

# Field Epidemiology Training Program Standard Core Curriculum



**U.S. Department of Health and Human Services**  
Centers for Disease Control and Prevention  
Coordinating Office for Global Health  
Division of Global Public Health Capacity Development

***Field Epidemiology Training Program  
Standard Core Curriculum***

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## **Who should read this material?**

This packet is intended for epidemiologists or program staff members who are planning or currently serving as program managers for a field epidemiology training program.

## **What is the FETP Standard Core Curriculum Project?**

One of the challenges to those starting and maintaining a field epidemiology training program is the development of a detailed program curriculum based on identified competencies. Using best practices of both science and adult education, the epidemiologists, instructional designers and public health advisors in Coordinating Office for Global Health have collaborated to create this suggested standard core curriculum for a two-year training program.

## **Who is the target audience of a Field Epidemiology Training program?**

This curriculum was created based on the following assumptions:

### **FETP Target Audience Participants:**

- Have health background
- Are available full time for formal training, field work & related Ministry of Health activities
- Have access to instructors and materials as needed
- Have basic computer skills, such as familiarity with basic hardware and software navigation
- Have access to required resources, including PC, email and internet access
- Require additional and consistent training during the entire two year program
- Take an active role in their education and vigorously seek solutions as issues arise
- Have the initiative to complete assignments in a timely manner

## **How can this curriculum help me?**

This curriculum provides guidelines to assist you in developing and managing your field epidemiology training program. You can compare the suggested competencies with the priorities of your organization to plan and implement your program. Customize the curriculum based on your program's priorities.

# Curriculum Design Glossary

The glossary provides a definition and example for each of the terms used in the design of the curriculum.

| Term                       | Purpose                                                                                                                               | Definition                                                                                                                  | Example                                                                                        |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Competency</b>          | Describes the expectations for job performance and for evaluation of the individual.                                                  | An integrated set of knowledge, skills, and attitudes that supports successful performance in public health service context | Use epidemiologic practices to conduct studies that improve public health program delivery     |
| <b>Instructional Goal</b>  | Guides the development of an instructional activity and provides the starting point for subsequent planning.                          | A broad statement of intent of a formal instructional plan that describes learning outcomes.                                | Design and conduct analytic studies                                                            |
| <b>Learning Objectives</b> | Frames specific lessons within an instructional goal and provides guidelines for content development, delivery method and evaluation. | A specific statement of what a learner will be able to accomplish on completion of a lesson or instruction activity.        | Construct a 2x2 table, tabulating the occurrence of disease and exposure in study participants |

## FETP Competencies

|                                                                       |
|-----------------------------------------------------------------------|
| <b>FETP Core Competency:<br/>Use science to improve public health</b> |
|-----------------------------------------------------------------------|

**Supported by the following competencies:**

|                                                       |                                                                                                                                                                                                                       |
|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Epidemiologic Methods</b>                          | <ol style="list-style-type: none"> <li>1. Use epidemiologic practices to conduct studies that improve public health program delivery</li> <li>2. Respond to outbreaks</li> </ol>                                      |
| <b>Biostatistics</b>                                  | <ol style="list-style-type: none"> <li>3. Analyze epidemiological data using appropriate statistical methods</li> </ol>                                                                                               |
| <b>Public Health Surveillance</b>                     | <ol style="list-style-type: none"> <li>4. Manage a public health surveillance system</li> </ol>                                                                                                                       |
| <b>Laboratory and Biosafety</b>                       | <ol style="list-style-type: none"> <li>5. Use laboratory resources to support epidemiologic activities</li> </ol>                                                                                                     |
| <b>Communication</b>                                  | <ol style="list-style-type: none"> <li>6. Develop written public health communications</li> <li>7. Develop and deliver oral public health communications</li> </ol>                                                   |
| <b>Computer Technology</b>                            | <ol style="list-style-type: none"> <li>8. Use computers for specific applications relevant to public health practices</li> </ol>                                                                                      |
| <b>Management and Leadership</b>                      | <ol style="list-style-type: none"> <li>9. Manage a field project</li> <li>10. Manage staff and resources</li> <li>11. Be an effective team leader and member</li> <li>12. Manage personal responsibilities</li> </ol> |
| <b>Prevention Effectiveness</b>                       | <ol style="list-style-type: none"> <li>13. Apply simple tools for economic analysis</li> </ol>                                                                                                                        |
| <b>Teaching and Mentoring</b>                         | <ol style="list-style-type: none"> <li>14. Train public health professionals</li> <li>15. Mentor public health professionals</li> </ol>                                                                               |
| <b>Epidemiology of Priority Diseases and Injuries</b> | <ol style="list-style-type: none"> <li>16. Evaluate &amp; prioritize the importance of diseases or conditions of national public health concern</li> </ol>                                                            |



# Curriculum at a Glance

| Epidemiologic Methods                            |                                        | Biostatistics                                          | Surveillance                                | Lab & Biosafety                                      | Communication                   | Computer Technology  | Management & Leadership                                                       | Prevention Effectiveness       | Teaching & Mentoring            | Epidemiology of Disease & Injury                   |
|--------------------------------------------------|----------------------------------------|--------------------------------------------------------|---------------------------------------------|------------------------------------------------------|---------------------------------|----------------------|-------------------------------------------------------------------------------|--------------------------------|---------------------------------|----------------------------------------------------|
| Introduction to Public Health & Epidemiology     | Advanced Tables, Graphs, Charts & Maps | Introduction to Biostatistics                          | Introduction to Surveillance                | Introduction to the Laboratory Role in Public Health | Field Reports                   | Word Processing      | Project Management for the Public Health Professional Monitoring & Evaluation | Public Health Economics        | Training Development Techniques | Prioritization of Disease                          |
| History & Description of the FETP Training Model | Descriptive Data Analysis              | Rates, Proportions & Ratios (Measures of Frequency)    | Surveillance System Development             | The Role of the Laboratory in the Field              | Internal Written Communications | Spreadsheets         | Team Building                                                                 | Prevention Effectiveness       | Training Delivery Techniques    | Epidemiology & Control of Communicable Diseases    |
| Framing the Problem                              | Data Management & Data Editing         | Central Location & Dispersion                          | Surveillance Data Analysis & Interpretation | Reproducibility & Validity                           | External Written Communications | Graphics             | Supervisory Skills                                                            | Burden of Disease Measurements | Mentoring Skills                | Epidemiology of Injury & Non-Communicable Diseases |
| Public Health Literature Review                  | Stratified Analysis                    | Rate Adjustment                                        | Surveillance Data Collection                | Specimen Management in the Field                     | Scientific Manuscripts          | Email & the Internet | Financial Management                                                          |                                |                                 | Vaccine Preventable Diseases                       |
| Descriptive Study Design                         | Matching Case Control Studies          | Probability                                            | Public Health Response                      |                                                      | Writing an Abstract             | Online Literature    | Time management                                                               |                                |                                 | Epidemiology of Public Health Disasters            |
| Surveys                                          | Effect Modification                    | Normal Distribution                                    | Surveillance System Evaluation              |                                                      | Poster Presentations            | Epi-Info             | Interpersonal Skills                                                          |                                |                                 | Bioterrorism                                       |
| Introduction to Qualitative Methods              | Analyzing Cross Sectional Studies      | Confidence Intervals for Case Control & Cohort Studies |                                             |                                                      | Epidemiologic Bulletins         |                      |                                                                               |                                |                                 |                                                    |
| Analytical Study Design                          | Ethics                                 | Statistical Inference                                  |                                             |                                                      | Briefing Statements             |                      |                                                                               |                                |                                 |                                                    |
| Introduction to Sampling                         | Outbreak Investigations                | Parametric Tests of Significance                       |                                             |                                                      | Oral Presentations              |                      |                                                                               |                                |                                 |                                                    |
| Measure of Association & Impact                  |                                        | Non Parametric Tests                                   |                                             |                                                      |                                 |                      |                                                                               |                                |                                 |                                                    |
| Causation                                        |                                        | Introduction to Correlation & Regression Analysis      |                                             |                                                      |                                 |                      |                                                                               |                                |                                 |                                                    |
| Questionnaire Design                             |                                        | Sample Size                                            |                                             |                                                      |                                 |                      |                                                                               |                                |                                 |                                                    |

# Competencies by Domain

## Epidemiologic Methods

| Epidemiologic Methods                                                                      |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                     |                                     |
|--------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| Competency Statement                                                                       | Instructional Goal                                                                      | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Topic                                                                                                                                                                                                                                                                                                                               |                                     |
| Use epidemiologic practices to conduct studies that improve public health program delivery | Describe principal epidemiologic concepts and their roles within the Ministry of Health | <ul style="list-style-type: none"> <li>Summarize the epidemiologic approach to addressing public health problems</li> <li>Explain the core epidemiologic functions</li> <li>List the uses of epidemiology in the management cycle</li> <li>Describe epidemiologic measurements of time, place and person</li> <li>Describe routine measures of morbidity and mortality</li> <li>Identify sources of routine morbidity and mortality</li> <li>Describe the interactions between host, agent, and environment</li> </ul> | Introduction to public health & epidemiology                                                                                                                                                                                                                                                                                        |                                     |
|                                                                                            |                                                                                         | <ul style="list-style-type: none"> <li>Describe the role of the FETP in the support of MOH mission and goals</li> <li>Identify the components of the FETP training model</li> <li>Explain the importance of regional/ global collaboration and TEPHINET</li> <li>Describe expectations of the FETP</li> </ul>                                                                                                                                                                                                          | History and description of the FETP training model                                                                                                                                                                                                                                                                                  |                                     |
|                                                                                            | Write a problem statement                                                               | <ul style="list-style-type: none"> <li>List the elements of a problem statement</li> <li>Work with a health team to write a complete health problem statement</li> <li>Explain the relationship between a research question and a health problem</li> </ul>                                                                                                                                                                                                                                                            | Framing the problem                                                                                                                                                                                                                                                                                                                 |                                     |
|                                                                                            | Use public health literature to develop recommendations                                 | <ul style="list-style-type: none"> <li>Critically review the scientific literature, including systematic literature reviews</li> <li>Synthesize findings in scientific literature across studies to make public health recommendations</li> </ul>                                                                                                                                                                                                                                                                      | Public health literature review                                                                                                                                                                                                                                                                                                     |                                     |
|                                                                                            | Design and conduct descriptive studies                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Describe the different types of descriptive epidemiologic studies</li> <li>Describe the differences between descriptive and analytic studies</li> <li>List two uses of descriptive studies</li> <li>Develop a case definition</li> </ul>                                                     | Descriptive study design            |
|                                                                                            |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Describe the differences between a survey and surveillance</li> <li>List the tasks needed to carry out a survey</li> <li>Describe reasons for a weighted survey design and analysis</li> <li>Prepare a survey protocol</li> <li>Conduct a survey</li> <li>Prepare a survey report</li> </ul> | Surveys                             |
|                                                                                            |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Describe when focus groups or key informant interviews should be conducted</li> <li>Plan &amp; conduct a focus group</li> <li>Present results of a focus group</li> </ul>                                                                                                                    | Introduction to qualitative methods |

## Epidemiologic Methods

| Competency Statement | Instructional Goal                  | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Topic                            |
|----------------------|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
|                      |                                     | <ul style="list-style-type: none"> <li>• Develop a list of key informants for selected health issues</li> <li>• Present results of a key informant interview</li> <li>• Use qualitative methods to inform the design of a study</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                  |
|                      | Design and conduct analytic studies | <ul style="list-style-type: none"> <li>• List uses of analytic studies</li> <li>• Develop exposure and outcome definitions</li> <li>• Describe the characteristics of a prospective study</li> <li>• Describe the characteristics of a retrospective study</li> <li>• List the advantages and disadvantages of cohort and case control studies</li> <li>• Design a cohort study</li> <li>• Design a case control study</li> <li>• Identify suitable control groups &amp; unexposed groups</li> <li>• Define an experimental study</li> <li>• Illustrate the design of an experimental study</li> <li>• Identify biases in cohort and case control studies</li> <li>• Minimize bias when designing and conducting analytic studies</li> <li>• Conduct a case control study or a retrospective cohort study</li> </ul> | Analytic study design            |
|                      |                                     | <ul style="list-style-type: none"> <li>• Describe the difference between probability and non-probability sampling</li> <li>• List the advantages &amp; disadvantages of various types of probability and non-probability samples</li> <li>• Describe the reasons for doing a probability sample</li> <li>• Differentiate between sampling error and bias</li> <li>• Describe the difference between simple, random, systematic, cluster, and stratified sampling</li> <li>• Describe the reasons for selecting clusters probability proportional to size</li> <li>• Describe the sampling method, given a specific study design for a health problem</li> </ul>                                                                                                                                                      | Introduction to sampling         |
|                      |                                     | <ul style="list-style-type: none"> <li>• Construct a 2-by-2 table, tabulating the occurrence of disease and exposure in study participants</li> <li>• Describe two ways to determine an excess risk of disease in persons exposed to certain agent</li> <li>• Calculate absolute risk (risk and rate difference), relative risk, rate ratio, and odds ratio</li> <li>• Describe the impact of differential and non-differential misclassification of subjects for exposure and disease</li> <li>• Determine the attributable risk</li> <li>• Determine the preventive fraction</li> <li>• Determine which measures of association or impact are appropriate for a cohort or case control study design</li> <li>• Describe in non-technical terms the interpretation of measures of impact and association</li> </ul> | Measures of association & impact |
|                      |                                     | <ul style="list-style-type: none"> <li>• Explain the difference between the various models of causation</li> <li>• State the relationship between association and causation</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Causation                        |

## Epidemiologic Methods

| Competency Statement | Instructional Goal                                               | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Topic                                  |
|----------------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
|                      |                                                                  | <ul style="list-style-type: none"> <li>• Explain the different types of causal inference</li> <li>• List the 7 Hill causal criteria</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                 |                                        |
|                      | Use a questionnaire to address a research question               | <ul style="list-style-type: none"> <li>• List the steps in designing a questionnaire</li> <li>• Describe the types of questions and when to use them</li> <li>• Describe how a questionnaire can be made more user-friendly for respondents and data-entry personnel</li> <li>• Explain the process to pilot-test a questionnaire</li> <li>• Create a practical field questionnaire addressing a research question</li> <li>• Explain the process of translating a questionnaire</li> <li>• Train interviewers in standardized interview techniques</li> </ul> | Questionnaire design                   |
|                      | Create tables, graphs, charts and maps for data analysis         | <ul style="list-style-type: none"> <li>• Prepare a table w/ 2 - 3 variables</li> <li>• Prepare line graphs &amp; scatter diagrams</li> <li>• Prepare stacked &amp; grouped bar charts</li> <li>• Prepare dot density maps</li> </ul>                                                                                                                                                                                                                                                                                                                           | Advanced tables, graphs, charts & maps |
|                      | Analyze and interpret data from descriptive and analytic studies | <ul style="list-style-type: none"> <li>• Correctly display time data</li> <li>• Correctly display place data</li> <li>• Correctly display person data</li> <li>• Generate hypotheses from descriptive data</li> <li>• Make actionable recommendations based on analysis</li> </ul>                                                                                                                                                                                                                                                                             | Descriptive data analysis              |
|                      |                                                                  | <ul style="list-style-type: none"> <li>• Use a systematic approach to data management and editing</li> <li>• Describe how to conduct quality-control data checks, including duplication and missing data</li> </ul>                                                                                                                                                                                                                                                                                                                                            | Data management & data editing         |
|                      |                                                                  | <ul style="list-style-type: none"> <li>• List 3 methods to control for confounding</li> <li>• Discuss when to perform a stratified analysis</li> <li>• Calculate a summary risk estimate using the Mantel and Haenszel test</li> <li>• Identify presence of confounding using stratified analysis</li> </ul>                                                                                                                                                                                                                                                   | Stratified analysis                    |
|                      |                                                                  | <ul style="list-style-type: none"> <li>• Describe how matching controls for confounding</li> <li>• List the advantages &amp; disadvantages of matching</li> <li>• Calculate matched &amp; unmatched measures of association in a case control study</li> </ul>                                                                                                                                                                                                                                                                                                 | Matching case control studies          |
|                      |                                                                  | <ul style="list-style-type: none"> <li>• Differentiate between effect modification and confounding</li> <li>• Identify the presence of effect modification in a data set</li> <li>• Present findings to express effect modification</li> </ul>                                                                                                                                                                                                                                                                                                                 | Effect modification                    |
|                      |                                                                  | <ul style="list-style-type: none"> <li>• Analyze a survey dataset</li> <li>• Analyze data from a cluster survey</li> <li>• Calculate the prevalence odds ratio</li> <li>• Calculate the prevalence ratio</li> <li>• Explain design effect</li> </ul>                                                                                                                                                                                                                                                                                                           | Analyzing cross sectional studies      |

## Epidemiologic Methods

| Competency Statement | Instructional Goal                                                                     | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Topic                   |
|----------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                      |                                                                                        | <ul style="list-style-type: none"> <li>• Explain the differences between the two &amp; when to use them</li> <li>• Identify limitations of cross sectional studies</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                         |
|                      | Follow ethics guidelines when planning and conducting research                         | <ul style="list-style-type: none"> <li>• Describe the importance of safeguarding the population's interest</li> <li>• Describe the role of an institutional review board</li> <li>• Describe ethical considerations of authorship, citations and acknowledgements</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Ethics                  |
| Respond to outbreaks | <p>Investigate an outbreak</p> <p>Develop an intervention strategy for an outbreak</p> | <ul style="list-style-type: none"> <li>• List the operational steps of an outbreak investigation</li> <li>• Given a cluster of cases of illness in a community:               <ol style="list-style-type: none"> <li>a. Determine whether an epidemic exists</li> <li>b. Verify the diagnosis</li> <li>c. Count cases and determine attack rate</li> <li>d. Develop biologically plausible hypotheses</li> </ol> </li> <li>• Describe the use of and present data in a line listing</li> <li>• Construct and interpret an epidemic curve</li> <li>• List the types of evidence that need to be collected in the field</li> <li>• Identify the essential roles in the logistics of outbreak investigation and response</li> <li>• Recommend strategies for control and prevention in response to an outbreak</li> <li>• Communicate investigation activities to 3 audiences: scientific, community, political</li> </ul> | Outbreak investigations |

## Biostatistics

| Biostatistics                                                    |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                      |                                                        |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Competency Statement                                             | Instructional Goal                                                                                          | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Topic                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                      |                                                        |
| Analyze epidemiologic data using appropriate statistical methods | Calculate descriptive statistics                                                                            | <ul style="list-style-type: none"> <li>Describe the scales of measurement (nominal, ordinal, interval, and ratio)</li> <li>Compare continuous and discrete data</li> </ul>                                                                                                                                                                                                                                                                                                                                          | Introduction to biostatistics                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                      |                                                        |
|                                                                  |                                                                                                             | <ul style="list-style-type: none"> <li>Differentiate between ratios, proportions, incidence, prevalence, attack rates</li> <li>Calculate ratios, proportions, incidence, prevalence, attack rates</li> <li>Describe differences between these measures &amp; the proper interpretation of each</li> <li>Explain the advantage of using rates over absolute numbers when describing a population</li> </ul>                                                                                                          | Rates, proportions, ratios (measures of frequency)                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                      |                                                        |
|                                                                  |                                                                                                             | <ul style="list-style-type: none"> <li>Calculate measures of central tendency (mean, median, mode)</li> <li>Calculate measures of dispersion (range, variance, standard deviation, standard error of the mean)</li> <li>Discuss in what setting the various measures of central tendency and dispersion are used</li> <li>Describe the characteristics of a skewed distribution</li> <li>Explain a confidence interval in non-technical terms</li> <li>Calculate a 95% confidence interval around a mean</li> </ul> | Central location and dispersion                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                      |                                                        |
|                                                                  |                                                                                                             | <ul style="list-style-type: none"> <li>Describe two reasons why rates should be adjusted</li> <li>Calculate direct adjusted rates using a standard population</li> <li>Calculate indirect adjusted rates using standard population rates</li> </ul>                                                                                                                                                                                                                                                                 | Rate adjustment                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                      |                                                        |
|                                                                  | Choose, calculate and interpret statistical tests according to study design and type of data being analyzed | Choose, calculate and interpret statistical tests according to study design and type of data being analyzed                                                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"> <li>Describe the relative frequency concept of probability</li> <li>Create a frequency distribution table &amp; histogram</li> </ul>                                                                                                                                                                                                                                                                | Probability                                                                                                                                                                                                                                                                                                                                                          |                                                        |
|                                                                  |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Describe the importance of a normal distribution</li> <li>Explain in non-technical terms the meaning of the central limit theory</li> <li>Convert raw scores into standard scores</li> <li>Determine probabilities from standard normal distribution</li> <li>Calculate the area inside the normal curve between the mean and 1 standard deviation, mean and two standard deviations</li> </ul> | Normal distribution                                                                                                                                                                                                                                                                                                                                                  |                                                        |
|                                                                  |                                                                                                             | Choose, calculate and interpret statistical tests according to study design and type of data being analyzed                                                                                                                                                                                                                                                                                                                                                                                                         | Choose, calculate and interpret statistical tests according to study design and type of data being analyzed                                                                                                                                                                                                                                                                                                                            | <ul style="list-style-type: none"> <li>Interpret a 95% confidence interval for an odds ratio</li> <li>Explain a confidence interval for an odds ratio in non-technical terms</li> <li>Interpret a 95% confidence interval for a relative risk</li> <li>Explain an odds ratio of 1</li> </ul>                                                                         | Confidence intervals for case control & cohort studies |
|                                                                  |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Discuss the difference between a standard deviation and standard error</li> <li>Calculate a z-test using the standard error of the mean</li> <li>Explain the meaning of type 1 &amp; type 2 errors</li> <li>Explain the relationship between the sample size, <math>1-\alpha</math>, <math>\beta</math>, and power</li> </ul> | Statistical inference                                  |
|                                                                  |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>Select an appropriate test statistic for the comparison of two means</li> </ul>                                                                                                                                                                                                                                               | Parametric tests of                                    |
|                                                                  |                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                      |                                                        |

## Biostatistics

| Competency Statement | Instructional Goal | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Topic                                               |
|----------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
|                      |                    | <ul style="list-style-type: none"> <li>• Determine when to use a z-test or t-test</li> <li>• Determine when to use an unpaired or paired t-test</li> <li>• Interpret an unpaired t-test on two samples</li> <li>• Compare two proportions using z-test for proportion</li> <li>• Use an unmatched Chi-square statistic</li> <li>• Apply appropriate tests of statistical significance for the comparison of two means or two proportions</li> </ul>                             | significance                                        |
|                      |                    | <ul style="list-style-type: none"> <li>• List several tests of significance for categorical frequency data</li> <li>• Interpret a Fisher exact test</li> <li>• Describe when to use a chi-square test vs. a Fisher exact test</li> <li>• Interpret a statistical method to compare paired nominal data</li> <li>• Apply an appropriate statistical method to compare ordinal data, paired and unpaired</li> </ul>                                                               | Non parametric tests                                |
|                      |                    | <ul style="list-style-type: none"> <li>• Interpret a Pearson product-moment correlation coefficient</li> <li>• Describe the purpose of using linear regression</li> <li>• Create a simple linear regression model given a two related variables</li> <li>• Describe the purpose and use of multiple linear regression models</li> <li>• Describe the purpose of using logistic regression</li> <li>• Describe the process for and create a logistic regression model</li> </ul> | Introduction to correlation and regression analysis |
|                      |                    | <ul style="list-style-type: none"> <li>• Calculate sample size for a chi square test</li> <li>• Calculate sample size for subgroup or stratified analysis</li> <li>• Describe the impact of sampling assumptions on sample size calculations</li> </ul>                                                                                                                                                                                                                         | Sample size                                         |

## Public Health Surveillance

| Public Health Surveillance                 |                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                               |
|--------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Competency Statement                       | Instructional Goal                                                        | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Topic                                         |
| Manage a public health surveillance system | Describe surveillance in public health practice                           | <ul style="list-style-type: none"> <li>Discuss the purpose and use of surveillance data</li> <li>Describe common sources of surveillance data</li> <li>Compare common surveillance strategies and systems</li> <li>Compare active and passive surveillance systems</li> <li>Describe the existing surveillance systems in your country</li> </ul>                                                                                                                                                                                                        | Introduction to surveillance                  |
|                                            | Establish a surveillance system                                           | <ul style="list-style-type: none"> <li>Describe the steps to establish a surveillance system</li> <li>Establish objectives for a surveillance system</li> <li>Develop surveillance case definitions</li> <li>Identify sources of data and data collection mechanisms</li> <li>Describe elements of the system that should be field -tested</li> <li>Develop and test an approach to surveillance data analysis</li> <li>Describe dissemination mechanisms and communication pathways</li> <li>Plan for the use of analysis and interpretation</li> </ul> | Surveillance system development               |
|                                            | Analyze and interpret surveillance data                                   | <ul style="list-style-type: none"> <li>Evaluate the reliability and validity of surveillance data</li> <li>Describe the types of bias that may occur in analyzing surveillance data</li> <li>Create time series graphs using raw data</li> <li>Describe limitations in surveillance data that impact interpretation</li> <li>Describe possible changes in reporting of surveillance data that may impact interpretation</li> </ul>                                                                                                                       | Surveillance data analysis and interpretation |
|                                            | Operate a surveillance system                                             | <ul style="list-style-type: none"> <li>Describe the operation of a surveillance system</li> <li>Describe the attributes of a surveillance system, including sensitivity and predictive value positive</li> <li>Actively participate in methods for ensuring :                             <ul style="list-style-type: none"> <li>Disease detection</li> <li>Confirmation of suspect cases</li> <li>Registration of cases</li> <li>Reporting between levels of the surveillance system</li> </ul> </li> </ul>                                             | Surveillance data collection                  |
|                                            | Identify an appropriate public health response based on surveillance data | <ul style="list-style-type: none"> <li>Discuss the causal chain process for making recommendations</li> <li>Describe characteristics of appropriate public health responses</li> <li>Discuss the process for making recommendations</li> </ul>                                                                                                                                                                                                                                                                                                           | Public health Response                        |
|                                            | Evaluate a surveillance system                                            | <ul style="list-style-type: none"> <li>Describe the steps to evaluate a surveillance system</li> <li>Identify stakeholders in an evaluation of a surveillance system</li> <li>Describe the common purposes for evaluating surveillance systems</li> <li>Develop questions to be used in an evaluation</li> </ul>                                                                                                                                                                                                                                         | Surveillance system evaluation                |



## Public Health Surveillance

| Competency Statement | Instructional Goal | Learning Objectives                                                                                                                                                                                                                                           | Topic |
|----------------------|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
|                      |                    | <ul style="list-style-type: none"><li>• Determine standards for assessing the performance of a surveillance system</li><li>• Develop conclusions and make recommendations based on the evaluation</li><li>• Plan for the use of evaluation findings</li></ul> |       |

## Laboratory and Biosafety

| Laboratory and Biosafety                                     |                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                      |
|--------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Competency Statement                                         | Instructional Goal                                                                                                            | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Topic                                                |
| Use laboratory resources to support public health activities | Describe the function and structure of laboratory as it interacts with clinical medicine and public health                    | <ul style="list-style-type: none"> <li>• Discuss the differences in organizational culture between clinical and public health laboratories</li> <li>• Describe current interaction between clinical, laboratory, and public health</li> <li>• Identify contact persons at central and local level laboratories for specimen testing</li> <li>• Summarize the value of laboratory data and its impact on public health decisions</li> </ul>                                                                                                                                | Introduction to the laboratory role in public health |
|                                                              | Coordinate laboratory and epidemiology activities including test selection, communication, and reporting results in the field | <ul style="list-style-type: none"> <li>• Consult with laboratorians before a field investigation begins</li> <li>• Describe the capacity to test for bacteriological or viral agents at the local and central level</li> <li>• Review the diagnostic tests available at the local level and recognize design characteristics that may affect specimen collection, transportation, and storage</li> <li>• Explain the advantages and disadvantages of different diagnostic tests for the most common etiologic agents</li> </ul>                                           | The role of the laboratory in the field              |
|                                                              | Analyze and interpret laboratory data accounting for factors that influence the results of diagnostic tests                   | <ul style="list-style-type: none"> <li>• Analyze laboratory data for public health importance</li> <li>• Calculate and explain in non-technical terms specificity, sensitivity, PVP, PVN</li> <li>• Interpret the results taking into account factors such as context, frequency of disease, sensitivity and specificity of the test, prevalence, and host relationship that can affect the results</li> <li>• Discuss the benefits of using a multi-stage screening program</li> </ul>                                                                                   | Reproducibility and Validity                         |
|                                                              | Identify and implement appropriate specimen collection, storage, and transportation measures                                  | <ul style="list-style-type: none"> <li>• Describe universal biosafety precautions in handling specimens</li> <li>• Using a checklist for sampling by organism, select the appropriate sampling method and identify the equipment &amp; proper transport requirements to collect the sample</li> <li>• Identify the minimum level of information needed for each test in regard to person, place, time, clinical signs, underlying diseases, and any treatment provided</li> <li>• Transport specimens at room temperature, refrigerated, and frozen conditions</li> </ul> | Specimen management in the field                     |

## Communication

| Communication                                |                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                 |
|----------------------------------------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Competency Statement                         | Instructional Goal                         | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Topic                           |
| Develop written public health communications | Create field reports                       | <ul style="list-style-type: none"> <li>Describe the stage in a field investigation which requires a:               <ul style="list-style-type: none"> <li>Notification of investigation report (<i>Epi 1</i>)</li> <li>Preliminary report</li> <li>Final report</li> </ul> </li> <li>Identify the recipient for each report</li> <li>Create each report with the necessary information at the appropriate time</li> </ul>                                                                                                                                                                                                                                                        | Field reports                   |
|                                              | Create reports for advocacy and management | <ul style="list-style-type: none"> <li>Write memoranda to program managers</li> <li>Create an executive summary</li> <li>Describe the purpose of a study proposal and protocol</li> <li>List the basic sections of a proposal or protocol</li> <li>Write clear study goals &amp; objectives</li> <li>Write a study protocol</li> <li>Propose practical public health recommendations based on scientific data</li> </ul>                                                                                                                                                                                                                                                         | Internal written communications |
|                                              |                                            | <ul style="list-style-type: none"> <li>Establish the message</li> <li>Define the audience</li> <li>Select the channel/media for dissemination</li> <li>Develop a plan to market the information</li> <li>Evaluate the impact of the message</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                           | External written communications |
|                                              | Create scientific reports                  | <ul style="list-style-type: none"> <li>Describe the content &amp; organization of a manuscript</li> <li>Describe the natural history of an article for a peer-reviewed journal, from inception to reprint requests</li> <li>List the factors used by journal editors &amp; reviewers when considering articles for publication</li> <li>Describe differences among various peer-reviewed journals in terms of their purposes, roles, impact &amp; development</li> <li>Provide a critical appraisal of a scientific paper on public health</li> <li>Prepare and deliver a scientific article for a specified target audience</li> <li>Write an effective cover letter</li> </ul> | Scientific manuscripts          |
|                                              |                                            | <ul style="list-style-type: none"> <li>Describe the two categories of abstracts: indicative &amp; persuasive</li> <li>Write an abstract containing the four required sections</li> <li>Evaluate the quality of abstracts</li> <li>Write an abstract based on a surveillance evaluation or outbreak investigation</li> </ul>                                                                                                                                                                                                                                                                                                                                                      | Writing an abstract             |
|                                              | Develop a poster presentation              | <ul style="list-style-type: none"> <li>Design presentations appropriate for the target audience</li> <li>Apply appropriate persuasive techniques</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Poster presentations            |

## Communication

| Competency Statement                                  | Instructional Goal                                    | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                           | Topic                   |
|-------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
|                                                       |                                                       | <ul style="list-style-type: none"> <li>• Design effective scientific posters</li> <li>• Describe strengths &amp; weaknesses of communicating through posters</li> </ul>                                                                                                                                                                                                                       |                         |
|                                                       | Publish an article in an epidemiologic bulletin       | <ul style="list-style-type: none"> <li>• Describe the organization, structure and components of a bulletin article</li> <li>• Prepare a bulletin article</li> </ul>                                                                                                                                                                                                                           | Epidemiologic bulletins |
| Develop and deliver oral public health communications | Develop and deliver oral public health communications | <ul style="list-style-type: none"> <li>• Create a plan for use of media in communicating warnings &amp; recommendations with the public</li> <li>• Provide the media with oral and written information about acute health events</li> <li>• Promote public health through the media</li> <li>• Create a briefing document for a specific audience (politicians, community leaders)</li> </ul> | Briefing statements     |
|                                                       |                                                       | <ul style="list-style-type: none"> <li>• Use a Single Overriding Communication Objective (SOCO) to prepare &amp; deliver a presentation for a specific target audience</li> <li>• Design presentations appropriate and effective for the target audience</li> <li>• Make scientific &amp; persuasive presentations for managers</li> <li>• Apply appropriate persuasive techniques</li> </ul> | Oral presentations      |

## Computer Technology

| Computer Technology                                                         |                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                          |                      |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| Competency Statement                                                        | Instructional Goal                                                                              | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                       | Topic                                                                                                                                                                                                                                                                                                                                                                                    |                      |
| Use computers for specific applications relevant to public health practices | Create and manipulate files in word processing, spread sheets, and graphics                     | <ul style="list-style-type: none"> <li>Navigate the workspace with menu bars and the mouse</li> <li>Modify text by changing the font, size and adding special effects</li> <li>Manipulate text using copy, cut and paste</li> <li>Format paragraphs with bullets, numbering and alignment</li> <li>Modify the page layout</li> <li>Use the styles and outline format (with formatted headings)</li> </ul> | Word processing                                                                                                                                                                                                                                                                                                                                                                          |                      |
|                                                                             |                                                                                                 | <ul style="list-style-type: none"> <li>Navigate the workspace with menu bars and the mouse</li> <li>Create a new worksheet</li> <li>Create and correct simple formulas</li> <li>Change the worksheet and cell layout</li> <li>Sort data</li> <li>Prepare the worksheet for printing</li> </ul>                                                                                                            | Spreadsheets                                                                                                                                                                                                                                                                                                                                                                             |                      |
|                                                                             |                                                                                                 | <ul style="list-style-type: none"> <li>Navigate the workspace with menu bars and the mouse</li> <li>Format text for presentations</li> <li>Create and format tables</li> <li>Create and format charts and graphs</li> <li>Format a master slide</li> </ul>                                                                                                                                                | Graphics                                                                                                                                                                                                                                                                                                                                                                                 |                      |
|                                                                             | Use the internet for communication and literature research                                      |                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Use the internet, world wide web, and the web browser</li> <li>Discuss the advantages and disadvantages of various search engines and internet directories</li> <li>List 3 ways to narrow a search</li> </ul>                                                                                                                                     | Email & the internet |
|                                                                             |                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Discuss why a literature review is important</li> <li>Conduct systematic literature reviews</li> <li>Identify various ways to evaluate internet information</li> <li>Use Pubmed to gather information</li> <li>Demonstrate the use of limits, the clipboard, and <i>My NCBI</i> in PubMed</li> </ul>                                              | Online literature    |
|                                                                             | Use Epi-Info and other statistical tools to enter, edit, analyze, and report epidemiologic data |                                                                                                                                                                                                                                                                                                                                                                                                           | <ul style="list-style-type: none"> <li>Develop and modify questionnaires</li> <li>Enter and store data using the ENTER program menu</li> <li>Conduct Basic ANALYSIS to select records using specified criteria, do mathematical and logical operations, Statistics, Lists, Frequencies, Tables, and Graphs</li> <li>Import files from other applications</li> <li>Use Epi-Map</li> </ul> | Epi-Info             |

## Management and Leadership

| Management and Leadership              |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                       |
|----------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|
| Competency Statement                   | Instructional Goal                                                                                  | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                        | Topic                                                 |
| Manage a field project                 | Plan a field project                                                                                | <ul style="list-style-type: none"> <li>Describe the elements and phases of a project</li> <li>Explain the steps of project planning</li> <li>Prepare a project statement</li> <li>Develop a project work plan</li> <li>Define the project team and team members functions</li> <li>Prepare a task schedule</li> <li>Design a communication plan</li> </ul>                                                                                 | Project management for the public health professional |
|                                        | Monitor or evaluate a program or project                                                            | <ul style="list-style-type: none"> <li>Differentiate between monitoring and evaluation</li> <li>Describe the logic model framework for monitoring or evaluation</li> <li>Develop a program or project logic model</li> <li>Develop a monitoring or evaluation plan</li> <li>Develop objectives with indicators that are Specific, Measurable, Achievable, Relevant and Time based (SMART)</li> <li>Conduct a project evaluation</li> </ul> | Monitoring & evaluation                               |
| Manage staff and resources             | Develop a budget for a project or program                                                           | <ul style="list-style-type: none"> <li>Estimate a project's cost</li> <li>Write a project budget</li> <li>Track project or program cost</li> </ul>                                                                                                                                                                                                                                                                                         | Financial management                                  |
| Be an effective team leader and member | Lead and participate in teams                                                                       | <ul style="list-style-type: none"> <li>Describe components &amp; aspects of a successful team</li> <li>Choose guidelines for resolving conflicts within team members</li> <li>Choose guidelines for providing feedback</li> <li>Recognize diverse styles and temperaments of team members</li> <li>Effectively perform a role on a team</li> <li>Lead meetings effectively</li> </ul>                                                      | Team building                                         |
|                                        |                                                                                                     | <ul style="list-style-type: none"> <li>Describe the characteristics of effective supervision</li> <li>Use delegation effectively</li> <li>Prepare a work plan</li> <li>Provide constructive feedback</li> </ul>                                                                                                                                                                                                                            | Supervisory skills                                    |
|                                        | Use interpersonal communication skills to enable efficient and sound leadership in the PH community | <ul style="list-style-type: none"> <li>Describe the importance of negotiation for coaching and advocacy</li> <li>Describe the steps involved when planning a negotiation</li> <li>Identify strategies, tactics and countermeasures that can be used during a negotiation</li> <li>Resolve conflict</li> <li>Describe the importance of regular communication</li> </ul>                                                                    | Interpersonal skills                                  |

## Management and Leadership

| <b>Competency Statement</b>      | <b>Instructional Goal</b> | <b>Learning Objectives</b>                                                                                                                                                                                                                                                                      | <b>Topic</b>    |
|----------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Manage personal responsibilities | Manage time effectively   | <ul style="list-style-type: none"><li>• Identify reasons for interruptions</li><li>• Use the four quadrants of time management to focus time and energy</li><li>• Use behavioral techniques to control interruptions</li><li>• Use appropriate techniques to overcome procrastination</li></ul> | Time management |

## Prevention Effectiveness

| Prevention Effectiveness                 |                                                                 |                                                                                                                                                                                                                                                                                    |                                |
|------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| Competency Statement                     | Instructional Goal                                              | Learning Objectives                                                                                                                                                                                                                                                                | Topic                          |
| Apply simple tools for economic analysis | Determine when to conduct an economic analysis                  | <ul style="list-style-type: none"> <li>Describe economic evaluation and its role in public health</li> <li>Determine when to conduct a decision, cost, cost-benefit, cost-utility or cost-effectiveness analysis</li> <li>Determine when to engage an economist</li> </ul>         | Public health economics        |
|                                          | Use health outcome measures to prioritize prevention strategies | <ul style="list-style-type: none"> <li>Describe health outcome measures (reduced morbidity, disability and avoidable mortality) as they relate to prevention effectiveness</li> <li>Choose an intervention strategy which balances public health impact, ease, and cost</li> </ul> | Prevention effectiveness       |
|                                          | Describe burden of disease measures                             | <ul style="list-style-type: none"> <li>Describe the composite measures of health for burden of disease assessment in developing countries</li> <li>Discuss limitations of composite measures</li> <li>Define a QALY &amp; DALY</li> </ul>                                          | Burden of disease measurements |



## Teaching and Mentoring

| Teaching and Mentoring             |                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                 |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|
| Competency Statement               | Instructional Goal                                                                                                               | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Topic                           |
| Train public health professionals  | Develop training for epidemiology and other public health topics using instructional design principles                           | <ul style="list-style-type: none"> <li>List the 5 major phases of a training program (<i>analyze, design, develop, implement, evaluate</i>)</li> <li>Create instructional goals and/or learning objectives that are both measurable and attainable</li> <li>Develop an instructional plan that addresses each of the 4 elements of an effective training session (<i>content, examples, practice, assessment</i>)</li> <li>Select or develop course content targeted to characteristics of the intended target audience</li> <li>Create appropriate evaluation instruments to measure effectiveness of instruction</li> </ul> | Training development techniques |
|                                    | Use fundamental concepts of adult learning theory to enhance retention during delivery and facilitation of instructional content | <ul style="list-style-type: none"> <li>Identify the 3 major types of learners</li> <li>List the 4 components that contribute to effective instruction (<i>motivation, retention, reinforcement, transfer</i>)</li> <li>Deliver and/or facilitate a training activity using appropriate techniques to encourage interaction and improve effectiveness of instruction</li> <li>Facilitate at least one case study using the guidelines established in <i>Facilitating Classroom Epidemiologic Case Studies</i></li> </ul>                                                                                                       | Training delivery techniques    |
| Mentor public health professionals | Guide and assist first year trainees in their development within the didactic and field components of the program                | <ul style="list-style-type: none"> <li>Establish a mentoring plan that provides a trainee with an opportunity for interaction on a regular basis</li> <li>Facilitate and provide feedback to trainee on activities occurring during their first year in the program</li> </ul>                                                                                                                                                                                                                                                                                                                                                | Mentoring skills                |

## Epidemiology of Priority Diseases and Injuries

| Epidemiology of Priority Diseases and Injuries                                                   |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                      |
|--------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Competency Statement                                                                             | Instructional Goal                                                                      | Learning Objectives                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Topic                                                |
| Evaluate & prioritize the importance of diseases or conditions of national public health concern | Prioritize diseases of public health importance                                         | <ul style="list-style-type: none"> <li>Explain the characteristics of a disease of public health importance</li> <li>Describe the different categories of public health diseases (infectious, chronic, epidemic prone, vaccine-preventable, etc)</li> <li>Identify 3 criteria for prioritizing diseases</li> <li>Prioritize a list of diseases based on their impact on public health</li> </ul>                                                                             | Prioritization of disease                            |
|                                                                                                  | Describe the major causes of morbidity and mortality nationally, regionally or globally | <ul style="list-style-type: none"> <li>Classify high priority infectious diseases by agent, reservoir, mode of transmission, incubation period &amp; period of communicability</li> <li>Discuss local, regional and worldwide trends in infectious disease morbidity and mortality</li> <li>List and discuss ways to control, eradicate and eliminate priority communicable diseases</li> </ul>                                                                              | Epidemiology & control of communicable diseases      |
|                                                                                                  |                                                                                         | <ul style="list-style-type: none"> <li>Differentiate non-communicable disease epidemiology from infectious disease epidemiology</li> <li>Discuss global &amp; national trends in chronic disease</li> <li>Analyze a chronic disease or mortality dataset</li> <li>Use health and other data sources for injury &amp; non-communicable disease to estimate the burden of chronic disease and injury</li> <li>Describe methods of estimating the burden of injuries</li> </ul> | Epidemiology of injury and non-communicable diseases |
|                                                                                                  |                                                                                         | <ul style="list-style-type: none"> <li>Conduct a field investigation to calculate immunization coverage</li> <li>Calculate vaccine efficacy &amp; interpret its meaning</li> </ul>                                                                                                                                                                                                                                                                                           | Vaccine preventable diseases                         |
|                                                                                                  | Prepare for and respond to emergencies                                                  | <ul style="list-style-type: none"> <li>Describe the public health consequences of disasters</li> <li>Detail the role of an epidemiologist in emergency preparedness &amp; response</li> <li>Design surveys and surveillance for disaster preparedness &amp; response</li> <li>Interact timely with the public in response to a public health disaster</li> <li>Outline a national readiness plan for man-made disasters, both intentional and unintentional</li> </ul>       | Epidemiology of public health disasters              |
|                                                                                                  |                                                                                         | <ul style="list-style-type: none"> <li>Describe the characteristics of a bioterrorism agent</li> <li>Discuss strategies to decrease the morbidity/mortality of potential bioterrorism agents</li> </ul>                                                                                                                                                                                                                                                                      | Bioterrorism                                         |

## Sample Checklist of Products Which Demonstrate Competency

| Outputs                          | Study Protocol | Outbreak Reports | Data analysis summary report | Surveillance evaluation report | Abstract for peer reviewed conference or journal | Manuscript | Bulletin article | Briefing statement | Presentation or poster | Economic evaluation protocol | Summary of class evaluations | Mentor evaluation report | Matrix of priority diseases | Field investigation project plan |
|----------------------------------|----------------|------------------|------------------------------|--------------------------------|--------------------------------------------------|------------|------------------|--------------------|------------------------|------------------------------|------------------------------|--------------------------|-----------------------------|----------------------------------|
|                                  | Competencies   |                  |                              |                                |                                                  |            |                  |                    |                        |                              |                              |                          |                             |                                  |
| Epidemiologic Methods            | X              | X                | X                            | X                              | X                                                | X          | X                | X                  | X                      |                              |                              |                          |                             |                                  |
| Biostatistics                    |                | X                | X                            | X                              | X                                                | X          | X                | X                  | X                      |                              |                              | X                        |                             |                                  |
| Surveillance                     |                |                  |                              | X                              | X                                                | X          | X                | X                  | X                      |                              |                              |                          |                             |                                  |
| Lab & Biosafety                  | X              | X                | X                            | X                              | X                                                | X          | X                | X                  | X                      |                              |                              |                          |                             |                                  |
| Computer Technology              | X              | X                | X                            | X                              | X                                                | X          | X                | X                  | X                      | X                            |                              | X                        | X                           | X                                |
| Communication                    | X              | X                | X                            | X                              | X                                                | X          | X                | X                  | X                      | X                            | X                            | X                        | X                           | X                                |
| Management & Leadership          | X              | X                |                              |                                |                                                  |            |                  | X                  |                        |                              | X                            | X                        |                             | X                                |
| Prevention Effectiveness         |                |                  |                              |                                |                                                  |            |                  |                    |                        | X                            | X                            |                          | X                           |                                  |
| Teaching & Mentoring             |                |                  |                              |                                |                                                  |            |                  |                    |                        |                              | X                            | X                        |                             | X                                |
| Epidemiology of Disease & Injury | X              | X                | X                            | X                              | X                                                | X          | X                | X                  | X                      | X                            |                              |                          | X                           | X                                |





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