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RESEARCH REPORT

Evaluation of the Council to Improve Foodborne Outbreak Response (CIFOR) Guidelines for Foodborne Disease Outbreak Response and Associated Toolkit

Jeanne S. Ringel • Christina Y. Huang • Kristy Gonzalez Morganti

Sponsored by the Council of State and Territorial Epidemiologists

RAND HEALTH

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Preface

This report assesses the distribution and use of the Council to Improve Foodborne Outbreak Response's (CIFOR's) *Guidelines for Foodborne Disease Outbreak Response* and associated Toolkit. These resources are designed to guide and support improvements in foodborne disease outbreak response capabilities at the state and local level. The results of this study provide important information about how the dissemination, content, and structure of the *Guidelines* and Toolkit can be changed to facilitate its use and further improve state and local foodborne outbreak response capabilities.

This work was prepared for the Council of State and Territorial Epidemiologists (CSTE). This research was conducted within RAND Health's Health Promotion and Disease Prevention Program. RAND Health is a division of the RAND Corporation. A profile of RAND Health, abstracts of its publications, and ordering information can be found at http://www.rand.org/health. More information about RAND is available at our website at http://www.rand.org.

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Summary

Introduction

Foodborne disease is a significant public health problem. Estimates from the U.S. Centers for Disease Control and Prevention (CDC) indicate that, in 2011, approximately one in six individuals in the United States was affected by a foodborne disease, resulting in 127,839 hospitalizations and roughly 3,000 deaths (Centers for Disease Control and Prevention, 2011; Scallan et al., 2011).

With reducing the burden of foodborne disease among its primary goals, CIFOR developed the *Guidelines for Foodborne Outbreak Response* (2009) and a companion Toolkit (2011) to facilitate improvements in foodborne disease outbreak detection and response at the state and local levels.

The objective of this study is to assess the distribution and use of the CIFOR *Guidelines* and Toolkit to determine whether and to what extent they are reaching their intended users and achieving their intended goals. Findings from this evaluation provide important information about how the dissemination, content, and structure of the *Guidelines* and Toolkit can be changed to facilitate their use and further improve foodborne outbreak response.

Methods

The RAND team used a mixed-method approach to evaluate the distribution and use of the CIFOR *Guidelines* and Toolkit. Data were collected through a survey of intended users from public health, environmental health, food regulatory agencies, and public health laboratories to quantify the reach and use of the CIFOR *Guidelines* and Toolkit. The survey was conducted among a convenience sample and thus may not be representative of the full population of intended users of the CIFOR resources. However, no list of intended users exists, and the CIFOR member organizations made every effort to distribute the survey link to their membership. The resulting survey sample included respondents from across key job functions and different levels of government.

Additional information was collected through in-depth interviews with staff from local jurisdictions and state agencies who were familiar with the CIFOR *Guidelines* and Toolkit. The sample of key informants for the interviews was developed purposively and again may not be representative of all users of the CIFOR resources. However, the interview sample was selected to represent diverse job functions, geographies, and governance structures, as well as various levels of government, making it possible to further explore differences in the training and utilization of these resources.

The study's qualitative approach focuses on harnessing the knowledge of stakeholders to gain more in-depth information, including examples of how the *Guidelines* and Toolkit have been used, what facilitates (or hinders) their use, and what improvements might be made.

Results

The results from our survey of intended users of the CIFOR resources and our interviews with key informants from state agencies and local jurisdictions that have experience using CIFOR resources provides important information about the awareness and use of these resources. The survey respondents were distributed across a range of jurisdictional levels and primary job functions (e.g., epidemiologists, laboratorians, regulators) and thus provided varied perspectives from the intended users of the *Guidelines* and Toolkit. Our interviewees were distributed across a range of geographic locations and types of governance and thus provided a more detailed perspective from a sample of actual users of the *Guidelines* and Toolkit.

On the whole, there is strong awareness of the CIFOR resources among intended users. Among our survey respondents, 80 percent reported being familiar with the *Guidelines* and 65 percent with the Toolkit. While high across all job functions, there is still some variation in awareness, suggesting that the methods of dissemination may have been more effective for some job functions than others. Our survey results also show that intended users at the city level are disproportionately unaware of the CIFOR resources, suggesting that it may be beneficial to target future dissemination efforts toward city-level jurisdictions. Approximately 18 percent of intended users were aware of the *Guidelines* but not the Toolkit. While this disconnect may be explained partly by the fact that the *Guidelines* have been available longer, it may also suggest that the methods used to disseminate the *Guidelines* were more effective than those for the Toolkit. Given the Toolkit's importance, as reported by the interviewees, for identifying areas for improvement and making changes, additional dissemination methods for the Toolkit may be an area to explore.

Both survey respondents and interviewees who had used the *Guidelines* and Toolkit found the resources very helpful. They reported that the documents are well organized and easy to navigate, and that they also find the content to be very useful. The interviewees reported that the *Guidelines* are a valuable reference but that the amount of information included can be

overwhelming. Additionally, training on the CIFOR Toolkit was reported as facilitating its use to identify areas for improvement and implement recommendations.

Survey respondents found the Toolkit Focus Areas and the *Guidelines* chapters to be highly relevant to their work. Many of the respondents reported that they have either implemented or are planning to implement recommendations from the CIFOR resources. Among survey respondents who reported using the Toolkit, the highest rates of planned or actual implementation were for Relationships (Focus Area 1), at 59 percent, and Communications (Focus Area 3), at 58 percent. Among the guidelines, the highest rates were seen for Planning and Preparation (Chapter 3), at 46 percent, and Investigation (Chapter 5), at 41 percent. In addition, approximately one-quarter to one-third of respondents reported that at least some of the recommendations across the Focus Areas and chapters were already in place. The lowest rates of planned or actual implementation were seen for Food Recall (Focus Area 11), at 22 percent, and Legal Considerations (Chapter 9), at 21 percent.

The ease of implementation is one factor that may affect choices about which recommendations to focus on. The survey results indicate that, overall, users of the CIFOR resources found the recommendations easy to implement. The notable exceptions include the set of recommendations related to performance indicators in the *Guidelines*, which 33 percent reported were difficult to implement, and recommendations related to food recall in the Toolkit, which 37 percent reported were difficult to implement. These results suggest that it may be useful to review the content of the Performance Indicators chapter and the Food Recall Focus Area and consider developing tools or resources that could facilitate implementation in these areas.

While all of the sites represented by our interviewees have used the CIFOR resources, there is substantial variation in their approaches and the extent of their use. In some sites, very little has been done (e.g., held a meeting to discuss the resources), while in others the *Guidelines* and Toolkit are used on an ongoing basis (e.g., in quarterly meetings) to improve different areas of response. Our survey and interview results identify several facilitators and barriers that help explain the overall levels of use and some of the variation between jurisdictions. Not surprisingly, given the economic situation of state and local governments, the biggest barrier reported by survey and interview respondents is not having adequate resources (e.g., time, money, and personnel) to carry out the recommended activities. Consequently, many of the recommendations identified by the interviewees were intended to address the resource problem, at least to some extent. For example, many respondents were interested in having greater access to templates and forms that could be adapted to their jurisdiction. They also wanted to see examples of how other jurisdictions had used the resources and implemented the recommendations. The underlying motivation for these suggestions was to make it easier to implement recommendations and save time and effort by not having to "reinvent the wheel."

Another important factor influencing the implementation of recommendations is the level of interest in foodborne disease outbreak response within an agency. Minimal interest can be a

significant barrier to implementation. This suggests that it may be useful to think about ways to communicate the importance of foodborne disease outbreak response more effectively and to develop tools or resources for staff to generate interest in jurisdictions where interest is low.

Once over the hurdle of implementation, many survey respondents reported noticeable improvements in their jurisdiction's foodborne disease outbreak response. Improvement in the timeliness of the response is the most commonly reported change by survey respondents (26 percent of respondents that implemented at least one recommendation reported an improvement in timeliness). Most interviewees reported that at least some changes have been made as a result of using the resources. Even in places that reported little use beyond an initial in-person training, improvements were reported in communication and in overall understanding of the foodborne disease outbreak response (e.g., roles and responsibilities of all parties). In places where the resources have been used to a greater extent, the most commonly reported changes included improvements in protocols, communication (e.g., the development of contact lists), after action reporting, and performance indicators. While there is a general sense that foodborne disease outbreak response has improved in a variety of ways as a result of the changes made, very few interviewees could point to measured improvements in performance indicators. Most of the jurisdictions and agencies are still in the process of identifying and implementing appropriate performance indicators for monitoring these changes.

Interview respondents offered a number of recommendations for facilitating the use of the CIFOR resources. In addition to the desire for additional tools and resources to assist with implementation, the recommendations addressed the content and organization of the resources, as well as their alignment with other key documents. While most interviewees felt the documents were comprehensive and had few suggestions for significant changes, three additional topics for inclusion came up in several interviews: (1) working with industry, (2) data systems and informatics, and (3) more detail on laboratory functions. Interviewees frequently noted the lengthiness of both the *Guidelines* and the Toolkit and asked for condensed summary materials. The most common suggestion for improving the *Guidelines* was to create a smaller version (e.g., pocket guide, checklist) of the document. Finally, many jurisdictions and agencies noted challenges in conforming to numerous standards and requirements and recommended that the *Guidelines* help users navigate the landscape. In particular, interviewees indicated the importance of common performance indicators across different grant programs, or a comparison for when indicators do not overlap.

Conclusions

Together, the results from the survey and the interviews suggest that the goals of the CIFOR *Guidelines* and Toolkit are being met. Respondents reported that the resources and the corresponding trainings helped them to

- **better understand current foodborne disease outbreak response activities in their agency/jurisdiction:** In particular, interview respondents noted that working through the Toolkit Focus Areas with all of their partners (i.e., environmental health, epidemiology, laboratory) helped them to understand the foodborne disease outbreak response system as a whole, as well as how their specific activities fit in.
- **become more familiar with recommended practices:** Many interview respondents noted that the *Guidelines*, in particular, was a key resource for them. They use it as a reference manual for themselves and a training document for new staff.
- **identify specific CIFOR recommendations and activities that will improve the performance of their agency/jurisdiction during future foodborne disease outbreak responses and make plans to implement those activities:** Through the use of the Toolkit, both survey and interview respondents reported identifying and implementing a set of recommended changes (e.g., improved protocols, updated contact lists).

Moreover, the results provide an early indication that the CIFOR resources are achieving the goal of improving foodborne disease outbreak response. There is a general sense among those that have used the resources that the resulting changes have improved foodborne disease outbreak response. Very few, however, were able to document changes with performance indicators. Fortunately, many state and local agencies report that they are in the process of developing and tracking such indicators. As more state and local jurisdictions collect and track this information, the strength of the evidence base supporting foodborne disease outbreak response can only improve and it will be possible to identify those recommendations and specific activities that generate the biggest improvements in foodborne disease outbreak response.

Finally, the results provide important information to CIFOR about how the resources could be revised and/or expanded to further increase their utility. The resources are viewed as comprehensive, and very few people identified additional topics that should be covered. Many respondents noted, however, that additional tools and resources to support their use of the *Guidelines* and Toolkit would be extremely helpful. If additional resources were available to facilitate implementation, the impact of the CIFOR resources on foodborne disease outbreak response could be even greater.

Acknowledgments

The authors would like to thank the CIFOR Evaluation Workgroup for providing valuable input into the design of the study and feedback on the results. We also wish to thank Lauren Rosenberg and Dhara Patel with the Council of State and Territorial Epidemiologists for their support and input. In addition, we thank the state and local practitioners that responded to our survey or participated in our key informant interviews. Their contributions were extremely valuable and we appreciate their willingness to share their time and their perspectives. Finally, we have benefitted from the comments of Julia Peek and Jeffrey Wasserman, who reviewed a draft of this report. Of course, any errors or omissions are the sole responsibility of the authors.

Abbreviations

AFDO	Association of Food and Drug Officials
APHL	Association of Public Health Laboratories
ASTHO	Association of State and Territorial Health Officials
CDC	Centers for Disease Control and Prevention
CSTE	Council of State and Territorial Epidemiologists
CIFOR	Council to Improve Foodborne Outbreak Response
EHS	environmental health scientists
FDA	Food and Drug Administration
FoodCORE	Foodborne Diseases Centers for Outbreak Response Enhancement
NACCHO	National Association of County and City Health Officials
NEHA	National Environmental Health Association
PFGE	pulsed-field gel electrophoresis

1. Introduction

Background

Foodborne disease is a significant public health problem. Estimates from the U.S. Centers for Disease Control and Prevention (CDC) indicate that, in 2011, approximately one in six individuals in the United States was affected by a foodborne disease, resulting in 127,839 hospitalizations and roughly 3,000 deaths (Centers for Disease Control and prevention, 2011; Scallan et al., 2011).

With reducing the burden of foodborne disease among its primary goals, the multidisciplinary Council to Improve Foodborne Outbreak Response (CIFOR) developed the *Guidelines for Foodborne Outbreak Response* (Council to Improve Foodborne Outbreak Response, 2009) and a companion Toolkit (Council to Improve Foodborne Outbreak Response, 2011) to enhance the ability of states and communities to detect and respond to an outbreak of foodborne disease. As stated in the Toolkit Overview, "the goals of the CIFOR *Guidelines* Toolkit are to help public health, environmental health, and food regulatory agencies and laboratories

- better understand current foodborne disease outbreak response activities in their agency/jurisdiction
- become more familiar with the CIFOR *Guidelines* and recommended practices
- identify specific CIFOR recommendations and activities that will improve the performance of an agency/jurisdiction during future foodborne disease outbreak responses, and make plans to implement those activities" (Council to Improve Foodborne Outbreak Response, undated).[1]

Objective

The objective of this study is to evaluate the distribution and use of the CIFOR *Guidelines* and Toolkit to determine whether and to what extent the materials are achieving these goals. Our evaluation findings provide important information about how the dissemination, content, and structure of the *Guidelines* and Toolkit can be changed to facilitate their use and further improve responses to outbreaks of foodborne disease.

[1] Please visit the CIFOR website to access the *Guidelines* and Toolkit. The key topics covered in each of these documents (i.e., the chapters in the *Guidelines* and the Focus Areas in the Toolkit) are presented in the Appendix of this report.

2. Methods

We used a mixed-method approach to evaluate the distribution and use of the CIFOR *Guidelines* and Toolkit. Data were collected through a survey of intended users from public health, environmental health, and food regulatory agencies, as well as public health laboratories, to quantify the reach and use of the CIFOR *Guidelines* and Toolkit. The survey was conducted among a convenience sample and thus may not be representative of the full population of intended users of the CIFOR resources. However, no list of intended users exists, and the CIFOR member organizations made every effort to distribute the survey link to their membership. The resulting survey sample included respondents across key job functions and different levels of government.

Additional information was collected through in-depth interviews with staff from local jurisdictions and state agencies that were familiar with the CIFOR *Guidelines* and Toolkit. The sample of key informants for the interviews was developed purposively and again may not be representative of all users of the CIFOR resources. However, the interview sample was selected to represent diverse job functions, geographies, and governance structures, as well as various levels of government, making it possible to further explore differences in the training and utilization of these resources.

The study's qualitative approach focuses on harnessing the knowledge of stakeholders to gain more in-depth information, including examples of how the *Guidelines* and Toolkit have been used, what facilitates (or hinders) their use, and what improvements might be made.

Table 2.1 lists the key research questions that were addressed in the surveys and interviews.

Table 2.1 Key Research Questions, by Method of Data Collection

Key Research Questions	Data Collection Method	
	Survey	Interview
Awareness of the CIFOR *Guidelines* and Toolkit		
Who is aware of the CIFOR *Guidelines* and Toolkit?	X	
Who has received the CIFOR *Guidelines* and Toolkit?	X	
Use of the CIFOR *Guidelines* and Toolkit		
What training has occurred using the *Guidelines* and/or the Toolkit?	X	X
What are practitioner's reactions to training on the CIFOR *Guidelines* and Toolkit?		X
How have the *Guidelines* and the Toolkit been used?	X	X
Have agencies used the *Guidelines* in examining their investigation procedures?	X	X
Have agencies changed procedures due to recommendations and indicators laid out in the *Guidelines*? If so, how?	X	X
Have the *Guidelines* aided in interagency communication?	X	X
Has use of the Toolkit aided in interagency communication?	X	X
If recommendations have not been incorporated into state/local outbreak response, what strategies can be used to do so?		X
Outcomes associated with the use of the CIFOR *Guidelines* and Toolkit		
What results or outcomes are associated with the use of the *Guidelines*? The Toolkit?	X	X
Examples of the use of the CIFOR *Guidelines* and Toolkit		
What are examples of implementation of the *Guidelines*? The Toolkit?		X
Facilitators and barriers to the use of the CIFOR *Guidelines* and Toolkit		
What facilitators help agencies in use/implementation?	X	X
What barriers do agencies face in use/implementation?	X	X
Practitioner reactions to and feedback on the CIFOR *Guidelines* and Toolkit		
What are practitioner's reactions to the CIFOR *Guidelines*?	X	X
What are practitioner's reactions to the CIFOR Toolkit?	X	X
Practitioner recommendations for improvement		
How can the *Guidelines* and Toolkit be improved?	X	X

Survey Methodology

Survey Instrument

The survey was designed to elicit information about and quantify the distribution and use of the *Guidelines* and Toolkit. The survey questions addressed the awareness, use, and implementation of recommendations from the *Guidelines* and Toolkit, including checklists of

core elements of each. The survey included questions related to the barriers and facilitators to implementation, as well as questions seeking feedback about the content and ease of use of the resources. The survey also included open-ended questions asking about suggestions for improvement.

The survey questions were drafted by our research team and shared with the CIFOR Evaluation Workgroup for review and input to ensure that the questions were clear, comprehensive, and used the appropriate terminology. The survey instrument was then revised to reflect the Workgroup's input and feedback.

Survey Sample and Delivery

The core intended users of the CIFOR resources are public health professionals at the state and local levels involved in foodborne disease outbreak response, including those in

- epidemiology
- environmental health
- food regulatory agencies
- public health laboratories.

To identify and target intended users in each of these categories, we worked with representatives from CIFOR member organizations. These organizations were asked to distribute the survey to their members using their preferred methods of communication, including general and specific listservs, e-Newsletters, and web links. This strategy leveraged the strength of the CIFOR member organizations' relationships with their members to improve survey response rates and ensure a broad sample of intended users.

The following organizations helped to distribute the survey:

- Association of Food and Drug Officials (AFDO)
- Association of Public Health Laboratories (APHL)
- Association of State and Territorial Health Officials (ASTHO)
- Council of State and Territorial Epidemiologists (CSTE)
- National Association of County and City Health Officials (NACCHO)
- National Environmental Health Association (NEHA).

The survey was conducted electronically using SurveyMonkey. Potential respondents were sent information about the survey and a link to the survey website. The electronic survey allowed for automated skip patterns and rapid data collection. Each organization that helped distribute the survey to their members was given a unique survey link to facilitate the tracking of responses at the organization level.

Survey Respondents

A total of 394 individuals accessed the web-based survey. Fewer than 6 percent (n = 23) indicated that they were not responsible for any foodborne disease outbreak related activities and

therefore did not complete the survey. The remaining 371 individuals comprised intended users of the CIFOR resources because they have some responsibility for responding to an outbreak of foodborne disease.

The respondents were from a range of organizations, jurisdictional levels, and job functions (Table 2.2). The largest organizational source of respondents (38 percent) was the CSTE link. Other sources that provided more than 10 percent of the respondents are NEHA, AFDO, and APHL. The intended user respondents were from various jurisdictional levels. As seen in Table 2.2, 51 percent of intended user respondents represented states, 32 percent represented counties, and 12 percent represented cities. The "other" category covers jurisdictions that do not fit neatly into any of these categories (e.g., federal agencies or regions comprised of several counties, cities, or states).

The respondents also represented a mix of job functions within foodborne disease outbreak response. The largest share of respondents (37 percent) reported epidemiologist as their primary job function. Environmental health scientists (EHS)/sanitarians (23 percent), regulators (13 percent), and laboratorians (11 percent) were also well represented. Very few respondents reported being public health nurses (3 percent) or members of preparedness staff (2 percent). These job functions have been combined with the "other" category for our analyses.

Given the variation in job function and jurisdictional level within the sample, the survey respondents reflected a diverse cross section of the intended users of the CIFOR resources.

Table 2.2 Survey Respondent Characteristics

Characteristic	Percentage of Total Respondents
Organizational Link	
CSTE	38.3
NEHA	20.8
AFDO	12.4
APHL	11.3
NACCHO	7.3
ASTHO	3.2
Other	6.8
Total	**100**
Jurisdictional Level	
State	51.0
County	32.4
City	11.5
Other	5.1
Total	**100**
Primary Function	
Epidemiologist	37.2
EHS/Sanitarian	22.6
Regulator	12.6
Laboratorian	11.4
Other	10.9
Public Health Nurse	3.2
Preparedness	2.1
Total	**100**

NOTE: The total number of respondents is 371.

Interview Methodology

Our interviews focused on two distinct populations. The first interview population was the CIFOR Council representatives, who are familiar with the development and dissemination of the CIFOR *Guidelines* and Toolkit. The second interview population included local jurisdictions and state agencies that report some use of the CIFOR *Guidelines* and Toolkit.

In the next section, we describe our approach to designing the sampling frame, including the selection of the interview sample, the selection of interview participants at each jurisdiction or agency, and the design of the interview guide for each population. The following section describes the interview methodology and the qualitative analysis approach we used.

Interview Sampling Frame

Population 1: CIFOR Council Representatives

Our team worked with CSTE and the CIFOR Evaluation Workgroup to identify potential CIFOR representatives to interview. The interview population was designed to include CIFOR Council representatives and staff who were familiar with how the CIFOR *Guidelines* and Toolkit were developed, how they were disseminated, and the training grants provided by CSTE. We also sought their impression of how the CIFOR *Guidelines* and Toolkit are being used by local jurisdictions and state agencies and of the perceived effectiveness of the CIFOR *Guidelines* and Toolkit in achieving CIFOR's goals. The sampling frame included two of the founders of CIFOR and two additional CIFOR Council representatives who work at state agencies.

Population 2: Local Jurisdictions and State Agencies

The local jurisdictions and state agencies were selected to comprise a variety of perspectives. We worked closely with CSTE and the CIFOR Evaluation Workgroup to develop and finalize a list of selection characteristics and potential sites to ensure a broad understanding of the user experience (see Table 2.3). Specifically, sites were selected to reflect functional and geographic diversity, as well as diverse organizational structures (i.e., centralized versus decentralized governance systems), and included agencies with recent response activities or a known history of *Guidelines* and/or Toolkit use (e.g., participation in CSTE-funded training, reported implementation of recommendations on the evaluation survey) in an effort to identify successful examples of how the resources have been used at the state and local levels.

Recruiting Interview Participants

Potential interview participants were identified in two ways. First, while taking the survey, local jurisdictions and state agencies could indicate their interest in participating in the interviews. Second, CSTE and CIFOR Evaluation Workgroup members identified additional local jurisdictions and state agencies.

Representatives at potential interview sites were contacted by email and asked if they would participate. All jurisdictions and agencies agreed to participate when contacted. Participating sites included local jurisdictions and state agencies from various regions across the country and represented a variety of state governance types (Table 2.3).

Table 2.3 Interview Sites and Characteristics

Sites	Characteristics	
	Type of Governance (i.e., centralized or decentralized)	Region
Local Jurisdictions		
Knox County, TN	Centralized	South
Los Angeles County, CA	Decentralized	West
Maricopa County, AZ	Decentralized	West
New York, NY	Decentralized	Northeast
Philadelphia, PA	Centralized	Northeast
Tacoma-Pierce, Pierce County, WA	Decentralized	Northwest
State Agencies		
Alaska	Decentralized	West
Arizona	Decentralized	West
Florida	Centralized	South
Maine	Centralized	Northeast
Michigan	Decentralized	Midwest
Pennsylvania	Centralized	Northeast
Utah	Decentralized	West
Washington	Decentralized	West

Interview Participants

Population 1: CIFOR Council Representatives

Our research team worked with CSTE and the CIFOR Evaluation Workgroup to identify four past and current CIFOR Council representatives for our interviews. CIFOR Council representatives were contacted by email to determine their interest in participating in the interviews; all agreed to participate. Two of the interviews were conducted within the larger context of eliciting the user perspective from the state agencies.

Population 2: Local Jurisdictions and State Agencies

Within each jurisdiction and agency, we identified an initial contact, either from survey respondents who volunteered to be contacted about their experience with the CIFOR resources, or from the CIFOR Council's knowledge. Our initial contact, via email, confirmed interest in participation and requested that the jurisdiction or agency point-of-contact identify additional colleagues, such as epidemiologists, environmental health specialists, and laboratorians, to participate in the group interview. The functional roles of participants interviewed varied across jurisdictions and agencies (Table 2.4).

Table 2.4 Characteristics of Interview Participants

Sites	Functional Role of Participants		
	Epidemiologist	Environmental Health Specialist	Laboratorian
Local Jurisdictions			
Knox County, TN	X	X	
Los Angeles County, CA	X	X	X
Maricopa County, AZ	X	X	
New York City, NY	X	X	X
Philadelphia	X	X	
Tacoma-Pierce, Pierce County, WA	X		
State Agencies			
Alaska	X	X	X
Arizona	X		
Florida	X	X	
Maine	X		
Michigan	X	X	
Pennsylvania	X		
Utah	X		X
Washington	X	X	

Interview Approach

Our interviews with key informants lasted approximately one hour and took place by conference call. The number of participants in each interview ranged from one to seven, depending on who was involved with the CIFOR work at that site (see Table 2.4 above). All respondents were assured of strict confidentiality. Available training materials and reports related to a site's experience with the *Guidelines* and Toolkit were also reviewed.

The interviews were conducted using a semistructured protocol. This facilitated note-taking, ensured that all relevant topics are covered, and provided a consistent approach to data collection across respondents.

We conducted telephone interviews with both the local jurisdictions and state agencies and the CIFOR Council representatives and staff. Two RAND researchers participated in each interview; one facilitated the discussion and the other took notes. Immediately following the interview, both researchers reviewed the notes to ensure that they had captured all relevant information from the discussion.

Analysis of Interview Notes

The notes from each interview were reviewed to identify major themes across the key research questions using standard qualitative techniques such as content analysis and pile sorting.

This qualitative approach yielded detailed information about the use of the CIFOR resources across the various functions and sites.

3. Results

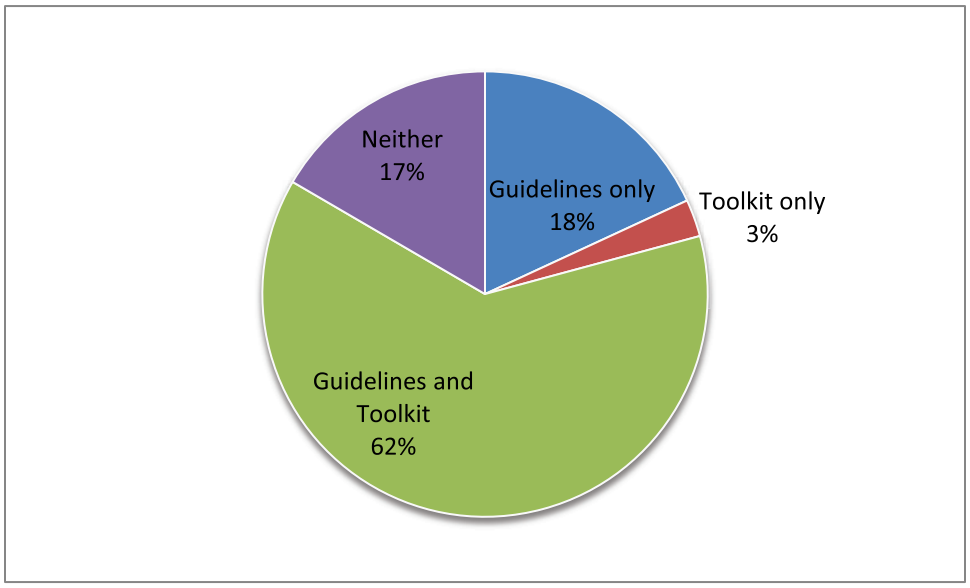
In this chapter, we present results according to the categories of key research questions shown in Table 2.1. As appropriate, we illustrate general findings with direct quotations that typify observations from survey or interview respondents.

Awareness of the CIFOR *Guidelines* and Toolkit

To achieve the goals of the CIFOR *Guidelines* and Toolkit, intended users must be aware and make use of these resources. CIFOR attempted to widely distribute and disseminate the CIFOR *Guidelines* by asking states how many copies they wanted and sending the requested number; it also made the resources available on its website, as well as those of its member organizations. In addition, CIFOR assisted states and jurisdictions with training on the Toolkit via webinars and small training grants.

Many of the intended users surveyed were aware of the CIFOR resources. Specifically, 83 percent were aware of at least one of the CIFOR resources, and the majority (62 percent) reported familiarity with both the *Guidelines* and the Toolkit (Figure 3.1).

Figure 3.1 Familiarity with CIFOR Resources (n = 371)



Familiarity with the resources was high across all primary job functions but highest (95 percent) among epidemiologists (see Table 3.1). Similarly, awareness of the CIFOR resources was quite high across respondents from all jurisdictional levels.

The distribution within a single organization of those unaware of the resources is relatively similar to the distribution of respondents overall. However, there are some differences in this distribution when looking at the respondents by jurisdictional level. A disproportionate number of respondents from cities are unaware of the CIFOR resources (21 percent versus 12 percent in the overall sample [data not shown]); the opposite is true for respondents at the state level (34 percent versus 51 percent [data not shown]). This result suggests that it may be helpful to target intended users at the city level in future dissemination efforts.

Table 3.1 Familiarity with CIFOR Resources, by Respondent Characteristic

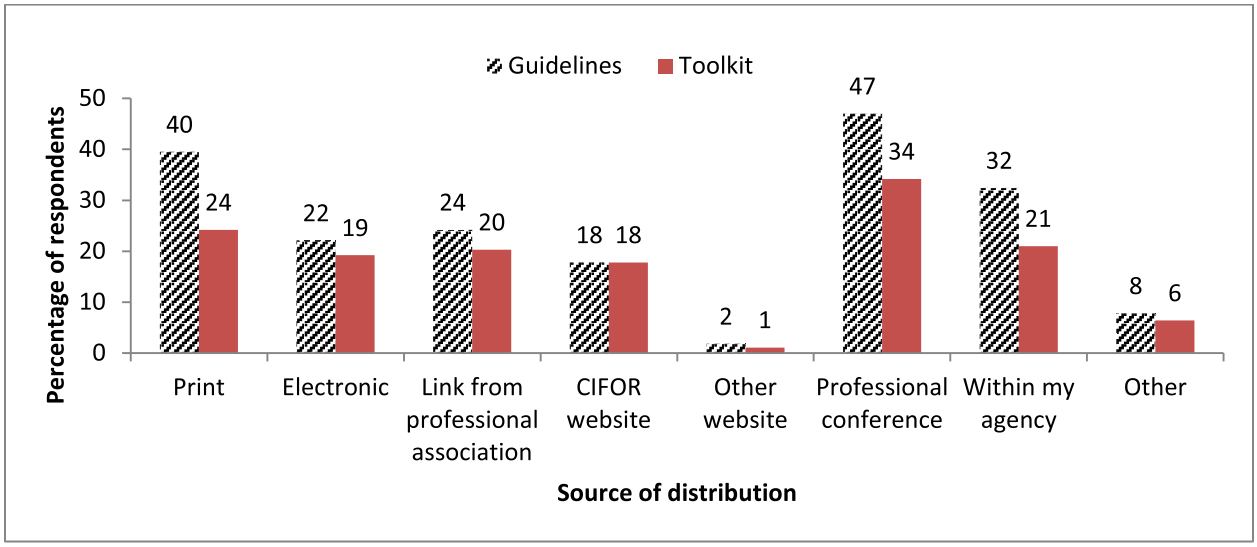
Characteristic	Familiarity with CIFOR Resources (%)			
	Guidelines Only	Toolkit Only	*Guidelines* and Toolkit	Neither
Organizational Link				
CSTE	13	4	74	9
NEHA	23	3	46	29
AFDO	28	2	54	16
APHL	17	0	63	20
NACCHO	8	4	64	24
ASTHO	18	0	64	18
Other	24	0	64	12
Total	13	4	74	9
Jurisdictional Level				
State	17	1	71	11
County	22	4	55	19
City	10	3	56	31
Other	22	11	44	22
Total	17	1	71	11
Primary Function				
Epidemiologist	13	2	80	6
EHS/Sanitarian	22	5	43	29
Regulator	33	2	50	14
Laboratorian	16	0	71	13
Other	15	2	54	30
Total	18	3	63	17

NOTE: The "Other" organizational link includes those who received the survey link from another respondent and those on a CIFOR-maintained list of individuals who requested a copy of the Toolkit. "Other" jurisdictional levels include more than one defined territory (e.g., federal agencies or regions comprised of several counties, cities or states). "Other" primary functions include public health nurses, preparedness staff, administrators/managers, legal staff, researchers, and educators.

Survey respondents were asked how they had learned about the CIFOR *Guidelines* and Toolkit resources and were able to select all options that applied. Figure 3.2 shows that respondents heard about the *Guidelines* and Toolkit in similar ways. The predominant methods

were professional conferences (42 percent for the *Guidelines* and 31 percent for the Toolkit), receiving a print copy in the mail (35 percent and 22 percent, respectively), and receiving a copy from a colleague (29 percent and 19 percent, respectively). A small percentage (less than 10 percent for both *Guidelines* and Toolkit) learned about the resources through other venues, such as trainings or direct involvement in the development or pilot-testing stages.

Figure 3.2 Receipt of CIFOR Resources, by Method



NOTE: Includes only respondents who were familiar with one or more CIFOR resource (n = 281). Respondents could check all options that applied.

The 56 respondents who were not familiar with the CIFOR resources were given information about and a link to the *Guidelines* and Toolkit and asked about their usefulness. The vast majority of respondents (75 percent for the *Guidelines* and 71 percent for the Toolkit) thought that the resources would be helpful in their work.

Use of the CIFOR *Guidelines* and Toolkit

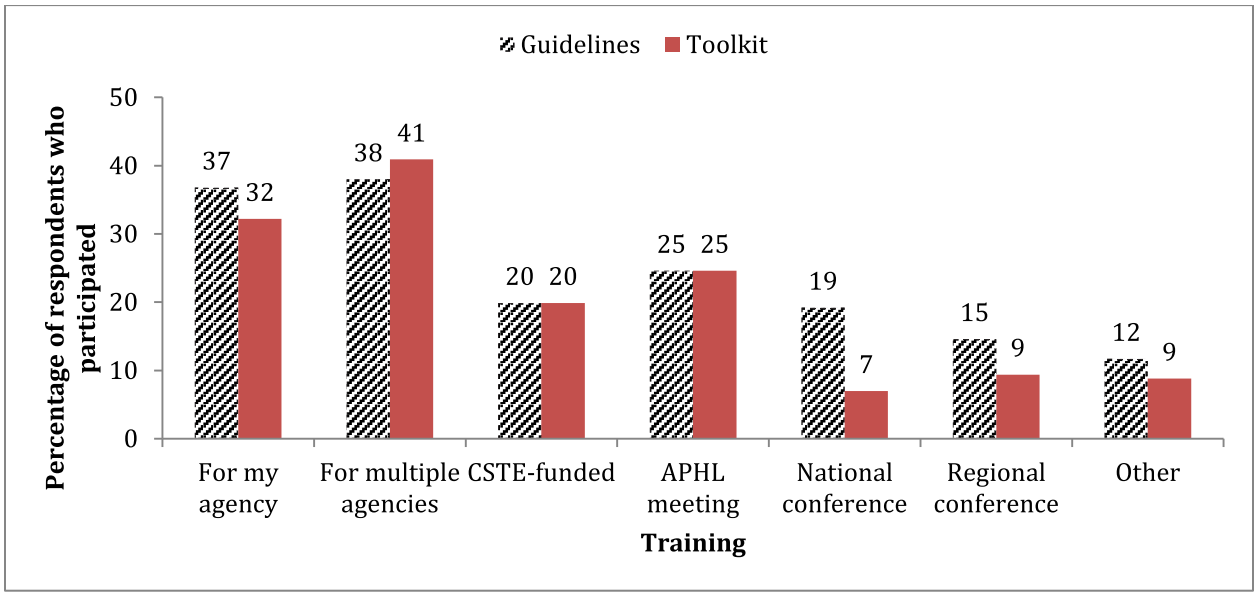
This section describes how practitioners at the state and local levels have used the CIFOR resources.

Training

Among the survey respondents who were aware of the CIFOR resources, 57 percent had participated in at least one training session on the *Guidelines* and 50 percent had participated in at least one training session on the Toolkit. Figure 3.3 shows the popularity of trainings organized for a single agency and for multiple agencies on the *Guidelines* and the Toolkit. About

40 percent of those who participated in training did so at a Toolkit training involving multiple agencies.

Figure 3.3 Participation in Training on CIFOR Resources



NOTE: Includes only those respondents who participated in at least one training on the Toolkit (n = 171). Respondents could check all options that applied.

To learn more about the training experiences, we interviewed 14 local jurisdictions and state agencies about their participation in training on the CIFOR Toolkit. Almost all (n = 11) of the sites hosted a training session on the CIFOR Toolkit. Two local jurisdictions attended a training hosted by their state, and another local jurisdiction had team members who attended a training conducted at a PulseNet meeting. All of the 11 hosting sites used external funding to conduct the training. Nine of these sites received some grant funding from CSTE. Other sites reported funding from sources such as the CDC Public Health Emergency Preparedness Cooperative Agreement, the Food and Drug Administration (FDA), and the Foodborne Diseases Centers for Outbreak Response Enhancement (FoodCORE). All jurisdictions and agencies cited funding as essential to their ability to conduct in-person training.

All of the training sessions included a diverse, multidisciplinary group of foodborne outbreak stakeholders, such as epidemiologists, environmental health inspectors, and staff from the public health laboratory. Most of the training sessions were one-day, in-person sessions. The location varied between off-site locations and a jurisdiction's office facility. The length of the training varied from a half day to a full day. The number of trainings ranged from one to seven. For example, in one state, the CIFOR Toolkit was used for training at seven local health jurisdictions.

Most jurisdictions and agencies used internal staff to facilitate the training; however, several sites reported using an external facilitator in the training. In some cases, additional participants/presenters included representatives from FDA, the United States Department of Agriculture, and CIFOR. The training formats varied across the jurisdictions and agencies. Some jurisdictions and agencies had presentations about the resources while others used more interactive formats, such as breakout groups. The majority reported using a combination of presentations and breakout sessions. Most sites organized their training around specific Focus Areas; however, several sites attempted to cover all the Focus Areas.

Those sites that narrowed their training selected Focus Areas in different ways. Some jurisdictions and agencies reported using a representative planning team to choose which Focus Areas would have the most relevance to the group. Several sites reported surveying the group prior to training: "We surveyed people that were going to attend [the training] and identified needs ahead of time. Almost every health department identified 'Communication.'" One state reported using a web-based survey that allowed staff to identify questions within each Focus Area that required attention. Other jurisdictions and agencies asked representatives to select one of three Focus Areas to work on during the actual training session. One state reported training on the Focus Areas that it knew it "could probably control" (i.e., make changes), remaining "as realistic as possible" in order to best implement the recommended changes.

Overall, the jurisdictions interviewed reported favorable reactions to the trainings in which the CIFOR *Guidelines* and Toolkit were used. It is important to note, however, that many of the interviewees were responsible for coordinating or facilitating the training for their jurisdiction or agency and thus likely had a more positive view of it than the other participants:

> Lots of positive feedback [from participants] after the training.

> All [elements of the training] seemed really useful.

Several interviewees commented on the Toolkit being useful to help their jurisdiction or agency identify areas for improvement and prioritize recommendations:

> Using the Toolkit at the training facilitated discussion. It helped [participating local jurisdictions] identify what was working well and what they already had in place and what needed improvement.

> The counties did find the training useful. There was pushback initially, but once they were at the training, they did find it useful, especially for prioritizing the recommendations.

Several interviewees also viewed the opportunity to meet and learn from colleagues in other jurisdictions or agencies as an additional benefit of the training:

> I enjoyed seeing how other local jurisdictions go about foodborne complaints.

> Meeting colleagues from other jurisdictions. How they work, their outlook. In a way, that was the most fun part. We saw people who were in similar shoes but with different approaches.

Recommendations Implemented and Other Changes Made

This section describes how respondents used the CIFOR *Guidelines* and Toolkit.

Use of CIFOR Guidelines

We examined the use of the CIFOR *Guidelines* among survey respondents who were either familiar with the *Guidelines* alone or who used the *Guidelines* separately from the Toolkit (referred to henceforth as *Guidelines users*). A total of 119 respondents fell into this category. Slightly more than half of *Guidelines* users implemented at least one recommendation from a *Guidelines* chapter separately from the Toolkit (53 percent).

Table 3.2 provides detailed information for each chapter of the *Guidelines* on whether and how respondents have used the information (the full titles of each of the *Guidelines* chapters are provided in Appendix A). There is variation across chapters in the extent to which the *Guidelines* have been used. The percentage of respondents who have not yet explored a particular chapter ranges from a high of 38 percent for Chapter 9 (Legal Considerations) to a low of 20 percent for Chapters 3 (Planning and Preparation), 4 (Surveillance), 5 (Investigation), and 6 (Control Measures). Across all chapters, a small percentage of respondents indicated that they had looked at the information in the chapter but did not intend to use it. A larger percentage, approximately one-third of respondents for each chapter, reported that the recommendations were already in place. The remaining respondents have either implemented or plan to implement at least one recommendation in the next year. The level of implementation also varies across chapters. Respondents who used the *Guidelines* separately reported implementing an average of 1.3 recommendations in each chapter they worked on. Approximately one-third of *Guidelines* users reported implementing one or more recommendations from Chapter 3 (Planning and Preparation). The lowest rate of implementation (10 percent) was for Chapter 9 (Legal Considerations). Between 10 and 20 percent of respondents reported that they plan to implement recommendations within the next year. Overall, the results indicate that the recommendations are now in place (i.e., were in place before or have been implemented using the CIFOR resources) in many jurisdictions. The level of total implementation among *Guidelines* users ranges between 40 and 60 percent, depending on the chapter.

Table 3.2 Use of the CIFOR *Guidelines* Chapters

Chapter	Have Not Explored (%)	Do Not Intend to Use (%)	Plan (%)	Implemented (%)	In Place (%)	Not Relevant (%)	Total (%)
3: Planning and Preparation	20	2	14	32	30	2	100
4: Surveillance	20	3	15	21	37	5	100
5: Investigation	20	4	14	27	29	7	100
6: Control Measures	20	4	19	18	35	4	100
7: Multijurisdictional Outbreaks	26	4	17	18	33	2	100
8: Performance Indicators	29	5	20	22	20	4	100
9: Legal Considerations	38	9	11	10	29	3	100

Implementation varied to some extent by jurisdiction level. For example, as Table 3.3 shows, *Guidelines* users at the state level are much more likely than those at other levels to report implementing at least one recommendation from Chapter 8 (Performance Indicators) (27 percent for state, 19 percent for county, 13 percent for city). As might be expected, implementation also varies across primary functions. For example, regulators are more likely than those in other roles to report implementing at least one recommendation from Chapter 6 (Control Measures).

Table 3.3 Implementation Status, by Respondent Characteristic

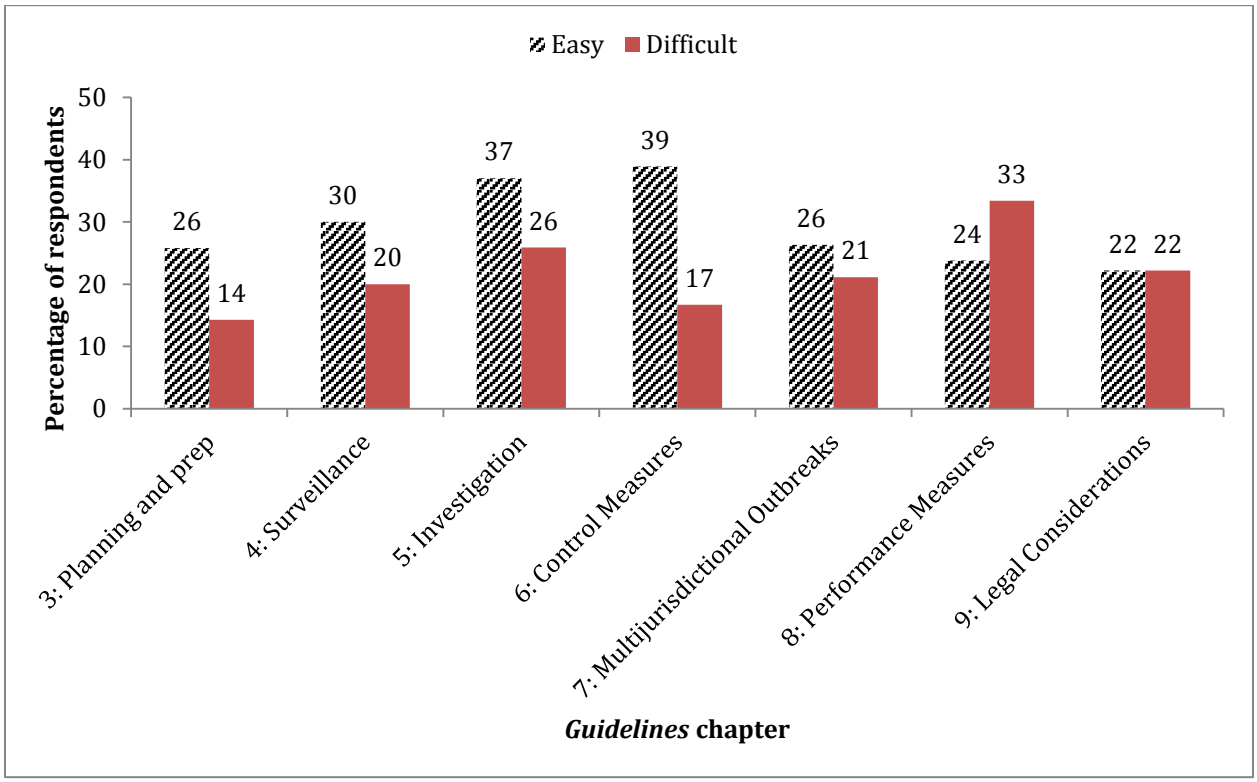
Characteristic	Use of CIFOR *Guidelines* Chapters (%)						
	Chapter 3: Planning & preparation	Chapter 4: Surveillance	Chapter 5: Investigation	Chapter 6: Control Measures	Chapter 7: Multijurisdictional Outbreaks	Chapter 8: Performance Indicators	Chapter 9: Legal Considerations
Organizational Link							
CSTE	34	22	28	20	20	30	10
NEHA	27	26	26	16	26	26	11
AFDO	32	17	19	29	18	6	6
APHL	30	20	30	0	11	11	0
NACCHO	43	14	29	14	14	14	17
ASTHO	50	0	50	0	50	0	0
Other	27	18	27	18	0	27	18
Total	32	20	27	18	18	22	10
Jurisdictional Level							
State	30	21	26	20	20	27	7
County	32	17	25	14	14	19	14
City	38	13	25	0	0	13	14
Other	43	50	50	50	50	0	0
Total	32	20	27	18	18	22	10
Primary Function							
Epidemiologist	30	22	31	18	19	29	13
EHS/Sanitarian	24	15	15	10	15	20	10
Regulator	29	14	15	31	15	8	8
Laboratorian	30	10	20	0	11	22	0
Other	57	33	43	27	27	13	7
Total	32	20	27	18	18	22	10

NOTE: "Other" jurisdictional levels include more than one defined territory (e.g., federal agencies or regions comprised of several counties, cities, or states). "Other" primary functions include public health nurses, preparedness staff, administrators/managers, legal staff, researchers, and educators.

Survey respondents who implemented at least one recommendation from the *Guidelines* were asked about their experience implementing those recommendations. Overall, more respondents found the recommendations easy to implement rather than difficult (Figure 3.4). However, for Chapter 8 (Performance Indicators), the opposite was true: 33 percent found the recommendations difficult to implement compared with 24 percent who found them easy. This may be due to the fact that many jurisdictions do not have all of the data systems in place that would facilitate the development and regular monitoring of performance indicators.

We explored implementation issues in greater detail through our interviews; these findings are presented later in the report.

Figure 3.4 Ease of Implementation, *Guidelines* Chapters



NOTE: Data for each *Guidelines* chapter include all respondents who indicated having implemented at least one recommendation from the specific chapter.

Use of the CIFOR Toolkit

This section summarizes the use of the CIFOR Toolkit among survey respondents who indicated they were familiar with the Toolkit. A total of 220 survey respondents, referred to as *Toolkit users*, belonged to this category. Over half (55 percent) of Toolkit users reported that their jurisdiction implemented at least one recommendation from a Toolkit Focus Area. Table 3.4 lists rates of Toolkit use by Focus Area (the full titles of each Focus Area are provided in Appendix A).

Table 3.4 Use of Toolkit Focus Areas

Focus Area	Have Not Explored (%)	Do Not Intend to Use (%)	Plan (%)	Implemented (%)	In place (%)	Not Relevant (%)	Total (%)
1: Relationships	17	1	19	40	22	1	100
2: Necessary Resources	25	3	23	25	22	3	100
3: Communications	20	2	21	37	19	1	100
4: Notification Systems	27	4	18	21	25	5	100
5: Pathogen Surveillance	29	3	13	21	28	5	100
6: Initial Steps	20	1	12	27	37	4	100
7: Epidemiology	17	2	16	21	33	11	100
8: Environmental Health	22	2	18	21	27	11	100
9: Laboratory	27	3	13	17	30	10	100
10: Control of Source	34	3	13	13	26	11	100
11: Food Recall	34	4	11	11	26	14	100
12: Secondary Spread	36	2	14	9	33	6	100

Use of the Toolkit varies across Focus Areas. For example, the percentage of Toolkit users who have not yet explored a particular Focus Area ranges from a low of 17 percent for Focus Areas 7 (Epidemiology Investigation) and 1 (Relationships) to a high of 36 percent for Focus Area 12 (Control of Secondary Spread). The percentage of respondents who plan to implement a Toolkit recommendation within the next year varies from 11 percent for Focus Area 11 (Food Recall) to 23 percent for Focus Area 2 (Necessary Resources).

The implementation of recommendations as a result of Toolkit use has been highest in Focus Areas 1 (Relationships; 40 percent) and 3 (Communications; 37 percent) and lowest in Focus Area 12 (Control of Secondary Spread; 9 percent). In some cases, respondents reported that the recommendations were already in place prior to receiving and working with the Toolkit. Over 30 percent of respondents reported that this was true for Focus Areas 6 (Initial Steps), 7 (Epidemiology Investigations), 9 (Laboratory), and 12 (Control Secondary Spread). It was least likely to be true for Focus Area 3 (Communications); 19 percent of respondents reported that the recommendations for this Focus Area were already in place before they worked with the Toolkit. Total implementation of the recommendations (i.e., those that were already in place or have been implemented as a result of using the Toolkit) is relatively high and ranges between 37 percent and 64 percent, depending on the Focus Area.

Table 3.5 shows how the percentage of Toolkit users who implemented at least one recommendation in a specific Focus Area varies by jurisdictional level and primary job function. Respondents at the city level were more likely than those at other jurisdictional levels to implement at least one recommendation related to Focus Area 7 (Epidemiology Investigation). In Focus Area 3 (Communications), respondents in “Other” jurisdictions were more likely than respondents at the state, county, or city levels to implement at least one recommendation.

Looking across job functions, regulators are more likely than those in other job categories to report implementing a recommendation for all Focus Areas.

Looking at rates of implementation across jurisdictional level and job function provides insight into how the Toolkit is being used. In some cases, variation may be expected—for example, it is not surprising that epidemiologists are more likely to report implementing a recommendation from Focus Area 7 (Epidemiology Investigation). In other cases, such variation may reflect barriers or facilitators encountered by different groups. For instance, no respondents from the city level reported implementing a recommendation related to Focus Area 11 (Food Recall).

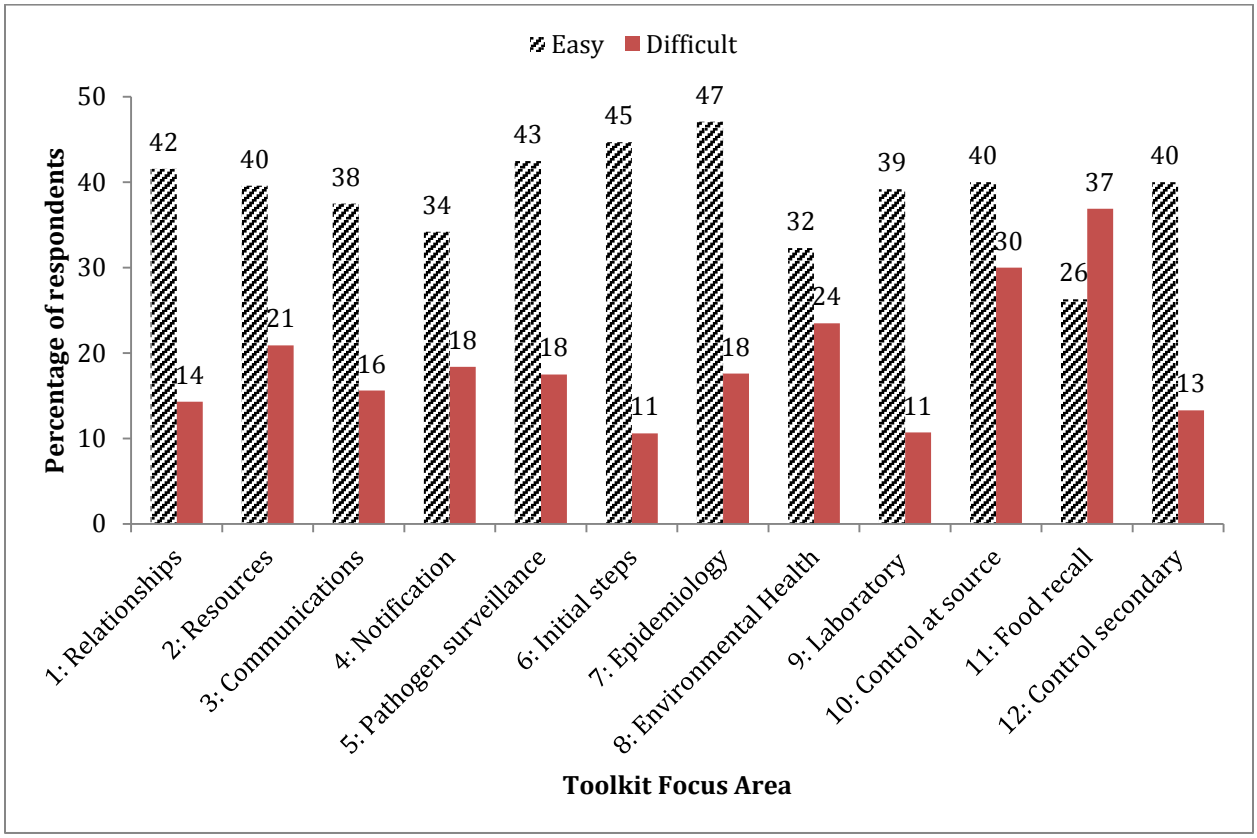
Table 3.5 Implementation Status, by Respondent Characteristic

Characteristic	Toolkit Focus Area											
	1: Relation.	2: Resources	3: Comm.	4: Notif.	5: Pathogen Surveil.	6: Initial Steps	7: Epi.	8: Env. Health	9: Laboratory	10: Control of Source	11: Food Recall	12: Secondary Spread
Organizational Link												
CSTE	32	22	26	16	18	21	19	17	13	8	9	6
NEHA	50	19	36	29	21	42	29	29	8	21	21	13
AFDO	35	31	47	13	18	40	19	27	19	31	25	7
APHL	35	22	47	26	39	11	17	11	39	0	0	0
NACCHO	39	29	43	21	8	31	8	17	8	8	8	25
ASTHO	50	50	75	25	75	50	50	50	50	25	25	25
Other	80	43	54	50	25	42	33	33	25	33	17	25
Total	40	25	36	22	22	27	21	21	17	14	12	10
Jurisdictional Level												
State	44	25	39	23	27	30	23	23	22	14	15	7
County	24	19	28	14	6	20	10	10	4	4	4	12
City	40	32	33	28	28	28	41	24	24	18	0	12
Other	78	44	56	50	44	50	25	50	22	56	44	13
Total	40	25	36	22	22	27	21	21	17	14	12	10
Primary Function												
Epidemiologist	39	23	32	19	22	24	21	16	17	13	8	9
EHS/Sanitarian	40	25	35	22	12	39	19	36	4	12	8	12
Regulator	58	31	47	27	35	43	27	40	31	38	31	20
Laboratorian	35	30	40	25	32	10	10	10	30	0	0	0
Other	32	26	45	25	10	35	30	20	10	15	30	10
Total	40	25	35	22	12	39	19	36	4	12	8	12

NOTE: “Other” jurisdictional levels include more than one defined territory (e.g., federal agencies or regions comprised of several counties, cities, or states).
“Other” primary functions include public health nurses, preparedness staff, administrators/managers, legal staff, researchers, and educators.

Respondents who implemented at least one Toolkit recommendation were asked about their experience implementing the recommendation(s). In general, respondents found the recommendations easy to implement, with the exception of Focus Area 11 (Food Recall), which 37 percent reported as difficult to implement compared with 26 percent who reported that implementation was easy.

Figure 3.5 Ease of Implementation, Toolkit Focus Areas



NOTE: The data for each Focus Area include all respondents who indicated they had implemented at least one recommendation from the specific Focus Area.

Implementation of Recommendations

Our interviews gathered additional detail and concrete examples of how the CIFOR *Guidelines* and Toolkit are being used. We describe the findings from these interviews below, illustrating general results with typical observations from those interviewed.

A majority of the site representatives interviewed explained that the CIFOR training and resources helped them to identify gaps and opportunities for improvement. However, the degree to which the sites actually made changes to address these issues varied. Most sites made at least some change, but a few made no changes:

> There was a lot of good discussion, but there was not any follow-up that they can identify.

> It hasn't really changed the way we are doing it. We haven't made any major changes or even anything minor.

Other sites reported using the CIFOR *Guidelines* and Toolkit in a variety of ways, including to standardize processes, to improve or develop outbreak protocols, to improve communication, and to improve after-action reports and their associated processes. Examples of such uses are described below.

One site reported using the CIFOR *Guidelines* and Toolkit to standardize processes within their data system:

> Streamlining of processes. We looked at questionnaires and [indicators]. Put a lot of planning into the [electronic] outbreak module…which isn't currently working. Hopefully we will get it working this year.

Representatives from most of the jurisdictions and agencies we interviewed reported using the CIFOR *Guidelines* and Toolkit to develop or improve their outbreak protocols:

> We took our outbreak protocol and added an after action report to be done as part of the process. We didn't do it every time before. Now it's in our policy and procedure manual and part of the official protocol.

> The multijurisdictional outbreak protocol has been worked on prior to the CIFOR *Guidelines*. It died out and they revamped it after the workshops. They worked with state and local partners on putting that together. Large sections came straight out of the CIFOR *Guidelines* (diagrams, schematics, etc.).

> We updated and shared our outbreak response protocol. We had it in writing. We submitted that to our department heads so that they could share it with their staff members.

> One of the things that came out of that [training] was a new protocol. Who is the team lead, what are the exact roles and responsibilities.

Several jurisdictions and agencies reported using the CIFOR *Guidelines* and Toolkit to improve their after-action reporting process:

> [We] have not really formalized the after action process. [We are] trying to complete investigation reports more quickly. [We] often investigated, but the report is not as timely as we'd like. That's something we've worked on improving.

> We made a change in our process to include at least one representative from each area involved in the outbreak on our after action reporting so people can understand the outcomes.

> One of the biggest products was the after action report. As a result of the Toolkit, they [the state and multiple local health departments] now meet quarterly to go over the most noteworthy outbreaks together and discuss what happened, what went well, and what didn't go very well.

> Didn't do hotwashes previously… after an outbreak response. The counties are doing more of this.

> Using CIFOR *Guidelines*, [the state] made a much more detailed and conclusive after action report that incorporates their web-based electronic system…and the CDC's NORS database….

The development and use of performance indicators was another use of the CIFOR *Guidelines* and Toolkit reported by interviewees:

> We realized that we were not monitoring transport time…. It can help to identify areas for improvement.

> We started to develop performance [indicators] by looking at what we should measure and what we could measure. We can't measure all things. We used the table from Chapter 8. It's pretty comprehensive.

> We are now reporting metrics.

The CIFOR *Guidelines* and Toolkit were also used to identify existing resources and obtain new resources:

> We used the *Guidelines* as justification. We got an additional field inspector….
> We used the *Guidelines* as proof of a national standard.

> [The CIFOR resources] showed me some of the assets we have with a large department. Also showed that smaller [departments] are centralized and working together. Gave me a better understanding of how others approached it.

Other changes stemming from use of the CIFOR *Guidelines* and Toolkit include more thorough documentation, improved questionnaires, and better tracking of complaints:

> Big change: documentation. We used to write a preliminary report [and] then write one at the end. Now we put that information into a database. We are more conscious of documenting what we're doing, putting information in [a] useable format so we can take it out more easily.

> We were looking for feedback on data issues and questionnaires. Because we were already in the process of updating it, the suggestions and feedback [from the training workshop] were easy to implement.

> One thing we continue to do and need to do work on…is a way to track complaints, investigations…. We don't have a real nice way of summarizing that activity. CDC has that—they get complaints and could summarize. [We] need to think more about how to better summarize and tie it up.

Jurisdiction and agency representatives offered a variety of observations about using the CIFOR *Guidelines* and Toolkit. For example, interviewees from one site reported being surprised by the ease (in some cases) and the difficulty (in others) of implementing changes. Those from another site explained that, because it took them a long time to go through one Focus Area, they have not been able to move on to another Focus Area:

> They [local health departments] were surprised to find that some of the things that seemed like simple actions were not as easy as they thought once they started working collaboratively with other agencies with different focuses. Other changes were so easy that they wondered why they didn't figure out how to do it before. It was an interesting eye-opener.

> We started with Focus Area 1 (Relationships). Took one hour to get through six of the questions. For me and another member who sat through the experience, it was not necessarily painful, but we didn't accomplish all that we wanted to accomplish. Had a lot of discussion…. That was over two years ago…. Have looked at other Focus Areas. Have not moved on to looking at Notification and Complaint (Focus Area 4).

Other jurisdictions and agencies reported continuing to implement the changes recommended in the CIFOR *Guidelines* and Toolkit. Several reported regular meetings, usually on a quarterly basis, to work on additional Focus Areas. For example, one state reported a statewide taskforce that meets quarterly and includes all state agencies and organizations relevant to foodborne disease outbreak. During its meetings, the taskforce provides updates on action items and works through new areas. It tracks progress using a spreadsheet and uses indicators to track the implementation of recommendations.

Interviewees also described the changes that are still in process. For example, one site is working to develop a standardized complaint form. Another site is creating a standardized electronic reporting system:

> We put together a subcommittee to develop a standardized complaint form that all counties can use. The complaint information could then be input into a spreadsheet and put into an Access database…. The standard form will help make things more consistent across counties.

> Standardize response—electronic disease reporting systems, labs report directly to that system. Everyone can see what cases there are in each jurisdiction. [We] are developing an outbreak module. It will connect cases to outbreaks so you could look at all the cases in the outbreak. Working on developing that right now.

Other jurisdictions and agencies mentioned additional changes they would like to implement but have not yet begun:

> We would like to implement more lab stuff. A lot of our wants were in the lab category, but we don't have any control. Some state lab was at the training. They want to [make these changes], but they also have restrictive resource issues.

> [We would like to] develop educational materials for physicians and labs to improve reporting.

Several sites noted making changes related to communications. These changes ranged from creating contact lists or email lists to tangible changes made to improve communication (e.g., whiteboards, daily briefings, communication folders or reports) and changes in culture:

> We developed a contact list for all of our partners involved in the epidemiology and lab side. That was helpful, even though it does change.

> As a result of the CIFOR training, we have improved our communication, at least within our own organization. We added a whiteboard (a communication board) so we can visually see what's going on for all participants [in the outbreak response]. It is an extra communication tool.

> We implemented daily briefings (may be short or longer). Our focus [is] on utilizing the CIFOR *Guidelines* as our quality control measures.

> The state created a foodborne disease webpage with a bunch of fact sheets for use internally and for public consumption.

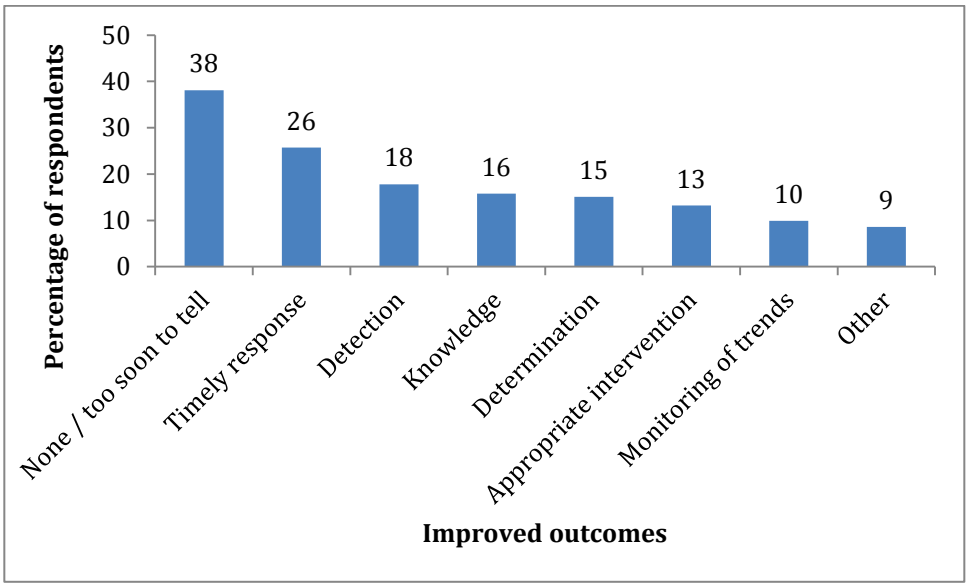
> Enhanced communication between the three-legged stool. Biweekly conference calls with environmental health, lab, and epidemiology to talk about acute issues we're investigating to make sure we are all on the same page.

> Everyone now has a clearer idea of what others are doing. People are more apt to call one another. Maybe it's because they are just more comfortable. People are less hesitant to contact people in other divisions.

Outcomes Associated with the Use of the CIFOR Guidelines *and Toolkit*

Survey respondents who reported implementing at least one recommendation from a Toolkit focus area or *Guidelines* chapter (n = 152) were asked if they had observed any improvements in their jurisdiction's capability to respond to a foodborne disease outbreak. Nearly 40 percent of respondents had observed no change or reported that it was too soon to be able tell; however, some respondents did note improvements (Figure 3.6). The most change was seen in the timeliness of response, with 26 percent of respondents noting improvements. The next biggest improvement area was the detection of foodborne disease, with 18 percent reporting improvement. Survey respondents were able to mark as many outcome changes as applied. On average, respondents noted improvement in one outcome category (data not shown).

Figure 3.6 Improved Outcomes Related to Implementation



NOTE: Includes only respondents who reported implementing at least one recommendation from the *Guidelines* or the Toolkit (n = 152). Respondents could check all options that applied.

To gather additional details and concrete examples, our interviews included questions about the outcomes associated with using the CIFOR *Guidelines* and Toolkit. Although most jurisdictions reported a general sense that response to foodborne disease outbreak had improved, very few respondents could point to measured improvements in performance indicators:

> Seems like [a] bump in [the] number of questionnaires returned and quality/completeness from public health nurses. We don't track yet.

> Feedback from other agencies that communication has been better.

> [We] have seen some improved reporting.

> [We] already had a pretty good system in place before, but there have been some incremental changes besides having the right policies in place.

Other sites reported that their use of the CIFOR *Guidelines* and Toolkit has improved the timeliness of their response but could not quantify the change:

> PFGE [pulsed-field gel electrophoresis] is timely…. Our timing is really good…. We've done a lot of improving timeliness of our response to different outbreaks.

> I think we have seen improved response. We haven't had any large-scale outbreaks in a while. One of the last ones went incredibly smoothly. [It was] also done in a timely fashion.

Only a few sites were using performance indicators; however, many sites noted the importance of using indicators to track progress:

> The biggest problem with this is that everything is alleged unless you have indicators to be definitive.

The jurisdictions and agencies whose representatives we interviewed were in various stages of using and implementing the performance indicators. As mentioned earlier, some sites reported that they had started to use performance indicators based on information provided in the CIFOR *Guidelines*:

> Performance [indicators] are used to track progress. The task force went through the CIFOR performance [indicators] and decided which ones would be good for the entire state and not too burdensome. They also wanted to track ones that aligned with PHEP [public health emergency preparedness] and lab grants reporting requirements. These will be built into the outbreak module of the surveillance system, so they will be very easy to track.

> No performance [indicators]. One of the things we've been looking at. Knowing that CIFOR has some built in, those will be areas we consider.

However, some sites reported that performance indicators, while essential, can be difficult to implement:

> Metrics…are a pain, but [they are] the only way you know where you are. Not just a feeling, but can actually document where each segment of response is and where you need help. They can help determine where to put resources.

Only one site reported a quantifiable change in outcomes based on the use of performance indicators:

> We made some changes based on metrics for outbreak investigation and surveillance activities. We looked at [the] completeness of interviews. Saw [a] metric that only 40 percent of interviews were complete. We can do a lot better than this. We made changes in our surveillance activities and now we are up.

Examples of the Use of the CIFOR *Guidelines* and Toolkit

In this section, we describe three examples, gathered through our interviews, of the different ways state and local jurisdictions have used the CIFOR resources to improve their response to a foodborne disease outbreak. These examples are intended to help other jurisdictions in their efforts to use the resources effectively.

Example 1: Holding Regional Meetings with Local Health Departments

One state agency used the Toolkit as the basis for a series of regional meetings with groups of local health departments. The objectives of these meetings were to

- bring together multidisciplinary teams involved in foodborne disease outbreak response
- familiarize participants with the CIFOR *Guidelines* and Toolkit
- identify actions to improve foodborne disease outbreak response
- create an action plan to implement selected recommendations.

Each meeting was organized in the same way. The facilitators provided an overview of the CIFOR resources, explaining why improving the response to foodborne disease outbreak is important. To illustrate the concepts and get attendees involved, the facilitators then worked through a scenario in which a local health department receives a message from an individual making a complaint about a possible foodborne disease, asking the participants to describe how they would respond, including what actions would be taken and who was responsible for taking them.

After they working through this scenario, the participants worked through two other activities designed to generate a better understanding of each organization's roles and responsibilities and identify areas for improvement. In the first activity, participants were asked to work with partners from their jurisdiction to sort a set of cards that represented key elements or functions from the Toolkit Focus Areas. They sorted the cards according to who (i.e., environmental health, epidemiology, laboratory, other) had primary responsibility for that function. This exercise facilitated discussions about who does what and identified where there were overlaps and/or gaps in coverage.

The second activity focused on assessing how well the jurisdiction was doing in each of the Focus Areas. The participants coded each of the cards with colored stickers reflecting their judgment about the jurisdiction's performance in that area. The color-coding helped to clearly identify and prioritize the areas each jurisdiction needed to work on.

Following this activity, the participants worked through the Focus Area Worksheets for their highest priority area. Throughout the process they were encouraged to take notes and jot down

ideas. At the end of the meeting, each jurisdiction generated a list of practical things they could do to improve their response to an outbreak of foodborne disease.

Since the regional meetings, the state has tried to track progress on the recommended actions, though not in a systematic way. It has found wide variation in how much the local jurisdictions have done. Some jurisdictions did nothing; others transformed their whole program. For example, one county was not conducting very many outbreak investigations, and the activities at the regional meeting demonstrated that it was not processing and forwarding complaints in a logical way. Everything was bottlenecked in one area of the agency. This county identified a solution that moved the responsibility to another area of the agency and gave oversight to multiple people so that if one person was out of the office, the entire process did not stop. Moreover, after working with the Toolkit, the county has made complaints a priority. It is improving complaint processing and moving information to the right people at right time.

Since using the Toolkit in the regional meetings, the state has also noted improvements in outbreak reporting from the counties. Whereas it used to receive reports with a lot of missing information (e.g., "unknown agent," "unknown contributing factors," "unknown foods involved"), the state is now seeing more complete reports, which it believes reflects better field and epidemiological investigations.

Example 2: Using Performance Indicators

A local health department also reported measurable improvements in outcomes as a result of using the CIFOR *Guidelines*. Although this jurisdiction's policies already mirrored many of the recommendations from the *Guidelines*, the group discovered additional areas for improvement once they started examining their own performance data.

The CIFOR *Guidelines* chapter on performance indicators helped the jurisdiction think about how to measure its work. Looking at the table of indicators in the *Guidelines*, the group discussed which were critical to measure and developed a prioritized set of core indicators.

This discussion of performance indicators had far-reaching positive effects, including

- the identification of a need for better documentation of information
- the utilization of a database for collecting and extracting information
- enhanced communication due to discussions about the numbers
- changes in investigation and surveillance activities due to gaps identified by the performance indicators.

External funding allowed this jurisdiction to enhance its activities, including training student interns to help with investigations and investing in new molecular technologies that reduce serotyping times. It worked with a local university to train students to participate in surge activities and found the students to be affordable, energetic, and excited to learn. The student interviewers helped increase the jurisdiction's capacity for acute investigations. As a result of this and the laboratory advances, it has improved both the interview process and lab subtyping

for *Salmonella* surveillance, improving turnaround times, the timeliness of collecting information, and the number of clusters identified.

Having to report performance indicators forced the jurisdiction to look at its data to see where it could make improvements. For example, the jurisdiction found that gaps in interview information were mostly the result of obtaining incorrect addresses. "Getting into the weeds" and examining the details has since improved the quality of data. The jurisdiction found it beneficial to document performance for each segment of the response to identify what the needs were and where to put resources. Resource allocation was especially important because local health departments do not have many resources to devote to this work.

While this jurisdiction acknowledged that changes could be a "headache to incorporate," the short-term costs of these changes resulted in long-term advantages by streamlining its system. It has even used the performance indicators to track student progress, giving each student personal performance reports for the year. The jurisdiction credits the external funding and the *Guidelines* for giving them the opportunity and a starting point at which to begin examining its own processes.

Example 3: Training Local Health Departments

One state used the CIFOR resources to both train local health department representatives in outbreak processes and as the focus of their quarterly foodborne taskforce meetings.

To train local health departments about the response to foodborne disease outbreak, the state applied for external public health preparedness funds. As a deliverable for the funds, the state required all local health departments to attend one of three regional trainings. It asked that each department send at least one epidemiologist and one environmental health representative. State laboratory representatives were also in attendance. At each training session, the participants were provided with an overview of the CIFOR resources and then were broken into small groups to discuss three Toolkit Focus Areas of their choice. Smaller local health departments were grouped together. After this breakout session, everyone shared what their group had discussed about the Focus Areas. This was designed to facilitate communication between the epidemiologists and the environmental health representatives (small groups) and help participants to learn from other jurisdictions' experiences (large group).

Although there was initial pushback from the local health departments, participants did find the training useful, especially in helping them to prioritize the recommendations. Ultimately, they were able to identify gaps in their existing plans and find ways to incorporate the recommended actions.

This state also has a taskforce dedicated to foodborne disease–related issues. The taskforce meets quarterly, and the agencies involved work through the various Focus Areas to identify new action items. The work that has come out of these meetings includes

- improving the state protocols

- developing a "how to do a foodborne outbreak response" presentation for the counties
- creating a webpage to house fact sheets for internal and external use
- building an outbreak module into the electronic surveillance system.

One key outcome of the taskforce was a subcommittee to create a standardized complaint form for the local health departments. This was especially useful because the small counties that lack sophisticated data systems for tracking outbreaks instead send hard copies of the data to the state to record, and a standardized form ensures that all the necessary information is captured in a way that is easy to extract.

The state has seen improvements in several of the local health departments since the trainings. For example, one local health department has worked with long-term care facilities to improve the reporting of norovirus by communicating the importance of such reporting and explaining the response process. Another local health department identified the need to clean up the chain of custody for samples taken in the field and has improved the timeliness of the field investigations. This jurisdiction has partnered with a local university to do interviews and, while the jurisdiction provides some funding, the university provides in-kind contributions such as the use of their call center for conducting the interviews.

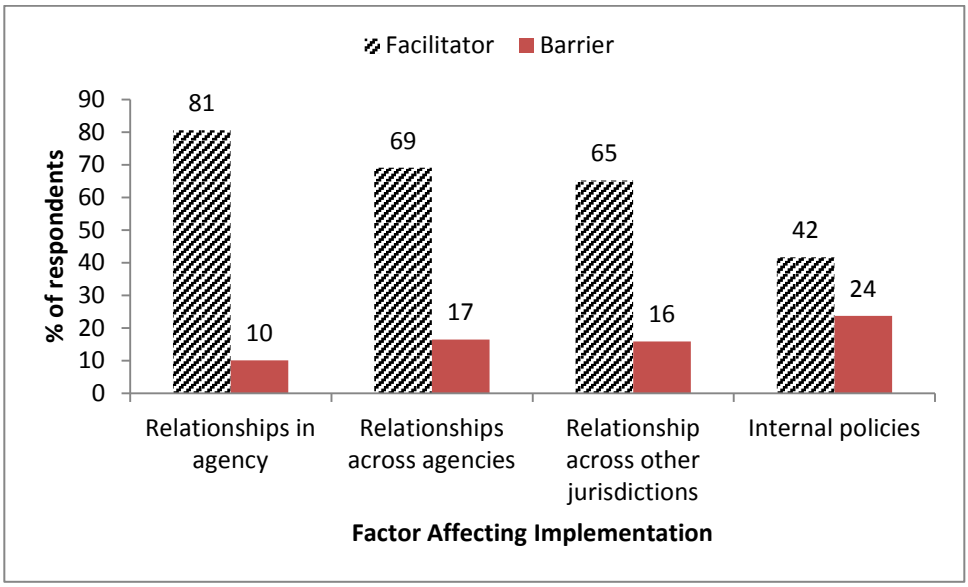
One reason the state's work has been so extensive is the support it receives from upper management. To garner this support, the state focused on the work associated with outbreaks in general, rather than foodborne-specific outbreaks. It felt that the multipurpose nature of outbreak capacity and preparedness was more appealing, particularly when resources are scarce. It has also applied this approach to the local health departments as well, trying to break down the CIFOR recommendations into small pieces that seem feasible to implement and have applications beyond foodborne-related matters.

Facilitators and Barriers to the Use of the CIFOR Resources

Survey respondents who indicated that they had implemented or planned to implement at least one recommendation from a Toolkit Focus Area or *Guidelines* chapter (n = 190) were asked about the facilitators and barriers they encountered or expect to encounter in implementing the recommendation.

The majority of respondents reported teamwork and relationships to be strong facilitators (see Figure 3.7). At the same time, however, some respondents saw existing relationships as barriers to implementation. Interestingly, of the people who noted a relationship barrier, 49 percent had implemented Focus Area 1 (Relationships). The greatest barrier to implementation in this category (noted by 24 percent of respondents) was the agencies' policies and procedures.

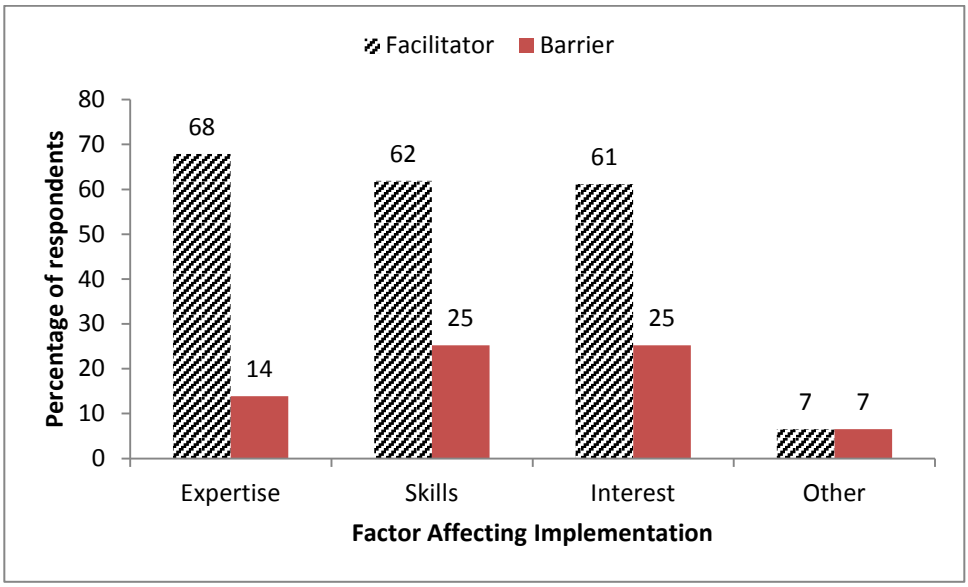
Figure 3.7 Facilitators and Barriers Related to Relationships and Policies



NOTE: Includes only respondents who had implemented or planned to implement at least one recommendation (n = 190).

Many respondents mentioned the expertise, skills, and level of interest within their jurisdiction as facilitators to implementation (see Figure 3.8). In particular, 68 percent of respondents noted that their colleagues' expertise made implementation easier. Conversely, 25 percent of respondents noted that not having access to people with the appropriate skills made implementation more difficult. Not surprisingly, an agency's level of interest in response to foodborne disease outbreak can either be a facilitator if interest is high or a barrier if interest is low. For the majority of respondents (61 percent), however, agency interest made implementation easier.

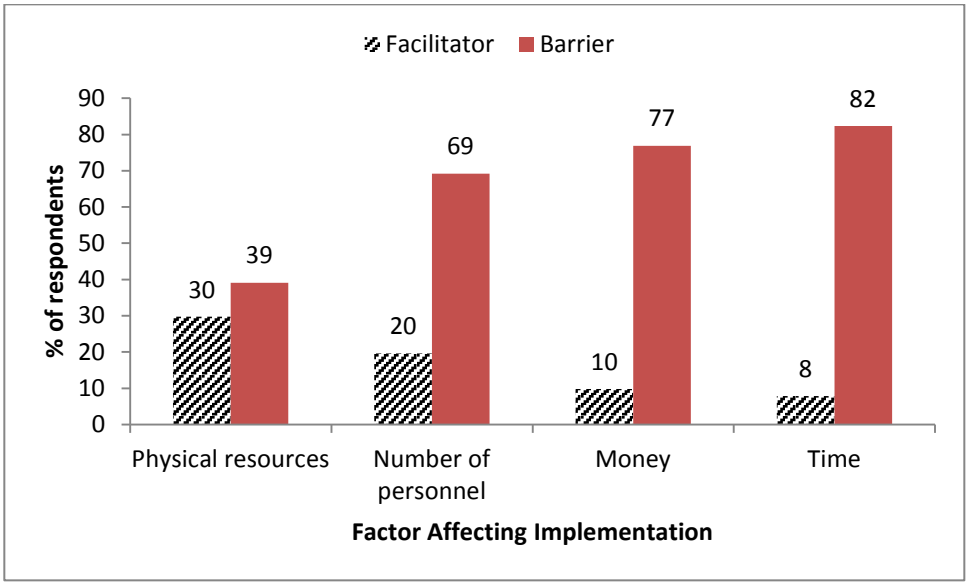
Figure 3.8 Facilitators and Barriers Related to Expertise, Skills, and Interest



NOTE: Includes only respondents who implemented or planned to implement at least one recommendation (n = 190).

Figure 3.9 clearly illustrates that limited resources can be a significant barrier to implementation. Over three-quarters of respondents noted that the lack of available time and financial resources made implementation more difficult.

Figure 3.9 Facilitators and Barriers Related to Resources



NOTE: Includes only respondents who implemented or planned to implement at least one recommendation (n = 190).

Interviewees also identified several factors that either facilitated or hindered their ability to implement recommendations from the *Guidelines* and Toolkit. As in the survey results, the availability of resources and the jurisdiction's level of interest in response to foodborne disease outbreak were commonly cited factors affecting implementation. In most cases, resources were identified as a barrier to implementation:

> [We] haven't really done much in terms of reaching out statewide. We planned to, but resources are a problem. The state is more financially limited than the counties and may not be able to follow through. I think it's a loss for all of us. The state doesn't have resources to support us.

> Economic challenges are impacting [our state] and are a major factor in additional implementation of any 'extra work' or 'more-detailed' work or more significant changes.

> This work is being done on top of other people's jobs, so time is a constraint.

A number of jurisdictions indicated that the grant funding available from CSTE to conduct trainings was critical to their ability to convene the appropriate group and work through some of the Focus Areas. Interviewees also identified ways to save resources by leveraging existing meetings. Others pointed to funding from other sources, such as FoodCORE and FDA, as facilitating their implementation of recommended improvements:

> One other thing that made the workshop successful was [the] ability to bring people from rural area[s]. The grants made it possible.

> Combining the workshop with annual training, when people were already going to be in the area, also helped.

> Having resources (funding) really helped. We were not doing PFGE typing, not interviewing all Salmonella cases. Now we are able to do it and focus on doing [it] faster and better.

The level of interest in foodborne disease outbreak can also serve as either a barrier or facilitator. Responses highlighted interest at two levels as being important for facilitating implementation: (1) interest among on-the-ground practitioners at the local level and (2) interest among senior leadership. Jurisdictions that indicated they had buy-in from these two levels said

it was critical to their success. When interest at either of these levels is lacking, implementing recommendations is more difficult:

> We have really good buy-in. We have a good collaborative spirit (not a struggle). It's impressive. It's like 'stop, drop, and roll.' People are ready to help. Whatever we need to do (e.g., Spanish interpreters). We have cross-department buy-in and commitment.

> People from all your different areas such as epidemiology and lab that are interested in coming together and working together to develop and streamline those programs. We are lucky that we have all that in [our state].

> [A lack of] county interest and prioritization can be a barrier to implementation.

> Buy-in from higher up is key. The epidemiologists understand this is important, but the health director might not make it a priority. Need to get buy-in from the directors and program managers and that will facilitate action at the county level.

Several interviewees suggested strategies for trying to increase interest in foodborne disease response. One interviewee noted that the *Guidelines* and Toolkit could help in this regard; another suggested that providing information about the economic effects of an outbreak could generate interest. Others noted that it might take real events for people to take notice:

> Real events can make the value of the staff and training in foodborne disease outbreak response crystal clear. One county reduced the number of investigators and then was hit with a series of large outbreaks.

Interviewees noted a range of other factors that facilitated their implementation of the recommendations. For example, in one site they noted that the recent focus on preparedness helped:

> Some of the emergency preparedness work that had gone on here at the health department (in terms of exercises) and for hurricanes became part of the organizational culture. Whether [or not] it is an emergency—you just respond. That carried over.

In another site, interviewees said that a general sense of frustration about how the system was working spurred them to action.

Additional factors identified as barriers to implementation include issues related to geography, as well as the size and scope of the *Guidelines*. For example, some of the state interviewees noted that long travel distances made it more difficult to have in-person meetings and trainings. Others noted that differences in the size, needs, and capabilities of the counties within the state could make it difficult to work together to set common policies and procedures:

> It can be hard to get people to overcome differences in their geographies—not all solutions work well for urban and rural areas (have to drive three hours to deliver specimen for testing, etc.). Need to get people to understand this and make policies flexible.

Several interviewees noted that the size and scope of the *Guidelines* were overwhelming, making it difficult to know where to begin:

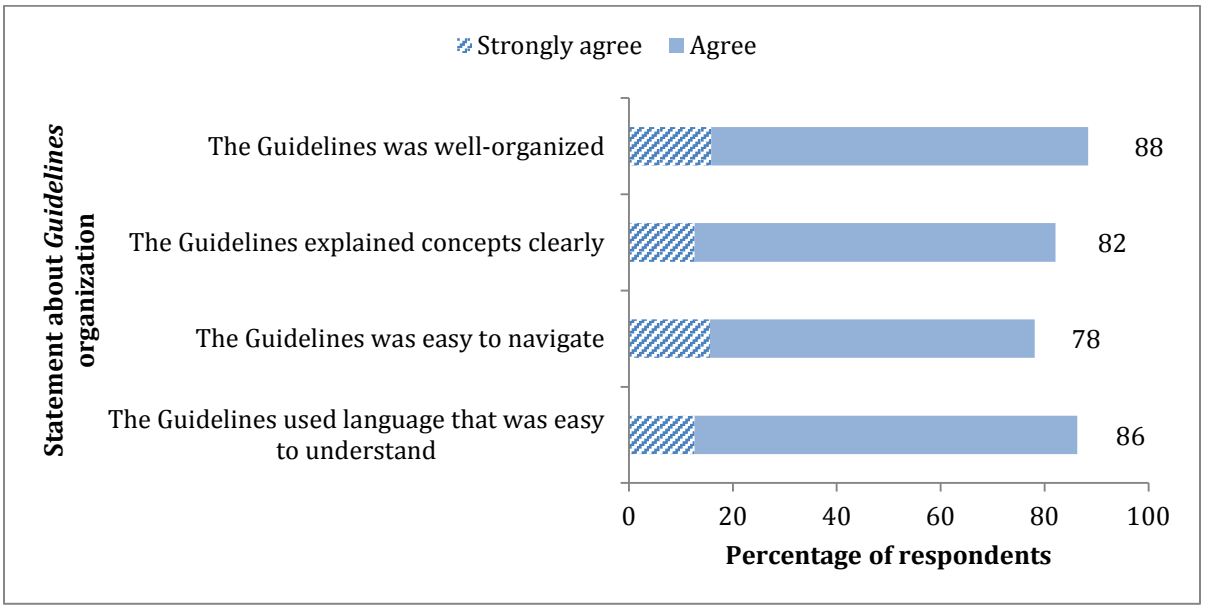
> [The] *Guidelines* can be quite daunting…make you feel like you are failing. Because [there are] so many things you can improve…finding a starting point is a challenge.

> One issue—there are so many performance indicators, so much that we could do and improve. We need to just pick a few.

Practitioner Reactions to and Feedback on the CIFOR *Guidelines* and Toolkit

The survey elicited feedback from *Guidelines* users about the document's usability and usefulness. Overall, respondents found the *Guidelines* to be very user-friendly. Figure 3.10 shows the responses of those who used the *Guidelines* separately from the toolkit. Eighty-two percent of respondents agreed that concepts were explained clearly, 78 percent agreed the document was easy to navigate, 86 percent agreed that the language used was easy to understand, and 88 percent agreed it was well organized.

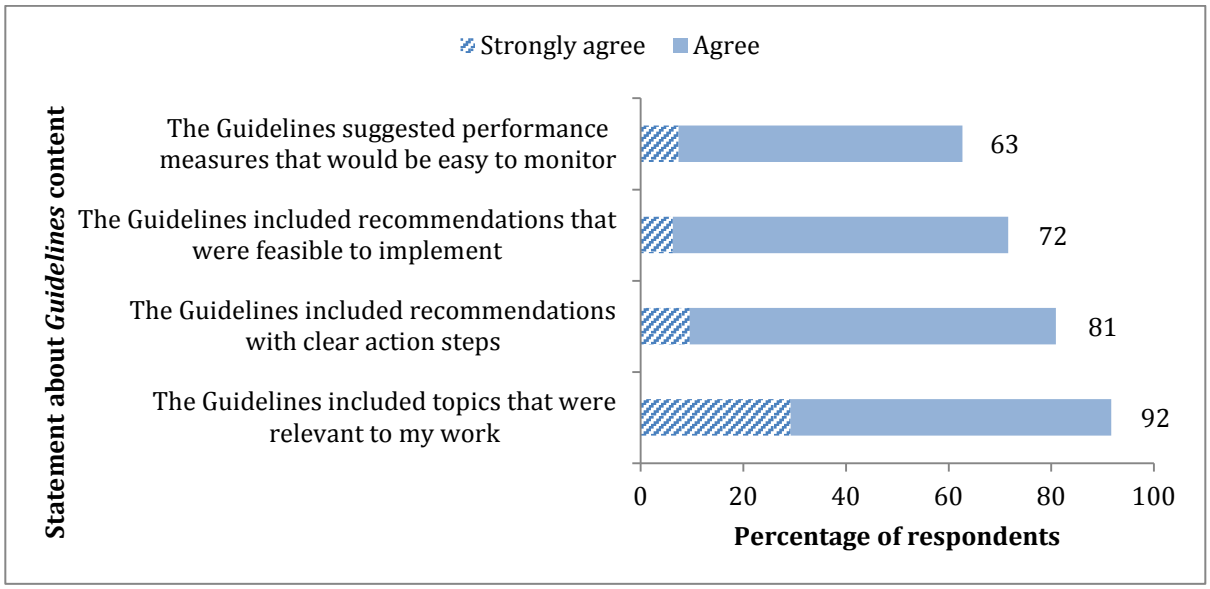
Figure 3.10 Feedback on the CIFOR *Guidelines* Related to Organization



NOTE: Includes only respondents who used the *Guidelines* separately from the Toolkit (n = 119).

In general, respondents agreed that the content of the *Guidelines* was useful. As Figure 3.11 shows, 81 percent of respondents reported that the *Guidelines* includes recommendations with clear action steps and 72 percent believed that the recommendations were feasible to implement.

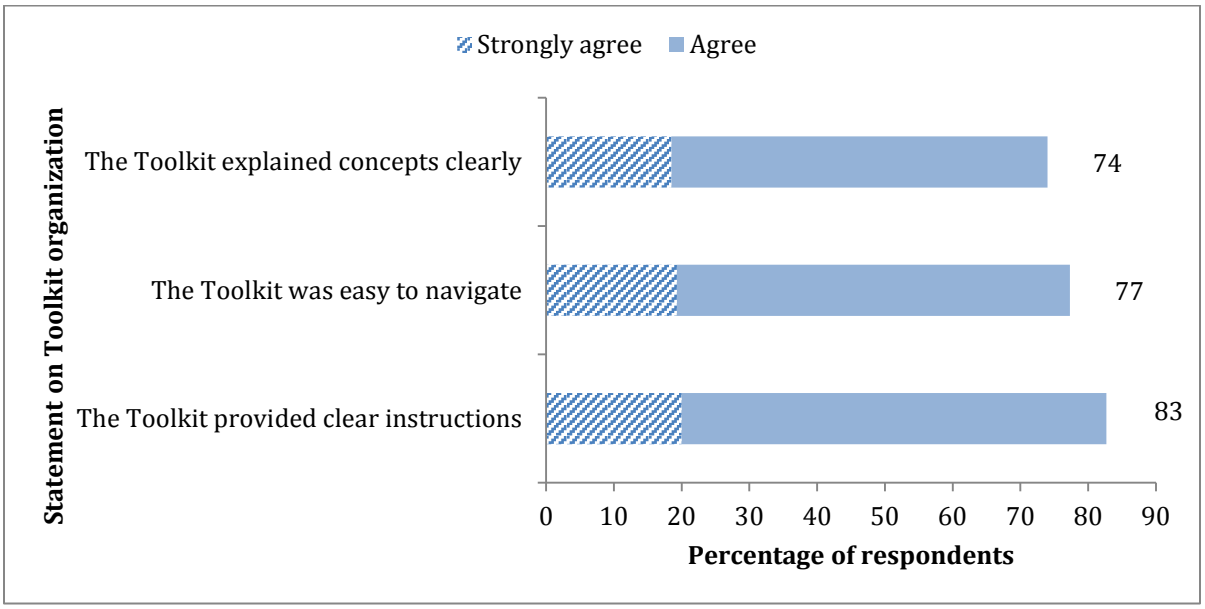
Figure 3.11 Feedback on the CIFOR *Guidelines* Related to Content



NOTE: Includes only respondents who used the *Guidelines* separately from the Toolkit (n = 119).

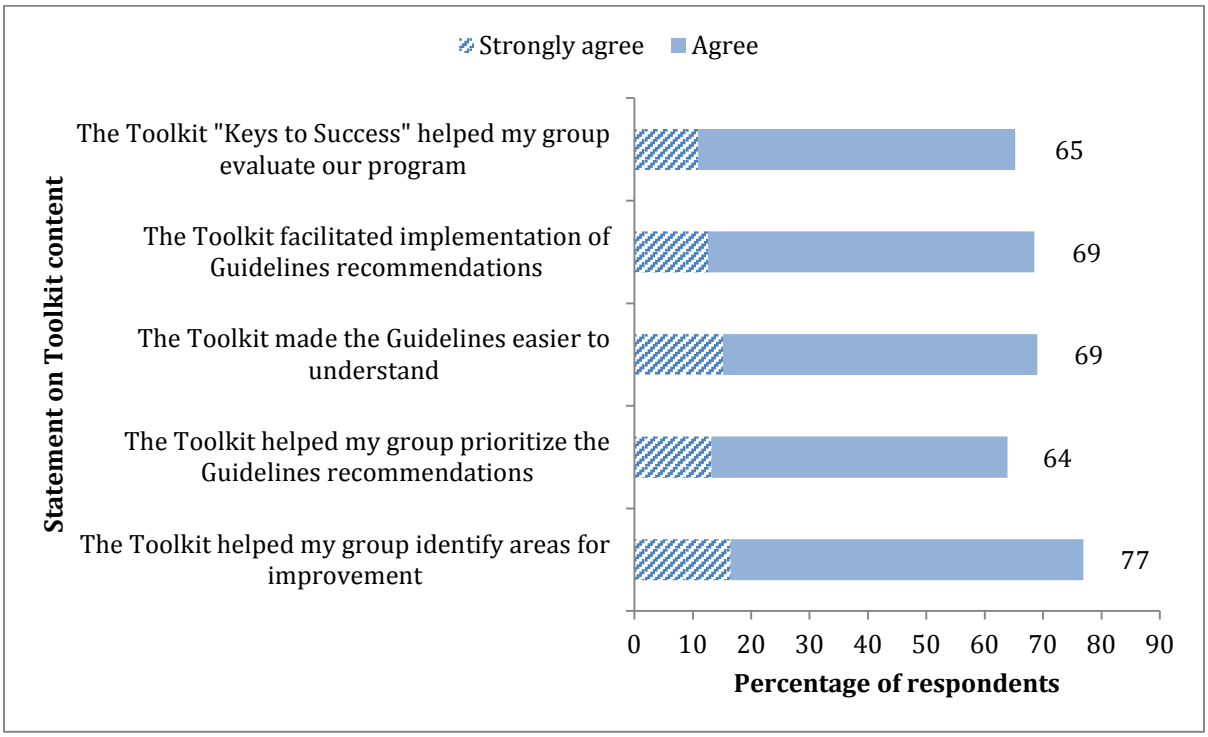
Survey respondents were also given an opportunity to provide feedback on the Toolkit's content and usability. Figure 3.12 illustrates that respondents generally found the Toolkit easy to use and understand. In particular, 74 percent of respondents familiar with the Toolkit agreed that it explained concepts clearly. Even greater percentages of respondents agreed that it was easy to navigate (77 percent) and provided clear instructions (83 percent). Respondents also reported that the content of the Toolkit was useful. For example, as seen in Figure 3.13, 69 percent of respondents familiar with the Toolkit agreed that the Toolkit made the *Guidelines* easier to understand and 77 percent agreed that the Toolkit helped to identify areas for improvement. Those respondents who had participated in a Toolkit training generally held more-favorable views about the Toolkit, but there did not appear to be any other differences between respondents based on whether they had received training.

Figure 3.12 Feedback on the CIFOR Toolkit Related to Organization



NOTE: Includes only respondents who were familiar with the Toolkit (n = 157).

Figure 3.13 Feedback on the CIFOR Toolkit Related to Content



NOTE: Includes only respondents who were familiar with the Toolkit (n = 157).

The reactions collected through our interviews were also generally positive. Interviewees often described the CIFOR *Guidelines* as a comprehensive reference guide:

> Main value of *Guidelines*—it has everything documented. It's like a Bible. It's a reference for something that basically just existed in people's heads, articles, or [was] passed on in each jurisdiction. One single reference source for information.

> It's great to have the *Guidelines*. You can always refer back to them. You know it's the optimal way to respond. It's a great resource to have. It's not very realistic that we are able to read the book. It's a good reference to have. It won't always happen the way it's dictated in the *Guidelines*.

> Very workable document. You can break it out into manageable sections depending on the time you have.

> The *Guidelines* creates some standardization. If you can get over the hurdle of getting people to read and implement them, then we get to the point of standardization and that will help create a national picture to understand how we are doing as a whole.

However, some interview participants described the *Guidelines* and, to a lesser extent, the Toolkit, as "overwhelming" or "intimidating." One interviewee explained that this could be a problem especially for smaller local health departments:

> Pretty comprehensive. It's sometimes overwhelming. Start to finish, it's some good stuff. It plays nicely with the smaller manual [the Toolkit].

> There is so much in the Toolkit that it is intimidating to people. There's no way to go through all the material as a whole, [or] even within the Focus Area.

> We did a poll and [found that] most people had the *Guidelines* but had not read them, or even parts. They were sitting on bookshelves. The local health department had not picked up *Guidelines* because [it had] no time, no money to focus on something. They got mail copies and had information. Thought 'that's a good idea' but to have dedicated time to sit down is challenging.

The CIFOR *Guidelines* and Toolkit were specifically described as being helpful for identifying areas of improvement:

> For better or worse, it was quite detailed. [We were] able to pick out the things we needed to work on in our state. The *Guidelines* helped facilitate pointing out more-specific areas.

> Guidelines were so extensive and inclusive. [The *Guidelines* helped us to] identify gaps that may be neglected day-to-day.

Several interviewees noted the practical style of the CIFOR *Guidelines*, which made it easier to translate the recommendations into practice:

> The way this [the *Guidelines*] is written, it's apparent that the authors understood what is meant to conduct this at the ground level. Better than an academic or a study environment. This translates well for what is done at the ground level. There is a sense that this can work.

> Sometimes the translation from academic to practice is missing the application in the real world. The *Guidelines* are not that way. They are pretty good for being able to put into practice without a lot of interpretation or modification.

> It is meant to work for local health departments.

The Toolkit was described as a useful companion to the CIFOR *Guidelines*, enabling people to more use the *Guidelines* more effectively:

> Good information. The Toolkit condenses what is in the *Guidelines*. It is very useful because people don't want to read the *Guidelines* cover to cover. They need the information distilled in a way that makes it easy to identify what you need to do.

> [The] Toolkit is organized in such a way that it makes going through the process pretty straightforward. It provides a nice template that can help them refocus if the discussion goes on [a] tangent and helps keep the session organized.

> For the most part, people [working within the jurisdiction] liked it…. All of the Toolkit topics seem relevant."

> The Toolkit distills the *Guidelines* into a series of tasks. It breaks it down and makes it much easier to understand and figure out where to start and what to do. Breaks it down into manageable actions….

> The Toolkit was good at in-depth rather than overview. [It helped us to] come up with goals and action items. That's what we wanted them to do. [To] really implement something.

While the vast majority of feedback on the Toolkit was positive, interviewees from one site reported that the Toolkit was "wordy" and used jargon. However, they also reported that the Toolkit was good to have as a training instrument. In addition, they explained that training was a key facilitator for using the Toolkit:

> The Toolkit is wordy. [The Toolkit] takes a while to get through…uses too much jargon. [The] Toolkit is fairly repetitive…. If we had not used the Toolkit as part of the training, then I think a total of zero people would use the Toolkit on their own volition…. Had we not had the Toolkit, then we would have figured out how to do some kind of training around this same document [the *Guidelines*]. [The] Toolkit made it easier. It is good to have the tool to use as needed.

An additional reported strength of the CIFOR *Guidelines* and Toolkit is its diverse and well respected contributing agencies.

> Relied on strength of contributing agencies.

> There is wide recognition that the resources are valuable. It is a reputable source of information that everyone respects, so they don't have to convince people that they are worth using.

Practitioner Recommendations for Improvement

Recommendations for Improving the Resources

Practitioners made recommendations for improving the *Guidelines* and Toolkit in four general areas: (1) content, (2) organization, (3) alignment, and (4) additional tools.

Content

As mentioned previously, jurisdictions and agencies were satisfied with both the *Guidelines* and Toolkit and appreciated having the resources available to them. Many interviewees felt the documents were comprehensive and had few suggestions for significant changes. However, three additional topics for inclusion were frequently mentioned: working with industry, informatics, and laboratory functions.

Interviewees requested more guidance on working with businesses, or "industry," including during traceback and recalls. Environmental health specialists also identified additional needs for eliciting the cooperation of establishments:

> Laying out some of the strategies for enforcement…when do you close a restaurant? When do you make those decisions?

> Would like to see information about how to interact with industry. How do you communicate and interact with businesses?

Data systems and informatics were also areas in which interviewees consistently requested additional help. While the CIFOR resources helped sites identify what kind of data to collect and how to collect it, interviewees struggled with how to manage the resulting data and integrate them into current systems at the local, state, and national levels. As one interviewee noted, "Excel just won't cut it." This issue was salient in discussions about performance indicators and useful tools, as well as within the context of recommendations:

> Guidance on the record keeping during investigations and how to set up a robust and easy-to-use system would be useful.

> Every system is different. At least acknowledging this is a barrier for many health departments and how others have tackled it. Especially if they have different systems in environmental health, epidemiology, and lab.

Those interviewees in laboratory positions had specific recommendations for improving the CIFOR resources. One interviewee asked for more instruction on the types of testing available to help the lab allocate scarce resources. Another interviewee noted the importance of keeping the *Guidelines* updated with advances in technology because "lab techniques are changing all the time." A few sites indicated that the laboratory was "a different beast," although part of the "three-legged stool," and that there was less in the CIFOR resources for laboratorians:

> Doesn't provide a good sense of what the laboratory is doing. It helps the laboratorian understand what others are doing. It would be useful to have more about what the lab is actually doing—for them[selves], but also for the other organizations to understand better.

Interviewees also suggested a range of additional topics that might be helpful to include. Some of these topics were specific to field staff, such as good interviewing techniques and knowing what questions to ask restaurant staff about recipe preparation. One interviewee suggested incorporating the CDC's OutbreakNet into the *Guidelines* as an additional resource for states. A local jurisdiction that used the *Guidelines* to advocate for more program resources proposed adding a section on how to approach management:

> How to use these [*Guidelines*] to effect larger changes…would be good justification to approach your boss—we should do it this way, or if we had this [resource], we could do it.

Although interviewees identified certain *Guidelines* topics as less relevant to their specific work or as particularly sensitive issues to discuss, no one advocated removing information:

> All the Toolkit topics seem relevant. [I] would not want to remove anything.

> At the state level, there are things in the *Guidelines* and Toolkit that aren't relevant to [us] specifically but are useful to read and understand what others are doing.

Organization

Interviewees frequently talked about the lengthiness of both the *Guidelines* and the Toolkit and asked for condensed summary materials. The most common suggestion for improving the *Guidelines* was to create a smaller version of the document:

> An additional tool or resource that would be useful might be a condensed version—pamphlet or handout—that hits the highlights. Bullet points or perhaps a pocket guide.

> Handbook (smaller version of the *Guidelines*) should prioritize issues. What are the top [essential] things a health department should be able to do?

Along with further condensing the *Guidelines* into a pocket guide or checklist, a few interviewees suggested repackaging the resource for different audiences, such as small versus large health departments:

> Would be helpful for smaller, rural, cash-strapped, lack of skilled pieces…. Really basic for health agencies who have hardly anything in place…. Finer pieces for larger, more advanced jurisdictions.

Interviewees also made small, superficial suggestions about the organization of the information that would enhance usability, such as numbering the lines in the Toolkit to facilitate group discussion and distributing loose-leaf rather than bound sections so that users could add and take things out more easily. A few sites indicated having trouble finding information when they needed it and hoped for a better roadmap or index for the *Guidelines*. One interviewee suggested that the *Guidelines* be available online as one document to facilitate searching, rather than as separate files for each chapter.

Alignment

Many jurisdictions and agencies noted the challenge posed by conforming to numerous standards and requirements and recommended that the *Guidelines* help users navigate the landscape. Data transfer within the response team and to national reporting streams (e.g., OutbreakNet, the National Electronic Disease Surveillance System [NEDSS]) was challenging due to the "lack of standard questionnaires and forms." Crosswalks were considered helpful but should be visible within the documents. Interviewees also asked for common performance indicators across different grant programs, or a comparison when indicators do not overlap:

> It's not always possible to reconcile epidemiology and lab [indicators]. Labs look at isolates. Epidemiologists look at cases. Might look at [indicators] and think we're doing something wrong or they're imperfect.

Additional Tools and Resources

Interviewees had several suggestions for additional resources they would like to see included. The most common request was for more opportunities to learn from other sites in case studies or examples. Interviewees at both the state and local levels frequently referred to their desire not to "reinvent the wheel":

> How are other states doing things? It would be useful to have access to best practices or ways to share implementation ideas and experiences—what worked, how did others implement the same recommendations, etc.?

> Put other examples of how well performing departments have solved the problem (best practices) in the Toolkit itself.

Interviewees also hoped for ready-made templates that they could be customized to their local circumstances. After-action report forms were frequently identified as a potentially useful tool to provide guidance on what information should be captured and what the difference was between official records and documents for internal use. One interviewee suggested a worksheet listing what needs to be done during an outbreak and what person or role was responsible for each action. Template interview forms, intake forms, and complaint logs that jurisdictions and agencies could edit would allow people to "at least have a starting point." Another suggestion, related to the requests for additional information on data management, as well as the alignment of metrics reporting, was a model data system for collecting information:

> Health departments need resources to build tools.... We built [our database] from scratch. We sent it to other local health departments so that they don't have to reinvent the wheel.

Many of the requested resources are available from a variety of different sources. That so many respondents still noted this as a problem suggests the need for better information about these resources (e.g., what is available and where it can be accessed) and/or a resource warehouse that could serve as a one-stop site for people working in this area.

Recommendations for Improving Training

Most of the interviewees who hosted a training session said they would use the same structure for any future training. Specifically, they indicated that they would use a mixture of

small- and large-group discussions with strong representation from all relevant disciplines and organizations.

In general, interviewees preferred in-person trainings for fostering relationships and getting things accomplished. However, they also noted that such trainings are more difficult to organize logistically and financially. In-person trainings were also viewed as a way to protect staff time to focus on foodborne outbreak response, as well as an opportunity to share resources across jurisdictions. Conversely, interviewees identified webinars as a feasible strategy for future trainings but recognized that it was not as ideal as in-person trainings. Videoconferences, such as those for the National Environmental Health Association's Epi-Ready course, were suggested as more interactive than the typical conference call. Interviewees also discussed barriers to training, such as time and money, in their responses:

> Face-to-face is best but not always practical. Meeting people and working with them allows you to develop relationships, enhance communication.

> I think technology is driving us away from face-to-face, but it's important to have that interaction, especially when you don't deal routinely with these people.

> Webinars are great because you don't have to travel, but you're also doing three other things at the same time. Being sequestered at a daylong training keeps you on task.

Regardless of the mode of training, getting participants engaged and being interactive were deemed important elements for future trainings. Interviewees suggested mock exercises and role-playing through different examples. A previous participant of Epi-Ready noted the usefulness of Epi-Ready's case studies, which include mistakes that readers can identify and talk about:

> [The] types of training that are most beneficial are more interactive. Even in webinar [format], there are activities, games, challenges, or breakouts for you to participate in and keep you in engaged. Provide learning through doing....

Interviewees also noted the need for more frequent trainings or follow-up. One site indicated that they plan to have additional training sessions until they cover all the Focus Areas in the Toolkit:

> It felt like a moment in time to devote effort. Would be nice [if continuous] to do again and improve our process.

A lot of preparation from both organizers and participants was required for a successful training. One state spent considerable time specifying the membership of the small discussion groups to ensure good representation from the different organizations and functions in attendance. From an organizer's point of view, sending the materials ahead of time and surveying participants to identify needs were very beneficial. A few interviewees felt they needed additional training (beyond what was provided in the Toolkit) on facilitating and helping other groups work through the Toolkit:

> The overviews are good, but it still needs someone who can spend a lot of time working on it to understand the material. There should be more effective ways to promote and export the info besides workshops. [We] were lucky to have someone who could devote a lot of time and energy to it and who had the organizational knowledge in order to facilitate workshops.

Summary of Results

Our survey of intended users of the CIFOR resources and our interviews with state agencies and local jurisdictions that have experience using the resources provided important information about the awareness and use of these materials. The survey respondents were distributed across a range of jurisdictional levels and primary job functions (e.g., epidemiologists, laboratorians, regulators) and thus provided a diverse cross section of the intended users of the *Guidelines* and Toolkit.[2] The interviewees were distributed across a range of geographic locations and types of governance and thus provided a good representation of actual users of the *Guidelines* and Toolkit.

On the whole, there is a strong awareness of the CIFOR resources among their intended users, particularly with respect to the *Guidelines*, of which 80 percent of survey respondents were aware. Although high across all job functions, there is some variation in the level of awareness, suggesting that the methods of dissemination may have been more effective for some job functions than others. The survey results show that a disproportionate number of city-level intended users are unaware of the CIFOR resources; thus that it may be beneficial to target future dissemination efforts to city-level jurisdictions.

Approximately 18 percent of survey respondents were aware of the *Guidelines* only. While this disparity may partly be due to the longer length of time the *Guidelines* have been available, it also suggests that the methods used to disseminate the *Guidelines* may have been more effective than those used for the Toolkit. Given the importance that interviewees assigned to the Toolkit for identifying areas for improvement and making changes, additional dissemination of the Toolkit may be an important area of improvement to explore.

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[2] There is no way to definitively know that this is a representative sample because there is no detailed information on the universe of intended users. Still, the distribution across jurisdictional levels and job functions indicates the survey collected information from a diverse set of intended users.

Both survey respondents and interviewees who had used the *Guidelines* and Toolkit found the resources to be very helpful. They reported the documents to be well organized and easy to navigate, and they found the content very useful. The interviewees reported that the *Guidelines* are a valuable reference but can be overwhelming given the amount of information included. Training on the CIFOR Toolkit was reported as facilitating the use of the Toolkit to identify areas for improvement and implement recommendations.

Survey respondents found the Toolkit Focus Areas and the *Guidelines* chapters to be highly relevant to their work. Many of the respondents reported either having implemented or planning to implement recommendations from the CIFOR resources. Among survey respondents who reported using the Toolkit, the highest rates of planned or actual implementation were for Relationships (Focus Area 1), at 59 percent, and Communications (Focus Area 3), at 58 percent. Among the guidelines, the highest rates were seen for Planning and Preparation (Chapter 3), at 46 percent, and Investigation (Chapter 5), at 41 percent. In addition, approximately one-quarter to one-third of respondents reported that at least some of the recommendations across the focus areas and chapters were already in place. The lowest rates of planned or actual implementation were seen for Food Recall (Focus Area 11), at 22 percent, and Legal Considerations (Chapter 9), at 21 percent.

The ease of implementation is one factor that may affect choices about which recommendations to focus on. The survey results indicate that, overall, users of the CIFOR resources found the recommendations easy to implement. The notable exceptions include the set of recommendations related to performance indicators in the *Guidelines*, which 33 percent reported were difficult to implement, and recommendations related to food recall in the Toolkit, which 37 percent reported were difficult to implement. These results suggest that it may be useful to review the content of the Performance Indicators chapter and the Food Recall Focus Area and consider developing tools or resources that could facilitate implementation in these areas.

While all of the sites represented by our interviewees have used the CIFOR resources, there is substantial variation in their approaches and the extent of their use. In some sites, very little has been done (e.g., held a meeting to discuss the resources), while in others the *Guidelines* and Toolkit are used on an ongoing basis (e.g., in quarterly meetings) to improve different areas of response. Our survey and interview results identify several facilitators and barriers that help explain the overall levels of use and some of the variation between jurisdictions. Not surprisingly, given the economic situation of state and local governments, the biggest barrier reported by survey and interview respondents is not having adequate resources (e.g., time, money, and personnel) to carry out the recommended activities. Consequently, many of the recommendations identified by the interviewees were intended to address the resource problem, at least to some extent. For example, many respondents were interested in having greater access to templates and forms that could be adapted to their jurisdiction. They also wanted to see examples of how other jurisdictions had used the resources and implemented the

recommendations. The underlying motivation for these suggestions was to make it easier to implement recommendations and save time and effort by not having to "reinvent the wheel."

Another important factor influencing the implementation of recommendations is the level of interest in foodborne disease outbreak response within an agency. Minimal interest can be a significant barrier to implementation. This suggests that it may be useful to think about ways to communicate the importance of foodborne disease outbreak response more effectively and to develop tools or resources for staff to generate interest in jurisdictions where interest is low.

Once over the hurdle of implementation, many survey respondents reported noticeable improvements in their jurisdiction's foodborne disease outbreak response. Improvement in the timeliness of the response is the most commonly reported change by survey respondents (26 percent of respondents that implemented at least one recommendation reported an improvement in timeliness). Most interviewees reported that at least some changes have been made as a result of using the resources. Even in places that reported little use beyond an initial in-person training, improvements were reported in communication and in overall understanding of the foodborne disease outbreak response (e.g., roles and responsibilities of all parties). In places where the resources have been used to a greater extent, the most commonly reported changes included improvements in protocols, communication (e.g., the development of contact lists), after action reporting, and performance indicators. While there is a general sense that foodborne disease outbreak response has improved in a variety of ways as a result of the changes made, very few interviewees could point to measured improvements in performance indicators. Most of the jurisdictions and agencies are still in the process of identifying and implementing appropriate performance indicators for monitoring these changes.

Interview respondents offered a number of recommendations for facilitating the use of the CIFOR resources. In addition to the desire for additional tools and resources to assist with implementation, the recommendations addressed the content and organization of the resources, as well as their alignment with other key documents. While most interviewees felt the documents were comprehensive and had few suggestions for significant changes, three additional topics for inclusion came up in several interviews: (1) working with industry, (2) data systems and informatics, and (3) more detail on laboratory functions. Interviewees frequently noted the lengthiness of both the *Guidelines* and the Toolkit and asked for condensed summary materials. The most common suggestion for improving the *Guidelines* was to create a smaller version (e.g., pocket guide, checklist) of the document. Finally, many jurisdictions and agencies noted challenges in conforming to numerous standards and requirements and recommended that the *Guidelines* help users navigate the landscape. In particular, interviewees indicated the importance of common performance indicators across different grant programs, or a comparison for when indicators do not overlap.

4. Study Limitations

The results presented in this report provide important insights into how widely the CIFOR *Guidelines* and Toolkit have been disseminated, how they are being used, and how they could be improved. However, the results need to be interpreted within the context of our study methods.

Several methodological limitations may affect the results. First, our survey was conducted among a convenience sample and thus may not be representative of the full population of intended users of the CIFOR resources. The primary barrier to generating a representative sample is the lack of a well-defined list of intended users from which to draw such a sample. However, while convenience samples may not be representative, the methods used here were designed to increase the likelihood that our study sample would reflect the desired population. In particular, the CIFOR member organizations, which represent all of the relevant disciplines, distributed the survey link to their membership using their preferred methods of communication, including general and specific listservs, e-Newsletters, and web links. The member organizations sent out multiple messages requesting participation. Because the survey link was coming from a trusted source, this method leveraged the strength of the CIFOR member organizations' relationships with their members to improve survey response rates. The final sample includes respondents from across the key job functions (i.e., environmental health, epidemiology, laboratory), as well as across the different levels of government (i.e., city, county, state). Still, those who chose to respond to the survey may have been more familiar with CIFOR and its resources than the full population of intended users. They may also have been more likely to use the resources to improve their response capabilities. Therefore, the levels of awareness and use that were found in the survey should probably be interpreted as upper bounds, with the true levels being somewhat lower. It may also be possible that people who had positive experiences using the CIFOR resources would be more likely to respond than others. If this is the case, then the feedback on the resources gathered from the survey may be more positive than what would be found in a representative population.

Second, the sample of key informants for our interviews was developed purposively and again may not be representative of all users of the CIFOR resources. The sample was selected to represent diverse job functions, geographies, governance structures, and levels of government, as well as identify successful examples of how the resources have been used. The selection of potential sites relied heavily on input from the CIFOR Evaluation Workgroup and on which survey respondents indicated an interest in being interviewed. By design, the sites identified, particularly those identified by the CIFOR Evaluation Workgroup, are more likely to have had positive experiences with the CIFOR resources than other sites. Those that volunteered through the survey to be interviewed likely had strong feelings, whether positive or negative, about the resources that they wanted to share. While much of the feedback about the resources was

positive, there were also many recommendations for improvement, suggesting a range of experiences with and perspectives on the resources.

Despite the fact that the data we gathered may not be representative of all intended users of the CIFOR resources, the study results are suggestive and can provide valuable input for CIFOR as it revised and updates the *Guidelines* and Toolkit. These study results will also be useful to state and local jurisdictions that are interested in using the resources to improve their capabilities to respond to foodborne disease outbreaks.

5. Conclusion

Together, the results from our survey and interviews suggest that the goals for the CIFOR *Guidelines* and Toolkit are being met. Respondents reported that the resources and corresponding trainings helped them to

- **better understand current foodborne disease outbreak response activities in their agency/jurisdiction:** In particular, interview respondents noted that working through the Toolkit Focus Areas with all of their partners (i.e., environmental health, epidemiology, and laboratory) helped them to understand the foodborne disease response system as a whole, as well as how their specific activities fit in.
- **become more familiar with recommended practices:** Many interview respondents noted that the *Guidelines*, in particular, was a key resource for them. They use it as a reference manual for themselves and a training document for new staff.
- **identify specific CIFOR recommendations and activities that will improve the performance of their agency/jurisdiction during future foodborne disease outbreak responses and make plans to implement those activities:** Through the use of the Toolkit, both survey and interview respondents reported identifying and implementing a set of recommended changes (e.g., improved protocols, updated contact lists).

Moreover, the results suggest that the CIFOR resources are achieving the goal of improving the response to foodborne disease outbreaks. Among those that have used the resources, there is a general sense that the changes they made have improved their response capability. However, very few were able to document changes with performance indicators. Fortunately, many state and local agencies report that they are in the process of developing and tracking such indicators. As more state and local jurisdictions collect and track this information, the strength of the evidence base supporting these response activities can only improve.

Finally, the results provide important information to the CIFOR Council about how the resources could be revised and/or expanded to further increase their utility. The resources are generally viewed as comprehensive; only a few people identified additional topics that should be covered. However, many respondents noted that additional tools and resources to support their use of the *Guidelines* and Toolkit would be extremely helpful. If additional resources were available to facilitate their implementation, the impact of these resources on the response to a foodborne disease outbreak could be even greater.

Appendix: Brief Description of the CIFOR *Guidelines* and Toolkit

Guidelines for Foodborne Disease Outbreak Response

CIFOR has developed consensus guidelines for foodborne disease outbreak detection and response. The *Guidelines* describe the overall approach to foodborne disease outbreaks, including preparation, detection, investigation, control and follow-up. The *Guidelines* also describe the roles of all key organizations in foodborne disease outbreaks. The *Guidelines* are targeted at local, state, and federal agencies that are responsible for preventing and managing foodborne disease. The document is organized into the following nine chapters:

Chapter 1. Overview of CIFOR Guidelines
Chapter 2. Fundamental Concepts of Public Health Surveillance and Foodborne Disease
Chapter 3. Planning and Preparation
Chapter 4. Foodborne Disease Surveillance and Outbreak Detection
Chapter 5. Investigation of Clusters and Outbreaks
Chapter 6. Control Measures
Chapter 7. Special Consideration for Multi-Jurisdictional Outbreaks
Chapter 8. Performance Indicators for Foodborne Disease Programs
Chapter 9. Legal Preparedness for Surveillance and Control of Foodborne Disease Outbreaks

The document is available at http://www.cifor.us/CIFORGuidelinesProjectMore.cfm.

Toolkit for the *Guidelines for Foodborne Disease Outbreak Response*

The Toolkit was developed to aid in the implementation of the *Guidelines for Foodborne Disease Outbreak Response* at the state and local levels. The Toolkit is intended to further the ability of states and cities to understand the contents of the *Guidelines* and to implement appropriate recommendations. The Toolkit comprises a series of worksheets designed to help jurisdictions identify which recommendations from the *Guidelines* would be most useful for their jurisdiction. The worksheets divide the *Guidelines* into the following twelve focus areas:

Focus Area 1. Relationships
Focus Area 2. Necessary Resources
Focus Area 3. Communications
Focus Area 4. Notification Systems
Focus Area 5. Pathogen-Specific Surveillance
Focus Area 6. Initial Steps
Focus Area 7. Epidemiology Investigation
Focus Area 8. Environmental Health Investigation

Focus Area 9. Laboratory Investigation
Focus Area 10. Control of Source
Focus Area 11. Food Recall
Focus Area 12. Secondary Spread

The Toolkit is available at http://www.cifor.us/toolkit.cfm.

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