

National Assessment of Epidemiologic Capacity in Food Safety Programs: Findings and Recommendations

RESPONDING

INVESTIGATING

IDENTIFYING

CONFIRMING

REPORTING

COUNCIL OF STATE AND TERRITORIAL EPIDEMIOLOGISTS



National Assessment of Epidemiologic Capacity in Food Safety: Findings and Recommendations

September 2002



Council of State and Territorial Epidemiologists

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EXECUTIVE SUMMARY

BACKGROUND

A long-standing goal of both CDC and CSTE has been to build state epidemiology capacity for the detection and prevention of foodborne illness. In 1997, CDC convened an expert panel to draft core competencies report for foodborne outbreak and response, focusing on epidemiologic and laboratory capacity. The panel's report was entitled *Essential Epidemiology and Laboratory Components of a State Foodborne Disease Prevention and Control Program*². As a follow-up to these activities, in 1999 CDC funded CSTE and the Association of Public Health Laboratories (APHL) to conduct assessments of states' foodborne investigation capacity with the goal of providing background data by which to determine the priority areas for building food safety program support. While it is recognized that laboratory and regulatory skills are critical to a well functioning food safety program to prevent and detect foodborne illness, the CSTE assessment was intended to concentrate primarily on the state or large-city health department's foodborne epidemiologic and surveillance capacity.

Currently, national public health systems do not have a measure of progress in place by which to assess the ability of state health departments to detect and prevent foodborne illness. In order measure progress and as a measure for evaluation of financial support, baseline data are needed for state food safety programs.

CSTE surveyed state and territorial health agencies to assess their enteric disease surveillance and epidemiologic response capacity and the capability for dealing with sporadic cases and outbreak of foodborne illness. Further, state and local jurisdictions may find that the survey provides a basis to justify investments in public health infrastructure for improving detection and prevention in foodborne illness including foodborne illness resulting from bioterrorist incidents.

METHODS

In 1997 a workgroup consisting of representatives from CSTE, APHL, CDC, other federal agencies, and state and local health departments convened a meeting that lead to the development of the report entitled *Essential Epidemiology and Laboratory Components of a State Foodborne Disease Prevention and Control Program*. This expert opinion report "summarizes what constitutes adequate epidemiology and laboratory capacity for surveillance and outbreak response at the state and local levels¹." Three years later in February 2001, CSTE convened another expert panel of local, state, and large-city epidemiologist who used the previous report as a blueprint to develop the

² Centers for Disease Control and Prevention. National Center for Infectious Disease. Division of Bacterial and Mycotic Disease. *Essential Epidemiology and Laboratory Components of a State Foodborne Disease Prevention and Control Program*. A report from a collaboration of CDC, CSTE, ASTPHLD, FDA, and NASPHV experts. February 2000.

CSTE food safety epidemiologic questionnaire. The survey questionnaire was revised based on feedback received during six pilot site visits that were conducted in the Spring and Summer of 2001. Beginning in October 2001, the assessment was conducted with state and territorial epidemiologists as a web-based survey. The survey was completed in February 2002.

The survey contained 106 questions divided into five parts:

- Background Information
- Function 1: Epidemiologic Surveillance Capacity to Identify Sporadic and Outbreak-Related Illnesses
- Function 2: Capacity to Investigate and Respond to Outbreaks
- Function 3: Public Health Infrastructure Necessary to Support Food Safety
- Function 4: Legal Authority

In March 2002, the CSTE Food Safety Standards Advisory Committee convened via five conference calls to develop performance/capacity standards based on a subset of questions from this survey. Members of this committee included state and local epidemiologists, a state environmentalist, a state laboratorian, members of CDC staff, and members of CSTE staff. These recommended standards were developed by consensus based on the reported capacity level of food safety programs received from the survey and on the anecdotal expertise and experience of the committee. On April 2, 2002, the performance/capacity standards were e-mailed to all State and Territorial Epidemiologists in an effort to provide valuable information for bioterrorism grant proposal preparation.

The frequency and percentage for each survey question's response were calculated based on the total number of responses to that question.

RESULTS

Forty-seven states and one territory (Guam) were included in the analysis (state response rate 94%). For the purposes of this document, "the respondents" refer to both the state respondents and the territorial respondent, providing a total of 48 respondents for analysis.

Laboratory confirmed cases were reported as being entered in the database by all the respondents. Other cases such as probable/presumptive and suspect were being entered in the database with probable/presumptive cases being entered by thirty-two respondents (68.1%) and suspect cases being entered in the database by twelve respondents (25.5%). Approximately thirty-five respondents reported that they had enough people to both enter (72.9%) and review (70.8%) the data for completeness and consistency during outbreaks. However for sporadic enteric reports, thirty-eight of the respondents (79.2%) reported that they had enough people to enter data while thirty-four respondents (70.8%) reported that they had enough people to review the data for consistency and completeness. Thirty-

six of the respondents (75.0%) reported that outbreak related case reports almost always get reviewed at the state level for consistency and completeness.

Twenty-three of the respondents (47.9%) reported that they do have a dedicated foodborne epidemiologist and 24 of the respondents (50.0%) reported that they do not. Of those 23 respondents reporting that they have a dedicated foodborne disease epidemiologist, 6 (26.1%) reported that they have doctoral-level epidemiologists, 14 (60.9%) reported that they have master-level epidemiologists, and 3 (13.0%) reported that they have bachelor-level professionals.

Twenty-six of the respondents (54.4%) reported that their agency financially supports enteric disease/foodborne illness continuing education and that their foodborne epidemiologists/disease investigation specialists attend the CDC Epidemiology-in-Action or an equivalent training course. Seventeen of the respondents (34.5%) reported that their agency does not financially support enteric disease/foodborne illness continuing education and 5 (10.4%) reported that they were not sure whether their agency provided such support. Twenty of the respondents (41.7%) reported that their foodborne epidemiologists/disease investigation specialists do not attend the CDC Epidemiology-in-Action or an equivalent training course and 2 of the respondents (4.2%) reported that they were not sure.

Regulations were the most common mechanism which legal authority to amend or modify the list of reportable diseases resided. Seventeen of the respondents (34.5%) reported that they have a protocol to guarantee chain of custody for food environmental specimens, while slightly less than half (n=23) reported that they did not.

RECOMMENDED PERFORMANCE/CAPACITY STANDARDS

CSTE encourages the application of disease prevention and health promotion by supporting the use of effective public health surveillance and good epidemiologic practice through training, capacity building and advocating for resources. These performance/capacity standards represent the view of the CSTE Food Safety Advisory Committee. The recommended standards were developed by consensus based on the reported capacity level of food safety programs received from the survey, and on the anecdotal expertise and experience of the committee. These standards should be considered preliminary and will be presented to the full membership of CSTE at its annual meeting in 2003 for the members' review, comment, and final approval.

Function 1: Epidemiologic Surveillance Capacity to Identify Sporadic and Outbreak Related Illnesses

- Food safety programs should keep records of enteric illness complaints from the general public (whether at the state and/or county level).

- Epidemiology offices should have the capability to receive in electronic form information from laboratory results and to maintain a database of such information.
- A database of laboratory confirmed and probable/presumptive cases of enteric illnesses should be maintained.
- Either for outbreak investigations or for sporadic enteric illnesses, food safety programs should have the capacity to complete the following tasks:
 - Enter data
 - Review for consistency and completeness
 - Compare reports to a standardized case definition

If needed, additional capacity can be obtained via surge capacity (surge capacity- the ability to obtain additional staff when needed from another area program, office or department). Epidemiologic surge capacity to respond to outbreaks, natural emergencies or bioterrorist events, should be identified and secured in advance.

- Food safety programs should have a standard complaint form that includes a core set of questions common to all jurisdictions.

Function 2: Capacity to Investigate and Respond to Outbreaks

Leadership

- Food safety programs should have an appointed outbreak team to respond to foodborne illness investigations. The team (s) should include members representing environmental, epidemiology and laboratory or other related fields as needed.
- Every jurisdiction should have a dedicated enteric/foodborne disease epidemiologist. Smaller jurisdictions where an entire full time equivalent is not justified should identify a staff member as the point of contact. At least a Master-level education with specific training and education and/or practical experience in foodborne disease epidemiology is recommended.

Case Ascertainment

- Written case definitions are required for syndromic and outbreak investigations. When possible laboratory confirmation should be part of the definition.
- Food safety programs should have the capacity to conduct active case surveillance as needed within their state in a timely and complete manner.
- Food safety programs should have broadcast fax capability especially with key partners. Key partners may include, hospital emergency rooms, physicians, hospital infection control specialist (s), other departments within the state, and other state health departments.

Data Collection and Management

- Food safety programs should have a standardized, non-pathogen specific questionnaire that can be modified for an outbreak investigation.
- Food safety programs should have the capacity to investigate all identified foodborne outbreaks in a timely and complete manner.

Traceback

- Food safety programs should be able to conduct traceback investigations of items implicated. The epidemiology program and environmental health program should participate or initiate early tracing of initial (common) exposure sources as dictated by local jurisdictional status. The state food safety program outbreak investigation team should conduct tracebacks with appropriate leadership appointed as required by the particular investigation. For example, if the investigation relates to a restaurant, the team leader may be a part of the environmental health program with the laboratory and epidemiology members as support.
- During an outbreak investigation, epidemiologist (s) may or may not routinely accompany environmental health specialist because each circumstance is different but should always be available.

Function 3: Public Health Infrastructure necessary to support food safety

- State food safety programs or when appropriate county or city jurisdictions should have the capability to receive electronic reports from their public health laboratories, respectively, all public health laboratories should have the capability to send electronic reports to all state food safety programs.
- Food safety programs should have the capability to electronically access environmental health inspection reports. In order to access the reports electronically, the reports must exist electronically. It is recommended that responsible programs within state health departments take steps towards developing an electronically accessible format available to all state enteric/foodborne disease epidemiology programs.
- Epidemiologists within food safety program should receive basic training in food facility environmental inspections; in turn, all state environmental health specialists should receive basic training in epidemiology. Training will allow both groups the ability to mutually understand one another's role as well as terminology.

Function 4: Legal Authority

- A regulation or statute that specifically requires the submission of certain enteric isolates to the public health laboratory should exist at all state food safety programs. This is very important in linking isolates from different jurisdictions.
- Training in legal issues (including chain of custody) regarding foodborne investigations should exist for epidemiologists as well as environmental health specialists. Both epidemiologists and environmental health specialists need to have some level of understanding of legal issues, especially regarding the release of information. A statute or regulation that addresses the release of individual facility information from routine inspections or outbreaks should exist at food safety programs.
- Food safety programs should develop a working relationship with their state health officer through their State Epidemiologist, which may lead to a more rapid modification of the list of reportable diseases.
- Food safety programs should have the authority to share information related to foodborne outbreaks (as long as the information does not constitute a breach in medical confidentiality) with federal agencies, e.g. USDA, FDA, EPA, and CDC. Overall, an increase in communication or information sharing should be an effort of both state and federal entities.

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BACKGROUND

This document is a report to CDC of a project supported in part by cooperative agreement U60/CCU007277-10. This particular project was funded through the cooperative agreement by the National Center for Infectious Diseases.

The Clinton Administration initiated the National Food Safety Initiative (NFSI) in 1997 as an effort to decrease the incidence and risks of foodborne illness. The intent of the NFSI focuses on several components, one of which is to enhance the nation's surveillance and response capacity to outbreaks of foodborne illness. Subsequently in 1997 a workgroup of CSTE, APHL, CDC, other federal agencies, and representatives of state and local health departments held a meeting which lead to the development of the *Essential Epidemiology and Laboratory Components of a State Foodborne Disease Prevention and Control Program Report*¹. The report "summarizes what are the adequate constituents of epidemiology and laboratory capacity for surveillance and outbreak response at the state and local levels¹."

Three years later in February 2001, the report was used as a blueprint by a group of experts convened by CSTE to develop the CSTE food safety epidemiologic questionnaire. The expert committee, known as the CSTE Food Safety Standards Advisory Committee, was composed of members from:

- State and local epidemiologists (Colorado; Philadelphia; Los Angeles County, California);
- Environmentalists from Dekalb County, Georgia; a state laboratorian from Rhode Island (representing the Association of Public Health Laboratories);
- Staff from the Centers for Disease Control and Prevention's National Center for Infectious Disease/Division of Bacterial and Mycotic Diseases-Food Safety Office; and
- CSTE staff from its national headquarters.

In 2001 CSTE began an assessment of foodborne illness surveillance and response capacity in state and territorial jurisdictions. This project was coordinated with similar assessments by the National Association of City and County Health Officials (NACCHO) and the Association of Public Health Laboratories (APHL).

The food safety epidemiology project also included the development of minimum performance/capacity standards for state and local enteric/foodborne disease control programs. In March 2002, the CSTE Food Safety Standards Advisory Committee held five conference calls to discuss minimum performance/capacity standards. These final standards from the Advisory Committee were developed by consensus based on the survey results as well as the expertise and experience of committee members. On April 2, 2002, these minimum performance/capacity standards were e-mailed to all State and Territorial Epidemiologists for their consideration. The Advisory Committee's standards are presented in the *Discussion* section of this document.

METHODS

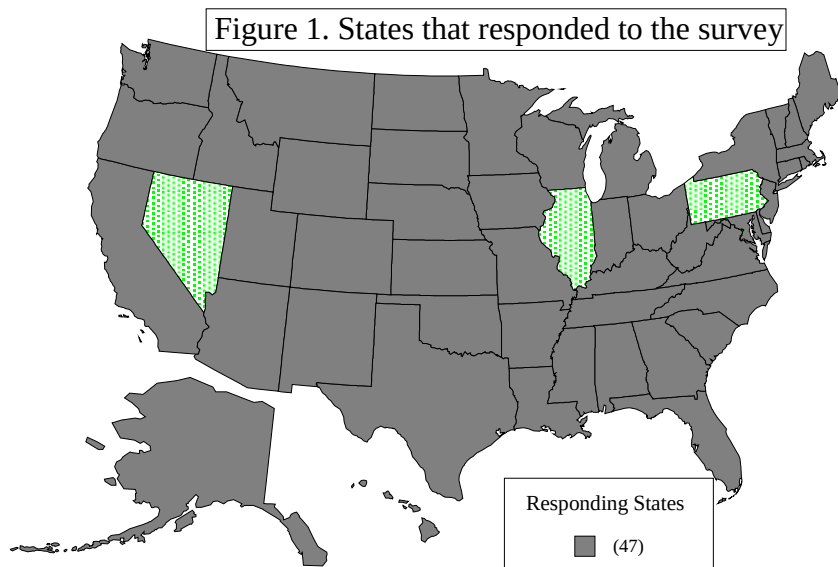
A pilot questionnaire was administered in person in Louisiana, Washington, Arizona, California, Maine, and Florida. Four were administered in mid-April, one in early May, and one in late May of 2001. Feedback received from the pilot study served to revise the assessment before it was administered nationwide.

The questionnaire (see Appendix A) contained 106 questions divided into five parts:

- Background Information
- Function 1: Epidemiologic Surveillance Capacity to Identify Sporadic and Outbreak-Related Illnesses
- Function 2: Capacity to Investigate and Respond to Outbreaks
- Function 3: Public Health Infrastructure Necessary to Support Food Safety
- Function 4: Legal Authority

Beginning in October 2001, the assessment was administered as a web-based survey. A link to the survey was e-mailed to all State and Territorial Epidemiologists. During the ensuing weeks to months, telephone calls and e-mails were made to the health agencies that had not yet responded. The survey was concluded in February 2002.

In this document, the term “food safety programs” refers to foodborne/enteric epidemiology programs. There were 48 respondents (47 states and one territory, Guam), as shown in Figure 1, but not all respondents answered each question. Data in this report are presented for all respondents in aggregate so that the response for any particular state or territory cannot be identified. Percentages are rounded to the nearest integer. The phrasing of questions presented in tables in the Results section has, in some instances, been shortened from the exact words used in the questionnaire; the question number is also provided so that the reader may refer to the questionnaire.



RESULTS

Forty-one of 48 (85.4%) respondents stated the enteric/foodborne disease program resided in the state health agency, 12.5% located the program in the county public health agency, and 2.1% located the program in a district or regional public health agency. In contrast to these responses, only 11 of 46 (23.9%) said the state is the sole entity responsible for enteric disease surveillance and food-related epidemiologic response; 63% responded that local health agencies are responsible within their own jurisdiction, while the state is responsible for jurisdictions not covered by local health agencies or when an outbreak affects multiple jurisdictions.

Function 1: Epidemiologic Surveillance Capacity to Identify Sporadic and Outbreak-Related Illnesses

The responses to questions related to Function 1 are displayed below in Table 1. In the *Essential Epidemiology and Laboratory Components of a State Foodborne Disease Prevention and Control Program Report*, this function is considered necessary core epidemiologic capacity in every jurisdiction, and adequate resources are required to perform specific surveillance functions, such as data collection.

Table 1.					
Q.	Question	N	% Yes	% No	% Not Sure
B1	Reporting sources for confirmed & probable reports of notifiable foodborne enteric diseases:				
	Physician/health care professionals	35	97	3	
	Infection control practitioners	35	97	3	
	Clinical laboratories	35	97	3	
	Public health laboratories	34	94	6	
	Other	22	91	9	
B2	Can Epi office receive electronic lab reports?	48	40	60	
B3	Can clinicians report via web?	48	2	96	2
B4	If there is a standard complaint form for enteric diseases, who developed the form? (List all that apply)	48			
	State health department		48		
	Local health department		2		
	Mixture of state and local health agencies		23		
	CDC		2		
	No standard form is used		19		
	Other		6		
B5	Does your agency keep records of enteric illness complaints from the general public?	48	58	38	4
B6	Reports entered into enteric illness database:	48			
	Laboratory confirmed cases		100		

	Probable/presumptive cases		67		
	Suspect cases		25		
B8	What criteria are used to define a case?	47			
	CDC/CSTE case definition		96		
	Physician diagnosed/reported case		2		
	Other		2		
B9	For sporadic cases, do you have enough people to:	48			
	Enter data		79	19	2
	Review data for consistency and completeness		71	27	2
	Compare to standardized case definition		85	15	
B10	During outbreaks, do you have enough people to:	48			
	Enter data		73	19	8
	Review data for completeness and consistency		71	23	6
	Compare to standardized case definition		90	10	
B11	Do outbreak-related case reports get reviewed for consistency and completeness at the state level?	48			
	Almost always		75		
	Sometimes		25		

Function 2: Capacity to Investigate and Respond to Outbreaks

This function addresses the detection and investigation of enteric/foodborne diseases. Detection and investigation are the methods for linking the case(s) and the implicated source in an outbreak. The Essential Component Report lists ten categories of response functions to increase the ability to rapidly detect, investigate and interrupt chains of transmission. These ten categories of response functions were incorporated in Function 2 of the survey questionnaire. The core outbreak response functions that were reported on during the survey consist of:

1. Leadership and management;
2. Verify of diagnosis;
3. Case ascertainment;
4. Data collection;
5. Data management;
6. Descriptive epidemiology;
7. Study design;
8. Data analysis;
9. Traceback; and
10. Environmental investigation.

The responses to questions related to Function 2 are displayed below in tables 2 through 8 which are grouped by the core outbreak response functions.

Leadership and Management

Table 2.					
Q.	Question	N	% Yes	% No	% Not Sure
C1	Does your agency convene a formal team in response to foodborne outbreaks?	48	71	27	2
C2	Do you have a written agreement, i.e. MOA, between programs represented on outbreak team?	48	27	69	4
C2a	If yes to C2, which programs:	13			
	Laboratory		23		
	Food regulatory		54		
	Other		23		
C3	Do you have a dedicated enteric/foodborne disease epidemiologist at your agency?	48	48	50	2
C3a	If yes to C3, what is their highest level of education	23			
	Doctoral-level		26		
	Masters-level		61		
	Bachelor-level		13		

Verification of diagnosis

More than two-thirds of the respondents reported that they had a definition for foodborne disease outbreak. Please see Appendix B, for a complete verbatim listing of the reported definitions for Question C4a on pages 3-6. Verbatim responses to “Other” for Question C5a are provided in Appendix B on page 6 and for Question C10a on pages 7-8.

Table 3.					
Q.	Question	N	% Yes	% No	% Not Sure
C4	Does program have a definition of foodborne disease outbreak	48	71	27	2
C5	Who in your agency is accountable for foodborne outbreak investigation?	48			
	Enteric/foodborne epidemiologist		35		
	State Epidemiologist		38		
	Local health department		10		
	Other		17		
C6	Of the outbreaks that are not investigated, which factors most limit your ability to investigate? (List all that apply)	48			
	Limited staff		67		
	Delayed notification		83		
	Lack of apparent importance		46		
	Laboratory capacity		21		
	Expertise		13		
	Travel policy constraints		11		

	Political consideration		13		
	Jurisdictional issues		19		
	Statistical support		8		
	Ability to pay overtime		8		
	Other		13		
C7a	Do you routinely collect stool samples for testing?	47	98	2	
C7b	Do you routinely collect vomitus for testing?	47	38	62	
C10	In outbreaks in which unable to submit food specimens, what are the barriers for lab testing?	47			
	Too expensive		4		
	Insufficient expertise at laboratory		6		
	Wrong food collected		32		
	Leftovers not available		98		
	Unnecessary		17		
	No capability for food testing, i.e. lab equipment		11		
	Other		13		

Case ascertainment

Almost 90% of the respondents surveyed reported that they feel there are barriers for conducting more active case surveillance. Verbatim responses to “Other” for Question C14a are provided in Appendix B on page 8 and for Question C15a on page 9.

Table 4.					
Q.	Question	N	% Yes	% No	% Not Sure
C13	Do you feel there are barriers for conducting more active case surveillance?	48	88	8	4
C14	If yes, which of the following reasons apply: (List all that apply)	42			
	Lack of staff		81		
	Low priority		29		
	Too time consuming		60		
	Lack of expertise		12		
	Other		33		
C15	Do you have broadcast fax or email capability to: (List all that apply)	48			
	Hospital emergency rooms		54		
	Physicians		50		
	Hospital infection control specialists		77		
	Other health departments within the state		88		
	Other state health departments		40		
	Other		19		
C16	Do you conduct syndromic surveillance for diarrheal disease?	48	15	77	8

Data collection/management

Twenty-two respondents (47%) reported that their program did not have sufficient statistical support in their enteric disease/foodborne epidemiology program. For the 9 respondents who answered “Yes” to Question C19a, verbatim responses are provided in Appendix B on pages 9-10 (question C19b).

Table 5.					
Q.	Question	N	% Yes	% No	% Not Sure
C17	For <u>non-point</u> source outbreak of <i>Salmonella</i> or <i>E. coli</i> O157:H7, do you have standardized questionnaire that can be modified?	48	75	23	2
C18	For <u>point</u> source outbreak, do you have standardized questionnaire that can be modified?	48	88	13	
C19	In your enteric/foodborne disease epi program, do you have sufficient statistical support?	47	45	47	9
C19a	If no, does the program obtain support elsewhere?	22	41	46	14
C19c	If the program does not obtain support elsewhere, does this compromise your ability to analyze outbreak investigation data?	9			
	Yes		0		
	Occasionally		78		
	Rarely		22		
	Did not answer	1			

Descriptive epidemiology

Seventy-nine percent of respondents reported that they produce formal reports of completed outbreak investigations, but less than half published the data in a scientific journal.

Table 6.					
Q.	Question	N	% Yes	% No	% Not Sure
C23	Do you routinely produce formal reports of completed outbreak investigations?	48	79	17	4
C23a	How do you summarize or publish these data? (List all that apply)	38			
	Scientific journal		42		
	Website		29		
	Newsletter		53		
	Periodic state/county report		66		
	Other		42		
C23b	How frequently do you summarize these data? (List all that apply)	37			

	Never		8		
	Weekly		3		
	Monthly		8		
	Semi-annually		5		
	Quarterly		5		
	Yearly		62		
	Less frequently		8		

Study Design

Table 7.					
Q.	Question	N	% Yes	% No	% Not Sure
C24	Do you have adequate capacity to conduct an analytic epidemiologic investigation, i.e. case-control or cohort studies?	47	64	30	6

Traceback and Environmental Investigation

Of the 24 programs that conduct traceback investigations of implicated items, the verbatim responses to “With whom do they coordinate” for Question C25a are provided in Appendix B on pages 10-11. For the 24 programs that do not conduct traceback investigations, the verbatim response to “Who conducts the traceback investigation” for Question C25b are presented on pages 11-12.

Table 8.					
Q.	Question	N	% Yes	% No	% Not Sure
C25	Does your enteric/foodborne disease epidemiology program conduct traceback investigations of implicated items?	48	50	48	2
C26	Does your program ever conduct traceback investigations prior to those conducted by regulatory officials?	48	29	60	10
C26a	If yes, are the results shared with the environmental investigation and lab programs?	14	93	0	7
C27	During an outbreak investigation, do epidemiologists routinely accompany environmental health specialist(s)?	48	44	50	6

Function 3: Public Health Infrastructure Necessary to Support Food Safety

There were four categories of infrastructure incorporated in Function 3 of the survey questionnaire. The core infrastructure components that were reported in the survey include:

1. Staffing
2. Facilities/equipment/supplies (and includes staffing)
3. Information and communication
4. Education and training

The responses to questions related to Function 3 are displayed below in tables 9 through 12.

Staffing

Table 9 below presents the results of a series of questions on the staffing of the foodborne disease program at the level of government of the reporting program. The numbers in the four right-hand columns indicate the number of programs with a particular number of staff of the type listed in the left-hand column. Part-time staffing was rounded to one FTE.

Table 9. Staffing of foodborne disease program—Question D1

Type	N	No. with 0	No. with 1	No. with 2	No. with >2
M.D.	32	6	17	7	2
D.V.M.	28	9	12	7	0
Ph.D.-level epidemiologist	27	15	11	1	0
Masters-level epidemiologist	32	5	10	6	11
Bachelors-level disease infection specialist	28	13	10	1	4
Public health nurse	29	15	4	3	7
Data manager	24	12	10	2	0
Data entry	27	11	11	3	2
Clerical	29	5	13	6	5

Facilities/Equipment/Supplies

Table 10.

Q.	Question	N	% Yes	% No	% Not Sure
D2	Does the program's computer system receive electronic reports from the public health lab?	48	31	67	2
D3	Does the program's computer system receive	48	25	75	

	electronic reports from private hospitals or reference labs?				
D4	Can the enteric/foodborne disease epi program electronically access environmental health food facilities inspection reports?	48	8	90	2
D5	Is there a 24-hour on-call response mechanism for foodborne disease issues?	48	96	4	
D6	Can you get public health lab support 24/7/365?	48	81	15	4
D7	Can you get environmental health support 24/7/365?	48	60	23	17

Information and Communications

There has been discussion for a long time about whether communication between the public health laboratory and the epidemiology units would increase if they were located in the same building; likewise for environmental health units and epidemiology units.

Table 11.

Q.	Question	N	% Yes	% No	% Not Sure
D8	Are the public health laboratory and epi units co-located in the same building?	48	29	71	
D9	Are the environmental health and epi units co-located in the same building?	48	50	50	
D10	Do the staff in the public health laboratory and the enteric disease epi units report to the same director (program manager)?	48	25	75	
D11	Do the staff in the environmental health and the epi units report to the same director (program manager)?	48	15	85	

Education and Training

Table 12.

Q.	Question	N	% Yes	% No	% Not Sure
E1	Does your agency financially support enteric disease/foodborne illness continuing education?	48	54	35	10
E2	Do your foodborne epidemiologists attend the CDC Epi-in-Action course or an equivalent?	48	54	42	4
E3	Do your epidemiologists receive training in environmental food facility inspections?	48	13	85	2
E4	Do your environmental health specialists receive training in epidemiology?	48	63	33	4

Function 4: Legal Authority

The legal authority to conduct foodborne disease investigations may be explicit in both statutes and regulations, with the statute giving broad authority and the regulation providing details on the actual investigation processes. There were five “No” responses to question F11 (“Do you have a statute/regulation that addresses the release of individual case information...?”). A follow-up question was administered to these respondents: “Do you have a policy that addresses the release of individual case information”. Verbatim responses to this question are provided in Appendix B on page 13 (question F12b).

Table 13.					
Q.	Question	N	% Yes	% No	% Not Sure
F1	Where is your legal authority to conduct foodborne investigations defined? (List all that apply)	47			
	Statute		85		
	Regulation		77		
	Policy		21		
Does your agency have legal authority to:					
F2	Collect reports of suspected enteric diseases?	48	90	4	6
F3	Collect reports of clinical syndromes?	48	71	19	10
F4	Perform on-the-spot emergency environmental inspections?	48	85	4	10
F5	Embargo or condemn food?	47	66	11	23
F6	Close a food service facility?	48	81	15	4
F7	Exclude sick or infected employees from food handling duties?	48	83	13	4
F18	Share information related to foodborne outbreaks with federal agencies, e.g. USDA, FDA, and CDC?	47	83	4	13
F8	Is there a regulation/statute specifically requiring submission of certain enteric isolates to the public health laboratory?	48	54	38	8
F9	Does the department of health have a protocol to guarantee chain of custody for food environmental specimens?	48	35	48	17
F10	Does your program train epidemiologists in legal issues regarding foodborne investigation?	48	10	79	10
F11	Do you have a statute/regulation that addresses the release of individual case information for enteric disease/foodborne illness reports?	48	79	10	10

F13	Do you have a statute/regulation that addresses the release of individual facility information from routine inspection or outbreaks?	47	53	13	34
F13a	Do you have a policy that defines release of individual facility information?	6	33	50	17
F14	Where does the authority to amend or modify the list of reportable diseases reside?	47			
	Statutes		43		
	Regulations		49		
	Policies		9		
F15	Does your agency have an IRB?	48	73	23	4
F16	Does your agency require IRB approval to conduct foodborne disease studies (case-control, cohort)?	48	13	79	8
F17	Does your agency require IRB approval to collect clinical specimens as part of foodborne investigations?	48	2	96	2

Recommended Performance/Capacity Standards

In March 2002 the CSTE Food Safety Advisory Committee developed performance/capacity standards listed below. Selected questions were directly linked to the standards. Following many of the standards is listed the corresponding question in brackets and italics and the percentage responding “Yes”. This permits rapid determination of how many respondents met a particular standard.

Function 1: Epidemiologic Surveillance Capacity to Identify Sporadic and Outbreak Related Illnesses

- Food safety programs should keep records of enteric illness complaints from the general public (whether at the state and/or county level). [*B5: %Yes=58*]
- Epidemiology offices should have the capability to receive in electronic form information from laboratory results and to maintain a database of such information. [*B2: %Yes=40*]
- A database of laboratory confirmed and probable/presumptive cases of enteric illnesses should be maintained. [*B6: %Yes=100 for lab, =67 for probable*]
- Either for outbreak investigations or for sporadic enteric illnesses, food safety programs should have the capacity to complete the following tasks [*B9*]:
 - Enter data [*%Yes=79*]
 - Review for consistency and completeness [*%Yes=71*]
 - Compare reports to a standardized case definition [*%Yes=85*]

If needed, additional capacity can be obtained via surge capacity (surge capacity is defined as the ability to obtain additional staff when needed from another area

- program, office or department). Epidemiologic surge capacity to respond to outbreaks, natural emergencies or bioterrorist events should be identified and secured in advance.
- Food safety programs should have a standard complaint form that includes a core set of questions common to all jurisdictions. [B4: %Yes=81]

Function 2: Capacity to Investigate and Respond to Outbreaks

Leadership

- Food safety programs should have an appointed outbreak team to respond to foodborne illness investigations. [C1: %Yes=71] The team (s) should include members representing environmental, epidemiology and laboratory or other related fields as needed.
- Every jurisdiction should have a dedicated enteric/foodborne disease epidemiologist. [C3: %Yes=48] Smaller jurisdictions where an entire full time equivalent is not justified should identify a staff member as the point of contact. At least a Master's level education with specific training and education and/or practical experience in foodborne disease epidemiology is recommended. [C3a: %Yes=87]

Case Ascertainment

- Written case definitions are required for syndromic [C16: %Yes=15] and outbreak investigations. [C4: %Yes=71] When possible laboratory confirmation should be part of the definition.
- Food safety programs should have the capacity to conduct active case surveillance as needed within their state in a timely and complete manner.
- Food safety programs should have broadcast fax capability especially with key partners. [C15] Key partners may include, hospital emergency rooms [%Yes=54], physicians [%Yes=50], hospital infection control specialist(s) [%Yes=77], other departments within the state [%Yes=88], and other state health departments [%Yes=40].

Data Collection and Management

- Food safety programs should have a standardized, non-pathogen specific questionnaire that can be modified for an outbreak investigation. [C17: %Yes=75]
- Food safety programs should have the capacity to investigate all identified foodborne outbreaks in a timely and complete manner.

Traceback

- Food safety programs should be able to conduct traceback investigations of items implicated. [C25: %Yes=50] The epidemiology program and environmental health program should participate or initiate early tracing of initial (common)

exposure sources as dictated by local jurisdictional status. [C27: %Yes=44]

The state food safety program outbreak investigation team should conduct tracebacks with appropriate leadership appointed as required by the particular investigation. For example, if the investigation relates to a restaurant, the team leader may be a part of the environmental health program with the laboratory and epidemiology members as support.

- During an outbreak investigation, epidemiologist (s) may or may not routinely accompany environmental health specialist because each circumstance is different but should always be available.

Function 3: Public Health Infrastructure necessary to support food safety

- State food safety programs or when appropriate county or city jurisdictions should have the capability to receive electronic reports from their public health laboratories, respectively, all public health laboratories should have the capability to send electronic reports to all state food safety programs. [D2: %Yes=31]
- Food safety programs should have the capability to electronically access environmental health inspection reports. [D4: %Yes=8] In order to access the reports electronically, the reports must exist electronically. It is recommended that responsible programs within state health departments take steps towards developing an electronically accessible format available to all state enteric/foodborne disease epidemiology programs.
- Epidemiologists within food safety program should receive basic training in food facility environmental inspections [E3: %Yes=13]; in turn, all state environmental health specialists should receive basic training in epidemiology. [E4: %Yes=63] Training will allow both groups the ability to mutually understand one another's role as well as terminology.

Function 4: Legal Authority

- A regulation or statute that specifically requires the submission of certain enteric isolates to the public health laboratory should exist at all state food safety programs. This is very important in linking isolates from different jurisdictions. [F8: %Yes=54]
- Training in legal issues (including chain of custody) regarding foodborne investigations should exist for epidemiologists as well as environmental health specialists. [F10: %Yes=10] Both epidemiologists and environmental health specialists need to have some level of understanding of legal issues, especially regarding the release of information. [F13: %Yes=53] A statute or regulation that addresses the release of individual facility information from routine inspections or outbreaks should exist at food safety programs.
- Food safety programs should develop a working relationship with their state health officer through their State Epidemiologist, which may lead to a more rapid modification of the list of reportable diseases.
- Food safety programs should have the authority to share information related to foodborne outbreaks (as long as the information does not constitute a breach in

medical confidentiality) with federal agencies, e.g. USDA, FDA, EPA, and CDC. [F18: %Yes=83] Overall, an increase in communication or information sharing should be an effort of both state and federal entities.

DISCUSSION/CONCLUSION

This report provides baseline data regarding food safety epidemiologic capacity in 47 states and one territory. The data are self-reported and, unfortunately, do not include Nevada, Illinois, Pennsylvania, and Puerto Rico. Nonetheless, the analyses provide a reasonable estimate of the status of the entire country.

An individual jurisdiction may compare its own responses to those of the aggregate as well as to the standards listed above. For purposes of planning and resource allocation, it could also be useful to stratify the respondents by various descriptive features (such as region, population, receipt of Emerging Infections Program funding, etc.) as well as perform cross-tabulations of various responses. For example, of states with multiple high-level epidemiologists in the foodborne disease program, what percentage conduct analytic studies and publish the results in scientific journals? Or there could be an ecologic analysis comparing responses to certain questions with the incidence of notifiable enteric infections (e.g., *Salmonella*, *Shigella*) or foodborne disease outbreaks (using published foodborne disease outbreak surveillance data [MMWR SS-1, March 17, 2000 or MMWR April 19, 2002; 51 (15): 325-9]). Thus, further work will be needed to use these data for comparisons between groupings of states and territories, to make inferences about disease occurrence and programmatic structure, and to evaluate programmatic progress in the future. If the assessment is conducted again in several years, it would be interesting to determine how many and what jurisdictions had changed their capacity and for what reasons.

Key findings of this report are:

- a. Less than half of states receive laboratory reports electronically;
- b. The primary reasons for not investigating foodborne disease outbreaks are limited staff and delayed notification of the outbreak;
- c. The primary reason for not conducting more active case surveillance is lack of staff;
- d. Less than 60% of respondents have broadcast fax or email capability to hospital emergency rooms and to physicians;
- e. Only 64% of respondents have the capacity to conduct analytic epidemiologic investigations;
- f. Less than 100% of respondents can obtain public health laboratory support and environmental health support 24/7/365; and
- g. Only 35% of respondents have a protocol to guarantee chain of custody for food specimens.

Considering that disease surveillance, investigation, and dissemination of information are needed for the daily practice of public health, these findings indicate that many state and local agencies need to make improvements in their infrastructure. This conclusion is consistent with the finding that a relatively large percentage of respondents did not meet

the minimum performance/capacity standards. These standards should be considered preliminary and will be presented to the full membership of CSTE at its annual meeting in 2003 for the members' review, comment, and final approval.

The report is also useful for assessing preparedness for a bioterrorist event. There are several criteria areas for the mitigation of foodborne illness listed in the Bioterrorism (BT) cooperative agreement award notice and grant guidelines³. For example, 70% of the respondents reported having a formal outbreak investigation team, which is an illustration of Focus Area A (Preparedness Planning and Readiness) of the BT grant criteria. Another illustration of the degree that states and territories are following procedures defined in the BT grant guidelines is the finding that more than half of the respondents reported their agency financially supports enteric disease/foodborne illness continuing education and that their foodborne epidemiologists/disease investigation specialists attend the CDC Epidemiology-in-Action or an equivalent training course – an illustration of the BT grant guideline Section G (Education and Training).

The findings of this report do not indicate the quantity of resources needed and precisely where the resources should be directed. Nonetheless, with these results state and local jurisdictions have a sound basis to justify investments in public health infrastructure for improving detection and response to foodborne illness resulting from common errors in food preparation, emerging or reemerging agents or vehicles, or potential bioterrorist incidents.

REFERENCES

1. Centers for Disease Control and Prevention. National Center for Infectious Disease. Division of Bacterial and Mycotic Disease. Essential Epidemiology and Laboratory Components of a State Foodborne Disease Prevention and Control Program. A report from a Workgroup of CDC, CSTE, ASTPHLD, FDA, and NASPHV experts. February 2000.
2. Centers for Disease Control and Prevention. Office of the Director. Grants Management Branch. *Cooperative Agreement U90/CCUXXXXXX-03-X. Public Health Preparedness and Response to Bioterrorism*. Atlanta, Georgia. DHHS. January 2002.

APPENDIX A

CSTE FOOD SAFETY EPIDEMIOLOGIC CAPACITY QUESTIONNAIRE

BACKGROUND

- Please click your response in the circle.

- A1. Which of the following *best* describes the agency within which your local enteric/foodborne disease program resides? (Please click one)
- ☐ State health agency
 - ☐ County public health agency
 - ☐ City or municipal public health agency
 - ☐ Multi-county, district or regional public health agency
 - ☐ Other (specify): _____
- A2. Please indicate which of the 4 categories/models best describes how enteric/foodborne disease surveillance and food-related epidemiologic response are structured in your state.
- ☐ The state is the sole entity responsible for enteric disease surveillance and food related epidemiologic response (i.e., there are no responsible local health departments or regional public health departments or regional public health districts).
 - ☐ The primary entity responsible for epidemiologic responses to food-related diseases is the county health department.
 - ☐ The primary entity responsible for epidemiologic responses to food-related diseases is the regional public health district.
 - ☐ Local Health departments (city and/or county) are responsible for epidemiologic responses to food-related diseases within their jurisdiction while the state is responsible for epidemiologic responses to food-diseases in areas of the state not covered by a functional local health department and/or for disease outbreaks that affect multiple local jurisdictions.
 - ☐ The primary entity responsible for epidemiologic responses to food-related diseases is the big city health department.

Function 1: Epidemiologic Surveillance Capacity to Identify Sporadic and Outbreak – Related Illnesses

- Please click your response in the circle or matrix unless otherwise stated.

B1. From what source does your public health system receive confirmed or probable reports regarding notifiable foodborne enteric diseases?

Reporting Source	Yes	No
Physicians/health care professional		
Infection Control Practitioners (hospitals)		
Clinical Laboratories		
Public Health Laboratories		
Other		

B2. Currently, does your epidemiology office have the ability to receive electronic laboratory reporting of enteric diseases?

- ☐ Yes
☐ No
☐ Not Sure

B3. Can clinicians report diseases via the WEB?

- ☐ Yes
☐ No
☐ Not sure

B4. If a standard state/local health department **complaint form** is used for enteric diseases, who developed the form?

- ☐ State Health Department
☐ Local Health Department
☐ Mix of state-developed and locally
☐ Centers for Disease Control and Prevention
☐ No standard form is used
☐ Other

a. If no standard **complaint form** is used, please specify in the space below why one is not used.

b. If “Other,” is clicked please describe in space below.

B5. Does your agency keep records of enteric illness **complaints** from the general public?

- ☐ Yes
- ☐ Not Sure
- ☐ No

a. If “No,” please explain why not in the space below.

B6. Which of the following reports of enteric disease are entered into your enteric illness database? (Click all that apply)

- ☐ Laboratory Confirmed cases
- ☐ Probable/Presumptive cases
- ☐ Suspect cases
- ☐ Not Sure

B7. Is your program usually able to meet the timeframe within the written policy?

- ☐ Yes
- ☐ No
- ☐ Not sure
- ☐ N/A

B8. What criteria does your agency usually use to define a case?

- ☐ CDC/CSTE case definitions
- ☐ A physician diagnosed/reported case
- ☐ Other
- ☐ N/A

a. If “Other,” please describe how you define a case in the space below.

B9. For sporadic enteric reports, does your enteric/foodborne disease program have enough people to complete the following tasks?

Enter data

- ☐ Yes
- ☐ No
- ☐ Not sure

Review for consistency and completeness

- ☐ Yes
- ☐ No
- ☐ Not sure

Compare to standardized case definition

- ☐ Yes
- ☐ No
- ☐ Not sure

B10. During outbreaks, does your enteric/foodborne disease program have enough people to complete the following tasks?

Enter data

- ☐ Yes
- ☐ No
- ☐ Not sure

Review for completeness and consistency

- ☐ Yes
- ☐ No
- ☐ Not sure

Compare to standardized case definition

- ☐ Yes
- ☐ No
- ☐ Not sure

B11. Do outbreak related case reports get reviewed for consistency and completeness at the state level?

- ☐ Almost always
- ☐ Sometimes
- ☐ Seldom
- ☐ Never

Function 2: Capacity to Investigate and Respond to Outbreaks

- Please click your response in the circle unless otherwise instructed.

Leadership

C1. Does your agency convene a formal outbreak team in response to foodborne outbreaks?

- ☐ Yes
- ☐ No
- ☐ Not sure

C2. Do you have a written agreement, i.e. memorandum of agreement, between the programs represented on your outbreak investigation team?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. If “Yes” to question C2, which programs are represented on the outbreak investigation team?

- ☐ Laboratory
- ☐ Food Regulatory
- ☐ Other (specify): _____

C3. Do you have a dedicated enteric/foodborne disease epidemiologist (s) at your agency?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. If “Yes,” what is their highest level of education?

- ☐ Doctoral-level epidemiologist
 - ☐ Master-level epidemiologist
 - ☐ RN-level epidemiologist
 - ☐ Bachelor-level professional
 - ☐ Other (specify):
-

Verify diagnosis

C4. Does your program have a definition of a foodborne disease outbreak?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. If “Yes,” what is the definition?

C5. Who in your agency is accountable for a foodborne outbreak investigation?

- ☐ Enteric/ Foodborne Epidemiologist
- ☐ Environmental Health Specialist
- ☐ Public Health Laboratory
- ☐ Public Health Nurse
- ☐ State Epidemiologist
- ☐ Medical Director
- ☐ Local Health Department
- ☐ Other

a. If “Other,” please specify who in the space provided below.

C6. Of the outbreaks that are “**not**” investigated, which of the following factors most limits your ability to investigate them (Click all that apply)?

- ☐ Expertise
- ☐ Laboratory capacity
- ☐ Statistical support
- ☐ Limited staff
- ☐ Ability to pay overtime
- ☐ Travel policy constraints
- ☐ Delayed notification
- ☐ Lack of apparent importance
- ☐ Political consideration
- ☐ Jurisdictional issues
- ☐ Other

a. If “Other,” please specify in space below.

C7. Do you routinely make an effort to collect the following samples for testing?

a. Stool

- ☐ Yes
- ☐ No
- ☐ Not sure

b. Vomitus

- ☐ Yes
- ☐ No
- ☐ Not sure

C8. For what proportion of foodborne outbreaks do you receive stool or vomitus specimen from?

Please indicate the approximate percentage: _____

C9. For what proportion of foodborne outbreaks do you collect food for testing?

Please indicate the approximate percentage: _____

C10. In outbreaks in which you are unable to submit food specimens, which of the following are barriers for submitting food for laboratory testing?

- ☐ Too expensive
- ☐ Insufficient expertise in the lab
- ☐ Wrong food collected (e.g., different batch/lot)
- ☐ Leftovers not available
- ☐ Unnecessary
- ☐ No capability for food testing (i.e., lab equipment)
- ☐ Other

a. If “Other,” please specify in space below.

Case Ascertainment

C11. In what proportion of outbreaks, that you investigate, is a formal written case definition developed?

Please indicate the percentage: _____

C12. For what proportion of outbreaks, that you investigate, you attempt to find additional cases through active case surveillance?

Please indicate the percentage: _____

C13. Do you feel that there are barriers for conducting more active case surveillance?

- ☐ Yes
- ☐ No
- ☐ Not sure

C14. If “Yes” to 13 above, please click all that apply.

- ☐ Lack of staff
- ☐ Low priority
- ☐ Lack of expertise
- ☐ Too time consuming
- ☐ Other

a. If “Other,” please specify in space below.

C15. Do you currently have broadcast fax or e-mail capability to any of the following?

(Please click all that apply)

- ☐ Hospital Emergency Rooms
- ☐ Physicians
- ☐ Hospital infection control specialists
- ☐ Other health departments within the state
- ☐ Other state health departments
- ☐ Other

a. If “Other,” please specify in space below.

C16. Do you conduct syndromic surveillance for diarrheal disease?

- ☐ Yes
- ☐ No
- ☐ Not sure

Data Collection/Management

C17. In the context of a non-point source community outbreak of *Salmonella* or *E. coli* O157, do you have a standardized, nonspecific trolling questionnaire available that can be modified for the ongoing outbreak?

- ☐ Yes
- ☐ No
- ☐ Not sure

C18. In the context of a point source outbreak, do you have a standardized template/questionnaire available that can be modified for the ongoing outbreak?

- ☐ Yes
- ☐ No
- ☐ Not sure

19. In your enteric disease/foodborne epidemiology program, do you have sufficient statistical support?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. If “No,” does your program obtain statistical support elsewhere?

- ☐ Yes
- ☐ No
- ☐ Not sure

b. If “Yes,” please specify where in the space provided below?

c. If “No,” does this compromise your ability to analyze outbreak investigation data?

- ☐ Yes
- ☐ Occasionally
- ☐ Rarely
- ☐ No
- ☐ Not sure

C20. Overall, what percentage of all foodborne outbreaks that you identify, are investigated?

Please indicate percentage: _____

C21. Of the outbreaks that are NOT investigated, which of the following factors limit your ability to investigate them:

- ☐ Expertise
- ☐ Laboratory capacity/capability
- ☐ Statistical support
- ☐ Limited number of staff
- ☐ Ability to pay overtime
- ☐ Travel policy constraints
- ☐ Delayed notification

C22. In your opinion, for what percentage of foodborne disease outbreaks do limited data entry capacity compromise your ability to investigate the outbreak?

Please indicate the percentage: _____

Descriptive Epidemiology

C23. Do you routinely produce formal reports of completed outbreak investigations?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. How do you summarize or publish these data (Click all that apply)?

- ☐ Scientific journal
- ☐ Web site
- ☐ Newsletter
- ☐ Periodic state/county report
- ☐ Other

b. If “Other,” please specify in space below.

b. How frequently do you summarize these data? (Click all that apply)

- ☐ Never
- ☐ Weekly
- ☐ Monthly
- ☐ Semi-annually
- ☐ Quarterly
- ☐ Yearly
- ☐ Less frequently

Study Design

C24. Do you have adequate capacity to conduct an analytic epidemiologic investigation, i.e., case control or cohort studies?

- ☐ Yes
- ☐ No
- ☐ Not sure

Traceback

C25. Does your enteric/foodborne disease epidemiology program conduct traceback investigations of implicated food items?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. If “Yes”, with whom do they coordinate?

b. If “No”, then who conducts traceback investigations?

C26. Does your enteric/foodborne disease epidemiology staff ever conduct tracebacks prior to those conducted by regulatory officials?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. If so, are the results shared with the environmental investigation and lab programs?

- ☐ Yes
- ☐ No
- ☐ Not sure

C27. During an outbreak investigation, do epidemiologist (s) routinely accompany environmental health specialist (s)?

- ☐ Yes
- ☐ No
- ☐ Not sure

Function 3: Public Health Infrastructure necessary to support food safety

- Please click your response in the circle or matrix unless otherwise instructed.

D1. Staffing

Please respond to the following questions on staffing for the foodborne disease program. Count staff that work at the level of government for which you are reporting (i.e., if you are reporting for a State, count only those persons who work at the State level. Local jurisdictions should report for their jurisdiction.)

<i>Epidemiology Program</i>	Number Of staff	FTE Cumulative
M.D.		
D.V. M.		
Ph.D.-level Epidemiologist		
Masters-level Epidemiologist		
Bachelors-level Disease Infection Specialist		
Public Health Nurse		
<i>Information Management</i>		
Data Manager		
Data Entry		
Clerical		

Facilities / Equipment / Supplies

D2. Does your program's computer system receive electronic reports from your public health laboratory computer system?

- ☐ Yes
☐ No
☐ Not Sure

- D3. Does your program's data computer system receive electronic reports from private hospitals or reference laboratories?
- ☐ Yes
☐ No
☐ Not Sure
- D4. Can your enteric/foodborne disease epidemiology program electronically access environmental health inspection food facilities reports?
- ☐ Yes
☐ No
☐ Not Sure
- D5. Is there a 24-hour on-call response mechanism for foodborne disease issues?
- ☐ Yes
☐ No
☐ Not Sure
- D6. Can you get public health laboratory support 24/7/365?
- ☐ Yes
☐ No
☐ Not Sure
- D7. Can you get environmental health support 24/7/365?
- ☐ Yes
☐ No
☐ Not Sure

Information and Communications

- D8. Are the public health laboratory and epidemiology units co-located in same building?
- ☐ Yes
☐ No
☐ Not Sure

D9. Are the environmental health and epidemiology units co-located in the same building?

- ☐ Yes
- ☐ No
- ☐ Not Sure

D10. Do the staff in public health laboratory and enteric disease epidemiology units report to the same director (program manager, etc.)?

- ☐ Yes
- ☐ No
- ☐ Not Sure

D11. Do the staff in environmental health and epidemiology units report to the same director (program manager, etc.)?

- ☐ Yes
- ☐ No
- ☐ Not Sure

IV. Education and Training

E1. Does your agency financially support enteric disease/foodborne illness continuing education?

- ☐ Yes
- ☐ No
- ☐ Not sure

E2. Do your foodborne epidemiologists/disease investigation specialists attend the CDC Epidemiology-in-Action or an equivalent training course?

- ☐ Yes
- ☐ No
- ☐ Not sure

E3. Do your epidemiologists receive training in environmental food facility inspections?

- ☐ Yes
- ☐ No
- ☐ Not sure

E4. Do your environmental health specialists receive training in epidemiology?

- ☐ Yes
- ☐ No
- ☐ Not sure

Function 4: Legal Authority

- Please click your response in the circle unless otherwise instructed.

F1. Where is your legal authority to conduct foodborne investigations defined?
(Please click all that apply)

- ☐ Statute
- ☐ Regulation
- ☐ Policy
- ☐ None of the above

F2. Does your agency have legal authority to collect reports of suspected (as opposed to probable or confirmed) enteric diseases?

- ☐ Yes
- ☐ No
- ☐ Not sure

F3. Does your agency have legal authority to collect reports of clinical syndromes?

- ☐ Yes
- ☐ No
- ☐ Not sure

F4. Does your agency have legal authority to perform on-the-spot emergency environmental inspections?

- ☐ Yes
- ☐ No
- ☐ Not sure

F5. Does your agency have legal authority to embargo or condemn food?

- ☐ Yes
- ☐ No
- ☐ Not sure

F6. Does your agency have legal authority to close a food service facility?

- ☐ Yes
- ☐ No
- ☐ Not sure

F7. Does your agency have legal authority to exclude sick or infected employees from food handling duties?

- ☐ Yes
- ☐ No
- ☐ Not sure

F8. Is there a regulation/statute that specifically requires the submission of certain enteric isolates to the public health laboratory?

- ☐ Yes
- ☐ No
- ☐ Not sure

F9. Does the department of health have a protocol to guarantee chain of custody for food environmental specimens?

- ☐ Yes
- ☐ No
- ☐ Not sure

F10. Does your program train epidemiologist (s) in legal issues (including chain of custody) regarding foodborne investigation?

- ☐ Yes
- ☐ No
- ☐ Not sure

F11. Do you have a statute or regulation that addresses the release of individual case information for enteric disease/foodborne illness reports?

- ☐ Yes
- ☐ No
- ☐ Not sure

F12. If "No," do you have a policy that addresses the release of individual case information? (Please Explain)

F13. Do you have a statute or regulation that addresses the release of individual facility information from routine inspection or outbreaks?

- ☐ Yes
- ☐ No
- ☐ Not sure

a. Do you have a policy that defines the release of individual facility information?

- ☐ Yes
- ☐ No
- ☐ Not sure

F14. Where does the legal authority to amend or modify the list of reportable diseases reside?

- ☐ Statutes
- ☐ Regulations
- ☐ Policies
- ☐ None of the above
- ☐ Not sure

F15. Does your agency have an Institutional Review Board (IRB)?

- ☐ Yes
- ☐ No
- ☐ Not sure

F16. Does your agency require IRB approval to conduct foodborne disease studies (case control, cohort)?

- ☐ Yes
- ☐ No
- ☐ Not sure

F17. Does your agency require IRB approval to collect clinical specimens as part of foodborne investigations?

- ☐ Yes
- ☐ No
- ☐ Not sure

F18. Do you have authority to share information related to foodborne outbreaks with federal agencies, e.g., USDA, FDA, and CDC?

- ☐ Yes
- ☐ No
- ☐ Not sure

ADDITIONAL INFORMATION

Respondent information

Respondent Name: _____

Title: _____

Who else participated in completing this survey?

- ☐ Health officer
- ☐ Food program director
- ☐ Other (specify): _____

In case we need to contact your health agency to clarify some of your answers, what is the name and contact information of the person with whom we should speak?

Name: _____

Title: _____

Agency Name: _____

Address: _____

Phone: (_____) _____ - _____

Fax: (_____) _____ - _____

Email: _____

THANK YOU

APPENDIX B

VERBATIM RESPONSES FOR FUNCTIONS

Function 1: Epidemiologic Surveillance Capacity to Identify Sporadic Outbreak-Related Illnesses

B4a. If no standard **complaint form** is used, please specify in the space below why one is not used. (Please Note: The responses below are verbatim as reported during this survey. In some cases respondents identified their state when responding. As a result, the name of the state has been replaced with "my state" to protect the privacy of those respondents.) **n=9**

- *Members of Epi Team ask key questions to determine if this is a sporadic case or is a potential outbreak.*
- *In "my state," complaints from citizens related to suspected foodborne disease are taken by county sanitarians, who investigate. I believe they are recorded on general complain forms. Reports from labs and physicians can be phoned or mailed on a report form that is used for all reportable diseases. We have a surveillance form to be completed by public health nurses on reports of enteric bacteria, which we designed ourselves.*
- *Each county develops their own.*
- *We are beginning to use CDC form, but find that developing our own based on the specifics of the situation is best*
- *Counties have their own forms when people call with complaints of illness after eating at a restaurant. But for foodborne disease surveillance, we have a standard form for each specific disease. The forms are designed by the state health department.*
- *Each local jurisdiction uses their own locally-developed system and forms. Note that a "complaint form" is very different than the form used to investigate a confirmed case, which I presume is the point of your next question.*
- *Little perceived need*
- *What do you mean by complaint form?*
- *State Health has a standard complaint form, County Health each have their own form, sanitarians have their own forms*

B4b. If “Other” is clicked, please describe in space below. Although n=3, of those respondents who use other forms than the ones provided as an option for this survey only 1 described why chose "other". (Please Note: the response below is verbatim as reported during this survey.)

- *I believe that responsibility lies within a different state agency.*

B5a. If “No”, please explain why not in the space below. Although n=18, of those respondents who do not keep records of enteric illness complaints, only 15 explained why. (Please Note: The responses below are verbatim as reported during this survey.)

- *County Health Departments keep a log of enteric complaints and provide monthly reports to the state.*
- *Complaints are taken, reviewed, and saved by LOCAL health departments and are NOT forwarded to the STATE HD (where I work)*
- *No systematic logging of complaints from the public. However, the daily "on-call" person lists the calls and their disposition, and sends that info to all the other persons who are on the schedule, so if multiple calls come in about a given topic, we catch them. We encourage county health departments to log all complaints to help them spot outbreaks*
- *Another state agency is responsible for handling enteric disease complaints.*
- *Such complaints are referred to and responded to by Local Health authorities.*
- *Records/complaints of an individual nature are kept by local health agencies.*
- *Single complaints are referred to Sanitation division, but for complaints of outbreak epi does initiate follow up.*
- *Div of Food & Lodging handles food complaints.*
- *Complaints would be referred to the local health departments who would do an investigation.*
- *Counties do, but not the state.*
- *this question is not clear. We keep records of restaurant complaints and records of disease reports. Not sure what an enteric illness complaint would be.*

- *Because it would not be beneficial - there are too many and investigations would rarely be meaningful.*
- *Individual cases are referred to county health departments for investigation.*
- *Function of local health jurisdictions.*
- *Individual complaint records are kept by the local health departments.*

B8a. If “Other,” please describe how you define a case in the space below. **n=1**
(Please Note: The response below is verbatim as reported during this survey. In some cases respondents identified their state when responding. As a result, the name of the state has been replaced with "my state" to protect the privacy of those respondents.)

- *Generally the CDC/CSTE definitions, but we modify the definitions to meet needs in “my state.”*

Function 2: Capacity to Investigate and Respond to Outbreaks

Verification of Diagnosis

C4a. If “Yes,” what is the definition? **n=34**
(Please Note: The responses below are verbatim as reported during this survey.)

- *two or more cases of gastroenteritis or other disease which were contracted through eating a common meal or food.*
- *An incident in which two or more persons experience a similar illness after ingestion of a common food, and epidemiologic analysis implicates the food item as the source of illness.*
- *CDC/CSTE definition*
- *Outbreak: unexpected #s of cases of an illness occurring in a cluster by time, place, person; 2 or more cases with a common exposure.*
- *Two or more cases of a similar illness resulting from ingestion of a common food.*
- *Two or more related cases*

- *An outbreak is an incident in which two or more persons have the same disease, have similar symptoms, or excrete the same pathogens; and there is a time, place, and/or person association between these persons. A foodborne disease outbreak is one in which a common food has been ingested by such persons. Nevertheless, a single case of suspected botulism, mushroom poisoning, ciguatera or paralytic shellfish poisoning, other rare disease, or a case of a disease that can be definitely related to ingestion of a food, can be considered as an incident of foodborne illness and warrants further investigation.*
- *Two or more cases of disease caused by the same organism traced to a single food, or a single case of a disease that is clearly caused by a specific food, like ciguatera or foodborne botulism*
- *Outbreak means the occurrence in a community or region of an illness clearly in excess of normal expectancy.*
- *We use the CDC definition: the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food.*
- *Two or more people contracting similar illness after exposure to the same food/beverage.*
- *Two or more cases of gastrointestinal illness when epidemiologic evidence implicates a particular, common food as the source of illness.*
- *Two or more persons experiencing a similar illness, usually gastrointestinal, after ingestion of a common food OR different foods in a common place. An outbreak may also be defined as a situation when the observed number of cases unaccountably exceeds the expected number. With certain foodborne illnesses, such as botulism or a chemical poisoning, even one case requires an in-depth epidemiological and environmental investigation.*
- *Two or more cases as long as they are not from the same household OR one case of any sporadic or bioterrorism agent*
- *Same as the CDC definition*
- *An incident in which 2 or more persons experience a similar illness after ingestion of a common food or meal and epidemiologic evaluation implicates the meal or food as the source of illness. Confirmed outbreaks may or may not be laboratory-confirmed.*
- *Two or more cases of potentially related foodborne disease.*

- *"Outbreak means an incidence of a disease or infection significantly exceeding the incidence normally observed in a population of people over a period of time specific to the disease or infection in question.*
- *Two or more cases of potentially related foodborne disease.*
- *CDC def*
- *2 or more cases epidemiologically related*
- *The occurrence of more cases of a foodborne illness than expected (the endemic rate) in a given area or among a specific group of people over a particular period of time. It may be a common source, propagated or a psuedo epidemic.*
- *Acute gastroenteritis involving 2 or more people, from different households, i.e. haven't eaten all meals together. (One case of botulism is considered an outbreak)*
- *The definition used is the CDC/CSTE's "foodborne disease outbreak" definition.*
- *A report of a cluster of 2 or more cases of enteric disease (either culture confirmed or suspected foodborne illness) that is generally among persons that do not all live in the same residence.*
- *Two or more cases from different households that have a common source.*
- *A foodborne illness outbreak means an incident in which two or more unrelated persons experience a similar illness after ingestion of a common food(s); and epidemiological analysis implicates the food(s) as a source of the illness. Foodborne illness disease outbreak includes a single case of illness such as one person ill from botulism or chemical poisoning.*
- *Two or more persons with lab-confirmed gastroenteritis and a common exposure, where an epidemiologic investigation implicates a particular foodborne exposure.*
- *An incident in which 2 or more persons experience a similar illness, usually gastrointestinal, after ingesting a common food, and epidemiologic analysis implicates food as the source of the illness.*
- *A foodborne outbreak is an incident in which two or more persons experience a similar illness after ingestion of a common food which has*

been implicated as a likely source of their illness by epidemiological analysis.

- *See manual-classic epi definitions*
- *Two or more cases of a similar illness thought to be caused by ingestion of a common food*
- *2 or more ill persons w/ epi and/or lab evidence implicating a common food or liquid as the source of the illness*
- *Two or more people experience a similar illness after ingestion of a common food*

C5a. If “Other,” please specify who in the space provided below. **n=8**
(Please Note: The responses below are verbatim as reported during this survey.)

- *no single person is accountable. there is a team approach, including PH nurses, epidemiologists, and environmental specialists as needed.*
- *team effort: foodborne/enteric epidemiologist, public health laboratory, local level: environmental health specialist, public health nurse, county health department epidemiologist,*
- *Primary responsibility lies with the local health department, but most can't do a good job on their own. So, the health district and often the state epidemiologists assist.*
- *Not one person, cannot effectively answer previous question*
- *There are multiple layers of responsibility. Local health depts. are responsible within their jurisdictions, but the state -- both Env. Health & Epidemiology -- are responsible for their respective involvements.*
- *Medical Epidemiologist who shares responsibility for STD/HIV, vaccine preventable disease, and general communicable disease control*
- *Epidemiology Field Unit (responsible for foodborne, waterborne, vaccine preventable, resp, bioterrorism, etc.)*
- *Field Epidemiologist*

C6a. If “Other,” please specify in space below. **n=6**

(Please Note: The responses below are verbatim as reported during this survey.)

- *uncooperative patients: groups who report the outbreak, but then refuse to participate in the investigation by not answering questions*
- *Lack of cooperation on part of patients, other investigatory participants. Food samples gone.*
- *Private individuals refuse to cooperate with an investigation. 2. Local health department declines to investigate the outbreak.*
- *Persons who became ill are unable to provide a complete guest list, and unwillingness of guests to participate in the investigation.*
- *Most outbreaks are investigated on a local level. State assists when requested.*
- *We do consider the likelihood that we will be able to successfully investigate- biggest issue being small sample size problems; also have to weigh the possible public health benefit of investigating a particular situation vs. the amount of staff time involved (eg, we seldom investigate small household outbreaks that are likely to have been caused by poor food handling within the home.*

C10a. If “Other,” please specify in space below. **n=6**

(Please Note: The responses below are verbatim as reported during this survey. In some cases respondents identified their state when responding. As a result, the name of the state has been replaced with "my state" to protect the privacy of those respondents.)

- *Usual problem is that the local environmentalist collects a dozen foods, most of them unlikely, and submits them to the lab to be tested for "everything". We in epidemiology are trying to correct this.*
- *If no etiologic agent identified and no stool submitted, no food will be tested*
- *“My State” lab does not perform testing for Norwalk-like virus.*
- *For Norwalk outbreaks, we have no capacity to test food for NLV (the technology is not widely available anywhere).*
- *Lab has criteria to accept food due to time and money constraints*

- *Laboratory does not do testing if viral agent suspected.*

Case Ascertainment

C14a. If “Other,” please specify in space below. Although **n=14**, of those respondents who responded "other," only 13 chose to specify.

(Please Note: The responses below are verbatim as reported during this survey.)

- *local ers may not cooperate, patients may not give specimen*
- *Local health departments are often resistant--their first impulse is often to sweep the outbreak under the rug*
- *In point source outbreak with no secondary cases, no reason*
- *As an example, sometimes it is hard to get the cooperation of the parties involved such as restaurant managers, etc. Also, the quality of info available also makes it difficult. Although credit card receipts are alot better these days, the card holder's name is usually printed on it.*
- *Political considerations, reluctance on part of restaurants, public.*
- *Limited infrastructure, no local health departments, limited resources*
- *Restaurant inability to provide names of recent patrons*
- *Others possibly exposed are no longer available for testing (tourists, traveling through, etc.)*
- *Sometimes restaurants are reluctant to give names of patrons. Once we get names of patrons of a particular restaurant, we don't always find the right telephone numbers.*
- *lack of provider participation in reporting,*
- *Inadequate funds, especially for personnel.*
- *Public not interested in cooperating with health dept or are unavailable by phone etc..*
- *Cooperation among exposed populations*

C15a. If “Other,” please specify in space below. **n=9**

(Please Note: The responses below are verbatim as reported during this survey. In some cases respondents identified their state when responding. As a result, the name of the state has been replaced with "my state" to protect the privacy of those respondents.)

- *We have the fax machine, and are in the process of getting the numbers for hospitals, ICP's, and physicians, with much help from anthrax publicity.*
- *Clinics*
- *Disaster Planners and Infectious Disease Physicians*
- *State Hospital Association, State medical societies, various emergency management committees and contacts*
- *“My state” clinical laboratories*
- *Hospital labs*
- *Hospital and other clinical laboratories.*
- *Community Health Centers, and Infectious Disease Specialists*
- *We will have broadcast fax capability w/in the next few months with hosp. ER's etc. The equipment is being purchased now*

Data Collection and Management**C19b.** If “Yes,” please specify where in the space provided below. **n=9**

Epidemiology. (Please Note: The responses below are verbatim as reported during this survey.)

- *PhD statistician with the state university provides statistical consultation/support as needed*
- *ad hoc assistance from CDC*
- *Other Bureau of Health statistical support*
- *State Epidemiologist's office*

- *CDC consults*
- *health statistics section of state health department*
- *CDC*
- *other health dept programs (e.g., chronic disease epi or health statistics)*
- *EIS*

Traceback

C25a. If “Yes,” with whom do they coordinate? n=24

(Please Note: The responses below are verbatim as reported during this survey. In some cases respondents identified their state when responding. As a result, the name of the state has been replaced with "my state" to protect the privacy of those respondents.)

- *state/local health depts, epi and consumer protection; fda; usda*
- *“My state” Department of Agriculture and Consumer Services (DACS) Food Safety Program, DACS Molluscan Shellfish Program, FDA, USDA*
- *“My state” Department of Agriculture, FDA, USDA, CDC.*
- *USFDA if applicable.*
- *Coordinate with Sanitation, State Food and Drug inspectors, Federal Food and Drug inspectors, and/or Federal USDA inspectors.*
- *USDA, FDA*
- *CDC, FDA, USDA State and local health officials*
- *The Division of Food and Drugs within the “my state” Dept. of Public Health usually takes the lead role in the trace back.*
- *FDA, USDA, County jurisdictions, Other State Agencies*
- *State Department of Agriculture USDA FDA State Department of Marine Resources State Division of Health and Human Services*
- *FDA, State Dept. of Agriculture, USDA, food supplier, etc..*
- *State's Food & Consumer Safety workers FDA*

- *State Agriculture/USDA/FDA as appropriate*
- *Dept of Ag USDA FDA*
- *state food regulatory program*
- *FDA, USDA, Food and Milk Program (within the “my state” Dept. of Health and Senior Services).*
- *“My state” Environment Department, USDA, FDA, retailers, others as identified*
- *The Department of Agriculture, USDA, FDA.*
- *With the Office of Food Protection who collaborates with FDA, USDA, and any other states involved.*
- *State Food and Drug, FDA*
- *UT Dept. of Agriculture and Food, Local Health Dept.*
- *Our Food Safety Program in Environmental Health*
- *Usually the state dept. of agriculture, sometimes FDA or USDA*
- *Public Health Sanitation Local Health departments*

C25b. If “No,” then who conducts traceback investigations? **n=23**

(Please Note: The responses below are verbatim as reported during this survey. In some cases respondents identified their state when responding. As a result, the name of the state has been replaced with "my state" to protect the privacy of those respondents.)

- *Department of Environmental Conservation sanitarians*
- *The Food Division within the Bureau of Environmental Services.*
- *FDA, USDA*
- *The Dept of Environmental Health at the state-level is responsible for traceback investigations.*
- *State Food and Drug Branch does tracebacks*

- *State Food Protection Program and/or local health departments.*
- *Food Protection Program*
- *Another state agency - department of inspections and appeals - and their local contracts*
- *Food Safety Program in the Division of Health*
- *Bureau of Consumer Health*
- *Nobody*
- *“My state” Department of Agriculture*
- *“My state” Department of Agriculture USDA FDA*
- *Food & Lodging*
- *“My state” Ag and Meat, along with USDA*
- *“My state” Department of Agriculture, USDA, FDA, local health departments, Ohio Department of Health food sanitarians*
- *Consumer Protection Division of the Oklahoma State Dept of Health.*
- *Health Dept. Food Protection Division, or regional FDA or USDA depending on the problem*
- *Health Protection Office within the Department of Health*
- *If necessary it would be done with FDA/USDA*
- *Not health dept jurisdiction, is under FDA or Dept of Agriculture*
- *We would work together with our state sanitarians and the appropriate federal agency*
- *Department of Agriculture*

Function 4: Legal Authority

F12. If “No,” do you have a policy that addresses the release of individual case information? **n=5**
(Please Note: The responses below are verbatim as reported during this survey.)

- *info is released only with authorized, legal consent*
- *Individual identifiers such as name, address, etc. are not released.*
- *All case information is considered private medical information.*
- *In cases of "public health emergency" statute permits any necessary suspension of confidentiality safeguards. De facto policy regarding FSW's in an outbreak setting, is to share identifying information as necessary. However, there is no formal written policy.*
- *Yes. No personally-identifiable information is released, except at the written request of the person to whom it pertains.*