCOMES

Phase I: Longitudinal Survey

Sample Demographics

Survey 1. A total of 1,213 individuals started the first survey. Of these, 1,185 (97.7%) completed the survey, (thus, there was a withdrawal rate of 2.3%). The sample consisted of 24% male, 63.7% female and 0.8% agender/non-binary (10.7% did not disclose gender). Ages ranged from 18-24 (1.1%), 25-34 (9.1%), 35-44 (20.2%), 45-54 (18.6%), 55-64 (18.6%) to 65 and older (0.4%). A minority of participants identified as having a protected status (12.1%), with 7.4% identifying as Indigenous, 1.3% identifying as racialized, 3.0% as identifying as having a disability, and 0.5% identifying as Other (13.4% of the respondents did not respond to this question). The majority of participants had a graduate degree (45.4%) or undergraduate degree (21.0%). Only 2.4% had high school diploma or less, 14.0% had a college diploma, and 5.2% had a professional degree (11% did not disclose education).

In terms of marital status, 14.0% were single and never married, 13.0% were common law, 53.8% were married, 1.9% were separated, 4.6% were divorced, and 0.5% were widowed (12.1% did not disclose marital status). During the surveys, 10.7% were living alone while 77.7% were living with others (11.6% did not disclose their living arrangements). Regarding having children under the age of 18, 37.1% of the participants reported not having any, and 51.6% reported having children under the age of 18 living at home. Again 11.2% of the participants did not disclose family status. Finally, 64.4% of the participants reported they did not have any chronic illness, whereas, 20.4% reported they did; 2.4% were unsure and 1.8% preferred to not say (10.9% did not respond).

The majority of participants were permanent employees (73.9%) with only 10.9% reporting as contractual and 4% reporting “other” (e.g., casual, substitute) (11.1% did not report status); 83.2% reported having full-time status and 5.4% reported part-time (11.3% did not report). 71.2%

of the participants belonged to a union, and 17.5% did not. Most participants had been with their organization for 10 or more years (56.5%), or 6-10 years (14.6%). The rest had less tenure: 2-5 years (12.0%), 6 months to 1 year (3.6%), under 6 months (1.9%). Most participants belonged to the non-managerial / union member group (47.6%), or management / professional group (19.6%). Only 2.6% were in the top management / executive group.

In terms of industry, a wide range of industries were represented, with the most in the Education Services (63.4%) and Utilities (10.5%), Health care / Social services (3.6%), Administration and Support / Waste Management / Remediation Services (2.5%) and Professional / Scientific / Technical (2.1%) as the next frequent industries. The majority of participants were from an urban center (52.4%) while 31.1% were from a rural center, and 3.4% were in remote locations (not near cities or towns). 10.4% of the participants worked in-person / on site, 78.9% worked remotely and on site throughout the pandemic, and 3.6% transitioned to remote work during the pandemic.

Survey 2. A total of 851 started the second survey. Of these, 506 (59.5%) completed the survey (thus, there was a withdrawal rate of 40.5%). In addition, 146 (28.9%) of these individuals had completed Survey 1, and 360 (71.1%) were new participants to the study. The new participants of this sample consisted of 30.9% male, 67.1% female and 0.6% agender/non-binary. The age distribution was slightly younger than Survey 1, with 18-24 (1.1%), 25-34 (19.6%), 35-44 (32.7%), 45-54 (28.8%), 55-64 (16.7%) to 65 and older (0.4%).

Survey 3. A total of 987 started the third survey. Of these, 702 (71.1%) completed the survey (thus, there was a withdrawal rate of 28.9%). In addition, 241 (34.3%) of these individuals had completed at least one of the first two surveys, thus 65.7% were new participants to the study. The new participants consisted of 43.5% male, 56.0% female and 0.2% agender/non-binary. Again,

the age distribution was slightly younger than Surveys 1 and 2, with 18-24 (14.4%), 25-34 (32.0%), 35-44 (27.6%), 45-54 (16.9%), 55-64 (8.0%) to 65 and older (1.1%).

Total Sample. Across all three studies, a total of 3,051 participants initiated the surveys, and 2,393 completed at least one survey. Of the completed surveys 387 participants completed at least two surveys, and of these, 5 completed all three surveys (with matching ID codes).

Longitudinal Sample. As noted above, only five participants completed all three surveys and had matching unique participant identification numbers. Given the very small sample size, no within-participant repeated measures analyses could be conducted.

Descriptive Results

Inferential statistics examined for differences across variables of interest among the three survey time points and there were no meaningful differences in trends observed over time. As such, for brevity, the descriptive analyses are presented for survey one which had the largest sample size, allowing for the most stable estimates. This survey was also administered in the closest proximity to the final Omicron lockdown which disrupted working conditions experienced by workers throughout the completion of this study.

Workplace OH&S Response. These results show the perception of the employees on their workplace responses and policies to the pandemic. In Survey 1, 94% of the participants indicated that their workplace had policies to prevent the transmission of COVID-19 in place. However, 66% noted no specific policies around contact tracing of positive COVID-19 cases at their workplace were in place. Approximately 60% of the respondents perceived the policies and practices as comprehensive, timely and transparent. Around 30% of the respondents considered the policies moderately comprehensive, timely and transparent. Less than 20% of the respondents rated the existing policies as not comprehensive, timely or transparent.

Remote Work Arrangements (ROSA). In Survey 1, 4% of the participants transitioned to remote work, and 85% worked remotely and in person over the pandemic. Of the 70% that had a designated workspace at home, 68% felt their home workspace was very different physically from their workplace. Around 9% of the participants working remotely were offered ergonomic assessment of the home workspace by their workplace. However, only 19% had the ergonomic assessment of their home workspace completed. 25% had older adults they needed to care for during the pandemic. 11% reported being distracted from their work due to their obligations as care providers for these older adults. 30% felt somewhat distracted. 39% of the participants indicated having children at home while they work, 39% reported being distracted from their work due to their obligations as care providers for their children, and 33% reported being somewhat distracted from their work.

Standard Work Arrangements. In Survey 1, 11% of the participant continued to work in person since the start of the COVID-19 pandemic. 75% of participants in person reported that their workplace required them to wear personal protective equipment (PPE). 96% noted that they had the option to voluntarily wear any PPE while at work. 56% indicated supplying the PPE they wear by themselves, not their employer. 70% agreed that the PPE they wear at work fits them appropriately, and 43% agreed that the PPEs are comfortable. 70% reported that seeing others wear PPE at work made them feel safe from transmitting COVID-19. However, 74% indicated that being in the workplace during COVID-19 made them feel vulnerable.

Psychosocial Work Conditions (COPSOQ III). In Survey 1, in terms of how participants felt about their work conditions during the pandemic, 29% reported not having enough time to complete all their work tasks. 97% indicated working at a high pace throughout the day, and 67% felt their work was emotionally demanding. 68% reported feeling pleased and satisfied with their work as a whole.

Worker Physical Health (HQP). In Survey 1, in terms of physical health, 51% of the participants reported not feeling dizzy at all, while 3% reported significant dizziness. 46% have experienced dizziness to varying degrees. A significant proportion of the participants, 54%, reported feeling tired or having low energy to some extent, while 40% reported feeling tired a lot. A smaller percentage, 7%, did not experience significant tiredness or low energy. 27% have experienced a lot of trouble sleeping, while 18% have had no trouble sleeping. 79% reported experiencing occasional or frequent headaches, while 21% have not had headaches. Most participants, about 75%, have experienced musculoskeletal problems, including back, neck, muscle, and joint pain. Approximately 40% have experienced one or more respiratory problems, including cold, flu, cough, sore throat, stuffy head, or runny nose. About 50% did not report significant stomach problems, including gas, indigestion, diarrhea, and nausea.

Worker Psychological (Mental) Health (COPSOQ III). The participants were asked to rate their general mental health and well-being in the last four weeks prior to each survey. In Survey 1, 62% of the participants rated their mental health as good or very good, 8% rated their mental health as excellent, and 31% reported fair or poor mental health. A significant proportion of the participants, 85%, indicated that they had occasionally or constantly felt worn out, emotionally and physically exhausted. Around 70% reported being tensed, irritable and having problems relaxing part or all the time. Approximately 60% indicated having problems concentrating or thinking clearly. 65% of the participants reported occasionally having trouble remembering and making decisions, while 17% reported frequently having problems with making decisions or remembering. About 60% noted that they had experienced occasional sadness, bad conscience, loss of self-confidence and interest in everyday things, 25% indicated not experiencing them, and approximately 15% reported experiencing them frequently.

PLS-SEM (Predictive Relationship) Results

As described above in the methods section, survey data was analyzed using Partial Least Squares structural equation modeling (PLS-SEM) to provide further insight into the relationships among perceptions of organizational policies and practices with the outcomes of interest (e.g., job-related attitudes and perceptions, employee health, and organizational behaviours like quality of work performance). Figure 1 presented above provides an illustration of the general model.

Models from each survey were compared for differences in the predictive relationships among the variables of interest and there were no meaningful differences in trends observed over time. As such, for brevity, the following analyses are presented for survey one which had the largest sample size, allowing for the most stable estimates. This survey was also administered in the closest proximity to the final Omicron lockdown which disrupted working conditions experienced by workers throughout the completion of this study.

In Survey 1, the data explained a significant amount of variance for the four key outcome variables: organizational commitment ($R^2_{adj.} = 0.49$), work engagement ($R^2_{adj.} = 0.43$), perceived quality of work ($R^2_{adj.} = 0.28$), and general health ($R^2_{adj.} = 0.52$). Each of these will be discussed separately although it should be noted they were included in a single model, thus, the results are not independent of each other.

Commitment was explained by: job characteristics ($p<0.001$), work pace ($p < 0.01$), social support and community ($p < 0.001$), job satisfaction ($p < 0.001$), emotional demands ($p < 0.001$). All of these had a positive relationship with commitment. In addition, organizational policies on preventing the transmission of COVID-19 had a direct, positive relationship with commitment ($p < 0.05$).

Work engagement had positive relationships with job characteristics ($p < 0.001$), possibilities of development ($p < 0.01$), work pace ($p < 0.001$), social support and community ($p < 0.05$), job

satisfaction ($p < 0.001$), job insecurity ($p < 0.05$), emotional demands ($p < 0.001$), and general health ($p < 0.001$). Work engagement had negative relationships with work-family conflict ($p < 0.001$). Of note, work-family conflict also significantly predicted job satisfaction, so it had both direct and indirect effects on work engagement.

Perceived quality of work had five direct predictors. Work pace ($p < 0.001$), social support and community ($p < 0.05$), job satisfaction ($p < 0.001$), job insecurity ($p < 0.05$), and general health ($p < 0.05$) were positively related; whereas, quantitative workload demands was negatively related to perceived quality of work ($p < 0.05$).

Finally, general health also had six predictors. Perceived justice ($p < 0.05$), vaccination status ($p < 0.05$) and musculoskeletal health complaints ($p < 0.01$) were positively related to general health. Whereas, headaches/fatigue ($p < 0.01$), depressive symptoms ($p < 0.001$), and burnout and stress ($p < 0.001$) were negatively related to general health. All of these predictors also had indirect effects on job engagement and quality of work through general health.

All of these results are similar to what we would expect given the literature and theories regarding these outcomes of interest. However, two findings were surprising: the positive relationship between job insecurity and work engagement and quality of work, and the positive relationships between emotional demands and commitment and engagement. One possible explanation for the job insecurity findings is over-performance stress. Over-performance stress is where employees feel pressure to over-perform (provide higher quality of work than what is normally expected) as a way to provide a sense of security (or respect).

Theoretically, the emotional demands' relationship with commitment and engagement may be associated with the nature of the work (e.g., teaching, nursing, care) where the job is more of a professional calling and that calling is being illustrated through commitment and engagement.

Being distracted due to dependent (elder and child) care only had indirect effects via burnout/stress and depressive symptoms on general health. None of the other four key outcomes had significant total effects by distraction of dependent care.

In this research, we included two psychological variables that were specific to the pandemic: return to work self-efficacy (adapted to fit the context of return to site, not return to work), and a composite measure on perceived vulnerability to PPE failures (failures on themselves, and failures on others). These two variables had significant direct effects on attitudes and specific health outcomes, and significant indirect effects on the key outcome variables. Specifically, return-to-worksite self-efficacy was positively related to perceptions of job characteristics ($p < 0.05$), and vertical trust ($p < 0.001$), and it was negative related to job insecurity ($p < 0.01$).

Vulnerability to PPE failures had several significant relationships. Specifically, the positive relationships were the following:

- Burnout and stress ($p < 0.001$),
- Cognitive stress ($p < 0.001$),
- Depressive symptoms ($p < 0.01$),
- Perceptions on emotional demands ($p < 0.001$),
- Perceptions of workload demands ($p < 0.001$),
- Perceptions of work pace ($p < 0.001$),
- Work-Family conflict ($p < 0.001$),
- Ear/Nose/Throat health issues ($p < 0.001$),
- Fatigue/Headaches issues ($p < 0.001$), and
- Musculoskeletal issues ($p < 0.001$).

The negative relationships with vulnerability to PPE failures were:

- Perceptions of job characteristics ($p < 0.05$)
- Perceptions on the quality of leadership ($p < 0.01$)
- Perceptions of social support and community ($p < 0.05$).

In terms of organizational interventions, there were two forms: the development and implementation of policies, and the implementation of PPE equipment and space protocols. Both had direct relationships with a variety of general workplace attitudinal and specific health outcomes,

but some also had an effect on perceptions of vulnerability and return to worksite self-efficacy, and some even had direct effects on the key outcomes.

In terms of policies, the individual's vaccination status related to their perceptions on the contact tracing policies and policies regarding preventing transmission, such that the vaccination status was negatively related to perceiving the existence of these policies (or the absence of these policies was associated with higher vaccination status; $p < 0.05$).

The comprehensiveness of the policies regarding the organizational response to the pandemic was strongly and negatively related to perceptions of vulnerability ($p < 0.001$). Similarly, having a specific policy regarding contact tracing was negatively related to perceptions of vulnerability ($p < 0.001$); however, this was the only thing to which contact tracing policies had a significant relationship. Policy comprehensiveness, on the other hand, had the most relationships (eight in total). It was positively related to: job characteristics ($p < 0.05$), job satisfaction ($p < 0.05$), and employees' perceptions of influence at work ($p < 0.001$). Policy comprehensive was negatively related to: depressive symptoms ($p < 0.01$), emotional demands ($p < 0.001$), GI Tract health issues (0.001), and fatigue and headaches ($p < 0.01$).

Policy transparency also had eight significant relationships, all of which were attitudinal (no direct relationships with health outcomes). The positive relationships were: job characteristics ($p < 0.001$), job satisfaction ($p < 0.05$), justice ($p < 0.001$), quality of leadership ($p < 0.001$), social support and community ($p < 0.001$), and vertical trust ($p < 0.001$). The negative relationships were with burnout/stress ($p < 0.01$) and job insecurity ($p < 0.001$).

Timeliness of pandemic related policies had interesting relationships in Survey 1. Specifically, timeliness of policies was positively related to perceptions that there were development opportunities in the organization ($p < 0.001$), but it was also negatively related to ear/nose/throat health issues. Perhaps the most interesting relationship was the negative relationship with workplace

interpersonal mistreatment ($p < 0.001$). It may be that with timely policies, people were less likely to gossip, harass or bully fellow employees because there were knowledge safety precautions in place. However, this underlying reason is conjecture as there was no relationship with stress (a known cause of mistreatment).

Finally, when organizations had a specific policy in place to prevent transmission in the workplace, this was positively related to perceptions of justice ($p < 0.05$), but also positively related to emotional demands ($p < 0.001$), and fatigue and headaches ($p < 0.05$). However, it was also positively related to return to worksite self-efficacy ($p < 0.001$) and organizational commitment (one of the key outcomes ($p < 0.05$).

In terms of organizational pandemic-related practices, perceptions of vulnerability was helped with PPE use ($p < 0.001$), implementation of e-sign and no-touch sensors ($p < 0.01$), occupancy limits and physical distancing ($p < 0.01$), and the use of physical barriers ($p < 0.001$). An interesting result for implementation of e-signatures and no-touch sensors was a positive relationship with workplace interpersonal mistreatment. This is interesting because it indicates the use of this form of intervention was associated with an increase in mistreatment. Return to worksite self-efficacy was not significantly related to any pandemic-related practices.

In terms of key outcomes, general health was positively impacted by e-signatures and no-touch sensors ($p < 0.05$), and organizational commitment was also positively impacted by e-signatures and no-touch sensors ($p < 0.05$). No other key outcome variables were directly related to pandemic-related practices. However, in terms of attitudinal outcomes, HVAC and focusing on air quality had the most significant direct effects with attitudes. Specifically, air quality was positively related to job characteristics ($p < 0.001$), emotional demands ($p < 0.05$), job satisfaction ($p < 0.01$), justice ($p < 0.01$), possibilities for development ($p < 0.05$), vertical trust ($p < 0.05$), and work pace (p

< 0.05). Finally, an interesting result is that the use of remote work had no significant results in Survey 1, which the exception of a reduction in emotional demands ($p < 0.001$).

Gender Effects

In the multi-group analysis, the model is examined between the male sample and the female sample, and the path coefficients (weight of the relationships) are statistically compared for differences. Ten relationships were found to be different for males and females: four differences for quality of work, two differences for work engagement, one for commitment, and then three for attitudinal outcomes (one for job satisfaction and two for trust).

For quality of work, job satisfaction was a stronger predictor for women than for men, possibilities for development was a stronger predictor for men than women, and job characteristics were about equal in strength for men and women except for women there was a positive relationship, and for men it was a negative relationship. None of these were specific to organizational responses to the pandemic. However, one finding was; return to worksite self-efficacy was a stronger predictor for men than women (it was not significant for women, but significant for men).

For work engagement, having influence at work was a significant negative predictor for men and not significant for women. Conversely, emotional demands were positively related for women but not significant for men. However, there were no gender differences for any organizational responses to the pandemic.

For commitment, there was only one predictor that was gender-sensitive: workplace interpersonal mistreatment. For women there was no significant relationship, but for men, there was a positive relationship (the more experienced, the more they reported feeling committed to the organization).

In terms of organizational responses to the pandemic, transparency of policies had a gendered effect with trust. Specifically, there was a positive relationship between transparency and trust for both women and men; however, the strength of the relationship was significantly stronger for men. In addition, vaccination status had a different relationship with trust, depending on gender. For females, there was no significant relationship, but for males there was a positive relationship on vaccination status and vertical trust.

Finally, the relationships between feelings of vulnerability of PPE failures and job satisfaction, burnout/stress, work engagement are gendered. With job satisfaction and work engagement, females have a negative relationship (the less vulnerability, the more job satisfaction, and more work engagement); however, for males the relationship is non-significant. With burnout/stress, there is a significant positive relationship for both males and females, but the relationship is significantly stronger for males.

For organizational OHS practices, PPE use was gendered with its relationship with general health. The relationship was non-significant for females, but positive for males. Air quality initiatives were positively related to job satisfaction for males, but not significant for females. Occupancy and social distancing initiatives had gendered effects for social support & community (significant negative effects for males, but no effect for females), and workload (negative relationship for females and no relationship for males).

An interesting result was the gendered effects on remote work. The results indicate that for emotional demands, there was a negative relationship for females (meaning remote work helped reduce emotional demands for females) and there was no relationship for males. But even more interesting was the gendered effect on work-family conflict. For women, remote work had a negative relationship (i.e., it reduced work-family conflicts), whereas men had a positive relationship (i.e., it increased work-family conflicts). Thus, when workers are recalled back to the worksite, male

employees may experience a relief from work-family conflicts while female employees may feel an increase.

Industry Effects

Due to unbalanced sample sizes for the various industries and that the multi-group analysis only permits comparison of two groups, we compared Education versus Non-Education to examine for industry effects.

For the policies, vaccination status, distraction due to dependent care, and the comprehensiveness of policies had industry-specific effects. Specifically, vaccination status was positively related to perceptions on policy timeliness for the non-education industry group, and non-significant for education; positively related to quantitative workload demands for education industry but nonsignificant for non-education, and negatively related to perceptions of policy transparency for education industry participants (not significant for non-education). Distraction by dependent care (elder and child care) was positively related to perceptions of policy comprehensiveness for non-education participants, and not significant for education participants.

In addition, for the education industry, comprehensiveness of policies was negatively related to burnout / stress, but it was not significant in the non-education industry group. Finally, the relationship between comprehensive policies and quality of work was opposite for the two groups: it was negative for non-education, and it was positive for education. Beyond these two nuances of policies, there were no other industry effects regarding policies.

There were several industry-based effects observed regarding the implementation of OHS pandemic-related practices (please see Table 1 below for summary of these industry effects). An interesting industry-based result is the relationship between remote work and workplace

interpersonal mistreatment. For the education industry, they were positively related; however, for non-education group, they were negatively related.

Table 1: Summary of Industry-Sensitive OHS Initiatives Outcomes

Relationship	**Non-Education**	**Education**
Hygiene → GI Tract Issues	n.s.	+
Hygiene → Vulnerability of PPE Failures	-	n.s.
E-signatures/No-touch → Work Engagement	+	n.s.
Remote Work → Musculoskeletal Issues	-	n.s.
Remote Work → Workplace Interpersonal Mistreatment	-	+
Air Quality / HVAC → Possibilities of Development	n.s.	+
Occupancy Limits / Social Distancing → Burnout/Stress	n.s.	-
Occupancy Limits / Soc. Dist. → Fatigue & Headaches	n.s.	-
Occupancy Limits / Soc. Dist. → Quality of Leadership	+	n.s.
PPE Use → Vulnerability of PPE Failures	n.s.	+
Vulnerability of PPE Failures → Trust	- (stronger)	-
Vulnerability of PPE Failures → Justice	- (stronger)	-
Vulnerability of PPE Failures → Emotional Demands	n.s.	+
*n.s. = not significant		

Region Effects

Due to unbalanced sample sizes for the various regions (urban, rural, remote) and that the multi-group analysis only permits comparison of two groups, we opted to run "urban" versus "rural and remote" to examine for region effects. There was a total of 12 significant differences; however, only 8 were related to pandemic policies or OHS practices. (See Table 2 for summary.)

Table 2: Summary of Region Sensitive Effects

Relationship	**Urban**	**Rural & Remote**
Contract Tracing Policies → Emotional Demands	n.s.	-
Contract Tracing Policies → Vulnerability to PPE Fails	- (lower effect)	- (higher effect)
E-sign and Touchless Sensors → Job Insecurity	+	n.s.
Occupancy Limits → Work pace	-	n.s.
Vulnerability to PPE Fails → GI Tract Concerns	+	n.s.
Screening practices → Ear/Nose/Throat Concerns	-	n.s.

*n.s. = not significant

Phase I Summary of Findings

Workplace OH&S Response. Overall, the results of our surveys indicated that the workplaces implemented measures to address health and safety during the pandemic. However, areas still require attention, specifically around contact tracing in the workplace. In terms of the comprehensiveness, timeliness and transparency of the measures implemented, the employees' perceptions of the policies were generally average, indicating that room for improvement remains.

Remote Work Arrangements (ROSA). Overall, our survey results indicated that majority of the participants felt distracted from work due to their obligations as care providers at home during the pandemic. A significant portion of the participants working remotely had no ergonomic assessment of their home workspace completed by their workplace.

Standard Work Arrangements. Overall, the results of our surveys indicated that only a quarter of the participants worked fully in person at their work site since the start of the pandemic. Most participants felt vulnerable and unsafe while working in person during the pandemic despite the wide use of PPE. A significant portion of the participants had to provide the PPE they use at work by themselves.

Psychosocial Work Conditions (COPSOQ III). Overall, the results of our surveys indicated that more than half of the participants are satisfied with their jobs, with everything taken into consideration. Most of the participants reported high physical and emotional demands at work.

Worker Physical Health (HQP). Overall, the results of our surveys indicated that a higher percentage of our participants experienced more physical symptoms at work.

Worker Psychological (Mental) Health (COPSOQ III). Overall, the results of our surveys indicated that most of the participants generally had good mental health in the four weeks prior to responding to each survey, despite experiencing occasional symptoms. There were reported high levels of emotional demands, and a large portion of the sample noted feeling physically and/or mentally exhausted part of the time, a large part of the time, to all of the time during that timeframe.

PLS Model summary. The results highlight the need for certain occupational health and safety initiatives during a pandemic, but some had more positive effects on employees' attitudes and physical and mental health than others. Looking at the top five initiatives and their total effects on our four outcomes of focus, we see that PPE usage had beneficial effects on quality of work. The use of remote work had beneficial impacts on feelings of vulnerability from PPE failures. Interestingly, hygiene practices' total effects were detrimental to general health.

Of special note is the influence of the OH&S initiatives on workplace interpersonal mistreatment via direct and indirect effects. PPE usage, use of remote work, and hygiene practices were all associated with a reduction of workplace interpersonal mistreatment.

Finally, the other major employee attitude was feelings of vulnerability for PPE failures. E-signatures / no-touch sensors, and occupancy limits / social distancing were two types of practices that helped reduce perceptions of vulnerability.

Organizational policies were a necessity for guiding employees and supervisors through the pandemic; however, they did not have a singularly beneficial effect on our key outcomes

(commitment, work engagement, quality of work, general health, plus workplace interpersonal mistreatment and feelings of vulnerability. Transparency of policies had consistently beneficial effects (direct and indirect) on these outcomes: improve commitment, work engagement, general health, quality of work, reduced feelings of vulnerability from PPE failures and lower rates of workplace interpersonal mistreatment.

The comprehensiveness of policies also had beneficial outcomes through direct and indirect effects. There was improved commitment, work engagement, and general health. There were no other significant effects on quality of work, workplace interpersonal mistreatment, or vulnerability.

Ensuring timely policies in response to pandemic threats and requirements had beneficial outcomes on work engagement (higher rates) and workplace interpersonal mistreatment (lower rates), but it had detrimental effects on general health. Contact tracing policies had three detrimental effects but one beneficial effect. While contract tracing policies were associated with lower rates of workplace interpersonal mistreatment, it was also associated with reduced work engagement, general health, and increased feelings of vulnerability for PPE failures. However, the worst effects came from the policies to prevent transmission of COVID-19. This type of policy had detrimental total effects on commitment, and general health, and no significant effects on the other outcome variables discussed in this section.

Phase II: Qualitative Interviews

Sample Demographics

A total of 21 participants were recruited from which 24% worked in power sector, 62% in education sector (including 61.5% at university and 38.5% in elementary, primary and secondary schools), and 14% in other industries (i.e., public, construction, and health industries). In terms of gender, 52% of the participants identified as female and 48% of the participants identified as male.

A summary of descriptive themes found in the interviews are presented below. In addition, the data was examined to see if there were trends and changes across the different phases of the pandemic, and if there were similarities with the two lockdown timeframes (initial and third (Omicron) phase of the pandemic). This temporal analysis is presented within each theme description as well.

Rate of Essential Worker Designation

In terms of being essential in the field, 80% of the participants in the power industry were deemed as "essential workers" in at least one phase during the pandemic. The participants from construction and public industries were not essential at all during the pandemic. However, this trend was different for participants from the health industry who were essential during all phases of the pandemic. For the education industry, only 15% were deemed essential at some point during the pandemic.

Across phases. It appeared that as the pandemic wore on, the classification of "essential worker" evolved and captured more individuals when the second lockdown occurred. The effect was primarily found in education, but not exclusively.

Work Arrangements

The majority of the participants experienced both remote work and on-site work arrangements during the pandemic. However, prior to the pandemic, no one worked exclusively at home. Several of the interviewees reported that during the time of data collection, they were still working remotely full-time. Interviewees that were deemed "Essential Workers" did not work from home during the pandemic and remained exclusively on site. Most of the participants, especially the ones working in education industry, were working from home during the first two phases of the pandemic, and then returned to their workplace or had a hybrid arrangement for the last two phases.

Participants were also asked if their work arrangements were similar to those of their work colleagues for each of the five timeframes. For the majority of participants, their colleagues had similar work arrangements; however, this varied across time (discussed below).

Across phases. Unsurprisingly, there were large shifts of location of work across the phases of the pandemic. Pre-pandemic, 76% of participants worked on site, 19% at home, and 5% worked the majority of time from home (~90% did some remote work but not fully from home). During the first lockdown, 71% were working remotely full-time, 19% were still fully on site, and 10% were in a hybrid work arrangement with majority of time at home (80-90% at home). As vaccinations were being released and some health measures were relaxed (second phase), 50% were now working on site, and 30% were fully at home. Finally, during the last phase, 65% were back on site, and 20% spent between 50-100 100% of their work time at home. The breakdown has not returned to pre-pandemic levels of on-site work.

In terms of similarity of work arrangements, prior to the pandemic 80% of the participants noted their colleagues had similar work arrangements. This ratio dropped during the first phase of the pandemic (76% similar work arrangements) and continued to drop for each timeframe afterward (67% for second phase, 58% for third phase, and 48% for fourth phase). This highlights that there has been less uniformity of work arrangements within organizations as the pandemic progressed and as we have begun to emerge from the pandemic.

Satisfaction / Happiness with Work Arrangements

In terms of happiness, individuals working in industries (other than education) were happier with working in the office or in the field rather than working from home. However, sometimes the mandatory nature of the work made them feel unhappy. On the other hand,

individuals working in the education industry were happier with working from home and also were happy about the flexibility that their employers provided for choosing their preferred work arrangement throughout the pandemic after lockdowns ended. However, what made them unhappy was the feeling of lack of safety that they had in their workplace due to the voluntary nature of the PPEs in their workplace, when mandatory public health measures were relaxed.

A source of discontentment, apart from finding themselves in an unknown and new situation, was the unexpected transition from in-person to remote work arrangements that put a lot of pressure on them in terms of adjusting to the new arrangement without being familiar with or having any previous experience in this regard. This was particularly evident when discussing the experiences during the first phase of the pandemic.

Across phases. Participants recalled that their happiness about their work arrangements were very positive (approximate average score 4.5 on a scale of 1 to 5), on the whole. However, during the first phase of the pandemic, happiness with the work arrangement started shifting downwards with several interviewees noting discontentment, and fewer people feeling very happy with it. During the second phase, when the vaccinations were available but there was also removal of some public safety protocols, happiness with work arrangements decreased dramatically with 50% of the participants noting they were explicitly unhappy with the work arrangements (approximate average score 2.8 on a scale of 1 to 5). During the second lockdown (Phase III of the pandemic), happiness with work arrangements started improving (approximate average of 3.8 on a scale of 1 to 5), and in Phase 4, they are nearly back to original levels (approximate average of 4.3 on a scale of 1 to 5).

Perceptions of Organizational Justice

In terms of fairness, most of the participants (irrespective of the industry) felt their work arrangements were fair when they had flexibility in choosing their preferred work arrangement (i.e., the percentage of time that they can work at home or on-site, or in the field). It is worth noting that particularly during the first phase of pandemic, participants felt fair about their mandatory work arrangement because they thought that it was the best thing that their organization could do at that time considering the unknown situation. Additionally, individuals felt it was fair when (1) they felt the nature of their jobs required such an arrangement; and/or (2) their workplace provided them with a safe working environment by providing required PPEs and health measures or providing them with the required equipment (e.g., ergonomic equipment) when they were working remotely.

In addition to the mandatory nature of the work location or the lack of required or provided PPEs in the workplace, sometimes the source of feeling unfairness was due to the extra duties that individuals were responsible for during and after the pandemic, or the lack of employer's trust in employees or lack of caring about them.

Although most participants felt that having the same work arrangement as their coworkers was fair, some of them noted that treating everyone in the same way was actually unfair. The latter follows the equity principle (it is deemed fair when people get what they need, not get exactly the same thing); whereas the former follows the equality principle (fairness is when everyone gets equal treatment). This tension between equity and equality is not new for organizations, but the pandemic and work arrangements brought this form of equity to the forefront for many participants.

Across phases. This tension between equality and equity was also reflected in the assessments of fairness across the pandemic timeframes. Prior to the pandemic, when everyone reported having the same work arrangements (equality principle), 86% of the participants felt it was fair. Then this assessment dropped during the first lockdown, where only 67% felt the work

arrangements were fair, yet the similarities remained unchanged (percent-wise). During the second phase when people started returning to on-site, similarity was still reducing but perceptions of fairness remained unchanged. By the last two phases, similarities were still reducing but perceptions of fairness were remaining unchanged or slightly improving. During the second phase of the pandemic, participants had the largest change and felt the work arrangements were unfair for their colleagues (as well as for themselves).

Working While Sick

In terms of working while under the weather, most of the participants (irrespective of the industry) stated that prior to the pandemic, if they had symptoms but they were still mobile and it was not a heavy sickness and it was manageable, they would continue working. However, participants stated that, during and after the pandemic, if they have any symptoms, especially when it is COVID-related symptoms, they did/do not work or if they work, they would work from home and do not go to their workplace.

After Phase III of the pandemic, the underlying reasons for participants' decisions to not attend the workplace while they are unwell were either because of the mandating rules of the organization to work from home while having symptoms, or because of their preferences to not exposing others to any health risk.

Most of the participants stated that working while sick affected their performance. Some of the effects that they mentioned included: reduction in their efficiency level, slower pace of the work, and the need to exert more energy than normal to do the same work while their levels of energy had dropped due to being sick. Additionally, most of the participants, in all industries except the healthcare, mentioned that there was no explicit management pressure to continue working while they were sick. This trend was different for participants in the health industry who were mandated

by management to attend work while sick, particularly during the first and the current phase of the pandemic, because of the staff shortage in this industry.

Another valuable point to take into account is the difference between education and non-education (except health) industries in terms of the source of obligation that participants felt to continue working while sick. For the participants working in non-education industries, the source of obligation stemmed from their internal perceptions of duty or responsibility to continue working while unwell. However, for participants in education industry, sources of obligation were mostly connected to their workplace's organizational culture or implicit expectations of management to continue working while sick (i.e., an implicit expectation to keep things moving, meet deadlines, virtually attend meetings, etc.).

Most of the participants also mentioned that working while sick had varied effects on their stress level. On the one hand, they stated that working while sick could reduce their level of stress because they felt that they were still functioning and 'doing something is better than doing nothing', and in this way they could reduce the possibility of work accumulation. However, on the other hand, they mentioned that working while sick increased their level of stress because they felt that they were not able to do that much so may fall behind their work. Additionally, participants working in non-education industries (except the health industry), mentioned that particularly, after the third phase of the pandemic one of the reasons that added stress while working when sick was because of the difficulties they might face for getting things done online or through phone or email instead of doing them in-person. For participants from the health industry, the source of added stress was the concern of transferring the sickness to the vulnerable individuals within their work settings while working with symptoms.

Across phases. Prior to the pandemic the majority of participants responded that they would work while ill (62%), and almost a third would work depending on the severity (29%).

However, starting with the outbreak of the pandemic and into the second phase of the pandemic, 40% of the participants would work while ill and more reported not working while ill (~20%). During the final two phases of the pandemic, even fewer reported working while ill (26%), and more reported not working while ill (~30%). Overall, there is a trend to reducing the amount time spent working while ill. Interestingly, a fair percentage of participants noted not becoming ill during the phases of the pandemic (14% in the most recent timeframe to 33% in the first phase of the pandemic).

Personal Protective Equipment in the Workplace

In terms of the usage of personal protective equipment (PPE) in the workplace, before the pandemic there was no PPE requirements other than what was needed for safe work, especially to work in the field. However, during the pandemic, while there were not any mandatory PPE for working at home, upon the return of employees to the workplaces, particularly after Phase III of the pandemic, organizations made it mandatory to use of some types of PPE in accordance with the public health measures. The most cited types of PPE for the workplaces were masks (medical or regular), face shields, safety goggles, plexiglass, social distancing, sanitizing materials or stations, safety and health signs, self-isolation in private offices or providing no-contact zones, one-way entrances, and flow arrows. Most of these PPE measures were provided by employers during the pandemic.

However, there was some dissatisfaction concerning the quality of provided PPE, particularly among employees working in education industry. Although almost all of the participants felt safe while using PPE, most of them found them uncomfortable especially, in terms of the feel of being stuck in the PPE (i.e., masks or shield) that made breathing hard for them and the difficulties they faced for interaction and communication with others. The most cited reasons for the hardship

in communication were the difficulties that using PPE caused for hearing peoples' voices and reading social cues such as the others' facial expressions, or reducing the ability to see for people wearing eyeglasses due to condensation on the lenses. All these reasons resulted in a reduction in participants' productivity and performance.

Across phases. The changes across the timeframes related to the lockdowns and status of returning to worksite, and the required public health protocols in place. No participants reported an increase in performance due to PPE; however, the number of participants who noted PPE reduced their performance appears to have declined over time. However, this could be more due to the removal of PPE requirements by public health rather than an indication of improved PPE quality.

Perceptions of Safety

Considering physical safety, almost all of the participants (irrespective of the industry) felt safe in their workplaces before the pandemic. Participants also mentioned that they felt safe when they worked remotely during the pandemic. However, upon return of employees to their workplaces, particularly after Phase III, there were some concerns regarding physical safety in the workplaces. This perception of a lack of safety mostly came from the increase in the number of people returning and present in the workplaces or the removal of the mandatory usage of PPE, which caused people to not take it seriously to use or to properly use PPE. However, in the post-pandemic era, this feel of unsafety improved and most of the participants mentioned that their feeling of safety has returned to pre-pandemic levels.

These physical concerns also affected the participants' perceptions of mental safety due to the stress and anxiety that these physical concerns caused for the participants. Other reasons that affected participants' mental health, particularly during the first two phases of pandemic, were: 1) lack of interaction with others that gave them the feel of loneliness, 2) the stress and anxiety that

they felt because of being in an unknown condition, 3) fear of getting Covid and transferring it to others (especially for essential workers), 4) the feelings of a lack of support or trust from their employers, and also 5) feeling burned out due to increased workloads caused by the changes in the nature of their works (i.e., in-person to online) or the change in their work arrangements.

Across phases. Mental and physical safety had different changes across the different timeframes. For physical safety, the first phase of the pandemic saw a marked increase of perceptions of safety with 86% of the participants feeling very safe at work (i.e., most were at home, but some were essential). During the second phase of the pandemic, with some returning to the worksite and relaxing of some public health protocols, there was a decrease of perceived physical safety (43% felt very safe, 43% felt somewhat safe). This remained the same during the second lockdown phase and started improving again in the fourth (current) phase (almost same level as pre-pandemic).

Mental safety had the opposite trend initially, where in the initial phase of the pandemic there was a significant shift downward (24% feeling unsafe or somewhat unsafe, 43% feeling somewhat mental safe and only 33% feeling mentally safe at work). It stayed at those approximate levels until the fourth phase of the pandemic, and it is approximately at the same pre-pandemic levels (86% feel somewhat to fully safe mentally at work). Thus, while the lockdown provided physical safety, the mental safety was impacted by the pandemic and organizational responses.

Perceptions of Job Security

In terms of employment status, almost all of the participants felt safe in their employment status before, during, and post-pandemic. However, it is worth noting that employees working in non-education sector (except the health industry) perceived a little bit of job insecurity during the first phase of the pandemic due to the unknown condition of the pandemic and the possibility of being laid off by the employers.

This fear was not seen among individuals working in education or health sectors. Most of individuals working in education sector felt pretty safe during all phases of pandemic in their employment status, particularly if they could get tenure in their position. For participants in the health industry, the shortage in the staff numbers in this sector during all phases of the pandemic made participants less concerned about the possibility of being laid off or substituted by the employer.

Across the phases. There were no remarkable differences across the five timeframes for perceptions of job security (or insecurity). While the qualitative comments may suggest some nuances between industries, there were no impacts overall from pre-pandemic, and the four phases of the pandemic.

Perceptions of Workload

The last item investigated in the interviews was participants' perceptions of their workloads. The general trend that can be seen among the participants is that, particularly for the individuals working in non-education industries (except the health one) or working in education industry in the elementary, primary and secondary schools (not for university employees), the amount of workload decreased during the first phase of the pandemic. This reduction was mostly due to a reduction in the amount of required work needed to be done by individuals or the inability of doing some types of work online. When they were able to return to more normal work duties, workload increased mostly because of the accumulated work from Phase I or the resuming of the work that was stopped because of the lockdowns during the pandemic.

Those who worked at the university or in the health industry experienced an increase in workload. For the ones working at the university this increased workload was mostly due to the transition from in-person to online platforms and all the training and required work that had to be

done in this regard. For participants in the health industry, increases in workload were due to the extra duties or precautions required at work and/or the staff shortage in this industry.

Across the phases. The relative workload, compared to pre-pandemic work levels, different across the four phases of the pandemic. The first phase only saw 14% of the participants maintaining the same workload. The other 86% was split between increase in workload (48%) and decrease in workload (38%). In the second phase of the pandemic, the 14% still had the same workload, but this time there was a swing to an increase in workload (81% had higher workload than pre-pandemic workloads).

In the third phase of the pandemic, again there was a slight shift in responses: 21% now had similar workload to pre-pandemic, 68% had more and 11% had lower workloads. The fourth (final) phase again saw a shift, this time towards pre-pandemic levels but not quite fully resumed (57% at pre-pandemic levels, while 43% were still experiencing an increased workload).

Phase III: Development of Policy and Practice Recommendations using a Delphi Panel

Sample Demographics

The 19 Panel members were chosen for their expertise in organizational policy development and/or OHS knowledge. Each of our industry partner organizations were represented, with representation from power (22%), education (63% from primary, secondary, and post-secondary institutions), and private, public, and municipal industries (25%). Panel members served as leaders in administration and/or human resources roles (47%), union representatives (32%), and OHS practitioners (21%). Fifty-eight percent (58%) of invited panel members identified as female, while 42% identified as male. Three-quarters (75%) of panel members represented organizations or workers in urban settings, and 25% worked in rural or remote settings.

Round 1. Out of 19 panelists, 11 (58%) responded to the survey invite. All gave informed consent to participate. Panelists represented all industry groups (education, power, private, public, and municipal sectors; percentages not reported to protect anonymity), employer (73%) and union (27%) roles, and both female (64%) and male (36%) gender identities.

Round 2. Out of 19 panelists, 9 (47%) completed the Round 2 structured questionnaire. Again, panelists represented all industry groups (education, power, private, public, and municipal sectors; percentages not reported to protect anonymity), employer (78%) and union (22%) roles, and both female (44%) and male (56%) gender identities.

Round 3. Eight panelists agreed to participate in the focus group. However, only four attended the focus group audio call, which was hosted on WebEx. All industries except power were represented (percentages not provided to protect anonymity). Representation was equally distributed for both employer/union roles (50% each) and male/female identities (50% each).

Delphi Panel Consensus

Round 1 (Structured questionnaire). Regarding pandemic-specific policy statements, 12 of the 26 items (46%) had reached "high levels of agreement" (i.e., 70% of panelists answered either 1-3 or 7-9 with less than 15% in another category). All 12 of the statements had reached a consensus in which panelists "strongly agreed" in endorsing the statement in question as an important recommendation. The remaining 14 items were carried forward to Round 2.

For the 12 pandemic-related practice statements, there was no consensus reached for any item. This may have resulted from the variance among the types of organizations and differences in workplace cultures represented by the panelists. All 12 items were carried forward to Round 2.

Round 2 (Structured questionnaire). For the 14 pandemic-specific policy statements, 6 of the 14 items (42%) had reached "high levels of agreement" (i.e., 70% of panelists answered either 1-3 or 7-9 with less than 15% in another category). For all 6 items that reached consensus, panelists "strongly agreed" that these statements were important recommendations.

For the 12 pandemic-related practice statements, panelists "strongly agreed" that 5 practice statements were important recommendations.

Round 3 (Focus Group). The responses from Rounds 1 and 2 were compiled and summarized by the research team and presented to panelists in the Round 3 focus group. In this round, the panelists reviewed the summarized feedback from two rounds of structured questionnaires and were given the opportunity to provide further clarifications on their initial responses based on the feedback and insights provided by other panelists. The iterative process of feedback, revision, and re-evaluation allowed for convergence towards a final consensus.

Below is a summary of the Delphi Panel discussion during the focus group during the iterative process that led to consensus on the final set of policy and practice statements.

Policy Statements:

Staying home while sick. The item on staying home while sick had reached consensus over the first survey (90.91% agreed). Panelists took particular issue with "administrative nuance" suggesting having to promote staying home while sick when their employees/union members did not

have adequate sick leave and asking employees/union members to potentially lose income to not spread illness in the workplace. While they admit that some employees may have the option to continue their work duties working from home, some employee types (e.g., teachers, janitors) may not have this option. Panelists also suggested that there may be a "sliding scale of sickness," in which the term "sick" could be defined differently based on individual context and has also been officially defined differently and more clearly over the course of the pandemic (e.g., "recovery" had changed from 14 days post illness to 24 hours post-fever) and that these differences add more difficulties in promoting staying home while sick. One participant also brought up what they called a "double standard" that workers were asked to stay home while sick but were exposed to illnesses in the workplace because children/students were allowed to be in the same spaces while sick.

Contact tracing. The item on contact tracing processes did not reach consensus during the two survey rounds. Panelists had differing opinions on contact tracing in the workplace. One participant (education) suggested that in a building with 700 children, contact tracing became pointless, especially once the longer incubation period of COVID-19 was considered. Another participant suggested that contact tracing was important at the beginning of the pandemic, with a second participant noting that it was good for the first portion of the pandemic, but once COVID-19 "quickly spiraled out of control," it became difficult to keep up with contact tracing. Panelists acknowledged that contract tracing made workers feel safer (i.e., less vulnerable); however, panelists also agreed that this effort was not always the best use of organizational or governmental resources, especially once vaccines became available and people felt safer with the risks of contracting COVID-19.

Work arrangements and individualized needs. There were two items on work arrangements and individualized needs, ("…work arrangements are the same for everyone" and "… work arrangements allow for individualized needs"), neither of which had reached a consensus during the

survey rounds. One participant suggested that these items are in between two human rights issues – those of potential disability accommodation and family status, but ultimately that work accommodations should meet individualized needs. Another participant suggested that it would be challenging to set up a uniform way to accommodate everyone especially with different employee types. Lastly, a participant from education suggested that the latitude for accommodations is limited in a school setting (due to the nature of the work and the layout of schools).

Promotion of social connection amongst coworkers. Panelists felt that social interaction was very important, especially in an isolation setting where employees might have felt the effects of isolation on their mental health. However, this may vary depending on the individual and their industry; panelists in education suggested that this type of work involved more of a social role than, for example, jobs within the tech industry, where employees often can work remotely and independently. They also suggested that previous context (i.e., pre-pandemic) would affect how (a lack of) social connections between coworkers would affect employee wellbeing and productivity.

Promotion of social connection between employees and their managers. Panelists who were in an administrative role noted that when they returned to the workplace, they wanted to make a point of being "visible" in their role in order to promote camaraderie in the workplace and wanted to promote an idea of "we" versus "them and me."

Surveillance of employees working remotely. Panelists suggested that "surveillance" may have an "ugly" meaning in the workplace, but this may vary depending on the industry. Panelists in education suggested that surveillance was a passive item, especially over the pandemic during isolation and remote teaching. Education panelists noted that they would "get phone calls" from parents if teachers were not teaching or not teaching adequately. Union panelists noted that

performance could be seen as an indicator and that micromanaging had negative implications and was counterproductive, and that privacy issues may come into play with surveillance of remote work.

Training on PPE usage. Panelists agreed that PPE training was important, but some types of PPE were self-explanatory and therefore, less relevant.

Consider employee gender for safety initiatives and employee needs. Panelists noted that the only times that they considered employee gender for safety initiatives would have been to better protect pregnant females from contracting COVID-19, and the appropriate fitting of PPE on female bodies. Panelists felt that in the context of work/family conflict, that it was not the place of the employer to consider the home life of employees when making workplace policy. A union participant suggested that in this context, collective agreement provisions would have to be considered by management.

Practice Statements

Increased Sanitization. Increased sanitization reached consensus on the surveys, with 100% of panelists agreeing that it was an important practice for implementation during the pandemic. Education panelists felt that this was the most important practice that was implemented over the pandemic.

Ergonomic equipment for remote work. Ergonomic equipment for remote work was also considered important from all (100%) panelists. Having ergonomic equipment for remote work was agreed to be very important. Panelists noted that not having ergonomic equipment available for workers may lead to more injuries being experienced by employees, and this could be expensive for

employers. Panelists in education noted that this might not be feasible (budgetary) for the education sector.

Remote work. Consensus was reached on remote work, with 89% of panelists considering offering remote work an important practice. Panelists noted that a slow transition to remote work would be best.

Physical barriers. Panelists noted that physical barriers may be important in some cases (i.e., public-facing roles), but may not be important or deployable in other cases. Education panelists noted that they ultimately affected instruction.

HVAC. Panelists noted that HVAC systems may not be feasible in all situations due to costly installation processes. Education panelists noted that the "biggest direction [they] got was opening of the windows."

Social distancing. Education panelists noted that this was not possible in school settings, even when they were at 50% occupancy. They noted that as administrators, it was problematic because the education sector had a different standard than other sectors. A union participant noted that there was a huge difference in healthcare compared to school settings and that in healthcare this practice was strongly recommended. They suggested that given their role in protecting health of patients, it was important to "practice what was preached by the public health officials".

Virtual meetings. Panelists noted that early in the pandemic, virtual meetings were helpful for social interaction and coordinated messaging but became a "trigger" as the pandemic continued – perhaps as a sign of the times or burnout and stress. Panelists noted that virtual meetings became "dreaded" and that employees became increasingly disengaged with virtual meetings. However, panelists suggested that virtual meetings are still helpful post-pandemic, particularly to include participation across wide geographical areas when travel may not be feasible for in-person events.

No-touch sensors. Panelists suggested that no-touch sensors were helpful, but perhaps not the best method of preventing the spread of COVID-19. They noted that increased sanitization and awareness of hygiene was a better route.

Staggered shifts. Education panelists noted that staggered shifts did not work in the education environment, and led to teachers having an increased workload that eventually became a union issue. They noted that teachers and students being in school was better for curtailing the mental health crises in young people during the pandemic. Union panelists suggested that this may be industry-specific, where some industries require a body in the workplace, and some wanted to ensure that there was a "connection of the workplace."

Mandatory PPE. Panelists suggested that once Public Health mandates removed the requirement for mandatory PPE, organizational policies that tried to require mandatory PPE rules became "moot," and that many people – both employees and the general public stopped wearing masks. Panelists noted that it became difficult as an employer to force employees to wear masks due to burnout, fatigue, and vaccination rates. A union participant suggested that policy makers would have to consider both the policy perspective and any potential legal perspectives.

Final Consensus on Pandemic Policy and Practice Recommendations

In the end, all 26 policy statements and 12 practice statements achieved consensus. Several individual policy and/or practice statements were grouped together to create more complete and comprehensive recommendations based on feedback from the Delphi Panel. These recommendations have been classified into three recommendation categories: 1) Important to guide policy/practice development; 2) Not important and/or not feasible to guide policy/practice development and 3) Industry and/or specific context may determine whether statements are

important for guiding policy/practice development. The final list of recommendations arising from this work are outlined below.

Recommendations for the Development of Organizational Policies to Protect Worker Health, Safety, and Productivity

Considerations for day-to-day operations. It is important to:

1. Ensure full transparency of organizational policies to all employees.
2. Have timely organizational policies.
3. Have comprehensive organizational policies to cover all aspects of the pandemic. to address changes in the pandemic.
4. Have organizational policies regarding how to reduce risk of transmission in place.
5. Reduce employees' concerns about vulnerability for exposures in the workplace,
    - to help employees feel safe.
    - to reduce uncertainty as much as possible by providing employees with access to valid and accurate information on the pandemic itself, and risks associated with it.
6. Adjust employee responsibilities to ensure workloads do not increase (or decrease) significantly in response to pandemic requirements.
7. Provide access to counselling and make stress management tools available to employees and managers.
8. Promote social connection amongst coworkers.
9. Promote social connection between employees and their managers.

10. Actively promote not working while sick and ensure that adequate sick leave time is available to support this policy.

Considerations for protecting human rights. It is important to:

1. Consider family considerations (e.g., children, elder care) when establishing safety initiatives and employee needs.
2. Ensure work arrangements can accommodate individualized needs as much as possible.
3. Consider employee gender for safety initiatives and employee needs in specific circumstances (e.g., exposure during pregnancy; adequate fit of PPE) while respecting contracts, collective agreements, and other relevant legislations.

Not important. It is likely not important to:

1. Require work arrangements that are the same for everyone.
2. Increase surveillance of employees when they work remotely.

Industry and/or context specific. The following recommendations may be specific to the industry or other contexts:

1. Have contact tracing processes in place and working well.
2. Offer remote work to protect worker health, safety, and productivity.
    - However, when remote work is provided, it is important to:

    - Provide training and assistance in developing new skills when transitioning employees to remote work; and
    - Help employees feel ready to return to onsite work.

3. To provide workers with pandemic-specific PPE measures.
    - However, if PPE is provided, it is important to:
        - Ensure provided PPE is proper quality and fit.
        - Provide training on appropriate PPE usage.
4. Consider the industry for other context-specific safety initiatives and employee needs in policy planning.

Recommendations for the Implementation of Organizational Practices to Protect Worker Health, Safety, and Productivity

Important. It is important to incorporate the following to protect worker health and safety:

1. Increase sanitization (hand-washing stations).
2. Increase ventilation (open windows).

Not important or feasible. It is likely not important or always feasible to incorporate the following to protect worker health and safety:

1. Improve indoor air quality through comprehensive HVAC systems.
2. Implement mandatory PPE.
3. Provide no-touch sensors in workspaces.

Industry or context-specific. It may be industry and/or context specific as to whether the following are important to protect worker health and safety:

1. Introduce physical barriers between workers.
2. Use virtual meetings.
3. Practice social distancing / limited occupancy, including the use of staggered shifts to reduce worker density.
4. Offer remote work arrangements to employees.
    - However, if remote work is offered, it is important to provide ergonomic equipment to workers when working from home.

Phase III Summary of Findings

Over the course of the Delphi Panel, panelists came to a consensus on many items as "important." Panelists only conceded that some items may be unimportant or not feasible during the focus group (Round 3). This may be because of the industries represented (versus not represented) during the focus group meeting. Panelists agreed that the "sledgehammer" effects from Phase I (i.e., the important variables from Phase I's model) were important in pandemic policy decision-making. Specifically, promoting and support social support and sense of community between employees and with management, seeking policy comprehensiveness and transparency, assisting employees feel less vulnerable to PPE failures, and ensuring employees had return to work-site self-efficacy were important to do.

The Delphi expert panel provided important insights on pandemic policy and practice recommendations. They suggested that all pandemic-specific policies and practices be timely,

comprehensive, and transparent, as well as promote perceptions of safety in the workplace, provide accurate information about the pandemic, and reduce transmission risks in the workplace.

Interestingly, one item that panel panelists felt strongly about was staying home while sick. While the Delphi panel had already come to a consensus about this item during the survey rounds, the focus group panel felt very strongly about the ethics of enacting this policy. The focus group panel did agree that employees staying home while sick was important, they had strong feelings about the reality that many employees across industries (but especially in education) did not have enough sick leave. Panelists who identified themselves as in administrative roles admit that they have problems with enforcing or promoting employees to stay home and potentially miss (a) day(s) of pay. Therefore, the participant panel suggest that employees have adequate access to sick leave, especially for those in positions where they cannot reasonably perform their job duties working from home.

The Delphi expert panel also suggests that policies should be able to fit individual needs, consider family considerations of employees such as child or elder care, as well as, in some situations, consider employee gender in extraordinary situations such as pregnancy in female-bodied individuals. Both the Delphi panel and the research team considered these items to fall under a "human rights" topic, as items such as disabilities and family status may fall under individual needs.

Social connection policies, both between coworkers and employee and management groups, was also deemed important by the Delphi panel. They cite reasons behind this, such as mental health during isolation and camaraderie between management and employees.

Both union and education workers agree that increased sanitization, ventilation, and ergonomic equipment for work from home were highly important. However, many of the implementation items were considered not feasible or context specific. The education panelists

suggest that many of the implementation items (e.g., mandatory PPE, HVAC) would be beneficial to have in schools, but ultimately not feasible either on account of time or pecuniary constraints. They also recognized that while physical barriers, social distancing, remote work, and virtual meetings could help reduce the risk of contracting COVID-19 in some workplaces, they did not necessarily add a benefit or were feasible in each workplace.

LIMITATIONS

Like all research, this research has limitations that need to be discussed as these impact the type of generalizations that may be made from the findings. Each phase of the research has its own limitations, which are associated with the type of research. These are each discussed individually. Then the overall implications of these limitations are presented.

Phase I Limitations

This study is subject to some limitations. Multi-Group Analysis (MGA) only permits two-group comparisons and require sufficient sample size for statistical power. First, our gender analysis did not include gender minorities in the overall analysis on account of insufficient statistical power (<5% of each survey's participants self-identified as a gender minority), and MGA is unable to run with fewer than 20 cases. Future studies or workplace assessments may have to specifically target those who self-identify as a gender minority to assess pandemic-related workplace attitudes in this demographic group.

Second, our industry analysis is a broad stroke and may miss some nuances between essential worker groups (e.g., healthcare workers vs. utility workers, and so on) and between essential worker groups and technical non-essential work groups, as well as other distinctions between worker types. Furthermore, there may be some variation between education workers' essential worker distinction that may have some effect on attitudes within that group.

There are also some limitations that would affect the generalization of the study results. This study's sample did not include those whose main source of income (i.e., main industry of employment) would be considered service industries such as retail, hospitality, and tourism, among others. These industries experienced the pandemic differently in terms of, for example,

compensation, interpersonal interactions, the ability to work from home, layoffs, and varied in terms of essential worker distinction; thus, the results cannot be generalized to workers in these industries.

Generalizing the results outside of the province of Newfoundland and Labrador may not be valid, as this province had the strongest COVID-19 responses in Canada, which resulted in less leeway for organizations to choose how to act in accordance with the pandemic. The effects of such government-led initiatives may have helped or hindered employee response to pandemic-related policies and work culture. Being government-led may increase one's sense of duty or may affect perceptions of fairness. Other Canadian provinces (and global jurisdictions) required more voluntary organization-led initiatives due to fewer public health-led initiatives.

Furthermore, much of the province's population is centered within three small cities, but a lot of the population also lives in smaller, less connected communities with varying levels of access to goods and services such as healthcare (e.g., emergency rooms, mental health services), internet speed and access (e.g., dial-up vs. fiber-optic cables), and even road access, among other rural vs. urban issues that may have unique effects on pandemic-related policies. Newfoundland and Labrador also has an older, less healthy (e.g., high levels of obesity and colorectal cancer) population. Many of the public policies may have been worded as protecting the vulnerable elderly (i.e., grandparents), which may have had an effect on how individuals perceived new, pandemic-related policies.

Lastly, this study was cross-sectional based, which may have implications on causal statements as well as potential common-method variance issues. While the statistical analysis was guided, in general, by general theoretical assumptions (policies/practices preceding attitudes, which preceded behaviours, it is possible that some attitudes may have actually altered recollection of initiatives, or health may have altered attitudes and perceptions of initiatives. Thus, causal claims need to be tempered and this research notes correlations between these variables.

While we had the survey design set up to allow for a longitudinal approach, many participants who claimed to be returning participants did not give a valid response ID in order to link their responses. Furthermore, to ensure confidentiality, we did not track participant ID addresses nor give each potential participant a unique link for tracking purposes.

Phase II Limitations

In the qualitative interviews, there was low representation in the health industry. Despite attempts to recruit from this industry, it has lower representation relative to the other industries in this research. As such, unique issues might not have been identified in the interview results. However, that said, the participants from health had similar responses as the other industry participants.

There was also low representation of the remote locations. There were representatives of rural and urban regions in the interviews but there were few participants from remote areas of Newfoundland and Labrador. Again, like the health industry, it is possible that some unique factors were not captured due to low representation.

Similar, to Phase I, our data did not include anyone from the service industry (e.g., restaurants, hotels). There is a study that examined the experiences of individuals in the hotel industry (Yu, Park & Hyun, 2020), and there were high risk factors associated with that industry that impacted employee stress, mental health, well-being, and their citizenship behaviours (going above and beyond their job requirements). Future research should examine the policies, practices and impacts on employee outcomes for this sector.

With the structured interview method, it is possible the research misses a factor that is not captured by the questions. However, at the end of the interview, all participants were asked if there were any additional insights or thoughts about the pandemic and their experiences within their

organization that was missed. Some participants added additional thoughts, which were included into the analyses, but the majority felt everything was covered by the interview questions.

Similar to Phase I, another limitation may be due to the province in which the data was gathered. As noted above, Newfoundland and Labrador had some of the strongest public health measures in response to the pandemic. In the interviews, the public health measures were clearly noted as having an impact in the perception of what was necessary and what was fair. These public health measures also influenced perceptions of safety.

Phase III Limitations

The Delphi Study had several additional limitations. The first limitation is the small sample size. We had planned for 19 panelists, however only 11 (58%) of the panelists participated in Round 1. Only nine (47%) panelists responded to Round 2. While eight participants responded with availability for the focus group, only four participants were able to make it to the meeting. Of these four participants, only education, and unionized workers in private, public, and municipal industries were represented, with no representation from higher education and power workers. While focus group participants did speculate about other industries (and some had experiences from several industries), this may have created a bias towards education and unionized jobs in our results.

Items for the Delphi Panel were taken from the items found important in Phase I (surveys) and Phase II (interviews) of the study. While this means that the items were representative of issues deemed important by our sample, this also means that items that are important to COVID-19 and pandemic policies for workplaces in Newfoundland and Labrador may have been overlooked on account of sample bias. Like with the other phases of the study, we have no input form workers in the service/retail or tourism industries. Furthermore, there was little input from those working in

healthcare, especially in Phase II and 3, even though healthcare workers would have been represented from one of the union group stakeholders.

Finally, the panelists (deemed experts) for the Delphi Study were suggested to us by our stakeholders. This may have created an age bias in our sample, as the term "expert" may apply to individuals who have been in their position for a longer time. Due to a technological hiccup, all participants in the focus group connected through phone, so we could not estimate age or any other visible demographics of our participants.

Overall Limitations

When all three phases of this study are considered together, the diversity of methodology helps reduce the threats of any single study. For example, the interviews helped to triangulate the results from the surveys. The Delphi study helped verify the validity and relevance of the results from the surveys and interviews, whilst examining further potential contextual factors for the implications. While the three phases of this study were integrated and incremental from each other, both the interviews and the Delphi studies gave participants the opportunity to add any additional or new insights.

There are two limitations that remain across all three phases of this research: industry representation and level of provincial (and national) public health measures for Newfoundland and Labrador. This research cannot be fully extrapolated to the service industries, like restaurants and hotels. Thus, caution needs to be exercised when implementing the recommendations in these industries.

Furthermore, the type and level of public health measures were deemed to be a factor within the interviews and Delphi studies. A noteworthy nuance of NL's governance during the pandemic was that the Chief Medical Officer was given substantial power (formally and informally) and respect by the government and public. In addition, the Minister of Health was a surgeon and the second Premier during the pandemic was also a surgeon by trade. Whereas, other provinces had tension between their Chief Medical Officer and governing bodies with a focus on the tension between business needs and public health needs.

Additionally, Newfoundland and Labrador has a collectivist culture. Thus, members of the public were more willing to put the needs of the group over the needs of the individual. In comparison, Ontario, which has an individualistic culture, individuals' needs and desires are considered more heavily than the need of the group. This cultural difference and the difference in the messaging may have influenced the very high rate of vaccination and compliance with public health measures.

To that end, care must be taken in extrapolating the recommendations to other provinces or countries where individual and business needs are prioritized over the collective and public health.

RESEARCH CONCLUSION

Our multi-method research took an extensive look at the workplace experiences of individuals in Newfoundland and Labrador during the COVID-19 pandemic to examine how organizational policies and practices impacted their job-related attitudes, performance on the job and their mental and physical health. The findings highlight some key take-away points for practitioners; however, the biggest implications are that employees' health and wellness were impacted by the pandemic and the organizational responses to it. Public health measures also played a role.

The lockdowns with the associated forced remote work for the majority of workers came with a mix of relief and feelings of safety, but also with some stress in terms of insufficient ergonomics, and too much or too little workload. The remote work had gendered effects for employees. Females experienced a reduction of emotional demands on the job with the remote work, and a reduction of work-family conflict; whereas, males experienced an increase in work-family conflict with remote work.

Organizational policies regarding the prevention of transmission of COVID-19 and contact tracing policies were not substitutable in their effects on employees. This suggests both are needed; however, in the interviews and Delphi study, it became clear that contact tracing policies played a more critical role in the initial phases of the pandemic and were less effective once vaccinations were common and public health measures were removed. The survey results also highlight that contact tracing was more relevant for the remote and rural workers than for urban workers.

The comprehensiveness and transparency of policies had a wide range of effects on the key outcomes, and it is highly recommended that organizations put an emphasis on doing this part well.

Timeliness of policies did not have a large effect, but the organizations in the study were deemed quite timely in their policy development. To that end, we recommend organizations work on being timely, but not at the expense of transparency and comprehensiveness.

We found two key attitudes that had predictive power on the key outcome variables: return-to-worksite self-efficacy and vulnerability to PPE failures. These are measurable attitudes that may help inform an organization on the readiness or risk factors for their employees when returning to the worksite. These attitudes were not relevant for employees who were remaining as remote workers as they were not having to return to worksite nor were they at risk while working at home for PPE failures. This research has shown which organizational practices may help with these attitudes.

One of the big outcomes of the pandemic has been a shift of awareness about working while ill. While this was not covered in Phase I of the research, it was discussed to a great extent in Phases II and III. Employees would work while ill for a variety of reasons prior to the pandemic, for example the workload would not be covered by others and the load would be unmanageable upon return, the preparation to have the sick time off would be more work than the sick time, guilt, or personal beliefs about importance of work. Rarely was it because a manager explicitly would require or pressure them to work. However, during the pandemic, most participants reported having a change of opinion on working while sick, that it was less desirable or appropriate to do so. Yet the lack of actual sick time or continual accumulation of workload would still pressure individuals to work while sick. The only difference is that they would do it from home, if permitted / possible. The Delphi panelists agreed that organizational / institutional policies regarding sick time forced some employees to work while sick or to forgo pay. This is a significant issue moving forward out of this pandemic.

Our results showed individual factors had implications for the key outcomes of general health, commitment, engagement, and quality of performance. Vaccination status not only had health outcomes for the employees. These health benefits were more than preventing getting COVID-19 or having a less severe case of COVID-19, but also in terms of mental health factors. In addition, vaccination status was also associated with many attitudinal and perception outcomes. This suggests that individuals who may not get vaccinated may be at higher risk of more negative outcomes than those who are able to be vaccinated. Future research needs to investigate what additional supports may be provided to these at-risk individuals. Finally, distraction by dependent care was a significant predictor of mental health (depression, burnout, and stress), and had indirect effects on general health. This was not a gendered effect, and this might apply outside of pandemics as well.

Finally, our results highlight the need for fairness and justice during the managing of a pandemic. The interviews highlighted the importance of fairness in terms of fair treatment, transparent communications, and equity (not equality). Interviewees and the expert panelists were clear on the tensions but importance of individual consideration from an occupational health and safety perspective, a human rights perspective, and from an equity, diversity, and inclusivity (EDI) perspective. It is clear that pandemics are very challenging for the individuals who are managing and leading the organizations, and that there are many tensions / conflicting needs that must be considered. This research hopefully sheds some light to make the prioritization of these conflicting needs easier to manage.

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