The Impact of COVID-19 on Faculty & Research Staff at McMaster University

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Executive Summary

This report draws on data from *The Impact of COVID-19 on McMaster University Faculty and Research Staff Survey* and *COVID Recovery Conversations - Moving Beyond the Pandemic* roundtable events. The purpose of both the survey and roundtable events was to assess the effects of COVID-19 on faculty and research staff at McMaster University and to offer participants the opportunity to provide suggestions for solutions moving forward.

The survey was shared with 1,400 employees (representing most of the university's research workforce) in the summer of 2021. We obtained 475 useable surveys for a response rate of 34%.

We also draw on the feedback collected from the *COVID Recovery Conversations - Moving Beyond the Pandemic* roundtable events to gain further insight into the effects COVID-19 had on faculty and research staff and suggestions for solutions, to compare with responses collected from the survey.

Several key findings emerged from the data collected from both the survey and the roundtable events. **First**, productivity declined among McMaster faculty and research staff during the pandemic. The data from our survey suggest that some groups were overexposed and more vulnerable to these hits. Participants agreed that early career researchers, women, and parents experienced the greatest declines. Our survey data supported this case for the latter two groups.

Second, many respondents reported that they experienced greater work, family and community stressors compared to before the pandemic. We also found increased anxiety and depression symptomology among most. One of the most profound statistics that we pulled from the survey was that 53% of respondents had thought more or much more about death now compared to before the onset of COVID-19 in March 2020.

Third, the exposure and mental health vulnerability to stressors was not equally distributed. Women were more likely than men to report these outcomes, and—when we examined subgroups of parents, mothers reported that they experienced more stressors and mental health symptoms than the fathers in our sample.

We outlined four typologies of faculty and research staff that came out of our survey results: (a) about a quarter of respondents we could label as *healthy and productive*. Most of these respondents were men, (b) one-fifth could be identified as *healthy but unproductive* –comprised mostly of men, (c) close to another quarter of the sample was characterized as *unhealthy but productive*—those who continually push themselves to the expense of their well-being, and (d) one-tenth of the sample we defined as *unhealthy and unproductive*. Women were overrepresented in both latter categories.

We conclude our report by offering several suggestions to help faculty and research staff recover from these past 18 months, as well as support their productivity, health and well-being in the years to come. Our proposed solutions are based on four broad themes including financial compensation, time and flexibility, long-term merit impacts, and community building.

Introduction

The COVID-19 pandemic impacted all segments of the population. Our research team wanted to better understand how faculty and research staff at McMaster University were affected in terms of their research productivity, work-family balance, and well-being. We also wanted to solicit feedback from this group about potential solutions to facilitate success in a post-pandemic context, both in the short and long term.

This report draws on data from *The Impact of COVID-19 on McMaster University Faculty and Research Staff Survey* and *COVID Recovery Conversations - Moving Beyond the Pandemic* roundtable events, the latter of which focused specifically on women in research.

We divide the following report into five main sections: 1) Data & Methodology, 2) Results, 3) Discussion, 4) Unequal Exposure and Vulnerability to COVID-19 Experiences, and 5) Suggested Solutions.

The Results provide an overview of each survey section. The Discussion outlines four archetypes of faculty and research staffs' experiences of COVID-19. The Solutions section offers suggestions across four areas based on survey data. The quantitative results are supplemented by qualitative responses from open-ended survey responses and the roundtable comments.

Data & Methodology

Survey Data Collection & Sample Characteristics

The survey of McMaster's employees was administered in two waves. Wave 1 was launched on June 23rd, 2021, with a reminder email sent on June 29th and the survey closed on July 4th. Upon closing, 20% of the non-responders were randomly selected for a Hard-to-Reach follow-up phone call. Fifty percent of these potential respondents received phone calls on July 5th and the other 50% received phone calls on July 6th. The Hard-to-Reach survey closed on July 11th.

Wave 2 was launched on June 30th, 2021, with a reminder email sent on July 6th and the survey closed on July 11th. We followed the same procedure as the first wave: Upon closing, 20% of the non-responders were randomly selected for a Hard-to-Reach follow-up phone call. Fifty percent of these potential respondents received phone calls on July 12th and the other 50% received phone calls on July 13th. The Hard-to-Reach survey closed on July 18th.

This research was approved by McMaster's Research Ethics Board (MREB# 5483).

We received a response rate to the survey of 34% (n=475), with an equal 50% gender split. Sixty-six percent of the sample identified their primary race/ethnicity as White; 24% identified as Asian[1]; and the remaining sample identified as either Hispanic, Black, Indigenous, or other.

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[1] These categories included: 1. South Asian (e.g., East Indian, Pakistani, Sri Lankan, etc.), 2. Southeast Asian (e.g., Vietnamese, Cambodian, Laotian, Thai, etc.), 3. West Asian or Arab (e.g., Afghan, Iranian, etc.), 4. Chinese, 5. Filipino, 6. Korean, 7. Japanese.

Table 1 provides a breakdown of the sample by faculty. The majority of respondents are from Health Sciences (~28%), Science (~22%), or Engineering (~18%).

TABLE 1 *Overview of Percentage of Respondents by Faculty*

Faculty	Respondents
Business	6%
Engineering	18%
Health Sciences	26%
Humanities	12%
Social Sciences	15%
Science	22%
Other	1%

Thirty-eight percent of these respondents have been employed by McMaster for five years or less. This statistic is noteworthy and might suggest that our sample over represents untenured faculty who might be in more precarious positions. Fifteen percent report employment for six to ten years and 27%, for 11 to 20 years. The remaining sample has been employed at McMaster for over 20 years.

Approximately 60% of respondents had a child living in the household; 16% of which had at least one child under 6 years of age, and ~20% had a child aged 6 to 11 in the household. Women are slightly over-represented in these numbers: 53% of parents are mothers compared to fathers, and mothers make up 55% of those with children under 11 years old.

Over 47% of respondents live in an area that was—at some point—declared a COVID-19 hotspot, and ~16% had a loved one who lived in a building that was once declared an outbreak location.

We did not directly ask respondents whether they had been diagnosed with COVID-19.

All other results are outlined in the following sections. We supplement these responses with quotes from the *COVID Recovery Conversations - Moving Beyond the Pandemic* roundtable events.

COVID Conversations Roundtable Events

Drs. Karen Mossman (VPR) and Susan Tighe (Provost) hosted two roundtable sessions (via Zoom) on June 21st and 22nd 2021, respectively. Each session lasted 1.5 hours and highlighted four key panelists. Excluding organizing administrators and hosts there were 45 attendees for the first roundtable discussion, and 37 in the second.

The first session featured Catherine Connelly, professor in Human Resources and Management, and Canada Research Chair in Organizational Behavior; Professor Leyla Soleymani, associate professor in Engineering Physics and Canada Research Chair in Miniaturized Biomedical Devices; Karin Stephenson, manager, commercial operations

Nuclear Operations and Facilities; and Vanessa Watts, assistant professor, Sociology, and Paul R. MacPherson Chair in Indigenous Studies.

The second session featured Faiza Hirji, associate professor in Communications Studies and Multimedia; Brenda Vrkljan, professor of Rehabilitation Sciences; Cynthia Belaskie, managing director of Canadian Housing Evidence Collaborative; and Sigal Balshine, professor of Psychology, Neuroscience, and Behaviour.

Each roundtable discussion was recorded and transcribed. With permission from respondents, and ethical clearance from the McMaster Research Ethics Board (MREB# 5575), we draw upon these transcripts to provide a broader perspective of faculty and research staffs' experiences, beyond the survey results.

Focal Survey Measures & Descriptive Results

Productivity

We asked respondents several questions about their productivity during the pandemic. These questions addressed a series of topics including the impact of COVID-19 on: (a) perceived career trajectory; (b) restriction of facilities/resources, and productivity specific to area of research (i.e., wet-lab, fieldwork, computer, interviews, etc.); (c) lost productivity/research time; and (d) conference attendance, publications, and grant submissions.

Perceived Career Trajectory & Consequences

Figure 1 presents the breakdown of those who perceived that their career trajectory has been negatively affected by COVID-19: 51% of respondents agreed or strongly agreed; 25% of respondents remained neutral, and 23% either disagreed or strongly disagreed. Thirty-three percent of our sample also considered leaving academia during the pandemic.

Restricted Facilities / Resources

Table 2 presents the breakdown of those who had restricted access to research facilities. Out of 136 researchers who indicated that they perform fieldwork research, 85% lost access to fieldwork facilities or locations, 72% experienced significant delays or total stoppages to their research as a result. Not surprisingly, those who exclusively perform international fieldwork all lost field access (n=40).

There were 110 respondents who used wet lab or animal facilities for their research, ~80% lost access to these facilities and 66% indicated that these restrictions resulted in significant delays or total stoppages to their research.

Other results of researchers who experienced significant research delays because of reduced access to facilities and resources are noted in Table 3.

TABLE 2 *Percentage of Respondents Who Lost Access to Necessary Research Facilities and Resources*

Research Facility/Resource	Respondents
Fieldwork	85%
Wet Lab	81%
Dry Lab	77%
On Campus Archives, Libraries, Core Facilities	55%
Community Partnerships	72%
Human Participants	87%
Other	43%

TABLE 3 *Percentage of Respondents Who Experienced Significant Delays*

Research Type	Respondents
Fieldwork	72%
Wet Lab	66%
Computer-based Research	21%
Community-based or Partnered Research	54%
Research Involving Human Participants	71%
All Research Types	62%

Lost Productivity & Research Time

We asked respondents the extent to which their research was impacted by COVID-19. Eighty-two percent of respondents experienced some delays in their research, and up to 63% indicated that at least one of their research projects was significantly delayed or stopped entirely. About 34% of these respondents reported that they will likely face delays over one year and nearly 60% indicated delays of over 6 months.

> *About 34% of these respondents reported that they will likely face delays over one year and nearly 60% indicated delays of over 6 months.*

Conferences, Publications, Grant Submissions & Student Recruitment

The following data compare respondents' experiences to what it was like prior to March 2020 (i.e., before the onset of the pandemic and closure of McMaster University and related facilities).

Conferences

Most respondents indicated that they had missed out on in-person speaking engagements and—as a result—networking and collaborative work opportunities

during the pandemic, compared to prior (~70%). Only 18% indicated that they had more conference or speaking engagement opportunities compared to before the pandemic.

Publishing

When asked to indicate the degree to which they had published scholarly outputs, 195 out of 368 (53%) indicated less or much less. Only 12% reported publishing more or much more.

Of the respondents whose scholarly outputs decreased or significantly decreased, ~65% reported that they had less/much less time to work on publications; 57% reported that they had missed opportunities to publish scholarly outputs due to increased family obligations and/or health concerns during the pandemic. Fifty-eight percent of respondents felt they were more or much more likely to stop working on existing scholarly outputs compared to before the pandemic. Less than 15% of the sample reported more or much more publishing opportunities or time to work on publications.

> *Fifty-eight percent of respondents felt they were "more" or "much more" likely to stop working on existing scholarly outputs.*

The survey results for lost grant opportunities were mixed: 47% of respondents said they had missed out on opportunities; 40% reported no change in grant writing opportunities, and only 13% indicated that they had greater opportunities.

Of our overall sample, 32% received less or much less funding during the pandemic than they otherwise would have, but ~22% received more – which might highlight those who benefited in research grants from the COVID-19 context/criteria depending on their research area.

Finally, 75 out of 164 respondents (46%) required additional funding to support changes in projects, due to lost data, while only 54% reported needing no additional or fewer funds.

Collaborations

Faculty and research staff were also limited in terms of their collaborations during the pandemic. Approximately 69% reported delays in correspondence with their collaborators. Almost half of respondents had at least one collaborator opt out of a research project; most of whom reported an increased workload as a result.

> *Almost half of respondents had at least one collaborator opt out of a research project.*

Among those who worked with human participants, 84% reported less or much less access to their participants; respondents' research was further inhibited by their

access to technology (47% of who had less or much less access); and over 54% had reduced access to necessary maintenance required for their research equipment.

Students

Overall, faculty and research staff had difficulties recruiting and training students during the past 15 months.

When asked to indicate the degree to which they had recruited new students for undergraduate research training programs, 50% reported they had fewer opportunities to recruit compared to before COVID-19. Furthermore, 46% of respondents had recruited fewer or far fewer new students for graduate research training programs.

Experiences of Lost Research Time

The previous statistics are underscored by respondents' open-ended responses to the survey, specific to the impact of the pandemic on research productivity.

As one respondent explains:

> *"The university has done a good job so far, in helping to mitigate the impacts of Covid-19, and continue to do so, understanding that the impact of Covid-19 doesn't end when we enter a post-covid situation. For example, lack of access, due to Covid restrictions, to some instrumentation, is costing us dearly in terms of research productivity, which then translates to loss of data for grant applications (and grants being rejected) and publications. We cannot make up this time. It is lost and the repercussions will take some time to dissipate."*

Similarly, another woman faculty member underscores:

> *"I think we need to recognize the impact is long-term. I am not sure what can be done about that beyond what is already suggested above, but I want folks to acknowledge the long-term impact. The impact on my career is not equivalent to the length of the pandemic - say 18 months. It is double, if not triple, that."*

Younger faculty are also concerned about the long-term consequences of the pandemic on their productivity:

> *"The impacts of COVID on research productivity may not be seen immediately, so measures to mitigate this during the Tenure and Promotion process should continue well after the pandemic 'ends'."*

> *"[…] Take into account that any disruptions snowball, especially for early career researchers - a missed grant/opportunity delays their programs far more than for 1 year."*

Work, Family and Community Stressors

We asked respondents about their experiences of work, family, and community stressors. Most expressed difficulties combining these roles during COVID-19 compared with prior to the pandemic.

Our survey questions addressed respondents' (a) preferred hours working from home, and (b) ability to balance work and family demands because of COVID-19.

Working from Home - Preferences

The majority of respondents reported they prefer the majority of their work hours be from home. Out of the 355 people who responded to this question, 57% of respondents prefer working "41+ hours" from home. Twenty-two percent prefer working 31 to 40 hours. The remaining responses are presented in Figure 3.

> *Fifty-seven percent of respondents prefer working "41+ hours" from home & 22% prefer working 31 to 40 hours.*

Work-Family Conflict

Work-to-family conflict is defined by the extent to which one's paid work role obligations are incompatible on some level with their family expectations.

Over ~54% of respondents reported that they had less or much less time for their work given their family expectations compared to before the pandemic. Over ~63% also said they had less energy to give to their family because of work, compared to before COVID-19. These same percentages reflect those who felt they were not doing as good of a job at home as expected (59%); and/or, could not concentrate on their personal life (63%).

> *Over ~63% also said they had less energy to give to their family because of work, compared to before COVID-19.*

Family-Work Conflict

In addition to work-to-family conflict, we assessed respondents' *family-to-work conflict*, defined by the extent to which one's family expectations are incompatible on some level with their paid work role obligations.

Over ~47% of respondents reported that they had less or much less time with their family given their work. Close to 52% also said they had less energy to give to their work because of family, compared to a pre-COVID-19 context. Close to 50% said that they were not doing as good of a job at work because of their family, and 52% said they had more difficulties concentrating on family than work, compared to pre-COVID-19 contexts.

> *Close to 50% said that they were not doing as good of a job at work because of their family.*

Childcare Stressors

Respondents were also given the opportunity to talk about the extent to which they were concerned about the impact of COVID-19 on their children. When asked the extent to which the respondent was concerned about how COVID-19 would impact the education of their children, over 73.5% were worried or very worried. These numbers are similar across respondents based on the questions about worries of their child's mental health (i.e., 67% were worried or very worried).

> *Sixty to 70% of parents are concerned about how COVID-19 would impact the education and mental health of their children.*

Experiences of Conflict between Work & Family

We heard several stories from faculty and research staff during the *COVID Conversations* about their experiences of work-family conflict, and the challenges/benefits of working from home.

For example, one respondent outlined the following:

> "[…] I would be remiss if I didn't say it was hard too….Not only did we have the pandemic but we also moved during that time, created 2 homes, so my kids have been asked to live with a lot of change and I found myself in more roles than ever. I was the worker, the mother, the counsellor, the teacher, the nurse and it was leading to burnout as many would probably say they felt as well."

Another commented on how the pandemic has disproportionately affected women faculty given the inequitable gender distribution of childcare:

> "I would say women, the data shows that women are taking up a lot of the domestic, at home duties at the sacrifice of their work to ensure that their families, that their children are taken care of. And what does that mean in terms of our careers? It means they are going to be quote "delayed." But these delays are not accounted for."

We also had someone comment about their challenges of having young children at home, and a partner working full time during the pandemic:

> "[…] I wanted to highlight a few particular challenges that I'm working with. One is the challenge of simply having young children when they've been home so much in Ontario. I think Ontario has been the province where kids have missed the most in person school. My partner works in health care so he has to go into the clinic and see patients and so I'm, you know, single momming it a lot of days. So I think that there's been this kind of you know the fatigue that you deal with, the feelings of sadness that you're dealing with from yourself and your family, the

inability to take time for yourself, the challenges of thinking when you do most of your work at night after you've spent a long hard day taking care of your family."

One comment was poignant in outlining the distinction between work and family obligations during the pandemic.

"I, so, think I sort of had like two pandemic experiences. One is the one working from home when the kids are in school, which is the like unicorn beautiful time of seven hours of solid focus. And then I get to take a break and I pick them up at the schoolyard and they come and hug me and it's like a hallmark movie and that is like so awesome because we're able to get so much done. And then they closed the school and I thought I was never going to be able to work again and I thought how am I even doing this like why am I putting my kids on a screen and I'm fighting to get stuff done and telling them to be quiet, like you know does this make any sense, is this sensible and maybe it did maybe it didn't I don't know but we're just doing our best. And so in some ways there's just like this picture perfect beautiful pandemic working from home situation and then this other one that was certainly less than perfect."

Health & Well-being

We asked respondents about their experiences of mental health and well-being during the pandemic, given the stressors they had faced across work, family, and community domains. We highlight the responses from these survey question, followed by qualitative responses.

General Physical & Mental Health

When asked how they would rate their overall physical health now, compared to before the pandemic, 45% said fair or poor. When asked how they would rate their overall mental health now, compared to before the pandemic, 62% said fair or poor.

> *When asked how they would rate their overall mental health compared to before the pandemic, 62% said fair or poor.*

Emotional Problems & Behaviours

We asked a series of questions in the survey about emotional difficulties and mental health symptomology experienced during COVID-19. These questions are based on validated measures of previous mental health research in the social sciences.

Depression Symptomology

We included a total of 11 questions on depression symptoms. We highlight the results from several of these questions and provide additional findings in Table 4.

When asked, in comparison to what it was like prior to March 2020, how often they "felt sad or depressed," 70% of respondents reported much more or somewhat more

often. This figure was similar amongst those who reported they had "felt discouraged about how things were going in their life," (71% reported more or much more). For both questions, ~23% reported similar levels, and only ~5% reported these feelings less than prior to the pandemic.

Approximately 51 to 58% of respondents reported that "they took little or no interest or pleasure in things", "felt down on themselves, no good, or worthless", or "felt so low that it either caused distress or interfered with their activities at home, work, or in their social life" more or much more than prior to the pandemic.

These statistics are concerning in and of themselves. However, the most alarming was that 53% reported that they thought a lot about death more or much more than prior to the onset of the pandemic (either their own or someone else's, or death in general).

> *53% of respondents reported that they thought a lot about death "more" or "much more" than prior to the onset of the pandemic.*

See Table 4 for additional results for respondents' depressive symptomology reports.

TABLE 4 *Overview of Respondents' Accounts of Depression Symptoms Compared to Before the COVID-19 Pandemic, by percentage.*

Depressive Symptoms	Respondents				
	Much.	Less	Same	More	Much..
Feel sad or depressed?	<3%	<3%	24%	49%	22%
Feel discouraged about how things were going in your life?	3%	3%	23%	48%	23%
Take little or no interest or pleasure in things?	2%	6%	34%	43%	15%
Feel down on yourself, no good, or worthless?	<3%	4%	38%	39%	16%
Think a lot about death (either your own, someone else's, or death in general)?	3%	2%	42%	35%	18%
Have trouble concentrating or making day-to-day decisions?	2%	3%	29%	44%	22%
Have a poor appetite or overeat?	2%	4%	49%	33%	12%
Have problems falling asleep, staying asleep, waking up too early, or sleeping	2%	3%	31%	39%	25%
Talk or move more slowly than usual?	2%	3%	66%	23%	6%

The header row structure: "Respondents" spans the five data columns. The columns are: Much [Less], Less, Same, More, Much [More].

Feel tired out, low in energy, or easily fatigued	2%	3%	22%	49%	24%
Feel so low that it either caused distress or interfered with your activities at home, work, or in your social life?	3%	2%	44%	38%	13%

Anxiety Symptomatology

We included a total of 10 questions on anxiety symptoms. We highlight the results from several of these questions and provide additional findings in Table 5.

Over 75% of respondents reported that they felt more or much more "worried or anxious," and "worried about a number of different things in their life, such as work, family, health, or finances."

Just under 50% reported that they "worried excessively or too much" (47%); had "trouble controlling their worry" (44%), or "felt so agitated that it either caused distress or interfered with their activities at home, work, or in their social life" (42%) more or much more than before COVID-19.

TABLE 5 *Overview of Respondents' Accounts of Anxiety Symptoms Compared to Before The COVID-19 Pandemic, by percentage.*

Depressive Symptoms	Respondents				
	Much Less	Less	Same	More	Much More
Feel worried or anxious?	<3%	<3%	19%	49%	27%
Worry about a number of different things in your life, such as your work, family, health, or finances?	2%	<3%	19%	48%	28%
Feel more worried than other people in your same situation?	<4%	6%	52%	27%	12%
Worry excessively or too much?	4%	<3%	46%	34%	13%
Have trouble controlling your worry?	<4%	2%	50%	33%	12%
Feel restless, keyed up, or on edge?	2%	3%	38%	42%	15%
Have difficulty concentrating or your mind going blank?	3%	3%	30%	44%	20%
Feel irritated, annoyed, or grouchy?	3%	3%	29%	47%	18%
Have muscle aches or tension?	<4%	4%	41%	36%	15%
Feel so agitated that it either caused distress or interfered with your activities at home, work, or in your social life?	<4%	<4%	50%	34%	9%
Feel so low that it either caused distress or interfered with your activities at home, work, or in your social life?	4%	3%	47%	36%	10%

Interference of Mental Health on Work Performance & Social Life

When asked how much their mental health (or emotional health) problems interfered with their performance at work, 58% reported a moderate or mild interference. Seventeen percent reported very severe to severe interference. A similar percentage of respondents reported that their mental health interfered with their social life: 15% reported a very severe or severe interference, and 57% reported a moderate or mild interference.

> *75% of respondents report that their mental health interfered with their performance at work during the pandemic.*

Unequal Exposure & Vulnerability to COVID-19 Stressors

A common theme of research on COVID-19 is the disproportional impact the pandemic had on certain groups of the population. We asked respondents which—if any—groups they felt were more exposed or vulnerable to research disruptions and other stressors associated with COVID-19.

Ninety-one percent of respondents agreed that some groups were disproportionately impacted including early career researchers (82%), parents (99%), women (72%), 2SLGBTQ+ (19%), those with physical or mental disabilities (63%), and BIPOC populations (35%). Many of the open-ended responses identified a common theme of those providing caregiving to others during the pandemic.

From the survey data, we present differences in productivity, stress exposure, and well-being across by two of these select statuses; gender and parental status. We then consider differences between mothers and fathers.[2] [3]

Gender Differences in Productivity, Stressors, and Well-being.

In some instances, women did report more impediments to their research compared to men. For example, women reported that they missed out on publishing, or had to stop working on output because of COVID-19 more or much more than male colleagues.

In all questions about work-family conflict, women reported that they experienced greater conflicts since prior to the pandemic, compared to men. We combined items about these conflicts to create two scales - *work-to-family conflict* (i.e., the extent to which work obligations impact family expectations, 4 items), and *family-to-work conflict* (i.e., the extent to which family obligations impact work expectations, 4 items). Across both scales, women reported significantly higher responses than men – suggesting that they had more or much more conflicts compared to before the pandemic.

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[2] Some of the other groups identified as disproportionally affected cannot be examined in detail, given our limited sample size.

[3] All group differences were based on mean tests across quasi-continuous categories of the variables ranging from 1 to 5. We identify only statistically significant differences in the text, based on corresponding t-tests greater than 1.96, $p < .05$, two-tailed.

These gender differences also emerged when looking at generalized depression and anxiety. We created scales from the items asked in the survey on each set of symptoms (depression, 11 items; anxiety, 10 items). Again, across both scales, women reported greater mental health and emotional problems than the men in our sample.

> *In all questions about work-family conflict, women reported that they experienced greater conflicts since prior to the pandemic, compared to men.*

Parental Differences in Productivity, Stressors, and Well-being

The story is almost identical when comparing parents and non-parents. Parents had less time for research output, more missed publishing opportunities, and more output that was stopped because of COVID-19.

Parents – not surprisingly – reported greater work-to-family conflict, and family-to-work conflict than non-parents compared to before the pandemic. The greater difference was found in reports of family-to-work conflict, which likely captures parents' experiences of working from home.

Parents and non-parents did not report differences in mental health outcomes, however.

The Combined Impact of Gender and Parental Status on Productivity, Stressors, and Well-being

We combined statuses to look at within-parent differences across mothers and fathers. The results are like those noted from the previous sections. However, amongst this subgroup, we do find significant gender differences in mental health outcomes. Mothers, compared to fathers, are more likely to report greater mental health and emotional problems than they would have prior to the pandemic. These results are based on the indices we created for both depression and anxiety.

> *Mothers, compared to fathers, are more likely to report greater mental health and emotional problems than prior to the pandemic.*

Discussion

We discuss the results from the survey and roundtable transcripts across several typologies of COVID-19 experiences. These typologies are based on the combined experiences across respondents' productivity, work-family stressors, and well-being during the pandemic.

Healthy and Productive

The first typology includes faculty and research staff who could be categorized as *healthy and more productive*. Despite the consequences of COVID-19, some were positively impacted in terms of their productivity, with benefits including: raising more funding, participating in more conferences, ease of international collaborations, connecting with industry and government more easily, more time to write, flexibility over scheduling, and more time with family.

These respondents make up approximately 27% of the sample – this includes only 41% women, and 59% men. We define this group based on our analyses of those who had positive career trajectories and reported the same, less, or much less distress[4] compared to before the pandemic.

Healthy but Less Productive

The second typology includes faculty and research staff who could be categorized as *healthy but less productive*. For most respondents – even those who outlined certain benefits – research productivity was significantly stunted or shutdown altogether. This took many forms: lab consumables and reagents on backorder or with significantly increased prices, halted work with industry partners, lack of access to instrumentation, difficulties working from home environments, lost data and grants because of research delays, inability to travel to access archival materials, inability to conduct in-person data collection with human participants, and many more. In other words, productivity was marked by complicated ambivalences during the pandemic.

This group comprises approximately 14% of the sample – 63% of whom are men, and 37% are women. We define this group based on our analyses of those who had negative career trajectories and reported the same, less, or much less distress compared to before the pandemic.

Unhealthy but Still Productive

The third typology includes faculty and research staff who could be categorized as *unhealthy but still productive*. Many respondents outlined how they maintained, and in some cases improved, their productivity throughout the pandemic. This productivity often resulted from intense pressures to generate funding, keep labs open, maintain research partnerships, and support graduate students. However, in many cases where work productivity was maintained or increased, the effort negatively impacted other elements of the person's life, including their emotional well-being, mental health, and ability to fulfill roles outside of academia. There were such severe pressures that many people compromised their personal lives and well-being to stay productive, for example a woman who wrote that some have "*[…] maintained productivity by losing sleep, keeping things going on the research front for the sake of our graduate students, and at the expense of our own health and sanity.*"

> *"[Some faculty have] maintained productivity by losing sleep, keeping things going on the research front for the sake of our graduate students, and at the expense of our own health and sanity."*

[4] We measure distress by the average score across a total of 21 items asking about depression and anxiety symptomology.

These respondents make up 22% of respondents in our sample: 58% of whom are women, and 42% are men. We define this group based on our analyses of those who had negative career trajectories and reported more or much more distress compared to before the pandemic.

Unhealthy and Less Productive

The fourth typology includes faculty and research staff who could be categorized as *unhealthy and less productive*. The pandemic took a massive mental health toll on McMaster faculty and research staff. Causes of this impact include the heavy workload, stresses about research, the inability to socialize or visit family, the lack of support while being away from campus, worries about the health of loved ones, and the multiple professional and personal roles that faculty and research staff were forced to occupy during the pandemic. These circumstances impacted individuals' research productivity, in addition to the time constraints placed on many to combine work and family obligations.

These respondents make up ~10% of respondents in our sample, but women are overrepresented at 60% compared to only 40% men. We define this group based on our analyses of those who had negative career trajectories and reported more, or much more distress compared to before the pandemic.

Based on the open-ended responses, and *COVID Conversations*, these faculty and research staff felt that they had been productive but on things that would never count. The issue of women's productive work going uncompensated and under-rewarded was exacerbated by the pandemic. Participants mentioned doing more outreach, university service, more community-engaged and collaborative research, working in the spheres of commercialization and innovation, mentoring students, sitting on committees, taking on more administrative duties.

Many participants felt galvanized to create a post-pandemic university environment that would be inclusive of many forms of productivity and that, as one roundtable participant put it, "[…] *at McMaster, we have such an opportunity to move beyond traditional metrics of scholarship. We know there are so many important ways of knowledge making and contributing locally and globally to the knowledge tapestry of our complex and evolving world.*"

Suggested Solutions

We conclude this report by outlining potential solutions to the consequences of the pandemic for faculty and research staff. Our recommendations are based on the survey results and *COVID Conversation* transcripts.

We asked all respondents about the extent to which they agreed with 11 proposed solutions to the broadly negative experiences brought about by the pandemic. We highlight the most popular of solutions proposed.

Responses to Survey Items on Proposed Solutions

The top recommendations from the survey identified two themes. The first was surrounding tenure, promotion, and CP/M. Over 93% of respondents agreed or strongly agreed that "*to avoid delays in promotions and tenure, McMaster should*

provide clear guidelines and policies, which ensure that evaluations and committees should give full consideration to the impacts caused by COVID-19."

Ninety-one percent of respondents agreed or strongly agreed that "*tenure and promotion files should include explicit instructions for external reviewers and internal review committees to consider inequalities generated by the pandemic*."

> *Ninety-one percent agreed that tenure and promotion files should include explicit instructions for external reviewers and internal review committees to consider inequalities generated by the pandemic.*

Further, many strongly agreed or agreed (84%) that "*the university should take efforts to help balance disparities in faculty CP/M scores and corresponding salary impacts because of the potential impact of COVID-19 on research productivity*."

The second theme from the survey data related to balancing work and family. For example, over 83% of respondents agreed or strongly agreed that "the university should ensure on-site, affordable childcare is available for all staff and faculty." A second related solution was that "*After the pandemic, McMaster should continue to offer more flexibility in working from home*." Over 85% of respondents agreed or strongly agreed with this statement, suggesting that a hybrid model of working from home (without penalty) would be welcomed among many faculty and research staff.

Suggested Solutions from Faculty and Research Staff: Open-Ended Responses

We offered respondents the opportunity to identify what solutions might be helpful beyond our provided list. There was overwhelming feedback.

Table 6 provides an overview of solutions across four areas, including financial compensation, time and flexibility, long-term merit impacts, and community building. Some of these ideas overlap with the survey item results noted previously. For example, the suggestions that fall under "long-term merit impacts" comprise evaluating merit in future years in ways that can account for the impact of COVID-19; providing more credit to those tasks during the pandemic that might be disproportionately placed on early career scholars, equity-seeking and deserving groups, and women.

Another area of recommendation is time and flexibility. For example, suggestions were made about additional course releases for early career researchers, or more teaching and administrative support to offset time burdens accumulated by the pandemic.

Other suggestions provided by respondents fall under broad categories of financial compensation and community building.

Financial compensation solutions might include flexibility in PDA spending, funding for lost research, and additional compensation for expenses endured related to teaching and research throughout the pandemic.

Community building moving forward was highlighted as a priority among many respondents. This included providing support to those hardest hit by the pandemic, offering relief to graduate students who endured impacts to their research, which set them back in the program; and, prioritizing the mental health of all university members moving forward.

Throughout these suggestions, there was a strong sentiment that participants do not want quick solutions for this year back on campus alone. Rather, they requested ongoing, continuous, and sustainable solutions that will adequately account for the long-term ripple effects of the pandemic.

Table 6 provides a summary of respondents' suggestions from the open-ended question. Table 7 outlines the percentage of respondents who agreed or strongly agreed with outlined suggestion statements.

TABLE 6 *Summary of Solutions*

Financial Compensation	Time and Flexibility	Long-Term Merit Impacts	Rebuilding Community
Flexible PDA spending	Course releases for all faculty	Evaluating merit in ways that account for COVID-19 impacts for years to come	Distributing COVID-19 supports with equity as a priority
Salary boosts and bonuses (that take into account inflation)	Delaying the tenure and promotion clock	Crediting teaching, community engagement, creative work, committee work, EDI work in CP/M	Ensuring that nobody who needs support gets "left behind"
Guaranteed funding for lost research	Allowing for flexible at-home work and meeting arrangements going forward	Reconsidering CP/M as a valuable method of measuring merit and productivity	Supporting graduate students going forward with the burdens of financial and emotional care
Proactive pay equity	More teaching and administrative support		Prioritizing faculty mental health through top-down, accessible solutions and resources
Reimbursements for expenses over the pandemic	Offering research leaves without any other duties for those who had their research programs disrupted		
Reimbursement for immigration fees and expenses for non-Canadian faculty and staff			

TABLE 7 *Percentage of Respondents Who Agree or Strongly Agree with Suggested Steps the University Should Take to Address the Impact of the Pandemic on Research Staff and Faculty*

Suggestions	Respondents
After the pandemic, McMaster should take specific efforts to prioritize and support the advancement of individuals/groups that have been heavily affected as a direct result of COVID-19	87%
After the pandemic, McMaster should continue to offer more flexibility in working from home.	88%
Departmental chairs should allocate flexible funds to support research productivity of groups that have been identified as being heavily affected as a direct result of COVID-19 impacts.	76%
The university should develop mentoring programs and/or peer support groups designed to maintain or recover the career trajectory of all faculty members	75%
In annual evaluations and promotions, the university should consider the increased and/or additional faculty service contributions during COVID-19	88%
The university should ensure on-site, affordable childcare is available for all staff and faculty	83%
To avoid delays in promotions and tenure, McMaster should provide clear guidelines and policies, which ensure that evaluations and committees should give full consideration to the impacts caused by COVID-19.	93%
Tenure and promotion files should include explicit instructions for external reviewers and internal review committees to consider inequalities generated by the pandemic.	91%
The university should provide additional, flexible teaching support (i.e., provision of stipends or course releases) to those individuals/groups whose research programs were most impacted as a direct result of COVID-19.	77%
The university should provide additional COVID-19 recovery funds that researchers can apply for.	77%
The university should take efforts to help balance disparities in faculty CP/M scores and corresponding salary impacts because of the potential impact of COVID-19 on research	84%

An Insight to Participants' Frustrations, Concerns, and Suggestions

We end this section with a series of quotes provided by respondents to the open-ended question we asked about what the university can do moving forward.

Institutional Support versus Individual Onus

One of the emerging themes suggests that the onus has been placed on faculty and research staff to better themselves, rather than there being an institutional shift in supporting those suffering the most.

For example, the following woman expressed the disproportionate mental health impacts on certain groups such as women and those with children:

> "The impacts for the pandemic are gendered. The institution's response has been to capitalize on productivity and weaponize "employee wellness". Creating lunch sessions where staff/faculty are to improve their wellness creates more of a burden and places the onus on us to improve ourselves rather than improving the institution and work environment. As a working parent that also has to school their children at home, do you think I have time to add these sessions into my already packed teaching and meeting schedule?"

Another faculty member states:

> "The University needs to invest in its people and in real ways. Promoting self-care workshops is insulting. We will lose some of our best and brightest."

> "The University needs to invest in its people and in real ways. Promoting self-care workshops is insulting. We will lose some of our best and brightest."

Many respondents indicated their frustration with the insufficiency of wellness sessions and self-care workshops which suggest their situation is entirely in their own control and ignores the structural work environment factors:

> "I think it would be helpful to provide meaningful, substantive supports (in the form of funds, reduced teaching loads, more technical/administrative support), rather than continually sending 'thank you for your efforts' messages and/or information about individual 'wellness' initiatives that ignore the structural realities of the situation. I also think it is particularly important to prioritize support for those who are likely to have been especially affected by the pandemic (e.g., members of equity-denied groups, parents of young children, early-career researchers), rather than folks like me."

Prioritizing Equitable Evaluation

Another recurring theme was the need for more substantial modifications or complete elimination of the Career Progress/Merit (CP/M) system. These included emphasis on how the current model perpetuates inequities and does not adequately compensate all types of work by faculty.

For example, one respondent suggests:

> *"This would be a great time to re-evaluate CP/M overall. In my area peer-reviewed publications are still viewed as the most significant research contribution. These don't take into account the time invested in building community partners, and developing creative or knowledge-mobilization outcomes that advance the work of these partners but don't lead to publications…"*

Some highlighted how the current revisions are insufficient as they do not account for the existing inequalities that might be embedded into the revised evaluation system:

> *"CPM modifications are a top priority. Though the choice between 3 year average and the 2020 score may have mitigated inequalities, it did not prevent those who benefitted from pandemic conditions to become *more* productive getting higher rankings and therefore widening the gap between them and their colleagues who, for a wide variety of structural reasons, could not. These inequalities are now baked into the salary structure."*

Finally, many outlined how structural inequities in entering academia are not reflected in the CP/M and pay systems at McMaster and that modifications to account for such disparities could help overcome inequities, especially in light of the pandemic:

> *"The university should recognize that certain demographics (mothers) had their work negatively impacted for a structural reason during the pandemic and should place a higher value on work achieved despite these circumstances in CP/M evaluations and other evaluations."*

Conclusion

In conclusion we offer a few take-away points.

Research Productivity Declined During the Pandemic

The fact that productivity declined among McMaster faculty and research staff during the pandemic is not a surprise. However, the data from our survey suggest that some groups were overexposed and more vulnerable to these hits. Participants agreed that early career researchers, women, and parents experienced the greatest declines. Our survey data supported this case for the latter two groups.

Stress Exposure and Mental Health Problems Increased During the Pandemic

Many respondents reported that they experienced greater work, family and community stressors compared to before the pandemic. We also reported increased anxiety and depression symptomology among most. One of the most profound statistics that we pulled from the survey was that 53% of respondents had thought more or much more about death now compared to before the onset of COVID-19 in March 2020.

The exposure and mental health vulnerability to stressors was not equally distributed. Women were more likely than men to report these outcomes, and—when we examined subgroups of parents, only mothers reported that they experienced more stressors and mental health symptoms than the fathers in our sample.

We outlined four typologies of faculty and research staff that came out of our survey results. First, about a quarter of respondents we could label as *healthy and productive*. Most of these respondents were men. Second, one-fifth could be identified as *healthy but unproductive* – these comprised mostly men. Third, close to another quarter of the sample was characterized as *unhealthy but productive*—those who continually push themselves at the expense of their well-being. Finally, one-tenth of the sample we defined as *unhealthy and unproductive*. Women were overrepresented in both latter categories.

Taking these results into consideration we offer three conclusionary points.

Reimagining Productivity

Considering the above, we conclude with the question *what does improved productivity look like and how can we get there?* As McMaster slowly enters a period of post-pandemic recovery, the university is committed to supporting their faculty and research staff, in particular the communities who have been most burdened. The survey and roundtable sessions that generated the data for this report were created as solution-oriented tools that would aid in the development of evidence-based improvements for members of the McMaster research community. The recommendations above were all generated from feedback of participants, who candidly described their needs and experiences over the past two years. Implementing these strategies will have positive impacts on all domains listed above – well-being, work-family interface, and equity.

Equity & Community

Comments made by participants highlighted that COVID-19 revealed gendered inequalities in academia that disproportionately burden female faculty and research staff. Panelists and attendees expressed that the pandemic intensified extant and deeply embedded structures in the university that uniquely affect women. Moreover, there were impacts based on race, ethnicity, nationality, inter/national status, and socioeconomic status. The pandemic intensified inequities that were already prevalent in the academy. Moving forward, the university should use the pandemic as an opportunity to address and review these inequities, especially considering how provided supports will be distributed among faculty and research staff in a way that accounts for these disparities.

Student, Staff, and Faculty Mental Health Care & Considerations

In this report we have underscored the mental health of our faculty and research staff participants. Yet, many of our respondents reported that the mental health of students suffered significantly during the pandemic, which in turn negatively impacted their own health and well-being. As we move forward—beyond the pandemic—we need to consider the overall pulse of the mental health among all members of our university and recognize that to have a healthy work environment we must address the needs across students, faculty, and staff. Many of our respondents felt that they were not provided the resources to support their own, or their students' mental health needs. This should be a priority of the university, given

that it will help provide the foundation for the research productivity and community we hope to build at McMaster in a post-COVID-19 context.

Appendix A

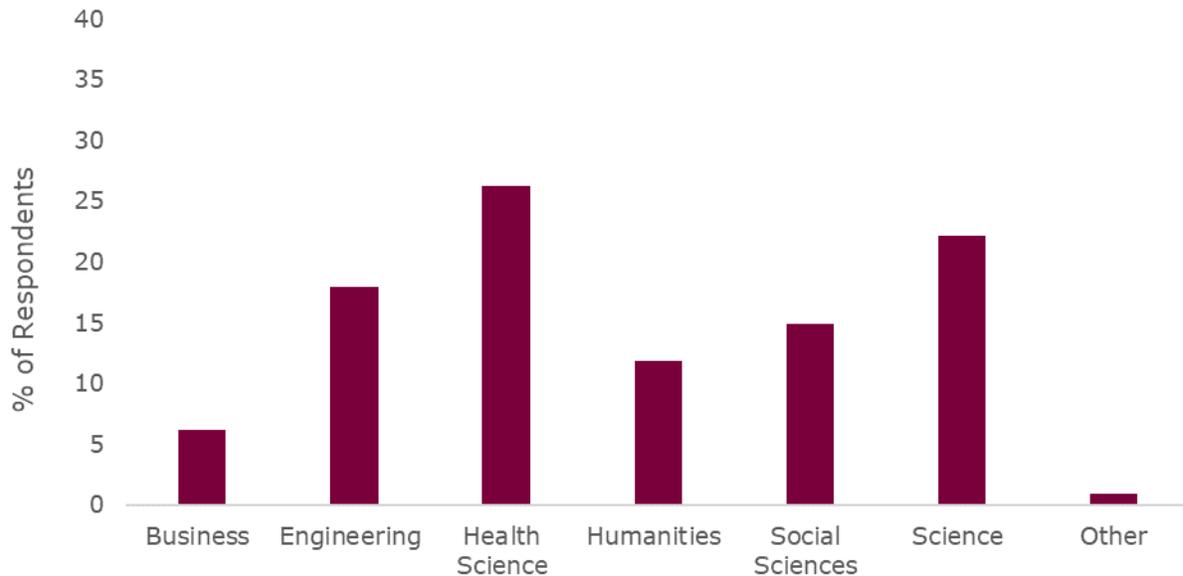**TABLE A1** *Percentage Breakdown of Respondents by Faculty*

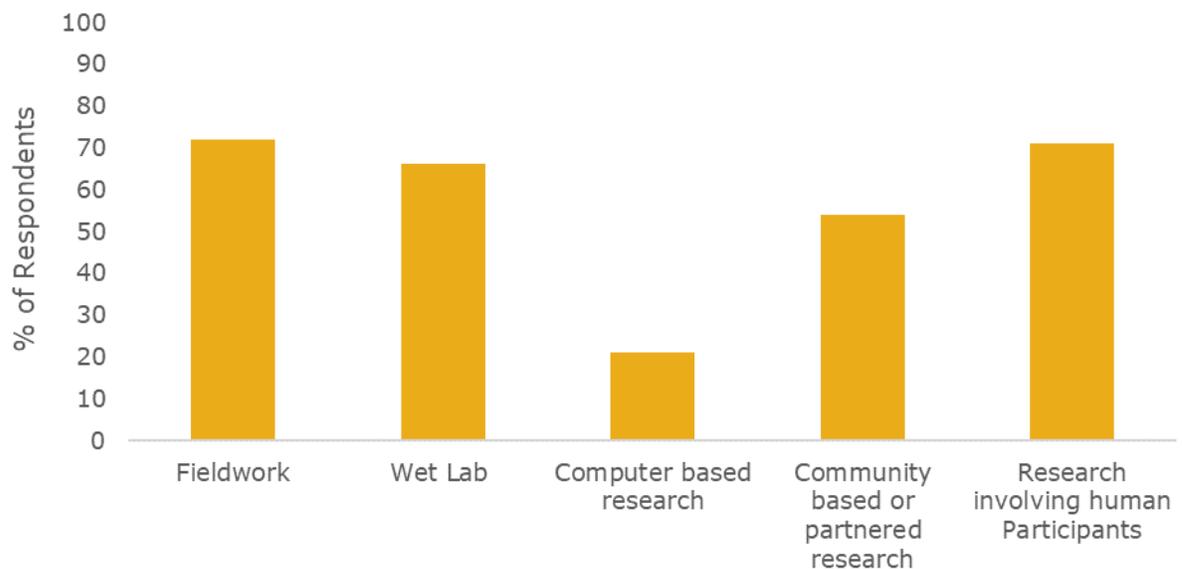**TABLE A2** *Percentage of Respondents Who Lost Access to Necessary Research Facilities and Resources*
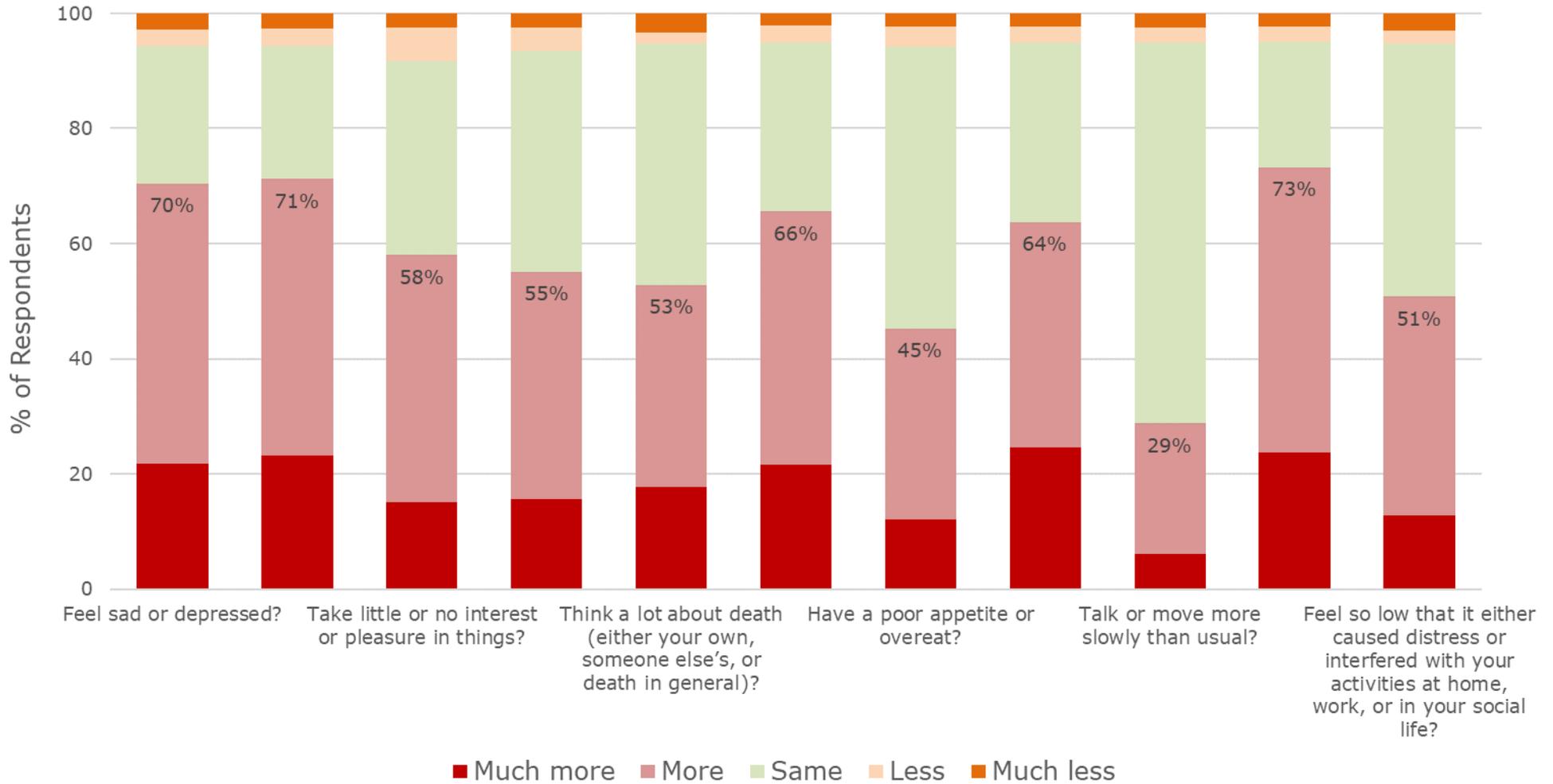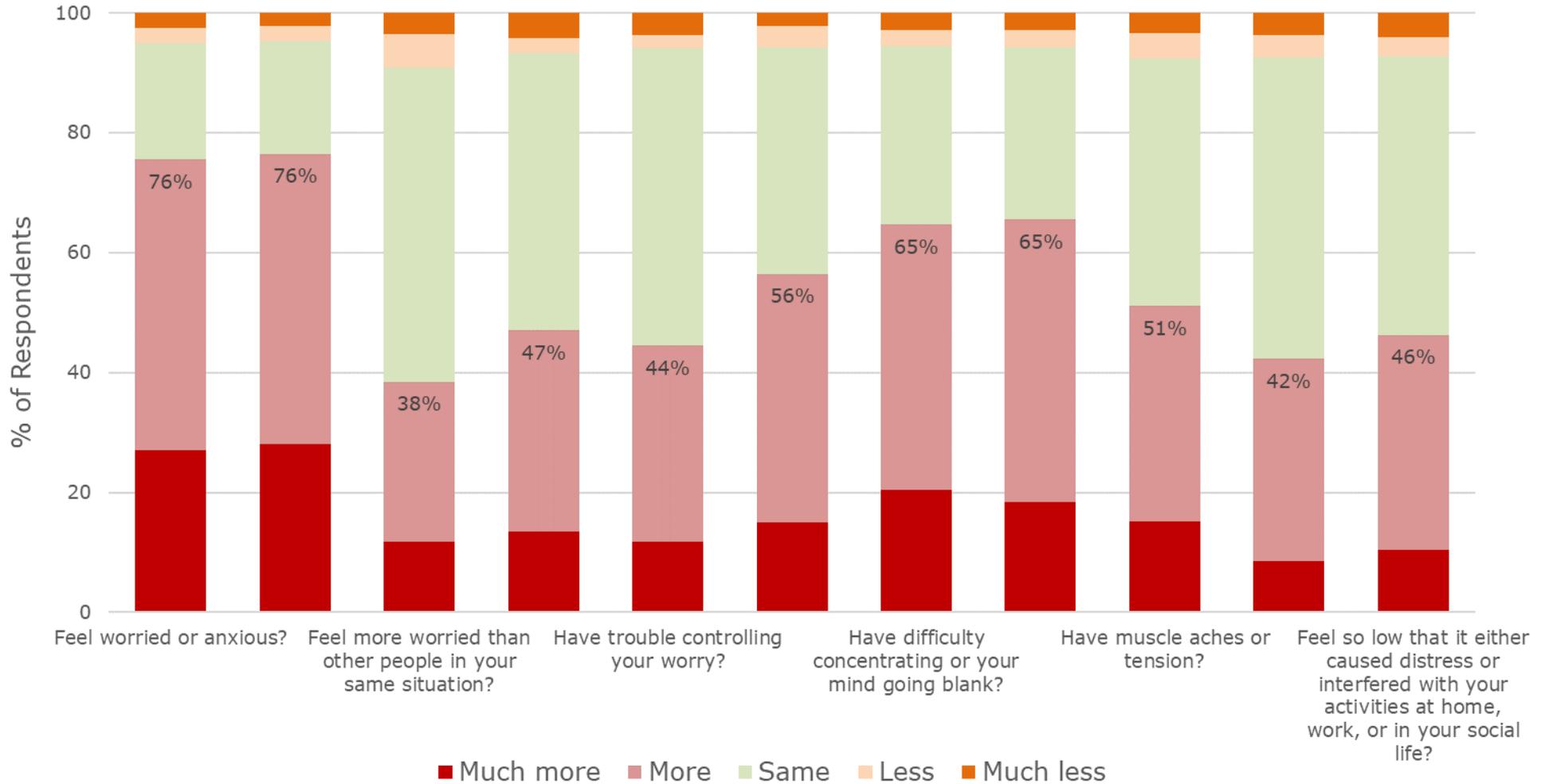
TABLE A3 *Frequency of Depressive Symptoms Compared to Before the Pandemic*

Note: Labeled % indicates those who experienced depressive symptoms "more" or "much more" than before the pandemic.

TABLE A4 *Frequency of Anxiety Symptoms Compared to Before the Pandemic*

Note: Labeled % indicates those who experienced anxiety symptoms "more" or "much more" than before the pandem