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## Consumer Education Needed on Norovirus Prevention and Control: Findings from a Nationally Representative Survey of U.S. Adults

Sheryl C. Cates<sup>1,\*</sup>, Katherine M. Kosa<sup>1</sup>, Jenna E. Brophy<sup>1</sup>, Aron J. Hall<sup>2</sup>, and Angela Fraser<sup>3</sup>

<sup>1</sup>RTI International, 3040 East Cornwallis Road, P.O. Box 12194, Research Triangle Park, North Carolina 27709

<sup>2</sup>Division of Viral Diseases, National Center for Immunization and Respiratory Diseases, Centers for Disease Control and Prevention, 1600 Clifton Road, Atlanta, Georgia 30329

<sup>3</sup>Department of Food, Nutrition, and Packaging Sciences, Clemson University, Clemson, South Carolina 29634, USA

### Abstract

Noroviruses (NoVs) are the leading cause of foodborne disease in the United States; however, little is known about consumers' knowledge of NoV infection and their understanding of how to prevent and control associated illness. A nationally representative Web-enabled panel survey of U.S. adults ( $n = 1,051$ ) was conducted to collect information on consumers' awareness and knowledge of NoVs. Respondents who had heard of NoVs were asked 22 true-and-false questions on the transmission, prevention, and control of NoVs. Forty-seven percent of respondents reported awareness of NoVs, and 85% of respondents had heard of the terms “cruise ship virus,” “the stomach bug,” or “the stomach flu,” which are commonly used to describe NoVs. Of those respondents who had previously heard of NoV or other terms used by consumers to describe NoV ( $n = 948$ ), 36% correctly answered 11 or more of the 22 true-and-false questions, suggesting that consumers have limited knowledge on how to prevent and control NoV infection. Most consumers do not understand that the primary mode of transmission for NoV infection is fecal to oral, and many have the misperception that meat and poultry are sources of NoV infection. There is the need to educate consumers about how to prevent and control NoV infection. Although there is a proliferation of food safety education materials available, most focus on foodborne bacteria rather than viruses. The survey results will be used to revise existing consumer food safety educational materials to include information on NoV prevention and control.

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Norovirus (NoV) outbreaks are most commonly attributed to direct person-to-person contact and contaminated food (8, 24). Foods implicated in NoV outbreaks are contaminated either directly with fecal matter at the source (e.g., shellfish harvested from sewage-contaminated waters or raspberries irrigated with sewage) or during food preparation by infected food handlers at home or away from home (5).

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\* Author for correspondence. Tel: 919-541-6810; Fax: 919-541-6683; scc@rti.org.

Although NoV outbreaks are reported year-round, they peak during cold months (4). NoV infections may induce vomiting, diarrhea, mild fever, abdominal cramping, and nausea. NoV infections are usually mild and short-lived (usually 2 to 3 days) but can be severe and sometimes fatal, especially among older adults and young children, who are more likely to become dehydrated if infected (4). The primary mode of transmission for NoVs is fecal to oral, although infectious vomitus may also play a role in transmission (4). Of all NoV cases, an estimated 30% or more are caused due to direct contact with those already infected (e.g., close contacts and family members) (4).

NoVs can withstand a wide range of temperatures, from freezing to 140uF, and can persist on environmental surfaces even after disinfection (4, 15, 16). Strict personal hygiene and proper disinfection of environmental surfaces is critical for preventing NoV transmission (7). To reduce the risk of foodborne NoV infection, it is recommended that consumers and those who prepare food for others (i) wash their hands with warm soapy water after using the bathroom and before eating or preparing food; (ii) do not prepare food for others if ill with diarrhea; (iii) use water from a safe supply for drinking and washing fresh produce; (iv) obtain shellfish from approved sources; and (v) cook shellfish until the shell opens and the flesh is fully cooked (9).

In the United States, NoVs are responsible for 19 to 21 million total illnesses annually, 56,000 to 71,000 hospitalizations, and 570 to 800 deaths (6). The burden of illness from foodborne NoV is of particular concern. About 48 million people get sick, 128,000 are hospitalized, and 3,000 die each year from foodborne diseases (20, 21); and, among known agents, NoVs are the most common cause of foodborne disease outbreaks (48%) (9) and illnesses (58%) in the United States (21).

Although numerous studies have reported on U.S. consumers' food safety knowledge, attitudes, and practices in general, little is known about U.S. consumers' specific knowledge of NoV prevention and control. As part of the U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture, Norovirus Collaborative for Outreach, Research, and Education (NoroCORE) (<http://norocore.ncsu.edu>), researchers conducted this study to assess consumers' knowledge of NoV illness, prevention, and control.

## Materials And Methods

A nationally representative survey of U.S. adults aged 18 years and older was conducted using a Web-enabled panel survey approach. RTI International's Committee for the Protection of Human Subjects, which serves as RTI's Institutional Review Board, reviewed and approved the study protocol.

### Conceptual model

To better understand how consumers will respond to messages on NoV prevention and control, we used the Health Belief Model as the conceptual framework for the survey instrument (14, 19). This model provides a framework for promoting preventative health behaviors and has been frequently used to guide the development of intervention and educational campaigns (26), including those on foodborne disease prevention (11, 18).

The Health Belief Model suggests that preventative health behavior is influenced by five factors: the perceived barriers to performing the recommended response, the perceived benefits of performing the recommended response, the perceived susceptibility to a health threat, the perceived severity of a health threat, and cues to action (26). Our survey focused on assessing consumers' knowledge of NoV illness, prevention, and control; their perceived personal susceptibility to and severity of NoV infection; and preferred methods for receiving information on food safety (i.e., cues to action).

### Questionnaire

Table 1 presents the survey topics and the source of the survey items. When possible, we used or modified items from existing surveys to develop the instrument. Prior to survey administration, the survey instrument was evaluated using cognitive interviewing techniques (25) with five adults and was subsequently refined based on the interview findings to improve readability and comprehension of the questions.

### Sample

The target population for the survey was noninstitutionalized, English-speaking adults aged 18 and older residing in the United States. The survey sample was selected from KnowledgePanel, a Web-enabled panel developed and maintained by GfK Custom Research (New York, NY). The panel is constructed using a probabilistic address-based sampling method that uses probability-based sampling of addresses from the U.S. Postal Service's Delivery Sequence File. The Web-enabled panel is statistically representative of the U.S. population and is the only such panel that employs address-based sampling for its panel recruitment and maintenance (22). The address-based sampling approach provides coverage of 97% of all U.S. households, including Internet and non-Internet households and cell phone-only households. Individual panelists without computer or Internet access are provided free basic laptops with Internet access in exchange for participating on the panel. Additionally, through a point-based reward system, active panelists receive cash-equivalent checks reflecting their level of participation on the panel.

At the time of sample selection, there were 49,357 active panel members. A sample of 1,666 adult (i.e., aged 18 and older) panel members was randomly selected to receive the NoV survey.

### Survey procedures

The survey was e-mailed to a random sample of 1,666 adult panelists. To maximize the response rate, two e-mail reminders were sent to nonrespondents. The survey was conducted over a 2-week period in April 2013.

### Analysis

Before the study sample was drawn, panel base weights were developed to reflect deviations from an equal probability of selection design (e.g., oversampling of certain states or demographic groups during panel construction). To reduce the effects of nonresponse and noncoverage bias in the overall panel membership, a poststratification adjustment was then applied. Following data collection, a set of study-specific poststratification weights was

constructed so that the study data were adjusted for the study's sample design and for survey nonresponse. These adjustments result in demographic and geographic distributions that align with benchmarks on age, race and ethnicity, education, census region, household income, and Internet access from the March 2013 Current Population Survey. The final weights were trimmed and scaled to sum to the total U.S. noninstitutionalized population aged 18 years and older.

Weighted frequencies were calculated for each survey question. For the true-and-false questions, the proportion of respondents who answered each question correctly and an overall score (i.e., the percentage of correct answers) were computed. Each true-and-false question was also grouped into a content domain (transmission, prevention and control strategies, illness, and food handling). The analysis was conducted using SAS version 9.3 (SAS Institute Inc., Cary, NC). This article presents the results regarding consumer knowledge of NoV illness, prevention, and control, as well as preferred sources for receiving food safety information. The results on perceived susceptibility to and severity of NoV infection are presented separately.

## Results

### Respondent demographic and other characteristics

Of the 1,666 sampled panel members, 1,051 completed the questionnaire, yielding a 63.1% completion rate. Table 2 provides the demographic characteristics of respondents. Among the 1,051 respondents, 52.0% were women and 66.4% were white, non-Hispanic. About half of respondents (54.5%) had at least one individual in the household who was considered at risk for foodborne disease (child 5 years of age or younger, pregnant woman, adult 60 years of age or older, or diagnosed with condition that weakens the immune system) (data not shown in table). Nineteen percent of respondents believed they had contracted a foodborne disease from food prepared at home during their lifetime, and 40.9% of respondents believed they had contracted a foodborne disease from food prepared at a restaurant (data not shown in table).

### Knowledge of foodborne pathogens

Eighty percent of respondents reported that they had heard that contamination of food by microorganisms, such as bacteria or viruses, can cause food poisoning. Respondents were asked if they had heard of seven specific bacteria or viruses that can make one sick. Awareness was highest for *Salmonella* (93.7%), *Escherichia coli* (92.9%), and hepatitis A (81.2%). Lesser-known pathogens included *Listeria* (56.1%), rotaviruses (46.1%), and *Campylobacter* (12.3%). Nearly half of respondents (46.8%) had heard of NoVs, and 84.9% of respondents had heard of the terms “cruise ship virus,” “the stomach bug,” or “the stomach flu,” which are common names used to describe NoVs in the United States.

### Knowledge of NoVs

Of the respondents who reported that they had heard of NoVs or the illness known as the “cruise ship virus,” “stomach bug,” or “stomach flu” ( $n = 948$ ), 22.7% reported that they had read or heard something specific about NoVs in the past 12 months. These respondents were

asked to select what they read or heard from a list of possible topics. Table 3 lists the specific topics respondents had read or heard about NoVs in the past 12 months. Of the respondents who reported they had read or heard something specific about NoVs ( $n = 224$ ), 74.5% reported hearing or reading about an outbreak.

Of the respondents who reported they had heard of NoVs or other terms used by consumers to describe NoVs ( $n = 948$ ), most respondents correctly identified from a list of possible symptoms the five most common symptoms of NoVs: diarrhea (75.8%), vomiting (73.9%), nausea (70.0%), abdominal cramps (68.1%), and fever (43.5%). One-third of respondents correctly identified all five of the most common symptoms, and 56.9% of respondents correctly identified nausea, diarrhea, vomiting, and abdominal cramps but did not identify fever.

Table 4 presents the percentage of respondents who correctly answered each of the 22 true-and-false questions on NoVs. Only respondents who reported they had heard of NoVs or other terms used by consumers to describe NoV ( $n = 948$ ) were asked these questions. Thirteen percent of respondents failed to answer any of the questions correctly. Many respondents were unable to answer the questions and selected “don't know” or left the question blank; 43% of respondents answered “don't know” to (or left blank) 11 or more of the 22 questions. Thirty-six percent of respondents correctly answered 11 or more of the 22 true-and-false questions.

With regard to transmission of NoVs, only 33% of respondents knew that most foodborne outbreaks of NoVs are caused by eating food that was handled or prepared by a person infected with NoV (i.e., answered “true” for statement 6). Less than one-half of respondents correctly identified as true any other statements describing direct personal contact with an infected person or contaminated surface, fecal to oral route, and contact with infectious vomitus as modes of transmission for NoVs (statements 2, 3, 4). Forty percent of respondents did not know that statement 1 is false: “It is safe for people infected with NoV to prepare food for others.”

For true-and-false statements regarding illness, only 18% of respondents knew that NoVs are the most common cause of foodborne-disease outbreaks in the United States (statement 14), and only 16% knew that about half of all outbreaks of food-related illness are caused by NoVs (statement 15), whereas the remaining respondents indicated that these statements were false or did not know the correct answer.

For true-and-false statements regarding food handling, only 14 to 16% of respondents knew that a statement indicating that the best way to prevent NoV infection is to thoroughly cook meat and poultry (statement 19) and a statement associating raw meat and poultry with NoV outbreaks (statement 18) were false, whereas the remaining respondents believed that these statements were true or did not know the correct answer.

With regard to prevention and control of NoVs, only 8% of respondents knew that statement 22 was false, suggesting that most respondents do not know how to properly sanitize a surface contaminated with vomit or feces, which is to use a chlorine bleach solution with a

concentration of 5 to 25 tablespoons (74 to 370 ml) of household bleach per gallon (3.785 liters) of water (7), not 1 tablespoon (15 ml) as specified in the true-and-false statement.

Areas in which respondents demonstrated some knowledge of NoVs (57% of respondents correctly answered the statement) included the following: NoVs affect the general population, not just young children and older adults (statement 8); people can become infected with NoVs many times in their life (statement 9); washing hands with soap and water can prevent the spread of NoVs (statement 20); and household bleach is the best sanitizer for use on NoV-contaminated surfaces (statement 21).

### Reported methods for receiving food safety information

Respondents were asked to identify their two most important sources of food safety information. The most commonly reported sources were as follows: food labels or packaging (40.9%), television and radio (32.8%), healthcare providers (32.8%), and the Internet (29.7%). Of respondents who get food safety information online, 39.4% of respondents rely on search engines (e.g., Google, Yahoo), whereas others search news sites (14.1%), medical sites (9.1%), and government agency sites (6.6%).

### Discussion

The survey findings suggest that U.S. consumers have greater awareness of foodborne bacteria compared with foodborne viruses such as NoVs. Our survey found that less than half of respondents had heard of NoVs, whereas 93 to 94% had heard of the pathogens *E. coli* and *Salmonella*. The U.S. Food and Drug Administration's (FDA's) 2010 Food Safety Survey (23), a random-digit-dialing telephone survey of 4,568 English- or Spanish-speaking noninstitutionalized U.S. adults, also reported high awareness of *E. coli* (90%) and *Salmonella* (94%). The FDA survey did not ask about awareness of NoVs. A Web-enabled survey of 1,212 U.S. adults conducted in 2005 found that awareness of Norwalk virus (term formerly used to refer to NoV) was 23.9% (1). Thus, comparing the results of the 2005 survey with the current survey, awareness of NoVs has nearly doubled from 23.9% in 2005 to 46.8% in 2013. This increase in awareness may be due in part to increased media coverage of NoVs as evidenced by a Google trend analysis (<http://www.google.com/trends/explore#q=norovirus>) (3).

Of the respondents who reported hearing something specific about NoVs in the past 12 months, 75% had read or heard about a specific NoV outbreak, whereas only 18% had read or heard about the cause or source of an outbreak. Furthermore, the majority had not read or heard any information on NoVs in terms of attribution, transmission, prevention, or control, which is substantiated by the results of the true-and-false questions, in which the majority of respondents failed to correctly answer more than half of the questions. Although there is reasonable awareness of the occurrence of NoV outbreaks, it appears that more effort is needed to inform consumers about actions they can take to prevent and control the spread of infection due to NoVs.

The survey identified several important gaps in NoV knowledge among U.S. consumers. First, most respondents were not aware that NoVs are the most common cause of foodborne

disease outbreaks and illness in the United States. Instead, most believed that bacterial pathogens such as *Salmonella* or *E. coli* are the most common cause of foodborne disease outbreaks and illness. Although a myriad of food safety education materials are available, most of these materials focus on foodborne bacteria and very rarely or never provide information on NoVs or other foodborne viruses. A systematic analysis of the USDA Education and Training Materials Database revealed that the word “virus” is only mentioned in 20% of the educational artifacts that are pertinent to general consumers; moreover, only 4% of the educational artifacts written for general consumers specifically mention NoV. However, detailed information on NoVs is found on the CDC's Web site (<http://www.cdc.gov/norovirus>) and on medical Web sites, such as WebMD and mayoclinic.com.

The survey findings suggest that most consumers do not understand that the primary mode of transmission for NoV infection is fecal to oral. Many respondents had the misperception that raw meat and poultry, which are commonly associated with outbreaks of bacterial foodborne illness, are major sources of NoV infection. Although meat and poultry were implicated in 21% of foodborne NoV outbreaks during 2001 to 2008, none of these involved contamination during production (5). NoV contamination of food most often occurs as a result of handling during preparation and service by an infected food worker, not intrinsic contamination of the raw commodity (5). According to Rosenstock (19), cues to action (e.g., education, public health interventions) influence perceived threat, which, in turn, influences behavior by prompting action. Thus, providing education on the consequences of unsafe practices can motivate consumers to follow the recommended safe practices. If consumers and food workers alike had a better understanding of the importance of infected food handlers in foodborne transmission for NoVs and that hand washing could prevent NoV contamination, they might be more conscientious about hand washing. The CDC (<http://www.cdc.gov/handwashing/>), the National Science Foundation Scrub Club (<http://www.scrubclub.org/home.aspx>), and other organizations have campaigns promoting the importance of hand washing to prevent infection.

Surprisingly, for the question on availability of a vaccine for NoV, 50.6% had the misperception that a vaccine is available, and 44.3% correctly answered that a vaccine is not available. For this question, very few respondents (5.1%) selected “don't know,” unlike other questions for which the percentage of “don't know” responses was quite high and ranged from 29.8 to 69.1%. Researchers anticipate that a vaccine for NoV will be available within the next 5 years.

Finally, the survey findings suggest that most consumers have limited knowledge of NoV prevention and control. Respondents were not aware that people infected with NoV may be able to spread the virus for at least 2 weeks, and 40% of respondents did not know that the following statement is false: “It is safe for people infected with NoV to prepare food for others,” thus potentially putting others in their household at risk of illness if they prepare food while ill with NoV infection.

Many respondents knew that NoVs affect the general population, not just young children and older adults; people can become infected with NoVs many times in their life; washing hands with soap and water can prevent the spread of NoVs; and household bleach is the best

sanitizer for NoV-contaminated surfaces. Knowledge of some of this information could potentially be due to a basic understanding of other common viral illnesses such as influenza.

Nearly one-third (29.7%) of the respondents identified the Internet as a preferred method for accessing food safety information. Internet use has increased rapidly; 74% of North Americans used the Internet in 2008, an increase of 130% from 2000 (13). One potential concern with the use of Internet information is source credibility. Therefore, it is important for sources such as government organizations or universities to provide accurate information about NoVs. As part of NoroCORE activities, the survey results will be used to revise existing Web-based consumer food safety educational materials to include accurate information on NoV prevention and control.

Limitations of the study include possible nonresponse bias. For this study, the extent of nonresponse bias was not assessed, although previous research conducted using KnowledgePanel found no association between the type of sample (nonresponders versus respondents) and the survey responses (12). For the true-and-false statements, it is not known to what extent respondents may have consulted other sources to answer the questions, although in the instructions to the survey we included the statements, “We want to gain an understanding of what YOU know about norovirus. Please answer these questions based on your current knowledge. Please do NOT consult additional resources or ask others to help you answer these questions.”

In conclusion, fewer than half of the respondents had heard of NoV, and most did not have a basic understanding of NoV transmission and had limited knowledge on how to prevent and control NoV infection. Although there is a proliferation of food safety education materials available, most focus on foodborne bacteria rather than viruses. As part of NoroCORE, the survey results will be used to revise existing Web-based consumer food safety educational materials to include information on NoV prevention and control.

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**Table 1**  
**Survey topics and sources of items for consumer NoVs survey**

Survey topic	Source
Awareness of specific foodborne pathogens	Cates et al. (2006) (1)
Knowledge of NoV symptoms <sup>a</sup>	Moe (2012) (17)
True-and-false questions on NoV transmission, illness, prevention, and food handling (respondents could respond yes, no, or don't know) <sup>a,b</sup>	Developed items based on information from CDC's Web site on NoV ( <a href="http://www.cdc.gov/NoV">www.cdc.gov/NoV</a> ) and reviewed by epidemiology and food safety experts
Specific information recently read or heard related to NoVs <sup>a</sup>	New survey items
Important sources of food safety information	New survey item
Lifetime foodborne illness experience	Items developed by Moe (2012) (17)
Perceived personal vulnerability for contracting NoV illness <sup>c</sup>	Modified items developed by Clayton and Griffith (2008) (2) and Hammitt and Haninger (2007) (10)
Demographic and other background characteristics	Responses to KnowledgePanel profile questionnaire

<sup>a</sup>Only asked if respondent had indicated they had heard of norovirus (NoV) or the terms "cruise ship virus," "stomach bug," or "stomach flu." The questionnaire indicated that these terms are common names to describe NoVs.

<sup>b</sup>To reduce ordering bias, the order of the true-and-false statements was randomized for each respondent.

<sup>c</sup>The results for questions on perceived personal vulnerability for contracting NoV illness are presented elsewhere.

**Table 2**  
**Demographic characteristics of respondents**

	No.	%
Gender		
Female	552	52.0
Male	499	48.0
Age (yr)		
18–29	153	21.2
30–44	241	25.6
45–59	310	27.3
60+	347	25.8
Education (highest degree received)		
Did not graduate	94	12.5
High school graduate	315	29.7
Some college, no degree	209	20.8
Associate's degree	80	8.0
Bachelor's degree	210	17.2
Master's degree	107	9.2
Professional or doctorate degree	36	2.6
Race/ethnicity		
White, non-Hispanic	763	66.4
Hispanic	104	14.5
Black, non-Hispanic	105	11.7
Other, non-Hispanic	44	6.1
2+ races, non-Hispanic	35	1.3

**Table 3**  
**Topics regarding NoVs that respondents had read or heard about in the past 12 months<sup>a</sup>**

<b>Topic<sup>b</sup></b>	<b>Weighted percentage (%)</b>
An outbreak of NoV	74.5
Symptoms of NoV	39.4
Importance of hand washing to prevent NoV	34.6
How to prevent NoV	25.0
How to clean/disinfect surfaces to prevent spread of NoV	19.3
Cause or source of NoV outbreak	17.5
How to treat NoV	12.2
When to see doctor about diarrhea and/or vomiting	11.2
How to prepare raw meat and poultry safely to prevent NoV	7.5
Specific foods that can cause NoV	4.5
Other	1.4

<sup>a</sup>Results are for respondents who had read or heard something specific about norovirus (NoV) in the past 12 months;  $n = 224$ .

<sup>b</sup>Respondents could select multiple responses.

**Table 4**  
**Weighted percentage of respondents' responses to true-and-false questions on NoVs<sup>a</sup>**

Statement	True	False	Don't know/did not answer
Transmission (7.3% answered all items correctly)			
1. It is safe for people infected with NoV to prepare food for others ( <b>False</b> ).	5.5	<b>59.5</b>	35.0
2. People can become infected with NoV if they come in contact with feces or vomit from an infected person ( <b>True</b> ).	<b>44.9</b>	8.3	46.8
3. People can become infected with NoV if they touch objects and surfaces that have been touched by a person with a NoV infection ( <b>True</b> ).	<b>44.5</b>	11.9	43.6
4. People can become infected with NoV if they have direct personal contact with an infected person ( <b>True</b> ).	<b>43.8</b>	12.7	43.5
5. NoV is <u>not</u> contagious ( <b>False</b> ).	21.5	<b>41.6</b>	36.9
6. Most foodborne outbreaks of NoV are caused by eating food that was handled or prepared by a person infected with NoV ( <b>True</b> ).	<b>32.7</b>	13.0	54.3
7. People infected with NoV may be able to spread NoV for at least 2 weeks even if they feel better ( <b>True</b> ).	<b>23.6</b>	10.0	66.4
Illness (0.8% answered all items correctly)			
8. Only young children and older adults can become infected with NoV, not the general public ( <b>False</b> ).	2.2	<b>68.8</b>	29.0
9. People can become infected with NoV many times in their life ( <b>True</b> ).	<b>60.9</b>	3.3	35.8
10. People can get vaccinated to prevent NoV infection ( <b>False</b> ).	50.6	<b>44.3</b>	5.1
11. Most NoV infections occur on cruise ships ( <b>False</b> ).	15.0	<b>33.0</b>	52.0
12. NoV infection can easily be treated with antibiotics ( <b>False</b> ).	19.0	<b>28.0</b>	53.0
13. Most NoV outbreaks occur in the summer ( <b>False</b> ).	11.3	<b>24.3</b>	64.4
14. NoV is the most common cause of foodborne-disease outbreaks in the United States ( <b>True</b> ).	<b>18.3</b>	15.8	65.9
15. About half of all outbreaks of food-related illness are caused by NoV ( <b>True</b> ).	<b>16.0</b>	14.9	69.1
Food handling (1.6% answered all items correctly)			
16. Any food can become contaminated with NoV ( <b>True</b> ).	<b>42.5</b>	7.1	50.4
17. NoV outbreaks have been commonly linked to contaminated green, leafy vegetables, such as lettuce and spinach ( <b>True</b> ).	<b>25.7</b>	13.1	61.2
18. Raw meat and poultry are commonly involved in NoV outbreaks ( <b>False</b> ).	28.4	<b>15.9</b>	55.7
19. The best way to prevent NoV infections is to cook meat and poultry thoroughly ( <b>False</b> ).	45.1	<b>14.2</b>	40.7
Prevention and control (5.0% answered all items correctly)			
20. Washing your hands with soap and water can prevent the spread of NoV ( <b>True</b> ).	<b>64.5</b>	5.7	29.8
21. Household bleach is the best sanitizer to use on surfaces contaminated with NoV ( <b>True</b> ).	<b>56.7</b>	4.3	39.0
22. To clean up a surface contaminated with vomit or feces, apply a solution of 1 tablespoon (15 ml) of bleach to 1 gallon (3.785 liters) of water and let sit for 10 min ( <b>False</b> ).	44.6	<b>8.1</b>	47.3

<sup>a</sup>Results are for respondents who had heard of norovirus (NoV) or the terms "cruise ship virus," "stomach bug," or "stomach flu," which are names frequently used by consumers to describe NoV.  $n = 948$ . The correct answer is in bold.