INCORPORATING TUBERCULOSIS CONTENT INTO PUBLIC HEALTH CORE CURRICULA LEARNING OBJECTIVES AND COMPETENCIES

Instructions: Use this document to search by topic (e.g., exploratory data analysis or study design), by discipline (e.g., environmental health sciences or health policy and management) or by specific ASPH competency (e.g. professionalism).

To search by discipline, simply use the Table of Contents that begins on this page and click on the discipline name to advance to the exercises developed for the discipline chosen.

To search by topic or competency, use the "Edit→Find" function.

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Biostatistics (BIOSTAT) (2 Case Studies)

BIOSTAT Case Study 1: Exploratory Data Analysis Techniques
Time to Complete Exercise: 30 minutes

LEARNING OBJECTIVES

At the completion of this Case Study, participants should be able to:
- Access TB surveillance data from the CDC Web site
- Generate box-and-whiskers plots, stem and leaf diagrams, and histograms
- Generate percentile values and measures of central tendency and dispersion for skewed distributions
- Describe the magnitude of the TB incidence (new case) rates in the United States
- Describe the differences in TB incidence rates by sex/gender and state across the United States

ASPH BIOSTATISTICS COMPETENCIES ADDRESSED

A.5. Apply descriptive techniques commonly used to summarize public health data

A.8. Apply basic informatics techniques with vital statistics and public health records in the description of public health characteristics and in public health research and evaluation

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED:

F. 8. [Communication and Informatics] Use information technology to access, evaluate, and interpret public health data

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BIOSTAT Case Study 2: Tests of Association for Categorical Data
Time to Complete Exercise: 45 minutes

LEARNING OBJECTIVES

At the completion of this Case Study, participants should be able to:
➤ Compare two or more proportions
➤ Calculate and interpret confidence intervals for proportions
➤ Understand the impact of expected values on the choice of statistical test used to compare proportions
➤ Interpret the results of tests of association
➤ Interpret logistic regression results.

ASPH BIOSTATISTICS COMPETENCIES ADDRESSED

A.1. Describe the roles biostatistics serves in the discipline of public health

A. 3. Describe preferred methodological alternatives to commonly used statistical methods when assumptions are not met

A.5. Apply descriptive techniques commonly used to summarize public health data

A.6. Apply common statistical methods for inference

A. 9. Interpret results of statistical analyses found in public health studies

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ENVIRONMENTAL HEALTH SCIENCES (EHS) (1 EXERCISE)

EHS Exercise 1: Risk Assessment: A Case Study of an Investigation of a Tuberculosis (TB) Outbreak in a Health Care Setting

Estimated Time to Complete in an Online Course or In-person Course Discussion: 30-60 minutes

LEARNING OBJECTIVES

At the completion of this case study, participants should be able to:
  ➢ Understand and identify TB risk groups (demographic and occupational)
  ➢ Interpret data from a contact investigation
  ➢ Identify environmental and occupational risks for TB transmission

ASPH ENVIRONMENTAL HEALTH SCIENCES COMPETENCIES ADDRESSED IN THIS MODULE

B.2 Describe genetic, physiologic and psychosocial factors that affect susceptibility to adverse health outcomes following exposure to environmental hazards.

B.4 Specify the current environmental risk assessment frame work

B.5 Specify approaches for assessing, preventing, and controlling environmental hazards that pose risks to human health and safety

B.8 Develop a testable model of environmental insult

NOTE: Please note this exercise *illustrates for students one way of how* to develop a testable model of environmental insult. Also, this case study refers to one specific microenvironment/occupational setting.

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Epidemiology (EPI) (1 Fact Sheet and 4 Case Studies)

EPI Fact Sheet 1: Primary, Secondary, and Tertiary Prevention Fact Sheet – Tuberculosis Examples

LEARNING OBJECTIVES

After reviewing this Fact Sheet, participants should be able to:
- Distinguish among primary, secondary, and tertiary prevention activities
- Provide examples of primary, secondary, and tertiary prevention activities related to the prevention and control of *M. tuberculosis*

ASPH EPIDEMIOLOGY COMPETENCIES ADDRESSED

C.6. Apply the basic terminology and definitions of epidemiology
C.8. Communicate epidemiologic information to lay and professional audiences

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED

I.8. [Public Health Biology] Apply biological principles to development and implementation of disease prevention, control, or management programs
L.1. [Systems Thinking] Identify characteristics of a system

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EPI Case Study 1: Incidence, Prevalence, and Disease Surveillance; Historical Trends in the Epidemiology of *M. tuberculosis*
Estimated Time to Complete Exercise: 30 minutes

LEARNING OBJECTIVES

At the completion of this Case Study, participants should be able to:

➢ Explain why denominators are necessary when comparing changes in morbidity and mortality over time
➢ Distinguish between incidence rates and prevalence ratios
➢ Calculate and interpret cause-specific morbidity and mortality rates
➢ Describe how changes in mortality or morbidity could be due to an artifact rather than a real change

ASPH EPIDEMIOLOGY COMPETENCIES ADDRESSED

C. 3. Describe a public health problem in terms of magnitude, person, place, and time
C. 6. Apply the basic terminology and definitions of epidemiology
C. 7. Calculate basic epidemiology measures
C. 9. Draw appropriate inference from epidemiologic data
C. 10. Evaluate the strengths and limitations of epidemiologic reports

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED

F.1. [Communication and Informatics] Describe how the public health information infrastructure is used to collect, process, maintain, and disseminate data
J.1. [Professionalism] Discuss sentinel events in the history and development of the public health profession and their relevance for practice in the field
L.2. [Systems Thinking] Identify unintended consequences produced by changes made to a public health system

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**EPI Case Study 2: Reliability, Validity, and Tests of Agreement in
M. Tuberculosis Screening**
Estimated Time to Complete Exercise: 30 minutes

LEARNING OBJECTIVES

At the completion of this Case Study, participants should be able to:
- ➢ Know how to construct 2-by-2 tables
- ➢ Compare screening techniques using the Kappa Statistic
- ➢ Distinguish between reliability and validity
- ➢ Identify groups at high risk for TB infection
- ➢ Identify methods used to screen for TB infection

ASPH EPIDEMIOLOGY COMPETENCIES ADDRESSED

C.2. Identify the principles and limitations of public health screening programs
C. 3. Describe a public health problem in terms of magnitude, person, place, and time
C. 6. Apply the basic terminology and definitions of epidemiology
C. 7. Calculate basic epidemiologic measures
C. 9. Draw appropriate inference from epidemiologic data
C. 10 Evaluate the strengths and limitations of epidemiologic reports

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EPI Case Study 3: Cross-Sectional, Case-Control, and Cohort Studies; Identification of TB Risk Groups and TB Risk Factors in Epidemiologic Studies
Estimated Time to Complete Exercise: 60 minutes

LEARNING OBJECTIVES

At the completion of this module, participants should be able to:
- ➢ Describe recent trends in TB incidence rates by race and ethnicity
- ➢ Distinguish between cross-sectional, case-control and cohort study designs
- ➢ Describe the advantages and disadvantages of these epidemiologic study designs
- ➢ Understand and identify TB risk groups (demographic and occupational)
- ➢ Calculate and interpret odds ratios, relative risks, and attributable risks
- ➢ Understand the difference between an odds ratio and a relative risk
- ➢ Interpret data from a contact investigation

ASPH EPIDEMIOLOGY COMPETENCIES ADDRESSED
- C. 3. Describe a public health problem in terms of magnitude
- C. 6. Apply the basic terminology and definitions of epidemiology
- C. 7. Calculate basic epidemiologic measures
- C. 9. Draw appropriate inference from epidemiologic data
- C. 10. Evaluate the strengths and limitations of epidemiologic reports

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED
- I.8. [Public Health Biology] Apply biological principles to development and implementation of disease prevention, control, or management programs
- L.10. [Systems Thinking] Analyze the impact of global trends and interdependencies on public-health; related problems and systems

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EPI Case Study 4: Using Molecular Epidemiology in a TB Contact Investigation
Estimated Time to Complete Exercise: 1 hour 30 minutes

LEARNING OBJECTIVES

At the completion of this case study, participants should be able to:

➢ Understand the goals of a tuberculosis (TB) interview in a TB contact investigation
➢ Be familiar with the criteria used to decide when a TB investigation should be initiated
➢ Define an outbreak
➢ Identify the steps you would take in investigating an outbreak
➢ Create a line list
➢ Distinguish between a case-control and a cohort study
➢ Calculate a relative risk and use confidence intervals to identify a statistically significant association between an exposure and an outcome
➢ Explain the difference between an epidemiologic and molecular link in a TB contact investigation
➢ Explain how molecular information could be used in an outbreak investigation

ASPH EPIDEMIOLOGY COMPETENCIES ADDRESSED

C.2. Identify the principles and limitations of public health screening programs
C.3. Describe a public health problem in terms of magnitude, person, place, and time
C.6. Apply the basic terminology and definitions of epidemiology
C.7. Calculate basic epidemiologic measures
C.9. Draw appropriate inference from epidemiologic data

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED

I.4. [Public Health Biology] Explain the biological and molecular basis of public health

I.8. [Public Health Biology] Apply biological principles to development and implementation of

disease prevention, control, or management programs

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Health Policy and Management (HPM)   (2 Exercises)

**HPM Exercise 1: Legal and Ethical Bases of Ensuring Public Health Measures:
An Example of Tuberculosis Treatment Completion
Estimated Time to Complete This Exercise: 50 Minutes**

LEARNING OBJECTIVES

At the completion of this case study, participants should be able to

➢ Describe the public health rationale for enforced compliance with medical treatment
➢ Explain the legal bases of isolation and detention of patients with communicable disease
➢ Evaluate the appropriateness of individual cases of enforced compliance with treatment

ASPH HEALTH POLICY AND MANAGEMENT COMPETENCIES ADDRESSED

D.2. Describe the legal and ethical bases for public health and health services
D.3. Explain methods of ensuring community health safety and preparedness

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HPM Exercise 2: Application of Quality and Performance Improvement Concepts: Examples from a Tuberculosis Control Program
Estimated Time to Complete This Exercise: 40 Minutes

LEARNING OBJECTIVES

At the completion of these exercises, participants should be able to:
- Describe the purpose, basic steps, and components of quality improvement
- Explain how the components of quality improvement fit within the logic model structure
- Select program inputs, outputs, and outcomes to be assessed as part of quality improvement efforts

ASPH HEALTH POLICY AND MANAGEMENT COMPETENCIES ADDRESSED

D.7. Apply quality and performance improvement concepts to address organizational improvement issues

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED

K.4. [Program Planning] Explain the contribution of logic models in program development, implementation, and evaluation

K. 5. [Program Planning] Differentiate among goals, measurable objectives, related activities, and expected outcomes for a public health program

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Social and Behavioral Sciences (SBS) (4 Exercises)

SBS Exercise 1: Explaining Health Behavior with the Health Belief Model (HBM) Screening for Latent Tuberculosis Infection
Estimated time to complete this exercise: 35 minutes

LEARNING OBJECTIVES:
At the completion of this exercise, participants should be able to:
➢ Describe the 5 principal constructs of the HBM
➢ Describe a public health problem using HBM constructs
➢ Apply HBM constructs to a health promotion intervention
➢ Identify the main limitations of HBM and how they may limit the model's applicability to some health behaviors

ASPH SOCIAL AND BEHAVIORAL SCIENCES COMPETENCIES ADDRESSED:
E.1. Identify basic theories, concepts, and models from a range of social and behavioral disciplines that are used in public health research and practice

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED
F. 4. [Communication and Informatics] Apply theory and strategy-based communications principles across different settings and audiences
G.10. [Diversity and Culture] Develop public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served
J.10.[Professionalism] Appreciate the importance of working collaboratively with diverse communities and constituencies (e.g., researchers, practitioners, agencies, and organizations)
K.1. [Program Planning] Describe how social, behavioral, environmental, and biological factors contribute to specific individual and community health outcomes

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<p style="text-align:center;color:blue;">**SBS Exercise 2: The Transtheoretical Model of Change:
An Application to Medication Adherence**</p>
Estimated time to complete this exercise: 60 minutes

LEARNING OBJECTIVES:

At the completion of this exercise, participants should be able to:

- ➢ Identify the central constructs of the transtheoretical model of change
- ➢ Distinguish among the six stages of change
- ➢ Apply constructs from the transtheoretical model of change to individual cases of medication adherence

ASPH SOCIAL AND BEHAVIORAL SCIENCES COMPETENCIES ADDRESSED

E.1. Identify basic theories, concepts, and models from a range of social and behavioral disciplines that are used in public health research and practice
E.7. Describe the merits of social and behavioral science interventions

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED

F.1.[Communication and Informatics] Apply theory and strategy-based communications principles across different settings and audiences
J.10. [Professionalism] Appreciate the importance of working collaboratively with diverse communities and constituencies (e.g., researchers, practitioners, agencies, and organizations)

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SBS Exercise 3: A Case Study in the Role of Social and Community Factors in the Onset and Solution of Public Health Problems
Time to Complete Exercise: 30 Minutes

LEARNING OBJECTIVES

At the completion of this exercise, participants should be able to:

➢ Identify the role of social and community factors in the onset of a public health problem
➢ Identify social and community factors that contribute to the solution of a public health problem
➢ Explain the rationale for using incentives and enablers to support treatment adherence
➢ Identify incentives and enablers that are responsive to individual and community needs and preferences

ASPH SOCIAL AND BEHAVIORAL SCIENCES COMPETENCIES ADDRESSED

E.3. Identify individual, organizational, and community concerns, assets, resources and deficits for social and behavioral science interventions

E.6. Describe the role of social and community factors in both the onset and solution of public health problems

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED

G.10. [Diversity and Culture] Develop public health programs and strategies responsive to the diverse cultural values and traditions of the communities being served

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SBS Exercise 4: Ethical Concerns in Delivering Public Health Services Debate: Arguments For and Against Universal Directly Observed Therapy (DOT) for Tuberculosis (TB)

Estimated Time to Complete Exercise: 1 hr for the debate, 2 hr for preparation

LEARNING OBJECTIVES:

At the completion of this exercise, participants should be able to:

➢ Describe the role of public health programs in meeting individual and community needs
➢ Argue for or against required public health services
➢ Describe the role of public health in protecting the public good while upholding individual autonomy

ASPH SOCIAL AND BEHAVIORAL SCIENCES COMPETENCIES ADDRESSED

E.9. Apply ethical principles to public health program planning, implementation, and evaluation

ASPH INTERDISCIPLINARY/CROSS-CUTTING COMPETENCIES ADDRESSED

H.8. [Leadership] Apply social justice and human rights principles when addressing community needs

J.2. [Professionalism] Apply basic principles of ethical analysis (e.g., the Public Health Code of Ethics, human rights framework, other moral theories) to issues of public health practice and policy

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