



THE UNIVERSITY OF UTAH

CENTER FOR
NATURAL & TECHNOLOGICAL
HAZARDS

Initial Impacts of COVID-19 on Undergraduate Research

As the novel coronavirus disease rapidly evolved to pandemic status (COVID-19) during March 2020, undergraduate education in the United States (US) was altered in unprecedented ways. Universities across the country have had to modify, postpone, or cancel various programs for undergraduate researchers. This flyer reports the preliminary results of a survey distributed to undergraduate students who researched or intended to research during the COVID-19 pandemic. Dr. Sara Grineski and Dr. Timothy Collins (both from University of Utah), Dr. Danielle Morales (University of Texas at El Paso), and Shawna Nadybal, and Shaylynn Trego (both from the University of Utah) were involved in the study. The study seeks to understand the specific impacts of COVID-19 on undergraduates' well-being and research experiences. We hope that the results reported here will help program directors, students, and others understand how undergraduate researchers were affected by the pandemic and assist in future planning processes.

Survey Methods

We partnered with 17 different universities to recruit undergraduate researchers for our survey (see Table 1). Students were eligible to participate if they were current undergraduate students who either were doing research in Spring 2020 and/or had planned to do research during the Summer 2020. The survey was administered online through QuestionPro and remained open from July 6 – 31. In total, 2,440 students were emailed about the survey; 983 students completed the survey in its entirety. Several hundred others provided some survey responses, which are included. About 1,000 students provided data on Spring 2020 research; 600 provided data on Summer 2020 research.

University	Completed Surveys
Baylor College of Medicine	37
University of Colorado Denver	66
East Carolina University	22
Embry-Riddle Aeronautical University	51
Louisiana State University	93
Mayo Clinic	109
Rice University	103
University of Nevada Las Vegas	48
University of New Orleans	46
University of Texas Arlington	36
University of Texas Austin	45
University of Texas at El Paso	219
University of Texas Southwestern	35
Bowie State, Clemson, UT Permian Basin, and University of Arizona	31
Other	42

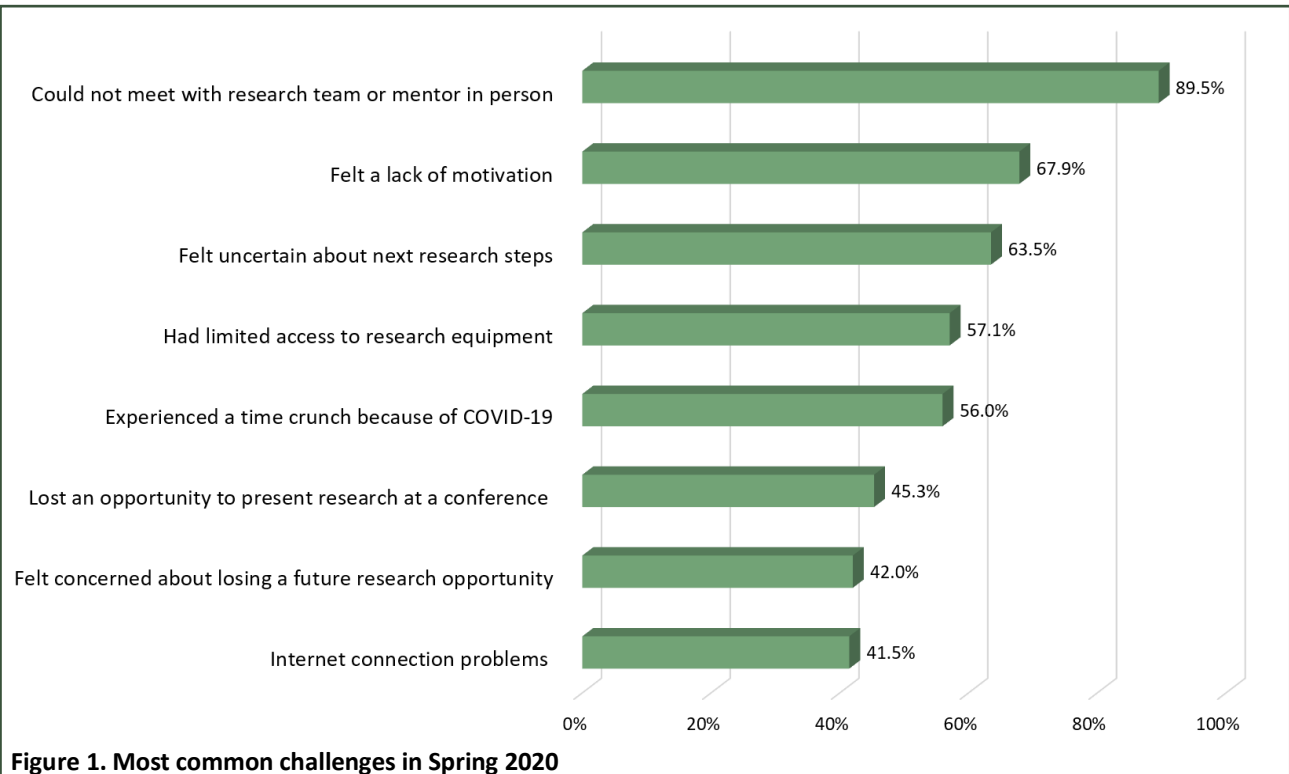
Table 1. Participating universities

Characteristics of Survey Respondents

Survey participants came from diverse backgrounds. 34.3% were non-Hispanic White, 5.4% were African American (non-Hispanic), 21.0% were Asian (non-Hispanic) 33.0% were Hispanic, and 6.3% were from Native American, Pacific Islander, Multiracial, or other race backgrounds. In terms of gender, 60.6% were women, 37.7% were men, and 1.7% were of another gender (i.e., transgender, genderqueer, or other). 80.9% were born in the US. 7.3% were international students. In terms of class standing, 44.4% were seniors, 36.0% were juniors, and the rest were first- or second-year students. Finally, 35.3% of students in our sample were first generation college students, defined as not having a parent with a college degree.

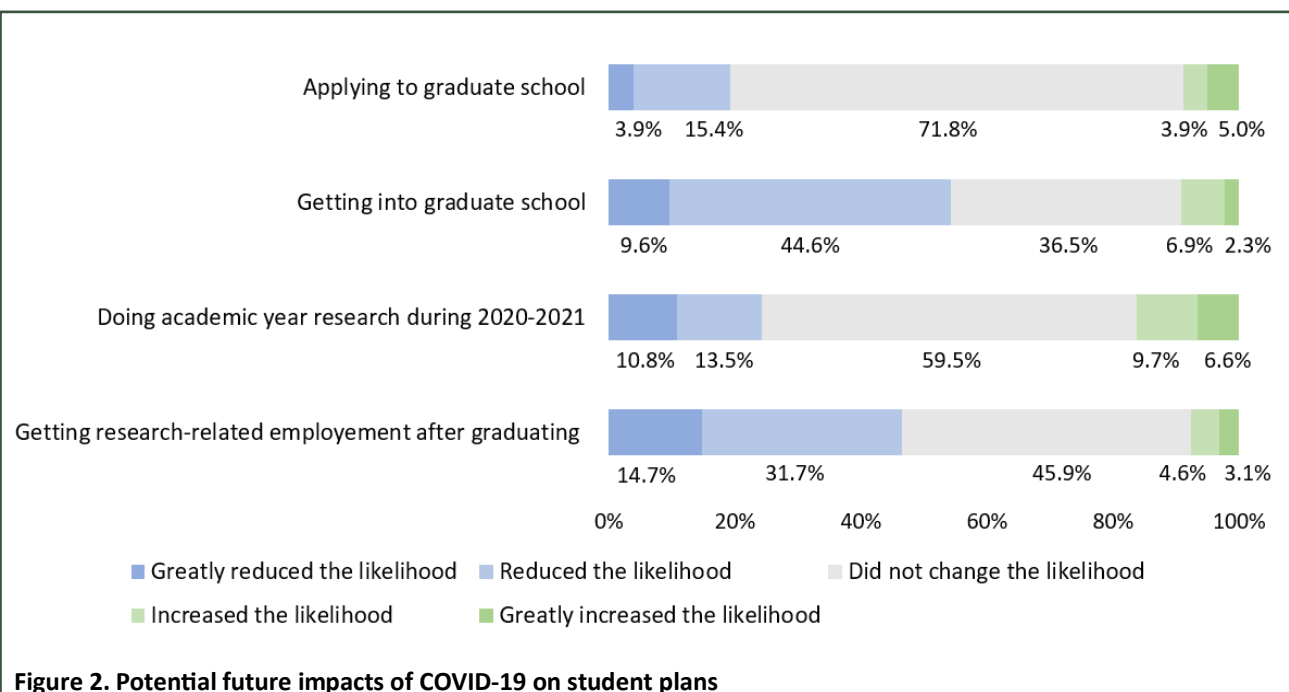
COVID-19 Impacts on Spring 2020 Research

We were interested in the impacts of COVID-19 on undergraduate researchers during their Spring 2020 semester. We found that, despite the onset of the pandemic, 94% of students did not formally resign from their research positions. For those who continued doing research in Spring, 75.2% of students reported a decrease in research workload as compared to before COVID-19. 10.2% of students reported no change in research workloads and 14.7% indicated an increase in research workload during COVID as compared to pre-COVID. Figure 1 details the most common challenges reported by students doing Spring 2020 research:



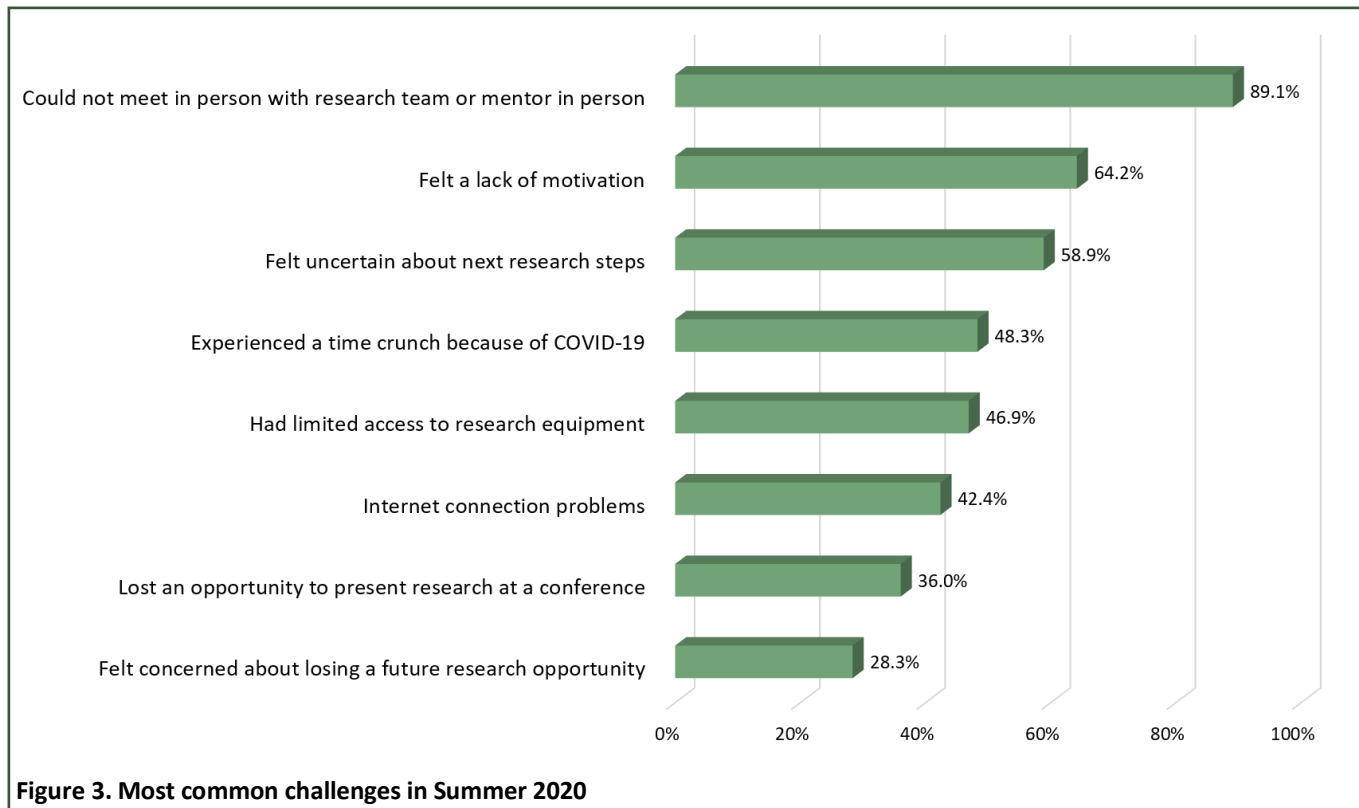
COVID-19 Impacts on Summer 2020 Research

Of students who intended to do research through a formal program during the Summer 2020 semester, 44.5% had their research opportunities cancelled. The most common impacts students experienced as a result of these cancellations were (1) lost opportunities to learn new skills (91.1%), (2) lost opportunities to network with other students and professors (90.3%), and (3) lost source of their summer employment (76.1%). For students whose program was cancelled, Figure 2 summarizes how likely students felt their cancelled opportunity would impact future academic and professional accomplishments.

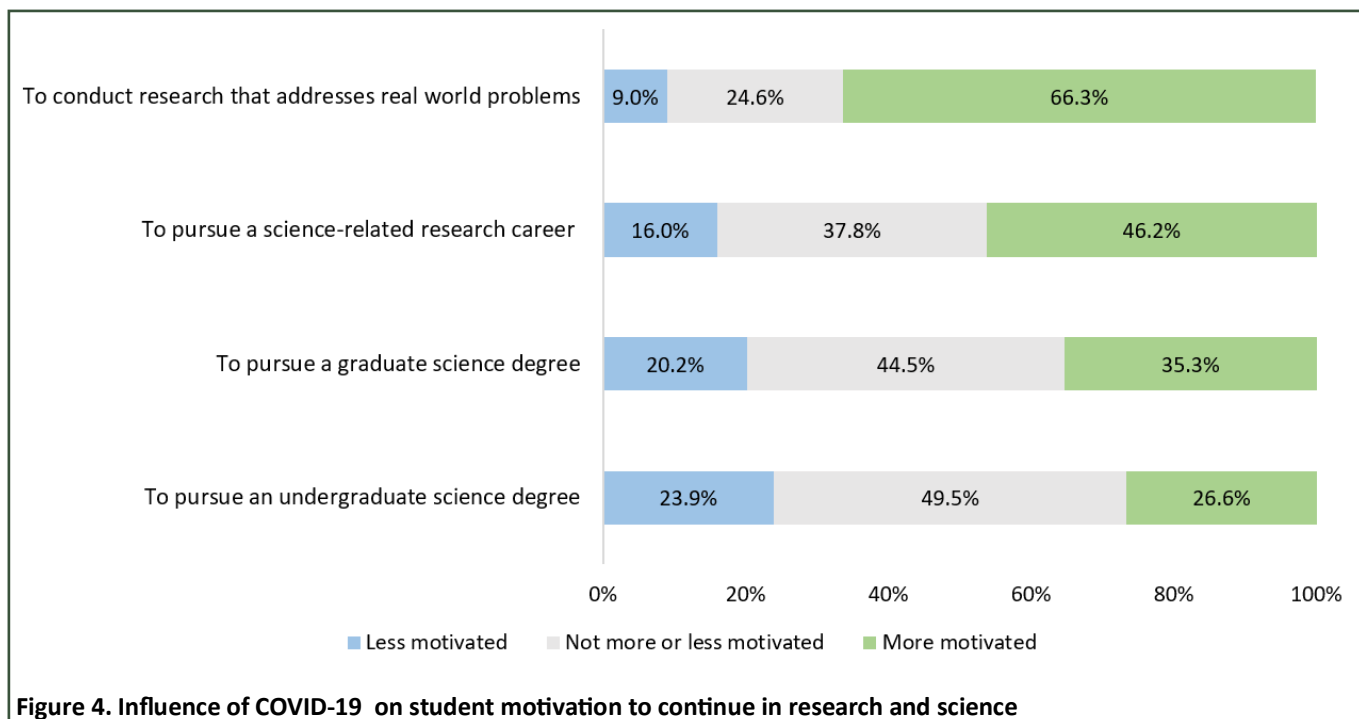




For students who did not have their Summer 2020 research opportunities cancelled, Figure 3 summarizes their most common experiences as they conducted summer research during COVID-19:



We also examined how the onset of COVID-19 impacted students' motivation for pursuing science-related degrees or employment opportunities. The pandemic had less of a positive impact on student motivation to obtain an undergraduate degree than it did on students' motivation to conduct research relevant to real world problems or to pursue a science-related career. Figure 4 summarizes these impacts.



COVID-19's Impact on Faculty-Undergraduate Mentoring Relationships

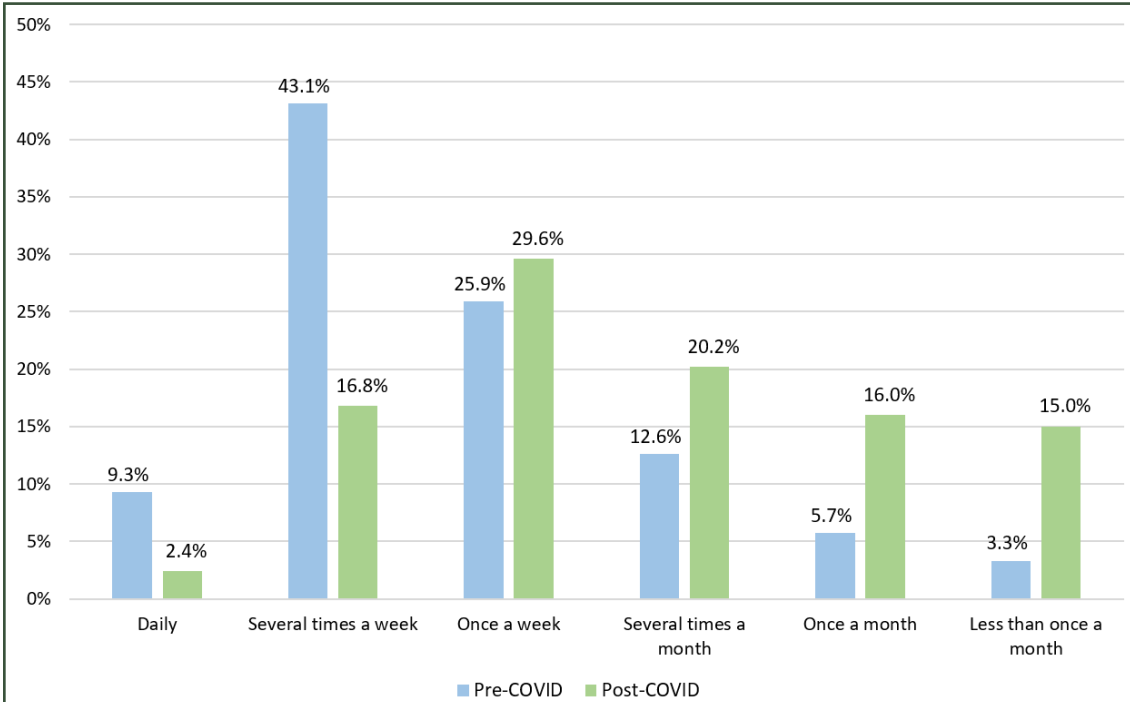


Figure 5. Changes in faculty mentor-student communication frequency before and after COVID

We were interested in how the onset of the pandemic may have impacted communication between faculty mentors and undergraduate mentees. Figure 5 summarizes how frequently students communicated with their mentors before and after the onset of COVID-19. Generally, communication frequency decreased, with students and mentors most often communicating once a week as opposed to several times a week prior to COVID-19.

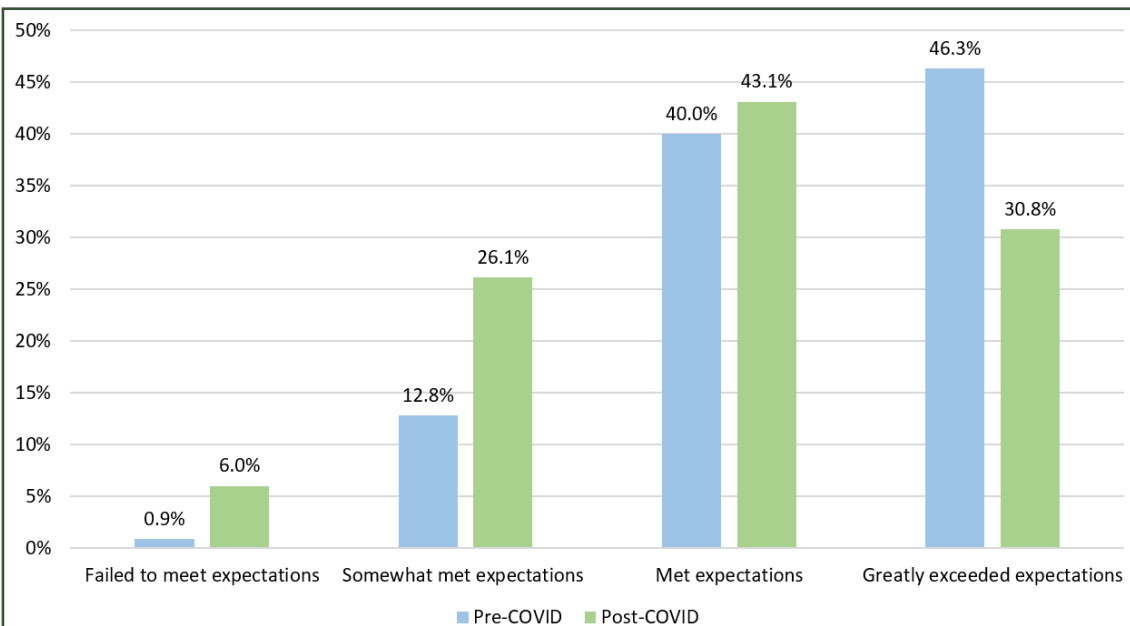


Figure 6. Changes in faculty mentor meeting students' expectations before and after COVID

We also wanted to examine whether the onset of the pandemic impacted students' satisfaction with their faculty mentors. Figure 6 shows that most faculty mentors met student expectations both before and after the onset of COVID-19, though there was a noticeable decrease in student satisfaction after the pandemic hit.

General COVID-19 Impacts

We were also interested in the general experiences that students had during COVID-19. Impacts to mental health emerged as one of the most common challenges that participants reported, with 31.4% of students showing signs of moderate to severe anxiety and 22.2% of students showing signs of moderately severe to severe depression. Table 2 lists additional impacts and adverse experiences that students encountered during the COVID-19 pandemic.

Summary of Results

Students were affected by the COVID-19 pandemic in terms of their social lives, research opportunities, employment and finances, living conditions, and physical and mental health.

These affects were caused by different facets of the pandemic, including difficulties travelling, having to move out of university housing, and job loss.

These personal experiences may have magnified the challenges that students faced while trying to conduct research during the Spring and Summer semesters. Most students who were doing research in Spring continued to do so, but not without pandemic-related interruptions. Workloads dramatically decreased as students struggled with a number of situational challenges such as an inability to personally meet with research teams and mentors, poor internet connections, time crunches, and lost opportunities to present their research.

Almost half of respondents who planned to research during the Summer semester had their programs cancelled due to COVID-19. While most students did not feel this would impact their future ability to conduct research or apply to graduate school, there was concern that cancelled programs would interfere with getting into graduate school and finding research-related employment. Students who were still able to do research during the Summer semester struggled with a lack of face-to-face meetings with their research teams, uncertainty regarding the next steps of their research projects, and finding motivation in the midst of the pandemic. However, the onset of the pandemic did increase students' motivation to research real-world problems, perhaps due to their own experiences with COVID-19.

Conclusion

Results underscore the importance of continuing undergraduate research opportunities, **Table 2. General COVID impacts** even under pandemic conditions. As we found, cancellations or changes to research programs caused many students to report concern over both their present and future circumstances. While situations that influence such program changes may be unavoidable, program directors should reflect upon how they might ease students' concerns about fundamental changes to their research experiences and potential impacts on their future academic and professional development. Additionally, improved communication between all participants would help keep mentors informed of their students' progress and the challenges they may be facing. The progression of COVID-19 has demonstrated how vulnerable academic environments are in the face of public health crises. We hope that the results reported here can help undergraduate research programs better prepare for and respond to unavoidable interruptions in the future.

Acknowledgements

We thank the Immunology, Inflammation and Infectious Disease Initiative, the Office of the Vice President for Research, and the Office of Undergraduate Research at the University of Utah for funding this project. Additionally, we are grateful for our contacts at the partnering institutions who recruited and disseminated our survey among their students. We also thank all the students who participated in our project; we hope to obtain additional funding to learn more about their long-term experiences with COVID-19. Lastly, we would like to Angela Midgley (University of Utah) for sending out incentives to survey participants.

Percent reporting each impact or experience

Students reported if the following aspects of their lives were impacted by COVID:	
Social life	85.9
Research	77.1
Mental health	72.9
Finances	57.8
Family and close friends' mental health	52.0
Coursework/GPA	46.4
Living conditions	46.2
Employment status	46.1
Students reported if they had experienced any of the following, due to COVID-19:	
Difficulties with travelling	41.0
Job loss	35.1
Family members lost jobs	31.8
Had to move out of university housing	31.4
Family members on whom student relies on for at least some financial support experienced a salary cut	24.2
Housemates acted irresponsibly with social distancing	23.9
Salary cut	14.3
Worried about food running out	13.0