Looking at Pandemics Through AzGA Lesson Plans

by Heather Moll and Gale Olp Ekiss

Why Geography?

Because geography straddles both human and physical geography, it is at a unique position to study pandemics.

Outcomes:

• Will focus on learning how the study of pandemics can become a Geo-Inquiry by relying on the work of Dr. Helen Hazen, University of Denver.
• Will share two lessons developed for the AzGA website: The Influenza Pandemic of 1918-19 and Four Corners Hantavirus: Geography and Health.
• Will demonstrate how to find links to a lesson on the Black Death, a list of web-based resources, and copies of these PowerPoints.
Geo-Inquiry Process (Nat Geo)

1. Ask
2. Collect
3. Visualize
4. Create
5. Act

Geo-Inquiry Worksheets (90 pages)

https://www.nationalgeographic.org/education/programs/geo-inquiry/

- Creating the right question
- Gathering the right data
- Planning the right visual
- Creating an effective visual
- Effectively Sharing your Geo-Inquiry

Questions for Student Research

- Imagine you are a pandemic advisor at the World Health Organization. What sorts of measures might you encourage your member states to take to reduce the risk of future pandemics? (e.g., closure of wet markets; regulations on the bushmeat trade; efforts to improve hygiene in agriculture; better surveillance to identify newly emerging diseases; efforts to identify potential pathogens in wild animals)

- To what degree might the interests of conservationists and public health experts intersect in the context of trying to reduce the likelihood of new pandemics? (e.g., intact ecosystems provide less opportunity for contact between humans and wild animals; reductions in logging and landscape conversion reduce human encroachment into natural ecosystems; discouraging people from eating wild animals offers conservation and health advantages)

- Imagine that you are a government official in the early weeks of the pandemic. What steps would you want to take in Wuhan to try to prevent the disease from spreading? How will you balance concerns over personal freedom with the need to control the spread of the disease? (e.g., quarantining cases and/or the whole city; careful surveillance and monitoring of the disease’s spread; disease testing to monitor spread; social distancing)

- If you are a government official in another country, what steps would you propose to try to prevent the disease entering your country and prepare for an outbreak? How might your decisions differ if your nation is relatively isolated (e.g., New Zealand) or has significant cross-border traffic (e.g., the U.S. or France)? How might your approach differ if your country is a city nation (e.g., Singapore) versus a more rural one (e.g., Guatemala)? (e.g., quarantining people coming from affected areas; careful case and contact tracing; putting into action pandemic preparedness plans; building up healthcare capacity)
Questions for Student Research

• Why is social distancing so important for controlling an airborne disease that is new to the human population? (e.g., everyone is susceptible to new diseases, so they spread rapidly; absence of effective vaccines or treatments make prevention critical; simply keeping people apart is effective for an airborne disease, regardless of the precise details of transmission)

• Why is quarantine alone unlikely to be successful in controlling the spread of COVID-19? (e.g., challenges of enforcing quarantine, including civil liberties issues; quarantine relies on high levels of compliance to be effective; COVID-19 may spread asymptomatically as well as before symptoms appear, making it hard to know whom to quarantine)

• Why is it so difficult to lift a lockdown without generating a renewed outbreak? What measures would have to be in place before lifting a lockdown in order to prevent renewed waves of infection? (e.g., the disease will likely spread again as soon as a lockdown is lifted, unless rigorous public health measures are in place to rapidly identify and isolate new cases and their contacts; alternatively we could wait for a vaccine; achieving herd immunity would potentially involve many thousands of additional deaths and so most governments have not proved willing to purposely follow this route)

Questions for Student Research

• What characteristics of the COVID-19 pandemic suggest that a contact-tracing app might be useful? (e.g., significance of close contact to spread of the disease; few current alternatives to social isolation for slowing the disease’s spread; challenge of asymptomatic cases)

• How might we address privacy concerns with contact-tracing apps? At the other extreme, are more stringent measures to try to enforce quarantine justified (such as the use of digital wristbands to monitor the movements of those infected)? (e.g., make the system voluntary; control who has access to the data generated; make sure that apps only record the bare minimum of information needed; perhaps controlling the disease will require compromising some civil liberties)

• What were some of the implications of India’s rapid lockdown? How could India have made its approach to controlling the virus more sensitive to the needs of its most impoverished citizens? (e.g., the virus probably spread with migrants from cities to rural areas; movement of people back to villages increases crowding in family homes; poverty increases as migrant workers are unable to work; possible shortages of food in rural areas to support the new influx of people)
Questions for Student Research

• What are some of the challenges facing coastal resorts that are being inundated with city-dwellers fleeing cities? What equity issues does this raise? (e.g., possible introduction of the virus to these remote areas; lack of hospital beds in rural areas; overextended infrastructure in small resort towns, e.g., busy car parks and congested streets; problems with social distancing at beauty spots; need for emergency services to attend to those injured in recreational activities)

• What is the role of government during a public health crisis? Should government have the right to restrict civil liberties for the “greater good” of controlling a pandemic? (e.g., connections to right-wing and libertarian versus left-wing politics that disagree at a fundamental level about the role of government; public health can be seen as a more worthy issue than most for curtailing individual liberties; certain individuals or groups may benefit/be disadvantaged more than others by curtailment of civil liberties)

• Do you think that voluntary public health measures are effective enough for a problem of the scale of the COVID-19 pandemic? Under what social circumstances do you think that voluntary measures might be most effective? Where are more authoritarian governments successful? (e.g., differences in style of government might influence the effectiveness of voluntary measures; more collectivist societies might be able to rely more on voluntary measures than more individualistic societies; more homogeneous societies might feel greater unity and willingness to participate voluntarily)

Questions for Student Research

• Why are today’s global commodity chains so vulnerable to disruption by events such as the COVID-19 pandemic? How might our global supply networks nonetheless provide some resilience? (e.g., workers unable to work; ships unable to get loaded owing to illness among workers; panic buying raising demand; increased demand for some products necessitating that factories switch to production of essentials; disruption to migrant labor supply; closed borders. On the other hand, globalized supply chains provide the potential to make up shortfalls in production associated with localized disruptions.)

• What are some of the short-term environmental benefits of the COVID-19 pandemic? Are any environmental benefits likely to persist in the long term? How might we try to solidify any short-term environmental benefits into long-term solutions? (e.g., short-term: reduced pollution, animals thriving in recently unpeopled spaces, closure of wet markets; long-term: potential for recession to defund environmental efforts, international attention may shift from environmental issues to recession and poverty reduction, return to the idea that environmental protection is a luxury. Policy and public attention are likely to be the best ways to solidify any gains; also public health and conservation messages might be used to reinforce one another after this experience, e.g., related to hunting wild animals.)
Questions for Student Research

• How might low socioeconomic status raise an individual’s risk of contracting coronavirus? How might low socioeconomic status increase the risk of an individual being sick enough to be hospitalized or die from COVID-19? (e.g., exposure: exposure may be highest in crowded communities such as poor inner-city areas; people in low-wage jobs likely to have to continue working and risk exposure; low-wage employees have limited power to demand protective equipment at work. Risk of hospitalization/death: higher for those with underlying conditions such as diabetes which are more common among the poor; poorer individuals may have less access to healthcare)

• How might the experience of being a minority influence your likelihood of contracting or dying from COVID-19? Think about how socioeconomic status might confound the relationship between race and health before considering how minority status itself might lead to poorer disease outcomes. (e.g., socioeconomic status: many minority groups more likely to be of lower socioeconomic status, with significant implications for health. Minority status: chronic stress can weaken the immune system; minorities may be less likely to seek healthcare, especially undocumented workers or those who are not proficient in the language of their host country; prejudice within the healthcare system may mean that minorities are not treated in the same way as majority populations)

A Greater Killer than the War: The Influenza Pandemic of 1918-1919
by Dr. Elizabeth Hinde

• High School
• 1-2 class periods

Arizona Social Science Standards—GEOGRAPHY

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.
- HS.G1.2 Use geospatial tools and related technologies to construct relevant geographic data to explain spatial patterns and relationships. Examining human population and movement helps individuals understand past, present, and future conditions on Earth’s surface.
- Examining human population and movement helps individuals understand past, present, and future conditions on Earth’s surface.
- HS.G3.1 Analyze the reciprocal nature of how historical events and the diffusion of ideas, technologies, and cultural practices have influenced migration patterns and the distribution of human population.
- HS.G3.4 Evaluate the consequences of human-made and natural catastrophes on global trade, politics, and human migration settlement.
A Greater Killer than the War: The Influenza Pandemic of 1918-1919

**Purpose:** In this lesson, students will be introduced to the Influenza Pandemic of 1918-1919. They will learn key facts about it and will use maps and primary source news articles to understand its spread and impact across the world.

1. Show Title Slide and Slide 1

Ask: Who do you think these people are? (police officers)
- Where do you think these people are? (Seattle)
- When do you think this picture was taken? (circa 1918)
- Why are they wearing masks? (protection from the flu – both getting it or spreading it)
- What do you think they are doing? (going to enforce laws that protect public from spread of the flu)

2. Show Slides 3-4 and introduce vocabulary (pandemic, epidemic, virus, influenza, global, and mortality rate).

3. Show Slides 5-8 and complete the worksheet.

4. Distribute World map and have students use resources to shade in each country affected by the pandemic.
Deadlier Than the War

Estimated 30 to 100 million people died worldwide.
- Approximately 116,500 Americans died in World War I.
- Approximately 675,000 Americans died from Influenza in 1918-1919.
- Millions more were infected but did not die.

Unlike other diseases, this one killed young people – ages 15-45 – at greater rates than any other age.

The mortality rate for this age group is usually the lowest, which made this disease one of the most unusual in history.

3 Waves of the Flu

The disease spread to other countries mainly through ports.
- Wave 1 – Spring 1918. Camp Riley, KS then to other military bases, and onto Europe to the Western Front and ports in Africa.
- Wave 2 – August 1918. France then across the world. This was the deadliest time of all.
- Wave 3 – February 1919. Less deadly version but killed many weakened people.
A Global Disaster (slide 7)

Also called the Spanish Flu since Spain’s newspapers reported the disease widely and people thought it started there.

In the U.S., the disease first appeared in military bases, then spread rapidly to other bases and points around the world.

Countries Infected All Over The World (slide 8)

Using the map packs, locate these countries that were affected by the Flu and shade each one on the outline map.

- India
- Indonesia
- England
- Colombia
- Portugal
- Spain
- Mexico
- Peru
- U.S.A.
- Italy
- Denmark
- Norway
- France
- Poland
- Saudi Arabia
- Brazil
- Australia
- New Zealand
- Egypt
- Sierra Leone
- Germany
- Nigeria
- Japan
- Costa Rica
- South Africa
- Sweden
- Afghanistan
- China
- Cuba
- Madagascar
- Argentina
- Paraguay
- Kenya
- Canada
- Iceland
- Philippines
- Russia
- Congo
- Samoan Islands
- Chad
Notable Survivors of the Flu Epidemic

- President Woodrow Wilson
- Franklin D. Roosevelt, future President of the U.S.
- John J. Pershing, U.S. General, WWI
- Wilhelm II, German Emperor, WWI
- David Lloyd George, Prime Minister of Britain, WWI
- Alfonso XIII, King of Spain
- Haile Selassie I, future Emperor of Ethiopia
- Walt Disney
- Edvard Munch, famous artist
- Georgia O’Keefe, famous painter
- Katherine Anne Porter, famous writer (*Pale Rider*)
- Mary Pickford, silent film star
- Lillian Gish, famous actress
- Leo Szilár, Inventor of Nuclear Chain Reaction
A Greater Killer than the War: The Influenza Pandemic of 1918-1919

5. Divide students into groups and read the AZ State Board of Health Bulletin from October 1918 (pages 2-6)

6. Each group should share one fact and one conclusion that have not been shared by another group.

7. Have small groups discuss:
   • How could a disease spread across the world today?
   • How can a pandemic be prevented?

Link to Lesson: https://geoalliance.asu.edu/influenza

Four Corners Hantavirus: Geography and Health

- High School
- 1-2 class periods

Arizona Social Science Standards—GEOGRAPHY

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.
Four Corners Hantavirus: Geography and Health

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.

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.

https://www.npr.org/sections/goatsandsoda/2017/02/14/512875666/from-vector-to-zoonotic-a-glossary-for-infectious-diseases

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.

K-W-L Chart

<table>
<thead>
<tr>
<th>Topic:</th>
<th>What I Know</th>
<th>What I Want to Know</th>
<th>What I Learned</th>
</tr>
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<tbody>
<tr>
<td></td>
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</table>
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 the Covid-19 chart.
Four Corners Hantavirus: Geography and Health

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?

Link to Lesson: https://geoalliance.asu.edu/hantavirus
The Bubonic Plague, the 14th Century Pandemic that Killed 1/3 of Europe

Materials include:

• Giovanni Boccaccio’s description of the Black Death in Florence, 1348, from the introduction to The Decameron, The Signs of Impending Death

• Recording Sheet: Introduction to The Decameron by Giovanni Boccaccio

• Jean Froissart (1337-1405), The Jacquerie (Social Upheaval Following the Black Death)

• The Black Death and Anti-Semitism

Linked on the pandemic lessons by Hinde and Dorn
As promised, how to access these lessons, PowerPoint, and resources they talked about.

- AzGA Website: [https://geoalliance.asu.edu/](https://geoalliance.asu.edu/)
- Virtual Workshops Tab
  - Looking at Pandemics Through the Geographic Lens of the 5 Themes