Preview: MPH5512 : Principles of Epidemiology

Syllabus

Course Overview

Epidemiology is the science of disease as it pertains to public health. Epidemiologists work to identify and mitigate diseases within a defined population. Epidemiology has often been considered the foundation of public health practice. Its methods and concepts can be found in the most essential and critical of routine and emergent public health functions. The science of epidemiology requires *abstraction*, where unconventional thinking becomes a normative practice for a well-trained epidemiologist. This course will introduce you to the foundational ideas and topics in epidemiology.

Through your studies, you will be introduced to the methods and principles of epidemiology in pertinent sociological, cultural, and individual contexts. The course will also cover application of epidemiological methodologies to address questions regarding causes, distribution of disease, fatalities, and disabilities in specific populations. Vulnerabilities in communities and relationships of risks to health outcomes will be examined in this course.

Course Competencies

(Read Only)

To successfully complete this course, you will be expected to:

1. Apply epidemiological methods to the breadth of settings and situations in public health practice.
2. Evaluate epidemiologic methods and findings in the field of public health.
3. Evaluate accuracy in epidemiological methods and research.
4. Explain the basic processes utilized in epidemiological field studies.
5.

Analyze the environmental and economic factors that have an impact on the incidence and progression of health outcomes.

6 Select communication strategies for different audiences and sectors.

7 Communicate audience-appropriate public health content in a logically structured and concise manner, writing clearly with correct use of grammar, punctuation, spelling, and APA style.

Course Prerequisites

Prerequisite(s): MPH5509.

Syllabus >> Course Materials

Required

The materials listed below are required to complete the learning activities in this course.

Integrated Materials

Many of your required books are available via the VitalSource Bookshelf link in the courseroom, located in your Course Tools. Registered learners in a Resource Kit program can access these materials using the courseroom link on the Friday before the course start date. Some materials are available only in hard-copy format or by using an access code. For these materials, you will receive an email with further instructions for access. Visit the Course Materials page on Campus for more information.

Book

Merrill, R. M. (2017). *Introduction to epidemiology* (7th ed.). Burlington, MA: Jones & Bartlett Learning. ISBN: 9781284094350.

Library

The following required readings are provided in the Capella University Library or linked directly in this course. To find specific readings by journal or book title, use Journal and Book Locator. Refer to the Journal and Book Locator library guide to learn how to use this tool.

- Angelo, K. M., Conrad, A. R., Saupe, A., Dragoo, H., West, N., Sorenson, A., . . . Jackson, B. R. (2017). Multistate outbreak of listeria monocytogenes infections linked to whole apples used in

commercially produced, prepackaged caramel apples: United States, 2014–2015. *Epidemiology and Infection*, *145*(5), 848–856.
- Barchfield, J. (2014, December 17). Health hazard found at Rio sailing venue. *Illawarra Mercury*, 31.
- Bentley, R. (2016, August 26). FDA says all blood donations should be tested for Zika virus. *TCA Regional News.*
- Gerstman, B. B. (2013). *Epidemiology kept simple: An introduction to traditional and modern epidemiology.* Chicester: Wiley-Blackwell.
- Joensen, K. G., Scheutz, F., Lund, O., Hasman, H., Kaas, R. S., Nielsen, E. M., & Aarestrup, F. M. (2014). Real-time whole-genome sequencing for routine typing, surveillance, and outbreak detection of verotoxigenic Escherichia coli. *Journal of Clinical Microbiology, 52*(5), 1501–1510.
- King, G., & Yuccas, J. (2017). Health officials in Minnesota are tackling the worst measles outbreak in nearly thirty years. *CBS This Morning*.
- Magiorakos, A.-P., Srinivasan, A., Carey, R. B., Carmeli, Y., Falagas, M. E., Giske, C. G., Harbarth, S., Hindler, J. F., Kahlmeter, G., Olsson-Liljequist, B., Paterson, D. L., Rice, L. B., Stelling, J., Struelens, M. J., Vatopoulos, A., Weber, J. T., & Monnet, D. L. (2012). Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: An international expert proposal. *Clinical Microbiology & Infection, 18*(3), 268–281.
- Tariq, Q., Daniels, J., Schwartz, J. N., Washington, P., Kalantarian, H., & Wall, D. P. (2018). Mobile detection of autism through machine learning on home video. *PLoS Medicine, 15*(11).
- Vander Schaaff, S. (2017). What men should know about cancer that spreads through oral sex: Tonsil, throat and other HPV-related cancers are on the rise. *The Washington Post* (Online).

External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- Centers for Disease Control and Prevention (CDC). (2017). John Snow: A legacy of disease detectives [Blog post]. *Public Health Matters Blog*. Retrieved from https://blogs.cdc.gov/publichealthmatters/2017/03/a-legacy-of-disease-detectives/
- Centers for Disease Control and Prevention (CDC). (n.d.). CDC current outbreak list. Retrieved from https://www.cdc.gov/outbreaks/index.html
- Centers for Disease Control and Prevention (CDC). (n.d.). List of vaccines used in the United States. Retrieved from http://www.cdc.gov/vaccines/vpd-vac/vaccines-list.htm
- Centers for Disease Control and Prevention (CDC). (n.d.). Morbidity and mortality weekly report (MMWR). Retrieved from https://www.cdc.gov/mmwr/index.html

- Centers for Disease Control and Prevention (CDC). (n.d.). National Notifiable Diseases Surveillance System (NNDSS). Retrieved from www.cdc.gov/osels/ph_surveillance/nndss/nndsshis.htm
- Centers for Disease Control and Prevention (CDC). (n.d.). Retrieved from https://www.cdc.gov/
- Centers for Disease Control and Prevention (CDC). (n.d.). Steps in an outbreak investigation [PDF]. Retrieved from http://www.cdc.gov/foodsafety/outbreaks/pdfs/steps-in-oubreak-investigation-508c.pdf
- Doctors Without Borders. (n.d.). Yemen. Retrieved from http://www.doctorswithoutborders.org/country-region/yemen
- Forouhi, N. G., & Wareham, N. J. (2014). Epidemiology of diabetes. *Medicine* (Abingdon), *42*(12), 698–702. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4282306/
- Hubbard, B., Grigg, T., & Almosawa, S. (2017, Aug 23). 'It's a slow death': The world's worst humanitarian crisis. *The New York Times*. Retrieved from https://www.nytimes.com/interactive/2017/08/23/world/middleeast/yemen-cholera-humanitarian-crisis.html?mcubz=1&_r=0
- Jones, C. M. (2017). Plan drives progress against antibiotic-resistant bacteria [Blog post]. Retrieved from https://www.hhs.gov/blog/2017/11/13/plan-drives-progress-against-antibiotic-resistant-bacteria.html
- Minnesota Department of Health. (2017). Health officials declare end of measles outbreak. Retrieved from http://www.health.state.mn.us/news/pressrel/2017/measles082517.html
- Public Health Action Support Team (PHAST). (n.d.). Biases. *Health Knowledge*. Retrieved from https://www.healthknowledge.org.uk/public-health-textbook/research-methods/1a-epidemiology/biases
- Public Health Action Support Team (PHAST). (n.d.). Errors in epidemiological measurements. *Health Knowledge*. Retrieved from https://www.healthknowledge.org.uk/e-learning/epidemiology/practitioners/errors-epidemiological-measurements

Suggested

The following materials are recommended to provide you with a better understanding of the topics in this course. These materials are not required to complete the course, but they are aligned to course activities and assessments and are highly recommended for your use.

External Resource

Please note that URLs change frequently. While the URLs were current when this course was designed, some may no longer be valid. If you cannot access a specific link, contact your instructor for an alternative URL. Permissions for the following links have been either granted or deemed appropriate for educational use at the time of course publication.

- Centers for Disease Control and Prevention (CDC). (n.d.). Epidemic Intelligence Service (EIS): Boots-on-the-ground disease detectives. Retrieved from https://www.cdc.gov/eis/index.html

Optional

The following optional materials are offered to provide you with a better understanding of the topics in this course. These materials are not required to complete the course.

Unit 1 >> Remove the Pump Handle! The History of Epidemiology

Introduction

Dr. John Snow is universally regarded in the field of public health as the father of modern epidemiology. His landmark work in responding to and intervening in a cholera epidemic in London in 1854 laid the groundwork for the principles and concepts that will be highlighted throughout this course.

In Unit 1, we will highlight some of the historical aspects of epidemiology and their contributions to the science that have helped develop and refine the field of epidemiology today. Topics discussed include Dr. Snow's cholera work, Koch's postulates, the epidemiological triangle, and other concepts that illustrate the relationship between disease and community.

Learning Activities

u01s1 - Studies

Readings

Use your Merrill *Introduction to Epidemiology* text to read the following:

- Chapter 1, "*Foundations of Epidemiology,*" pages 1–16.
- Chapter 2, "*Historic Developments in Epidemiology*," pages 17–38.
- Chapter 3, "*Practical Disease Concepts in Epidemiology*," pages 39–66.
- Appendix I: Case Studies, "*Case Study I: Snow on Cholera*," pages 243–262.

Use the Internet to complete the following:

Centers for Disease Control and Prevention (CDC). (2017). John Snow: A legacy of disease detectives [Blog post]. *Public Health Matters Blog*. Retrieved from https://blogs.cdc.gov/publichealthmatters/2017/03/a-legacy-of-disease-detectives/

Multimedia

The study of disease can be traced back to ancient Greeks and Hippocrates's *On Airs, Waters, and Places*, one of the first examples of the connection between disease occurrence and place—a key element of epidemiology.

- View the Significant Events in Epidemiology timeline of epidemiological milestones.

u01s1 - Learning Components

- Identify the core functions of public health.
- Study the history of epidemiology.

u01s2 - Capella Resources

Campus Resources

Use the Internet to explore the following:

- Library Research and Information Literacy Skills can help you improve your information literacy and searching skills.
  - Review Get Critical Search Skills.
  - Read about Evaluating Source Quality.
- The Public Health Masters Research Guide provides information about finding library articles and other resources in the field of public health.
  - Use Finding Journal Articles to review the Capella University Library databases and Open Access Journals.
- Visit the Capella Writing Center to help you improve your writing.
- Complete the tutorial Forming a Search Strategy in preparation for your course project.

u01s2 - Learning Components

- Become familiar with academic resources to study the field of public health.

u01d1 - Historical and Current Events in Epidemiology

Identify a current epidemic. Review the information on the epidemic and compare and contrast the actions taken by Dr. Snow to contemporary epidemiology practices.

- What was done similarly?
- What advances have we made?
- What additional advances do we need?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read the posts of your peers and respond. Provide substantive comments and, wherever possible, include examples and citations to support your comments. Cite all sources in proper APA style.

Critical-Thinking Skills in Discussion Posts and Responses

Beginning with this discussion, you are expected to demonstrate the use of critical-thinking skills in your initial posts and responses. Focus on providing specific details and insights that could enhance understanding of the topic for yourself and others.

Include at least one (but not all) of the following elements of critical thinking in your posts and responses:

- Identify the assumptions (explicitly stated or implied by the writers) underlying their statements or conclusions. You could also provide alternative assumptions for consideration.
- Identify areas of uncertainty, knowledge gaps, and/or information needed for a more complete understanding.
- Identify areas of conflicting evidence or other perspectives.
- Identify examples of criteria that could be used to evaluate the information. What kind of support for this information would you seek?
- Evaluate evidence and provide support for your evaluation.

Course Resources

Graduate Discussion Participation Scoring Guide

APA Style and Format

u01d1 - Learning Components

- Study the history of epidemiology.
- Study the role of quantitative and qualitative methods and sciences in describing and assessing a population's health.
- Practice academic writing in discussions.

Unit 2 >> Measures Used in Epidemiology

Introduction

Epidemiologists rely on data—and their skill in interpreting it—to ascertain disease status, understand disease distribution and determinants, and ultimately to translate this understanding into effective public health interventions.

This unit will introduce the core statistical measures used in epidemiology and provide a foundational understanding of why certain measures are used in epidemiology. More than learning how to perform the statistic (in-depth training in biostatistics), the trained epidemiologist must know which measure to use in his or her work and research. Basic information on the types of measures and calculation of rates to compare population subgroups will also be introduced.

Before beginning your studies this week, read Measures Used in Epidemiology [DOC] to learn about three key topics related to measures:

- Prevalence and Incidence.
- Ratios.
- Rates.

Learning Activities

u02s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to read the following:

- Chapter 4, "Design Strategies and Statistical Methods in Descriptive Epidemiology," pages 67–90.
- Chapter 5, "Descriptive Epidemiology According to Person, Place, and Time," pages 91–120.

Use the Internet to complete the following:

- Centers for Disease Control and Prevention (CDC). (n.d.). Morbidity and mortality weekly report (MMWR). Retrieved from https://www.cdc.gov/mmwr/index.html
    - You will be using this website in the second discussion in this unit.

Use the Capella library to read the following:

- Barchfield, J. (2014, December 17). Health hazard found at Rio sailing venue. *Illawarra Mercury*, 31.
- Bentley, R. (2016, August 26). FDA says all blood donations should be tested for Zika virus. *TCA Regional News.*

Multimedia

Vila Health

- Click **Vila Health: A Day in the Life of an Epidemiologist** to learn more about the work of an epidemiologist.
    - Epidemiologists study data gathered by public health entities to identify patterns of disease or risk. The work is varied: while much of it involves lab or office tasks, epidemiologists may also be involved in field-data collection.

Course Resources
Vila Health: A Day in the Life of an Epidemiologist

u02s1 - Learning Components

- Study the role of quantitative and qualitative methods and sciences in describing and assessing a population's health.
- Study the structure of research design.

u02s2 - Your Online ePortfolio

Your Online ePortfolio

Online ePortfolios serve two key purposes: 1) to support learning and reflection, and 2) to be used as a showcase tool. Your learning journey can be documented, and ePortfolios contribute to lifelong learning and growth through reflection and sharing. Online ePortfolios can also be shared with employers and peers to present artifacts that demonstrate your accomplishments at Capella.

Using ePortfolio to Prepare for Your Capstone

Your program may culminate in a capstone course. At that time you may be required to show evidence of your learning throughout the program by referring to multiple assessments that you have created. You will be telling a story about your learning throughout the program using artifacts you have collected during many of these courses.

Using ePortfolio to Build Your Career

As you are preparing to tell your story in the professional world, leverage your ePortfolio artifacts to demonstrate the knowledge and competencies you have gained through your program in professional conversations, performance reviews, and interviews.

To do that, reflect on the knowledge and skills you have gained from your courses and the elements you have put in your portfolio, along with how you have already applied these things to your professional life or how you might apply them in the future.

Next, create your story or talking points to tell your professional story.

Saving Your Documents to ePortfolio

You will need a place to store your documents in an organized fashion so that you can access them at a later date. Do not rely on the courseroom to store your assignments for you, as you will lose access to the courseroom after you have completed the course. Capella uses a cloud-based portfolio platform to facilitate your organization of the artifacts you create throughout your program.

To make an online portfolio useful, it is essential that it is organized clearly and that important files of any format are accessible. Read the Online e-Portfolio Guidelines [PDF] to ensure you set up your online portfolio correctly. For more information on ePortfolio visit the Campus ePortfolio page.

Privacy Statement

Capella complies with privacy laws designed to protect the privacy of personal information. While you may voluntarily share your own information publicly, you are obligated to protect the personal

information of others that may be associated with your academic or professional development. Before sharing information and material in any ePortfolio that is set up to be shared externally to your program at Capella, please consider privacy obligations in relation to protected populations who may be included or referenced in your academic or clinical work. Refer to the Family Educational Rights and Privacy Act (FERPA) and/or the Health Insurance Portability and Accountability Act (HIPAA) if you have specific questions or concerns about your choices.

u02s2 - Learning Components

- Become familiar with academic resources to study the field of public health.

u02d1 - Rate Calculations

Epidemiologists are called upon frequently to translate numbers into meaningful narratives for their readers. Your Unit 3 assignment is just such an example. This discussion will give you the opportunity to practice this.

Preparation

For this discussion, there will be two equations. Learners with last names starting with the letters A–L will do calculation A and those with last names starting with letters M–Z will do calculation B.

Calculation A

- Calculate the incidence rate: 4,875 healthy people are tracked over a two-year period. Over that two-year period, 75 of those people develop a particular disease. Determine the incidence rate of disease over the study period.

Calculation B

- Calculate the prevalence per thousand: 125 people out of 5000 have food poisoning. Determine the disease prevalence per 1000 people.

Discussion Activity

Draft a short paragraph summarizing the results of your calculation. Your narrative should explain why you think a reader should remember these numbers and what kind of action these numbers suggest a public health professional might choose to take in response. Show all your work.

- What are the implications of your suggested action?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read the posts of your peers and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with reference to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
APA Style and Format
Capella University Library

u02d1 - Learning Components

- Practice constructing clear and concise messages in online discussions.
- Study the role of quantitative and qualitative methods and sciences in describing and assessing a population’s health.

u02d2 - Prevalence Versus Incidence

Among the core measures in epidemiology are morbidity measures known as *prevalence* and *incidence*. Define both terms comprehensively and use data to apply them to a health problem of your interest. This may be data extracted from your health department, the Centers for Disease Control (CDC), or a peer-reviewed article from the CDC's Morbidity and Mortality Weekly Report, linked in Resources.

- After defining the terms, please discuss the similarities and differences of the two terms together.
- From a public health perspective, in which statistic would it be more concerning to see an increase? Why?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read the posts of your peers, then respond with analyses of their discussions, offering insight to other potential factors and issues that can be highlighted in their responses.

Course Resources
Graduate Discussion Participation Scoring Guide
Public Health Masters Research Guide
Capella University Library
APA Style and Format
Centers for Disease Control and Prevention (CDC)
Morbidity and Mortality Weekly Report (MMWR)

u02d2 - Learning Components

- Use statistical terminology when discussing epidemiology.
- Practice constructing clear and concise messages in online discussions.

Introduction

Now that you have a solid understanding of the data that drives public health action and policy, this course will begin to shift focus to the actual work of epidemiologists.

Epidemiology plays an important role in the implementation of the ten essential public health services and the three core competencies (assessment, assurance, and policy development) throughout the public health arena. *Descriptive epidemiology* is the essence of translating epidemiological data into layman's terms of understanding health issues. This unit will help you understand the role of descriptive studies for identifying problems and establishing hypotheses while explaining the characteristics of person, place, and time in relation to acute disease outbreaks and in studies of chronic and environmental health diseases.

Translating Data Into Layman's Terms

The concepts of person, place, and time are used in descriptive epidemiology to study diseases and public health issues. The environment can play a role in the development of some diseases; for example, tropical diseases happen in regions where warm weather and wet conditions favor the existence of their disease agents, including insects as well as rodents and other mammals who are carriers, transmitters, and in some cases, vectors.

Socioeconomic Factors

Economic, social, and political factors play a strong part in fostering a healthy environment that creates healthy people. High-risk areas—those with poor sanitation and unsafe drinking water, overcrowding, poverty, or political unrest—can lead to unhealthy people. For instance, cholera only happens where waste is not disposed of properly and there is no safe drinking water.

Income, gender, race, and ethnicity also can affect a person's general health. For example, gang violence may occur in poor neighborhoods and domestic violence is more prevalent among families with financial stress. Specific public health interventions are needed to break the cycles that cause public health issues.

Learning Activities

u03s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to complete the following:

- Chapter 6, "*General Health and Population Indicators*," on pages 121–140.

Use the Capella library to read the following

- Gerstman, B. B. (2013). *Epidemiology kept simple: An introduction to traditional and modern epidemiology*. Chicester: Wiley-Blackwell.
    - Chapter 3, "Epidemiologic Measures," pages 66–90.

Use the Internet to complete the following:

- Centers for Disease Control and Prevention (CDC). (n.d.). National Notifiable Diseases Surveillance System (NNDSS). Retrieved from www.cdc.gov/osels/ph_surveillance/nndss/nndsshis.htm
    - You will refer to this website in this unit's second discussion.

u03s1 - Learning Components

- Study the role of quantitative and qualitative methods and sciences in describing and assessing a population's health.

u03a1 - Annual Report: Calculations and Executive Summary

Overview

Imagine that you are working as an epidemiologist in a hospital system. You are working on the organization's annual report; you must examine several pieces of data and complete calculations for an overview of what occurred in the past year.

Your task for this assignment is to complete some calculations on the data, interpret the results, and prepare an executive summary of the results for hospital leadership.

- The calculations you perform look at rates, risk rates, relative risk, age-adjusted rate, prevalence, incidence, and case ratios. You are required to show your work in an appendix to be included in the annual report.
- Use the Capella library and the Internet to find executive summaries and annual reports on which to model the format of your assignment. If you wish, you may use your own organization's

format and style for this assignment.

Assignment Instructions

Step One: Calculations

Complete the calculations found in the Calculations Template [DOC] linked in Resources.

Step Two: Executive Summary

Create a 2–3 page executive summary of the results of your calculations. Your narrative need not be exhaustive, but it should be descriptive enough to address each of the following elements effectively as specified in the assignment scoring guide:

- Analyze statistical data to ascertain causal public health inferences.
- Interpret epidemiological statistical data in public health interventions.
- Evaluate public health risks using epidemiological statistical measures.
- Explain reliability, precision, statistical significance, and sample size effect in epidemiological studies and research.
- Describe risks related to misinterpretation of data.

Additional Requirements

- Follow current APA guidelines for style and formatting, including in-text and reference citations.
- Write clearly and logically, with correct use of spelling, grammar, punctuation, and mechanics.

Submit your executive summary and the calculations template as attachments in the assignment area.

Course Resources
APA Style and Format
Calculations Template [DOC]

u03d1 - Epidemiology Curves

For this discussion, read Epidemiology Curves (linked in Resources), then write a paragraph or two describing the information these charts deliver about each case.

Write an additional paragraph indicating your recommendations in each of these cases.

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Review your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
Epidemiology Curves [DOC]
Capella University Library
APA Style and Format
Public Health Masters Research Guide

Introduction

With a solid foundation on the basic concepts and drivers behind the field of epidemiology, this course now turns its focus on experimental designs and epidemiological research. The following units will begin to look at the specific elements involved in epidemiological study design.

The Cohort Study and the Case-Control Study

This unit will examine the two major observational studies commonly used in epidemiological research: the cohort study and the case-control study. The objective of both study types is to learn about causal relationships between originating exposures and subsequent health outcomes.

Learning Activities

u04s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to read the following:

- Chapter 7, "Design Strategies and Statistical Methods in Analytic Epidemiology," pages 141–158.

Research

Use the Capella library or another peer-reviewed literature source to locate two epidemiological studies. One must be an experimental study and one must be a cohort study. You will be reporting on these two studies in the discussion for this unit. This activity will also help you prepare the methods section of your course project.

Cohort Study Designs

Use the Capella library to complete the following

- Use the advanced search function in the ProQuest Central database to conduct the following search:
    - On the first line, enter *experimental design* and change the dropdown menu to Subject heading – MAINSUBJECT.

- On the second line, enter *disease OR epidemiology* and change the dropdown menu to Anywhere except full text – All (this only pulls results for articles that use the keywords in the citation and abstract of the article).
- Check the "Peer reviewed" box, limit the date as needed, then click "Search."

Multimedia

- View the Strength and Limitations of Research Designs illustration.
  - When designing an epidemiological study, you must first decide which type of study to conduct. Sometimes that choice will be easy. If studying an outbreak of disease in a specific community, a cohort study is likely to be the best choice. Often, though, study selection is not easy or self-evident.

Optional Readings

Review the following Campus resources as needed:

- Research & Scholarship.
- Public Health Masters Research Guide.

u04s1 - Learning Components

- Become familiar with academic resources to study the field of public health.
- Study the structure of research design.

u04d1 - Study Designs Into Practice

Tobacco use among U.S. adolescents is on the rise due to the advent of electronic cigarettes, according to a recent University of California San Francisco study published on Science Daily (2017). And in 2015, the Centers for Disease Control and Prevention reported a 300 percent increase in e-cigarette use among middle and high school students over a single year.

For this discussion, create a cohort study to test the hypothesis that teenagers are more likely to try electronic cigarettes the first time they use tobacco, and answer the following questions:

- What is the exposure being studied by this hypothesis? How might you measure the exposure in your cohort study?
- How might you identify cases in this study?
- What additional factors would you measure in this study?

- What are some of the limitations you might encounter when measuring first-time electronic cigarette use?
- Since adolescent and teenage use might be a rare event to capture, would you consider utilizing a case-control study? How would you design a case-control study to test the hypothesis?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

References

Science Daily. (2017). E-cigarettes are expanding tobacco product use among youth [Blog post]. Retrieved from https://www.sciencedaily.com/releases/2017/01/170123094733.htm

Centers for Disease Control and Prevention. (2015). E-cigarette use triples among middle and high school students in just one year. Retrieved from https://www.cdc.gov/media/releases/2015/p0416-e-cigarette-use.html

Course Resources

Graduate Discussion Participation Scoring Guide

u04d1 - Learning Components

- List major causes and trends of morbidity and mortality.

- Practice academic writing in discussions.

u04d2 - Informed Consent

Overview

In 1944, the medical team of the Manhattan Project agreed to conduct secret radiation-exposure experiments at four U.S. hospitals in an effort to develop safety guidelines for Manhattan Project workers.

Between 1945 and 1947, 18 patients in these hospitals who were diagnosed (and in some cases, misdiagnosed) with terminal illnesses and expected to live no longer than 10 years were injected with plutonium. Of these, just one is known to have signed a consent form (Atomic Heritage Foundation, 2017). Seven patients lived longer than 10 years, and five lived more than 20 years. The remaining survivors were not notified that they had been injected with plutonium until 1974 (Subcommittee on Energy Conservation and Power, Committee on Energy and Commerce, U.S. House of Representatives, 1986).

Discussion Activity

For this discussion, consider the following questions:

- Whose interests were served by the decision not to tell the participants they had been injected with plutonium?
- Should the participants have been informed of their radiation exposure even though they might have been alarmed by this disclosure (thus possibly compromising quality of life)?
- Is research on people without their informed consent ever permissible, even in the interests of national security or in times of war?
- Should the U.S. government that sponsored the experiments be expected to make financial reparations to the survivors or their next of kin?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Review learner responses and respond with analyses of their discussions and offer insight to other potential factors and issues that can be highlighted in their responses.

References

Atomic Heritage Foundation. (2017, Jul). Human radiation experiments [Blog post]. Retrieved from https://www.atomicheritage.org/history/human-radiation-experiments

U.S. House of Representatives. (1986). American nuclear guinea pigs: Three decades of radiation experiments on U.S. citizens. Retrieved from http://contentdm.library.unr.edu/cdm/singleitem/collection/conghear/id/102#metajump

Course Resources

Graduate Discussion Participation Scoring Guide

u04d2 - Learning Components

- Discuss ethical considerations in study design.
- Discuss the scientific merit of public health research.

Unit 5 >> Cross-sectional and Clinical Trial Designs

Introduction

While not paired traditionally as similar study designs, cross-sectional (observational) designs and clinical trials (experimental) possess many similarities when viewed from public health and epidemiological perspectives. Both approaches take a forward-moving approach, where subjects are followed from the beginning of a study to the end, and progress is monitored throughout the study. Both approaches also lack any information on the timing of exposure and are often used for comparing diagnostic tests. This unit will take a closer look at each study design and discuss the strengths and limitations of each while highlighting their uses in public health research and practice.

Experimental Epidemiology

Experimental epidemiology is used primarily to test the efficacy of disease-prevention measures. These studies are similar to cohort studies, requiring follow-up with the subjects to determine the outcome.

The experimental study is used to show or confirm a causal relationship between exposure and disease. If an exposure is removed in the study group and there is a reduction in disease in this group, it can be assumed there is a defining relationship between the exposure or treatment and the

disease. These experiments are conducted when there is great uncertainty about the outcome of a preventive measure.

Types of Experimental Studies

To begin your studies this week, read Types of Experimental Studies [DOC] to learn more about the following topics:

- Control Group.
- The Research Question.
- Review of Literature.

Learning Activities

u05s1 - Studies

Readings

Use your *Introduction to Epidemiology* to read the following:

- Chapter 8, "Experimental Studies in Epidemiology," pages 159–172.

Multimedia

- View the Research Flow Chart: Steps in Designing Research illustration.
- View the Fixed-Step Solution Process: Choose a Research Design illustration.

u05a1 - Study Design Proposal

Scenario

You are a member of a research team that has been asked to create a proposal for a study design to address a potential cholera outbreak in Puerto Rico.

The Centers for Disease Control and Prevention is sending a team of epidemiologists to Puerto Rico to investigate cases of cholera associated with Hurricane Maria. As a team member, you are asked

to research study design for the upcoming investigation, identifying the advantages and disadvantages of the following four designs as they relate to the mission:

- Cross-sectional.
- Case control.
- Cohort.
- Clinical trial.

Your job is to report back to leadership with a recommendation for a study design to be used in the investigation. You must also recommend an implementation strategy that considers the nature of the environment and the affected population.

Instructions

To successfully complete this assignment, you must include the following:

- Outline the basic processes a team will use to investigate a public health threat.
- Select the appropriate study design for investigating a disease outbreak.
- Compare epidemiological strengths and weaknesses of study designs used in research and practice.
- Recommend evidence-based epidemiological methods for investigating cases of disease outbreak after a natural disaster.
- Describe how to control bias in an epidemiological research study.
- Recommend implementation strategies for a disease investigation team.

Additional Requirements

- **Length**: 6–8 pages plus cover page and references.
- **Formatting:** Arial or Times New Roman, 12 point. Use headings and subheadings for each component.
- **Resources**: Cite sources in text and include a reference page in current APA format.

Course Resources
APA Style and Format
Capella University Library
Public Health Masters Research Guide

u05d1 - Cross-sectional and Clinical Trial Study Designs

For this discussion, imagine that you are a newly hired assistant professor at a teaching university and you wish to conduct a clinical trial examining the efficacy of a new, FDA-approved Ebola vaccine. You will be examining the immunological response in your study participants. Discuss the steps you would take as the principle investigator to get your study started, and address the following questions:

- What paperwork would need to be submitted?
- What boards or committees would need to review and approve your study?
- What regulatory requirements would apply to your study?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based, and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
Capella University Library
APA Style and Format

u05d1 - Learning Components

- Explain the critical importance of evidence in advancing public health knowledge.

Unit 6 >> Errors in Epidemiology

Introduction

Effective use of epidemiological data requires more than knowing the facts. It also requires understanding the reasoning behind the methodology and acknowledging that all measurements can be affected by varying degrees of random and systematic error. This unit will provide a deeper understanding of some of these major issues while finishing up on their significance and place in critically reviewing and accepting epidemiological literature in journals, presentations, and research.

Up- and Downsides of Peer Review

The peer-review process is the standard procedure used to select scientific work for publications. The most respected journals tend to have a strict peer-review process and a reputation for being ethically and scientifically sound. Peer reviewers for such prestigious journals are usually the best in their fields. The downside is that these rigorous standards mean that only a small circle of people is approved, which makes the process almost inaccessible to junior researchers or professionals from less well-known academic institutions. Added to this is the duration of the process: in general, most submissions require several passes through the peer-review process before publication, which can take over two years. Furthermore, the process has been critiqued because it does not allow for much feedback from the rest of the scientific community—although few can deny the benefits it has brought to the sciences, especially in the medical field.

With online publication, the new challenge is creating a Web-based peer-review process. Many journals accept online submissions but still use a small panel for the peer-review process. Some journals are less restricted, with more peer reviewers behind the scenes. Finally, several journals are just online publications that promote participation in the scientific community, may or may not use peer reviewers, and are more open to public criticism and comment.

Which model will fit the needs of the future? Do we continue with the old peer-review process only, or with a combination of the old system and the new online peer-review process? Or do we go online only? Those are the main questions that will be discussed in this unit, along with materials about the critical appraisal of scientific articles.

Learning Activities

u06s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to read the following:

- Chapter 9, "Causality," pages 173–192.

Use the Internet to complete the following:

- Jones, C. M. (2017). Plan drives progress against antibiotic-resistant bacteria [Blog post]. Retrieved from https://www.hhs.gov/blog/2017/11/13/plan-drives-progress-against-antibiotic-resistant-bacteria.html
- Public Health Action Support Team (PHAST). (n.d.). Biases. *Health Knowledge*. Retrieved from https://www.healthknowledge.org.uk/public-health-textbook/research-methods/1a-epidemiology/biases
- Public Health Action Support Team (PHAST). (n.d.). Errors in epidemiological measurements. *Health Knowledge*. Retrieved from https://www.healthknowledge.org.uk/e-learning/epidemiology/practitioners/errors-epidemiological-measurements

u06d1 - Bias in Epidemiological Research

Nearly all of the roughly 50 different types of bias identified in epidemiological practice and research belong to one of two categories:

- Information bias.
- Selection bias.

Use the Capella library or another scholarly resource to locate a research study, then complete the following:

- Identify any bias as well as strengths and opportunities of the research study.
- Discuss the origin of the bias you observed in the research study, including common mistakes in epidemiological studies that create this bias, and methods to help reduce the bias in

epidemiological research and practice.

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based, and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
Public Health Masters Research Guide
APA Style and Format
Capella University Library

u06d1 - Learning Components

- Discuss ethical considerations in study design.
- Discuss the science of primary, secondary, and tertiary prevention in population health including health promotion and screening.

u06d2 - Types of Errors in Epidemiological Research

Discuss the similarities and differences between random and systematic errors in epidemiological research.

Locate two articles about public health issues or medical events: one that shows an example of a random error in epidemiological research, and one that shows an example of a systematic error in epidemiological research. For each article, suggest how the error might have been controlled with methodology. Is one type of error necessarily "better" than the other? In other words, does a researcher hope for more random or systematic errors? Why?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Review your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based, and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
Capella University Library
APA Style and Format

u06d2 - Learning Components

- Study the science of primary, secondary, and tertiary prevention in population health, including health promotion and screening.

- Locate examples of bias in epidemiology.
- Identify errors in epidemiology study designs.

Unit 7 >> Infectious Diseases and Outbreak Epidemiology

Introduction

The practice of outbreak investigation and epidemiology is the cornerstone of epidemiological work in public health. Whether working an acute epidemic outbreak like the Dr. Snow cholera outbreak highlighted in previous units or studying the steadily increasing incidence of an infectious disease within a community, the steps of outbreak investigation are followed almost universally.

This unit will introduce those core operational functions while providing an overview of how these procedures work in the study and investigation of infectious diseases.

Learning Activities

u07s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to read the following:

- Chapter 10, "Field Epidemiology," pages 193–210.
- Appendix I: Case Studies, "Case Study II: "Working Through an Infectious Disease Outbreak," pages 261–267.
- Appendix I: Case Studies, "Case Study III: "Common-Source Outbreak of Waterborne Shigellosis at a Public School," pages 267–272.

Use the Internet to complete the following:

- Centers for Disease Control and Prevention (CDC). (n.d.).Steps in an outbreak investigation [PDF]. Retrieved from http://www.cdc.gov/foodsafety/outbreaks/pdfs/steps-in-oubreak-investigation-508c.pdf
- Minnesota Department of Health. (2017). Health officials declare end of measles outbreak. Retrieved from http://www.health.state.mn.us/news/pressrel/2017/measles082517.html
    - This is an example of a news release from a public health agency. You will be creating a news release for the Unit 7 assignment. Find other examples online.

Use the Capella library to read the following:

- King, G., & Yuccas, J. (2017). Health officials in Minnesota are tackling the worst measles outbreak in nearly thirty years. *CBS This Morning*.

u07s1 - Learning Components

- Study the science of primary, secondary, and tertiary prevention in population health, including health promotion and screening.
- Study the effects of environmental factors on a population's health.
- Compare and contrast examples of news releases used in the field of public health.

u07d1 - Outbreak Investigation Steps

Refer to Table 10-1, "Steps for Conducting a Field Investigation," page 247 in your *Introduction to Epidemiology* text for this discussion.

Please choose two steps and discuss the impacts of each from an epidemiological standpoint:

- What are the major operational issues in this step?
- What are the common errors performed in this step?
- Can this step be worked in tandem with other steps or must it be done independently (or even temporarily) to successfully investigate an outbreak?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Review your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based, and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with reference to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your

workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
Capella University Library
APA Style and Format

u07d1 - Learning Components

- Discuss the science of primary, secondary, and tertiary prevention in population health.

u07a1 - Outbreak Investigation: News Release

Overview

This assignment will take you through the ten steps of an outbreak investigation using a Vila Health simulation (linked in Resources). As you proceed through the simulations, pay attention to what happened: what went right, what went wrong, and the lessons learned. After completing this media simulation, you will create a news release on the events surrounding the investigation.

Preparation

News Release

Use the Internet to find examples of news releases from public health organizations.

Vila Health: Outbreak Investigation

Use the Vila Health: Outbreak Investigation simulation linked in Resources to complete your assignment. You will introduce yourself in the hospital as the infection-control manager from a state public health agency. There are reports that numerous patients have contracted a gastrointestinal illness.

As you receive each update from various staff members, take notes, perform your research, and then report on the steps taken in the outbreak investigation. Each step in the report should be about one page long, but some may take multiple pages to capture a comprehensive response.

As you progress through the media simulation, your answers to key questions and thoughts will be recorded and made available to you at the end of the simulation. Save the PDF file to help compose your news release.

Instructions

Using the document from the interactive media experience as well as knowledge from the course, develop a news release on the events surrounding the investigation. Remember, you are writing from the position of the infection-control manager for a public health agency.

Your news release must include the following:

- Overview of the case.
- Steps taken regarding the case.
- Analytics used to review the information.
- Interaction of host, agent, and environment.
- Considerations on socioeconomic factors that may affect disease spread.
- Actions taken regarding prevention and containment.
- Any follow-up actions that should be taken.

The following criteria will be used to grade your assignment:

- Evaluate how well an outbreak investigation followed best practices in public health.
- Discuss the interaction among agent, host, environment, and the chain of disease transmission.
- Select appropriate data to share with the public in a news release.
- Describe the environmental and socioeconomic factors related to disease outbreak.
- Describe the importance of routine monitoring and surveillance of early-stage disease clusters.
- Describe the actions needed to prevent or contain a disease outbreak.

Additional Requirements

- **Length**: 3–5 pages of content plus cover page, references, and appendix.
- **Style**: Write in a way that is concise, balanced, logically organized, and appropriate for your selected audience and format.
- **Formatting:** Arial or Times New Roman, 12 point. Use headings and subheadings for each component.
- **Resources**: Cite sources in text and include a reference page (APA format).

Include your notes from the media interactive as an appendix and your news release as attachments to this assignment. You will be graded primarily on the quality of your news release. The appendix may be used as a reference by the instructor while grading.

ePortfolio

Consider saving this activity to your ePortfolio.

Course Resources
APA Style and Format
Vila Health: Outbreak Investigation | Transcript
ePortfolio
Capella University Library

Unit 8 >> Chronic Disease Epidemiology

Introduction

As preventive public health measures, clinical diagnosis, and treatment for infectious diseases advanced in the 20th century, population health understands that people are living healthier, longer lives. As a whole, the average lifespan has increased dramatically in the past hundred years, which has led to the development and identification of chronic disease morbidity in defined populations.

This unit will provide you with an overview of the epidemiology of chronic diseases to better explain the determinants of these syndromes while linking physical, social, and environmental risk factors associated with these maladies. Topics discussed include but are not limited to cancer epidemiology, diabetes, and heart disease.

The Molecular Level of Disease

Epidemiology applies to the molecular level of disease in much the same way as it applies to the disease transmission and ecology in the world in general. Diseases mutate and exploit new sources of infection transmission and new virulence. Tiny plasmids exchanged among bacteria brought new resistance to most of the armamentarium of existing medical advances by the year 2000. The epidemiological study of disease agents on the molecular and genetic levels has reached new levels of sophistication.

To begin your studies this week, read Chronic Disease Epidemiology [DOC] to learn more about the following important topics covered in this unit:

- Overuse of Antibiotics.
- Genetic Epidemiology.

Learning Activities

u08s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to read the following:

- Chapter 11, "Chronic Disease Epidemiology," pages 211–230.

Use the Capella library and the Internet to complete the following:

- Angelo, K. M., Conrad, A. R., Saupe, A., Dragoo, H., West, N., Sorenson, A., . . . Jackson, B. R. (2017). Multistate outbreak of listeria monocytogenes infections linked to whole apples used in commercially produced, prepackaged caramel apples: United States, 2014–2015. *Epidemiology and Infection*, *145*(5), 848–856.
- Forouhi, N. G., & Wareham, N. J. (2014). Epidemiology of diabetes. *Medicine* (Abingdon), *42*(12), 698–702. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4282306/
- Joensen, K. G., Scheutz, F., Lund, O., Hasman, H., Kaas, R. S., Nielsen, E. M., & Aarestrup, F. M. (2014). Real-time whole-genome sequencing for routine typing, surveillance, and outbreak detection of verotoxigenic Escherichia coli. *Journal of Clinical Microbiology, 52*(5), 1501–1510.
- Magiorakos, A.-P., Srinivasan, A., Carey, R. B., Carmeli, Y., Falagas, M. E., Giske, C. G., Harbarth, S., Hindler, J. F., Kahlmeter, G., Olsson-Liljequist, B., Paterson, D. L., Rice, L. B., Stelling, J., Struelens, M. J., Vatopoulos, A., Weber, J. T., & Monnet, D. L. (2012). Multidrug-resistant, extensively drug-resistant and pandrug-resistant bacteria: An international expert proposal. *Clinical Microbiology & Infection, 18*(3), 268–281.

- Tariq, Q., Daniels, J., Schwartz, J. N., Washington, P., Kalantarian, H., & Wall, D. P. (2018). Mobile detection of autism through machine learning on home video. *PLoS Medicine, 15*(11).
- Vander Schaaff, S. (2017). What men should know about cancer that spreads through oral sex: Tonsil, throat and other HPV-related cancers are on the rise. *The Washington Post* (Online).

u08s1 - Learning Components

- Study the science of primary, secondary, and tertiary prevention in population health, including health promotion and screening.
- Study communication strategies used in the field of public health.

u08d1 - Cancer Epidemiology

Chronic diseases and cancer are two major epidemiology categories. For this discussion, identify a chronic disease and a cancer.

For the chronic disease, provide information on incidence, prevalence, risk, and environmental factors associated with the disease.

- How could increased awareness of this information impact health-related behaviors in someone's life?

Discuss the three pathways of the specified cancer. Be sure to support your statements with concepts you have gained thus far from the course and link the common risk factors associated from each pathway to your selected cancer.

- Does this cancer occur in residents of developing countries, developed countries, or both? Why?
- What is the economic impact of this cancer in terms of treatment costs and funding allocations?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Review your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.

- Identify an assumption on which the post seems to be based, and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
APA Style and Format
Capella University Library

u08d1 - Learning Components

- Discuss the science of primary, secondary, and tertiary prevention in population health.
- Study the effects of environmental factors on a population's health.

Unit 9 >> Epidemiology and the Environment

Introduction

With a foundation in infectious and chronic disease epidemiology, we can now discuss a common risk factor in all disease: the environment. In this unit, you will begin to build on the epidemiological concepts used to investigate and define the role of the environment in the onset of diseases and explore how epidemiological methods can be implemented to limit diseases and conditions caused by environmental exposure to chemical and biological agents.

Concepts in this unit will highlight development and maintenance of surveillance programs for environmental factors contributing to health problems.

Learning Activities

u09s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to read the following:

- Appendix I: Case Studies, "Case Study V: Retrospective Cohort Study of the Association of Congenital Malformations and Hazardous Waste," pages 272–274.
- Appendix I: Case Studies, "Case Study VI: History and Epidemiology of Polio Epidemics," pages 278–290.

Research: Genetic Epidemiology

Use the Internet and the Capella library to research the directions genetic epidemiology is taking:

- Centers for Disease Control and Prevention. (n.d.). Public health genomics. Retrieved from https://www.cdc.gov/genomics/
- ProQuest Medical Library Advanced Search.

Final Assignment Preparation

Review the following resources to ensure you are using best practices when creating a slide presentation:

- Guidelines for Effective PowerPoint Presentations [PPTX].
- PowerPoint Presentations.

u09s1 - Learning Components

- Identify the core functions of public health.
- Review best practices in presentation design.

u09a1 - Bioweapons and Epidemiology

Scenario

Assume the role of an Epidemic Intelligence Service (EIS) officer for the Centers for Disease Control and Prevention. (*Optional career tip*: visit the EIS website linked in Resources to learn more about the role).

You are responsible for educating the health department leaders at the state and county levels on a bioterrorism threat to the United States.

Preparation

Use the Capella library as well as relevant public health and government websites to complete the following:

- Identify a bioterrorism agent of your choice and research this agent.
- You must describe the nature of the threat to the health of the population of your community clearly. Present the evidence that supports your level of concern and propose recommended steps for a community to prepare for a bioterrorist attack.

To successfully complete this assignment, you should address the following criteria:

- Apply epidemiological methods to investigate a potential bioterrorism threat.
- Determine the scientific merit of epidemiological findings used to identify and evaluate public health risks.
- Recommend methods for determining the identification and monitoring of epidemics and disease clusters.
- Analyze environmental and economic risk factors that impact the incidence and spread of disease in the event of a bioterrorist attack.
- Create a communication strategy that prepares stakeholders to anticipate and respond to a bioterrorist attack.
- Create an educational presentation using technology in a way that is clear, well organized, and generally free of formal and structural errors.

Assignment Instructions

After completing your research and gathering the relevant data, develop a presentation for your local public health leaders to alert them of the threat. Your presentation must contain the following information:

- **Section One: Executive Summary**
    - State the problem and provide a high-level summary of information that would support a call to action.
- **Section Two: Threat Analysis**
- **Name of the Agent**
    - Etiology.
    - Identification.
    - Lab analysis.

- **Disease Process:**
  - Reservoir.
  - Mode of transmission.
  - Incubation period.
- **Level of Threat**
  - Occurrence.
  - Susceptibility.
  - Period of communicability.
- **Section Three: Prevention and Response**
  - Response plan: Surveillance and monitoring.
  - Communication strategy.
- **Section Four: References and Appendices**

Additional Requirements

- **Media presentation:** Minimum of 12 slides, with speaker's notes in each slide. Upload the presentation.
- **Resources:** At least three scholarly resources other than the course text or assigned journal articles. Include citations at the end of the presentation.
- **APA guidelines:** Resources and citations are formatted according to current APA style and format. When appropriate, use APA-formatted headings.
- **Font and font size:** Use an appropriate size and weight for presentations, generally 24–28 points for headings and no smaller than 18 points for bullet-point text. For PowerPoint tips, refer to the Campus links in Resources.

ePortfolio

Consider saving this activity to your ePortfolio.

Course Resources
Guidelines for Effective PowerPoint Presentations [PPTX]
APA Style and Format
Capella University Library: PowerPoint Presentations
Capella University Library

ePortfolio

Epidemic Intelligence Service (EIS)

u09d1 - Environmental Epidemiology and Disasters

Below you will find a list of some well-known environmental disasters. For this discussion, you will choose one and discuss the event's environmental epidemiological impact. Items to address include the epidemiological triangle, risk factors, and short- and long-term health impacts for the exposed, the social health impact of the event, and the economic impact of the event.

Note: Do not feel bound to these examples; if you would like to write about another environmental public health disaster with which you are familiar, please do so!

- 1952 London, England: The Great Smog.
- 1956 Kumamoto prefecture, Japan: Minimata Disease.
- 1962–1975 Vietnam: Agent Orange exposures.
- 1978 Niagara Falls, NY: Love Canal disaster reported by the *New York Times*.
- 1976 Sevoso, Italy: Explosion and dioxin cloud.
- 1984 Bhopal, India: Union Carbide pesticide plant explosion.
- 1986 Chernobyl, Soviet Union: Nuclear reactor meltdown.
- 2000s Guiyu, China: Electronic waste village.
- 2001 New York, NY: Collapse of the World Trade Center towers.
- 2002 Hunan Province, China: SARS outbreaks begin.
- 2002 Tuberculosis peaks worldwide.
- 2005 Graniteville, SC: Train crash and chlorine gas release.
- 2009 H1N1 Flu Pandemic.
- 2010 Cholera outbreak in Haiti.
- 2011 Fukushima Daiichi, Japan nuclear disaster.
- 2016 The Great Smog of Delhi, India.
- 2017 Cholera outbreak in Yemen.

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based, and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
Capella University Library
APA Style and Format

u09d1 - Learning Components

- Identify the core functions of public health.
- Study the effects of environmental factors on a population’s health.

Unit 10 >> Epidemiology and a Brave New World

Introduction

As the course comes to a close, we will discuss challenges facing today's epidemiologists, using the CDC's current outbreak list as well as recent updates from Doctors Without Borders on the spread of infectious diseases as war continues in Yemen. In the final unit discussion, you will be asked to consider working in public health overseas, choosing an organization and a role in that organization.

Learning Activities

u10s1 - Studies

Readings

Use your *Introduction to Epidemiology* text to read the following:

- Chapter 12, "Clinical Epidemiology," pages 231–242.
- Appendix I: Case Studies, "Case Study IV: Retrospective Analysis of Occupation and Alcohol-Related Mortality," pages 272–275.

Use the Internet to complete the following:

- Doctors Without Borders. (n.d.). Yemen. Retrieved from http://www.doctorswithoutborders.org/country-region/yemen
    - Read the latest news on the spread of infectious diseases and browse the articles and media on Doctors Without Borders's page about their work in this war-torn nation.
- Hubbard, B., Grigg, T., & Almosawa, S. (2017, Aug 23). 'It's a slow death': The world's worst humanitarian crisis. *The New York Times*. Retrieved from https://www.nytimes.com/interactive/2017/08/23/world/middleeast/yemen-cholera-humanitarian-crisis.html?mcubz=1&_r=0

u10s1 - Learning Components

- Study the science of primary, secondary, and tertiary prevention in population health, including health promotion and screening.
- Study the effects of environmental factors on a population's health.

u10d1 - Current Epidemics: Where Do We Go From Here?

Use the CDC Current Outbreak List (linked in Resources) for this discussion.

- Provide an overview of an outbreak of your choice to the class, including the 5 W's (who, what, where, when, and why).
- Describe one or two calculations you learned in this course that helped you better understand the epidemic information. Why was this helpful?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Read your peers' posts and respond, using one of the following approaches:

- Identify knowledge gaps or unknowns that were not considered in your peer's post.
- Identify an assumption on which the post seems to be based, and pose a useful alternative or contrasting approach based on a different assumption.
- Ask a probing question.
- Elaborate on a particular point.

Support your views with references to assigned readings and other theoretical, empirical, or professional literature. If you are responding with a personal perspective or an example from your workplace experience, be sure to focus on both the theoretical and practical implications. Cite all sources in proper APA style.

Course Resources
Graduate Discussion Participation Scoring Guide
CDC Current Outbreak List
Capella University Library
APA Style and Format

u10d1 - Learning Components

- Discuss the science of primary, secondary, and tertiary prevention in population health.

u10d2 - What If...

Now that you have reached the end of the course, take a moment to consider a "what if":

- If you were given an opportunity to participate with an overseas public health organization, which organization tops your list and why?

- What aspect of epidemiology would you want to work on with this organization?
- How would you connect with this organization?

Response Guidelines

Respond to posts that have had few responses thus far.

Refer to the Faculty Expectations for Response Guidelines.

Review your peers' posts and respond, including one of the following:

- Tell him or her specifically why you chose to respond to the post.
- Ask a probing question.
- Offer suggestions and resources.

Course Resources

Graduate Discussion Participation Scoring Guide

u10d2 - Learning Components

- Practice constructing clear and concise messages in online discussions.
