



Four Corners Hantavirus: Geography and Health

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Grade Level High School
Duration 1-2 class periods

National Standards

GEOGRAPHY

Essential Element 1: The World in Spatial Terms

1. How to use maps and other geographic representations, geospatial technologies, and spatial thinking to understand and communicate information

Element 5: Environment and Society

15. How physical systems affect human systems.

Element 6: The Uses of Geography

18. How to apply geography to interpret the present and plan for the future.

AZ Standards

ELA

Reading Integration of Knowledge and Ideas

11-12.RI.7 Integrate and evaluate multiple sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in print in order to address a question or solve a problem.

Writing

Production and Distribution of Writing

11-12.W.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Arizona Social Science Standards

The use of geographic representations and tools help individuals understand their world.

HS.G1.1 Use geographic data to explain and analyze relationships between locations of place and regions. Key tools and representations such as maps, remotely sensed and other images, tables, and graphs

Human-environment interactions are essential aspects of human life in all societies.

HS.G2.1 Analyze interactions within and between human and physical systems

Examining human population and movement helps individuals understand past, present, and future conditions on Earth's surface.

HS.G3.4 Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration settlement.

Overview

Everything about the study of a disease is geographical. Geographers look at the historical occurrences, time of year, vector habitat availability, and incidences of human exposure. Geographers can map the data, track the migration of the disease, and offer help in getting control of the spread of the disease. To see how geographical factors are employed, a case study on hantavirus can be beneficial for students to see how geography can help solve world problems.

Purpose

In this lesson, students will learn about hantavirus: how to prevent it and why this disease is prevalent in the Four Corners region of the southwestern United States. They will also compare this disease to what they know about a more recent occurrence, Covid 19.

Materials

- Hantavirus Student Guide

Four Corners Hantavirus: Mapping Geography and Health

- Hantavirus Worksheet and Answer Key

Objectives

The student will be able to:

- Read a variety of maps.
- Explain how natural systems impact human systems.
- Compare two diseases in terms of their causes and effects.

Procedures

1. Introduce students to the concept of a vector (the carrier and transmitter of a disease). Ask students for examples of vectors. (**mosquitoes**—malaria, dengue, West Nile fever, Zika fever, yellow fever, etc.; **ticks**—encephalitis, Lyme disease; contact with **infected animal**—hantavirus, Ebola, contact with an **infected person**—Ebola, Covid 19. Explain that geography has an important part to play in the discovery of where diseases originate, how they are transmitted, and how they can be contained or cured.

2. Create a 2 KWL charts on the whiteboard or use a projection device. Label Chart 1 as Covid 19. Label Chart 2 as hantavirus. Have students share what they already know about Covid 19 to fill in the K section. Spend some time then filling in the W section. Repeat the process with Chart 2.

3. Distribute and read aloud the Hantavirus Student Guide. Have students complete the L section of the hantavirus chart. Then have students apply any learning they have from hantavirus to the L section of Chart 1.

4. Distribute the Hantavirus Worksheet. Assign students to work in groups or individually on the questions. Allow students to see Chart 1 and Chart 2 to assist in their answers.

5. Collect the worksheet.

6. Discuss the geographic factors.

- How did natural systems impact the human systems?
- What are causes and effects of diseases?
- How did geographers display the data, so it was clearly communicated to everyone?
- Of what importance is contact tracing during the spread of the disease?

- What might need to change in the natural system, so the human systems are not affected?
- What roles do governments play in solving issues with spread of disease?
- What aspects of our mobility are limited due to disease?
- What are the economic effects of disease that snowball into a global effect?
- Which locations/nations are easier to shield from disease?
- Which parts of society are hurt the most in a pandemic?

Assessment

Geography and ELA

The worksheet can be graded for completeness and accuracy. Mastery will be considered a score of 80% or higher.

Extensions

Have students find credible articles on the Internet and do further research. Have them select one or more of the geographic factors in #6 (above) and write their findings in regards to their selected disease/pandemic keeping in mind this is a reflection of how geographers help fight world health issues.

Have the students explore

<https://www.cdc.gov/hantavirus/resources/index.html> where there are brochures, fact sheets, and podcasts on hantavirus.

Students could explore the geography of medicine in the United States by visiting <http://www.dartmouthatlas.org/> where they can gain information on Covid 19 including maps of the spread.

Sources

<http://www.cdc.gov/health/diseases.htm>

<http://www.cdc.gov/ncidod/diseases/hanta/hantavirus.htm>

<http://www.ihs.gov/medicalprograms/envhealth/hantavirus.htm>