Stopping an Epidemic of Misinformation: How K–12 Science Teachers Responded to Ebola

Technical Report

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November 2016

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ACKNOWLEDGEMENTS

This report is based on work supported by the National Science Foundation under Grant No. DRL–1520689. 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.

The study would not have been possible without help from the National Science Teachers Association (NSTA), the National Science Education Leadership Association (NSELA), and the Council of State Science Supervisors (CSSS). NSTA used their extensive network to recruit teachers for the study. NSELA and CSSS also publicized the study to their members. All three organizations provided valuable feedback on study instruments.

INTRODUCTION

In the fall of 2014, concern over Ebola was at its highest. Although spread of the virus in the U.S. was unlikely, news headlines at the time suggested there was an epidemic of misinformation. A school district in Maine put a teacher on administrative leave for three weeks because parents learned that the teacher had recently traveled to Dallas, where two nurses had been infected with the virus (Blad, 2014). Districts in Ohio and Texas 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 suggested that concern over Ebola was growing in the U.S. (Pew Research Center, 2014). Forty-one percent of the 2,000 respondents indicated being "very worried" or "somewhat worried" that they or someone they knew would be exposed to the Ebola virus. In a Gallup poll at the beginning of November 2014, 17 percent of respondents rated Ebola as the nation's most urgent health-related problem, a much higher percentage than obesity, cancer, and heart disease (Saad, 2014). Clearly, a substantial proportion of the population held beliefs about Ebola that were not based on scientific evidence. The U.S. school system, with over 100,000 schools, 3 million teachers (over 1 million of whom teach science), and 50 million students, was uniquely positioned to convey accurate information about Ebola—including how the disease spreads and, just as importantly, how to prevent it from spreading.

In the spring of 2015, Horizon Research, Inc. (HRI) received support from the National Science Foundation to study a critically important phenomenon: how teachers, and in particular science teachers, respond when urgent science-related issues such as Ebola emerge and what guides their responses to these issues. The study addressed the following research questions:

1. How do K–12 science teachers adapt their teaching when science-related issues like Ebola emerge, whether the issue is part of their curriculum or not?
2. What factors shape teachers' response when Ebola-like issues emerge?
3. Where do K–12 science teachers get their information about Ebola and other emerging and urgent science-related issues, and what types of resources do they find most useful?
4. What do K–12 science teachers know about Ebola?

In partnership with the National Science Teachers Association (NSTA), the National Science Education Leadership Association (NSELA), and the Council of State Science Supervisors (CSSS), HRI developed and administered a survey to K–12 science teachers. HRI also conducted interviews with a portion of the teachers who responded to the survey. The purpose of the interviews was to delve more deeply into issues asked about on the surveys and to illustrate how individual teachers responded to Ebola.

The study was motivated by HRI's interest in helping teachers respond to the next Ebola-like situation. HRI anticipated that data collected in this study would inform the nation's response to subsequent Ebola-like issues. Findings about where teachers get their information, what formats are most useful, and how they use the information have the potential to help education and health organizations target their dissemination efforts so that schools can serve as an outlet for accurate resources about Ebola and issues like Ebola.

Following an overview of the study methodology, this report details the study findings, organized by research question. Interspersed with the quantitative results are vignettes of Ebola instruction based on follow-up interviews with questionnaire respondents.

METHODOLOGY

The methodology for this study involved the development of a teacher questionnaire, recruitment of participants, data collection, sample reduction, and data analysis. This section provides a description of each of these components of the methodology, as well as important information on interpreting the findings of the study while reading the report.

Instrument Development

The teacher questionnaire developed by HRI for the study is included in the Appendix. Some survey items asked teachers where they acquired information about Ebola and what factors affected their teaching of the topic. CSSS, NSELA, and NSTA reviewed these items to ensure that they accounted for likely information sources, instructional activities, and influential factors. Other survey items, reviewed by scientists with Ebola-specific expertise, were intended to measure teachers' understanding of the Ebola virus specifically—for example, how the virus is transmitted and how to prevent transmission. HRI conducted cognitive interviews (Desimone & Le Floch, 2004) with teachers on all survey items to ensure that the items were interpreted as intended. The revised items were then programmed in an online survey platform for administration.

Participant Recruitment

In collaboration with the study partners (CSSS, NSELA, and NSTA), HRI wrote a brief overview of the study and an invitation to participate. NSTA distributed the study announcement (including a link to the registration page) to its extensive mailing list using multiple email blasts. In addition, NSTA included the announcement in various newsletters. CSSS and NSELA also sent the announcement to their members. As a result of these efforts, approximately 3,500 K–12 teachers of science registered for the study.

Data Collection and Sample Reduction

After removing ineligible registrants (e.g., teachers in other countries), HRI administered the web-based questionnaire to 3,442 K–12 teachers in May 2015. To encourage response, completers were entered into drawings for 10 $100 cash prizes. Survey data collection closed at the end of June 2015 with a response rate of 70 percent.

The study timeline and budget precluded drawing a nationally representative sample for the teacher survey. Instead, HRI attempted to register and survey enough teachers that a representative group could be constructed from respondents for analysis purposes. HRI used

demographic data from the 2012 National Survey of Science and Mathematics Education (Banilower et al., 2013) to specify the target sample characteristics. For example, survey respondents were removed from the sample until it closely resembled population parameters for race/ethnicity. Ultimately, roughly half of the survey respondents were excluded from the analysis in order to achieve this goal. HRI also segmented the respondents sample into elementary, middle, and high school teachers. This approach allowed researchers to make claims about these categories of teachers separately. The final analysis sample sizes are:

- Elementary school teachers, N = 244
- Middle school teachers, N = 445
- High school teachers, N = 566

Reading this Report

The results of the study, like those from any survey based on a sample of a population (rather than on the entire population), are subject to sampling variability. The sampling error (or standard error) provides a measure of the range within which a sample estimate can be expected to fall a certain proportion of the time. For example, survey findings may indicate that 36 percent of high school teacher respondents gave a lecture when they addressed Ebola with their students. If the sampling error for this estimate was 3 percent, then, according to the Central Limit Theorem, 95 percent of all possible samples of that same size selected in the same way would yield estimates between 30 percent and 42 percent (that is, 36 percent ± 2 standard error units). The standard errors for the estimates presented in this report are included in parentheses in the tables (see Figure 1).

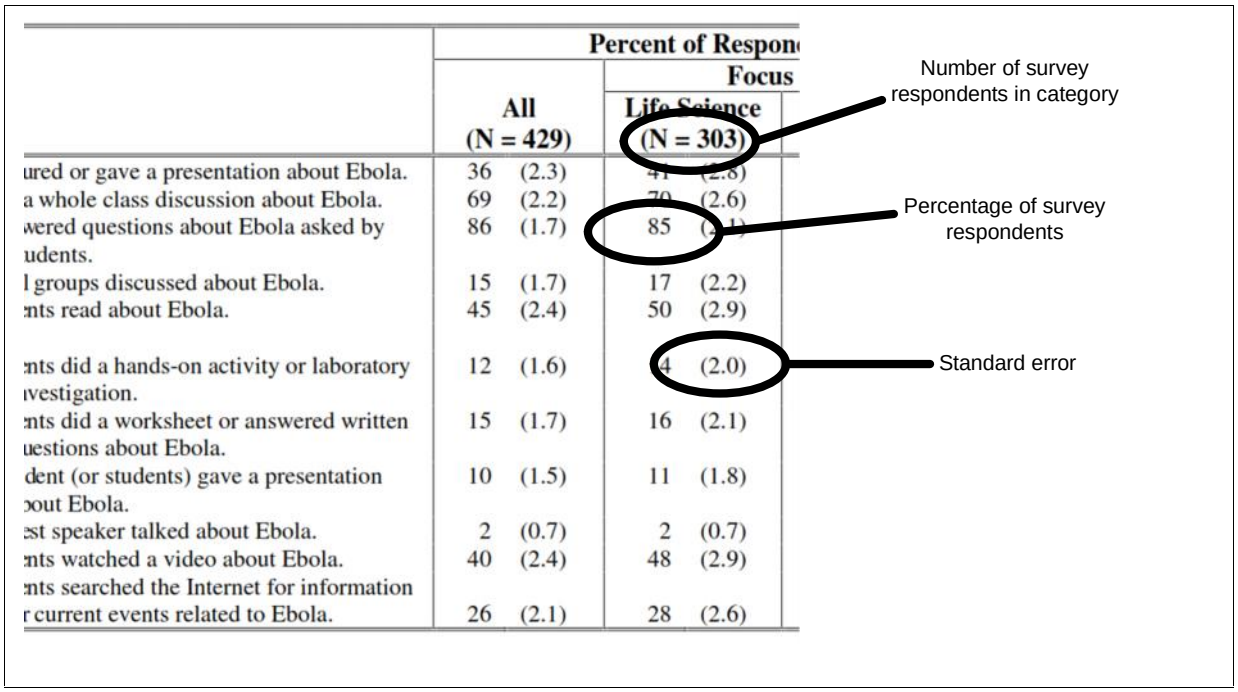

Figure 1

In many tables, results for middle and high school teachers are reported separately for life science and non-life science teachers. This distinction was not appropriate for elementary teachers, who typically teach Earth, life, and physical science. A summary of each table highlighting or interpreting the results precedes the table. The summary points out only those differences that are substantial as well as statistically significant at the 0.05 level. [1]

A description of the survey sample for each grade range is in Appendix A.

[1] Given the preliminary and exploratory nature of this report, all tests of significance were conducted without controlling the Type 1 error rate.

FINDINGS

The results that follow include all grade ranges and are organized in four categories:

- Teaching about Ebola;
- Factors in Teachers' Decision Making;
- Teachers' Sources of Information; and
- Teachers' Knowledge about Ebola.

Teaching about Ebola

The survey asked teachers about whether they had spent class time on Ebola and what influenced their decisions to address Ebola or not. Those teachers reporting they addressed Ebola were also asked how much class time was devoted to the topic and what instructional activities were used. The findings related to teaching about Ebola are presented below.

A large proportion of teachers, regardless of grade range, devoted some class time to Ebola. Life science teachers were the most likely to focus on the topic.

Table 1 show the percent of respondents who devoted class time to Ebola. Overall, the percentage of teachers who did increased from elementary school (46 percent) to higher grade ranges (81 percent for middle and 76 percent in high school). In middle and high school, over 90 percent of those who taught only life science devoted some class time to Ebola. Also, middle school, non-life science teachers were more likely than high school non-life science teachers to devote class time to Ebola (68 percent and 44 percent, respectively).

Table 1
Respondents Who Devoted Class Time to Ebola

	N	Percent of Respondents
Elementary School Science Teachers	244	46 (3.2)
Middle School Science Teachers		
All middle school science teachers	443	81 (1.9)
Teachers of any life science	364	83 (2.0)
Teachers of only life science	57	91 (3.8)
Non-life science teachers	79	68 (5.3)
Teachers of only physical science	24	79 (8.5)
High School Science Teachers		
All high school science teachers	566	76 (1.8)
Teachers of any life science	405	88 (1.6)
Teachers of only life science	208	94 (1.7)
Non-life science teachers	161	44 (3.9)
Teachers of only physical science	126	42 (4.4)

Of those who spent class time on Ebola, most elementary teachers spent one class session, while most middle and high school teachers devoted more than one class session.

The majority of elementary teachers who taught about Ebola devoted one class session, while most middle and high school teachers devoted more than one class session (see Table 2). High school life science classes were more likely than non-life science classes to spend more than one class period on Ebola. The average lesson on Ebola lasted 25–30 minutes (see Table 3).

Table 2
Number of Class Sessions Devoted to Ebola*

	Percent of Respondents		
		Topic of Class	
	All	Life Science	Non-Life Science
Elementary School	**(N = 113)**	—	—
1 Class Session	58 (4.7)		
2 Class Sessions	22 (3.9)		
3 Class Sessions	11 (2.9)		
>3 Class Sessions	9 (2.7)		
Middle School	**(N = 359)**	**(N = 142)**	**(N = 217)**
1 Class Session	34 (2.5)	30 (3.8)	36 (3.3)
2 Class Sessions	31 (2.4)	32 (3.9)	29 (3.1)
3 Class Sessions	16 (1.9)	14 (2.9)	17 (2.6)
>3 Class Sessions	20 (2.1)	24 (3.6)	17 (2.6)
High School	**(N = 429)**	**(N = 303)**	**(N = 126)**
1 Class Session	31 (2.2)	26 (2.5)	45 (4.5)
2 Class Sessions	29 (2.2)	28 (2.6)	30 (4.1)
3 Class Sessions	17 (1.8)	18 (2.2)	13 (3.1)
>3 Class Sessions	23 (2.0)	28 (2.6)	11 (2.8)

* Only those who indicated devoting class time to Ebola are included in this table.

Table 3
Mean Minutes per Lesson Devoted to Ebola*

	Mean Minutes per Lesson		
		Topic of Class	
	All	Life Science	Non-Life Science
Elementary School	**(N = 113)** 24.07 14.63†	—	—
Middle School	**(N = 359)** 27.82 16.30†	**(N = 142)** 29.70 16.33†	**(N = 217)** 26.59 16.20†
High School	**(N = 429)** 30.47 21.44†	**(N = 303)** 32.35 22.29†	**(N = 126)** 25.95 18.55†

* Only those who indicated devoting class time to Ebola are included in this table.
† Standard deviation.

Although most teachers spent about one class period on Ebola, some spent substantially more. The following vignette, based on an interview with a high school biology teacher, illustrates extensive class time on Ebola.

Vignette 1: Extensive Class Time on Ebola in a Life Science Class

Ms. Donnelly[2] teaches several 9th–12th grade Biology classes at a semi-rural, public school in North Carolina. She has a degree in Biology and has been teaching for 27 years.

Ms. Donnelly's Ebola-related instructional decisions occurred during the early days of the outbreak, in the spring of 2014, when she and a fellow biology teacher were planning for the upcoming year. They were discussing a text for the honors-level class to read for a semester-long book project: "I just said, 'You know, maybe we should do [*The Hot Zone*] now because I just heard on the news that there was a case of [Ebola],' or something. We talked about it, and we just made that decision right then…We put together this book project before we went home for the summer."

Donnelly and her colleague found a wealth of resources to go along with the text: "There were 300 and some questions that go with this book. We went through really quickly and picked the ones that we thought were appropriate for our students." The students generally did reading assignments and answered questions at home and then had in-class discussions during subsequent class periods. In addition to the book project, Ms. Donnelly played National Public Radio stories for her classes, mainly about the human impact of the outbreak. Students also explored a Howard Hughes Medical Institute virtual virology lab, watched the movie *Outbreak*, and completed a viral timeline that was used to document the history of Ebola and compare Ebola to other viruses. The near-constant media reports also became rich sources of classroom discussion material. Her students discussed how the 2014 outbreak compared to the outbreak discussed in *The Hot Zone*, the viral lifecycle of Ebola, and various media stories throughout the semester-long unit.

Life science teachers were much more likely than non-life science teachers to address Ebola as a part of their curriculum.

When they addressed Ebola, life science teachers were almost twice as likely as non-life science teachers to address Ebola as a part of their curriculum (see Table 4). Interestingly, almost half of life science teachers reported addressing Ebola as a standalone topic, suggesting that for at least some, part of their treatment fell within their curriculum while other parts did not. Not surprisingly, non-life science teachers were more likely than their life science counterparts to treat Ebola as a standalone topic, unrelated to the rest of their science curriculum.

[2] All teacher names are pseudonyms.

Table 4
How Respondents Addressed Ebola in Relation to their Curriculum*†

	Percent of Respondents		
		Focus of Class	
	All	Life Science	Non-Life Science
Addressed as part of curriculum			
Elementary	47 (4.7)	—	—
Middle	63 (2.5)	87 (2.9)	48 (3.4)
High	78 (2.0)	90 (1.7)	48 (4.5)
Addressed as a standalone topic			
Elementary	62 (4.6)	—	—
Middle	63 (2.5)	46 (4.2)	74 (3.0)
High	53 (2.4)	48 (2.9)	67 (4.2)

* Only those who indicated devoting class time to Ebola are included in this table.
† N for all categories: All Elementary, 113
All Middle School, 359; Life science, 142; Non-life science, 217
All High School, 429; Life science, 303; Non-life science, 126

Ebola appears to have been taught through whole class discussions and driven by student questions.

The survey presented teachers with a list of instructional activities that could have been used to address Ebola (see Table 5). Regardless of grade range or focus of the class (life science or not), the most prevalent instructional activities used by all teachers were question-and-answer, with students asking questions (around 85 percent of teachers), and whole class discussion (just under 70 percent). Teachers of life science classes were much more likely than those of non-life science classes to have students watch videos about Ebola.

Table 5
Instructional Activities Used to Address Ebola*†

	Percent of Respondents					
			Focus of Class			
	All		Life Science		Non-Life Science	
I answered questions about Ebola asked by students.						
Elementary	86	(3.3)	—		—	
Middle	82	(2.0)	80	(3.4)	84	(2.5)
High	86	(1.7)	85	(2.1)	88	(2.9)
I led a whole class discussion about Ebola.						
Elementary	69	(4.4)	—		—	
Middle	65	(2.5)	63	(4.1)	67	(3.2)
High	69	(2.2)	70	(2.6)	67	(4.2)
Students read about Ebola.						
Elementary	29	(4.3)	—		—	
Middle	42	(2.6)	46	(4.2)	40	(3.3)
High	45	(2.4)	50	(2.9)	33	(4.2)
Students watched a video about Ebola.						
Elementary	17	(3.5)	—		—	
Middle	33	(2.5)	42	(4.2)	26	(3.0)
High	40	(2.4)	48	(2.9)	22	(3.7)
I lectured or gave a presentation about Ebola.						
Elementary	12	(3.0)	—		—	
Middle	25	(2.3)	27	(3.8)	24	(2.9)
High	36	(2.3)	41	(2.8)	24	(3.8)
Students searched the Internet for information or current events related to Ebola.						
Elementary	18	(3.6)	—		—	
Middle	26	(2.3)	31	(3.9)	23	(2.9)
High	26	(2.1)	28	(2.6)	21	(3.6)
Small groups discussed about Ebola.						
Elementary	5	(2.1)	—		—	
Middle	14	(1.8)	16	(3.1)	12	(2.2)
High	15	(1.7)	17	(2.2)	8	(2.4)
Students did a worksheet or answered written questions about Ebola.						
Elementary	5	(2.1)	—		—	
Middle	14	(1.8)	16	(3.1)	12	(2.2)
High	15	(1.7)	16	(2.1)	13	(3.0)
Students did a hands-on activity or laboratory investigation.						
Elementary	4	(1.9)	—		—	
Middle	11	(1.6)	18	(3.2)	6	(1.6)
High	12	(1.6)	14	(2.0)	6	(2.2)
A student (or students) gave a presentation about Ebola.						
Elementary	8	(2.6)	—		—	
Middle	7	(1.4)	11	(2.6)	5	(1.5)
High	10	(1.5)	11	(1.8)	8	(2.4)
A guest speaker talked about Ebola.						
Elementary	2	(1.2)	—		—	
Middle	2	(0.8)	4	(1.6)	1	(0.8)
High	2	(0.7)	2	(0.7)	4	(1.7)

* Only those who indicated devoting class time to Ebola are included in this table.

† N for all categories: All Elementary, 113
All Middle School, 359; Life science, 142; Non-life science, 217
All High School, 429; Life science, 303; Non-life science, 126

The following vignette illustrates how students' questions shaped one teacher's instruction about Ebola.

Vignette 2: How Students' Questions Shaped One Teacher's Instruction

Mr. Calabria teaches both 8th grade science and 12th grade Environmental Systems in adjacent middle and high schools in rural Texas, near Dallas. Though not a science major in college, Mr. Calabria has a longstanding interest, and has taken several science courses at the University of Texas. He follows science advances in the news, and student questions about Ebola heightened his interest: "I keep up with all science news. It would have been based on *Washington Post* and *New York Times* reports. Then, after the kids were bringing it up, I started really looking at the CDC [to] make sure I had as accurate information as I could get them."

Being near Dallas, where a nurse was diagnosed with Ebola virus disease, the level of talk about Ebola ran high in Mr. Calabria's community. Intense student interest, frequent questions, and widely expressed misconceptions were important factors in shaping his Ebola instruction for his classes. "They didn't understand how it was transmitted. They thought if you were so much on the same block as somebody who had Ebola, you were going to get Ebola."

Several factors worked together to lead Mr. Calabria to treat Ebola differently in his two courses. For the 12th grade Environmental Systems course, students' questions about Ebola tied to learning standards by bringing up population limits and growth, impacts of environmental factors on organism interactions, and dependence of transmission rates on changes from rural to urban culture. The lack of standardized testing for his 12th grade course allowed more time for addressing student questions about Ebola. In addition, Mr. Calabria found that the depth of student interest encouraged a welcome break from a "weak textbook" to explore a topic with real-world relevance. Ebola did not fit as well with his 8th grade science standards; however, the intensity of Ebola interest drove him to take time to respond to students' questions despite his reluctance to diverge from preparing students for standardized testing.

The most commonly addressed topics by all teachers were defining Ebola and how the virus is transmitted, including how to prevent transmission.

The survey also provided a list of topics teachers could have addressed during Ebola instruction (see Table 6). Regardless of grade range, the topics most commonly addressed by teachers were defining Ebola (more than 90 percent of teachers) and how the virus is transmitted (ranging from 68 percent of elementary teachers to 93 percent of high school teachers), including how to prevent transmission (ranging from 58 percent of elementary teachers to 79 percent of high school teachers). In general, it appears that life science classes addressed more topics than non-life science classes. Specifically, life science classes were more likely to address the following topics: symptoms of Ebola in humans, how Ebola is diagnosed, how Ebola is treated, and history of Ebola. These findings are consistent with life science teachers spending more time than non-life science teachers on Ebola (see Tables 2 and 3).

Table 6
Topics Addressed During Ebola Instruction*†

	Percent of Respondents					
			Focus of Class			
	All		Life Science		Non-Life Science	
What Ebola is (e.g., Ebola is a virus)						
Elementary	95	(2.1)	—		—	
Middle	94	(1.2)	97	(1.4)	92	(1.8)
High	94	(1.2)	96	(1.1)	89	(2.8)
How Ebola is transmitted among humans						
Elementary	68	(4.4)	—		—	
Middle	89	(1.7)	92	(2.3)	87	(2.3)
High	93	(1.3)	94	(1.4)	90	(2.7)
Ways to prevent Ebola transmission						
Elementary	58	(4.7)	—		—	
Middle	76	(2.3)	82	(3.2)	71	(3.1)
High	79	(2.0)	84	(2.1)	68	(4.2)
Symptoms of Ebola in humans						
Elementary	42	(4.7)	—		—	
Middle	66	(2.5)	75	(3.6)	60	(3.3)
High	77	(2.0)	83	(2.2)	63	(4.3)
Likelihood of a widespread Ebola outbreak in the United States						
Elementary	54	(4.7)	—		—	
Middle	65	(2.5)	67	(4.0)	65	(3.3)
High	77	(2.0)	79	(2.3)	73	(4.0)
Where Ebola originated (i.e., what part of the world)						
Elementary	43	(4.7)	—		—	
Middle	65	(2.5)	70	(3.9)	62	(3.3)
High	74	(2.1)	79	(2.4)	64	(4.3)
How Ebola is transmitted to humans from other animals						
Elementary	40	(4.6)	—		—	
Middle	62	(2.6)	73	(3.8)	54	(3.4)
High	72	(2.2)	73	(2.6)	70	(4.1)
Survival rates of Ebola victims						
Elementary	26	(4.1)	—		—	
Middle	51	(2.6)	56	(4.2)	47	(3.4)
High	70	(2.2)	78	(2.4)	53	(4.5)
Factors that place people at risk for contracting Ebola						
Elementary	29	(4.3)	—		—	
Middle	56	(2.6)	57	(4.2)	55	(3.4)
High	69	(2.2)	71	(2.6)	63	(4.3)
Common misconceptions about Ebola						
Elementary	49	(4.9)	—		—	
Middle	61	(2.7)	63	(4.3)	61	(3.5)
High	67	(2.4)	67	(2.9)	66	(4.5)
How Ebola is treated						
Elementary	40	(4.6)	—		—	
Middle	49	(2.6)	57	(4.2)	43	(3.4)
High	58	(2.4)	65	(2.8)	42	(4.4)
History of Ebola (e.g., first discovered in the 1970s)						
Elementary	17	(3.5)	—		—	
Middle	36	(2.5)	42	(4.2)	31	(3.2)
High	54	(2.4)	60	(2.8)	39	(4.4)
How Ebola is diagnosed						
Elementary	14	(3.3)	—		—	
Middle	32	(2.5)	41	(4.1)	26	(3.0)
High	38	(2.4)	45	(2.9)	22	(3.7)

* Only those who indicated devoting class time to Ebola are included in this table.

† N for all categories: All Elementary, 113
All Middle School, 359; Life science, 142; Non-life science, 217
All High School, 427; Life science, 301; Non-life science, 126

The following vignette illustrates how one teacher addressed multiple topics about Ebola.

Vignette 3: In-Depth Exploration of Ebola in a Biology Class

Mr. Fisher has been teaching various levels of Biology for five years. His current assignment is in suburban New Jersey at a large public high school. Due to his personal interest in microbiology and infectious diseases and a strong background in the sciences, Mr. Fisher is very familiar with Ebola. A trip to Africa also spurred additional research.

Mr. Fisher provided Ebola-related instruction through a multi-day unit in all of his life science classes. Several factors encouraged him to explore this topic in depth: student interest, the abundance of misconceptions about the disease in his classes, the availability of resources (particularly through the CDC website), his own understanding of Ebola, and the age appropriateness of the topic for his students.

As expected in a multi-day unit, Mr. Fisher provided students with various instructional activities focused on Ebola. The class read and answered questions about an article focused on infection called, "*You Can't Catch Ebola From a Giraffe in Tanzania*;" linked the spread of Ebola to a lab activity that modeled disease transmission; watched news clips on YouTube as well as a PBS documentary focused on outbreak in the Democratic Republic of Congo (formerly known as Zaire) during the 1990s; and even had a guest speaker from the county health department who addressed the basic biology of the virus along with its transmission and history. Throughout the unit, Mr. Fisher identified student misconceptions in discussions and tailored his instruction to replace misinformation with facts about the disease. When asked about the misconceptions students brought to the classroom, he stated, "They think that it's airborne. They think that Africa is a country when it's a continent, and they think that every country in Africa has Ebola, that there's an outbreak going on in New Jersey, and that they're gonna get it in the United States." This abundance of misinformation was another reason Mr. Fisher chose to include varied aspects of the Ebola situation in his instruction. He was also able to loosely tie his Ebola instruction to his cellular biology unit, which is when he discusses viruses. He stated, "In our curriculum…you cover eukaryotes and prokaryotes, and of course, you cover bacteria with prokaryotes, and that's where I kind of throw in viruses."

Regardless of grade range, about 8 in 10 respondents indicated that their students asked about the virus before the class discussed it.

The survey included a question about whether students asked about Ebola before teachers began addressing it. For all grade ranges, about 80 percent of teachers who reported devoting some class time to Ebola indicated that their students asked about the virus first (see Table 7). There was no significant difference between life science classes and non-life science classes.

Table 7
Respondents Indicating Students Asked about Ebola before They Began Addressing It*†

	Percent of Respondents		
		Focus of Class	
	All	Life Science	Non-Life Science
Elementary	78 (3.9)	—	—
Middle	83 (2.0)	83 (3.2)	83 (2.5)
High	79 (2.0)	78 (2.4)	81 (3.5)

* Only those who indicated devoting class time to Ebola are included in this table.

† N for all categories: All Elementary, 113
All Middle School, 359; Life science, 142; Non-life science, 217
All High School, 429; Life science, 303; Non-life science, 126

The percentage of teachers who would have addressed Ebola if students had not asked increases with the grade range.

The survey also asked respondents to indicate if they would have addressed Ebola if students had not asked. Approximately half of elementary teachers said they would have addressed the topic (see Table 8). In secondary grades, life science teachers were much more likely than non-life science teachers to indicate that they would have addressed Ebola even if students had not asked. Still, the percentage of non-life science teachers is quite substantial—55 percent of middle grade teachers and 64 percent of high school teachers.

Table 8
Respondents Indicating They Would Have Addressed Ebola if Students Had Not Asked*†

	Percent of Respondents		
		Focus of Class	
	All	Life Science	Non-Life Science
Elementary	47 (5.3)	—	—
Middle	65 (2.8)	79 (3.8)	55 (3.7)
High	82 (2.1)	89 (2.0)	64 (4.8)

* Only those who indicated their students asked questions about Ebola are included in this table.

† N for all categories: All Elementary, 88
All Middle School, 299; Life science, 118; Non-life science, 181
All High School, 337; Life science, 235; Non-life science, 102

Factors in Teachers' Decision Making

A major focus of the questionnaire was identifying factors that influenced teachers' decisions regarding whether to address Ebola or not. The survey presented a list of potential factors and asked teachers to respond on a three-point scale where 1 was "discouraged me from addressing Ebola with my students"; 2, "not a factor"; and 3, "encouraged me to address Ebola with my students." An exploratory factor analysis suggested that the items formed three categories of influences: Likelihood of Lesson Success, Policy, and Influence of Others. The items in each of these categories are shown in Figure 2 along with the accompanying internal reliabilities.[3] Tables 9–11 present the results grouped by these overarching factors and grade range. Note that only two points of the response scale (discouraged and encouraged) are presented; all other responses were in the "not a factor" category.

[3] The internal reliability of Influence of Others composite was quite low (Cronbach's alpha = 0.348 (elementary); 0.565 (middle); 0.382 (high)). It is important to note that there was very little variation in teachers' responses to these items, which may partially account for the low reliability. The overwhelming majority of ratings were in the "not a factor" category.

Grouping of Factors that Influenced Decision Making about Ebola

Likelihood of Lesson Success (Cronbach's alpha = 0.778 (elementary); 0.761 (middle); 0.755 (high))

- Your knowledge of Ebola
- Your knowledge of how to teach about Ebola
- Availability of resources for teaching about Ebola
- Appropriateness of the topic of Ebola for the age group I teach
- Student interest in Ebola

Policy (Cronbach's alpha = 0.857 (elementary); 0.742 (middle); 0.691 (high))

- District/state-administered tests in science
- School/district pacing guides for science
- District/state-administered tests in other subjects (e g , mathematics, English/Language arts)
- District/state standards for science instruction
- School/district pacing guides for other subjects (e g , mathematics, English/Language arts)
- Availability of time for science instruction in general

Influence of Others (Cronbach's alpha = 0.348 (elementary); 0.565 (middle); 0.382 (high))

- Other teachers in your school or district
- Your school administration
- Parent/guardian beliefs or opinions about Ebola
- Your district administration

Figure 2

Students' interest and age appropriateness of the topic were the most encouraging factors in teachers' decision to address Ebola.

All teacher respondents who taught about Ebola indicated two factors as the most encouraging in their decision to address the topic: student interest (93 percent or above for all grade ranges) and age appropriateness (ranging from 52 percent of elementary to 90 percent of high school teachers). See Tables 9–11. Also, two-thirds of high school respondents indicated their knowledge of Ebola as an encouraging factor. Among elementary school teachers who did not address Ebola, appropriateness of topic for the age group they teach was one major discouraging factor (62 percent). Among the middle and high school teachers who did not address Ebola, over one-third indicated state/district curriculum standards for science discouraged them from addressing the topic (see Tables 9–11). Regardless of grade range, several factors were indicated by one-third or more of teachers who did not teach about Ebola as discouraging them from addressing the topic:

- Availability of time for science instruction in general (48–70 percent)
- Knowledge of how to teach about Ebola (roughly 45 percent for all)
- School/district pacing guides for science (36–61 percent)
- Availability of resources for teaching about Ebola (39–50 percent)
- Knowledge of Ebola (36–42 percent)

Table 9
Respondents Rating Various Factors
Affecting their Decision to Address Ebola: Elementary Teachers

	Percent of Respondents (N = 243)*	
	Discouraged	**Encouraged**
Likelihood of Lesson Success		
Student interest in Ebola		
Did not teach about Ebola	23 (3.8)	10 (2.6)
Did teach about Ebola	2 (1.2)	93 (2.4)
Appropriateness of the topic of Ebola for the age group I teach		
Did not teach about Ebola	62 (4.3)	2 (1.4)
Did teach about Ebola	16 (3.5)	52 (4.7)
Your knowledge of Ebola		
Did not teach about Ebola	40 (4.4)	3 (1.6)
Did teach about Ebola	17 (3.6)	36 (4.5)
Your knowledge of how to teach about Ebola		
Did not teach about Ebola	45 (4.5)	2 (1.4)
Did teach about Ebola	22 (4.0)	21 (3.8)
Availability of resources for teaching about Ebola		
Did not teach about Ebola	50 (4.4)	0 ---†
Did teach about Ebola	22 (3.9)	13 (3.2)
Policy		
Availability of time for science instruction in general		
Did not teach about Ebola	48 (4.4)	1 (0.8)
Did teach about Ebola	19 (3.7)	18 (3.6)
District/state standards for science instruction		
Did not teach about Ebola	24 (3.8)	0 ---†
Did teach about Ebola	2 (1.2)	9 (2.7)
School/district pacing guides for science		
Did not teach about Ebola	36 (4.3)	1 (0.8)
Did teach about Ebola	11 (2.9)	5 (2.1)
District/state-administered tests in science		
Did not teach about Ebola	20 (3.5)	0 ---†
Did teach about Ebola	5 (2.1)	3 (1.5)
District/state-administered tests in other subjects (e.g., mathematics, English/Language arts)		
Did not teach about Ebola	15 (3.1)	0 ---†
Did teach about Ebola	4 (1.9)	1 (0.9)
School/district pacing guides for other subjects (e.g., mathematics, English/Language arts)		
Did not teach about Ebola	26 (3.9)	0 ---†
Did teach about Ebola	7 (2.4)	3 (1.5)
Influence of Others		
Other teachers in your school or district		
Did not teach about Ebola	3 (1.6)	0 ---†
Did teach about Ebola	2 (1.2)	3 (1.5)
Parent/guardian beliefs or opinions about Ebola		
Did not teach about Ebola	10 (2.7)	1 (0.8)
Did teach about Ebola	6 (2.3)	4 (1.7)
Your school administration		
Did not teach about Ebola	3 (1.5)	0 ---†
Did teach about Ebola	0 ---†	1 (0.9)
Your district administration		
Did not teach about Ebola	2 (1.3)	1 (0.8)
Did teach about Ebola	0 ---†	0 ---†

* For all factors: Did not teach about Ebola, N = 130; Did teach about Ebola, N = 113

† Standard Error not calculated

Table 10
Respondents Rating Various Factors
Affecting their Decision to Address Ebola: Middle School Teachers

	Percent of Respondents (N = 444)*	
	Discouraged	**Encouraged**
Likelihood of Lesson Success		
Student interest in Ebola		
Did not teach about Ebola	9 (3.2)	26 (4.8)
Did teach about Ebola	0 (0.3)	93 (1.3)
Appropriateness of the topic of Ebola for the age group I teach		
Did not teach about Ebola	21 (4.5)	14 (3.8)
Did teach about Ebola	1 (0.6)	78 (2.2)
Your knowledge of Ebola		
Did not teach about Ebola	42 (5.4)	11 (3.4)
Did teach about Ebola	8 (1.4)	44 (2.6)
Your knowledge of how to teach about Ebola		
Did not teach about Ebola	43 (5.4)	10 (3.2)
Did teach about Ebola	11 (1.6)	32 (2.5)
Availability of resources for teaching about Ebola		
Did not teach about Ebola	39 (5.3)	1 (1.2)
Did teach about Ebola	14 (1.8)	29 (2.4)
Policy		
Availability of time for science instruction in general		
Did not teach about Ebola	59 (5.4)	0 ---†
Did teach about Ebola	22 (2.2)	28 (2.4)
District/state standards for science instruction		
Did not teach about Ebola	39 (5.3)	1 (1.2)
Did teach about Ebola	5 (1.1)	23 (2.2)
School/district pacing guides for science		
Did not teach about Ebola	61 (5.3)	1 (1.2)
Did teach about Ebola	14 (1.8)	8 (1.4)
District/state-administered tests in science		
Did not teach about Ebola	25 (4.7)	1 (1.2)
Did teach about Ebola	5 (1.1)	5 (1.2)
District/state-administered tests in other subjects (e.g., mathematics, English/Language arts)		
Did not teach about Ebola	13 (3.7)	0 ---†
Did teach about Ebola	4 (1.0)	3 (0.9)
School/district pacing guides for other subjects (e.g., mathematics, English/Language arts)		
Did not teach about Ebola	18 (4.2)	0 ---†
Did teach about Ebola	3 (0.9)	3 (0.8)
Influence of Others		
Other teachers in your school or district		
Did not teach about Ebola	5 (2.3)	0 ---†
Did teach about Ebola	1 (0.6)	11 (1.7)
Parent/guardian beliefs or opinions about Ebola		
Did not teach about Ebola	8 (3.0)	0 ---†
Did teach about Ebola	1 (0.6)	8 (1.4)
Your school administration		
Did not teach about Ebola	1 (1.2)	0 ---†
Did teach about Ebola	1 (0.6)	8 (1.4)
Your district administration		
Did not teach about Ebola	1 (1.2)	0 ---†
Did teach about Ebola	0 (0.3)	2 (0.7)

* For all factors: Did not teach about Ebola, N = 85; Did teach about Ebola, N = 359

† Standard Error not calculated

Table 11
Respondents Rating Various Factors
Affecting their Decision to Address Ebola: High School Teachers

	Percent of Respondents (N = 562)*	
	Discouraged	**Encouraged**
Likelihood of Lesson Success		
Student interest in Ebola		
Did not teach about Ebola	9 (2.5)	46 (4.3)
Did teach about Ebola	0 ---†	95 (1.0)
Appropriateness of the topic of Ebola for the age group I teach		
Did not teach about Ebola	10 (2.5)	33 (4.0)
Did teach about Ebola	0 (0.2)	90 (1.4)
Your knowledge of Ebola		
Did not teach about Ebola	36 (4.2)	14 (3.0)
Did teach about Ebola	6 (1.1)	66 (2.3)
Your knowledge of how to teach about Ebola		
Did not teach about Ebola	44 (4.3)	7 (2.3)
Did teach about Ebola	7 (1.2)	48 (2.4)
Availability of resources for teaching about Ebola		
Did not teach about Ebola	40 (4.2)	4 (1.6)
Did teach about Ebola	11 (1.5)	28 (2.2)
Policy		
Availability of time for science instruction in general		
Did not teach about Ebola	70 (4.0)	1 (1.0)
Did teach about Ebola	22 (2.0)	28 (2.2)
District/state standards for science instruction		
Did not teach about Ebola	36 (4.2)	0 ---†
Did teach about Ebola	2 (0.7)	18 (1.9)
School/district pacing guides for science		
Did not teach about Ebola	44 (4.3)	2 (1.3)
Did teach about Ebola	11 (1.5)	7 (1.2)
District/state-administered tests in science		
Did not teach about Ebola	26 (3.8)	0 ---†
Did teach about Ebola	4 (1.0)	5 (1.0)
District/state-administered tests in other subjects (e.g., mathematics, English/Language arts)		
Did not teach about Ebola	12 (2.8)	0 ---†
Did teach about Ebola	2 (0.6)	2 (0.7)
School/district pacing guides for other subjects (e.g., mathematics, English/Language arts)		
Did not teach about Ebola	7 (2.2)	0 ---†
Did teach about Ebola	3 (0.8)	1 (0.6)
Influence of Others		
Other teachers in your school or district		
Did not teach about Ebola	1 (0.7)	5 (1.9)
Did teach about Ebola	0 (0.3)	15 (1.7)
Parent/guardian beliefs or opinions about Ebola		
Did not teach about Ebola	1 (1.0)	3 (1.5)
Did teach about Ebola	0 ---†	9 (1.4)
Your school administration		
Did not teach about Ebola	0 ---†	0 ---†
Did teach about Ebola	1 (0.4)	8 (1.3)
Your district administration		
Did not teach about Ebola	1 (0.7)	0 ---†
Did teach about Ebola	0 (0.2)	2 (0.7)

* For all factors: Did not teach about Ebola, N = 135; Did teach about Ebola, N = 427

† Standard Error not calculated

Student interest was the most important single factor for teachers who addressed Ebola.

An open-ended question survey asked teachers who addressed Ebola to identify the single most important factor in their decision making. Teachers could choose from the list presented or identify a new one. Regardless of grade range, student interest was by far the most frequently mentioned "single most important factor" among those who addressed Ebola (see Table 12). No other factor was identified by more than 8 percent. The most frequently cited factors among those who did not address Ebola were different for each grade range. Among elementary teachers, age appropriateness of the topic was the most frequently cited factor (33 percent); in middle grades, district/state standards for science instruction (31 percent); and in high school, either availability of time for science instruction (21 percent) or district/state standards for science instruction (20 percent).

Table 12
Single Most Important Factor that Determined Whether Teachers Addressed Ebola*

	Percent of Respondents					
	Elementary		Middle		High	
Student interest in Ebola						
Did not teach about Ebola	11	(2.9)	4	(2.1)	4	(1.7)
Did teach about Ebola	80	(3.9)	72	(2.4)	65	(2.3)
Your knowledge of Ebola						
Did not teach about Ebola	10	(2.7)	10	(3.3)	11	(2.8)
Did teach about Ebola	1	(0.9)	3	(0.9)	7	(1.3)
Availability of time for science instruction in general						
Did not teach about Ebola	22	(3.7)	21	(4.6)	21	(3.6)
Did teach about Ebola	0	---†	2	(0.8)	2	(0.8)
District/state standards for science instruction						
Did not teach about Ebola	18	(3.5)	31	(5.2)	20	(3.5)
Did teach about Ebola	5	(2.0)	6	(1.3)	3	(0.8)
Appropriateness of the topic of Ebola for the age group I teach						
Did not teach about Ebola	33	(4.2)	2	(1.7)	2	(1.1)
Did teach about Ebola	2	(1.3)	4	(1.1)	8	(1.3)
Importance of covering current events‡						
Did not teach about Ebola	0	---†	0	---†	0	---†
Did teach about Ebola	6	(2.2)	6	(1.3)	7	(1.3)
School/district pacing guides for science						
Did not teach about Ebola	4	(1.8)	15	(4.0)	14	(3.1)
Did teach about Ebola	0	---†	1	(0.6)	0	(0.3)
District/state-administered tests in science						
Did not teach about Ebola	7	(2.2)	6	(2.7)	11	(2.7)
Did teach about Ebola	0	---†	1	(0.4)	0	(0.2)
Availability of resources for teaching about Ebola						
Did not teach about Ebola	7	(2.4)	9	(3.1)	4	(1.7)
Did teach about Ebola	5	(2.0)	7	(1.3)	2	(0.8)
Your knowledge of how to teach about Ebola						
Did not teach about Ebola	6	(2.1)	6	(2.7)	5	(1.8)
Did teach about Ebola	3	(1.6)	0	(0.3)	0	(0.3)
District/state-administered tests in other subjects (e.g., mathematics, English/Language arts)						
Did not teach about Ebola	1	(0.8)	1	(1.2)	2	(1.3)
Did teach about Ebola	0	---†	0	(0.3)	0	---†
Other teachers in your school or district						
Did not teach about Ebola	0	---†	1	(1.2)	0	---†
Did teach about Ebola	0	---†	0	(0.3)	1	(0.5)
Your school administration						
Did not teach about Ebola	1	(0.8)	0	---†	0	---†
Did teach about Ebola	0	---†	0	---†	1	(0.4)
School/district pacing guides for other subjects (e.g., mathematics, English/Language arts)						
Did not teach about Ebola	0	---†	4	(2.1)	1	(0.8)
Did teach about Ebola	0	---†	1	(0.4)	0	(0.2)
Parent/guardian beliefs or opinions about Ebola						
Did not teach about Ebola	0	---†	0	---†	0	---†
Did teach about Ebola	2	(1.3)	1	(0.5)	0	(0.3)
Your district administration						
Did not teach about Ebola	1	(0.8)	0	---†	0	---†
Did teach about Ebola	0	---†	0	---†	0	(0.2)

* N for all categories: Elementary: All, 231; Did not teach about Ebola, 123; Did teach about Ebola, 108
Middle: All, 428; Did not teach about Ebola, 81; Did teach about Ebola, 347
High: All, 548; Did not teach about Ebola, 132; Did teach about Ebola, 416

† Standard Error not calculated

Teachers' Sources of Information

In order to explore where teachers were getting their information about Ebola, teachers completing the survey were asked how they searched for information about Ebola and where they obtained information. In addition, teachers were queried about the usefulness of the information they found in planning their instruction. Findings about teachers' sources of information are described below.

Regardless of grade range, teachers were most likely to use the Internet to search for information about Ebola.

Teachers who taught about Ebola were roughly twice as likely as those who did not to report searching for information about the topic (see Table 13). Of those who searched for information, the vast majority reported using the Internet (see Table 14). A high percentage of teachers (ranging from 63 percent in elementary to 74 percent in high school) also indicated that they used websites that are not specifically news related (e.g., Centers for Disease Control, National Institutes of Health).

Table 13
Teachers Who Actively Searched for Information about Ebola†

	Percent of Respondents		
		Taught about Ebola	
	All	Yes	No
Have you actively searched for information about the Ebola virus?			
Elementary	58 (3.2)	78 (3.9)	39 (4.4)
Middle	79 (1.9)	88 (1.7)	41 (5.4)
High	82 (1.6)	92 (1.3)	50 (4.4)

† N for all categories: All Elementary, 232; Yes, 111; No, 121
All Middle School, 436; Yes, 353; No, 83
All High School, 552; Yes, 421; No, 131

Table 14
How Respondents Searched for Information about Ebola*†

	Percent of Respondents					
			Taught about Ebola			
	All		Yes		No	
Internet search engine (e.g., Google, Bing, Yahoo!)						
Elementary	89	(2.7)	94	(2.5)	79	(6.0)
Middle	95	(1.2)	96	(1.2)	91	(4.9)
High	92	(1.3)	93	(1.3)	85	(4.5)
Through websites that are not specifically news related (e.g., Centers for Disease Control, National Institutes of Health)						
Elementary	63	(4.2)	64	(5.2)	60	(7.2)
Middle	72	(2.4)	74	(2.5)	53	(8.7)
High	74	(2.1)	77	(2.2)	55	(6.2)
Directly through a news organization that reports the news (e.g., newspaper, TV newscast, news website, newswires, news radio)						
Elementary	31	(4.0)	32	(5.0)	30	(6.7)
Middle	34	(2.5)	34	(2.7)	29	(7.9)
High	33	(2.2)	36	(2.4)	20	(5.0)
Asking health professionals						
Elementary	22	(3.7)	20	(4.5)	24	(6.5)
Middle	21	(2.3)	22	(2.5)	9	(5.2)
High	20	(2.0)	20	(2.2)	18	(5.2)
Asking friends or colleagues						
Elementary	10	(2.6)	11	(3.4)	6	(3.6)
Middle	14	(1.8)	14	(2.0)	12	(5.6)
High	11	(1.5)	10	(1.5)	18	(4.8)
Social media (e.g., Facebook, Twitter, Instagram)						
Elementary	4	(1.8)	2	(1.6)	9	(4.1)
Middle	5	(1.2)	4	(1.1)	12	(5.6)
High	4	(0.9)	3	(0.9)	8	(3.3)

* Only those who indicated actively searching for information about Ebola are included in this table.
† N for all categories: All Elementary, 134; Yes, 87; No, 47
All Middle School, 346; Yes, 312; No, 34
All High School, 451; Yes, 386; No, 65

Among those who taught about Ebola, respondents most frequently used websites from health organizations as sources of information.

The survey asked respondents to indicate the various media sources they used as a source of information about Ebola. Tables 15–17 present the percentage of respondents who indicated they used each source a moderate amount or to a great extent. Regardless of grade range, websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health) appear to be the most frequently used sources of information by far for teachers who taught about Ebola (ranging from 78 percent of elementary teachers to 91 percent of high school teachers). Popular science magazines (e.g., *Scientific American*, *Discover*) were also noted by teachers who taught about Ebola as a common source of information, as were TV news programs, on-line news sites, and newspapers (print or on-line). Interestingly, the only source indicated by more than 50 percent of those who did not teach about Ebola was TV news programs.

Table 15
Respondents Indicating that Various Media Served as a Source of Information about Ebola to a Substantial Extent: Elementary Teachers[†‡]

	Percent of Respondents (N = 235)	
	Did not teach about Ebola (N = 124)	Did teach about Ebola (N = 111)
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	37 (4.4)	78 (3.9)
Popular science magazines (e.g., Scientific American, Discover)	23 (3.8)	54 (4.8)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	64 (4.3)	62 (4.6)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	42 (4.4)	50 (4.8)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	41 (4.4)	53 (4.8)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	10 (2.8)	44 (4.7)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	22 (3.8)	50 (4.8)
Printed publications from international health organizations (e.g., World Health Organization)	11 (2.8)	36 (4.6)
Local news station (e.g., NBC4), via radio, TV, or Internet	60 (4.4)	50 (4.8)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	37 (4.4)	41 (4.7)
Other magazines, whether print or online (e.g., Time, New Yorker)	17 (3.4)	41 (4.7)
Conversations with health professionals (e.g., nurses, doctors)	9 (2.6)	21 (3.9)
Radio talk show	26 (3.9)	16 (3.5)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	11 (2.8)	28 (4.3)
Conversations with other teachers	3 (1.6)	8 (2.6)
Conversations with others (i.e., not health professionals or teachers)	12 (2.9)	15 (3.4)
TV talk show (e.g., the View, Today Show, Daily Show)	12 (2.9)	8 (2.6)
Social media (e.g., Facebook, Twitter)	19 (3.6)	7 (2.5)
Resources provided by your school district	2 (1.4)	5 (2.2)

[†] Includes respondents indicating 3 or 4 on a four-point scale ranging from 1 "Not at all" to 4 "To a great extent."

[‡] For ease of comparison, Tables 15–17 are sorted in the same order, determined by the "Did teach about Ebola" column in Table 17.

Table 16
Respondents Indicating that Various Media Served as a Source of Information about Ebola to a Substantial Extent: Middle School Teachers[†‡]

	Percent of Respondents (N = 440)	
	Did not teach about Ebola (N = 84)	Did teach about Ebola (N = 356)
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	37 (5.3)	84 (1.9)
Popular science magazines (e.g., Scientific American, Discover)	37 (5.3)	57 (2.6)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	71 (5.0)	58 (2.6)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	44 (5.4)	62 (2.6)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	46 (5.5)	56 (2.6)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	16 (4.0)	47 (2.7)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	28 (4.9)	43 (2.6)
Printed publications from international health organizations (e.g., World Health Organization)	13 (3.7)	40 (2.6)
Local news station (e.g., NBC4), via radio, TV, or Internet	51 (5.5)	44 (2.6)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	52 (5.5)	41 (2.6)
Other magazines, whether print or online (e.g., Time, New Yorker)	14 (3.8)	34 (2.5)
Conversations with health professionals (e.g., nurses, doctors)	5 (2.4)	20 (2.1)
Radio talk show	27 (4.9)	15 (1.9)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	15 (3.9)	25 (2.3)
Conversations with other teachers	7 (2.9)	14 (1.9)
Conversations with others (i.e., not health professionals or teachers)	11 (3.4)	13 (1.8)
TV talk show (e.g., the View, Today Show, Daily Show)	12 (3.6)	11 (1.6)
Social media (e.g., Facebook, Twitter)	10 (3.3)	7 (1.4)
Resources provided by your school district	6 (2.7)	4 (1.0)

[†] Includes respondents indicating 3 or 4 on a four-point scale ranging from 1 "Not at all" to 4 "To a great extent."

[‡] For ease of comparison, Tables 15–17 are sorted in the same order, determined by the "Did teach about Ebola" column in Table 17.

Table 17
Respondents Indicating that Various Media Served as a Source of Information about Ebola to a Substantial Extent: High School Teachers[†‡]

	Percent of Respondents (N = 557)	
	Did not teach about Ebola (N = 131)	Did teach about Ebola (N = 426)
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	47 (4.4)	91 (1.4)
Popular science magazines (e.g., Scientific American, Discover)	39 (4.3)	65 (2.3)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	51 (4.4)	61 (2.4)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	47 (4.4)	59 (2.4)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	47 (4.4)	59 (2.4)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	18 (3.4)	51 (2.4)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	27 (3.9)	43 (2.4)
Printed publications from international health organizations (e.g., World Health Organization)	15 (3.1)	43 (2.4)
Local news station (e.g., NBC4), via radio, TV, or Internet	43 (4.3)	42 (2.4)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	23 (3.7)	39 (2.4)
Other magazines, whether print or online (e.g., Time, New Yorker)	20 (3.5)	33 (2.3)
Conversations with health professionals (e.g., nurses, doctors)	13 (2.9)	20 (1.9)
Radio talk show	23 (3.7)	19 (1.9)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	14 (3.0)	19 (1.9)
Conversations with other teachers	11 (2.8)	18 (1.9)
Conversations with others (i.e., not health professionals or teachers)	12 (2.9)	8 (1.3)
TV talk show (e.g., the View, Today Show, Daily Show)	8 (2.3)	8 (1.3)
Social media (e.g., Facebook, Twitter)	8 (2.4)	5 (1.0)
Resources provided by your school district	1 (0.8)	2 (0.7)

[†] Includes respondents indicating 3 or 4 on a four-point scale ranging from 1 "Not at all" to 4 "To a great extent."

[‡] For ease of comparison, Tables 15–17 are sorted in the same order, determined by the "Did teach about Ebola" column in Table 17.

Respondents reported that the most useful source of information, regardless of grade range, was websites from health organizations (e.g., the Center for Disease Control, National Institutes of Health).

The survey asked respondents to rate the usefulness of the sources of information they reported, using a four-point scale where 1 was "not at all useful"; 2, "minimally useful"; 3, "moderately useful"; and 4, "very useful." (see Table 18). Teachers overwhelmingly rated websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health) as moderately or very useful in planning Ebola instruction (over 80 percent of respondents regardless of grade range).

Table 18
Respondents Indicating that Sources of Information about Ebola Were Substantially Useful*†

	Percent of Respondents					
	Elementary		Middle		High	
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	85	(3.7)	83	(2.1)	85	(1.8)
Printed publications from international health organizations (e.g., World Health Organization)	64	(6.7)	63	(3.5)	66	(3.0)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	64	(6.0)	63	(3.3)	65	(2.8)
Popular science magazines (e.g., Scientific American, Discover)	58	(6.0)	62	(3.0)	65	(2.6)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	58	(5.4)	52	(3.0)	54	(2.7)
Conversations with health professionals (e.g., nurses, doctors)	58	(6.8)	46	(4.2)	51	(3.8)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	62	(5.7)	52	(3.2)	47	(2.9)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	51	(5.5)	51	(3.0)	47	(2.7)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	51	(5.1)	46	(2.9)	41	(2.6)
Other magazines, whether print or online (e.g., Time, New Yorker)	44	(6.1)	38	(3.5)	39	(3.1)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	55	(6.9)	48	(3.9)	38	(3.4)
Conversations with other teachers	24‡	(7.2)	30	(3.8)	34	(3.3)
Radio talk show	42‡	(8.3)	30	(4.1)	33	(3.6)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	35	(5.4)	42	(3.2)	32	(2.8)
Local news station (e.g., NBC4), via radio, TV, or Internet	34	(5.0)	31	(2.7)	25	(2.4)
Resources provided by your school district	50‡	(13.9)	19	(6.1)	22	(7.0)
Conversations with others (i.e., not health professionals or teachers)	29‡	(7.9)	23	(3.9)	19	(3.4)
Social media (e.g., Facebook, Twitter)	12‡	(5.6)	18	(4.1)	15	(3.3)
TV talk show (e.g., the View, Today Show, Daily Show)	23‡	(7.2)	21	(3.9)	12	(2.8)

* Only those who indicated devoting class time to Ebola are included in this table. Respondents were shown only those response options they indicated using as a source of information about Ebola at least minimally. The number of respondents (N) varied; the appendix includes tables that display the number of respondents for each source.

† Includes respondents indicating 3 or 4 on a four-point scale where 1 was "Not at all useful"; 2, "Minimally useful"; 3, "Moderately useful"; and 4, "Very useful."

‡ Indicates a source that fewer than 50 respondents reported using.

Several sources of information were rated as "minimally useful" or "not at all useful" by approximately half or more teachers.

There were several sources rated as "minimally useful" or "not at all useful" by teachers (see Table 19). Radio talk shows were rated low in usefulness by approximately half or more middle school and high school teachers. Two sources of information—print on-line non-science magazine and printed publications from teacher professional organizations—were rated low by approximately half or more high school teachers. Regardless of grade range, several sources of information were rated by approximately half or more of teachers as "minimally useful" or "not at all useful" including:

- Local news stations;

- National broadcast TV news programs;
- 24 hour TV news;
- TV talk shows;
- Online-only sources (e.g., Huffington Post, Yahoo News, AOL);
- Social Media (e.g., Facebook, Twitter);
- Resources provided by their school districts;
- Conversations with other teachers; and
- Conversations with others (i.e., not health professionals or teachers).

Table 19
Respondents Indicating that Sources of Information about Ebola Were Not Useful*†

	Percent of Respondents					
	Elementary		Middle		High	
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	15	(3.7)	17	(2.1)	15	(1.8)
Printed publications from international health organizations (e.g., World Health Organization)	36	(6.7)	37	(3.5)	34	(3.0)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	36	(6.0)	37	(3.3)	35	(2.8)
Popular science magazines (e.g., Scientific American, Discover)	42	(6.0)	38	(3.0)	35	(2.6)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	42	(5.4)	48	(3.0)	46	(2.7)
Conversations with health professionals (e.g., nurses, doctors)	42	(6.8)	54	(4.2)	49	(3.8)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	38	(5.7)	48	(3.2)	53	(2.9)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	49	(5.5)	49	(3.0)	53	(2.7)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	49	(5.1)	54	(2.9)	59	(2.6)
Other magazines, whether print or online (e.g., Time, New Yorker)	56	(6.1)	62	(3.5)	61	(3.1)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	45	(6.9)	52	(3.9)	62	(3.4)
Conversations with other teachers	76‡	(7.2)	70	(3.8)	67	(3.3)
Radio talk show	58‡	(8.3)	70	(4.1)	67	(3.6)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	65	(5.4)	58	(3.2)	68	(2.8)
Local news station (e.g., NBC4), via radio, TV, or Internet	66	(5.0)	69	(2.7)	75	(2.4)
Resources provided by your school district	50‡	(13.9)	81	(6.1)	78	(7.0)
Conversations with others (i.e., not health professionals or teachers)	71‡	(7.9)	77	(3.9)	81	(3.4)
Social media (e.g., Facebook, Twitter)	88‡	(5.6)	82	(4.1)	85	(3.3)
TV talk show (e.g., the View, Today Show, Daily Show)	77‡	(7.2)	79	(3.9)	88	(2.8)

* Only those who indicated devoting class time to Ebola are included in this table. Respondents were shown only those response options they indicated using as a source of information about Ebola at least minimally. The number of respondents (N) varied; the appendix includes tables that display the number of respondents for each source.

† Includes respondents indicating 1 or 2 on a four-point scale where 1 was "Not at all useful"; 2, "Minimally useful"; 3, "Moderately useful"; and 4, "Very useful."

‡ Indicates a source that fewer than 50 respondents reported using.

Teachers' Knowledge about Ebola

In order to examine teacher knowledge about Ebola, the survey asked respondents to answer 20 true/false statements about Ebola and also asked them to rate their confidence in the correctness of their answer. Specifically, questions were asked about the Ebola virus itself, how it is transmitted, and how to prevent transmission. The findings from teachers' responses to these items follow below.

The majority of respondents, regardless of grade range, answered most of the statements about Ebola correctly. However, those who taught about Ebola had higher test scores and confidence scores than those who did not teach about Ebola.

Scores were created from teachers' responses to the true/false statements as well as their ratings of their confidence in the correctness of their answer (see Table 20). On average, respondents answered three-fourths of the true/false questions correctly. Regardless of grade range, the teachers who addressed Ebola scored higher on the test and rated their confidence higher than the teachers who did not teach Ebola.

Table 20
Mean Test Scores and Confidence Scores

	Percentage of True/False Statements Answered Correctly		Confidence of Answering True/False Statements Correctly	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Elementary				
Did not teach about Ebola (N = 120)	74.42	14.76	47.26	23.02
Did teach about Ebola (N = 111)	78.69	11.34	60.00	22.21
Middle				
Did not teach about Ebola (N = 83)	77.47	10.55	51.49	20.96
Did teach about Ebola (N = 352)	80.50	11.78	65.70	20.35
High				
Did not teach about Ebola (N = 131)	77.90	13.21	59.47	21.66
Did teach about Ebola (N = 419)	83.52	10.20	75.08	16.75

The majority of teachers answered two questions incorrectly, one of which appeared to be a focus of instruction.

All but two true/false statements were answered correctly by about 60 percent of respondents. These two questions were answered correctly by less than 50 percent of the respondents for all grade ranges (see Tables 21–23). The question that focused on drug availability for treating people infected with the Ebola virus was answered incorrectly by 64 percent of elementary school teachers and 60 percent of middle and high school teachers. The other question focused on how the Ebola virus is transmitted and was answered incorrectly by 81 percent of elementary teachers, 69 percent of middle school teachers, and 67 percent of high school teachers.

Interestingly, transmission was one of the most frequently covered topics. Teachers' confidence level for those two questions did not vary from the confidence levels of the other answers where the majority of teachers responded correctly, suggesting that teachers' confidence did not align particularly well with their knowledge.

Table 21
Teachers Answering True/False Statements: Elementary

	Percent of Respondents (N = 231)			
	Answering Correctly	Not at All Confident	Somewhat Confident	Very Confident
The Ebola virus is only known to infect mammals, including humans, apes, monkeys and bats. (True)	86 (2.3)	24 (2.9)	58 (3.3)	18 (2.6)
There is currently no vaccine proven safe and effective for preventing the Ebola virus disease in humans. (True at the time the survey was administered)	77 (2.8)	17 (2.5)	54 (3.4)	29 (3.1)
If a person is infected with the Ebola virus, symptoms generally appear within 24 hours. (False)	79 (2.7)	18 (2.6)	53 (3.4)	30 (3.1)
People who die from the Ebola virus disease typically die as a result of blood loss. (False)	69 (3.0)	39 (3.3)	50 (3.4)	12 (2.2)
The Ebola virus is transmitted to humans by only certain mammals, including other humans, bats, apes, and monkeys. (True)	67 (3.1)	32 (3.2)	52 (3.4)	16 (2.5)
Anyone who is infected with the Ebola virus will develop the Ebola virus disease. (False)	68 (3.1)	27 (3.0)	57 (3.3)	16 (2.4)
Anyone infected with Ebola will die as a result. (False)	98 (1.0)	7 (1.7)	35 (3.2)	58 (3.3)
Without specific laboratory tests, diagnosing a person in the early stages of the Ebola virus disease is difficult because the symptoms are similar to other diseases, such as flu, malaria, and typhoid fever. (True)	89 (2.0)	16 (2.5)	51 (3.4)	32 (3.1)
There is currently no Ebola drug available for treating people infected with the Ebola virus. (True at the time the survey was administered)	36 (3.2)	21 (2.8)	54 (3.4)	25 (2.9)
Providing Ebola patients with intravenous (IV) fluids and balancing their electrolytes (body salts) can improve their chances of survival. (True)	90 (1.9)	27 (3.0)	50 (3.3)	23 (2.8)
The Ebola virus is typically transmitted from one human to another by some insects, including mosquitos. (False)	84 (2.4)	30 (3.1)	46 (3.4)	24 (2.9)
The Ebola virus can be spread through direct contact with blood or other bodily fluids of a person who is sick with the Ebola virus disease. (True)	97 (1.1)	11 (2.1)	34 (3.2)	55 (3.4)
The Ebola virus is likely to spread from one person to others through the air. (False)	70 (3.0)	25 (2.9)	45 (3.4)	29 (3.1)
The Ebola virus is likely to spread from one person to others through water. (False)	73 (2.9)	32 (3.1)	47 (3.4)	21 (2.7)
Most people infected in an Ebola outbreak are infected by human-to-human transmission. (True)	93 (1.7)	19 (2.6)	46 (3.3)	36 (3.2)
People infected with the Ebola virus are unable to transmit it to someone else until they show symptoms (fever, fatigue, etc.). (True)	19 (2.6)	23 (2.8)	55 (3.3)	22 (2.8)
If put on and taken off properly, protective garments such as gloves, gowns, and masks can be effective at preventing Ebola transmission. (True)	94 (1.6)	12 (2.2)	47 (3.3)	42 (3.3)
The risk of getting the Ebola virus disease is high when someone goes to a place where people have had Ebola, even if no one with the disease is still there. (False)	65 (3.1)	27 (3.0)	60 (3.3)	12 (2.2)
Health care procedures in the United States make a widespread Ebola outbreak unlikely. (True)	79 (2.7)	20 (2.7)	54 (3.4)	26 (2.9)
Controlling Ebola outbreaks where they start (in Africa, for example) is an important step in preventing infections from occurring in the United States. (True)	95 (1.4)	9 (1.9)	44 (3.3)	47 (3.4)

Table 22
Teachers Answering True/False Statements: Middle

	Percent of Respondents (N = 435)							
	Answering Correctly		Not At All Confident		Somewhat Confident		Very Confident	
The Ebola virus is only known to infect mammals, including humans, apes, monkeys and bats. (True)	86	(1.6)	12	(1.6)	65	(2.3)	22	(2.0)
There is currently no vaccine proven safe and effective for preventing the Ebola virus disease in humans. (True at the time the survey was administered)	80	(1.9)	9	(1.4)	53	(2.4)	37	(2.4)
If a person is infected with the Ebola virus, symptoms generally appear within 24 hours. (False)	84	(1.8)	10	(1.5)	48	(2.5)	42	(2.4)
People who die from the Ebola virus disease typically die as a result of blood loss. (False)	58	(2.4)	21	(2.0)	63	(2.4)	16	(1.8)
The Ebola virus is transmitted to humans by only certain mammals, including other humans, bats, apes, and monkeys. (True)	79	(2.0)	15	(1.8)	63	(2.4)	22	(2.0)
Anyone who is infected with the Ebola virus will develop the Ebola virus disease. (False)	72	(2.2)	17	(1.8)	64	(2.4)	19	(1.9)
Anyone infected with Ebola will die as a result. (False)	97	(0.8)	5	(1.0)	27	(2.2)	68	(2.3)
Without specific laboratory tests, diagnosing a person in the early stages of the Ebola virus disease is difficult because the symptoms are similar to other diseases, such as flu, malaria, and typhoid fever. (True)	97	(0.8)	7	(1.3)	49	(2.5)	44	(2.4)
There is currently no Ebola drug available for treating people infected with the Ebola virus. (True at the time the survey was administered)	40	(2.3)	13	(1.6)	59	(2.4)	28	(2.2)
Providing Ebola patients with intravenous (IV) fluids and balancing their electrolytes (body salts) can improve their chances of survival. (True)	91	(1.3)	17	(1.8)	46	(2.4)	37	(2.4)
The Ebola virus is typically transmitted from one human to another by some insects, including mosquitos. (False)	88	(1.6)	17	(1.8)	44	(2.4)	39	(2.4)
The Ebola virus can be spread through direct contact with blood or other bodily fluids of a person who is sick with the Ebola virus disease. (True)	97	(0.8)	7	(1.2)	26	(2.2)	67	(2.3)
The Ebola virus is likely to spread from one person to others through the air. (False)	77	(2.0)	12	(1.6)	47	(2.5)	41	(2.4)
The Ebola virus is likely to spread from one person to others through water. (False)	81	(1.9)	22	(2.0)	52	(2.5)	26	(2.1)
Most people infected in an Ebola outbreak are infected by human-to-human transmission. (True)	96	(1.0)	11	(1.5)	44	(2.4)	46	(2.4)
People infected with the Ebola virus are unable to transmit it to someone else until they show symptoms (fever, fatigue, etc.). (True)	31	(2.2)	12	(1.6)	58	(2.4)	30	(2.2)
If put on and taken off properly, protective garments such as gloves, gowns, and masks can be effective at preventing Ebola transmission. (True)	98	(0.6)	6	(1.2)	39	(2.4)	55	(2.5)
The risk of getting the Ebola virus disease is high when someone goes to a place where people have had Ebola, even if no one with the disease is still there. (False)	67	(2.3)	15	(1.8)	62	(2.4)	22	(2.0)
Health care procedures in the United States make a widespread Ebola outbreak unlikely. (True)	83	(1.8)	10	(1.5)	50	(2.5)	40	(2.4)
Controlling Ebola outbreaks where they start (in Africa, for example) is an important step in preventing infections from occurring in the United States. (True)	97	(0.8)	7	(1.2)	35	(2.3)	59	(2.4)

Table 23
Teachers Answering True/False Statements: High

	Percent of Respondents (N = 550)			
	Answering Correctly	Not At All Confident	Somewhat Confident	Very Confident
The Ebola virus is only known to infect mammals, including humans, apes, monkeys and bats. (True)	92 (1.2)	9 (1.3)	57 (2.1)	33 (2.0)
There is currently no vaccine proven safe and effective for preventing the Ebola virus disease in humans. (True at the time the survey was administered)	83 (1.6)	6 (1.0)	47 (2.2)	48 (2.2)
If a person is infected with the Ebola virus, symptoms generally appear within 24 hours. (False)	84 (1.6)	9 (1.2)	43 (2.1)	48 (2.2)
People who die from the Ebola virus disease typically die as a result of blood loss. (False)	57 (2.1)	16 (1.6)	61 (2.1)	24 (1.8)
The Ebola virus is transmitted to humans by only certain mammals, including other humans, bats, apes, and monkeys. (True)	79 (1.8)	10 (1.3)	57 (2.2)	33 (2.0)
Anyone who is infected with the Ebola virus will develop the Ebola virus disease. (False)	80 (1.7)	11 (1.4)	57 (2.1)	32 (2.0)
Anyone infected with Ebola will die as a result. (False)	99 (0.4)	2 (0.6)	16 (1.6)	82 (1.7)
Without specific laboratory tests, diagnosing a person in the early stages of the Ebola virus disease is difficult because the symptoms are similar to other diseases, such as flu, malaria, and typhoid fever. (True)	94 (1.0)	4 (0.9)	41 (2.1)	55 (2.2)
There is currently no Ebola drug available for treating people infected with the Ebola virus. (True at the time the survey was administered)	40 (2.1)	9 (1.2)	55 (2.2)	37 (2.1)
Providing Ebola patients with intravenous (IV) fluids and balancing their electrolytes (body salts) can improve their chances of survival. (True)	95 (0.9)	8 (1.1)	39 (2.1)	53 (2.2)
The Ebola virus is typically transmitted from one human to another by some insects, including mosquitos. (False)	91 (1.2)	9 (1.2)	37 (2.1)	54 (2.2)
The Ebola virus can be spread through direct contact with blood or other bodily fluids of a person who is sick with the Ebola virus disease. (True)	99 (0.4)	2 (0.6)	17 (1.6)	80 (1.7)
The Ebola virus is likely to spread from one person to others through the air. (False)	87 (1.5)	5 (1.0)	38 (2.1)	57 (2.2)
The Ebola virus is likely to spread from one person to others through water. (False)	81 (1.7)	10 (1.3)	51 (2.2)	39 (2.1)
Most people infected in an Ebola outbreak are infected by human-to-human transmission. (True)	94 (1.0)	5 (1.0)	34 (2.0)	60 (2.1)
People infected with the Ebola virus are unable to transmit it to someone else until they show symptoms (fever, fatigue, etc.). (True)	33 (2.0)	7 (1.1)	52 (2.2)	41 (2.1)
If put on and taken off properly, protective garments such as gloves, gowns, and masks can be effective at preventing Ebola transmission. (True)	97 (0.7)	3 (0.7)	31 (2.0)	66 (2.1)
The risk of getting the Ebola virus disease is high when someone goes to a place where people have had Ebola, even if no one with the disease is still there. (False)	75 (1.9)	10 (1.3)	54 (2.2)	36 (2.1)
Health care procedures in the United States make a widespread Ebola outbreak unlikely. (True)	86 (1.5)	6 (1.0)	44 (2.2)	50 (2.2)
Controlling Ebola outbreaks where they start (in Africa, for example) is an important step in preventing infections from occurring in the United States. (True)	97 (0.7)	3 (0.8)	27 (1.9)	69 (2.0)

SUMMARY

This report details findings from a survey about teachers' decisions and instruction related to the Ebola outbreak of 2014. Survey data show that almost half of elementary school teachers and over three-fourths of middle and high school science teachers addressed Ebola during the 2014–15 school year. The results indicate that student interest was the major factor in determining whether or not teachers took up Ebola in their instruction. Age appropriateness was also an important factor, especially among elementary teachers, who tended to identify it as a discouraging factor. This finding may explain why only about half of elementary teachers taught about Ebola. In contrast, middle and high school teachers saw age appropriateness as an encouraging factor.

Since the topic of viruses is commonly included in life science classes, it was not surprising to find that life science teachers were almost twice as likely as non-life science teachers to address Ebola as a part of the curriculum. In fact, over 87 percent of middle and high school life science teachers covered the topic.

Although a high percentage of teachers reported that they would have addressed the topic without the students asking, about 80 percent of those who taught about Ebola reported that their students asked first. Students not only initiated the topic, but also drove the discussion. The most commonly addressed topics by all teachers were not surprising—defining Ebola and explaining how the virus is transmitted, including how to prevent transmission. The most frequent instructional activity was question-and-answer, guided by students' questions.

Teachers most frequently cited websites from health organizations as substantially useful sources of information about Ebola (over 80 percent regardless of grade range). In order to get a better sense of how well the teachers understood the Ebola virus, the survey asked teachers to answer a series of 20 true or false questions. On average, teachers answered three-fourths of the items correctly. In contrast, the majority of teachers answered two questions incorrectly. About 60 percent of teachers incorrectly answered a question on whether a drug was available for treating people infected with the Ebola virus. Interestingly, the other question related to a topic teachers reported addressing the most in their classroom: how Ebola is transmitted and how to prevent the transmission. This question was answered incorrectly by more than two-thirds of teachers, regardless of grade range. The large overlap between the percentage of teachers who taught about the transmission of Ebola and the percentage of teachers who missed those transmission questions indicates that many teachers may have provided students with incorrect information.

One of the largest differences between those who did and did not teach about Ebola was confidence in their knowledge of Ebola. Interestingly, teachers' confidence scores did not seem

to reflect their test scores. Specifically, teachers seemed less confident than their test scores would suggest. This finding was evident in individual items as well.

IMPLICATIONS

Although the concern over Ebola has largely passed, similar events are inevitable. Very recently, the U.S. faced the possibility of a Zika outbreak. The possibility of effects on unborn children from Zika had the potential to generate questions and concerns among students just as Ebola did.

This study suggests that the majority of K–12 science teachers would discuss a topic like Ebola or Zika. It also suggests that sources of information tailored for teachers are lacking. In describing their Ebola instruction, most teachers cited websites of health organizations as their main source of information. These findings argue for policies and funding that support the development of materials specifically for classroom use.

From initiating the conversation to driving the discussion in class, student interest provided the opportunity for teachers to address Ebola in their classroom. Teachers should leverage student interest and use instruction to deepen students' understanding of core science concepts and practices. Given time constraints for addressing required content, instruction should integrate students' learning about core science concepts while engaging them with the science practices. Topics like Ebola and Zika offer opportunities for authentic exploration of key science ideas, with students asking questions, constructing arguments from evidence, and developing explanations.

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APPENDIX

APPENDIX A

SAMPLE DEMOGRAPHICS

Table A-1
Elementary Grades Teacher Sample Demographics

	Study Sample (N = 244)		National	
Race/Ethnicity				
American Indian or Alaska Native	0	---[†]	1	(0.3)
Asian	1	(0.7)	2	(0.4)
Black or African American	5	(1.3)	5	(1.1)
Native Hawaiian or Other Pacific Islander	1	(0.6)	0	(0.2)
White	91	(1.8)	91	(1.5)
Hispanic/Latino	3	(1.1)	8	(1.4)
Two or more races	2	(1.0)	1	(0.4)
Sex				
Female	91	(1.8)	94	(0.8)
Male	9	(1.8)	6	(0.8)
Type of School				
Public	93	(1.7)	93	(1.4)
Private	7	(1.7)	7	(1.4)
Region				
Midwest	21	(2.6)	21	(1.7)
Northeast	17	(2.4)	16	(1.4)
South	46	(3.2)	48	(2.3)
West	16	(2.3)	15	(1.8)
Community Type				
Urban	30	(2.9)	28	(1.9)
Rural	23	(2.7)	23	(1.8)
Suburban	48	(3.2)	49	(2.0)
Grades Taught				
Pre-K	4	(1.3)	Unavailable	
K	19	(2.5)	Unavailable	
1	22	(2.6)	Unavailable	
2	26	(2.8)	Unavailable	
3	35	(3.1)	Unavailable	
4	46	(3.2)	Unavailable	
5	55	(3.2)	Unavailable	

[†] Standard Error not calculated

Table A-2
Elementary School Sample Demographics

	Study Sample (N = 244)		National	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Student Race/Ethnicity				
American Indian or Alaska Native	0.60	1.41	0.73	2.71
Asian, Native Hawaiian, or other Pacific Islander	5.49	10.38	4.51	9.46
Black or African American	15.93	24.17	14.93	21.30
Hispanic/Latino	16.59	20.73	20.74	27.49
White	57.35	30.57	58.29	33.59
Two or more races	3.28	3.01	0.79	2.59
Percent of Students Eligible Free or Reduced-price Lunch	49.17	27.12	47.46	28.25

Table A-3
Middle Grades Teacher Sample Demographics

	Study Sample (N = 445)		National	
Race/Ethnicity				
American Indian or Alaska Native	0	(0.2)	0	(0.2)
Asian	2	(0.6)	2	(0.8)
Black or African American	4	(1.0)	6	(1.2)
Native Hawaiian or Other Pacific Islander	0	(0.2)	0	(0.1)
White	90	(1.4)	90	(1.4)
Hispanic/Latino	5	(1.0)	5	(1.0)
Two or more races	4	(0.9)	1	(0.3)
Sex				
Female	83	(1.8)	70	(2.0)
Male	17	(1.8)	30	(2.0)
Type of School				
Public	91	(1.4)	92	(2.0)
Private	9	(1.4)	9	(2.0)
Region				
Midwest	26	(2.1)	26	(2.4)
Northeast	19	(1.9)	17	(1.8)
South	34	(2.2)	35	(1.9)
West	21	(1.9)	21	(2.1)
Community Type				
Urban	30	(2.2)	29	(2.4)
Rural	29	(2.2)	26	(2.3)
Suburban	41	(2.3)	44	(2.7)
Subjects Taught				
Life science	86	(1.7)	89	(1.3)
Earth science	75	(2.1)	84	(1.6)
Physical science	74	(2.1)	70	(2.2)
Grades Taught				
6	39	(2.3)	Unavailable	
7	59	(2.3)	Unavailable	
8	53	(2.4)	Unavailable	

† Standard Error not calculated

Table A-4
Middle School Sample Demographics

	Study Sample (N = 445)		National	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Student Race/Ethnicity				
American Indian or Alaska Native	0.90	5.24	1.47	5.70
Asian, Native Hawaiian, or other Pacific Islander	4.06	8.50	4.95	9.89
Black or African American	12.57	19.65	15.15	22.25
Hispanic/Latino	15.71	21.41	16.75	22.90
White	63.11	29.93	60.98	32.22
Two or more races	2.50	2.69	0.70	3.43
Percent of Students Eligible Free or Reduced-Price Lunch	46.70	24.49	46.24	26.75

Table A-5
High School Teacher Sample Demographics

	Study Sample (N = 566)		National	
Race/Ethnicity				
American Indian or Alaska Native	0	(0.2)	0	(0.2)
Asian	2	(0.7)	2	(0.5)
Black or African American	2	(0.6)	3	(0.5)
Native Hawaiian or Other Pacific Islander	0	(0.3)	0	(0.2)
White	93	(1.1)	92	(0.8)
Hispanic/Latino	4	(0.9)	4	(0.6)
Two or more races	2	(0.6)	2	(0.4)
Sex				
Female	77	(1.8)	54	(1.4)
Male	23	(1.8)	46	(1.4)
Type of School				
Public	81	(1.6)	83	(2.7)
Private	19	(1.6)	17	(2.7)
Region				
Midwest	21	(1.7)	25	(1.4)
Northeast	17	(1.6)	21	(1.5)
South	39	(2.1)	34	(1.2)
West	23	(1.8)	20	(1.1)
Community Type				
Urban	35	(2.0)	30	(1.9)
Rural	26	(1.8)	28	(1.7)
Suburban	39	(2.1)	43	(1.9)
Subjects Taught				
Life science	73	(1.9)	69	(1.1)
Earth science	27	(1.9)	44	(1.5)
Physical science	58	(2.1)	70	(1.3)
Grades Taught				
9	61	(2.1)	Unavailable	
10	78	(1.7)	Unavailable	
11	83	(1.6)	Unavailable	
12	81	(1.6)	Unavailable	

Table A-6
High School Sample Demographics

	Study Sample (N = 566)		National	
	Mean	**Standard Deviation**	**Mean**	**Standard Deviation**
Student Race/Ethnicity				
American Indian or Alaska Native	0.99	5.31	1.02	4.17
Asian, Native Hawaiian, or other Pacific Islander	4.69	7.57	5.68	9.95
Black or African American	12.38	17.86	13.33	18.47
Hispanic/Latino	15.34	19.78	14.55	20.95
White	63.79	27.46	64.64	28.58
Two or more races	2.44	2.45	0.78	2.20
Percent of Students Eligible Free or Reduced-price Lunch	40.56	21.00	35.42	22.57

APPENDIX B

SURVEY

RESPONDING TO EBOLA
TEACHER QUESTIONNAIRE

Thank you for agreeing to complete the questionnaire. *Your responses are important whether or not you addressed Ebola in your science instruction*. **Please complete the entire questionnaire *even if you did not teach about Ebola.***

1. **How many science classes do you teach this school year (2014–15)? If you teach the same group of students all day (you have a self-contained classroom), please enter 1.**

2. **During the 2014–15 school year, did you devote any class time to Ebola (e.g., class discussion, formal lesson, student presentation, current event coverage)? (select one)**

   - (•) Yes
   - ( ) No, skip to Question 14

3. **Did you devote any class time to Ebola in *more than one* of your science classes? (select one)**

   - ( ) Yes
   - ( ) No

If yes, please answer the following questions for the one class that <u>best represents</u> how you addressed Ebola with your students.

4. What grade levels are included in the class you are answering about? (select all that apply)

- ☐ K
- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ 9
- ☐ 10
- ☐ 11
- ☐ 12

5. Which of the following best describes the content focus of the class you are answering about? (select one)

- ○ Earth science (e.g., geology, astronomy, meteorology, oceanography)
- ○ Life science (e.g., biology, ecology, anatomy and physiology)
- ○ Physical science (e.g., chemistry, physics)
- ○ Environmental science
- ○ General science
- ○ Integrated science
- ○ Other (please specify): _____

6. **About how many sessions in this class devoted any time to Ebola? (select one)**

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6
- ○ 7
- ○ 8
- ○ 9
- ○ 10
- ○ >10

7. **On average, about how many minutes per session were devoted to Ebola in this class? (Enter your response as numerals, e.g., "45")**

8. **Did you use Ebola to address topics you are responsible for teaching in this class (e.g., characteristics of viruses; spread, treatment, and prevention of disease)?**

- ○ Yes
- ○ No

9. **Did you address Ebola as a stand-alone topic, unrelated to the rest of your science curriculum (e.g., a current event topic outside of the specified curriculum of this class)?**

- ○ Yes
- ○ No

10. **Did your students ask questions about Ebola before you began addressing it in this class?**

- ○ Yes
- ○ No, skip to Question 12

11. Would you have addressed Ebola in this class if your students had not asked questions about it?

- ○ Yes
- ○ No

12. Which of the following took place when Ebola was addressed in this class? (select all that apply)

- ☐ I lectured or gave a presentation about Ebola.
- ☐ I led a whole class discussion about Ebola.
- ☐ I answered questions about Ebola asked by students.
- ☐ Small groups discussed about Ebola.
- ☐ Students read about Ebola.
- ☐ Students did a hands-on activity or laboratory investigation.
- ☐ Students did a worksheet or answered written questions about Ebola.
- ☐ A student (or students) gave a presentation about Ebola.
- ☐ A guest speaker talked about Ebola.
- ☐ Students watched a video about Ebola.
- ☐ Students searched the Internet for information or current events related to Ebola.
- ☐ Other: _____

13. In addressing Ebola in this class, which of the following topics were covered? (select all that apply)

- ☐ What Ebola is (e.g., Ebola is a virus)
- ☐ How Ebola is transmitted to humans from other animals
- ☐ How Ebola is transmitted among humans
- ☐ Ways to prevent Ebola transmission
- ☐ Factors that place people at risk for contracting Ebola
- ☐ Symptoms of Ebola in humans
- ☐ How Ebola is diagnosed
- ☐ How Ebola is treated
- ☐ Survival rates of Ebola victims
- ☐ Where Ebola originated (i.e., what part of the world)
- ☐ History of Ebola (e.g., first discovered in the 1970s)
- ☐ Likelihood of a widespread Ebola outbreak in the United States
- ☐ Common misconceptions about Ebola
- ☐ Other: _____

14. Please rate the influence of each of the following factors on your decision of whether to address Ebola in this class. (select one on each line)

	Discouraged me from addressing Ebola with my students	Not a Factor	Encouraged me to address Ebola with my students
Your school administration	○	○	○
Your district administration	○	○	○
District/state standards for science instruction	○	○	○
District/state-administered tests in science	○	○	○
District/state-administered tests in other subjects (e.g., mathematics, English/Language arts)	○	○	○
School/district pacing guides for science	○	○	○
School/district pacing guides for other subjects (e.g., mathematics, English/Language arts)	○	○	○
Availability of time for science instruction in general	○	○	○
Availability of resources for teaching about Ebola	○	○	○
Student interest in Ebola	○	○	○
Appropriateness of the topic of Ebola for the age group I teach	○	○	○
Parent/guardian beliefs or opinions about Ebola	○	○	○
Other teachers in your school or district	○	○	○
Your knowledge of Ebola	○	○	○
Your knowledge of how to teach about Ebola	○	○	○

15. Of the factors listed below and any others you listed, what was the single most important factor that determined whether you addressed Ebola in this class? Please describe why that factor was so important.

- Your school administration
- Your district administration
- District/state standards for science instruction
- District/state-administered tests in science
- District/state-administered tests in other subjects
- School/district pacing guides for science
- School/district pacing guides for other subjects
- Availability of time for science instruction in general
- Availability of resources for teaching about Ebola
- Student interest in Ebola
- Appropriateness of the topic of Ebola for the age group I teach
- Parent/guardian beliefs or opinions about Ebola
- Other teachers in your school or district
- Your knowledge of Ebola
- Your knowledge of how to teach about Ebola

16. Practical constraints aside, should teachers at your grade level address Ebola *in their science instruction*? (Note: If you teach multiple grades, please answer for the lowest grade level you teach.)

- Yes, teachers at my grade level ***should*** address Ebola, ***regardless*** of whether it relates to their science curriculum.
- Yes, teachers at my grade level ***should*** address Ebola, ***but only*** if it directly relates to their science curriculum.
- No, teachers at my grade level ***should NOT*** address Ebola, ***regardless*** of whether it relates to their science curriculum.

17. To what extent has each of the following been a *source of information* for you about Ebola? (select one on each line)

	Not at All	Minimal	Moderate	To a Great Extent
Local news station (e.g., NBC4), via radio, TV, or Internet	○	○	○	○
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	○	○	○	○
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	○	○	○	○
TV talk show (e.g., the View, Today Show, Daily Show)	○	○	○	○
Radio talk show	○	○	○	○
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	○	○	○	○
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	○	○	○	○
Popular science magazines (e.g., Scientific American, Discover)	○	○	○	○
Other magazines, whether print or online (e.g., Time, New Yorker)	○	○	○	○
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	○	○	○	○
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	○	○	○	○
Social media (e.g., Facebook, Twitter)	○	○	○	○

17 (continued). To what extent has each of the following been a *source of information* for you about Ebola? (select one on each line)

Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	○	○	○	○
Printed publications from international health organizations (e.g., World Health Organization)	○	○	○	○
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	○	○	○	○
Resources provided by your school district	○	○	○	○
Conversations with health professionals (e.g., nurses, doctors)	○	○	○	○
Conversations with other teachers	○	○	○	○
Conversations with others (i.e., not health professionals or teachers)	○	○	○	○

Respondents who did not address Ebola, skip to Question 19

18. Please rate the *usefulness* of the sources of information about Ebola you explored for *planning your instruction*. (select one on each line)

	Not at All Useful	Minimally Useful	Moderately Useful	Very Useful
Local news station (e.g., NBC4), via radio, TV, or Internet	○	○	○	○
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	○	○	○	○
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	○	○	○	○
TV talk show (e.g., the View, Today Show, Daily Show)	○	○	○	○
Radio talk show	○	○	○	○
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	○	○	○	○
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	○	○	○	○
Popular science magazines (e.g., Scientific American, Discover)	○	○	○	○
Other magazines, whether print or online (e.g., Time, New Yorker)	○	○	○	○
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	○	○	○	○
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	○	○	○	○
Social media (e.g., Facebook, Twitter)	○	○	○	○

18 (continued). Please rate the *usefulness* of the sources of information about Ebola you explored for *planning your instruction*. (select one on each line)

Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	○	○	○	○
Printed publications from international health organizations (e.g., World Health Organization)	○	○	○	○
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	○	○	○	○
Resources provided by your school district	○	○	○	○
Conversations with health professionals (e.g., nurses, doctors)	○	○	○	○
Conversations with other teachers	○	○	○	○
Conversations with others (i.e., not health professionals or teachers)	○	○	○	○

19. Have you actively searched for information about the Ebola virus? (select one)

- ○ Yes
- ○ No, skip to Question 21

20. In which of the following ways have you actively *searched for* information about the Ebola virus? (select all that apply)

- ☐ Internet search engine (e.g., Google, Bing, Yahoo!)
- ☐ Directly through a news organization that reports the news (e.g., newspaper, TV newscast, news website, newswires, news radio)
- ☐ Through websites that are not specifically news related (e.g., Centers for Disease Control, World Health Organization)
- ☐ Social media (e.g., Facebook, Twitter, Instagram)
- ☐ Asking friends or colleagues
- ☐ Asking health professionals
- ☐ Other: _____

21. Did you complete any of the following types of biology/life science courses at the undergraduate or graduate level? (select one on each line)

	Yes	**No**
General/introductory biology/life science courses (for example: Biology I, Introduction to Biology)	○	○
Biology/life science courses beyond the general/introductory level	○	○

22. Which of the following *national professional organizations* are you currently a member of? (select all that apply)

- ☐ AACT (American Association of Chemistry Teachers)
- ☐ AAPT (American Association of Physics Teachers)
- ☐ ACS (American Chemical Society)
- ☐ AFT (American Federation of Teachers)
- ☐ NABT (National Association of Biology Teachers)
- ☐ NAEYC (National Association for the Education of Young Children)
- ☐ NEA (National Education Association)
- ☐ NESTA (National Earth Science Teachers Association)
- ☐ NCTM (National Council of Teachers of Mathematics)
- ☐ NSTA (National Science Teachers Association)
- ☐ Other, please specify: _____
- ☐ None of the above

23. Based on your current knowledge, please indicate whether you think each of the following statements about Ebola is *true or false*. Also, please indicate *how confident you are* in your response. (indicate true or false and confidence level on each line)

	Statement		Confidence in Your Response		
	True	**False**	**Not at All Confident**	**Somewhat Confident**	**Very Confident**
The Ebola virus is only known to infect mammals, including humans, apes, monkeys and bats.	( )	( )	( )	( )	( )
There is currently no vaccine proven safe and effective for preventing the Ebola virus disease in humans.	( )	( )	( )	( )	( )
If a person is infected with the Ebola virus, symptoms generally appear within 24 hours.	( )	( )	( )	( )	( )
People who die from the Ebola virus disease typically die as a result of blood loss.	( )	( )	( )	( )	( )
The Ebola virus is transmitted to humans by only certain mammals, including other humans, bats, apes, and monkeys.	( )	( )	( )	( )	( )
Anyone who is infected with the Ebola virus will develop the Ebola virus disease.	( )	( )	( )	( )	( )
Anyone infected with Ebola will die as a result.	( )	( )	( )	( )	( )
Without specific laboratory tests, diagnosing a person in the early stages of the Ebola virus disease is difficult because the symptoms are similar to other diseases, such as flu, malaria, and typhoid fever.	( )	( )	( )	( )	( )
There is currently no Ebola drug available for treating people infected with the Ebola virus.	( )	( )	( )	( )	( )
Providing Ebola patients with intravenous (IV) fluids and balancing their electrolytes (body salts) can improve their chances of survival.	( )	( )	( )	( )	( )
The Ebola virus is typically transmitted from one human to another by some insects, including mosquitos.	( )	( )	( )	( )	( )
The Ebola virus can be spread through direct contact with blood or other bodily fluids of a person who is sick with the Ebola virus disease.	( )	( )	( )	( )	( )
The Ebola virus is likely to spread from one person to others through the air.	( )	( )	( )	( )	( )

23 (continued). Based on your current knowledge, please indicate whether you think each of the following statements about Ebola is *true or false*. Also, please indicate *how confident you are* in your response. (indicate true or false and confidence level on each line)

The Ebola virus is likely to spread from one person to others through water.	( )	( )	( )	( )	( )
Most people infected in an Ebola outbreak are infected by human-to-human transmission.	( )	( )	( )	( )	( )
People infected with the Ebola virus are unable to transmit it to someone else until they show symptoms (fever, fatigue, etc.).	( )	( )	( )	( )	( )
If put on and taken off properly, protective garments such as gloves, gowns, and masks can be effective at preventing Ebola transmission.	( )	( )	( )	( )	( )
The risk of getting the Ebola virus disease is high when someone goes to a place where people have had Ebola, even if no one with the disease is still there.	( )	( )	( )	( )	( )
Health care procedures in the United States make a widespread Ebola outbreak unlikely.	( )	( )	( )	( )	( )
Controlling Ebola outbreaks where they start (in Africa, for example) is an important step in preventing infections from occurring in the United States.	( )	( )	( )	( )	( )

Thank You!

APPENDIX C
TABLES

Table C-1
Respondents' Perceptions of Usefulness of Sources of Information about Ebola as Substantially Useful: Elementary Grades[†‡*]

	N	Percent of Respondents	
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	98	85	(3.7)
Printed publications from international health organizations (e.g., World Health Organization)	53	64	(6.7)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	66	64	(6.0)
Popular science magazines (e.g., Scientific American, Discover)	69	58	(6.0)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	84	58	(5.4)
Conversations with health professionals (e.g., nurses, doctors)	53	58	(6.8)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	85	51	(5.7)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	73	62	(5.5)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	98	51	(5.1)
Other magazines, whether print or online (e.g., Time, New Yorker)	68	44	(6.1)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	53	55	(6.9)
Conversations with other teachers	37	24	(7.2)
Radio talk show	36	42	(8.3)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	80	35	(5.4)
Local news station (e.g., NBC4), via radio, TV, or Internet	93	34	(5.0)
Resources provided by your school district	14	50	(13.9)
Conversations with others (i.e., not health professionals or teachers)	34	29	(7.9)
Social media (e.g., Facebook, Twitter)	34	12	(5.6)
TV talk show (e.g., the View, Today Show, Daily Show)	35	23	(7.2)

† Includes respondents indicating 3 or 4 on a four-point scale where 1 was "Not at all useful"; 2, "Minimally useful"; 3, "Moderately useful"; and 4, "Very useful."

‡ Only those who indicated devoting class time to Ebola are included in this table. Respondents were shown only those response options they indicated using as a source of information about Ebola at least minimally.

* For ease of comparison, Tables C1–C3 are sorted in the same order, determined by the "Did teach about Ebola" column in Table C–3.

Table C-2
Respondents' Perceptions of Usefulness of Sources of Information about Ebola as Substantially Useful: Middle School Teachers†‡*

	N	Percent of Respondents	
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	325	83	(2.1)
Printed publications from international health organizations (e.g., World Health Organization)	195	63	(3.5)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	214	63	(3.3)
Popular science magazines (e.g., Scientific American, Discover)	258	62	(3.0)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	271	52	(3.0)
Conversations with health professionals (e.g., nurses, doctors)	140	46	(4.2)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	288	51	(3.2)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	251	52	(3.0)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	305	46	(2.9)
Other magazines, whether print or online (e.g., Time, New Yorker)	194	38	(3.5)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	168	48	(3.9)
Conversations with other teachers	143	30	(3.8)
Radio talk show	129	30	(4.1)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	237	42	(3.2)
Local news station (e.g., NBC4), via radio, TV, or Internet	284	31	(2.7)
Resources provided by your school district	42	19	(6.1)
Conversations with others (i.e., not health professionals or teachers)	118	23	(3.9)
Social media (e.g., Facebook, Twitter)	92	18	(4.1)
TV talk show (e.g., the View, Today Show, Daily Show)	113	21	(3.9)

† Includes respondents indicating 3 or 4 on a four-point scale where 1 was "Not at all useful"; 2, "Minimally useful"; 3, "Moderately useful"; and 4, "Very useful."

‡ Only those who indicated devoting class time to Ebola are included in this table. Respondents were shown only those response options they indicated using as a source of information about Ebola at least minimally.

* For ease of comparison, Tables 15–17 are sorted in the same order, determined by the "Did teach about Ebola" column in Table 17.

Table C-3
Respondents' Perceptions of Usefulness of Sources of Information about Ebola as Substantially Useful: High School Teachers†‡*

	N	Percent of Respondents	
Websites from health organizations (e.g., the Centers for Disease Control, National Institutes of Health)	407	85	(1.8)
Printed publications from international health organizations (e.g., World Health Organization)	255	66	(3.0)
Printed publications from federal agencies (e.g., the Centers for Disease Control, National Institutes of Health)	292	65	(2.8)
Popular science magazines (e.g., Scientific American, Discover)	329	65	(2.6)
Newspapers, whether print or online (e.g., NY Times, Boston Globe)	338	54	(2.7)
Conversations with health professionals (e.g., nurses, doctors)	170	51	(3.8)
Online-only sources (e.g., Huffington Post, Yahoo News, AOL)	337	47	(2.9)
Websites from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	305	47	(2.7)
National broadcast TV news program (e.g., NBC Nightly News, CBS Nightly News)	360	41	(2.6)
Other magazines, whether print or online (e.g., Time, New Yorker)	242	39	(3.1)
Printed publications from teacher professional organizations (e.g., National Science Teachers Association, National Association of Biology Teachers)	203	38	(3.4)
Conversations with other teachers	200	34	(3.3)
Radio talk show	170	33	(3.6)
24 hour TV news (e.g., CNN, MSNBC, FOX, BBC)	284	32	(2.8)
Local news station (e.g., NBC4), via radio, TV, or Internet	328	25	(2.4)
Resources provided by your school district	36	22	(7.0)
Conversations with others (i.e., not health professionals or teachers)	139	19	(3.4)
Social media (e.g., Facebook, Twitter)	120	15	(3.3)
TV talk show (e.g., the View, Today Show, Daily Show)	130	12	(2.8)

† Includes respondents indicating 3 or 4 on a four-point scale where 1 was "Not at all useful"; 2, "Minimally useful"; 3, "Moderately useful"; and 4, "Very useful."

‡ Only those who indicated devoting class time to Ebola are included in this table. Respondents were shown only those response options they indicated using as a source of information about Ebola at least minimally.

* For ease of comparison, Tables 15–17 are sorted in the same order, determined by the "Did teach about Ebola" column in Table 17.