RESEARCH TO PRACTICE BRIEF

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THE MULTIPLIER EFFECT

THE CRITICAL ROLE OF SCIENCE TEACHERS IN COMMUNICATING ACCURATE INFORMATION ABOUT ZIKA

During the recent Ebola outbreak of 2014–15, science teachers were fighting a different kind of epidemic—an epidemic of misinformation. Despite the low risk of spread here in the U.S., some school districts closed schools when they learned that staff, parents, or students had been on the same flight as one of the infected Dallas nurses. A poll by the Pew Research Center at the time indicated that 41 percent of Americans were "very worried" or "somewhat worried" that they or someone they knew would be exposed to the Ebola virus (Pew Research Center, 2014). During this same period, science teachers were fielding questions from their students and trying to answer them.

LESSONS FROM EBOLA

Zika already poses a much greater threat to the U.S. than Ebola ever did, and the possibility of effects on the unborn is sure to generate questions and concerns among students just as Ebola did. It is more important than ever to ensure that accurate information about Zika is available and communicated nationally. The United States school system, with over 100,000 schools, 3 million teachers (over 1 million of whom teach science), and 50 million students, is a potentially effective means for conveying *accurate information about emerging health-related issues such as Zika*—how the disease spreads and, just as importantly, how to prevent it from spreading. Science teachers multiply the effect of dissemination efforts, passing on the information they acquire to the 20–150 students they teach each day. But, do teachers address health-related issues in their classrooms? When they do, where do they get their information, and is it reliable?

Recently, a partnership of organizations, led by Horizon Research, Inc., CSSS, NSELA, and NSTA (with support from the National Science Foundation) surveyed the nation's science teachers to understand how they address health-related issues, specifically in the context of Ebola. What the researchers learned sheds light on how science teachers will likely respond to Zika and how to support teachers when they talk about the virus with their students.

Each teacher has the potential to reach 20–150 students. During the recent Ebola outbreak, high school life science teachers alone reached over 5 million U.S. students with information about the virus.

FINDINGS

Most science teachers did address Ebola in their classrooms.

The survey found that despite Ebola not being a part of their curriculum, most K–12 science teachers addressed it in their classrooms. Specifically, more than three-quarters of middle and high school science teachers and just under half of elementary science teachers devoted some class time to the topic, typically one or two class periods. Middle school and high school life science teachers might be expected to address a topic like Ebola (and the vast majority did, reaching several million students), but the study found that almost half of those who do *not* teach life science (e.g., chemistry and physics teachers) also addressed Ebola with their students. Why? Among all types of teachers, the most frequently cited reason was that students were interested in the topic and asked questions. In fact, almost 80 percent of science teachers surveyed reported that students asked about the virus before teachers addressed the topic.

Science teachers searched for appropriate information about Ebola to use with their students.

Study data indicate that teachers actively sought information about the virus and disease, likely to shore up their own knowledge. Among those who addressed Ebola, two-thirds reported relying on websites from health organizations (e.g., CDC, NIH, WHO). No other resource was relied on nearly as much, including television news programs, newspapers (print or online), websites from science teacher organizations, or magazines.

Interviews conducted with teachers following the survey indicated that teachers would benefit from access to resources that are age appropriate for their students, which was not surprising as a lack of resources was cited by many teachers as a deterrent to teaching about Ebola.

Science teachers were more likely to teach about Ebola if they were confident in their knowledge of the topic.

The survey asked science teachers to respond to a series of true/false statements about the Ebola virus and Ebola virus disease. In addition to answering each statement, respondents rated their confidence in their answers. These responses were combined into a single confidence score for each individual. Among high school science teachers, one of the largest differences between those who did and did not teach about Ebola was confidence in their knowledge of Ebola. Similarly, about a third of high school teachers who did *not* teach about Ebola reported that their knowledge of Ebola *discouraged* them from addressing Ebola in their classroom, compared to only 6 percent who did teach about it.

RECOMMENDATIONS FOR SCIENCE TEACHERS WHO WANT TO ADDRESS ZIKA WITH THEIR STUDENTS

As Zika spreads into the U.S., the topic is likely to capture students' interest and generate questions. And if Ebola is a guide, science teachers will respond, whether Zika is part of their curriculum or not. Excellent Zika resources for the general public already exist (e.g., http://www.cdc.gov/zika/ and http://www.portal.pmnch.org/csr/disease/zika/en/), and teachers can draw on them for their instruction. Findings from the Ebola study suggest the following recommendations for designing instruction related to Zika:

Instruction should acknowledge students' interest and concern and use them as an entry point for discussing Zika.

Typically, science teachers must generate interest with a question or problem that engages students. With topics like Ebola and Zika, students come to class with interest and questions, and some of the questions are predictable: What exactly is Zika? What are the symptoms? How likely am I to get it, and if I do, what will happen to me? How does Zika spread, and how to do you prevent it from spreading? Teachers should anticipate these questions and be prepared to use them as entry points for instruction about Zika.

Instruction should deepen students' understanding of core science concepts and practices.

Given time constraints for addressing required content, Zika instruction should integrate students' learning about core science concepts while engaging them with the science practices. What the Zika virus is, how it spreads, and how it can be avoided offer opportunities for authentic exploration of key science ideas, with students asking questions, constructing arguments from evidence, and developing explanations. For example, students could explore the criteria for what is considered alive (i.e., whether viruses are alive, and how are they classified in biology) (MS-LS1.A), how the Zika virus impacts human growth and development (HS-LS1.B), and the potential impact of mosquito control on ecosystem dynamics (MS-LS2.C). Students can also engage with the science and engineering practices in the context of learning about Zika. For example, students can construct an explanation that predicts patterns of interactions of mosquito populations with other organisms when mosquito control mechanisms are introduced (MS-LS2-2). Small groups of students could also design solutions focusing on various aspects of the problem such as reducing human exposure to the mosquitos that transmit the Zika virus (e.g., protective clothing) or reducing mosquito breeding (e.g., eliminating sources of standing water) (HS-ETS1-2).

Instruction should reflect the most up-to-date science about Zika.

Teachers should take advantage of organizations that are likely to have the most up-to-date information about Zika, including CDC (http://www.cdc.gov/zika/) and WHO (http://www.portal.pmnch.org/csr/disease/zika/en/). The CDC's Zika page includes an option to subscribe to a mailing list with updates about Zika. WHO has developed a smartphone app that updates with the latest Zika news (http://www.who.int/risk-communication/zika-virus/app/en/).

Instruction should be tailored for particular age groups.

Some teachers reported avoiding Ebola because of concerns about age appropriateness, and depending on the detail involved, those concerns may be justified. Discussing Ebola symptoms with young children, for example, would likely do more harm than good. The potential for harm to unborn babies associated with Zika should be off limits for some age groups and treated respectfully and compassionately with all others.

CONCLUSION

The threat posed by Zika to the U.S. is very real, and the potential consequences are tragic. At the same time, this public health issue creates a situation not common in science classrooms—students driving instruction with their questions. Results from the Ebola study suggest that when students ask about Zika, science teachers will respond. Teachers should be prepared to leverage this moment by staying up to date on Zika, and when opportunity arises, they can use it deepen students' understanding of important science concepts and practices.

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MORE INFORMATION

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