March 2022

POLICY BRIEF

SCIENCE TEACHERS AS PUBLIC HEALTH EDUCATORS

THE CRITICAL ROLE OF K–12 SCIENCE TEACHERS IN COMMUNICATING ACCURATE INFORMATION ABOUT SARS-COV-2 AND COVID-19

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INTRODUCTION

In early 2020, the World Health Organization (WHO) declared COVID-19 a global pandemic. Since then, tens of thousands of science teachers in the United States have been doing their best to answer student questions about SARS-CoV-2 and COVID-19.[1] For biology/life science teachers, the pandemic presents a real-world opportunity to engage students in the science of viruses and how to reduce their transmission. But biology teachers have not been alone in fielding student questions. High school chemistry and physics teachers, middle school general science teachers, and elementary teachers have all responded to students' needs for information and reassurance. In this way, teachers across grade levels have served an important function as public health educators.

Variants of SARS-CoV-2 are still circulating widely, posing a significant threat to human health and well-being. In the United States alone, nearly one million individuals have died from the virus (Johns Hopkins University, 2022) while numerous others battle short- and long-term health effects. And although effective vaccines are now readily available to those as young as five years old, vaccine hesitancy persists (CDC, 2022). Further, individuals are increasingly experiencing "pandemic fatigue" as mask-wearing, hand-washing, and social distancing practices have infiltrated their daily lives for more than two years (WHO, 2020). If the United States is to continue making progress toward eradicating this virus, it is more important than ever to ensure that accurate, up-to-date information is available and consistently communicated. The United States school system, which consists of over 1 million science teachers and 50 million students, is a reasonable and effective avenue for conveying scientific information about COVID. But, to what extent do science teachers address this topic in their classrooms? When they do, where do they get their information, and is it reliable? Further, what additional support do they need to serve this role even more effectively?

THE STUDY

Horizon Research, Inc. conducted a national survey of 2,330 K–12 science teachers and follow-up interviews with a sample of 40 teachers to understand their decision making and resulting instruction

[1] Throughout the remainder of this document, we use the term "COVID" to refer to both the virus and the disease. However, we use the individual terms if we are specifically referring to one or the other.

about COVID during the 2019–20 academic year. The study provides (1) important information about the ways in which science teachers serve as public health educators in response to the pandemic and (2) suggestions for how to support them in this capacity going forward.

FINDINGS

Most science teachers addressed COVID in their classrooms, irrespective of the school and community contexts in which they worked.

The survey found that despite viruses not usually being a part of their curriculum, three-fourths or more of science teachers at each grade band (elementary, middle, high) devoted class time to COVID. Although life science teachers were more likely than non-life science teachers to address COVID at both the middle and high school levels, it is noteworthy that approximately 70 percent of non-life science teachers also took up the topic. Additionally, there were no significant differences in the frequency with which science teachers took up the topic based on political leaning of the county (Democratic or Republican), community type (urban, suburban, or rural), percentage of students in the school eligible for free or reduced-price lunch, or percentage of students in the school from underrepresented minority groups. This finding is particularly striking, as it points to the wide-reaching influence of teachers and potential of K–12 science instruction for disseminating accurate scientific information equitably.

Science teachers searched for accurate and trustworthy sources of information about COVID.

Study data indicate that teachers actively sought out information about the virus and disease, a difficult task given that information was, and still is, rapidly changing. Among those who addressed COVID, large percentages relied on information from health organization websites such as the Centers for Disease Control and Prevention (CDC), Johns Hopkins University, the National Institutes of Health (NIH), and the WHO. In fact, teachers who taught about COVID were far more likely to access health information websites than teachers who did not teach about the topic. Additionally, science teachers spent time helping students evaluate sources of information for themselves, a strategy they employed in an effort to combat misinformation and foster critical thinking. This is another important finding, as evaluating information and drawing accurate conclusions are key components of scientific literacy (NGSS Lead States, 2013).

> *I did refer to the CDC, Johns Hopkins, and the National Science Teaching Association, because they have a lot of really good up-to-date information that was timely. . . . So that's pretty much the resources that I used, ones that I felt were reputable and that I trusted and have used in the past.*
>
> *(Middle School Teacher)*

Student questions served as an entry point for discussing multiple facets of COVID.

Across grade ranges, nearly 80 percent of teachers who devoted class time to COVID indicated that their students asked questions before they addressed the topic. This held true in life science and non-life science classes, suggesting that students turned to science teachers in all disciplines for information. Student questions prompted class discussions and activities focused on a variety of topics, including what the virus is, how it is transmitted, and treatment/diagnosis. However, students also turned to their science teachers for reassurance, raising complex and oftentimes sensitive questions (What if my parents

> *There were days where it was really important. Like, it was clear that they needed to talk about [COVID], and they needed to ask me questions. And so those days, if we needed to dedicate the whole class period to it, I dedicated the whole class period to it.*
>
> *(High School Teacher)*

lose their jobs because businesses are closing? Who could take care of me if I got COVID-19? When can I see my grandma again?). In fact, at the elementary level, the most important reason teachers cited for teaching about COVID was to address student fear and anxiety. These data suggest that in addition to providing accurate scientific information, teachers also provided support for student emotional and mental health, two additional components of public health.

Science teachers relied heavily on units and lessons they created to teach about COVID.

Approximately half of elementary teachers and two-thirds of middle and high school teachers relied heavily on units and lessons they created to teach about COVID. Teachers noted that there were few ready-made materials available for teaching about COVID, especially in the early days of the pandemic. Further, when materials were available, they were often written at a very basic level and/or with a younger audience in mind. Although instructional materials became more prevalent over time, teachers still invested a great deal of time into fact-checking the content and modifying the materials to fit within their teaching situations and constraints.

> *Mostly I just put in "COVID for kids" or "teaching COVID to kids" and Googled. At the time, that's all I could do.*
>
> *(Elementary School Teacher)*

SUPPORTING TEACHERS AS PUBLIC HEALTH EDUCATORS

When students turned to their science teachers with questions about COVID, teachers across grade bands responded. Teacher response was thoughtful and deliberate, drawing on reputable sources of information to make informed instructional decisions as scientific knowledge of the virus and disease evolved. Teachers also provided support for student emotional and mental health when faced with difficult student questions and concerns.

Given that science teachers have demonstrated a willingness to participate in a national response to this pandemic, what can be done to support them in this role? First, teachers need resources. Although teachers were able to cobble together information from multiple sources, it took an intensive effort and substantial amount of time to do so. Instead, teachers would benefit from a curated set of resources, ideally housed by an organization they know and trust in the field of health (e.g., CDC, NIH) or science education (e.g., National Science Teaching Association). Such resources would need to be robust enough to help teachers cover a range of student questions (scientific and social/emotional) and appropriate for the grade level(s) they teach.

Second, teachers need administrators, parents, and their communities to help them make science instruction a priority. Unfortunately, the COVID-19 pandemic is ongoing and future pandemics are inevitable, suggesting that ongoing science education is both necessary and warranted going forward. If science teachers are to continue building student knowledge about viruses and the resulting diseases, they need time and flexibility to do so. For example, elementary teachers would benefit from dedicated time to teach science that is not in direct competition with literacy and mathematics. Middle and high school science teachers would benefit from common planning time or extended preparation time that would allow them to thoughtfully consider how to integrate emerging scientific topics into the broader curriculum.

Finally, although teachers have done their best to address student concerns and fears related to the pandemic, most are not trained to do so. Recognizing that students will go to their science teachers with such questions, schools might consider establishing or strengthening relationships between science

teachers and school counselors or psychologists to provide students with the support they need. Additionally, health organizations such as the CDC or NIH might also provide science-teacher-specific suggestions (to complement their existing suggestions for parents and caregivers) for supporting student mental health.

ACKNOWLEDGEMENT

This policy brief is based upon work supported by the National Science Foundation (Grant No. DRL–2027397). Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

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MORE INFORMATION

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