

Epidemiology Concentration competencies

The following competencies are based on the competencies proposed by the Association of Schools of Public Health, ASPH Education Committee, Core Masters in Public Health Competency Development **Project, Version 2.3**, <http://www.asph.org/userfiles/version2.3.pdf> and CDC/CSTE Tier 1 <http://www.cste.org/competencies.asp> were analyzed and decided upon in light of the population to be served.

A. Recognition of public health problems

Recognize the existence of public health problems

Identify problems with assistance of other public health professionals

Collaborate in conducting a community health status assessment

Characterize investigative processes

Develop hypotheses

B. Problem conceptualization and critical thinking

Create and develop a conceptual framework for epidemiological research problems

Apply principles of causal inference to epidemiologic data

Review epidemiological literature in a defined problem area using advanced bibliographic and informatics resources

Critique published epidemiological studies including evaluation of study design implications, statistical analysis methods, and interpretation of research findings and their strengths and weaknesses

C. Conducting surveillance activities

Identify surveillance data needs

Implement new or revise existing surveillance systems

Report key findings from the surveillance system

Support evaluation of surveillance systems

Collaborate in defining database requirements

Conduct investigations (outbreaks or other relevant public health problems)

Identify the principles and limitations of public health screening and surveillance programs

D. Study design, data collection, and implementation

Apply fundamental epidemiologic study designs including ecologic, cross-sectional, cohort, and case-control studies, and explain their uses for solving epidemiological problems

Choose a study design appropriate for a particular epidemiological research question

Design an appropriate, scientifically sound study including

- Specification of the study aims
- Development of the study design
- Specification of data collection methods and data management methods, as well as identifying appropriate sources of data
- Identify sources of bias and confounding factors and implement strategies to minimize the effects of bias and confounding factors

Implement or closely observe the implementation of one or more epidemiological study designs in the field

E. Data sources and data management:

Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and evaluation

Identify key sources of data for epidemiologic and statistical analysis purposes

Describe data management strategies to ensure high quality data

F. Analysis, summarization and interpretation of data

Describe a public health problem in terms of magnitude, person, time and place

Distinguish among basic measures of association, including rate ratio, risk ratio, incidence density ratio, odds ratio, attributable risk, and population attributable risk

Identify situations in research studies in which confounding and interaction and effect modification measures may be influential, and apply designs and statistical methods appropriate to the quantitative assessment of confounding and effect modification

Use appropriate statistical methods for analysis of epidemiological data

Use standard statistical software packages for epidemiological research
Calculate and interpret basic population measures of health and disease occurrence including incidence, prevalence, and survival

Evaluate diagnostic test properties including sensitivity, specificity, positive predictive value and negative predictive value and measures of reliability

Make appropriate comparisons of disease rates within and between populations

Plan and conduct data analysis

Identify key findings from the study

Draw appropriate inferences, distinguishing between association and causation, from epidemiologic data

G. Ethical/legal treatment of human subjects

Follow ethics guidelines and principles when planning studies, conducting research, and collecting, disseminating, and using data

Be familiar with the Institutional Review Boards research requirements and Review Board processes

Bring potential conflicts of interest to the attention of collaborators

Be familiar with Insurance Portability and Accountability Act (HIPAA) and applicable state and local privacy laws

Recognize agency procedures for handling Freedom of Information Act (FOIA) requests

Identify and communicate potential violations of ethical principles in preparing and submitting publications to attention of colleagues

Identify potential ethical problems in research studies and alternative approaches to solving ethical dilemmas

H. Dissemination of study findings

Develop written and oral presentations based on epidemiologic or statistical findings for both public health professionals and communication with lay audiences

Discuss the dissemination of epidemiologic or public health data analysis findings to inform policy and programming decisions

I. Monitoring and Evaluation of programs

Collect relevant data for use in tracking program objectives and outcomes

Monitor progress towards program objectives and outcomes

Communicate information about progress toward program objectives and outcomes to program managers

Prepare reports to supervisors, funding agencies, clinical and public health communities as well as the general public.

J. Cultural competency

Design and conduct surveillance activities and epidemiological research in a manner that is respectful to individuals from different cultural and social backgrounds

Communicate epidemiological research findings using mechanisms that are tailored to special population groups and vulnerable communities

K. Evidence-based interventions and control measures

Identify and develop appropriate and effective evidenced-based interventions and control measures

Develop an appropriate cultural/social/political framework for recommended interventions

Epidemiology Concentration Competencies
1. Recognition of public health problems
A. Recognize the existence of public health problems
B. Identify problems with assistance of other public health professionals
C. Collaborate in conducting a community health status assessment
D. Characterize investigative processes
E. Develop hypotheses
2. Problem conceptualization and critical thinking
A. Create and develop a conceptual framework for epidemiological research problems
B. Apply principles of causal inference to epidemiologic data
C. Review epidemiological literature in a defined problem area using advanced bibliographic and informatics resources
D. Critique published epidemiological studies including evaluation of study design implications, statistical analysis methods, and interpretation of research findings and their strengths and weaknesses
3. Conducting surveillance activities
A. Identify surveillance data needs
B. Implement new or revise existing surveillance systems
C. Report key findings from the surveillance system
D. Support evaluation of surveillance systems
E. Collaborate in defining database requirements
F. Conduct investigations (outbreaks or other relevant public health problems)
G. Identify the principles and limitations of public health screening and surveillance programs
4. Study design, data collection, and implementation
A. Apply fundamental epidemiologic study designs including ecologic, cross-sectional,

cohort, and case-control studies, and explain their uses for solving epidemiological problems
B. Choose a study design appropriate for a particular epidemiological research question
C. Design an appropriate, scientifically sound study including <ul style="list-style-type: none"> i. Specification of the study aims ii. Development of the study design iii. Specification of data collection methods and data management methods, as well as identifying appropriate sources of data iv. Identify sources of bias and confounding factors and implement strategies to minimize the effects of bias and confounding factors
D. Implement or closely observe the implementation of one or more epidemiological study designs in the field
5. Data sources and data management
A. Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and evaluation
B. Identify key sources of data for epidemiologic and statistical analysis purposes
C. Describe data management strategies to ensure high quality data
6. Analysis, summarization and interpretation of data
A. Describe a public health problem in terms of magnitude, person, time and place
B. Distinguish among basic measures of association, including rate ratio, risk ratio, incidence density ratio, odds ratio, attributable risk, and population attributable risk
C. Identify situations in research studies in which confounding and interaction and effect modification measures may be influential, and apply designs and statistical methods appropriate to the quantitative assessment of confounding and effect modification
D. Use appropriate statistical methods for analysis of epidemiological data
E. Use standard statistical software packages for epidemiological research
F. Calculate and interpret basic population measures of health and disease occurrence including incidence, prevalence, and survival
G. Evaluate diagnostic test properties including sensitivity, specificity, positive predictive value and negative predictive value and measures of reliability
H. Make appropriate comparisons of disease rates within and between populations

I. Plan and conduct data analysis
J. Identify key findings from the study
K. Draw appropriate inferences, distinguishing between association and causation, from epidemiologic data
7. Ethical/legal treatment of human subjects
A. Identify potential ethical problems in research studies and alternative approaches to solving ethical dilemmas
B. Follow ethics guidelines and principles when planning studies, conducting research, and collecting, disseminating, and using data
C. Be familiar with the Institutional Review Boards research requirements and Review Board processes
D. Bring potential conflicts of interest to the attention of collaborators
E. Be familiar with Insurance Portability and Accountability Act (HIPAA) and applicable state and local privacy laws
F. Recognize agency procedures for handling Freedom of Information Act (FOIA) requests
G. Identify and communicate potential violations of ethical principles in preparing and submitting publications to attention of colleagues
8. Dissemination of study findings
A. Develop written and oral presentations based on epidemiologic or statistical findings for both public health professionals and communication with lay audiences
B. Discuss the dissemination of epidemiologic or public health data analysis findings to inform policy and programming decisions
9. Monitoring and Evaluation of programs
A. Collect relevant data for use in tracking program objectives and outcomes
B. Monitor progress towards program objectives and outcomes
C. Communicate information about progress toward program objectives and outcomes to program managers
D. Prepare reports to supervisors, funding agencies, clinical and public health communities as well as the general public.

10. Cultural competency
A. Design and conduct surveillance activities and epidemiological research in a manner that is respectful to individuals from different cultural and social backgrounds
B. Communicate epidemiological research findings using mechanisms that are tailored to special population groups and vulnerable communities
11. Evidence-based interventions and control measures
A. Identify and develop appropriate and effective evidenced-based interventions and control measures
B. Develop an appropriate cultural/social/political framework for recommended interventions

