



uBEATS Teacher's Guide:

Overview of Diseases with Most Impact on U.S. Morbidity & Mortality (Grades 11-12)

This teacher guide is a supplementary text to support the use of the uBEATS Overview of Disease on U.S. Morbidity & Mortality module for grades 11-12.

To help students develop the knowledge necessary for an incredible future in health care, we created UNMC Building Excellence in Academics Through STEM (uBEATS), an online health science resource for Nebraska students.

UNMC uBEATS modules are short (15 minutes or less), interactive online health science modules to supplement curriculum taught in grades 6 – 12. These do not replace curriculum, but are a supplement for teachers and students incorporating evidence based information and UNMC expert guided material. Each module is chunked into sections with formative and summative assessments with immediate feedback provided.

Tips on how to utilize uBEATS modules:

- Internet access is required to view uBEATS modules.
- For those who have access to one-to-one technology, modules can be used in or outside of the classroom as a topic introduction, extension, or review.
- For classrooms without individual student devices modules can be used in whole group instruction. Formative assessment questions can use the teacher's preferred call and response method and summative assessment questions can be displayed on the board and answered individually by students or printed and distributed to students after viewing the module.

Objectives

- Explain the relationship between morbidity and mortality.
 - Describe the role of epidemiologists in investigating morbidity and mortality.
 - List five diseases with the highest mortality rates in the United States.
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Introduction

This module begins with descriptions of four persons, each dealing with different risk factors for specific diseases. Anita has a strong family history of breast cancer. Bob has a high risk of heart disease and stroke, following a life of unhealthy diet and lack of exercise. Jean faces a variety of problems after smoking cigarettes for 40 years. Roberto's daily alcohol consumption has increased his chances of heart disease, cancer, stroke, and Alzheimer's disease. This learning module explores how risk factors and lifestyle choices affect quality of life and eventual death.

Prior Knowledge

Before beginning this module, the student should understand the Next Generation Science Standards (NGSS) featuring [Three-Dimensional Learning](#).

Core Idea LS1.A. Structure and Function

- **By the end of grade 12.** Systems of specialized cells within organisms help them perform the essential functions of life, which involve chemical reactions that take place between different types of molecules, such as water, proteins, carbohydrates, lipids, and nucleic acids. All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells.
- Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Outside that range (e.g., at a too high or too low external temperature, with too little food or water available), the organism cannot survive. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.. [A Framework for K-12 Education](#).

Science and Engineering Practices [NGSS](#)

- Constructing explanations and designing solutions

Crosscutting Concepts [NGSS](#)

- Cause and Effect



Key Terms/Vocabulary

Morbidity, mortality, prevalence, disease, lifestyle, influenza, epidemic, pandemic, epidemiologist, disease outbreak, pathology, cardiovascular, coronary artery, heart attack, myocardial infarction, symptom, plaque, risk factor, blood pressure, cholesterol, obesity, diabetes, medical conditions, habits, biological factors, genetics, cancer, oncologist, prostate, urinary bladder, urethra, biopsy, tumor, ductal breast cancer, lobular breast cancer, mammogram, respiratory, pulmonology, oxygen, carbon dioxide, chronic, chronic obstructive pulmonary disorder (COPD), asthma, stroke, neurologist, cerebrovascular accident (CVA), ischemic, hemorrhagic, Alzheimer's disease, geriatric, psychiatrist, dementia.

Science Standards

This module is related to the content of UNMC High School Alliance: Introduction to Pathology and Microbiology

Pathology is the study of disease processes. The field lays the foundation for all of clinical medicine and medical research. All diseases begin at the cellular level and changes in the structure and function of tissues ultimately lead to symptoms that health care providers see on a daily basis. This course will introduce students to medical terminology, normal histology and gross/microscopic pathology, allowing students to correlate the findings they see into basic clinical concepts.

Nebraska's College and Career Ready Standards for Science 2024

[Nebraska Science Standards](#)

Biology Structure and Function: SC.HSP.6.1.F

- Construct an explanation based on evidence that animals have structures that function to support survival, growth, behavior, and reproduction. Emphasis is on the basic principles of animal form and functions. Examples of basic principles could include animal nutrition, circulation, gas exchange, immunity, osmoregulation and excretion, hormonal and endocrine control, reproduction, development, neural control systems, and animal behavior.



Extensions of the lesson

- To help students become more familiar with the Key Terms of this module, the teacher can use the vocabulary list for a classroom Word Wall, or integrate the vocabulary into classroom word games during review sessions.
- To help the students see personal relevance, suggest that they have a private family conversation about their own ancestry and family history of illness.
- As student misconceptions become apparent, the teacher may need to reinforce these important concepts:
 - Morbidity refers to lifestyle problems encountered by people with a particular disease.
 - Mortality is the rate of death caused by a particular illness within a population.
 - Epidemiologists use disease statistics from area hospitals in order to calculate rates of morbidity and mortality within a specific population.
 - Genetics, medical conditions, and lifestyle habits affect a person's risk of developing certain diseases.
 - There are many different kinds of cancer, but prevalence is not the same as deadliness. Early detection blocks many cases from raising mortality rates.
 - Stroke happens when brain tissue is damaged or killed by lack of oxygen delivery from blood vessels. One type, ischemic, is caused by blockage within the vessel; the other type, hemorrhagic, is the result of a break in the blood vessel.

Enrichment

- For information about Healthcare Career Opportunities, see the [UNMC Health Career Book](#).
- Students should be watchful in current events for recent news about CDC reports.
- For an example of a professional research paper, students can read [Physical Activity, Health Benefits, and Mortality Risk](#).
- To make connections in your community, contact local hospitals, local and state public health departments, healthcare clinics, nurses, doctors, fitness centers, nursing homes.