



HOSA STRATEGIES FOR EMERGENCY PREPAREDNESS: COMPETITIVE EVENTS

MODULE 1: EPIDEMIOLOGY COMPETITIVE EVENT

PURPOSE

The purpose of this module is to familiarize HOSA advisors with the Epidemiology Competitive Event. This is a written event for an individual competitor evaluating the competitor's knowledge of the incidence and distribution of diseases in large populations, and the conditions influencing the spread and severity of disease.

In preparing for this event, students will study the effects of health and disease in populations, improve their scientific literacy, and gain insights into public health careers.

OBJECTIVES

1. Explain the purpose of the Epidemiology Competitive Event.
2. Identify official references that support the knowledge and skills needed to help HOSA chapter members prepare for this event.
3. Describe the components of the Epidemiology Competitive Event.
4. Analyze opportunities for integrating epidemiology event knowledge and skills into the health science classroom.
5. Explore career opportunities in the field of public health epidemiology.

RESOURCES

Epidemiology Competitive Event Guidelines from the HOSA Handbook, Section B, available at <http://www.hosa.org/natorg/sectb/cat-ii/ep.pdf>.

This event consists of a written test containing fifty (50) multiple-choice items, AND a case study that is composed of between five (5) and twenty (20) short answer questions worth 50% of the final total score.

The official references for the development of all test items and the case study are entirely web-based. Below is a list of the resources and test plan:

WEBSITE	TOPIC	TEST %
Excite! http://www.cdc.gov/excite/classroom/index.htm	An Introduction to Epidemiology	10
	Steps of an Outbreak Investigation	10
Detectives in the Classroom http://www.montclair.edu/Detectives/project/EpiBackgrounds.htm	Epidemiology Backgrounds and Essential Questions	10
Young Epidemiology Scholars http://www.collegeboard.com/yes/ft/iu/framework.html http://www.collegeboard.com/yes/ae/gloss.html	Epidemiology Glossary	10
	Intellectual Framework	15
Emerging and Re-emerging Infectious Diseases http://science-education.nih.gov/customers.nsf/HSDiseases.htm	Understanding Emerging and Re-emerging Infectious Diseases	20
What is Public Health? http://www.whatispublichealth.org/careers/index.html	Careers in Public Health	15
Disaster Epidemiology and Assessment http://www.cdc.gov/nceh/hsb/disaster/default.htm#pubs	CDC Activities <ul style="list-style-type: none"> • Mission, goals and objectives • Application and service in disaster settings: surveillance and rapid needs assessment • Applied research to prevent injuries, illnesses and deaths • Consultation and training • Field investigations 	10
Excite website http://www.cdc.gov/excite/classroom/index.htm#exercises	Case Study – Epidemiological scenario – short answer questions	

CONTENT

Perhaps it is best to begin this module with an understanding of the various websites, programs, and agencies that serve as the references for the Epidemiology Competitive Event. Below is a description of the reference, along with highlights of availability to the HOSA advisor. It is important to review each site and become familiar with the support and resources they offer. Additionally, the user will want to crosswalk the information to course content and identify opportunities for the students to learn new knowledge while practicing their analytical and problem-solving skills.

EXCITE! — Excellence in Curriculum Innovation through Teaching Epidemiology and the Science of Public Health– This website resource, developed by the CDC, teaches students about the causes and prevention of disease and injury. Students improve their research and analytical skills, by following the suggestions offered in their teaching and reference materials. Learning in this manner provides real-world relevance to what they have learned about the scientific method. Essentially, students will learn how to solve real disease outbreaks on their own. The site contains an extensive resource library, sample lesson plans and case studies, career information, and easy-to-follow content on epidemiology and disease outbreak investigation.

Young Epidemiology Scholars – This resource includes workshops and teaching units designed to help teachers educate students about epidemiology as they teach their curriculum. Goals include improving scientific literacy and encouraging more students to prepare for careers in public health. The teaching units cover a wide variety of topics. For preparation of round one of this competitive event, the user will need to refer to the topics listed in the test plan. Also, on this site are additional articles and websites, as well as dates for workshops held around the country.

Detectives in the Classroom - This curriculum, developed by Montclair State University, consists of five instructional modules that explore specific health-related issues relevant to through the science of epidemiology. Each module contains an essential question for students to answer as they work through multiple investigations. These lesson plans align with the National Science Education Standards. The website also contains valuable resources and information about evaluations, partnerships, and workshops.

Emerging and Re-emerging Infectious Diseases – This high school supplement was developed by the National Institutes of Health. The user can view the web version or download the Teachers' Guide. The curriculum contains general information about infectious diseases and five interactive student activities designed so that students learn valuable epidemiological concepts. Students learn basic scientific principles related to emerging and re-emerging infectious diseases, experience the process of scientific inquiry, and recognize the role of science in society and the relationship between basic science and personal and public health.

What is Public Health? - This website, developed by the Association of Schools of Public Health, was designed to help the learner understand the various roles that public health professionals play to ensure the American public remains healthy. The site provides a look into the world of public health and the impact it has on the lives of society. It also gives an overview of public health careers and contains numerous links to a diverse range of those careers.

Disaster Epidemiology and Assessment – This portion of the CDC website contains information regarding preparing for, responding to, and recovering from a natural or technologic disaster. Examples of actual field studies conducted by the CDC are included, as well as other activities for service in disaster settings.

4. Locate the webpage, *Epidemiology in the Classroom*, on the **Excite** website. Choose one of the case study exercises (Legionnaires or Smoking and Lung Cancer) and review the teaching directions in the section titled, *Suggestions for Classroom Use*.
 - a. If possible, implement one or more of the activities in your classroom. Once the activity is completed, debrief with the students by having them discuss what they have learned about epidemiology. Have them submit a summary of what they learned for you to include in your course notebook.
 - b. If you are unable to complete a lesson in your classroom, review the case study and develop ten (10) multiple choice items which can be utilized by HOSA members as they prepare for the competitive event round one test. It is suggested to use traditional testing on specific knowledge points regarding epidemiology and outbreak investigation. If you are unsure about writing high quality test items, take time to review *Multiple Choice Testing: Advanced Assessment for HOSA Advisors*, pages 8 – 19, a document used in HOSA 103, which can be located/downloaded from the HOSA website at <http://www.hosa.org/hosa103/module2/Docs/M2MultipleChoiceTesting.pdf>.
5. Download *Epidemiology Backgrounds* from the **Detectives in the Classroom** website. There are 5 modules containing a total of 34 investigations. Read and study the document and ask yourself the following questions: What is the essential question for this module? What are the major concepts students need to understand in order to adequately answer the question? As you identify the major concepts complete the information on the form provided (Attachment 1-3).
6. Locate the *Epidemiology Glossary* and *Intellectual Framework for the Teaching of Epidemiology* webpages. These are the two official event resources on the **Young Epidemiology Scholars** website. Note that these two resources are 25% of the test plan. Review each of the webpages and be able to compare the concepts and terminology. Incorporate this content into flash cards for your HOSA members or into a PowerPoint Q & A game, which can be used as class starters. Include a copy of your chosen activity in your course notebook. Or, if you prefer, create a different learning tool that can be used by your students to prepare for this event. Describe the activity you created on the form provided. (Attachment 1-4)

7. Locate the *Teachers' Guide to Emerging and Re-emerging Infectious Diseases*. You will find the information referenced in the event test plan on pages 5-19. Read these pages and develop a content outline that can be used as a guide for HOSA competitors as they prepare for the epidemiology event. Once you have finished, complete the form. (Attachment 1-5) Include the outline and completed form in your course notebook.
8. Write a description of the website for the topic *What is Public Health?* Since you will be advising and encouraging HOSA members as they prepare to compete in this event, develop a tool or instructional strategy you can provide them, which will assist them in their study. This tool may be developed from ideas such as note-taking strategies, popular games, or anticipation guides. Make sure you include your tool in your course notebook.
9. Go to the link for the CDC website, **Disaster Epidemiology and Assessment**. Create an informational PowerPoint presentation on the CDC activities included on the test plan. If you are currently working with HOSA members, you may wish to assign this as their project. If you do so, develop a rubric for them to use as a guide and an evaluation tool. Include copies of the slides and rubric in your notebook.
10. *Optional:* The following websites offer UPDATED information about emerging and re-emerging infectious diseases. Checking these sites periodically will help you obtain current and reliable information to update your curriculum content on this topic.
 - <http://www.cdc.gov/ncidod/EID/> - This link takes you to the publication, *Emerging Infectious Diseases*, a monthly journal published by the Coordinating Center for Infectious Diseases, Centers for Disease Control and Prevention.
 - <http://www.cdc.gov/ncidod/EID/rss/upcoming.xml> - This list contains articles from the *Emerging Infectious Diseases Journal*, published online ahead of print.
 - http://www.cdc.gov/ncidod/diseases/eid/disease_sites.htm - This CDC webpage contains a list of emerging and re-emerging infectious diseases. The links on this page lead to numerous webpages and articles about the diseases.
 - <http://www.cdc.gov/ncidod/student.htm> - This web address links to additional educational resources for students and teachers.

- <http://www.cdc.gov/ieip/> - This link will take you to information about the International Emerging Infections Program (IEIP), is a component of the CDC which identifies and responds to emerging infections around the world.
- http://www.who.int/topics/emerging_diseases/en/ - This address links to information about emerging diseases on the World Health Organization's website, as well as other related sites.
- <http://www3.niaid.nih.gov/topics/emerging/> - This site contains a wealth of information about emerging and re-emerging infectious diseases by the National Institute of Allergy and Infectious Diseases, part of the National Institutes of Health.

ATTACHMENT 1-1

EPIDEMIOLOGY WEBSITE SCAVENGER HUNT

Test Plan Topic	Official Reference	Weblink to Specific Topic
<i>Example</i>		
<i>Required background information for student exercises used in "How to Investigate an Outbreak"</i>	<i>Excite!</i>	<i>http://www.cdc.gov/excite/classroom/outbreak/appendix.htm</i>
Steps to Investigating an Outbreak		
Career information about epidemic intelligence workers		
Newspaper articles about public health careers		
A list of 5 essential questions related to epidemiology		
A copy of "Epi Talk", one of the handouts used in Curriculum Investigations		
A curriculum investigation that teaches students how to form a hypothesis		
Examples of CDC activities on research in disasters		
CDC definition of Rapid Needs Assessment		
Five major types of infectious agents		
Determine if malaria is an emerging or re-emerging disease		

ATTACHMENT 1-2

LESSON PLAN: INTRODUCTION TO EPIDEMIOLOGY

INSTRUCTOR		DATE
COURSE TITLE		CLASS PERIOD
UNIT	SPECIFIC TOPIC	
INSTRUCTIONAL GOAL (outcome that students should be able to demonstrate upon completion of the lesson)		
LESSON CONTENT (How the lesson will incorporate information from "An Introduction to Epidemiology")		
INSTRUCTIONAL PROCEDURES <ul style="list-style-type: none">a. Focusing event (something to get the students' attention)b. Teaching procedures (methods you will use)c. Formative check (progress checks throughout the lesson)d. Student participation (how you will get the students to participate)e. Closure (how you will end the lesson)		
MATERIALS AND AIDS (what you will need in order to teach this lesson)		

ATTACHMENT 1-3

EPIDEMIOLOGY BACKGROUND CONCEPTS

Module Number	Essential Question	Major Concepts
One	How is this disease distributed and what hypotheses might explain that distribution?	
Two	Is there an association between the hypothesized cause and the disease?	
Three	Is the association causal?	
Four	What should individuals and society do when preventable causes of disease are found?	
Five	Did the prevention strategy work?	

ATTACHMENT 1-4

**CREATIVE ACTIVITY FOR THE YOUNG EPIDEMIOLOGY
SCHOLARS WEBSITE**

If you created a different learning tool (other than a PowerPoint or flash cards) for assignment six (6), describe the activity in the space below.

Description of Activity
Materials/Equipment Needed
Notes to Students (explain how to use activity and other pertinent information)

ATTACHMENT 1-5

UNDERSTANDING EMERGING AND RE-EMERGING INFECTIOUS DISEASES

After completing the outline from this assignment, answer the following questions as you reflect on the information contained in this resource.

1. Is there new knowledge taught in this resource that you have not noted in previous resources from this module? Explain your answer.

2. Think about the information which is taught in this resource and compose several essential questions related to those concepts.

3. Does any of the information in your outline align with courses you are currently teaching? If so, please write suggestions for how you might incorporate this information in your classroom.

4. What are your suggestions to HOSA members who will need to study this material in preparing for the epidemiology event?
