COVID-19 GRADUATE STUDENT SURVEY

THE EARLY IMPACTS OF COVID-19 ON GRADUATE STUDENTS ACROSS CANADA

TSPN

TORONTO SCIENCE POLICY NETWORK

The Toronto Science Policy Network (TSPN) is a student-run science policy group based at the University of Toronto. TSPN provides a platform for students (undergraduate and graduate), post-doctoral fellows, faculty, staff, and members of the local community to learn about and engage in the science-policy interface through workshops, public panels, talks, and various advocacy efforts.

The survey, report, and associated materials are the work of the Toronto Science Policy Network.

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Acknowledgements: We wish to acknowledge the history of the lands on which we are each living on. Canada is home to many different Indigenous peoples. We ask that each of you take a moment to research, learn about, and reflect upon the Indigenous people whose lands you are currently on. For example, many of our contributors reside in the Greater Toronto Area. We are located on the traditional territory of many nations, including the Mississaugas of the Credit, the Anishnaabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. This territory is covered by the Upper Canada Treaties, and is within the lands protected by the "Dish With One Spoon" wampum agreement. It is now home to many diverse First Nations, Inuit and Métis peoples.

We would like to thank all the graduate students who participated in our national bilingual survey, and all the individuals, student groups and departments who assisted us in the development and distribution of this survey across Canada. In particular, we would like to thank Paul Dufour, Kimberly Girling (PhD), Ellen Gute (PhD), Shawn McGuirk, Jennifer Polk (PhD), Vasa Lukich (PhD), Reinhart Reithmeier (PhD), and Molly Sung (PhD) for their critical insights as reviewers of this report. This project was made possible thanks to funding from the University of Toronto's COVID-19 Student Engagement Award.

Disclaimer: This report is based on survey data collected between 22nd April to 31st May 2020, presenting a snapshot of the early impacts of COVID-19 pandemic on graduate students in Canada, which continue to change rapidly. Participation in this survey was voluntary, and may therefore be prone to self-selection bias. In addition, we acknowledge that all of the contributors to this project are full-time graduate students and post-doctoral fellows who are living, and working, through an ongoing global pandemic. We have taken all efforts to address survey limitations and report data as accurately as possible.

Correction: On page 21 of our original report, the legend in Figure 4 is incorrect. This figure has been corrected in this version.

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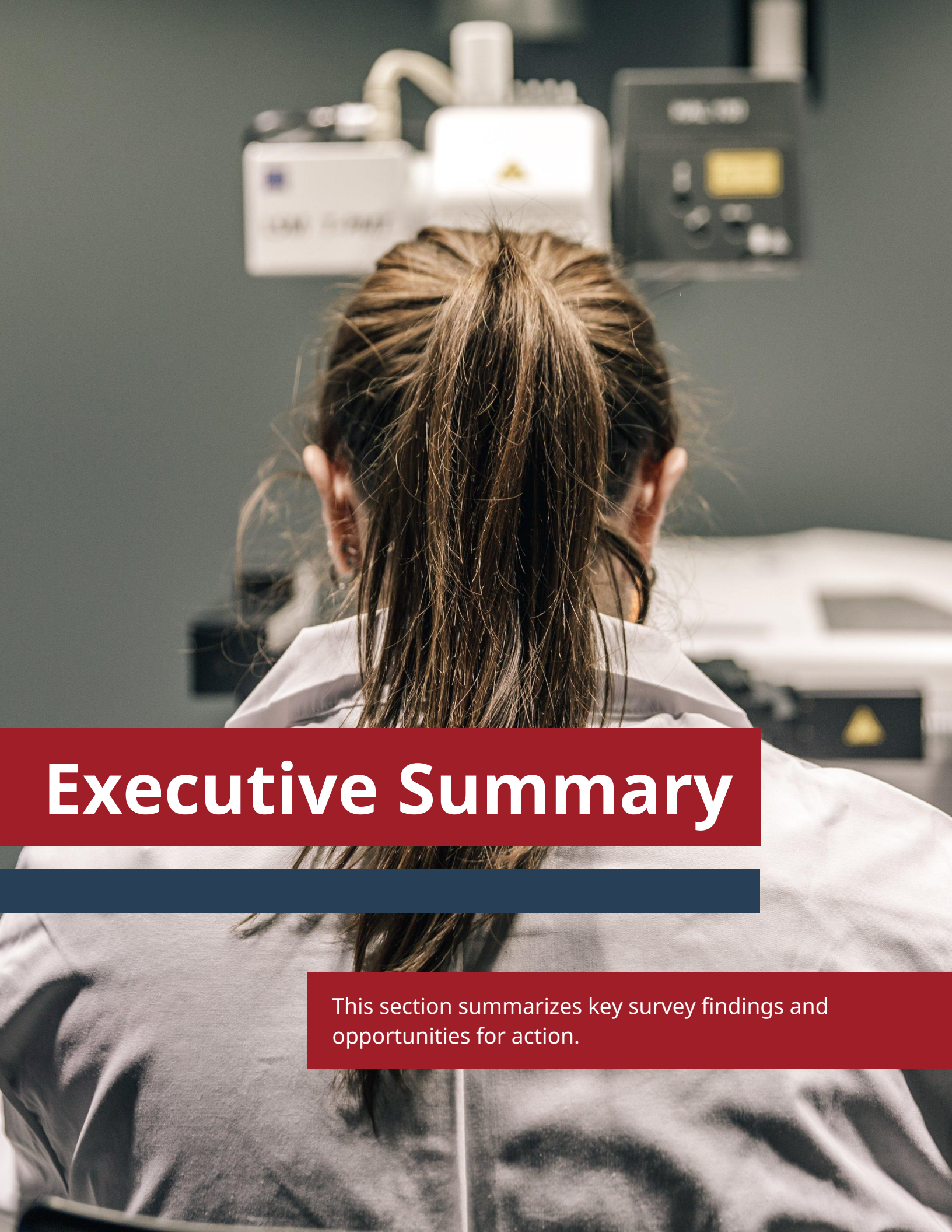


Executive Summary

This section summarizes key survey findings and opportunities for action.

Executive Summary

The Toronto Science Policy Network conducted a national bilingual survey to understand the early impacts of COVID-19 on the lives of graduate students across Canada, including their graduate studies, health and wellness, and future prospects. This survey was open from April 22nd, 2020 to May 31st, 2020, collecting a total of 1,431 responses. All responses to this survey were anonymous. Based on this survey, we make recommendations to ensure graduate students receive support as Canada slowly begins to recover from the effects of the COVID-19 pandemic.

Key Findings

- **Financial concerns:** Graduate students are increasingly concerned about their possible sources of income and ongoing expenses, including tuition fees, stipends and assistantships.
- **Impact on research:** Around three-quarters of graduate students reported that COVID-19 has negatively impacted their ability to conduct research due to institutional closures. Seventy-eight percent of research-stream graduate students planning to study or research abroad had to cancel their plans.
- **Financial stability among research-stream students:** Only twenty-seven percent of research-stream graduate students have guaranteed funding until the end of their degree. In addition, forty percent of research-stream respondents received no, or insufficient, communication to alleviate their concerns about stipend continuation.
- **Impact on work experience among professional-stream students:** Forty percent of respondents in professional-stream programs reported that their internships for the summer and/or fall 2020 semesters had been cancelled or postponed.
- **Impact on health and wellness:** Twenty-six percent of respondents are now considering taking a long term leave of absence, compared to pre-COVID-19. Graduate students increasingly reported experiencing anxiety, depression, feelings of helplessness, loneliness, or being overwhelmed compared to before the pandemic. Seventy-two percent indicated that these feelings increased as a result of COVID-19.

- **Impact on teaching:** Seventy-nine percent of graduate students with teaching responsibilities received no compensation for the additional time and work needed to transition to online teaching. Thirty-five percent of graduate students with teaching responsibilities reported being dissatisfied with the level of departmental support.
- **Impact on coursework:** Graduate students were increasingly dissatisfied with the quality of their lectures and practicals. Twenty-nine percent of respondents had the practical component of their courses cancelled.
- **Impact on international graduate students:** Sixty-percent of international graduate students planned to travel home, but were unable to. Over half of international graduate students indicated that in light of the COVID-19 pandemic, they were worried about completing their degree requirements before the expiration of their study permit.
- **Insufficient communication:** Half of the graduate students indicated that they received no, or insufficient, communications regarding expectations for remote work from their department and/or supervisor.
- **Impact on professional development opportunities:** Half of the graduate students reported cancellations to professional development activities they were participating in, including campus events, student organized conferences, and professional training programs.
- **Impact on degree completion:** Around forty percent of research-stream respondents reported that COVID-19 would impact their degree timeline, and their ability to complete their degree. Within the professional stream, half of the respondents were not concerned about the impact COVID-19 would have on their degree timeline, and reported that COVID-19 had not impacted their ability to complete their degree.
- **Impact on graduation:** Of those planning to complete degree requirements by August 2020, half of respondents report being unable or uncertain about their ability to graduate because of changes resulting from COVID-19.

Key Recommendations

Based on our survey findings, we have identified the following opportunities where supervisors, student groups, institutions, and governments can take action to support graduate students. Additional details regarding each recommendation is available on page 42 of this report.

Recommendation 1: Establish clear and direct lines of communication between graduate students, supervisors, departments and institutions.

Recommendation 2: Reduce the financial burden faced by graduate students, and introduce flexibility into degree completion times.

Recommendation 3: Improve existing health and wellness support systems available at institutions.

Recommendation 4: Provide extensions to study and work permits for international students.

Recommendation 5: Mitigate the impact of COVID-19 on the ability of graduate students to conduct research.

Recommendation 6: Improve the quality of virtual teaching and coursework by establishing clear expectations, introducing relevant pedagogical training and increasing the flexibility of course structures.

Recommendation 7: Mitigate the impact of COVID-19 on the ability of graduate students to participate in professional development opportunities.

Recommendation 8: Advocate for increased support for graduate students to decision-makers within institutions, and in various levels of government.

Recommendation 9: Embrace long-term planning to mitigate the impacts of COVID-19 in the years to come.

Introduction

This section introduces why the Toronto Science Policy Network launched this survey.

Introduction

A graduate student is an individual who has completed an undergraduate (i.e. Bachelor's) degree, and is pursuing a master's or doctoral degree.

Graduate students are the life force of discovery and innovation, providing the critical ideas, talent, and labour necessary for the majority of post-secondary research being conducted in Canada. These vital contributions promote economic growth and development, and strengthen the knowledge-based economy at both a local and national level. Unsurprisingly, graduate students are on the front-lines of the COVID-19 pandemic, leading efforts, for instance, in vaccine development, tracking COVID-19 related data, and producing personal protective equipment for front-line workers.

Today, there are over 175,000 graduate students enrolled in universities across Canada, with around 127,000 and 48,000 students pursuing a master's and doctoral level degree respectively. Between 2011 and 2015, full-time master's and doctoral enrollments increased by 13% and 6% respectively, demonstrating a growing interest in graduate studies, with graduates working in all sectors of the Canadian economy.

Similar to other sectors, the COVID-19 pandemic has led to temporary closures of institutions and research spaces, forcing graduate students to put their studies on hold, which, in many cases, has caused considerable delays in degree completion, and the abandonment of ongoing coursework, research, or other academic responsibilities. While some aspects of graduate studies can be completed remotely, many graduate students remain trapped in a limbo, facing an uncertain future.

Graduate studies before the pandemic

Graduate studies often involve a high degree of self-directed and independent learning, and can be classified into two streams: research (i.e. the completion of a research project, thesis or dissertation), and professional (i.e. a greater emphasis on coursework, internships, and work experience). Even within these two streams, the structure of graduate studies can vary widely between different disciplines and programs.

In professional programs, students tend to self-fund their graduate studies through student loans, lines of credit, and various sources of income, with limited institutional or governmental financial support. In contrast, most graduate students enrolled in a research-stream program receive a funding package, which may involve a combination of a basic research stipend, institutional and governmental scholarships or awards, and teaching and research assistantships. Between research disciplines, the value of a stipend can vary widely.

Prior to the pandemic, graduate students in Canada reported a high level of satisfaction in the quality of their academic experience and supervision, though satisfaction decreased with each subsequent year of study. Seventy percent of graduate students in Canada reported that it is challenging to obtain funding, citing the limited number of available awards and the variable cost of living among different cities as critical barriers when navigating the current federal scholarship and awards ecosystem. Even among scholarship and award recipients, 66% report requiring additional sources of funding in order to support themselves. At the time of graduation, 46% of master's students and 36% of doctoral students owe about $30,000 in student debt.

With this financial precarity in mind, it is unsurprising that across the world, graduate students are more likely to experience challenges with their mental health than the general population, with 36% seeking help for anxiety or depression caused by their graduate studies. While Canada-wide data is scarce, graduate students in Ontario report facing anxiety regarding the time taken to complete their degree, the potential of failing, and their ability to afford tuition fees. Similarly, 49% of graduate students at the University of Toronto reported having poor mental health, citing that a majority of their stress stemmed from uncertainties surrounding post-degree employment.

Taken altogether, this paints a bleak picture for graduate students — and this is before the COVID-19 pandemic has been taken into account.

How is COVID-19 impacting Canada's academic community?

The impacts of COVID-19 have already been observed in other aspects of the academic community. Post-secondary students in Canada report being worried about the effects of the pandemic on their ability to continue their education and pay upcoming tuition fees. Similarly, post-doctoral researchers report facing interruptions to their research, and having to cancel travel plans for research conferences, meetings and lab visits — all of which are critical to career advancement in the competitive sphere of academia. The pandemic is also disproportionately impacting researchers belonging to marginalized groups, with women in academia already reporting negative impacts on their research productivity. Graduate students living away from their families, especially students from Indigenous communities and international students, face additional challenges with mental health as a result of the isolation brought on by closures and social distancing. For those considering returning home, there is also anxiety involved in considering the risk of introducing COVID-19 to their loved ones.

Canada's academic community is not the only one struggling as this is a global issue. In the UK, a survey of almost 5,000 doctoral and early career researchers found that over 75% of respondents were unable to carry out data collection, or effectively discuss and disseminate their research findings. In Australia, a survey of 1,020 doctoral students at the University of Sydney found that 75% of respondents expect to experience financial hardship as a result of the pandemic, where 45% expect to abandon their graduate studies within six months, signalling an impending global crisis when it comes to training and supporting the next generation of researchers and professionals.

To date, there have been some investments to help mitigate the impacts of COVID-19 on the broader academic community in Canada. For example, the federal government's recent investments include some considerations for graduate students, such as the ability to request a funding extension for expiring federal scholarships through the three federal research funding agencies. Similarly, institutions and provincial governments across Canada have rolled out various supports to aid graduate students. This includes post-secondary institutions introducing emergency grants to assist with short-term financial stress, the province of British Columbia announcing emergency financial support for students, and Mitacs providing internship opportunities for college and university students.

While these investments are critical, they are not sufficient to mitigate the impact of COVID-19 on graduate students, especially as only a small proportion of graduate students will be able to access these new funds — specifically, those who currently hold an expiring federal scholarship or fellowship, are supported by federal research grants, are conducting research in COVID-19 priority areas, or have the availability to seek full- or part-time work. A number of calls to action have been shared within the academic community, including calls from TSPN and some of our partners, but little effort was taken in the early days of the pandemic to understand how COVID-19 was impacting graduate students across Canada.

Why we launched this survey

While a number of surveys have been launched to understand the effects of COVID-19 on post-secondary students, none have focused on the specific realities faced by graduate students.

To address this critical gap, the Toronto Science Policy Network launched a national bilingual survey to understand the early impacts of COVID-19 on the lives of graduate students across Canada. This survey was developed in consultation with multiple student groups, and covers various aspects of graduate studies, including funding, health and wellness, and future prospects. Our goal was to provide data to highlight the needs and concerns of graduate students, and identify opportunities for action to enable both student groups and decision-makers at the institutional, provincial and federal levels, to launch evidence-informed efforts to better support graduate students in Canada.

We launched this survey on April 22nd, 2020 and closed it on May 31st, 2020, collecting a total of 1,431 responses. We received 733 responses in the first week alone, highlighting the eagerness of graduate students to talk about the impact of COVID-19 in the early stages of the pandemic. In this report, we describe key findings from our survey.

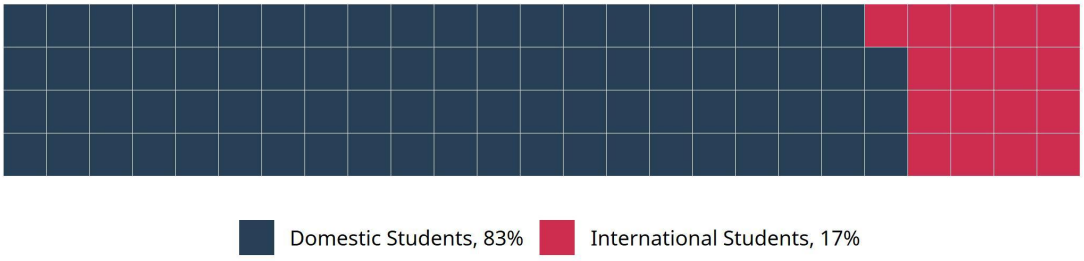
Survey Findings

This section shares findings from our survey, grouped into the following sections: demographics, working remotely, funding, health and wellness, research, teaching, courses, international students, and future prospects.

Demographics

83% were domestic students

*Domestic Students include Canadian Citizens or Permanent Residents.

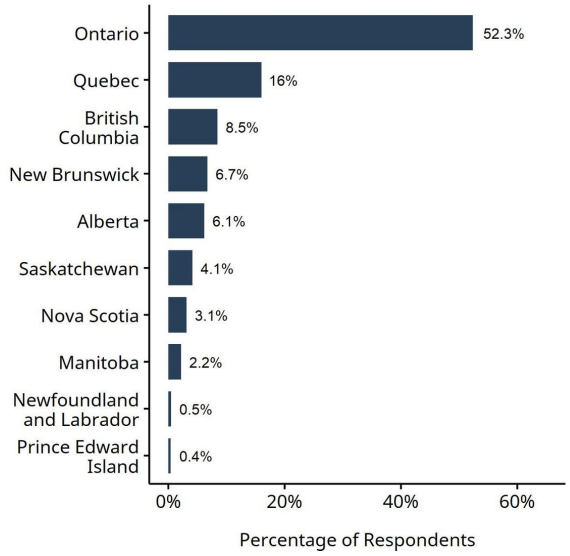


Most respondents identified as white and female

Gender	Percentage
Female	70.6%
Male	24.9%
Multiple responses	1.5%
Non-binary	1.0%
Prefer not to answer	0.9%
Agender	0.3%
Gender-fluid	0.3%

Race*	Percentage
White	64.7%
Chinese	7.5%
Multiple responses	6.1%
South Asian	6.0%
Prefer not to answer	2.8%
Latin American	2.7%
Arab	2.6%
Black	2.0%
Other	2.0%
Southeast Asian	1.8%
West Asian	0.9%
Korean	0.6%
Filipino	0.4%
Japanese	0.1%

52.3% were from Ontario**

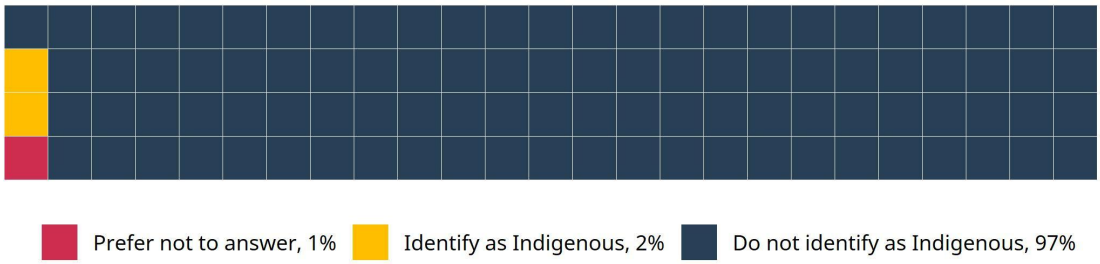


These categories are based on [Statistics Canada's Visible Minority and Population Group Reference Guide, from the Census of Population (2016)](#).

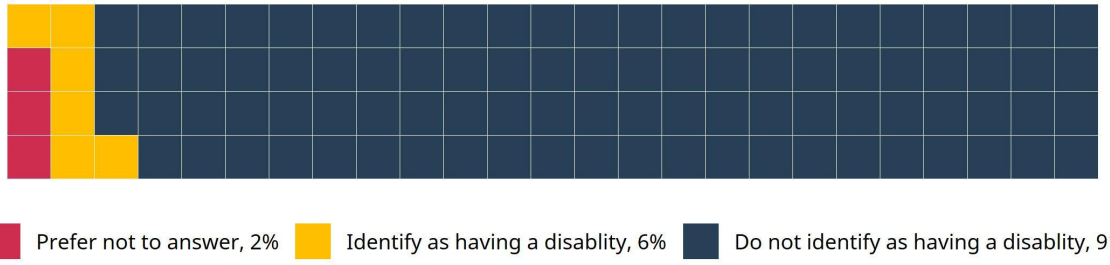
**The response rate broken down by institution is available on page 68.*

2% identified as Indigenous

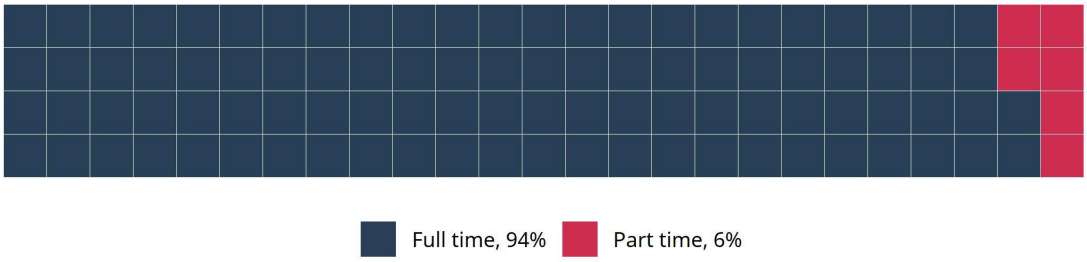
Including First Nations, Métis, or Inuit peoples



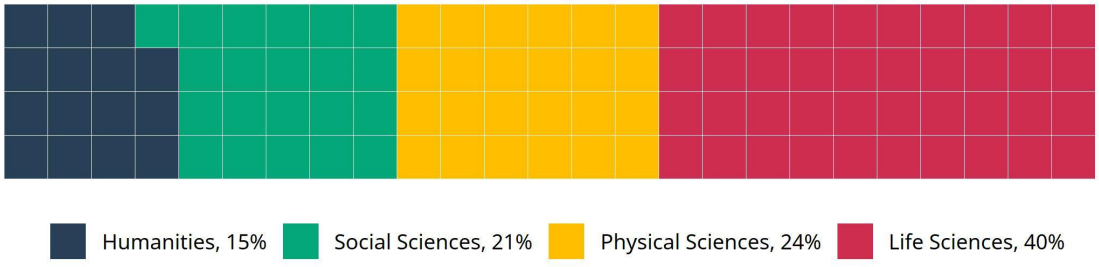
6% identified as having a disability



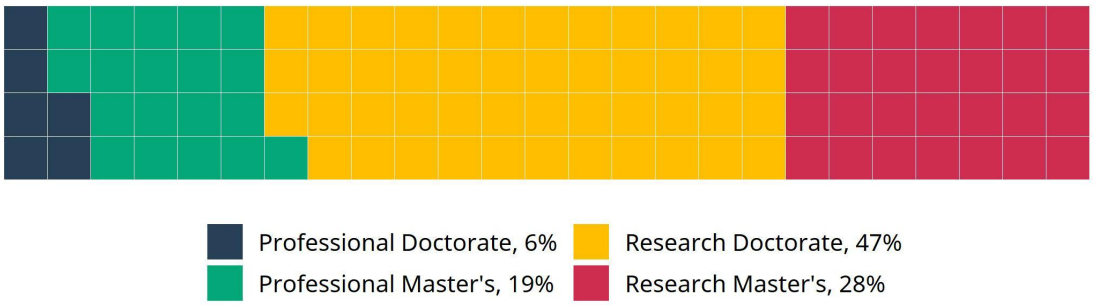
94% had a full course load



40% were in the life sciences



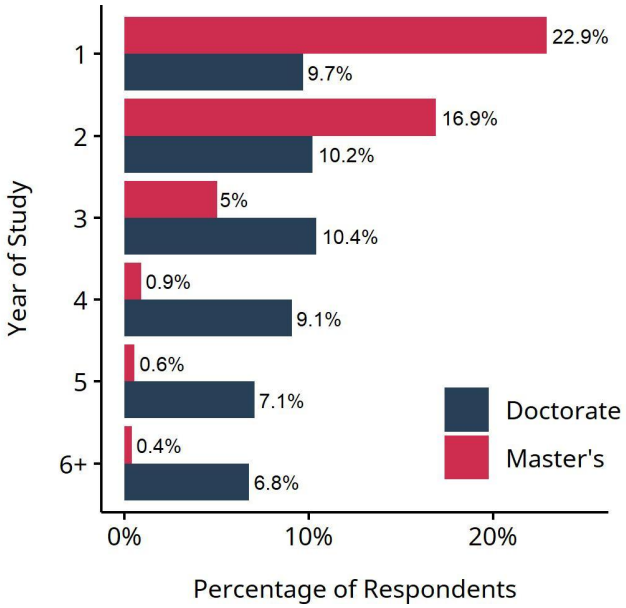
47% were research-stream doctoral students



Limitations

This survey was distributed to graduate students across Canada (see **Methodology** on page 64 for more details). The survey responses represent a snapshot of the early days of the pandemic, where confusion among graduate students was likely at its highest. Participation in this survey was voluntary, and may therefore be prone to self-selection bias. However, we received a total of 1,431 unique responses, with almost half of our responses in the first week.

Year of study



Our survey respondents predominantly identified as white and female, and were largely enrolled in research-stream programs. Almost half of respondents were enrolled in institutions in Ontario. Our demographics partially correspond to what is reported in the Canadian Association for Graduate Studies' (CAGS) 44th Statistical Report, which found that Ontario and Quebec have had the highest level of full-time graduate enrollments every year (since 1992), and that around half of students enrolled in full- and part-time graduate studies are female. There is limited race-based data available, making it difficult to discern whether our respondents are truly reflective of the current graduate student population in Canada.

Working Remotely

As a result of COVID-19, graduate students have been forced to quickly adapt to working from home. This presents a new set of challenges. How has COVID-19 affected the ability of graduate students to complete different components of their studies? Have reasonable working expectations been set? Below are responses from all 1,431 respondents.

Most graduate students began working remotely in March 2020 (90%, n=1,281). Respondents reported receiving instructions to start working remotely from either their institution (61%, n=876), department (57%, n=818), faculty (42%, n=596), and/or supervisor (50%, n=721). Only 11% (n=158) received no instructions from official sources for remote work.

Over 80% had access to basic resources needed to work remotely, including a computer (99%, n=1,415) and a reliable internet connection (93%, n=1,043). However, a quarter of respondents reported that they did not have access to library resources (23%, n=335) or access to a safe and quiet work space (27%, n=384).

> 76% of graduate students report that COVID-19 had a negative impact on the ability to conduct research

Graduate students reported that COVID-19 has had a notable negative impact on their ability to conduct research (76%, n=1,006) due to institutional closures. Additionally, 50% of respondents reported an impact on their ability to participate in seminars, practicums or internships, which are essential components of degree requirements and/or career development.

Half of the graduate students (n=720) indicated that they received no communications regarding expectations for remote work from their department and/or supervisor, or that expectations were unclear (**Figure 1**). There were differences in communication across academic divisions. In particular, 23% (n=50) of graduate students in the humanities received no communication regarding expectations for remote work, compared to only 8% (n=47) of life sciences graduate students (**Figure 2**).

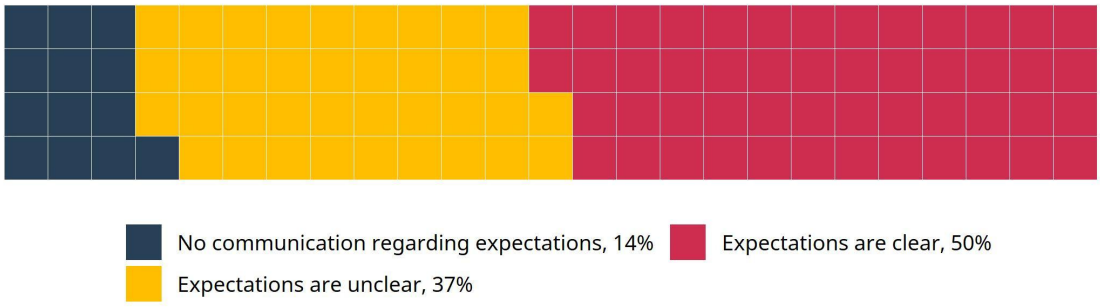


Figure 1: Communication of expectations for remote work during the COVID-19 pandemic received from the respondents' institution, department, faculty, and/or supervisor(s).

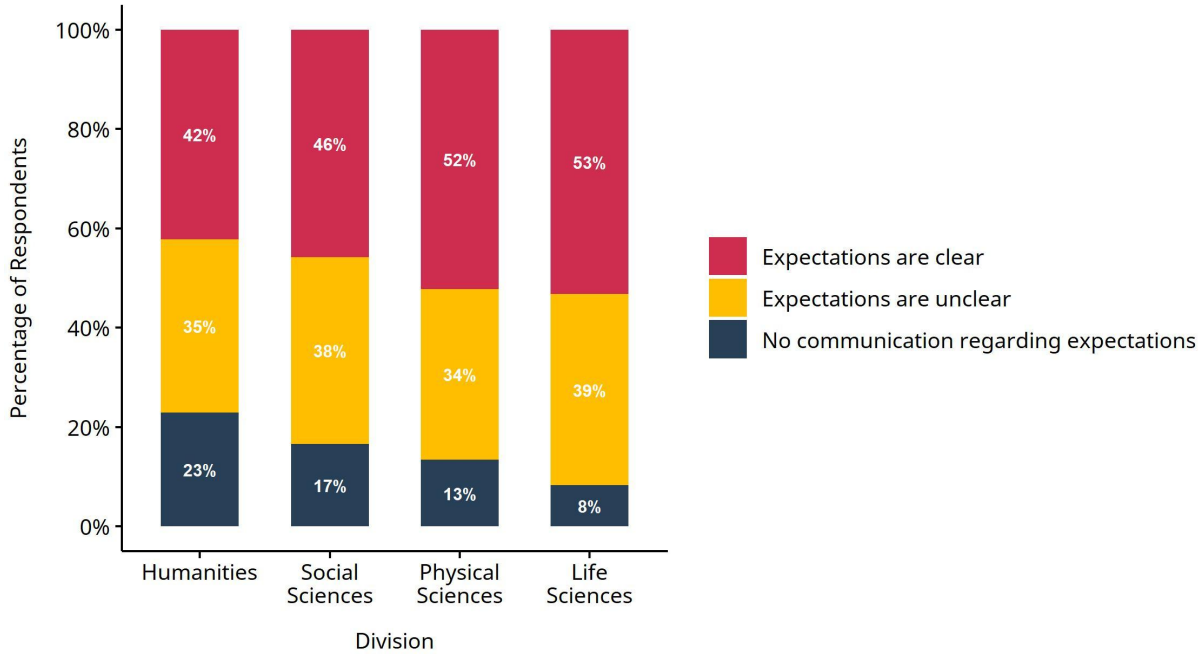


Figure 2: Communication of remote work expectations during the COVID-19 pandemic for graduate students in the humanities (n=218), social sciences (n=306), physical sciences (n=341), and life sciences (n=566).

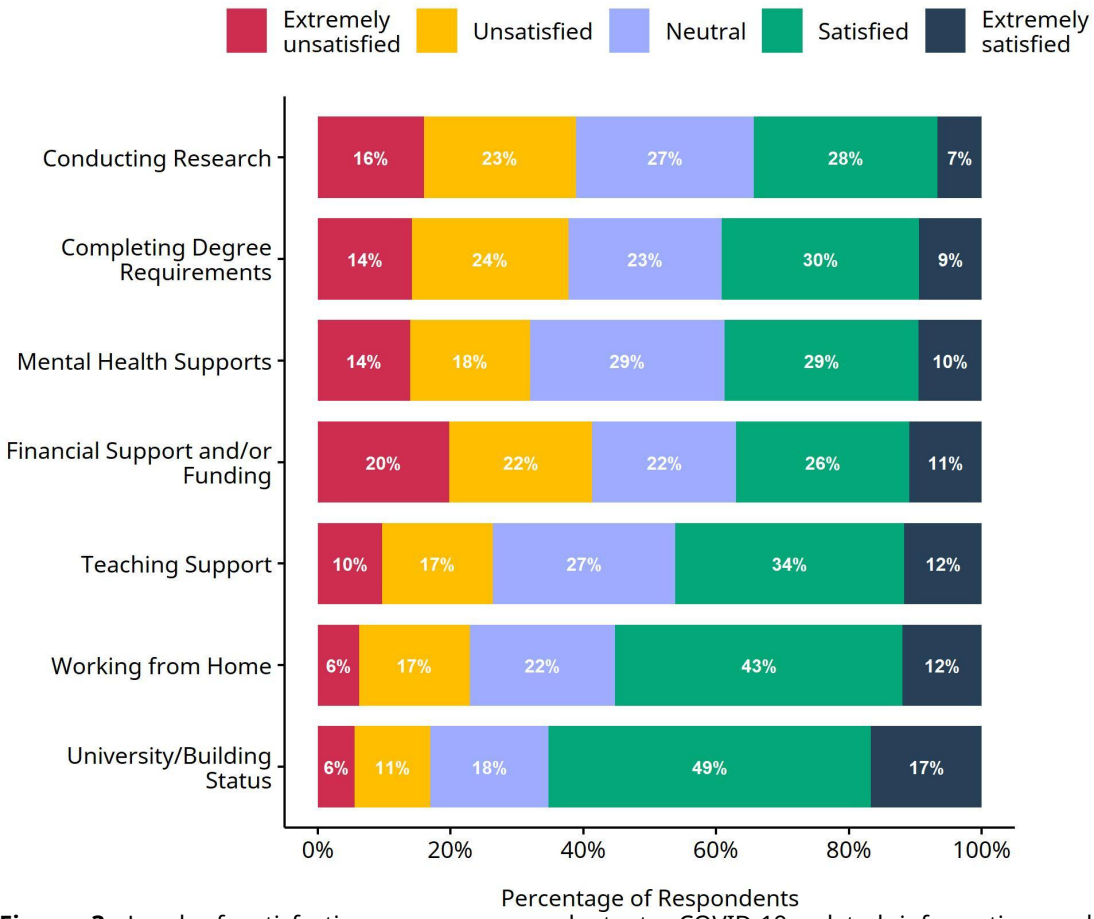


Figure 3: Level of satisfaction among respondents to COVID-19 related information and updates. Respondents were asked about updates regarding their ability to conduct research, complete degree requirements, access mental health supports, sources of financial support, teaching support, working from home, and the university or building status (i.e., whether the institution was open or closed).

On average, 31% of respondents reported being satisfied or extremely satisfied with the general COVID-19 related updates and information provided by their institution, department, faculty, and/or supervisor(s) (**Figure 3**). However, 41% (n=566) expressed dissatisfaction with the updates provided regarding financial support and/or funding. In addition, almost 40% of respondents were unsatisfied to some degree with the communication relating to guidelines around conducting research, and completing degree requirements.

Graduate students were largely able to participate in scheduled candidacy or qualifying exams (82%, n=785), courses (75%, n=804), thesis and dissertation defences (67%, n=425), and committee and/or supervisory meetings (65%, n=1,469).

283 respondents opted to share additional thoughts regarding working remotely, expressing:

- Dissatisfaction with the level of guidance provided for remote work. In some cases, respondents stated that the expectations were unfairly higher due to the perception that students have more time at home.
- That there are various barriers impacting productivity while working from home including:
  - the lack of a dedicated home work space
  - limited access to resources and equipment (e.g., computers, journal articles, and printers)
  - physical health (e.g., sitting all day, and a lack of ergonomic equipment)
  - mental health (e.g., anxiety, stress, and depression)
  - additional responsibilities (e.g., work, and caregiving).

Funding

Graduate students rely upon various sources of income to pay for their living expenses and tuition fees. These include stipends, scholarships, teaching, research assistantships, and unrelated paid work. What concerns do graduate students have regarding their financial situation amid COVID-19? Below are responses from 254 professional and 1,177 research-stream respondents.

Graduate students reported an increase in concern regarding almost all of their possible sources of income and ongoing expenses, compared to pre-COVID-19 (**Figure 4**). During the pandemic, 53% of graduate students reported feeling either concerned or very concerned about their income, including income from the following sources: research assistantships (45%), teaching assistantships (51%), and stipends (49%).

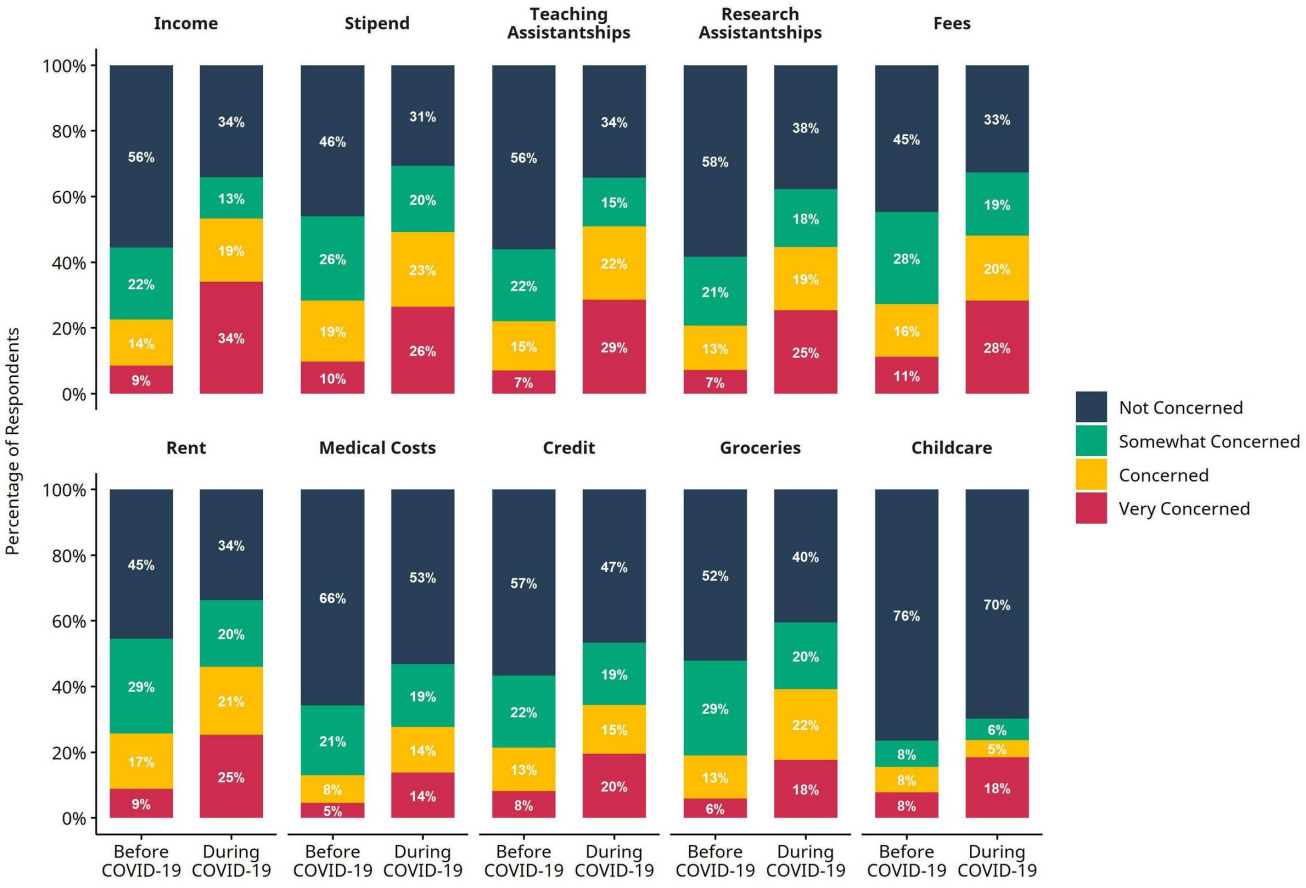


Figure 4: Changes in the level of concern among graduate students before COVID-19 and during COVID-19 related to income, stipends, teaching and research assistantships, fees, rent, medical costs, credit groceries, and childcare.

Similarly, there was an increase in the number of graduate students feeling concerned or very concerned about tuition fees (21% increase), rent (20%), credit card and loan payments (13%), and childcare expenses (8%).

34% of research-stream graduate students do not have guaranteed funding

Most graduate students enrolled in a research-stream program receive a funding package, which may involve a combination of a basic research stipend to help cover tuition and living expenses. Of the 1,177 research-stream graduate students, only 27% (n=314) report that they have a stipend which is guaranteed until the end of their degree, with 30% (n=333) not receiving a stipend at all. Forty-five percent reported not having guaranteed funding (34%, n=399) or that their funding may need to be extended due to COVID-19 (11%, n=131).

Forty percent (n=464) of research-stream respondents received no, or insufficient, communication to alleviate their concerns about stipend continuation from their supervisor and/or department **(Figure 5)**.

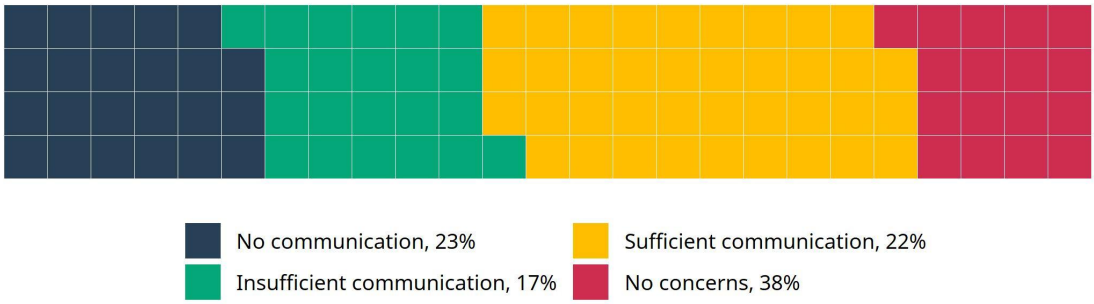


Figure 5: The quality of communication received by research-stream graduate students towards alleviating their concerns about stipend continuation from their supervisor and/or department.

Professional-stream graduate students (n=254) are also being impacted by COVID-19. A majority of respondents (88%, n=223) have not been contacted about the impact of COVID-19 on their time to degree completion and/or associated costs.

COVID-19 has impacted the ability of most (64%, n=68) professional-stream respondents to complete their scheduled summer internship, practicum or work term in summer 2020 and/or fall 2020 (**Figure 6**). Respondents reported that this experience had either been cancelled (24%, n=25), postponed (16%, n=17), or the status remained uncertain (25%, n=26).

Amid COVID-19, some institutions have introduced emergency grants as a source of financial support that students can apply for if the need arises. Sixty-nine percent (n=986) of all respondents reported receiving information from their institution, department or unions about available emergency grants (**Figure 7**).

> 40% of professional-stream respondents reported that their internship had been cancelled or postponed

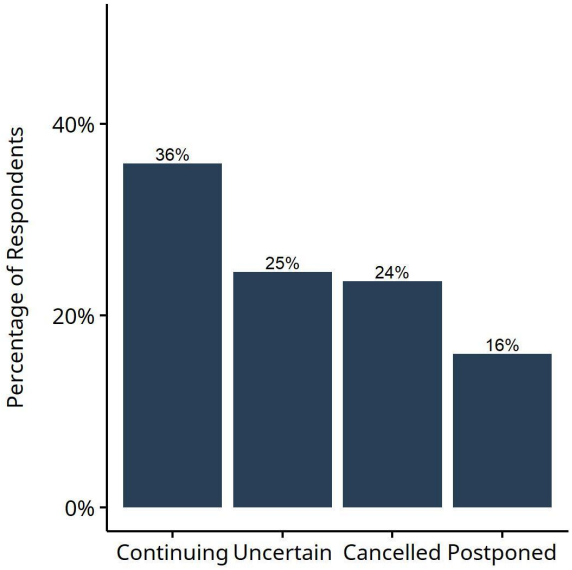


Figure 6: Changes in the requirement for professional-stream graduate students to complete a summer practicum, internship, or work term in Summer 2020 and/or Fall 2020 as part of their degree requirements.

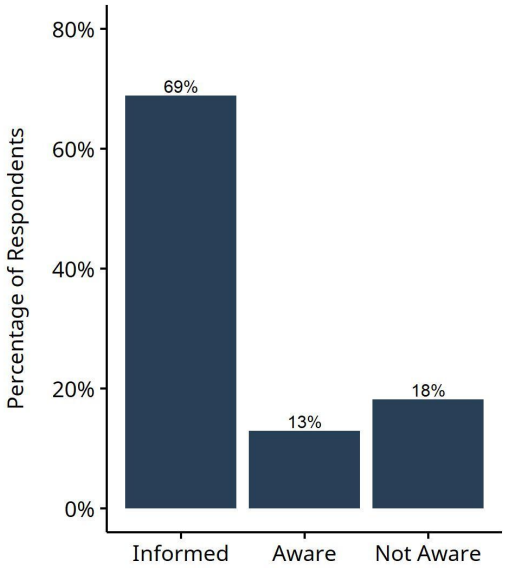


Figure 7: Level of graduate student awareness of available emergency grants. Possible responses included: (i) graduate students were directly informed about these grants ("Informed"), (ii) were already aware of these grants but had not been informed ("Aware"), or (iii) were not aware or informed about such grants existing at their institution ("Not Aware").

Respondents enrolled in a research-stream program (n=149) expressed:

- That an inability to conduct research would cause delays in degree completion, and could mean students may be cut off from their funding before completing their graduate studies.
- General uncertainty about their current financial situation, and their inability to plan for the future as a result of persistent uncertainty and a lack of communication from their institution.

Respondents enrolled in a professional-stream program (n=38) expressed:

- Dissatisfaction in the level of guidance being provided by their institution especially in regards to available emergency funds.
- Uncertainty about their finances, pointing to specific concerns, such as the possibility of needing to accrue additional debt, their dismay at paying the same level of tuition for virtual classes, and the cancellation, postponement or inability to find an internship or job.

Health & Wellness

Given the pre-existing mental health challenges faced by graduate students, health and wellness is an important consideration. Are graduate students experiencing additional challenges with their health as a result of COVID-19? Are they receiving sufficient support? Given its nature, this is the only section of the survey where all questions were optional.

Prior to COVID-19, 10% of graduate students (n=133, of 1,363 responses) indicated that they were considering taking a long-term leave of absence (**Figure 8**). This has since increased to 26% of respondents (n=361 of 1,401) reporting that they were considering a long-term leave of absence at the time of the survey (**Figure 9**).

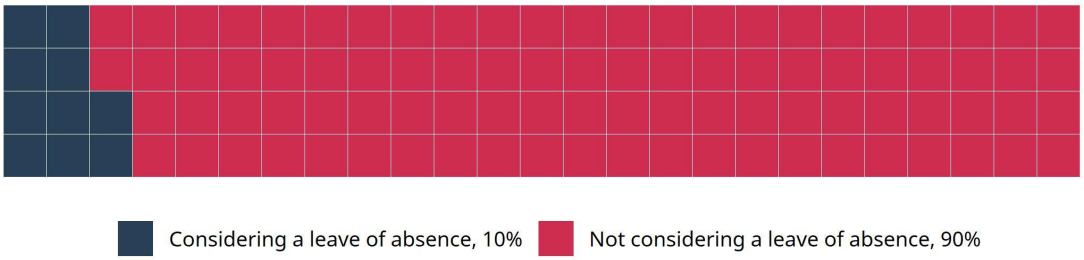


Figure 8: Proportion of respondents considering taking a long-term leave of absence prior to the pandemic.

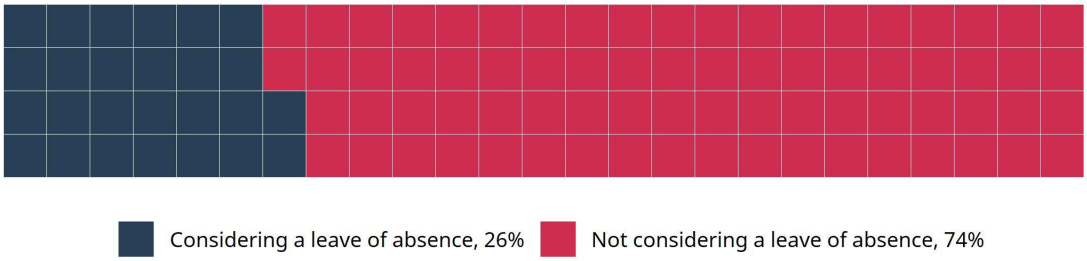


Figure 9: Proportion of respondents considering taking a long-term leave of absence at the time of the survey.

> There was a 16% increase in graduate students considering a long term leave of absence

When respondents were asked to specify why they were considering taking a leave of absence now, compared to pre-COVID-19, the following concerns were reported:

- An inability to complete degree requirements from home (n=189, which was not a concern prior to COVID-19).
- Challenges with personal finance and/or a need to assist family financially (n=210, compared to n=108 prior to COVID-19).
- Challenges with mental health (n=198, compared to n=122).
- The need to take care of dependents, including home-schooling children or taking care of a loved one who was ill (n=87, compared to n=53).

There was an increase in the number of graduate students expressing dissatisfaction with their access to mental health support (32 to 38%) and primary care (14 to 23%) services provided by their institutions, compared to before COVID-19 (**Figure 10**).

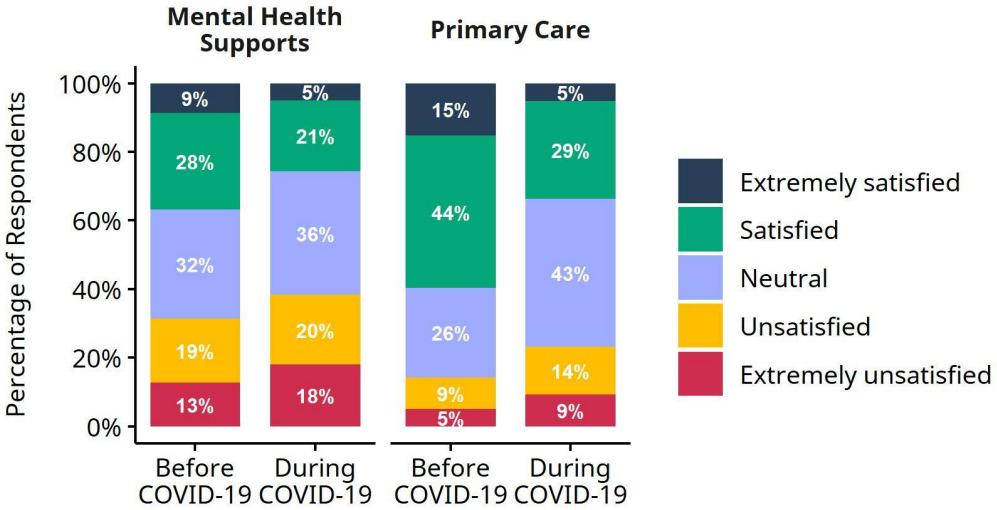
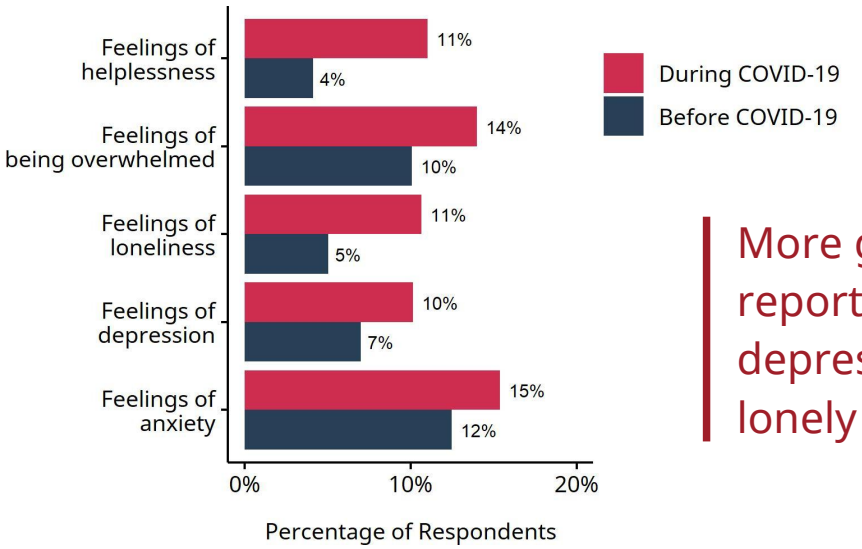


Figure 10: Satisfaction levels of respondents to institutional mental health support services (left) and primary care services (right) before COVID-19 and at the time of the survey.

An increased proportion of graduate students reported experiencing anxiety, depression, feelings of helplessness, loneliness, or being overwhelmed compared to before COVID-19 (**Figure 11**). On average, 72% of respondents indicated that these feelings increased (~43%) or increased significantly (~29%) as a result of COVID-19 (**Figure 12**).



More graduate students report feeling anxious, depressed, helpless, lonely or overwhelmed

Figure 11: Percentage of respondents reporting feelings of anxiety and depression before COVID-19 and at the time of the survey.

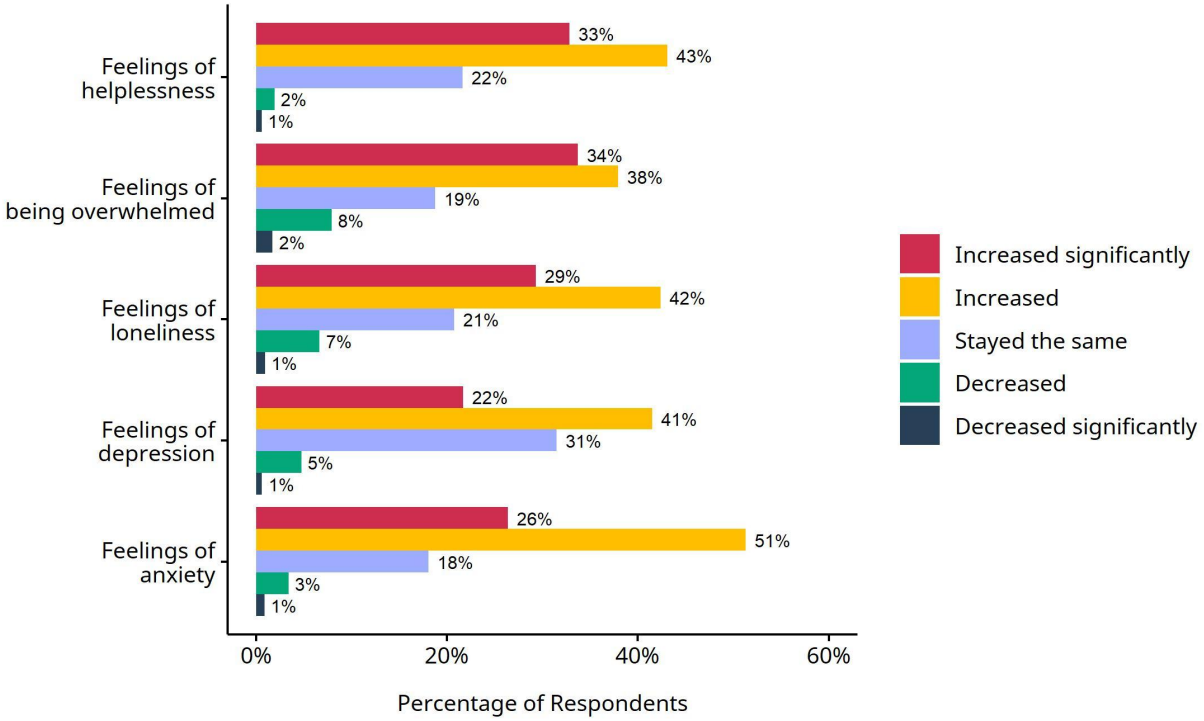


Figure 12: Changes to mental health, compared to before COVID-19.

When asked to expand upon additional mental health challenges, the most common concerns among 200 respondents were: anxiety and panic attacks, a reduction in motivation or focus, uncertainty, feeling overwhelmed, and depression. Respondents also reported that the COVID-19 pandemic exacerbated pre-existing mental health challenges.

Fifty-two percent of respondents (n=718) were uncertain about whether additional mental health resources had been provided by their institution amid COVID-19 (**Figure 13**). A fifth of graduate students who responded (21%, n=288) felt that the additional resources provided were insufficient.

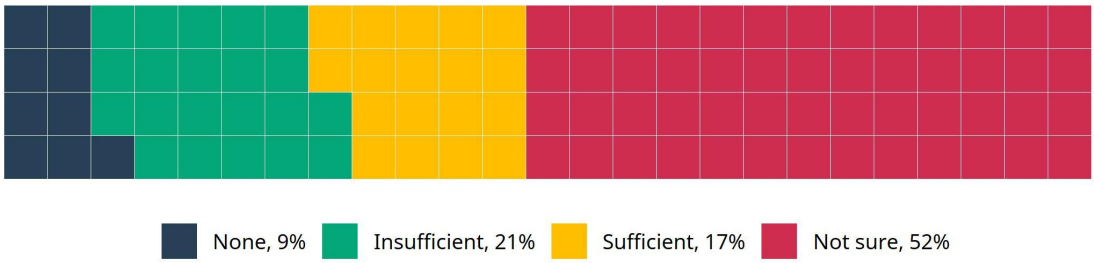


Figure 13: The quality of additional mental health resources provided by institutions, if any.

Most respondents (79%, n=1,115) experienced no changes in their living situation in the early stages of the COVID-19 pandemic. Nine percent of respondents (n=130) indicated that they required additional housing support as a result of COVID-19.

198 graduate students opted to share additional thoughts at the end of this section, expressing:

- General anxiety, loneliness, and exhaustion, stating that it was difficult to be productive due to COVID-19 related isolation and financial uncertainty.
- Dismay at the limited mental health resources offered through their institution, the difficulty in accessing these resources, and the challenges of virtual group support.
- Concerns about physical health, either due to lack of access to services for chronic conditions or neck/back pain due to improper home office set-up.

Research

As a result of COVID-19, graduate students are unable to access a variety of research infrastructures, making it difficult to carry out activities critical for their graduate studies. How have graduate students adapted to carrying out research? Below are responses from 1,177 respondents.

COVID-19 related institutional closures impacted graduate students differently, depending on their academic discipline (**Figure 14**). Approximately half of the graduate students in the physical (50%, n=150) and life sciences (56%, n=278) reported that their research depended on their ability to access a physical space, such as a lab, library, or studio. In contrast, 17-18% of students in the humanities and social sciences were dependent on physical access to conduct research. Overall, only 23% (n=268) of respondents did not require access to a physical space to conduct their research.

77% of research graduate students require some access to a physical space for their work

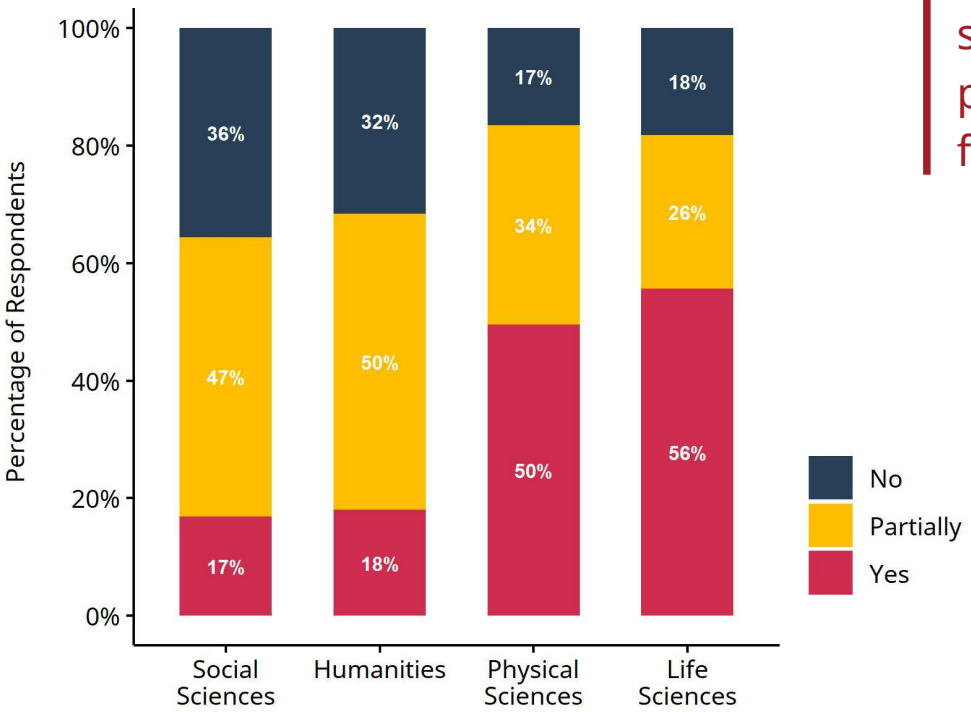


Figure 14: Proportion of graduate students in social sciences (n=306), humanities (n=218), physical sciences (n=341), and life sciences (n=566) who require access to a physical space for their research.

Graduate students are now meeting less frequently with their supervisor and research groups, compared to before COVID-19 (**Figure 15**). The number of graduate students who rarely meet with their supervisor increased by 13%.

Over half of respondents (54%) reported being satisfied with the frequency of meetings, with 24% of graduate students reporting dissatisfaction.

While working remotely, graduate students largely read academic literature (81%, n=953), conducted data analysis (55%, n=647) and wrote a variety of materials (**Figure 16**). Of the respondents planning to complete their graduate degrees in the near future (n=241), 23% (n=56) had decided to postpone their defense, with the remaining 77% (n=185) planning to defend virtually.

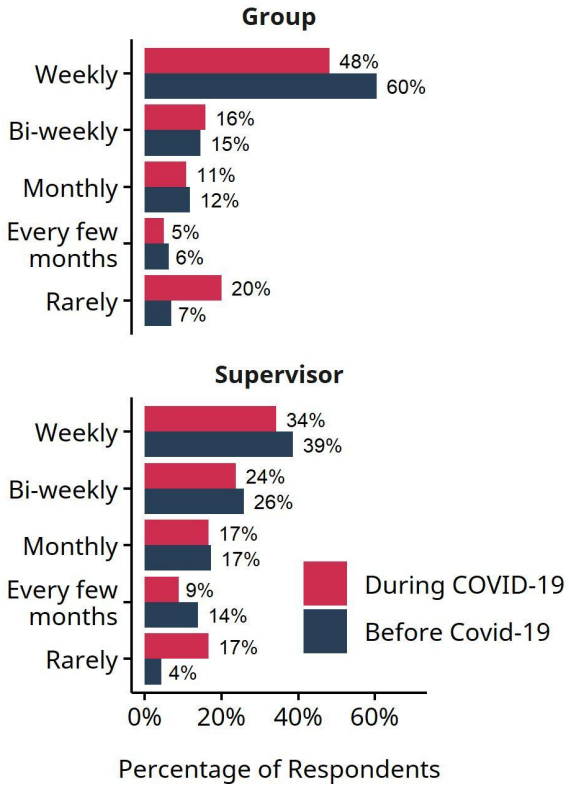


Figure 15: Frequency of meetings with research groups and supervisors before COVID-19, and at the time of survey.

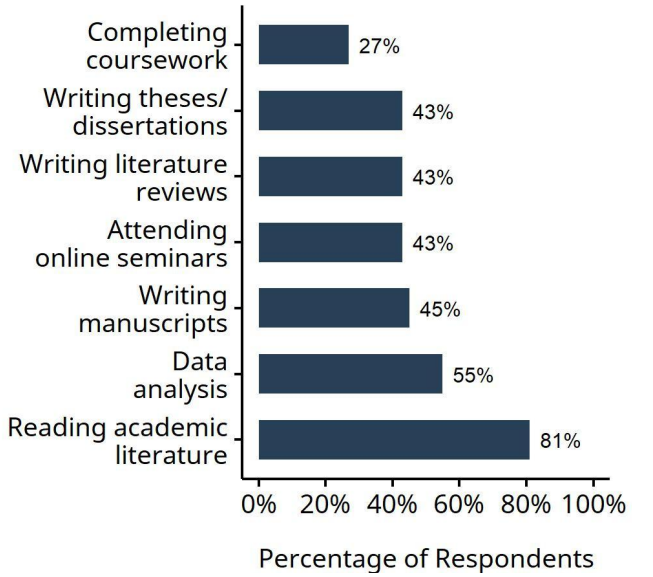


Figure 16: Activities completed by research-stream graduate students while institutions were closed.

Unsurprisingly, COVID-19 halted aspects of graduate research involving travel. Of the respondents planning to study or conduct research abroad (n=336), 78% (n=263) of graduate students reported needing to cancel their plans.

Of those planning to attend a local and/or international conference, respondents reported that conferences had either been cancelled (72%, n=590), postponed (27% n=220), or transitioned to an online format (33% n=269) with only 69 respondents still planning to virtually attend.

Respondents were divided when asked about whether the change in conference status would impact their time to degree completion (**Figure 17**). When asked about their future prospects, 41% of respondents believed the change in conference programming would have a moderate impact or be very impactful (**Figure 18**).

78% of graduate students planning to study or conduct research abroad had to cancel their plans

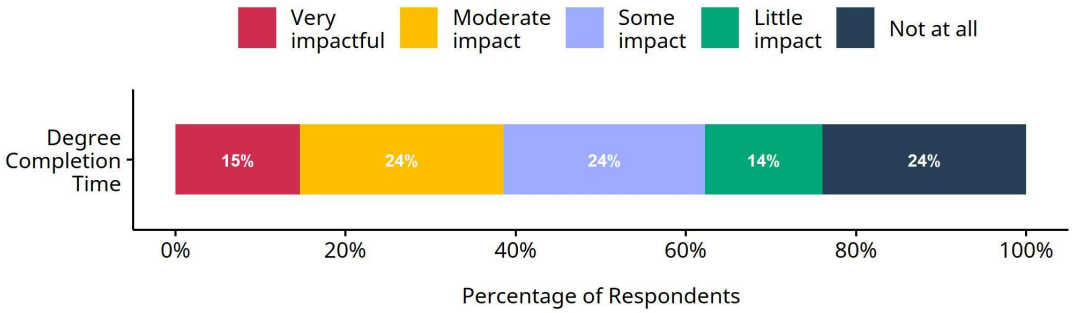


Figure 17: The percieved impact of local and international conference cancellations on degree completion time.

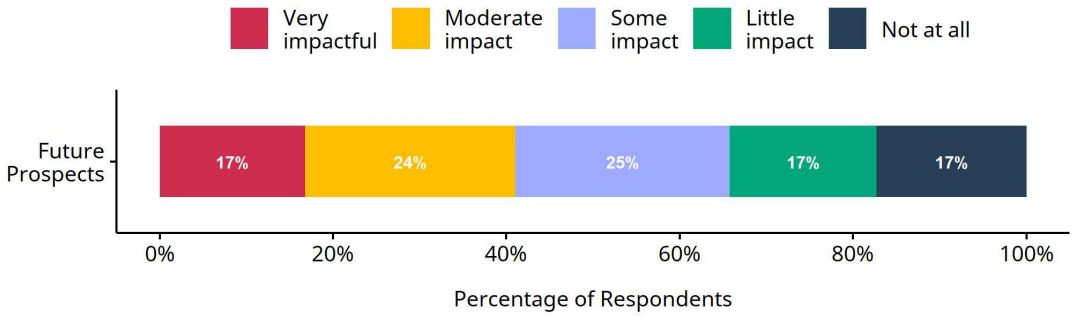


Figure 18: The perceived impact of the cancellation of local and international conferences on future prospects.

172 research-stream graduate students felt:

- Uncertain about their ability to complete their degree on time, or at all.
- That work was impossible either due to:
  - a lack of access to necessary equipment or resources,
  - an inability to collaborate,
  - severe and debilitating mental health challenges.
- Confused about remote work expectations, and felt unsupported by their institution and/or supervisor.
- That they may need to entirely change the direction of their research, or abandon their research altogether, with many also expecting that the quality of their thesis would be greatly diminished as a result of COVID-19.
- Concerned about lost opportunities for professional development due to conference and event cancellations.

Teaching

Graduate students often have teaching responsibilities, which may be mandatory or optional depending on their program. How much support have graduate students received in the shift to remote teaching? Below are 416 responses from graduate students with a teaching position.

Teaching responsibilities often account for a large portion of a graduate student's income, and in some cases, may be mandatory depending on the program or academic discipline. A total of 416 survey respondents indicated that they were teaching assistants (TAs) and/or course instructors (CIs) during the winter or summer semesters. Of these, 92% (n=385) identified as TAs, 5% (n=20) as CIs, and 3% (n=11) as both TAs and CIs (**Figure 19**). Sixty-eight percent (n=281) of respondents held a teaching position in the winter semester, 11% (n=46) in the summer semesters, and 21% (n=89) in both semesters.

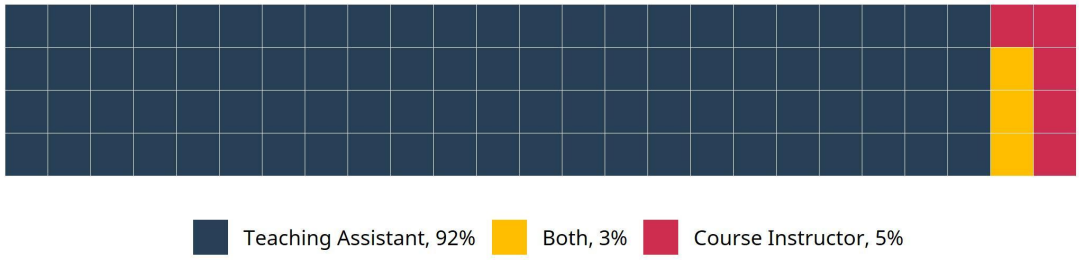


Figure 19: Breakdown of the teaching positions held by graduate students who completed this survey section.

A majority of respondents (59%, n=244) reported that they had received some form of support from their CI or department while transitioning to remote teaching. Thirty percent (n=126) reported that they had not received any support, while 11% (n=46) were unaffected because their role was already remote prior to COVID-19.

> 79% of TAs and CIs received no compensation for the additional time and work needed to transition to online teaching

An increased proportion of TAs and CIs reported being unsatisfied with various aspects of their teaching requirements since the start of the pandemic, with 34% dissatisfied with the level of departmental support (**Figure 20**).

With the shift to online learning, 58% (n=240) of respondents reported that they felt that this transition will impact the availability of future CI and/or TA positions.

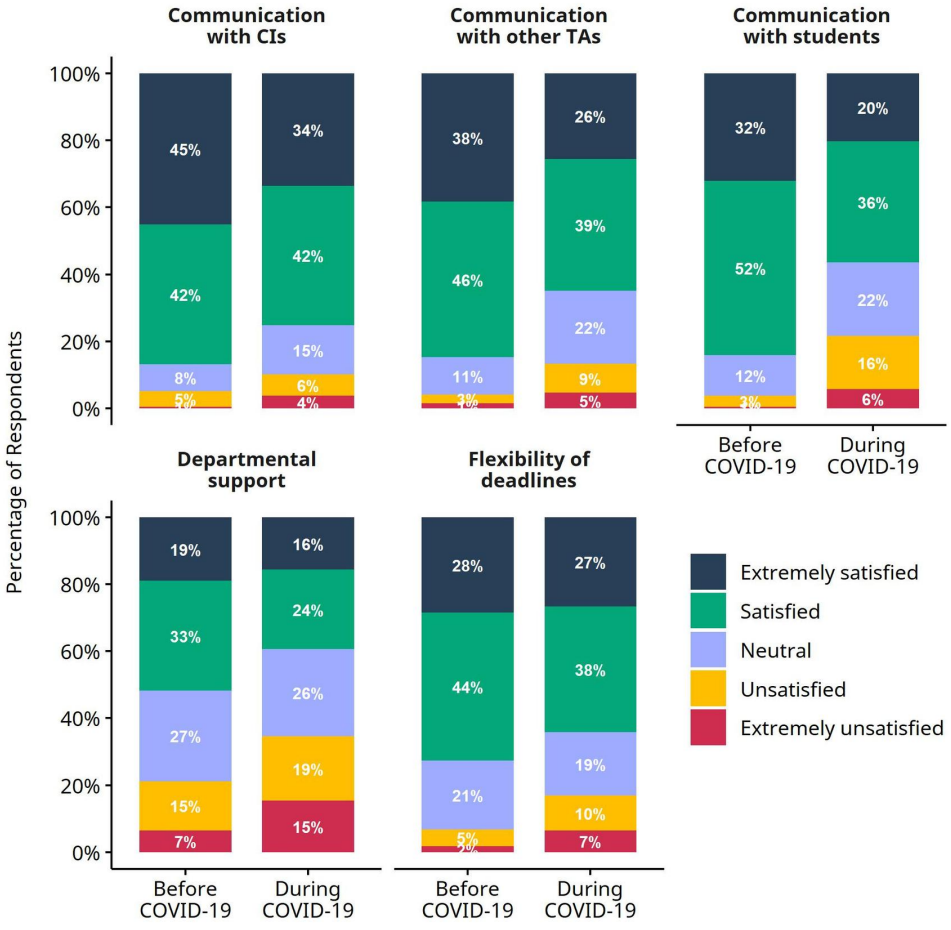


Figure 20: The level of satisfaction among graduate students towards different aspects of their teaching responsibilities, before COVID-19 and at the time of the survey.

37 respondents shared additional thoughts expressing that:

- Communication by the universities during the transition to teaching online was poor.
- There was an increased workload upon transitioning to teaching online, which was not fairly compensated.

Courses

Instructors have had to quickly adapt their courses to an online format. How did course structures change as a result of COVID-19? How satisfied are graduate students with the quality of their education now? Below are 772 responses from graduate students enrolled in a course.

The number of courses that graduate students have to complete depends on their program and academic discipline. In this survey, a total of 772 respondents reported that they were enrolled and/or planned to enroll in a course during either the remaining winter semester (91%, n=668) or the summer (47%, n=350) semester (**Figure 21**).

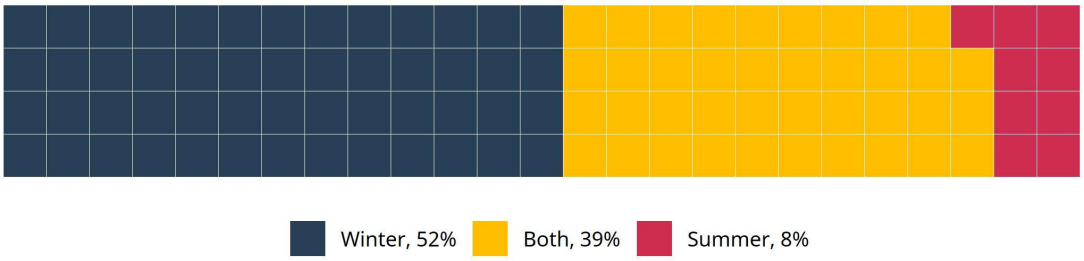


Figure 21: Percentage of respondents taking courses in the winter, summer or both semesters.

In the wake of the pandemic, course instructors had to quickly adjust lecture styles. Respondents reported that the most common lecture formats were live virtual lectures (48%, n=321), followed by a hybrid model of live virtual lectures with recordings (35%, n=237), and course recordings from a previous year (17%, n=114).

Seventy-four percent (n=575) of respondents in this section were taking courses which had an in-person lab or field component. Of these respondents, 29% (n=168) reported that these components were cancelled entirely, with 10% (n=59) uncertain about its status for summer 2020 courses.

> 29% of respondents had the practical component of their courses cancelled

There was a small increase in the number of respondents who indicated their courses had no exams (59%, n=509), compared to before COVID-19 (54%, n=477) (**Figure 22**). With the shift to virtual classes, reported a 5% and 8% increase in traditional take-home and open-book exams respectively.

Most institutions implemented various changes to incorporate flexibility into courses, including an extension for pass-fail grading (47%, n=347), opportunities to withdraw from a course while keeping the course on a student's transcript (48%, n=356), and the option to remove courses from a student's transcript (35%, n=258).

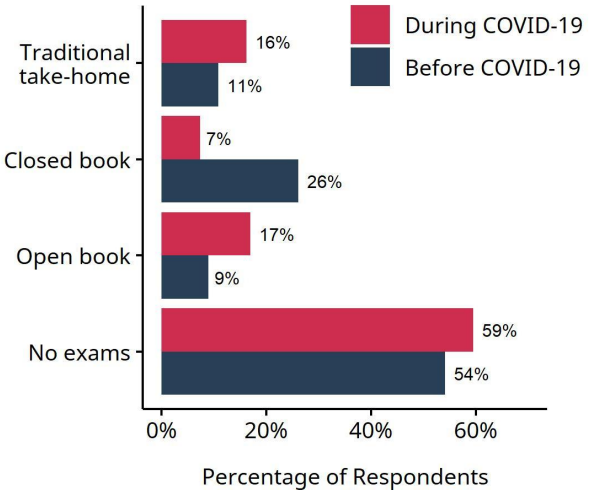


Figure 22: Changes to exam format after shift to virtual classes in March.

Respondents reported an increase in dissatisfaction regarding various aspects of their course structures (**Figure 23**). More graduate students reported feeling dissatisfied with the quality of their practical (34% increase) and lecture (21%) components of coursework.

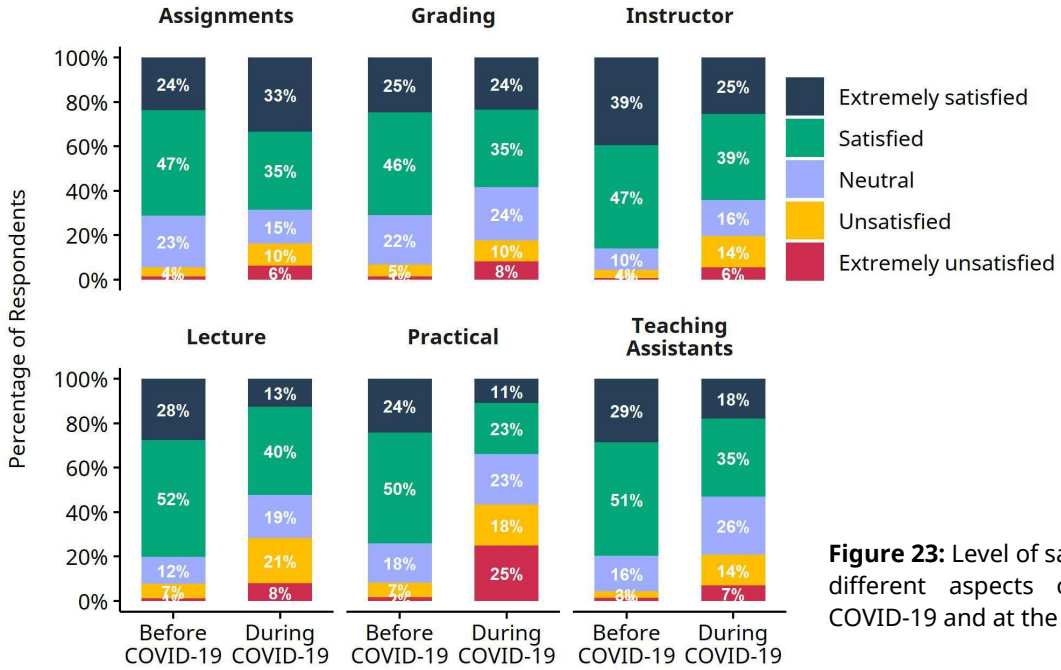


Figure 23: Level of satisfaction regarding different aspects of courses, before COVID-19 and at the time of the survey.

65 graduate students taking courses expressed:

- That course requirements changed as a result of COVID-19, and that their thoughts on the changes were largely negative.
- Frustration with poor and inconsistent communication from their institutions, and general feelings of uncertainty as a result.
- Feeling that the quality of their education would be hampered significantly post-COVID-19, and that institutional responses were insufficient to date.
- Dismay at tuition fees, given the decrease in the quality of course delivery.

International Students

Much of the initial response to COVID-19 by governments and institutions overlooked international students. Are international students concerned about completing their degree within the limits of their study permits? How has COVID-19 affected their ability to travel home, and secure housing? Below are responses from 243 international students.

When asked about whether COVID-19 had impacted their ability to travel home, 60% (n=146) of international graduate students stated that they intended on going home but were unable to, while 33% (n=81) had no travel plans. Seven percent (n=16) indicated that they were abroad, whereas only 2% (n=5) were able to return to Canada amid COVID-19.

Respondents reported various barriers or considerations impacting their ability to travel home (**Figure 24**), including Canadian travel restrictions (14%, n=144) and the limited availability of flights (13%, n=133).

> 60% of graduate students planned to travel home but were unable to

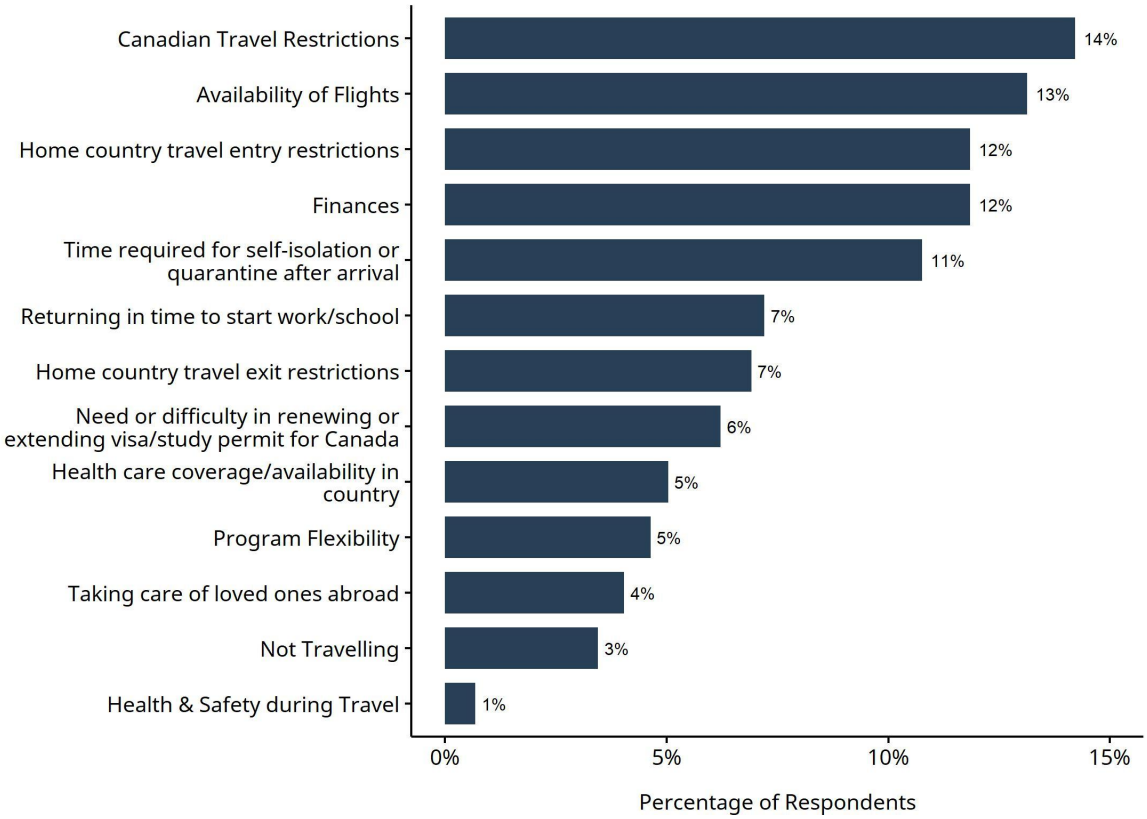


Figure 24: Concerns international graduate students had that impacted their decision to travel home.

Only 29% (n=69) of international students were dissatisfied with their institution's level of support in regards to travel (**Figure 25**).

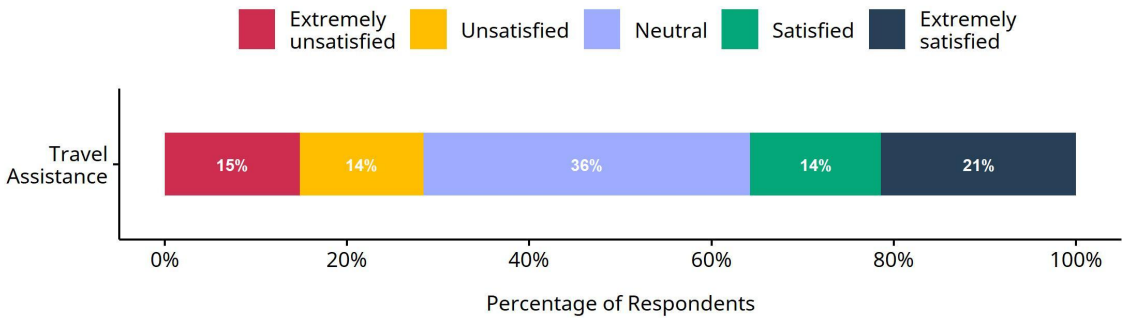


Figure 25: Graduate students indicated how satisfied they were with their institution's assistance with housing and travel, given the possibility that they may not be able to return to school if they leave the country.

When asked if housing assistance was provided by their institution, 46% (n=112) of international graduate students report that their institutions were not providing additional housing support, with 40% (n=98) unsure if this support was available. In addition, only 13% (n=32) reported dissatisfaction with the assistance provided by their institutions.

Over half of international graduate students (54%, n=131) indicated they were worried about completing their degree requirements before the expiration of their study permit due to COVID-19 (**Figure 26**).

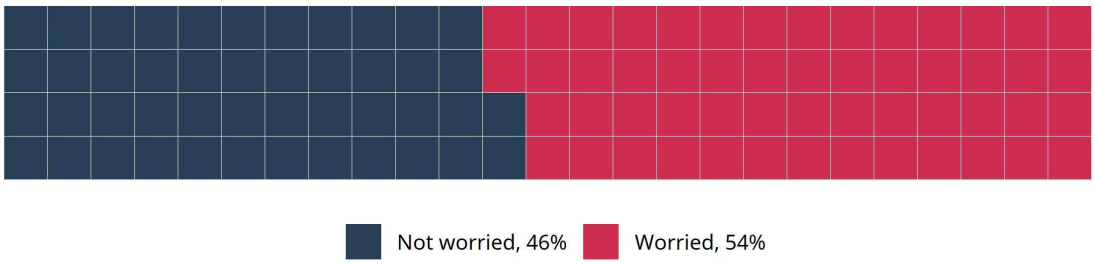


Figure 26: Percentage of international graduate students who were worried about completing their degree requirements before the expiration of their study permit, in light of the pandemic.

67 international graduate students also expressed:

- Feeling left out of COVID-19 related assistance, whether that was support from their institutions or the federal government (e.g., being ineligible for Canadian Emergency Student Benefit).
- Concern over finances, citing the high tuition fees and difficulty in finding jobs, especially due to study permit restrictions. These worries were exacerbated by the distance from their loved ones and other sources of support.

Future Outlook

While all graduate students have been forced to adapt to this new normal, what does the future hold? We asked graduate students about their future prospects, and whether they believed COVID-19 had impacted the time it would take to complete their degrees. Below are the results from all respondents in either the professional stream (n=254) or research stream (n=1,177) programs.

Forty-percent of research-stream respondents (n=468) reported that COVID-19 would impact their degree timeline, with 39% (n=461) uncertain about the pandemic's impact (**Figure 27**). Within the professional stream, most respondents (52%, n=132) were not concerned about the impact COVID-19 would have on their degree timeline.

When asked about the impact of COVID-19 on their ability to complete their degree, research-stream respondents were divided, with 44% (n=516) reporting there would be an impact (**Figure 27**). Most (51%, n=129) professional-stream respondents felt that COVID-19 had not impacted their ability to graduate.

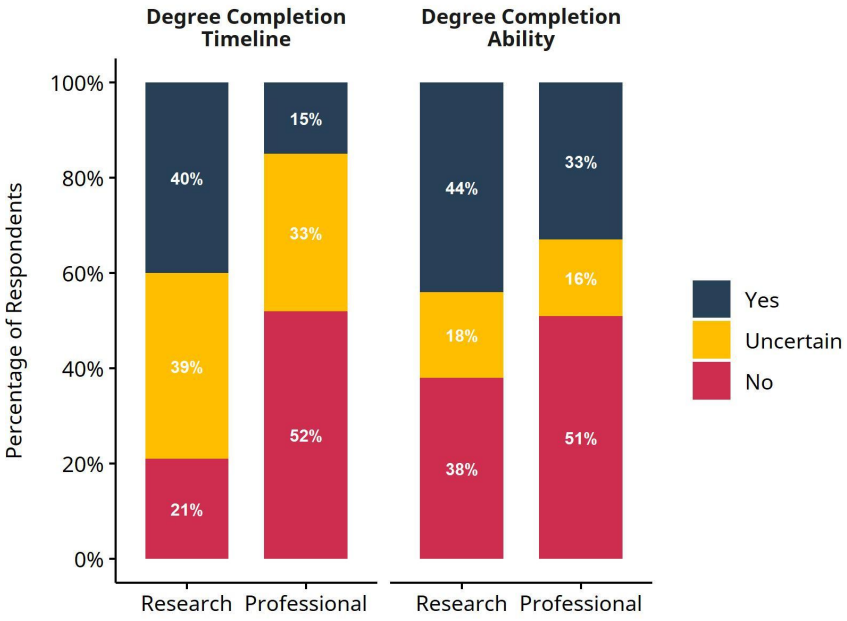


Figure 27: The percentage of graduate students for professional and research-stream programs who think COVID-19 has changed the timeline of their degree and ability to complete their degree.

Of those planning to complete degree requirements by August 2020 (n=367), 49% (n=181) expected COVID-19 to have no impact on their graduation (**Figure 28**). 17% (n=64) report being unable to graduate because of changes resulting from COVID-19, and 33% remained unsure about their ability to graduate as planned.

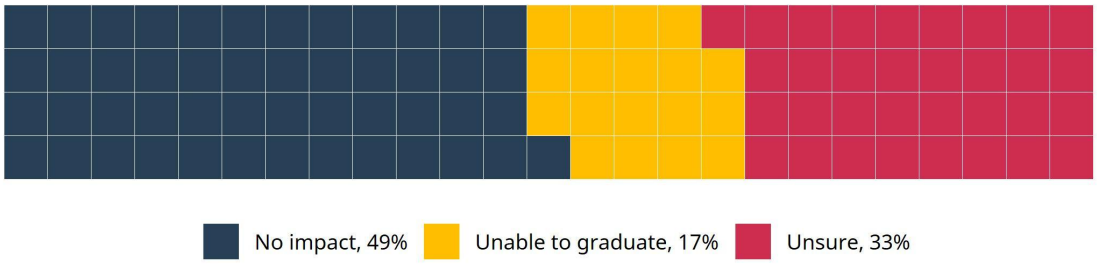


Figure 28: The impact on graduation for graduate students intending to complete degree requirements by August 2020.

Most respondents indicated they would be continuing their graduate studies into the summer (72%, n=1035) and fall (73%, n=145) semester, with 2% (n=27) reporting that they would be deferring their studies in the fall due to financial concerns. In some cases, graduate students were employed on a part or full-time basis (6-11%, n=88-160), while others were seeking employment (24-26%, n=339-370) in these two semesters.

188 respondents opted to share additional thoughts, expressing:

- Worry that COVID-19 related research disruptions would impact both their degree completion timelines, and that the weakened economy would negatively impact their ability to find employment.
- Concern about their financial security, flagging the lack of information on stipend payments from their educational institutions in particular.
- Concerns about the risk of COVID-19 infection when returning to campus, uncertainty over course format leading to an inability to plan ahead, degree requirements not being met, and negative impacts to their mental health.

Recommendations

In this section, we share opportunities for action for both student groups and decision-makers in institutions and various levels of government.

Recommendations

The graduate students of today are the leading innovators of tomorrow. But in order to realize this potential, it is critical to mitigate the adverse impacts of COVID-19 on graduate students, and provide targeted resources to help students thrive.

Graduate students are certainly not alone in feeling the negative effects of the COVID-19 pandemic, but they have less influence, and are in more vulnerable positions compared to other members of the academic community. Prior to COVID-19, graduate students reported a variety of bleak experiences, including financial precarity and a number of challenges to their health and wellness (see **Introduction**). The COVID-19 pandemic has magnified these existing issues, and introduced new challenges, highlighting several opportunities for action.

Based on our survey findings, which present a snapshot of graduate student experiences across Canada, it is clear that a comprehensive and compassionate response is necessary. In this section, we share recommendations for all members of the academic community, especially academic supervisors, and decision-makers at institutions and various levels of government.

As UNESCO described in their recent "Next Normal" campaign, this is the time to build a better normal. Decision-makers, the ball is now in your court. How will you support Canada's budding young researchers and professionals, and ultimately, the next-generation of Canadian innovation?

1 Establish clear and direct lines of communication between graduate students, supervisors, departments and institutions.

As a result of the pandemic, graduate students across Canada have adapted to working remotely in a short time frame, and with limited guidelines or support. While this transition has been an unprecedented change for all members of the academic community, there are clear opportunities for improvement moving forward.

Graduate studies involve a high degree of self-directed and independent learning, leaving many students isolated as they pursue their degrees. For many, this sense of isolation has been magnified by the COVID-19 pandemic. To address this, and promote health and wellness, consistency around communication is imperative.

Institutions, especially at the department level, must establish clear guidelines for communication between graduate students and supervisors, including implementing new requirements regarding the frequency of meetings. Students should also have access to additional contacts within their department to turn to for support in rectifying different issues, including their health & safety on campus, mental health resources, the structure of their funding packages, and access to campus facilities.

As graduate students transition back into research and learning spaces, the situation is rapidly changing. It is imperative that relevant information, including safety procedures and work expectations, is communicated in a clear, timely, and accessible manner, with consideration towards reduced productivity in these challenging times. There is a need for increased support and empathy by institutions for all graduate students, and in particular, for those who are facing difficulties working from home and those with additional care-giving responsibilities.

Recommendation 1.1

Institutions, Departments, and Supervisors: Improve lines of communication (in terms of clarity and frequency) between supervisors, graduate students and research groups.

Recommendation 1.2

Institutions and Departments: Create clear and accessible guidelines regarding returning to institutions.

Recommendation 1.3

Departments and Supervisors: Set out general guidelines for productivity and work expectations for graduate students, including the amount of time being spent on work.

Recommendation 1.4

Supervisors: Meet with graduate students at least once or twice a month to ensure their well being, and offer practical suggestions to alleviate challenges.

2 Reduce the financial burden faced by graduate students, and introduce flexibility into degree completion times.

In addition to financial precarity, graduate students are concerned about the impact of COVID-19 on their time to degree completion, and whether any delays may result in increased tuition costs. These concerns are being exacerbated by the economic effects of the COVID-19 pandemic. The Canadian economy is estimated to contract by 5.9%, suggesting long-term ramifications for graduates entering the labour market. With a perilous job market ahead, it is critical to reduce the financial burden faced by graduate students, and introduce flexibility into degree completion times.

As graduate students no longer have access to the same quality of resources, teaching, and support, provincial governments and universities should consider either reducing, or waiving, tuition fees to allow graduate students to be able to complete their studies. Recent opinion research in Ontario has indicated there is widespread support for such an initiative amongst the public.

Various levels of government have already extended the timeline for student loan repayments. Moving forward, governments should also consider (i) introducing further extensions, at least on an as-needed basis, to the end of 2021; and (ii) prioritizing the availability of grants, rather than loans, when it comes to financial assistance for students with debt. These two changes will be critical for students in professional-stream programs, where there is often little financial support. These efforts will also assist students who may need to pursue graduate studies on a part-time basis as a result of COVID-19.

The progress of research-stream graduate students has been severely impacted by COVID-19, and many may run out of funding before graduation. Here, institutions should consider extending the time to degree completion for graduate students by at least one semester, or the time length of COVID-19 related closures, to account for delays in research. This extension should be coupled with no additional tuition costs. (Refer to **Recommendation 5** for more about how to mitigate funding-related issues for research-stream graduate students.)

Due to the shift to online courses, there is also a decrease in the availability of practical and lab-based teaching positions. This can be a critical loss of income for graduate students, especially those who depend on teaching hours to help cover their costs of living, or those who are required to teach a certain number of hours as part of their funding package. Here, departments should consider restructuring funding packages, and offering alternative teaching or employment opportunities for graduate students who rely on teaching hours for income.

Finally, institutions should introduce financial support and resources, such as emergency grants and access to financial counsellors, to help account for the additional time required to complete their degrees, supplement losses in income (e.g. the cancellation of teaching assistantships in the shift to teaching online), and address financial uncertainties brought on or exacerbated by COVID-19. For example, students may switch to part-time studies due to additional responsibilities, such as child-care or working to support their loved ones financially. Here, departments should re-evaluate and adjust requirements, to ensure students are able to graduate in a timely manner despite setbacks due to COVID-19.

Recommendation 2.1

Governments: Continue the extension of student loan repayments, and increase the proportion of funding provided as grants rather than loans.

Recommendation 2.2

Governments and Institutions: Introduce a tuition reduction or waiver, especially for graduate students in financial need.

Recommendation 2.3

Institutions: Clarify and adjust expectations regarding degree completion and funding packages (if applicable). Introduce mechanisms to extend the stipends of graduate students in cohorts with guaranteed funding by at least one semester or the length of the pandemic, to account for the delays in research that will be ongoing.

Recommendation 2.4

Institutions, Departments, and Supervisors: Provide additional support for students who have switched to part-time studies due to additional responsibilities, and offer this as an option for full-time programs too.

3 Improve existing health and wellness support systems available at institutions.

In Canada, there is a mental health crisis on university campuses. The COVID-19 pandemic has laid bare the need to accelerate the improvement of mental health support systems and reduce the associated stigma. In particular, there needs to be a drastic increase in the types of mental health resources provided by institutions and provincial governments, including the introduction of flexible counselling hours, increased availability of long-term mental health care, and mandatory training to ensure awareness of mental health issues among graduate students, supervisors, and administrators.

A quarter of survey respondents are now considering taking a long-term leave of absence, compared to pre-COVID-19 (10%). Given this, institutions should consider adjusting or easing the documentation requirements involved in requesting a leave of absence, especially as students are facing challenges in accessing support services right now. Similarly, any deadlines to apply for a leave of absence should be eliminated to account for the ongoing, widespread uncertainty induced by the pandemic.

Finally, access to student services, particularly, mental health services, should not be revoked during a long-term leave of absence. COVID-19 has had a marked effect on student mental health, and as such, institutions should not exacerbate this further by cutting off support services during a leave, as this may only render a student's return more challenging.

COVID-19 has also led to the closure of schools, daycare, summer camp and other child-care facilities. The lack of clarity and government action regarding when, and how, such facilities will reopen will have severe repercussions on graduate students' ability to plan for the fall semester. Here, institutions should consider introducing emergency funding for the provision of physically distant childcare on-campus.

Recommendation 3.1

Governments: Continue to invest in and improve the types of mental health resources and support available.

Recommendation 3.2

Institutions: Improve and increase the level of support available to graduate students by ensuring reduced wait times for on-campus counselling services, and providing mental health training to faculty, students and staff.

Recommendation 3.3

Institutions: Provide clear and easily accessible directions on how students can access mental health supports.

Recommendation 3.4

Institutions: Increase flexibility of long-term leaves of absence.

Recommendation 3.5

Institutions: Provide physically distant childcare on-campus or emergency funding for graduate students with dependants.

4 Provide extensions to study and work permits for international students.

International graduate students face additional challenges to their health and finances given their distance from loved ones, the limitations imposed on them by study permits, and their inability to access many of the government services introduced during COVID-19.

As international students do not have access to the same level of support from government agencies, they require additional support and consideration from their institutions. Therefore, it is critical that institutions do not raise tuition fees for international graduate students, especially as in some cases, the quality of education may be diminished. Instead, institutions should strengthen the support available to international students, including guidance around travel and housing, and access to emergency financial assistance.

The federal government has already introduced some measures to aid international students. For example, international students working in an essential service can work more than 20 hours per week off-campus until August 31st 2020. Here, the government should consider extending this temporary measure. In addition, the federal government should consider: (i) introducing more flexibility to the application process for post-graduation work permits, as COVID-19 is leading to delays in degree completion for international students; and (ii) extending the length of post-graduation work permits to account for the current poor economic outlook. We should not penalize international graduate students, especially those who are keen to continue making Canada their home.

Finally, the federal government should clearly communicate any changes in policies regarding permits and travel restrictions to allow international students to plan their housing and travel in advance.

Recommendation 4.1

Governments: Clearly communicate any changes in policies regarding permits and travel restrictions to allow international students to plan their housing and travel in advance.

Recommendation 4.2

Governments: Continue to advance flexibility regarding study and post-graduation work permits and their limitations.

Recommendation 4.3

Institutions: Do not increase tuition for international graduate students, particularly those without guaranteed funding.

Recommendation 4.4

Institutions: Strengthen the resources available to international students, including funding, travel and housing supports.

5 Mitigate the impact of COVID-19 on the ability of graduate students to conduct research.

Around three-quarters of graduate students reported that COVID-19 had negatively impacted their ability to conduct research due to institutional closures. This impact will continue into the future for many reasons, including altered work schedules, limited facility operations, the need for physical distancing, and reduced access to research spaces. To reduce this impact, institutions should increase the flexibility of degree requirements, including extending deadlines to reach candidacy, and for degree completion. In collaboration with their students, academic supervisors should establish contingency plans for research projects to mitigate undue stress and allow students to conduct meaningful work while completing their degree requirements.

If typical research cannot be conducted, it is incumbent on departments to re-shape the graduate learning experience such that the quality of education is upheld. This could include the provision of funding for additional training to shift research goals and develop the skills necessary to do so. Institutions can also introduce training for skills such as statistical analysis, project management and various forms of science communication. These opportunities are especially vital as graduate students will now have to navigate financial uncertainty and a job market with limited prospects, where even one additional skill or experience, and the connections gleaned from it, may be critical in securing a job.

In Budget 2019, the federal government committed a $114 million investment over five years, starting in 2019-20, with $26.5 million per year ongoing, to the three federal granting agencies (CIHR, NSERC and SSHRC). While these are commendable investments, they continue to fall short of the amount recommended in the Fundamental Science Review (FSR). In addition, the Government's recent COVID-19 related research investments only reach a subset of graduate students — specifically, those who currently hold an expiring federal scholarship or fellowship, are supported by federal research grants, are conducting research in COVID-19 priority areas, or have the availability to seek full- or part-time work.

This limited and exclusive funding means that research-stream graduate students continue to face challenges in obtaining funding, which affects who is able to pursue and complete their graduate studies. In the short-term, the federal government should consider extending expiring federal scholarships (on an as-needed basis), and introducing needs-based financial awards which all research-stream graduate students can apply to.

In the next federal budget, the federal government should increase the number of graduate scholarships and awards offered via the three federal funding agencies, specifically an increase of $140 million over four years, as recommended by the FSR. In addition, equity, diversity and inclusion should be prioritized when allocating funding to mitigate the impact of COVID-19 on graduate students across Canada. This can include introducing federal grants to offset the costs of childcare for graduate students, and allocating funding specifically for individuals belonging to equity-seeking groups, such as members of Black and Indigenous communities. This will reinvigorate the current federal scholarship and awards ecosystem, allowing graduate students to successfully complete their graduate degrees and contribute their specialized knowledge and skills to the Canadian economy.

Finally, institutions should also prepare contingency plans in the event of a second COVID-19 wave. Here, findings from two additional surveys can help guide best practices: (i) the Science & Policy Exchange launched a short survey to invite young scientists to share their thoughts and concerns about resuming research activities; and (ii) a study from McMaster University will soon shed light on best practices for closing down labs based on researchers' experiences in the early months of COVID-19.

Recommendation 5.1

Federal government: Extend expiring federal scholarships (on an as-needed basis), and introduce needs-based financial awards which all research-stream graduate students can apply to.

Recommendation 5.2

Federal government: Increase the number of graduate scholarships and awards offered via the three federal funding agencies, with prioritization of equity, diversity and inclusion in funding allocation.

Recommendation 5.3

Institutions: Develop contingency plans in the event of a second wave.

Recommendation 5.4

Departments: Increase the flexibility of degree requirements to mitigate COVID-19 related research disruptions.

Recommendation 5.5

Departments: Re-shape the graduate learning experience such that the quality of education is upheld, if typical research activities can no longer be conducted.

6 Improve the quality of virtual teaching and coursework by establishing clear expectations, introducing relevant pedagogical training and increasing the flexibility of course structures.

With the transition to remote teaching, COVID-19 has transformed the delivery of coursework. Most graduate students with teaching responsibilities are used to teaching in-person via lectures, tutorials, or hands-on practical sessions. The transition to virtual teaching requires new pedagogical skills, and new forms of interaction to create an open and engaging learning space. To ensure an optimal learning and teaching experience, it is imperative that institutions provide additional training to TAs, and ensure access to technical and teaching support.

As graduate students with teaching responsibilities are now working from home, the lines between their work and personal lives are often blurred. It is important to set out clear expectations between teaching assistants, course instructors (CIs), and students, and on how to manage these boundaries, including setting up dedicated online office hours and establishing expected turnaround times for email inquiries.

The transition into the fall semester will not be easy for students who are already struggling with remote learning. Here, priorities in course planning should include fostering a more engaging learning experience, despite the virtual nature of coursework.

It is also necessary to ensure that online options are available for all courses to ensure students' safety and well-being amid the ongoing pandemic. Here, CIs should embrace the Universal Design for Learning principles to ensure that online learning is accessible to all graduate students. This can include closed captioning (a feature available in both Google Slides and PowerPoint) and offering lecture transcripts.

Course syllabi will also need to be adapted to meet the new challenges of working from home, as it is important to recognize that people may be living and working in different time-zones, with variable access to the internet. CIs should consider polling students (anonymously) to understand what barriers students face, and to account for this in course planning, be it through more flexibility (e.g. making attendance at live lectures optional), providing more learning support (e.g. additional teaching assistants), or implementing innovative approaches for instruction and examination. In some cases, students may need assistance in accessing technology, devices and the internet through financial assistance or device loan programs. These resources will be particularly important for students belonging to low-income, rural, remote and/or Indigenous communities.

CIs must reconsider their approach to courses with a lab or practical component, which are often an essential component of graduate degrees. In developing practical courses, such as labs, CIs will need to ensure that substitutes are of the same quality, or provide the same value to the degree.

Recommendation 6.1

Institutions: Provide fully online course options to ensure students have the choice to prioritize their health or that of their loved ones.

Recommendation 6.2

Departments: Provide pedagogical training and support for teaching assistants and course instructors.

Recommendation 6.3

Departments, Teachings Assistants & Course Instructors: Establish clear and reasonable expectations between teaching assistants, instructors, and students on communications, and setting boundaries between work and home life.

Recommendation 6.4

Course Instructors: Increase the flexibility of course structures and engage with students during course planning, with consideration towards the difficulties and challenges being faced by everyone during this pandemic.

7 Mitigate the impact of COVID-19 on the ability of graduate students to participate in professional development opportunities.

COVID-19 has led to the cancellation of various professional development opportunities, including conferences, internships and plans to study or conduct research abroad. Such activities are a critical part of building a professional network for graduate students.

Graduate students have also reported increased feelings of anxiety and uncertainty about completing degree requirements, as observed in all sections of this survey. As the full economic effects of the pandemic are still unknown, the stresses surrounding future job employment are only going to increase. Therefore, not only is mental health support crucial, but there needs to be greater consideration on the part of institutions to help graduate students adjust to this "new normal." Here, institutions should make a concerted effort in preparing graduate students for the future job market and alleviate some of the stress surrounding employment.

Academic societies and institutions can play a leading role by transitioning in-person activities to online, as some have already done. This can include networking events, virtual job fairs and mentorship programs, with a focus on helping students transition out of school and effectively search for a job in an uncertain job market. In addition, institutions can redirect existing conference travel grants — which are not likely to be used during the pandemic — to cover any associated costs of participating in such professional development opportunities.

In professional-stream programs, work experience obtained through internships or practicums is critical to future career success. To mitigate the impact of COVID-19 on this critical component, institutions should implement additional professional development activities, as previously mentioned.

Institutions should also consider expanding work-study programs, particularly to include specialized, paid placements for students in professional degree programs. Here, investments from various levels of government will be critical. This can also be an opportunity to partner with external organizations. For example, Mitacs has recently introduced a number of internship opportunities for students thanks to a recent $40 million investment from the federal government.

It is also important to normalize participation in such opportunities. Supervisors should encourage their graduate students to learn new skills and participate in these opportunities, even if it isn't directly relevant to the student's research.

Recommendation 7.1

Governments: Continue to create, or subsidize, work experiences to help graduate students prepare for an uncertain job market.

Recommendation 7.2

Institutions: Prepare graduate students for the uncertain job market by transitioning in-person professional development activities to a virtual space.

Recommendation 7.3

Institutions & Departments: Redirect existing conference travel grants to cover any associated costs of participating in such professional development opportunities.

Recommendation 7.4

Institutions & Departments: Encourage and normalize participation in additional professional development programs.

Recommendation 7.5

Supervisors: Encourage students to learn new skills and attend professional development workshops, even if they do not directly link back to their research.

8 Advocate for increased support for graduate students to decision-makers within institutions, and in various levels of government.

While COVID-19 has impacted all members of the academic community, graduate students are often powerless to speak up, especially those who are dependent on their academic supervisors for funding. This is where advocates, including supervisors, student groups and unions, must speak up and use their privilege to help graduate students.

Advocacy can take various forms. This can include penning an op-ed to highlight the impact of COVID-19 on graduate students, participating in faculty meetings to raise issues, or similar to TSPN, collecting data to understand where support can be extended towards graduate students.

Student unions and groups can help graduate students navigate these uncertain times by clearly communicating how they are advocating for their members, and engaging their members when launching advocacy efforts (e.g. through surveys or virtual consultations). If possible, student unions and groups should redirect funds from in-person events and orientations to provide needs-based bursaries, and online opportunities for professional development and social programming.

In particular, groups, such as the Chief Science Advisor's Youth Council and the Intersectoral Student Committee (Le Comité intersectoriel étudiant), are well-placed to recommend increased support for graduate students to decision-makers.

Graduate students can also take an active role in science advocacy and policy efforts, through organizations such as the Toronto Science Policy Network, Science & Policy Exchange, and Evidence For Democracy. With more graduate students taking part in such activities, we can amplify our voices and collectively advocate for increased support for graduate students. However, we acknowledge that this isn't possible for everyone, especially for those with little time to dedicate to additional activities as a result of care-giving and other responsibilities.

Recommendation 8.1

Supervisors & Faculty Members: Advocate for graduate students to decision-makers within your institution, and in various levels of governments.

Recommendation 8.2

Student Groups & Unions: Start and/or continue advocating for graduate students, and engage with graduate students to inform advocacy efforts.

Recommendation 8.3

Graduate Students: Take an active role in participating in science advocacy and policy efforts, if possible.

9 Embrace long-term planning to mitigate the impacts of COVID-19 in the years to come.

Both institutions, and various levels of government, must be transparent and embrace long-term thinking. The impacts of COVID-19 will be felt for many years to come, and graduate students need to know that they will be supported through to the completion of their degrees. In particular, COVID-19 offers an opportunity to address the fiercely competitive nature of academia, and foster an "ethics of care" as we look to build back better — specifically, a stronger, more empathetic and collaborative academic community as the pandemic subsides.

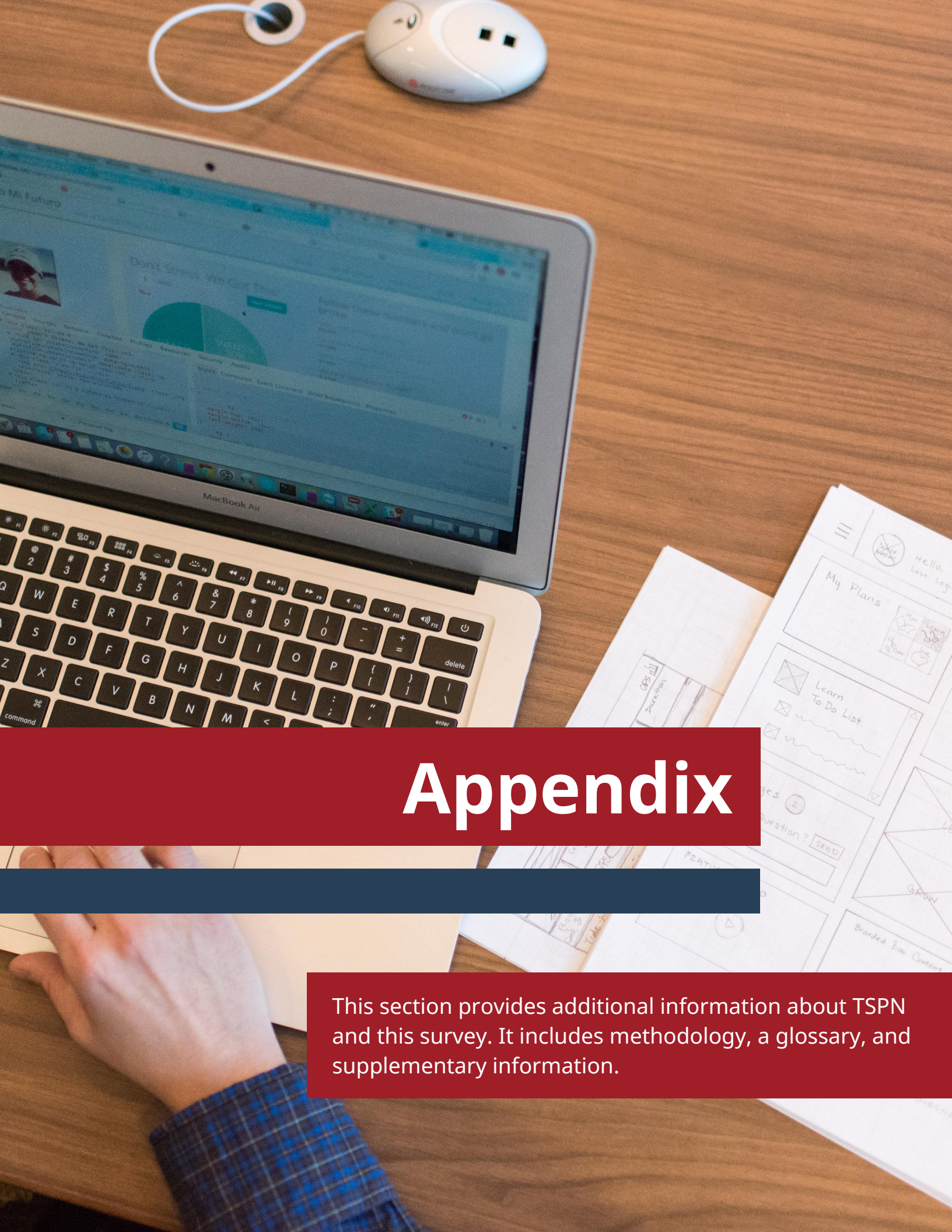
This is also an opportunity for academic societies and conferences to diversify learning opportunities in the sphere of professional development, as perhaps more of these events will take place online beyond the pandemic, with an opportunity to include graduate students across Canada and beyond in these activities, helping build a more interconnected, international graduate community.

Recommendation 9.1

Institutions, Departments, Academic Societies, and Supervisors: Build a stronger, more empathetic and collaborative academic community as the pandemic subsides.

Recommendation 9.2

Institutions, Departments, and Academic Societies: Graduate students should be invited to weigh in on any long-term strategic planning efforts by having a seat reserved at the decision-making table (e.g. in committees, or through the establishment of Youth Councils, similar to the Chief Science Advisor of Canada).



Appendix

This section provides additional information about TSPN and this survey. It includes methodology, a glossary, and supplementary information.

Toronto Science Policy Network (TSPN)

TSPN is a student-run science policy group based at the Universiy of Toronto (U of T). We provide a platform for students (undergraduate and graduate), post-doctoral fellows, faculty, staff, and members of our community at-large to learn about and engage in the science-policy interface.

Founded in 2018

TSPN was founded in July 2018 by a group of graduate students at U of T and has since grown into a large, inter-disciplinary volunteer network.

300+ participants

Over 300 individuals from across Toronto, and the Greater Toronto Area, have participated in one of TSPN's events or advocacy initiatives.

To date, we have hosted 13 events, and three major advocacy initiatives, including:

101 Workshops

In this series, we invite experts to help build skills that scientists need to engage in the science-policy interface. Previously, we've hosted workshops on policy brief writing, science advocacy and public policy.

Advocacy Initiatives

We co-led the #VoteScience campaign (a non-partisan effort to advocate for science in the 2019 federal elections), launched a letter-writing campaign to Members of Parliament, and developed a COVID-19 graduate student survey.

Public Panels

In each panel, we invite three expert speakers and a moderator to discuss the science behind key policy topics. Past panels have discussed topics such as climate action and the importance of representation in STEM fields.

TSPN Talks

In this speaker series, we invite scientists to share lessons from their past research and science policy experiences. Past speakers include Dr. Molly Shoichet and Dr. Jennifer McKelvie.

Methodology

Initially, this was intended to be a survey of the University of Toronto's graduate student population, but we quickly expanded our scope to include students from across Canada in the early stages of survey design. The TSPN team developed questions in consultation with graduate student groups from a number of academic disciplines. The survey consisted of 14 different sections, where respondents were directed to different sections depending on their graduate student experience (**Figure 29**). The goal for each section was to ask how COVID-19 had impacted specific components of graduate studies.

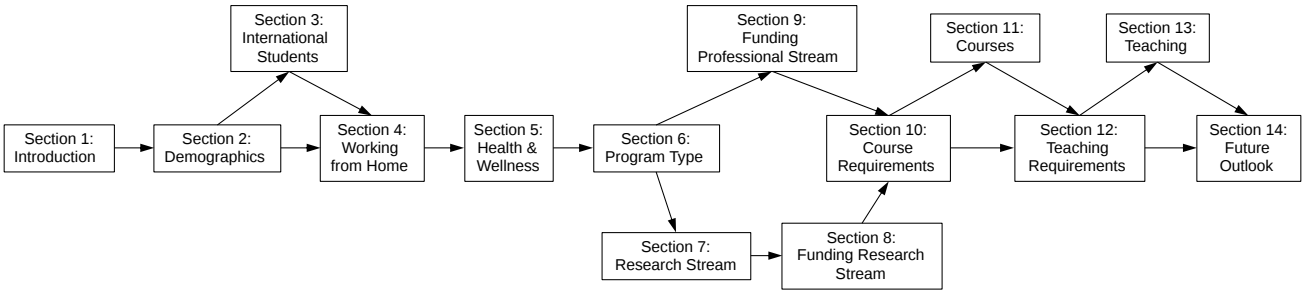


Figure 29: The outline of survey sections.

The English version of the survey was launched on April 22nd, 2020, with a French version launched two weeks later, on May 6th, 2020. Most responses were submitted within a week of the survey's launch (**Figure 30**). The French survey's translation was carried out by TSPN members, with secondary proofreading by the Science & Policy Exchange.

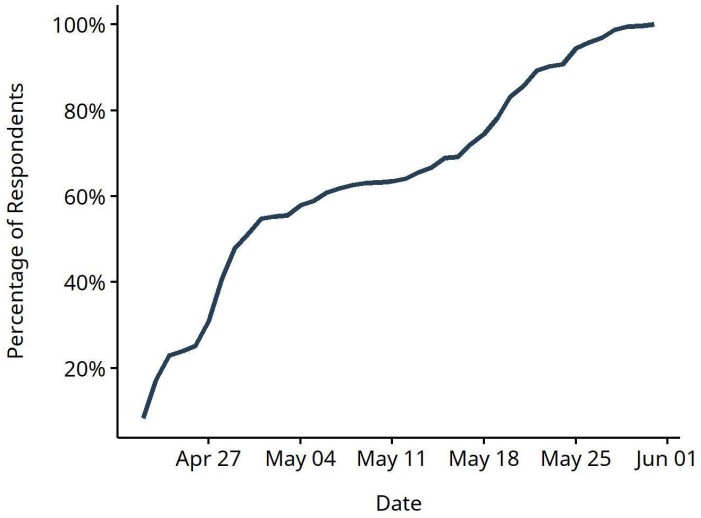


Figure 30: Survey response rate.

The survey was distributed to graduate students via email, mailing lists, social media, word-of-mouth, and by reaching out to graduate student associations, departments and institutional contacts. This included contacting graduate student associations, departments, and other institutional contacts across Canada. The survey was also shared widely on Twitter, Facebook and LinkedIn, with paid advertising used on Facebook for one week (May 20 to 24 2020). Both surveys closed on May 31st, 2020.

As TSPN is a student-run group, we do not have the option to receive an ethics approval for human research. However, all survey respondents were asked for consent before starting the survey. All responses were anonymous. The survey was completely voluntary, and respondents were self-selecting.

Prior to analysis, erroneous responses, including duplicate responses and responses from undergraduate students, were removed. Survey data was aggregated, and using R, plots were generated. In the results, rounding of numbers may have led to some deviation. For selected questions, respondents were permitted to select more than one response, so not all totals add up to 100%. In addition, given their nature, all questions in the Health and Wellness section were optional.

A full list of the survey questions are available at the TSPN website. Additional information regarding this survey can be requested via to.scipolicynetwork@gmail.com.

Glossary

CERB: Canada Emergency Response Benefit, an emergency benefit provided by the Government of Canada for workers who have lost income due to COVID-19.

CESB: Canada Emergency Student Benefit, an emergency benefit provided by the Government of Canada for students who are actively looking for work but are unemployed due to COVID-19.

Course Instructor (CI): This individual is the primary teacher of a course, and is responsible for the course structure, outline, implementation and evaluation. These positions can be held by seasonal instructors, graduate students, and professors.

Fall term: Typically takes place from September to December.

Graduate Studies: The continuation of education in a university or academic institution after the completion of a Bachelor (undergraduate) degree, typically includes master's and doctoral programs.

Humanities: These subjects cover the breadth of human learning and culture throughout time, including history, philosophy, literature, art and religion.

Institution: An organisation or establishment that is devoted to a specific cause, which is often of a public character. In the context of this survey, this includes universities, and secondary research spaces, such as research hospitals.

Life Sciences: This branch of natural science encompasses the study of living organisms, including biology, zoology, biochemistry, virology, cytology, and ecology.

Physical Sciences: This branch of natural science encompasses the study of non-living systems, including astronomy, chemistry, earth sciences, engineering, and physics.

Professional Development: Builds on skills outside of what is typically learned within the course of an academic program and includes concepts such as: project management, time management, communication, teamwork, and leadership skills.

Professional-stream: These programs are often course-based and involve internships or work-experience within the relevant field. The course may also be accredited by the professional body overseeing that occupation, for example the Association of MBAs.

Research-stream: These programs require the completion of a research project, thesis or dissertation as a degree requirement. Typically, this research is done under supervision of an academic supervisor. These programs often include some form of funding package.

Social Sciences: These subjects cover the study of humans and their relationships, including anthropology, archeology, economics and human geography.

Stipend: The funding that a graduate student receives (usually through a grant awarding body) to cover university tuition and living costs whilst completing an academic course.

Summer term: Typically takes place from May to August.

Supervisor: An academic role (usually a professor), this is the lead researcher who manages grants and a research team. Research-steam graduate students often work under a supervisor for the duration of their degree.

Teaching Assistant (TA): A person who assists the course instructor in the teaching process, and provides support to students. They are employed on temporary contracts by the university.

Thesis or Dissertation: An extensive essay in which the person proposes a theory which is researched and tested. It is performed by a person in an academic environment.

Winter term: Typically takes place from January to April.

Response Rate by Institution

Alberta

Institution	Percentage
University of Alberta	3%
University of Calgary	3%
University of Lethbridge	1%

British Columbia

Institution	Percentage
Simon Fraser University	3%
University of British Columbia	5%
University of Northern British Columbia	<1%
University of Victoria	<1%

Manitoba

Institution	Percentage
University of Manitoba	2%
University of Winnipeg	<1%

New Brunswick

Institution	Percentage
University of Moncton	<1%
University of New Brunswick	7%

Newfoundland and Labrador

Institution	Percentage
Memorial University of Newfoundland	<1%

Nova Scotia

Institution	Percentage
Dalhousie University	3%
Mt St Vincent University	<1%

Ontario

Institution	Percentage
Brock University	1%
Carleton University	1%
McMaster University	1%
Nipissing University	1%
Ontario Tech University	1%
Queen's University	1%
Ryerson University	1%
Saint Mary's University	<1%
University of Guelph	2%
University of Ottawa	1%
University of Toronto	35%
University of Waterloo	4%
University of Western Ontario	2%
University of Windsor	<1%
Wilfrid Laurier University	1%
York University	1%

Prince Edward Island

Institution	Percentage
University of Prince Edward Island	<1%

Québec

Institution	Percentage
Concordia University	<1%
École nationale d'administration publique	1%
Institut national de la recherche scientifique	<1%
McGill University	1%
Université de Montréal	1%
Université de Sherbrooke	3%
Université du Québec à Montréal	6%
Université du Québec à Rimouski	2%
Université du Québec à Trois-Rivières	1%
Université du Québec en Abitibi-Témiscamingue	1%
Université du Québec en Outaouais	<1%
Université Laval	1%

Saskatchewan

Institution	Percentage
University of Regina	4%
University of Saskatchewan	<1%

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- Critical Review and Editing: FQ, SB, FT
- R Code Development: SB, FQ
- Figure Design: SB
- Report Design: SB, FQ, FT
- Funding Acquisition: FQ, DB, MO, SB

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We wish to acknowledge the history of the lands on which we are each operating on. Canada is home to many different Indigenous peoples. We ask that each of you take a moment to research, learn about, and reflect upon the Indigenous people whose lands you are currently on. For example, many of our contributors reside in the Greater Toronto Area. We are located on the traditional territory of many nations, including the Mississaugas of the Credit, the Anishnaabeg, the Chippewa, the Haudenosaunee and the Wendat peoples. This territory is covered by the Upper Canada Treaties, and is within the lands protected by the "Dish With One Spoon" wampum agreement. It is now home to many diverse First Nations, Inuit and Métis peoples.

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