

# Competencies for Applied Epidemiologists in Governmental Public Health Agencies

## Tier 3b: Senior Scientist/Subject Area Expert

### **Example of Functional Responsibility**

- Senior scientist/subject area expert in an epidemiologic focus area.

### **Examples of Educational and Experiential Criteria**

- Master's degree with a focus in epidemiology with 4 or more years' work experience in epidemiology in a public health agency; or
- Doctoral-level epidemiologist with at least 2 years' work experience at a Tier 2 epidemiologist level; or
- Other nonepidemiology professional degree or certification (e.g., RN, MD/DO, DDS/DMD, DVM, PhD, RS) with specific epidemiology training (e.g., MPH degree, CDC Epidemic Intelligence Service program) and at least 4 years' work experience at a Tier 2 epidemiologist level.

### **Competencies and Subcompetencies for Skill Domain 1—Assessment and Analysis**

- Validate identification of public health problems pertinent to the population
  - Synthesize key findings from the critical thinking process to determine whether a public health problem exists
  - Evaluate need for further investigation or other public health action on the basis of results of literature review and assessment of current data
  - Lead collaborations with others inside and outside the agency to identify the problem and form recommendations
- Organize surveillance
  - Evaluate validity of conducting surveillance for the particular public health issue under consideration
  - Evaluate surveillance data needs
  - Implement new or revise existing surveillance systems
  - Synthesize key findings from the surveillance system and other pertinent information for use by decision-makers
  - Design and conduct evaluation of surveillance systems
- Design investigation of acute and chronic conditions or other adverse outcomes in the population
  - Design a community health status assessment
  - Recommend priorities of potential public health problems to be addressed
  - Determine investigative processes
  - Verify hypotheses
  - Design investigations (e.g., disease investigations, studies, or screening programs)
  - Design investigation techniques consistent with the public health problem
- Synthesize principles of good ethical/legal practice for application to study design and data collection, dissemination, and use
  - Integrate ethics guidelines and principles when planning studies; conducting research; and collecting, disseminating, and using data
  - Design data collection, management, and dissemination and use of data and information to comply with relevant laws
  - Verify conclusions that have been reached regarding distinction between public health practice and public health research
  - Ensure legal and ethical conduct of human subjects research
  - Ensure application of Institutional Review Board processes
  - Ensure that conflicts of interest do not interfere with research or investigations
  - Incorporate privacy laws into study design to protect confidentiality, including Health Insurance Portability and Accountability Act and applicable state and local privacy laws
  - Know agency procedures for handling Freedom of Information Act requests
  - Apply ethical principles in preparing and submitting publications
- Manage data from surveillance, investigations, or other sources
  - Define database requirements, if indicated
  - Manage databases
- Evaluate data from an epidemiologic investigation or study
  - Create analysis plan for data
  - Evaluate data
- Evaluate results of the analysis, and interpret conclusions
  - Assess the validity of the epidemiologic data, taking into consideration bias and other study limitations
  - Assess need for special analyses, including survival analyses, cost-effectiveness/cost benefit/cost utility analyses
  - Synthesize key findings from the study

The Centers for Disease Control and Prevention (CDC) and the Council of State and Territorial Epidemiologists (CSTE) convened an expert panel to develop Competencies for Applied Epidemiologists (AECs) in Governmental Public Health Agencies. The AECs were intended to improve the practice of epidemiology within the public health system. The expert panel included representatives from local, state, and federal public health agencies and schools of public health.

The AECs present a comprehensive list of competencies that define the discipline. They describe functional, analytical, and managerial competencies in four tiers—entry-level or basic, mid-level, supervisory and senior scientist/researcher. The AECs were developed within the framework of the eight skill domains of the Core Competencies for Public Health Professionals—a product of the Council on Linkages between Academia and Public Health Practice—and are consistent with the larger field of public health practice.



## **Competencies for Applied Epidemiologists in Governmental Public Health Agencies**

### **Tier 3b: Senior Scientist/Subject Area Expert**

- Formulate new interventions on the basis of evidence when available, and control measures in response to epidemiologic findings
  - Examine cultural/social/political framework to develop recommendations or interventions
  - Design recommendations using scientific evidence or interventions
- Evaluate programs
  - Develop measurable and program-relevant goals and objectives in collaboration with program staff
  - Develop program logic models and theories of action in collaboration with program staff
  - Synthesize surveillance and other data to allow tracking of program objectives and outcomes
  - Critique progress toward program objectives and outcomes
  - Evaluate progress toward program objectives and outcomes for program managers and staff to aid in program planning and modification

#### ***Competencies for Skill Domain 2—Basic Public Health Sciences***

- Use current knowledge of causes of disease to guide epidemiologic practice
- Develop processes for using laboratory resources to support epidemiologic activities
- Apply principles of informatics, including data collection, processing, and analysis, in support of epidemiologic practice
- Develop and manage information systems to improve effectiveness of surveillance, investigation, and other epidemiologic practices

#### ***Competencies for Skill Domain 3—Communication***

- Organize preparation of written and oral reports and presentations that communicate necessary information to professional audiences, policy makers, and the general public
- Create messages that follow the principles of risk communication
- Model interpersonal skills in communication with agency personnel, colleagues, and the public
- Use effective communication technologies

#### ***Competencies for Skill Domain 4—Community Dimensions of Practice***

- Lead epidemiologic studies, public health programs, and community public health planning processes at the state, local, or tribal level
- Develop community partnerships to support epidemiologic investigations

#### ***Competencies for Skill Domain 5—Cultural Competency***

- Differentiate special populations by race; ethnicity; culture; societal, educational, and professional backgrounds; age; gender; religion; disability; and sexual orientation
- Establish relationships with groups of special concern (e.g., disadvantaged or minority groups, groups subject to health disparities, historically underrepresented groups)
- Ensure that surveillance systems are designed to include groups subject to health disparities or other potentially underrepresented groups (using standard categories where available)
- Organize investigations that use languages and approaches tailored to population
- Ensure that standard population categories or subcategories are used for data analyses
- Use knowledge of specific sociocultural factors in the population to interpret findings
- Recommend actions that will be relevant to the affected community

#### ***Competencies for Skill Domain 6—Financial and Operational Planning and Management (Operational Planning, Financial Planning, and Management Skills)***

- Conduct epidemiologic activities within the financial and operational plan of the agency
- Describe the financial planning and budgetary process of the agency
- Implement operational and financial plans for assigned projects
- Prepare proposals for extramural funding for review and input from managers
- Use skills that foster collaborations, strong partnerships, and team building to accomplish epidemiology program objectives

#### ***Competencies for Skill Domain 7—Leadership and Systems Thinking***

- Promote the epidemiologic perspective in the agency strategic planning process
- Promote the organization's vision in all programs and activities
- Use performance measures to evaluate and improve epidemiology program effectiveness
- Promote ethical conduct in epidemiologic practice
- Promote workforce development
- Prepare for emergency response

#### ***Competencies for Skill Domain 8—Policy Development***

- Bring epidemiologic perspective in the development and analysis of public health policies