Topic 9.2: Technological Advances and Limitations After 1900 — Disease

Standards Table

Theme	Learning Objective	Key Concept(s)	Education Standards Met
Humans and the Environment (ENV)	Explain how environmental factors affected human populations over time.	KC-6.1.III, KC-6.1.III.A	AP World History: causation, continuity/change, and evidence-based reasoning (SAQ focus)

Learning Objectives

- Explain how disease patterns affected populations after 1900
- Analyze how poverty and environment contributed to disease spread
- Evaluate the impact of medical innovations on human survival
- Explain how new diseases and longer life expectancy created new challenges
- Use specific historical evidence in SAQ responses

Lesson Overview

After 1900, disease patterns changed significantly due to both environmental conditions and technological advances. While medical innovations such as vaccines and antibiotics reduced mortality and increased life expectancy, diseases associated with poverty—such as malaria and tuberculosis—continued to affect large populations. At the same time, new diseases such as HIV/AIDS emerged, creating global health crises. Increased life expectancy also led to a rise in chronic diseases such as heart disease and cancer. This lesson examines how environmental factors and technological developments interacted to shape population trends and global health outcomes.

Essential Vocabulary

- **epidemic** — a rapid spread of disease within a population
- **pandemic** — a disease outbreak that spreads across multiple regions or globally
- **chronic disease** — a long-lasting illness such as heart disease or cancer
- **HIV/AIDS** — a global epidemic disease that emerged in the late 20th century
- **public health** — efforts to prevent disease and improve population health

Background Reading

Diseases have always shaped human populations, but after 1900, the impact of disease was transformed by both environmental conditions and technological innovation. Medical advancements such as vaccines and antibiotics significantly reduced deaths from infectious diseases. For example, vaccines helped control diseases like smallpox, while antibiotics made it possible to treat bacterial infections that were previously fatal. These developments contributed to increased life expectancy in many parts of the world.

However, the benefits of medical innovation were not evenly distributed. Diseases associated with poverty, including malaria and tuberculosis, continued to affect large populations, especially in developing regions. Poor sanitation, limited access to healthcare, and lack of clean water allowed these diseases to persist. Environmental conditions, such as climate and population density, also played a role in disease transmission.

At the same time, new diseases emerged that created global health challenges. HIV/AIDS became a major epidemic in the late 20th century, spreading rapidly and causing significant social and economic disruption. Increased global travel and urbanization contributed to the spread of infectious diseases, making it more difficult to contain outbreaks.

Finally, as life expectancy increased, new health challenges emerged. Chronic diseases such as heart disease, diabetes, and cancer became more common, particularly in developed countries. These diseases were often linked to lifestyle and aging populations rather than infectious causes. This shift demonstrates how technological progress can create both benefits and new challenges for human populations.

Primary Sources

Primary Source 1: World Health Organization, Report on Global Health (1978 Alma-Ata Declaration excerpt)

https://www.who.int/publications/almaata_declaration_en.pdf

The Conference strongly reaffirms that health is a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, and that the attainment of the highest possible level of health is a most important worldwide social goal. The realization of this goal requires the action of many other social and economic sectors in addition to the health sector.

The existing gross inequality in the health status of the people, particularly between developed and developing countries, as well as within countries, is politically, socially and economically unacceptable and is, therefore, of common concern to all countries.

Questions

1. Identify ONE claim the document makes about global health inequality.
2. Explain ONE cause of unequal health outcomes suggested by the document.
3. Analyze the purpose of this document in its historical context.
4. How does this document reflect environmental or economic factors affecting disease?
5. Explain how this document connects to a broader Unit 9 theme.

Primary Source 2: U.S. Public Health Service, Report on HIV/AIDS (1987)

https://www.cdc.gov/mmwr/preview/mmwrhtml/00001912.htm

Acquired immunodeficiency syndrome (AIDS) is caused by a virus that attacks the body's immune system, leaving individuals vulnerable to opportunistic infections and diseases. Since its identification, AIDS has spread rapidly across multiple regions, affecting diverse populations.

The epidemic has created significant public health challenges, requiring education, prevention efforts, and medical research. Social stigma and lack of information have complicated efforts to control the spread of the disease.

Questions

1. Identify ONE characteristic of HIV/AIDS described in the document.
2. Explain ONE reason the disease spread rapidly.
3. Analyze how this document reflects a new type of global health challenge.
4. Explain ONE social effect of the disease mentioned or implied.
5. Compare this disease to earlier infectious diseases.

Primary Source 3: Norman Borlaug, The Green Revolution Speech (1970)

https://www.nobelprize.org/prizes/peace/1970/borlaug/lecture/

The Green Revolution has demonstrated that scientific advancements in agriculture can significantly increase food production. New high-yield varieties of wheat and rice have helped feed growing populations, particularly in developing countries.

However, these advancements must be accompanied by proper distribution systems and continued investment in agricultural development. Without these, hunger and inequality may persist despite increased production.

Questions

1. Identify ONE claim Borlaug makes about agricultural technology.
2. Explain ONE positive effect of the Green Revolution.
3. Explain ONE limitation or concern raised in the document.
4. Analyze Borlaug's point of view as a scientist.
5. Explain how this relates to population growth.

Key Tables / Charts

Disease Patterns After 1900

Type of Disease	Example	Cause
Infectious (controlled)	Smallpox	Vaccines
Poverty-related	Malaria, tuberculosis	Poor sanitation
Emerging diseases	HIV/AIDS	Global spread
Chronic diseases	Heart disease, cancer	Aging populations

Environmental Factors and Disease

Factor	Impact
Poverty	Increased disease spread
Urbanization	Faster transmission
Global travel	Rapid global spread
Medical advances	Reduced mortality

Change / Continuity / Comparison

Change over time:
After 1900, medical innovations significantly reduced deaths from infectious diseases and increased life expectancy. New diseases emerged, and chronic illnesses became more common as populations aged.

Continuity over time:
Despite medical progress, diseases linked to poverty and environmental conditions continued to affect large populations, especially in developing regions.

Comparison:
Developed regions benefited more from medical advances, while developing regions continued to face higher rates of infectious disease due to environmental and economic factors.

Key Takeaways

- Medical advances reduced many deadly diseases
- Poverty-related diseases continued to persist
- New diseases emerged in the modern era
- Longer life expectancy led to chronic illnesses
- Environmental factors strongly influenced disease patterns

SAQ Practice Section

SAQ Set 1 (Stimulus-Based — Medical Advances)
Stimulus:
"Vaccines and antibiotics dramatically reduced mortality rates in the 20th century, allowing populations to grow and live longer lives."
A. Identify ONE example of a medical innovation that supports this statement.
B. Explain ONE effect of this innovation on human populations.
C. Explain ONE limitation of medical advances in reducing disease globally.

SAQ Set 2 (Stimulus-Based — Disease & Poverty)
Stimulus:
"Diseases associated with poverty continued to affect large populations despite advances in medical technology."
A. Identify ONE disease associated with poverty.
B. Explain ONE reason this disease persisted.
C. Explain ONE broader social or economic effect of this disease.

SAQ Set 3 (Non-Stimulus — Environmental Change)
Skill Focus: Causation
A. Identify ONE environmental factor that contributed to the spread of disease after 1900.
B. Explain ONE way this factor affected disease transmission.
C. Explain ONE effect of increased life expectancy on disease patterns.