

# Exploring Undergraduate Biology Students' Attitudes and Science Communication about COVID19 and COVID19 Vaccines



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## Background

As of March 18, 2021, COVID19 has caused over 2.6 million deaths (WHO, 2021). COVID19 vaccines are our greatest hope for curbing the impact of COVID19 but 30-40% of people in the United States are unsure or do not intend to get a COVID19 vaccine (Fisher et al., 2020). Biology students could help communicate accurate scientific information to the public, but we currently do not know the extent to which biology students communicate with others, how prepared they feel to communicate accurately, or whether they hold unfavorable attitudes towards COVID19 mitigation strategies like the public. Further, since there may be a need for cultural competence in COVID19 education for politically conservative and religious students, we also explored differences in attitudes, communication, and confidence for students with different religious and political affiliations.

## Research Questions

- What are biology students' attitudes and behaviors related to COVID19 mitigation efforts?
- How often do students communicate to others about COVID19 and COVID19 vaccines and how prepared do they feel to communicate these topics accurately?
- Are there differences between biology majors and non-majors, more conservative and less conservative students, and religious and non-religious students?

## Methods

We surveyed 495 students across 17 different undergraduate biology classes. Students were asked about their frequency of communication concerning COVID19 and COVID19 vaccines, as well as their confidence in discussing these topics. Students were asked to indicate their perceptions of the severity of COVID19, mitigation measures, and conspiracy theories surrounding COVID19. We also asked students to report their major, political affiliation and religion. We ran linear models with major, political affiliation, and religious affiliation as predictors of COVID19 attitudes and behaviors.

## Findings

Table 1: Demographics of the participant population including career path, political identification, and religious affiliation

Student Demographic	COVID19 Study Participants n = 495 % (n)
<b>Intended Career</b>	
Medical Professional	57.6% (285)
Non-Medical Professional	11.3% (56)
Other	30.9% (153)
Decline to state	0.2% (1)
<b>Political Identity</b>	
Conservative	19.8% (98)
Non-Conservative	53.9% (267)
Decline to state	26.3% (130)
<b>Religious Identity</b>	
Christian	59.7% (295)
Non-Christian	8.6% (43)
Non-Religious	23.9% (118)
Other	4.6% (23)
Decline to state	3.2% (16)

Most students felt a little or moderately prepared to communicate accurately about COVID vaccine safety and efficacy

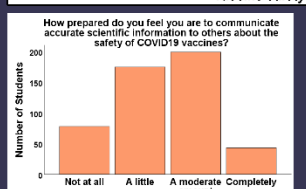


Figure 1: How prepared students feel to communicate accurate scientific information about the safety of COVID19 vaccines

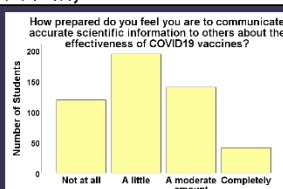


Figure 2: How prepared students feel to communicate accurate scientific information about the effectiveness of COVID19 vaccines

Students had misconceptions about COVID19

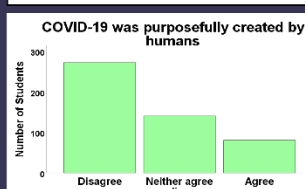


Figure 3: Students' agreement with the statement that COVID19 was purposefully created by humans

Most students are communicating about COVID19 vaccines at least sometimes

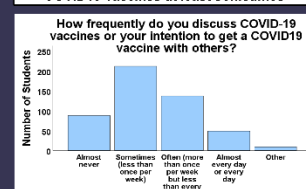


Figure 4: How frequently students discuss COVID19 vaccines and their intention of getting the vaccine

About half of students intend to get a COVID19 vaccine

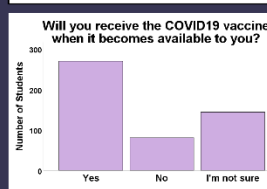


Figure 5: Intent of students to vaccinate

Religious and conservative students are more likely to have misconceptions; biology majors are less likely to agree that vaccine was rushed unsafely

Table 2: Differences between students who are biology majors versus non-majors, more conservative versus less conservative, and religious versus non-religious regarding their endorsement of each statement

	Biology Major	More Conservative	Religious
Vaccines were rushed unsafely	Less	More	More
Vaccines are effective	--	Less	Less
Flu & COVID19 equal severity	--	--	More

(-) indicates any difference is not statistically significant (p > .05)

Religious and conservative students are less likely to get info from CDC, WHO; religious students are more likely to get info from social sources; biology majors are more likely to listen to instructors

Table 3: Information source preferences of biology majors versus non-biology majors, more conservative versus less conservative students, and religious versus non-religious students

	Biology Major	More Conservative	Religious
CDC, WHO	--	Less	Less
Media News	--	--	More
Social Media	--	Less	More
Healthcare Provider	--	--	--
Instructors	More	--	--
Friends & Family	--	--	More

(-) indicates any difference is not statistically significant (p > .05)

Religious and conservative students are more likely to endorse conspiracy theories

Table 4: Likelihood of biology versus non-biology majors, more conservative versus less conservative, and religious versus non-religious students to endorse the following conspiracy theories

	Biology Major	More Conservative	Religious
Exaggerated to hurt Trump	--	More	--
Created by humans	--	More	--
Released by humans	--	More	More
Chinese bioweapon	--	More	--
Caused by 5G	--	More	More
A 5G cover-up	--	More	More*
Forced vaccination	--	More	More
Big Pharma profit	--	More	More
Mass sterilization	--	More	More

(-) indicates any difference is not statistically significant (p > .05). \*When p-value is marginal (p=05-06)

Religious students are just as likely to communicate about COVID19, just as confident in accuracy; biology majors are more likely to discuss COVID19 vaccines

Table 5: Frequency of biology versus non-biology majors, more conservative versus less conservative, and religious versus non-religious students to discuss COVID19 mitigation and COVID19 vaccines

	Biology Major	More Conservative	Religious
COVID19 mitigation	--	Less	--
COVID19 vaccines	--	Less	--

(-) indicates any difference is not statistically significant (p > .05)

Table 6: Differences in preparation levels when discussing different aspects of COVID19 vaccines and COVID19 mitigation between biology and non-biology majors, more conservative and less conservative students, and religious and non-religious students

	Biology Major	More Conservative	Religious
Vaccine safety	More	Less	--
Vaccine efficacy	More	Less	--
Mask efficacy	--	Less	--
COVID19 risks	--	Less	--

(-) indicates any difference is not statistically significant (p > .05)

Religious and conservative students are less likely to get vaccine, more concerned about vaccine factors; biology majors are more likely to vaccinate

Table 7: Students' willingness to receive the COVID19 vaccine

	Biology Major	More Conservative	Religious
Vaccine Intention	More*	Less	Less

\*When p-value is marginal (p=05-06)

Table 8: Likelihood of biology versus non-biology majors, more conservative versus less conservative, and religious versus non-religious students to be concerned with the following vaccine factors

	Biology Major	More Conservative	Religious
Vaccine Safety	--	More	More
Vaccine Efficacy	--	More*	More
Vaccine Novelty	--	More	More
Vaccine Rigor	--	More	More
Vaccine Contents	--	More	More
Vaccine Trust	--	Less	Less
Anti-vaccination	--	More	More

(-) indicates any difference is not statistically significant (p > .05). \*When p-value is marginal (p=05-06)

## Acknowledgements

This research was funded in part by the MTSU Office of Research and Sponsored Programs via Undergraduate Research Experience and Creative Activity (URECA) grants.

## Conclusion

While students often communicated about COVID19 and COVID19 vaccinations, many felt that they were not adequately prepared to disseminate accurate information about these topics.

While religious students were more likely than nonreligious students to have misconceptions about COVID19 vaccines, they were just as likely to be communicating about COVID19 vaccines and felt just as prepared to communicate accurately.

Our data suggests that students would benefit from COVID19 education and training on how to communicate responsibly about COVID19 mitigation efforts.



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