

UTAH

Foodborne Disease Surveillance & Outbreak Response Training Needs Assessment

**Final Report
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| TABLE OF CONTENTS | PAGE |
|---|-------------|
| Table of contents | i |
| 1 Introduction | 1 |
| 2 Methods | 2 |
| 2.1 <i>Interview guide</i> | 2 |
| 2.2 <i>Key informant recruitment and interviews</i> | 2 |
| 2.3 <i>Data analysis</i> | 2 |
| 3 Results | 3 |
| 3.1 <i>Key informant characteristics</i> | 3 |
| 3.2 <i>Ranking of training needs</i> | 6 |
| 3.3 <i>Training delivery methods</i> | 8 |
| 3.4 <i>Additional resources</i> | 10 |
| 3.5 <i>Outbreak investigation challenges</i> | 10 |
| 3.6 <i>CoE Trainings</i> | 12 |
| 3.7 <i>Barriers to participating in trainings</i> | 14 |
| 3.8 <i>Training preferences</i> | 15 |
| 4 Conclusions | 17 |
| Acknowledgements | 18 |
| Authors | 18 |
| Appendix A: Interview Guide | 19 |
| Appendix B: Pre-Interview Summary | 27 |

1 INTRODUCTION

The Colorado Department of Public Health and Environment (CDPHE) and the Colorado School of Public Health (CSPH) have partnered to form the Colorado Integrated Food Safety Center of Excellence (CoE), one of six Integrated Food Safety Centers of Excellence designated by the Centers for Disease Control and Prevention (CDC). The Colorado CoE is dedicated to identifying and developing model practices in foodborne disease surveillance and outbreak response. The CoE provides trainings, continuing education opportunities, and serve as a resource for local, state, and federal public health professionals who respond to foodborne illness outbreaks. The Colorado CoE Region includes Arizona, Colorado, Kansas, Montana, Nebraska, New Mexico, Oklahoma, Texas, Utah, and Wyoming.

The Colorado CoE and the Utah Department of Health (UDOH) partnered to conduct a training needs assessment in Utah. The purpose of this report is to summarize the training needs in foodborne disease surveillance and outbreak response in local health departments in Utah. This needs assessment will prioritize the implementation of existing CoE trainings in Utah and inform the development of future trainings in the Colorado CoE Region.

2 METHODOLOGY

Key informant interviews were used to assess the training needs of public health personnel in Utah in the area of foodborne disease surveillance and outbreak response.

2.1 Interview guide

Key informant interviews were conducted with the aid of an interview guide (Appendix A). The interview guide included questions about the informant's position, experience, and agency; general training needs; CoE training awareness and needs; and training challenges, preferences, and logistics. The interview guide was piloted prior to initiating interviews with actual informants.

The guide asked informants their job title, experience in their position, and role in foodborne outbreak investigations. The guide ascertained information about the informant's agency, including agency staff, disciplines represented in foodborne outbreak investigations, the number of foodborne and enteric disease outbreaks investigated in recent years, how outbreaks were detected by their agency, and recent training information. UDOH provided information on the number of outbreaks reported by agency.

Informants were asked the strengths and weaknesses of the agency during an outbreak investigation, and specifically which challenges were most commonly encountered during an investigation. Informants were presented 14 potential training topics and asked to rank the usefulness on a scale of 1-5 (1 being the least useful and 5 being the most useful). Informants were asked which training and resource modalities were most likely to be utilized by their agency.

Informants were queried about their familiarity with the Centers of Excellence. The interviewer introduced specific CoE trainings, and asked the informant to assess their agency's interest and needs for CoE trainings on a scale of 1-5 (1 being the least interested in the training, 5 being the most interested in the training). Finally, informants were asked about potential challenges, preferences, and logistics.

2.2 Key informant recruitment and interviews

Our goal was to interview key informants representing different levels of experience and specialization from local public health departments in Utah. Key informants were selected by the Utah Department of Health (UDOH). An introductory email was sent to informants from UDOH explaining the purpose of the training needs assessment and informing them a CoE team member would be in contact to schedule an interview. A Pre-Interview Summary (Appendix B) was sent to the informant. Interviews were conducted via internet audio-only conferencing software (Zoom) by a team member of the CoE at the Colorado School of Public Health. All interviews were recorded with permission from the informant.

2.3 Data analysis

Interviews were transcribed by hand and summarized in an Excel spreadsheet. Potential trainings, ranked on a scaled of 1-5, were weighted and summed to give an overall score (i.e., 5 being the most useful was given a weight of 5; 1 being the least useful was given a weight of 1). Qualitative data were analyzed using a basic qualitative inductive approach (reading, coding displaying, reducing, and interpreting). After these steps were taken, common and emergent themes were inferred from the data.

3 RESULTS

3.1 Key informant and agency characteristics

Fifteen key informant interviews were completed from August to September 2016. Nine informants were direct staff supervisors, 4 were frontline staff, and 2 were project managers or administrative directors. Informants represented multiple disciplines, including 4 environmental health specialists, 4 epidemiologists, 4 public health nurses, and 2 managers. One informant was a non-foodborne outbreak investigator working as a diabetes educator (Table 1). Five informants had 1-5 years of experience in a position responding to outbreaks; 5 had 6-20 years of experience, and 2 had less than 1 year of experience or no experience.

Table 1. Key informant characteristics

| Characteristic | N=15 |
|---------------------------------------|---------|
| Occupation | |
| Epidemiologist | 4 (27%) |
| Environmental health specialist | 4 (27%) |
| Public health nurse | 4 (27%) |
| Manager | 2 (14%) |
| Other | 1 (7%) |
| Discipline | |
| Epidemiology | 7 (47%) |
| Environmental Health | 6 (40%) |
| Epidemiology and Environmental Health | 1 (7%) |
| Other | 1 (7%) |
| Location/counties covered | |
| Urban | 6 (40%) |
| Rural | 8 (53%) |
| Tribal | 1 (7%) |
| Agency* | |
| Central Utah Public Health Department | 1 |
| Weber/ Morgan Health Department | 2 |
| Bear River Health Department | 1 |
| Davis County Health Department | 2 |
| Wasatch County Health Department | 1 |
| Southeast Utah Health Department | 1 |
| Southwest Utah Health Department | 2 |
| Utah County Health Department | 2 |
| Tri County Health Department | 1 |
| Summit County Health Department | 1 |
| Salt Lake County Health Department | 1 |
| Utah Navajo Health System | 1 |

*One informant represented two agencies

Informants represented 11 of the 13 local public health agencies and 27 of the 29 counties in Utah. Agencies included the Central Utah Public Health Department, Weber/Morgan Health

Department, Bear River Health Department, Davis County Health Department, Wasatch County Health Department, Southeast Utah Health Department, Southwest Utah Health Department, Utah County Health Department, Tri County Health Department, Summit County Health Department, Salt Lake County Health Department, and the Utah Navajo Health System (Table 1). Six informants worked in urban health departments, 8 worked in rural health departments, and 1 worked in a combination health department (Figure 1).

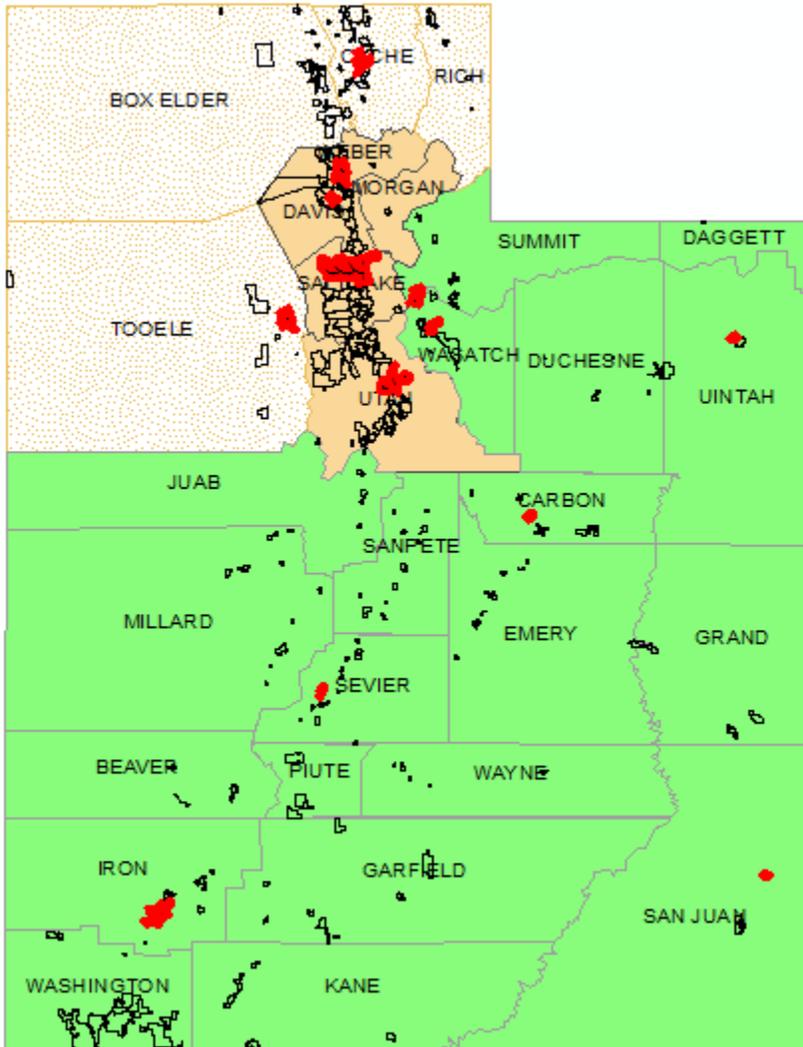


Figure 1. GIS depiction of Utah health departments. The location of each informant's health department's main city location is outlined in red; all major municipalities are outlined in black; and each county is color coded by its designation, according to the state, as mostly rural, mostly urban, or an even mix of the two.

Four agencies reported no foodborne outbreaks to UDOH in 2015; 8 reported 1-3 outbreaks; and 4 reported 4+ outbreaks. Ten informants reported their agency averaged less than 5 foodborne outbreaks per year, 1 reported an average of 5-10 per year, and 1 reported an average of more than 10 per year. Twelve informants reported their agency conducted an environmental assessment or environmental health investigation during recent outbreak investigations. One informant reported their agency conducted an analytical study during recent outbreak investigations. The most common outbreak detection methods included notification by an external entity (93%), complaints directly to the health department (93%), and pathogen-specific disease surveillance (71%) (Table 2).

Table 2. Primary methods of foodborne outbreak detection

| Detection Format | Number reporting "Yes" | (%) |
|---|------------------------|-----|
| Notification by an external entity (DOH, CDC) | 13 | 93% |
| Complaints directly to the health department | 13 | 93% |
| Pathogen-specific disease surveillance | 10 | 71% |
| Other: "igotsick website" | 8 | 57% |
| Correctional Facilities | 3 | 21% |
| Other: "Long term care facilities" | 1 | 7% |
| Other: "Social Media reports" | 1 | 7% |
| Other: "Monitoring lab results" | 1 | 7% |

All informants reported receiving training in foodborne disease surveillance and outbreak response at some point in their career. Eight informants (53%) reported their agency currently offers training on this topic to their employees. The most frequently cited trainings informants reported attending were offered by UDOH, FDA, and CDC.

Quotes from key informants regarding training opportunities...

"We might not get a lot of outbreaks since we are a small health department, and we are spread really thin, so getting more expertise from these trainings would be extremely helpful."

-Environmental Health Director

"We really need more trainings with information on legal issues and lab procedures. We get a lot of lab samples or requests and honestly do not know how to handle them or what to do next."

-Regional Epidemiologist

"Our igotsick website is just one piece. It's not complete. It does not ask the questions we need, so it's more to supply contact information, but then we still have to call and follow up to get the information we need. Overall, it is a great tool."

-Food Service Facilities and Bureau Manager

"Since most rural HD workers wear many hats, there may not be a lot of interest in training solely focused on food outbreaks since it is such a small part of their jobs."

-Nursing Director

"There are a lot of rural HDs that do not have specialized Epi or EH surveillance teams so trainings need to be generalized."

-Nursing Director

3.2 Ranking of training needs

Training on ‘Legal issues in surveillance and outbreak investigations’ and ‘Environmental assessments and investigations’ received the highest overall scores, followed by ‘Overview of outbreak investigation’ (Table 3).

Table 3. Importance of training needs as ranked by informants

| Training | Overall score* | Number of informants ranking training as 4 or 5*‡ |
|--|----------------|---|
| Legal issues in surveillance and outbreak investigations | 61 | 13 (93%) |
| Environmental Assessments and Investigations | 61 | 12 (86%) |
| Overview of outbreak investigation | 58 | 11 (79%) |
| Communicating with the media and the public | 56 | 10 (71%) |
| Control of secondary spread | 56 | 10 (71%) |
| Sample specimen collection and transport | 56 | 10 (71%) |
| Writing after action reports | 52 | 9 (64%) |
| Laboratory methods and interpretation | 51 | 8 (57%) |
| Control of Source | 51 | 8 (57%) |
| Interview Skills | 47 | 8 (57%) |
| Questionnaire Design | 46 | 7 (50%) |
| Descriptive epidemiological methods | 41 | 6 (43%) |
| Foodborne disease surveillance systems | 45 | 5 (36%) |
| Analytical epidemiological methods | 42 | 5 (36%) |

*How useful do you think these trainings would be to you and your organization (where 1 is least useful and 5 is the most useful)? Overall score is the sum of informant responses, with a total possible score of 75.

‡ One informant did not answer because their job did not include food outbreak investigations

Training preferences differed by occupation (Table 4). Informants working in epidemiology ranked ‘Legal issues in outbreak investigation and surveillance’, ‘Laboratory methods and interpretation’, and ‘Environmental assessments/investigation’ highest. Informants working in environmental health ranked ‘Overview of outbreak investigation’, ‘Environmental assessments/investigation’, and ‘Control of secondary spread’ highest.

Table 4. Importance of training needs as ranked by informants, by occupation

| | Epidemiology | | Environmental Health | |
|--|----------------|--------------------------|----------------------|--------------------------|
| | Overall Score* | Ranked as 4 or 5, n (%)‡ | Overall Score | Ranked as 4 or 5, n (%)‡ |
| Environmental Assessments and Investigations | 34 | 6 (75%) | 32 | 7 (100%) |
| Legal issues in surveillance and outbreak investigations | 36 | 7 (88%) | 29 | 7 (100%) |
| Overview of outbreak investigation | 30 | 5 (63%) | 33 | 7 (100%) |
| Control of secondary spread | 29 | 4 (50%) | 32 | 7 (100%) |
| Sample specimen collection and transport | 33 | 5 (63%) | 27 | 6 (86%) |
| Communicating with the media and the public | 32 | 6 (75%) | 27 | 4 (57%) |
| Control of Source | 26 | 3 (38%) | 30 | 6 (86%) |
| Writing after action reports | 33 | 7 (88%) | 23 | 3 (43%) |
| Laboratory methods and interpretation | 35 | 7 (88%) | 20 | 2 (29%) |
| Interview Skills | 26 | 4 (50%) | 25 | 5 (71%) |
| Questionnaire Design | 28 | 5 (63%) | 21 | 2 (29%) |
| Foodborne disease surveillance systems | 27 | 3 (38%) | 21 | 2 (29%) |
| Descriptive epidemiological methods | 27 | 5 (63%) | 18 | 2 (29%) |
| Analytical epidemiological methods | 31 | 5 (63%) | 14 | 0 (0%) |

**Consider each of the following topic areas and rate them on a scale of 1-5 (where 1 is least useful and 5 is the most useful)? Overall score is the sum of informant responses, with a total possible score of 75 for 15 informants.*

‡One informant chose not to answer this section of the interview since their job did not include food outbreak investigations; one other informant was classified as both environmental health and epidemiology, so was included in both

3.3 Training delivery methods

Informants reported a preference for in-person trainings (at a regional location) and online or distance learning trainings (Table 4). For online or distance learning, the three most commonly preferred online learning modalities were online videos, short online trainings, and bi-directional video (Table 5).

Table 4. Preferences for training modalities

| Training Modality (n=15) | Number of times ranked in Top 3 | (%) |
|------------------------------------|---------------------------------|-----|
| In person (at a regional location) | 11 | 73% |
| Online or distance learning | 11 | 73% |
| In person (at agency) | 10 | 67% |
| Online tools | 9 | 60% |
| Technical assistance | 3 | 20% |
| Case studies | 1 | 7% |

Table 5. Preferences for specific online or distance training modalities

| Online or Distance Learning Training Modality (n=15) | Number of times selected as “Yes” | (%) |
|--|-----------------------------------|------|
| Videos | 15 | 100% |
| Short (less than 1 hour) | 13 | 87% |
| Bi-directional video | 13 | 87% |
| Case studies | 12 | 80% |
| Podcasts | 12 | 80% |
| Long (½ work day or longer) | 11 | 73% |

Training modality (online or in-person) differed by urban or rural agencies (Figure 2). Rural agencies preferred online trainings, and agencies near municipalities and UDOH preferred in-person trainings, had no preference, or equally preferred both online and in-person trainings.

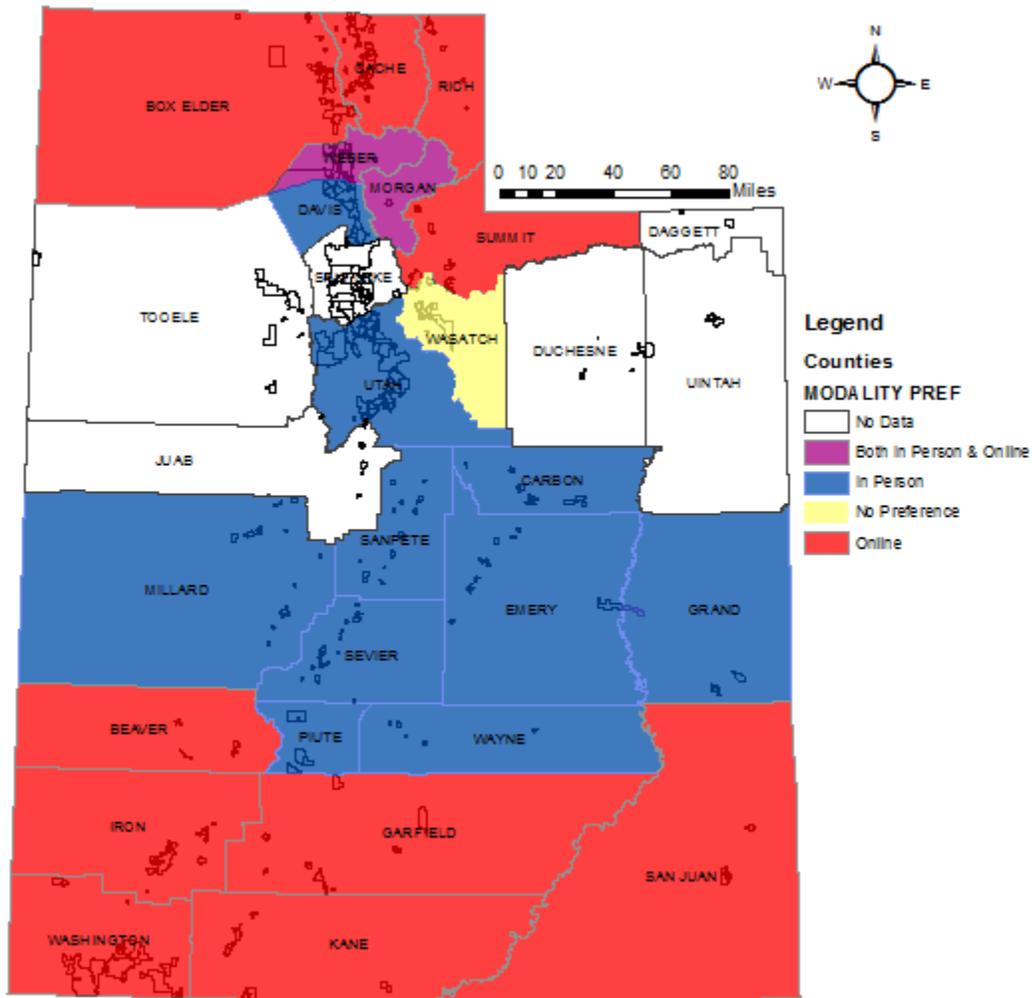


Figure 2. GIS depiction of training modality preferences by county

3.4 Additional resources

Informants reported additional resources that would assist them during an outbreak investigation included contact lists of who to call during an outbreak (36%), checklists of what to do during an outbreak (29%), and job action sheets (7%). Many informants mentioned investigating foodborne outbreaks is a small fraction of their job duties, and more training and resources would help them transition into the role of an outbreak investigator when the rare foodborne outbreak occurs.

3.5 Outbreak investigation challenges

Informants reported the most common challenges during outbreak investigations included the inability to collect sufficient specimens to confirm a diagnosis, poor recall of food exposures, delays in the reporting or identification of the illness, and an inability to contact sufficient cases or controls for interviews (Table 6).

Table 6. Challenges experienced during outbreak investigations

| Challenge | N=14* | % |
|--|-------|-----|
| Inability to collect sufficient specimens to confirm diagnosis | 13 | 93% |
| Poor recall of food exposures | 13 | 93% |
| Delayed reporting or identification of the illness | 12 | 86% |
| Inability to contact/interview sufficient cases or controls | 12 | 86% |
| Inadequately trained staff | 10 | 71% |
| Insufficient staff | 8 | 57% |
| Political or media scrutiny | 6 | 43% |
| Unwillingness of implicated facility to respond or participate | 5 | 36% |
| Difficult coordinating a response across multiple agencies | 4 | 29% |

* One informant did not answer because their job did not include food outbreak investigations

Informants cited resort towns or tourists in their jurisdiction as an additional challenge in outbreak investigations. Much of the population is mobile and no longer in the area by the time the investigation begins, and the presence of tourists increases media attention.

Commonly recognized strengths of agencies included good communication (43%), coordination across departments and other agencies (43%), and quick response and awareness of roles at the onset of an outbreak (36%).

Quotes from informants about specific challenges when doing outbreak investigation work...

I feel like our team is very self-motivated, and they want to get the job done. We have a good amount of variation in terms of experience; the challenge is harnessing that."

-Epidemiologist

"Some of the topics in trainings are so inclusive that my staff gets lost on the analysis portion that we rely on the state for. For example, 'Epi in Action' was way above the heads of most of the people in my health department in terms of what they needed or wanted to hear about."

-Nursing Director

"My experience with the rural HD's is that they have a real problem communicating with both of their EH and Epi departments."

-Epidemiology Supervisor

"In Utah, many of the resources are focused in heavily populated areas, so this is a frustration and a challenge to smaller, rural health departments. These few, heavily populated centers have more staff and training opportunities available."

-Environmental Health Director

"I know I don't know everything, but I'd like to know the phone numbers of the guys that do."

-Environmental Health Scientist

"The main challenge we face as a small agency is coordination with other agencies. We need to make sure roles and responsibilities are clear in order for everyone to come together."

-Epidemiologist

"We work really well internally between the different divisions. We really believe in the idea of 'Divide and Conquer.'"

-Epidemiologist

3.6 CoE Trainings

Five informants (33%) had previously heard of the Integrated Food Safety Centers of Excellence. After a brief explanation of CoE trainings and tools, the highest scores included the Food Source Information Wiki, Environmental Assessment Quick Train, Food Safety Seminar Series, Epi Ready, and CIFOR Self-Assessment (Table 7).

Table 7. Ranking of all CoE trainings and the overall score of interest*

| CoE Training | Rural (n=9) | Urban (n=6) | Total (n=15) |
|--|-------------|-------------|--------------|
| Food Source Information Wiki | 42 | 29 | 71 |
| Environmental Assessment Quick Train | 39 | 30 | 69 |
| Food Safety Seminar Series | 38 | 28 | 66 |
| Epi Ready | 30 | 29 | 59 |
| CIFOR Self-Assessment | 31 | 25 | 56 |
| Public Health Lab Videos | 29 | 26 | 55 |
| Applied Outbreak Investigation | 31 | 23 | 54 |
| Outbreak Response Interview Training | 30 | 24 | 54 |
| Post-Outbreak Hot wash Facilitation | 31 | 23 | 54 |
| Outbreak Technical Assistance | 28 | 23 | 51 |
| CIFOR Performance Measures | 26 | 25 | 51 |
| Patient Specimen Collection Instructions | 36 | 15 | 51 |
| ECHO Learning Communities | 24 | 24 | 48 |
| Foodborne Illness Complaint Form | 29 | 19 | 48 |
| Total possible score | 45 | 30 | 75 |

**Consider each of the following CoE trainings and resources, and rate them on a scale of 1-5 (where 1 is least useful and 5 is the most useful)? Overall score is the sum of informant responses, with a total possible score of 75 for 15 informants.*

** One informant did not answer because their job did not include food outbreak investigations*

A majority of informants reported an increased interest in future CoE trainings after learning more about the CoE. In addition to the CoE trainings, informants expressed interest in attending the Epidemiology in Action course (developed by the Rollins School of Public Health), as well as FDA trainings.

Ten informants (67%) had not previously heard of the Integrated Food Safety Centers of Excellence. Preferred modes of advertising included advertising at other trainings, meetings, or conferences; and e-mail or listserves (Figure 3).

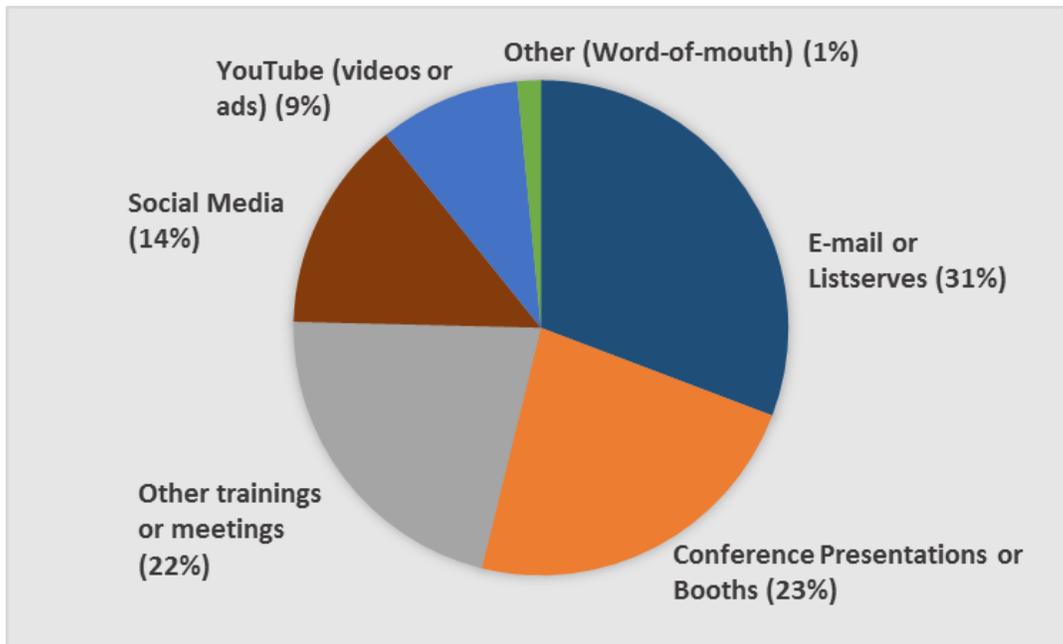


Figure 3. Most effective modes of advertisement suggested by key informants.

Quotes from informants about advertising CoE trainings...

"I feel like a great way to spread the word about these trainings would be to get other people to talk about it. Referral systems are very important! I take a training a lot more seriously if a colleague I trust found it valuable."

-Regional Epidemiologist

3.7 Barriers to participating in trainings

Funding, time commitment, and a lack of knowledge about available trainings were cited as the main barriers to participating in online and in-person trainings (Tables 8 and 9). Several informants, particularly in smaller health departments, mentioned that being part of a small staff often limited them in how far they could travel for trainings. If they were away from the office, necessary tasks would not be accomplished.

Table 8. Challenges to attending online trainings

| Challenges to ONLINE trainings | N=15 | % |
|--|------|-----|
| Lack of knowledge or awareness about trainings being offered | 13 | 87% |
| Lack of funding | 12 | 80% |
| Time Commitment | 10 | 67% |
| Lack of appropriately leveled courses | 9 | 60% |
| Lack of communication with the resources providing the trainings | 6 | 40% |
| Lack of access to adequate computer equipment or internet capability | 1 | 7% |

Table 9. Challenges to attending in person trainings

| Challenges to IN PERSON trainings | N=15 | % |
|--|------|-----|
| Lack of funding | 14 | 93% |
| Time Commitment | 13 | 87% |
| Lack of knowledge or awareness about trainings being offered | 11 | 73% |
| Travel restrictions | 10 | 67% |
| Lack of staff | 9 | 60% |
| Lack of appropriately leveled courses | 8 | 53% |
| Lack of communication with the resources providing the trainings | 6 | 40% |

The highest ranked incentives to participation in trainings were the opportunity for professional development and holding trainings in conjunction with other trainings or meetings. All informants stated they would be willing to pay a registration fee of \$10-\$30 if that fee covered meals during the training; 12 informants (86%) agreed to pay for lodging for a limited number of nights; and 14 informants (100%) would be willing to pay commuting costs. The majority of agencies would not cover registration fees or commuting expenses for trainings held out of state.

Table 10. Incentives to attend trainings

| Incentives | N=14* | % |
|---|-------|------|
| Professional development | 14 | 100% |
| Holding trainings in conjunction with other trainings or meetings | 13 | 93% |
| Networking opportunities | 12 | 86% |
| Continuing education credits | 12 | 86% |
| Coverage of lodging expenses | 12 | 86% |
| Coverage of commuter expenses | 12 | 86% |
| Coverage of meals | 9 | 64% |

* One informant chose not to answer this section of the interview since their job did not include food outbreak investigations

3.8 Training preferences

Most informants preferred trainings held at their local health department, followed by a regional location. Thirteen informants (87%) preferred January to March, when workload decreases. Agencies that did not prefer these months were those in extremely rural areas with concerns about long-distance road travel during winter months.

There was not an obvious preference between online or in person as whole by agency. Informants elaborated that the preferred modality depends on the training material, time of year, and incentives associated with travel.

Table 11: Training preferences regarding location, time of year, and modality

| Training Preferences | N | % |
|-------------------------|----|-----|
| Location | | |
| Local health department | 8 | 53% |
| Regional location | 5 | 33% |
| State health department | 2 | 13% |
| Time of Year | | |
| Winter (Jan-Mar) | 13 | 87% |
| Fall (Oct-Dec) | 6 | 40% |
| Spring (April-June) | 5 | 33% |
| Summer (July-Sep) | 1 | 7% |
| Modality | | |
| In Person | 6 | 40% |
| Online | 5 | 33% |
| No Preference | 4 | 27% |

Table 12: Epidemiology and environmental health staff who could attend in-person trainings hosted at local, regional, state settings

| | Rural | | Urban | |
|--|--------------------|----------------------------|--------------------|----------------------------|
| | Epidemiology Staff | Environmental Health Staff | Epidemiology Staff | Environmental Health Staff |
| Informants | 5 | 7 | 3 | 5 |
| Total foodborne | 18 | 55 | 37 | 42 |
| Number of staff at your agency who could attend an in-person training at: | | | | |
| Your local agency | 18 (100%) | 49 (89%) | 30 (81%) | 42 (100%) |
| Regional location | 10 (56%) | 22 (40%) | 12 (32%) | 33 (79%) |
| Salt Lake City | 10 (56%) | 18 (33%) | 15 (41%) | 42 (100%) |

Quotes from informants about future training opportunities...

"If you can give me the tools you have mentioned, I would be head and shoulders above where I am now."

-Environmental Health Scientist

"We are more likely to commit to trainings that make the best use of our time. I am someone who wears many hats and fills many different roles, so I need to make sure the time I spend in trainings is the best use of my time."

-Environmental Health Scientist

"I want my staff to empathize with other agencies and other departments. Sometimes we want answers right away, and if we better understand the processes, and the time needed, for say certain laboratory tests to run, it may help us to be more patient and understanding."

-Epidemiology Supervisor

"While I do not work in foodborne outbreaks, I think the training for people like me, in related fields, could be really helpful."

-Diabetes Educator

4 CONCLUSIONS

This assessment highlights the need for more training opportunities for public health personnel in Utah in foodborne disease surveillance and outbreak response. Training needs and preferences differed by rural and urban health departments and by occupation. Informants from rural agencies emphasized only a small percentage of job duties include foodborne disease surveillance and outbreak investigation. Rural informants stated they “wear many hats” and would be more inclined to complete a training on multiple topics. Rural informants requested more refresher trainings, tools, and resources that would help recall the basic principles of foodborne outbreak investigation and know who to contact for assistance.

Urban health departments investigated outbreaks more frequently and reported having more specialized staff and a stronger emphasis on training staff for outbreak investigations. Informants from these agencies requested specialized trainings and improved communication and delegation during multi-jurisdictional outbreaks. They reported having limited time to complete longer trainings due to workload, particularly if travel is necessary.

A number of training topics were ranked highly, with some variation by discipline, including ‘legal issues in surveillance and outbreak investigations’, ‘environmental assessments and investigations’, ‘overview of an outbreak investigation’, and ‘control of secondary spread’. The top CoE-specific trainings included Epi Ready, Environmental Assessment Quick Train, Food Safety Seminar Series, CIFOR Self-Assessment, and the: Food Source Information Wiki.

Barriers to participating in trainings included funding, time commitment, and lack of knowledge or awareness about available trainings. Therefore, while many informants said they preferred in-person trainings, online trainings may be a more feasible option. In addition to reducing barriers, incentivizing the informants to attend meetings may also be useful, including the opportunity for professional development, holding trainings in conjunction with other trainings or meetings, creating networking opportunities, and offering continuing education credits.

This information will be used by the Colorado CoE and UDOH to guide future planning and training development.

ACKNOWLEDGEMENTS

We would like to thank all of the key informants for taking the time to participate in this needs assessment and for their valuable input. This training needs assessment was funded by the Colorado Integrated Food Safety Centers of Excellence (Epidemiology and Laboratory Capacity for Infectious Diseases (ELC), Cooperative Agreement Number CDC-C110-101204PPHF13 from CDC).

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APPENDIX A

Utah Key Informant Interview Guide

Needs Assessment

Information collected prior to interview:

Key Informant Name:

Position:

Name of Health Department/ Agency:

Location (County/City):

Is this an Urban or Rural/Frontier county?

Contact Information: phone _____ email _____

Size of health department:

Number of Counties:

Size of Population Served:

Number of overall outbreaks reported in 2015:

Section 1: Introduction

Hi, my name is _____, and I am a graduate student with the Colorado Integrated Food Safety Center of Excellence (CoE). Thank you for talking with me today.

The CoE develops trainings and resources for public health professionals investigating foodborne outbreaks. The CoE and the Utah Department of Health have collaborated to develop the survey to learn about training needs in Utah in foodborne illness surveillance and outbreak response. The primary purpose for collecting this information is to determine what existing trainings can meet the training needs of local health departments in Utah. The secondary purpose is to use this information for future training development as part of the CoE.

As we talk, please keep in mind that there are no “right” or “wrong” answers to any of the questions I ask you — The information you provide is a valuable part of this training needs assessment, I am simply interested in learning about your current training needs so that you and your team are better equipped when detecting and responding to foodborne illness outbreaks. Just to clarify when I say foodborne outbreak investigations, I am speaking broadly about foodborne and enteric infections transmitted by food and other routes (so I am interested in a variety of things ranging from person-to-person norovirus outbreaks to E. coli O157 outbreaks due to contact with animals at a petting zoo).

This interview will take about 30-45 minutes. Everything you share with me today will be kept confidential, but I will be recording this interview, so that I won't miss anything you say. After our interview, the recording of our conversation will be summarized. However, no names or identifying information will be included in the summary. Can I confirm that you are okay talking with me today? [Wait for verbal consent.]

*Interviewer: By checking this box the person consents to this interview.
[turn on digital recorder]*

Section 2: Position and Experience

I'd like to start by asking you some basic questions about your position, agency, and experience.

1. What is your current position title, and would you classify it as either:

TITLE: _____

Project manager/ Administrative director

Direct staff supervisor

Front line employee/ staff

Other: _____

2. How long have you been in this position?

3. What is your role, if any, in a food outbreak investigation?

Probe- Overall coordination, interviewing, environmental assessments, analysis of data?

4. How many people work in your health department/ agency?

5. How many people in your agency work primarily on foodborne outbreak investigations?

6. Of those involved in foodborne outbreak investigations, which disciplines are represented within your agency and how many of each?

Epidemiology _____

Environmental Health _____

Laboratory _____

Other _____

7. How many foodborne outbreak investigations does your agency investigate per year on average?

8. Over the past year (2015), how many foodborne outbreak investigations did you and your team investigate? *Probe- If no outbreaks in the past year, when was the most recent?*

9. Did you, or anyone in your team, conduct an environmental assessment, environmental health investigation, or an analytical study as part of a foodborne outbreak?

10. How were these foodborne outbreaks primarily detected?

Corrections

Complaints to a Health Department

Disease Surveillance

Notification by External Entity (i.e. state DOH, CDC)

Other, please specify: _____

11. Does your organization offer any trainings (in-person or online) in outbreak response or surveillance related to enteric/foodborne disease for their employees?

Probe- In house? External? What types of trainings are offered? Please list.

12. Over the past year, have you attended any in-person or online trainings (through your own agency or an outside source) or courses on foodborne disease surveillance or outbreak response?

Probe- Name of training? Who gave it? Where? When? Helpful?

Were the trainings you attended helpful? **Yes or No**

Section 3: Training Needs

Please consider some of the outbreaks that your team investigated in prior years

1. What challenges to completing your outbreak investigation did you or your team encounter when investigating these outbreaks?

Probe- Specific example? Why a challenge?

Below is a list of some of the most common challenges encountered when working an outbreak. Please select all of the challenges that you or your team faced in responding to any enteric/foodborne disease-related outbreaks during 2015 (or previous years, as considered above).

- Delayed reporting/identification of illness
- Inability to contact/interview sufficient cases or controls
- Inability to gather sufficient specimens to diagnose/confirm
- Poor recall of food exposures
- Unwillingness of implicated facility to respond or participate
- Difficulty coordinating response across agencies
- Insufficient staff (support or investigative)
- Inadequately trained investigative staff
- Political pressure or media scrutiny

Other, please specify: _____

2. Can you think of trainings that would have better prepared you or your team to deal with these challenges? *Probe- Specific training? Specific skills? What would be the best format for this training (in-person or online)?*

3. Can you think of things that went well when responding to these outbreaks? *Probe- Specific example? Why did it go well? Training/preparation?*

4. Please consider each of the following topic areas and rate them on a scale of 1-5 (1=least useful, 5=most useful) with regard to how useful these trainings would be to you and your team or organization.

| Topics for Trainings | Usefulness | | | | |
|--|------------|---|---|---|------|
| | Least | | | | Most |
| Foodborne Disease Surveillance Systems (e.g., local and national electronic disease reporting systems) | 1 | 2 | 3 | 4 | 5 |
| Overview of an Outbreak Investigation (e.g., steps in an outbreak investigation, relationships, roles and responsibilities of local, state, and federal agencies) | 1 | 2 | 3 | 4 | 5 |
| Sample/Specimen Collection and Transport (e.g., materials and procedures for collecting, storing, and transporting food samples and clinical specimens, chain of custody documentation) | 1 | 2 | 3 | 4 | 5 |
| Laboratory Methods and Interpretation (e.g., sample/specimen processing, pathogen identification, PFGE/WGS significance) | 1 | 2 | 3 | 4 | 5 |
| Descriptive Epidemiological Methods (e.g., making line lists, epi curves, data sources) | 1 | 2 | 3 | 4 | 5 |
| Analytic Epidemiological Methods (e.g., designing case-control and cohort studies, analyzing data) | 1 | 2 | 3 | 4 | 5 |
| Questionnaire Design (e.g., designing questionnaires for use in case-control and cohort studies) | 1 | 2 | 3 | 4 | 5 |
| Interviewing Skills (e.g., carrying out hypothesis generating interviews or routine case interviews) | 1 | 2 | 3 | 4 | 5 |
| Environmental Assessments/Investigations (e.g., retail food establishments, recreational water settings, child care settings) | 1 | 2 | 3 | 4 | 5 |
| Control of Secondary Spread (e.g., infection control measures, such as utilized during a norovirus outbreak) | 1 | 2 | 3 | 4 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| Control of Source (e.g., food recall authority and process) | 1 | 2 | 3 | 4 | 5 |
| Communication/Risk Communication (e.g., writing press releases, providing interviews/press conferences to media, communicating with at-risk populations, intra-team and interagency communication) | 1 | 2 | 3 | 4 | 5 |
| Legal Issues in Surveillance and Outbreak Investigations (e.g., what personnel are legally able to do, what information can be collected and shared) | 1 | 2 | 3 | 4 | 5 |
| Writing After Action Reports (e.g., assessing what went well and what did not go well after an outbreak investigation, preparing reports for internal and external dissemination) | 1 | 2 | 3 | 4 | 5 |

5. What training and resource modalities would be most likely to be UTILIZED by you or your agency? (Please choose your top 3 in no specific order).

- In-person trainings (at a remote location)
- In-person trainings (at your agency)
- Online or distance learning
- Case studies
- Technical assistance
- Online tools
- Other: _____

6. Which distance learning modalities would be most likely to be UTILIZED by you or your agency? (Please choose all that apply).

- Longer online courses (Typically ½ work day or longer)
- Short online trainings (Typically shorter than 1 hour)
- Bi-directional video meetings and courses
- Videos
- Seminars or webinars
- Case studies
- Podcasts
- Other: _____

7. Are there other resources that could help you investigate an outbreak?
Probe for clarity- such as, but not limited to: questionnaires, check lists, etc?

Section 3: CoE Trainings

1. Have you previously heard about the Integrated Food Safety Centers of Excellence, also known as the CoEs?

If yes, from where?

If no, describe the CoEs: There are six regional Integrated Food Safety Centers of Excellence based in Colorado, Florida, Minnesota, New York, Oregon, and Tennessee. We are funded by CDC and our mission is to provide trainings and resources to improve foodborne outbreak detection and response. The Colorado CoE is a collaboration between the state health department and the Colorado School of Public Health. We collaborate with surrounding states in the Rocky Mountain region, including Utah.

2. Which of the following do you feel the CoE could better use to advertise its products?

- Email
- List serves

- Advertising at conferences
- In conjunction with other trainings or meetings
- Booths at conferences
- Social Media
- YouTube (ads or videos)
- Other _____

3. Which of the following **CoE in-person trainings** are you most interested in or would best meet the needs of your agency? **On a scale of 1-5 (1 being the least interested, 5 being the most interested)** how interested do you think you would be in these trainings?

| | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| Epi Ready <i>A 2-day team based training covering the basics of an outbreak investigation from the epi/lab/eh perspectives (awareness level)</i> | | | | | |
| Applied Outbreak Investigation <i>A 1-day training practicing the basic epidemiological skills of an outbreak investigation (practice-based)</i> | | | | | |
| Outbreak Response Interview Training <i>A 1/2-day training practicing basic skills to conduct interviews during an analytical study. The Outbreak Response Interview Training can be used for students, or public health staff who might be involved in the epi study of an outbreak and want to practice their interviewing skills.</i> <i>(practice-based)</i> | | | | | |

4. Which of the following **CoE online trainings and distance learning trainings** are you most interested in or would best meet the needs of your agency? **On a scale of 1-5 (1 being the least interested, 5 being the most interested)** how interested do you think you would be in these trainings?

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Environmental Assessment QuickTrain <i>Short, interactive modules covering the basics of environmental assessments (awareness level)</i> | | | | | |
| In the Public Health Lab Videos <i>A short video tour of the public health lab for non-laboratorian investigators to see basic lab procedures (awareness level)</i> | | | | | |
| ECHO Learning Communities <i>Bi-directional video courses, covering a variety of intermediate or advanced topics, such as whole-genome sequencing and hypothesis-generation.</i> | | | | | |

| | | | | | |
|---|--|--|--|--|--|
| Food Safety Seminar Series <i>Quarterly webinar presentations, on topics such as the burden of foodborne illness, choosing study design, and norovirus</i> | | | | | |
|---|--|--|--|--|--|

5. Which of the following **CoE services** are you most interested in or would best meet the needs of your agency? **On a scale of 1-5 (1 being the least interested, 5 being the most interested)** how interested do you think you would be in these services?

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Post-Outbreak Hotwash Facilitation If the agency has recently investigated a foodborne outbreak and is in need of a hot wash or debriefing, the CoE can help facilitate this discussion. | | | | | |
| Outbreak Technical Assistance The CoE can provide guidance with questionnaire design, interviewing, database management, Epi Info, data analysis, and many other technical steps in a foodborne outbreak investigation. | | | | | |
| CIFOR Self-Assessment The CIFOR Toolkit is intended to further the ability of state and local health departments to understand the contents of the CIFOR Guidelines, to conduct a self-assessment of their outbreak detection and investigation procedures, and to implement appropriate recommendations from the nine chapters in the Guidelines. The Toolkit walks public health practitioners through a series of eleven "Focus Areas" using topic-specific worksheets for each Focus Area. | | | | | |
| CIFOR Performance Measures The CIFOR Guidelines identify performance indicators for foodborne disease programs, which are divided into foodborne disease program objectives and indicators (short-term, intermediate, and long-term) and major performance indicators and metrics for program evaluation (for local and state communicable disease, environmental health, and laboratory programs). Using state outbreak data, the Colorado CoE will evaluate (or facilitate evaluation) of the metrics. | | | | | |

6. Which of the following **CoE tools** are you most interested in or would best meet the needs of your agency? **On a scale of 1-5 (1 being the least interested, 5 being the most interested)** how interested do you think you would be in these tools?

| | 1 | 2 | 3 | 4 | 5 |
|------------------------------|---|---|---|---|---|
| Food Source Information Wiki | | | | | |

| | | | | | |
|--|--|--|--|--|--|
| Foodborne Illness Complaint Form | | | | | |
| Patient Specimen Collection Instructions | | | | | |

7. Are there additional trainings from other agencies you are aware of and interested in receiving?

Section 4: Challenges, preferences, and logistics

1. What challenges do you or your team face in taking advantage of or participating in online trainings? (Select all that are a "YES")
 - Lack of funding
 - Lack of knowledge/awareness of trainings on topics that I need/am interested in
 - Lack of communication with the resources providing the training
 - Lack of appropriately leveled courses (e.g. Needing an advanced course and only finding basic courses being offered)
 - Time commitment
 - Lack of access to adequate computer equipment or internet capability
 - None, I have no barriers to participate in online trainings

Other, please specify: _____

2. What challenges do you or your team face in taking advantage of or participating in in-person trainings, meetings or conferences? (Select all that are a "YES")

- Lack of funding
- Lack of staff (coverage, cannot get time off)
- Lack of knowledge/awareness of trainings on topics that I need/am interested in
- Lack of communication with the resources providing the training
- Lack of appropriately leveled courses (e.g. Needing an advanced course and only finding basic courses being offered)
- Travel restrictions not related to funding
- Time commitment
- None, I have no barriers to attend in-person trainings

Other, please specify: _____

3. How can we help to reduce these barriers?

4. Identify any incentives that encourage you to attend trainings. (Select all that are a "YES")

- None
- Professional development
- Opportunity to network and interact with colleagues
- Continuing education credits
- Coverage of lodging expenses (hotel)
- Coverage of commute expenses (mileage)
- Supplying meals (i.e. Lunch served during day trainings)
- Holding trainings in conjunction with other work-related conferences/trainings
- Other, please specify: _____

5. If attending a training, would you or your team be willing to: (Select all that are a "YES")

- Pay a registration fee (\$10-\$25) per person if the training included refreshments/lunch?

- Pay for your own lodging? Up to how many nights? _____
- Pay for your own mileage/ commute costs? How many miles maximum? _____

6. Where would you PREFER trainings be held?

- Your local health department
- Regional location
- Salt Lake City Public Health Laboratory
- Other: _____

7. Where would you or your team NOT be willing to attend trainings?

- Your local health department
- Regional location
- Salt Lake City Public Health Laboratory
- Other: _____

8. (FOR EPIDEMIOLOGY STAFF ONLY): How many EPIDEMIOLOGY employees could your agency send to a training in each of the following settings:

- Your local health department
- Regional location
- Salt Lake City Public Health Laboratory

9. (FOR ENVIRONMENTAL HEALTH STAFF ONLY): How many ENVIRONMENTAL HEALTH employees could your agency send to a training in each of the following settings:

- Your local health department
- Regional location
- Salt Lake City Public Health Laboratory
- Other: _____

10. What time of year works best for in-person trainings?

11. Does your agency have a preference between in-person or online trainings?

12. Hypothetically, if the CoE were to host **12 (1 per month)** of the following trainings, how many out of 12 would you or your team be likely to attend?

How many **online** trainings could you or your team attend?

How many **in-person** trainings could you or your team attend at your **local health department**?

How many **in person** trainings lasting **1/2 day at a regional location** could you or your team attend? _____ out of 12

How many **in person** trainings lasting **1-2 days at a regional location** could you or your team attend? _____ out of 12

How many **in person** trainings lasting **3 or more days at a regional location** could you or your team attend? _____ out of 12

Section 5: Wrap up and thank you

1. Before we end is there anything that I have not touched on that you think is important for me to know as far as improving your organization's response to outbreak investigations?
2. Is there anybody else that you can think of that would be good for me to speak to about training related to foodborne disease surveillance and outbreak response?

Probe- Another person in your role at your agency? Or someone from another agency?

APPENDIX B

Utah Key Informant Interview Guide

Needs Assessment

Pre-Interview Summary

Introduction

Thank you in advance for agreeing to take part in our upcoming interview which will help complete Colorado Integrated Food Safety Center of Excellence (CoE) needs assessment for the state of Utah. This pre-interview summary is a guide to help you better understand the purpose of the needs assessment, inform you about what sort of information we are seeking and give you a brief description of the CoE trainings to which we will be referring to throughout the upcoming interview. After reviewing this summary, if you feel that you are not the best representative within your agency for us to speak to, we would appreciate a referral to whomever you would recommend to complete the interview.

Purpose of the Needs Assessment

The CoE develops trainings and resources for public health professionals investigating foodborne outbreaks. The CoE and the Utah Department of Health have collaborated to develop a survey-style interview to learn about training needs in Utah in foodborne illness surveillance and outbreak response. The primary purpose for collecting this information is to determine what existing trainings can meet the training needs of local health departments in Utah. The secondary purpose is to use this information for future training development as part of the CoE. The information provided during the interview will be a valuable part of this training needs assessment. We at the CoE are interested in learning about your current training needs so that you and your team are better equipped when detecting and responding to foodborne illness outbreaks.

Section 1 of the Interview: Position and Experience

In the first section of the interview, we will be asking questions about the interviewee's current position and about the people that he/she may supervise. This includes information about daily duties, the size of the agency and how many people within the agency work in specialized fields (e.g. epidemiology, environmental health). We are interested to know how many outbreaks the agency has investigated within the past year and what sort of trainings the personnel have completed regarding food outbreak investigation.

Section 2 of the Interview: Training Needs

This section is to help the CoE better understand what sort of trainings are currently being offered to employees in the agency, shortcomings of those trainings, and gaps in the trainings which could be supplemented or improved with the offered CoE trainings, tools, and services. The questions will give specific examples of trains related to food illness surveillance and outbreak response. The interviewee will give a 1-5 ranking of importance of each training area (e.g. analytic epidemiological methods, interviewing skills, etc.), as well as their agency's preference of training modalities (e.g. in person, online, podcasts, etc.).

Section 3 of the Interview: CoE Trainings

The primary goal of this needs assessment is to pair the most appropriate and needed CoE trainings to each individual agency within the state of Utah. This final section will assess how familiar the interviewee is with the CoE and our existing training offerings, as well as help identify which trainings, services, and tools best meet the food outbreak investigation training needs of the agency. Below is a brief introduction to the current CoE offerings to help familiarize the interviewee with the terminology and availability of each type of training offered.

CoE In-Person Trainings

| |
|---|
| Epi Ready <i>A 2-day team based training covering the basics of an outbreak investigation from the epi/lab/eh perspectives (awareness level)</i> |
| Applied Outbreak Investigation <i>A 1-day training practicing the basic epidemiological skills of an outbreak investigation (practice-based)</i> |
| Outbreak Response Interview Training <i>A 1/2-day training practicing basic skills to conduct interviews during an analytical study (practice-based)</i> |

CoE Online Trainings & Distance Learning Trainings

| |
|---|
| Environmental Assessment QuickTrain <i>Short, interactive modules covering the basics of environmental assessments. (awareness level)</i> |
| In the Public Health Lab Videos <i>A short video tour of the public health lab for non-laboratorian investigators to see basic lab procedures. (Awareness level).</i> |
| ECHO Learning Communities <i>Bi-directional video courses, covering a variety of intermediate or advanced topics, such as whole-genome sequencing and hypothesis-generation.</i> |
| Food Safety Seminar Series <i>Quarterly webinar presentations, on topics such as the burden of foodborne illness, choosing study design, and norovirus</i> |

CoE Services

| |
|--|
| <p>Post-Outbreak Hotwash Facilitation <i>If the agency has recently investigated a foodborne outbreak and is in need of a hot wash or debriefing, the CoE can help facilitate this discussion.</i></p> |
| <p>Outbreak Technical Assistance <i>The CoE can provide guidance with questionnaire design, interviewing, database management, Epi Info, data analysis, and many other technical steps in a foodborne outbreak investigation.</i></p> |
| <p>CIFOR Self-Assessment <i>The CIFOR Toolkit is intended to further the ability of state and local health departments to understand the contents of the CIFOR Guidelines, to conduct a self-assessment of their outbreak detection and investigation procedures, and to implement appropriate recommendations from the nine chapters in the Guidelines. The Toolkit walks public health practitioners through a series of eleven "Focus Areas" using topic-specific worksheets for each Focus Area.</i></p> |
| <p>CIFOR Performance Measures <i>The CIFOR Guidelines identify performance indicators for foodborne disease programs, which are divided into foodborne disease program objectives and indicators (short-term, intermediate, and long-term) and major performance indicators and metrics for program evaluation (for local and state communicable disease, environmental health, and laboratory programs). Using state outbreak data, the Colorado CoE will evaluate (or facilitate evaluation) of the metrics.</i></p> |

CoE Tools

| |
|---|
| <p>Food Source Information Wiki This provides public health professionals with rapid access to basic information on production practices and food distribution systems for a range of agricultural food products, from farm to fork. The goal of the Wiki is to better equip outbreak responders to determine the cause of a foodborne outbreak and factors contributing to food contamination.</p> |
| <p>Foodborne Illness Complaint Form This tool is a standard form to collect information about foodborne illness complaints in a manner that assists in the detection and investigation of foodborne illness outbreaks.</p> |
| <p>Patient Specimen Collection Instructions One page visual instructions for public health professionals to give patients for stool collection during a foodborne outbreak investigation.</p> |

For more specific information on these food outbreak investigation trainings, services and tools, or to access other CoE offerings, visit COFoodSafety.org