Foodborne Illness Outbreak Detection, Investigation, and Response: Competencies for Epidemiologists

Overview

This competency set represents the set of knowledge and skills desirable for epidemiologists engaged in foodborne illness outbreak detection, investigation, and response at local and state public health agencies. These competencies build on the Competencies for Applied Epidemiologists in Governmental Public Health Agencies (AECs) developed by the Council for State and Territorial Epidemiologists (CSTE) and the Centers for Disease Control and Prevention (CDC) (available here).

Tiers

This competency set is organized into three tiers which progress from lower to higher levels of skill complexity.

- Tier 1 competencies apply to entry-level epidemiologists or epidemiologists who are new to foodborne illness outbreak investigations. Epidemiologists in Tier 1 should be able to recognize foodborne illness outbreaks and participate in outbreak investigations with guidance.
- Tier 2 competencies apply to epidemiologists who routinely detect, investigate, and respond to foodborne illness outbreaks. Epidemiologists in Tier 2 should have the knowledge and skills required to conduct all aspects of the outbreak investigation.
- Tier 3 competencies apply to epidemiologists in senior, program management, supervisory or managerial roles. Epidemiologists in Tier 3 should direct, innovate and advance foodborne outbreak detection, response and investigation.

The level of skill required for epidemiologists in a given public health agency often increases as the frequency of foodborne outbreaks increases. (Figure 1).

Intended Use

Developed by the Integrated Food Safety Centers of Excellence (CoEs), the primary intended use of these competencies is to guide the development and evaluation of curricula for CoE trainings and resources. This competency set can also be used to help assess workforce knowledge and skills, identify training needs, develop workforce development and training plans, and in writing job descriptions.

The purpose of the tier framework is to help epidemiologists identify relevant competencies. This tier framework is a simplification of the diversity that exists in the public health workforce and these categories may not represent all foodborne disease epidemiologists. Some agencies may have one individual who conducts work across multiple tiers. Additionally, some epidemiologists may need to be more competent in environmental health; these individuals should consider reviewing the "Foodborne Illness Outbreak Detection, Investigation, and Response: Competencies for Environmental Health Professionals", which complement the competencies listed here.

	Topic Area	Tier 1: Recognize Recognize foodborne outbreaks and participate in investigations with guidance	Tier 2: Apply Apply knowledge and experience to conduct foodborne outbreak investigations	Tier 3: Innovate Innovate and advance foodborne outbreak response and investigation
C1	**Surveillance**	Participates in routine enteric disease surveillance activities	Coordinates routine enteric disease surveillance activities	Manages routine enteric disease surveillance systems
C2	**Outbreak detection**	Recognizes how to use surveillance and other data sources to detect outbreaks	Detects clusters and outbreaks using surveillance and other data sources	Improves methods for cluster and outbreak detection
C3	**Interview skills**	Interviews enteric disease cases (sporadic and outbreak-associated) and other people associated with an outbreak investigation	Determines what interview questions or questionnaires should be used for enteric disease cases (sporadic and outbreak-associated) and other people associated with an outbreak investigation	Develops model practices for enteric disease case interviewing and enteric disease case investigation guidelines
C4	**Investigation team[1]**	Participates on foodborne outbreak investigation teams	Establishes foodborne outbreak investigation teams	Advises foodborne outbreak investigation teams and establishes standard outbreak response protocols based on thorough knowledge of team roles and responsibilities
C5	**Specimen testing**	Collects clinical specimens and environmental samples for testing	Requests and interprets appropriate laboratory testing based on symptom profile, duration, and incubation (if known)	Collaborates with laboratorians to implement novel testing methods and optimize existing procedures for sample collection, delivery, and testing
C6	**Data analysis**	Performs data entry and basic epidemiologic analyses	Performs routine epidemiological analyses and uses data management tools	Performs complex epidemiological analysis and designs data management systems

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[1] Outbreak investigative teams are made up of a variety of professionals, including: epidemiologists, microbiologists, environmental health professionals, regulatory compliance officers and inspectors, and health communication specialists. A team may add other professionals as the investigation proceeds.

C7	**Hypothesis generation**	Participates in interpretation of descriptive data, information on food-pathogen pairs, case exposure data, and other preliminary information to hypothesize about potential sources of an outbreak	Interprets descriptive data, information on food-pathogen pairs, case exposure data, and other preliminary information to hypothesize causes of an outbreak	Guides interpretation of descriptive data, information on food-pathogen pairs, case exposure data, and other preliminary information to hypothesize causes of an outbreak
C8	**Study Design**	Collects data for epidemiological studies to test hypotheses about outbreak sources	Designs basic epidemiological studies to test hypotheses about outbreak sources	Designs complex epidemiological studies to test hypotheses about outbreak sources
C9	**Communication**	Participates in communication with external partners and stakeholders during and after an outbreak investigation	Communicates with external partners and stakeholders during and after an outbreak investigation	Facilitates communication among external partners and stakeholders involved in an outbreak investigation
C10	**Enteric disease biology**	Describes how enteric disease biology impacts an epidemiologic outbreak investigation	Applies knowledge of enteric disease biology to an epidemiologic outbreak investigation	Interprets enteric disease biology in the context of an epidemiologic outbreak investigation and advises team/others
C11	**Control measures**	Explains enteric disease control measures	Recommends and/or implements enteric disease control measures	Evaluates enteric disease control measures
C12	**Legal authority**	Identifies resources or guidance on laws and regulations governing public health during an outbreak investigation	Applies the laws and regulations governing public health during an outbreak investigation	Recommends changes to laws and regulations governing public health during an outbreak investigation, if needed
C13	**Quality Improvement**	Explains the importance of evaluation and continuous quality improvement	Implements strategies for evaluation and continuous quality improvement	Develops strategies for evaluation and continuous quality improvement
C14	**Environmental health**	Describes the roles and jurisdiction of environmental health and regulatory professionals in outbreak investigations	Collaborates with environmental health and regulatory professionals to implement appropriate environmental health actions	Develops model practices for shared investigation responsibilities with environmental health and regulatory professionals
C15	**Reporting to surveillance**	Describes the importance of reporting foodborne illness outbreaks to national surveillance	Assists in the reporting of foodborne illness outbreaks to national surveillance	Improves the quality and completeness of foodborne illness outbreak data reported to national surveillance

Figure 1. Foodborne illness outbreak detection, investigation, and response: Target audience framework for public health professionals in the epidemiology role