

UNNATURAL CAUSES ...is inequality making us sick?

A documentary and public engagement campaign from California Newsreel



DISEASE AND SOCIAL POLICY IN THE AMERICAN SOUTH: A Case Study of the Pellagra Epidemic

GRADE LEVELS: 10th grade through second year of college/university.

SUBJECTS: American History, Health, Rural History.

SUMMARY: This lesson presents six activities in which students learn about two epidemics in American history and understand their social, economic, and political contexts, rather than a conventional medical history. In Activity 1 students reflect on their own conceptions about the longevity of Americans today and the factors that influence it. Activity 2 uses a timeline to introduce a case study in its historical context: the early-1900s pellagra epidemic in the American South. In Activities 3 and 4 students use primary sources to learn about the course of the pellagra epidemic. These activities lead up to Activity 5, in which students learn about the socioeconomic conditions in the South that led to the epidemic, write bills, and present their solutions to a model Congress set in 1920. In Activity 6 students use what they learn from the pellagra case study and compare pellagra to the Type II diabetes epidemic affecting the Pima and Tohono O'odham Indians of southern Arizona today.

OBJECTIVES:

- To learn about the socioeconomic conditions in the American South during the late 19th and early 20th centuries.
- To practice analyzing and making deductions based on primary source documents.
- To understand the socioeconomic factors that help explain why certain groups of Americans are, on average, sicker than others.

TIME ALLOTMENT: Two to five class periods, depending on number of activities implemented.

MATERIALS:

- The documentary *UNNATURAL CAUSES: Is Inequality Making Us Sick?* and materials posted on its Web site at <http://www.unnaturalcauses.org/>
- Articles from *The New York Times Archive*, available free online: <http://www.nytimes.com/ref/membercenter/nytarchive.html>
- Web access is required during part of Activity 5, but could be avoided by printing out the necessary documents beforehand.

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BACKGROUND – THE STORY OF PELLAGRA

When students learn about the history of disease it is usually through the prism of medical breakthroughs, rather than the social and economic conditions that can make us healthy or sick. In this lesson, students study the course of the deadly pellagra epidemic that affected primarily the American South from approximately the turn of the century to the early 1920's. Students act as medical detectives, or epidemiologists, as they make hypotheses about the causes of the disease and why certain groups of people suffered from it more than others. They discover much about the *production* of the poverty that afflicted the American South during the Jim Crow era and how economic and social policies continue to influence population health.

Pellagra first came to the attention of U.S. doctors in 1902, but it also affected regions of Italy. It was known as the disease of the four D's (dermatitis, diarrhea, dementia, and death) and struck up to 100,000 people a year, killing as many as 40% of the afflicted. In both countries, it sickened those who relied on a corn-based diet, and corn was immediately implicated in its cause. At the time, scientists were making great breakthroughs studying microbes, especially disease-causing bacteria, whereas they knew little about how vitamins worked. Until Dr. Joseph Goldberger was assigned to investigate the epidemic for the United States Public Health Service, doctors were simply on the wrong track, assuming microbial origins of the disease.

Goldberger determined that the cause of the disease was not rotten corn or contaminated water; in fact, the disease was not caused by germs at all. Rather, it was caused by a dietary deficiency (later found to be the vitamin niacin) common to those who could afford little more than corn. Many Southerners had relied on a corn-based diet for generations, but new mechanical processing of corn stripped it of its nutrients.¹ Pellagra was rampant among mill workers and tenant farmers (sharecroppers), as well as residents in institutions like orphanages and prisons. Women, children, and the elderly suffered disproportionately. Half of the victims were African American.

In a series of simple but brilliant experiments, Goldberger showed that when prisoners were fed a diet that included fresh milk, meat, and vegetables, they recovered from the disease within months. However, the Southern power elite resisted the idea that that such a dire level of poverty existed in the 20th century American South. They campaigned against Goldberger's conclusions that pellagra was a form of malnutrition caused by the low wages paid mill workers and the debt cycle endemic to tenant farming. There were so many skeptics that Goldberger even injected himself with the blood of pellagra sufferers to demonstrate that the disease was not contagious.

This lesson looks at the socioeconomic factors that led to the pellagra epidemic and the power relationships that generated resistance to the evidence of the disease's true cause. It then takes a similar look at a modern epidemic: diabetes among Native

¹ Native American and Latin American peoples had also used corn as a staple for many centuries, but treated their corn with lime (an alkali), which restored niacin and thus prevented pellagra.

Americans in the southwestern United States.

ACTIVITY 1: FACTORS IN PREDICTING LONGEVITY

Purpose:

- To explore students' preconceptions about life expectancy in America.
- To help students understand how health and illness are distributed unequally among different population groups.²

Distribute Worksheet #1. Ask students: Relative to *other industrialized nations*, how fortunate or unfortunate do you think Americans are in terms of our average life expectancy (longevity)?

Now ask students for the reasons behind their thinking, and generate a list of their reasons on the board. For example, students might feel fortunate because the United States has some of the best medical facilities and doctors in the world. They might feel unfortunate because we do not have a universal health care system, for example.

Now ask students to think about what factors influence the patterns of life expectancy between populations. In other words, why might some populations live *on average* longer, healthier lives than others? By *population*, we mean members of a class, racial/ethnic group, or neighborhood.

Ask students to use the table on their worksheet to rank the following factors from the order of most important (1) to least important (10):

Type of occupation
Individual behaviors of population members (diet, smoking, etc.)
Genes
Income level
Neighborhood characteristics
Education level
Access to medical care
Economic and racial inequality
Education level
Influence over government and corporate decision-making

Find out by a show of hands which two factors the class thought most influenced population longevity. Which factors did they list last in influence? Hold a brief discussion about why students ranked various factors as they did.

Now show a clip from the first episode of the program "In Sickness and In Wealth," from the beginning of the program to the end of Chapter 7. (Transcripts for this episode can be found on the Web site: <http://www.unnaturalcauses.org/transcripts.php>.) After viewing the clip, ask students

² Note that this lesson deals with epidemiology, or population health: the study of the incidence, distribution, and control of disease in a *population*. Thus it explores average outcomes in groups, not why one individual becomes ill. Be aware that students may have trouble making this distinction at first.

to reassess their previous assumptions in light of what they just learned.

You may want to read aloud or distribute the following quotations from the film to help start the discussion.

NARRATOR: We spend two trillion dollars per year on medical care. That's nearly half of all the health dollars spent in the world. But we've seen our statistics. We live shorter, often sicker lives than almost every industrialized nation. We rank 30th in life expectancy.

S. LEONARD SYME (Epidemiologist, UC Berkeley School of Public Health): We know that social class is the most important determinant of health above any other risk factor.

DAVID WILLIAMS (Sociologist, Harvard School of Public Health): During the 1960s to early '70s, the black-white gap in income narrowed and the black-white gap on multiple indicators of health also narrowed. What this says very eloquently is that economic policy is a health policy. And when we improve economic circumstances and narrow the economic gap we improve the health.

Guide the discussion to help students understand how class factors (like education, income, occupation, and influence over decision-making) are often mutually reinforcing and interactive. For example, education provides opportunities for better jobs and thus income, but family income and wealth often determines where one can live and what kind of schools one can attend. While we may think we are all free to make the "right" behavioral choices, the choices we make are often constrained by the choices we have. Furthermore, many health threats (e.g., location of toxic dumps, low-paying or insecure jobs) have little or nothing to do with personal choice.

Ask students to look once again at how they filled in the chart "Factors Influencing Longevity." How did students rank causes related to class?

Did students know that the U.S. has such poor health outcomes relative to other rich nations, or that class is a determinant of health?

What preconceptions do students bring to the table when thinking about health in America?

Worksheet #1 - Factors in Predicting Longevity

Relative to *other industrialized nations*, how fortunate or unfortunate do you think Americans are in terms of our average life expectancy (longevity)?

| | | | | |
|---------------------|------------------|------------------|--------------|--------------------------|
| 1. Very Unfortunate | 2. Disadvantaged | 3. About average | 4. Fortunate | 5. Luckiest in the World |
|---------------------|------------------|------------------|--------------|--------------------------|

Factors Influencing Average Life Expectancy in a Population

Rank the following factors from the order of most important (1) to least important (10):

| | |
|---------------------------------------------------------|--|
| Type of occupation | |
| Individual behaviors of population members | |
| Genes | |
| Income level | |
| Neighborhood characteristics | |
| Education level | |
| Access to medical care | |
| Economic and racial inequality | |
| Education level | |
| Influence over government and corporate decision-making | |

ACTIVITY 2: FORMING HYPOTHESES ABOUT PELLAGRA BASED ON TIMELINES OF U.S. HEALTH AND HISTORY

Purpose:

- To help students think like epidemiologists³ as they search for the cause of pellagra.
- To give students some background information about the state of medical knowledge during the pellagra epidemic.

Explain to students that in order to broaden their picture of the American South in the first decades of the 20th century, they are going to study a once-deadly disease called pellagra. Explain that students will take on the role of medical detectives, or epidemiologists, as they try to piece together the causes of the disease based on a timeline and primary source documents. Provide students with the information below, but *do not reveal to students the cause of pellagra.*

In 1902, the first known-case of pellagra in the United States was reported. Between 1907 and 1912, when the U.S. epidemic reached its peak, 25,000 people were diagnosed with the disease, primarily in the South. It had killed forty percent of them. The symptoms of pellagra were terrifying. Those afflicted suffered from “the four D’s”: dermatitis, diarrhea, dementia, and eventually death. Patients’ skin was visibly deformed by the disease, especially the face and hands. The cause was unknown, and sufferers were often shunned by other people and sometimes even refused refuge in hospitals. Finding the cause of the disease was a pressing matter.

Show the class two headlines from *The New York Times Archives*: “South’s Crusade Against Pellagra,” March 15, 1909, and “100,000 Cases of Pellagra,” October 10, 1915. You can display the articles directly on computer or print them out, but do not let students read the articles in depth. The goal is to show the class that pellagra was a scary and unknown disease when it struck. They need to solve the riddle of its origins themselves.

Provide the students with copies of the Timeline of U.S. History and Health, and Worksheet #2, with charts “Disease-Causing Agents Discovered 1896–1922” and “Socioeconomic Factors that Might Affect Population Health.”

³ If necessary, remind students that epidemiology is the branch of medical science that deals with the *incidence, distribution, and control* of disease in a *population*.

Worksheet #2 – Forming Hypotheses about Pellagra

Use the “Timeline of U.S. History and Health” to complete the following charts.

Disease-Causing Agents Discovered 1896–1922

The understanding of disease 100 years ago was much more rudimentary than it is today. For example, the fact that bacteria (invisible to the naked eye) could cause some diseases had only recently been discovered. For many centuries, quarantining the sick was the only known way to curtail the spread of infectious diseases.

Complete this chart referencing only the “Medical History” column from the timeline.

| Disease | Known Agent | Means of Prevention / Cure |
|-------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------|
| Typhus | | |
| Dysentery | | |
| Malaria | | |
| Tuberculosis | | |
| Beriberi | | |
| Whooping Cough | | |
| Diabetes | | |
| Yellow fever | | |
| Hookworm | | |
| Influenza | | |
| Ricketts | | |
| In the space below, explain what kinds of disease-causing agents medical investigators of pellagra were most likely looking for in 1920: | | |

Complete this chart using the U.S. History column and what you already know.

Socioeconomic Factors that Might Affect Population Health

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Overall conditions in the South | |
| Farmers in the South | |
| Conditions for African Americans | |
| Possible foreign sources of disease | |
| Conditions for factory workers | |
| Efforts to improve U.S. health and working conditions | |
| Periods of financial panic | |
| Based on this list, make some hypotheses about why the pellagra epidemic struck heavily in the American South and not other regions of the country. Also, make a hypothesis about who was most affected by the disease, and when. | |

Worksheet #2 – KEY

Parenthetical information is not on provided timeline.

Disease-Causing Agents Discovered 1896-1922

| Disease | Known Agent | Means of Prevention/Cure |
|-----------------------|--------------------------------------|-----------------------------------------------------------------------------------------------|
| Typhus | Bacteria spread by body lice | Sanitation. Lice control. (Vaccine not perfected until WWII) |
| Dysentery | Bacteria | None known |
| Malaria | Parasite carried by mosquitoes | Mosquito control |
| Tuberculosis | Bacteria | X-ray for diagnosis, hospital rest, isolation (Antibiotics treatment not invented until 1948) |
| Beriberi | Dietary deficiency | Improved diet |
| Whooping Cough | Bacteria | Vaccine |
| Diabetes | Lack of insulin (hormone) production | Insulin injections |
| Yellow fever | Virus spread by mosquito | Mosquito control |
| Hookworm | Hookworm itself | The worms are killed using thymol, then cleared from the body by imbibing Epsom salts |
| Influenza | (Not known until the 1930s) | None known. |
| Rickets | Vitamin deficiency | Vitamin D/ Cod liver oil |

In the space below, explain what kinds of disease-causing agents medical investigators of pellagra were most likely looking for:

At this time in history, most medical breakthroughs had been related to bacterial or parasitic agents of disease, which is probably what medical experts first considered as the cause of pellagra. They also understood that vermin commonly carried and spread disease. In 1897, it was understood that beriberi was caused by dietary deficiency, and in the early 1920's, researchers began to explore and understand the importance of vitamins, including in the treatment of rickets.

Socioeconomic Factors that Might Affect Population Health

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General conditions in the South | Cheap labor and low taxes draw textile mills. Average income is 40% lower than elsewhere in the U.S. Remains predominantly rural. Child labor and long working hours are prevalent. |
| Farmers in the South | Most farmers (70%) do not own their land in 1900. Tenant farming (share-cropping) is widespread and tenant farmers are caught in a cycle of debt peonage to landlords. In 1916, the Federal Farm Act makes it easier for farmers to get credit, potentially facilitating land purchases. |
| Conditions for African Americans | Segregation, disfranchisement, and unequal treatment for African Americans are worsening. KKK ascendant in many states. Lynchings are common, most (80%) occur in the South. NAACP founded in 1909. |
| Possible foreign sources of disease | Following the Spanish American War, soldiers return from abroad. Huge influx of immigrants, though quota legislation in 1921 limited inflow. |
| Conditions for factory workers | Southern workers paid half that of many workers elsewhere Child labor and twelve-hour work days are widespread Southern mill owners are anti-union. Child labor and long hours are particularly prevalent in South. In the 1900's, unions become stronger, win some controls on work day lengths. |
| Efforts to improve U.S. health and working conditions | Vaccination mandates legalized. Meat inspection and food labeling required. Through unionization and legislation, workers start winning better conditions: coalminers, federal employees, and railroad workers get work hour limits; Illinois passes child welfare legislation; Oregon limits women's working hours; etc. |
| Periods of financial panic | 1907 stock market crash, 1919-1921 post-WWI depression, 1920 corn market crash |
| <p>Based on this list, make some hypotheses about why the pellagra epidemic struck heavily in the American South, and not other regions of the country. Also make a hypothesis about who was most affected by the disease, and when.</p> <p>There is more concentrated and widespread poverty in the South, especially among tenant farmers and mill workers who worked long hours at low wages. Jim Crow laws, abetted by violence, created an impoverished underclass of African Americans, who may have suffered heavily from the disease. Children may also have suffered disproportionately because of the prevalence of child labor. Rates of pellagra may have increased during financial depressions, in 1907 and 1921. (Students might also logically guess that a disease agent was introduced following the Spanish American War or during the immigrant influx, though this is not an actual source of pellagra.)</p> | |

Timeline of U.S History and Health

| Date | Medical History | U.S. History | History of Pellagra |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------|
| 1896 | <p>Thomas Edison invents the fluoroscope, an important development in early X-ray technology.</p> <p>Using X-rays, tuberculosis can be diagnosed and its progress followed.</p> | <p>Jim Crow era officially begins with the Supreme Court decision in <i>Plessy v. Ferguson</i> stating that “separate but equal” facilities based on race are Constitutional. The court’s decision legitimates the South’s Jim Crow laws, which deprived African Americans of rights won during the Civil War and Reconstruction.</p> <p>Northern workers are often paid twice that of Southern factory workers. Drawn by cheap labor and low taxes, investors are opening more textile mills in the South.</p> <p>Southern mill-owners are steadfastly anti-union.</p> | <p><i>Optional activity: ask students to fill in this column as they find out about the disease and its course.</i></p> |
| 1897 | <p>The first full-length X-ray of a live human body is produced.</p> <p>The disease beriberi is found be caused by a deficiency in the diet.</p> <p>Researchers discover that dysentery is caused by bacteria.</p> | <p>The South remains predominantly rural.</p> <p>Lynchings occur in the U.S. at an average of 187 per year; 80% take place in the South.</p> | |
| 1898 | <p>A hormone (adrenalin) is isolated in a laboratory for the first time.</p> <p>Researchers discover that malaria is transmitted by mosquitoes.</p> | <p>The Spanish-American War is fought to oust Spain from Cuba and the Philippines.</p> | |
| 1899 | | | |
| 1900 | <p>The first U.S. tuberculosis hospital is founded in Denver. Isolation of TB sufferers keeps the disease from spreading while providing patients with rest to help heal their lungs.</p> | <p>Since 1890, 3.6 million new immigrants have arrived.</p> <p>Life expectancy in the U.S. is 48 for males and 51 for females.</p> <p>Average income in the South is 40% of that in the North.</p> <p>By 1900, 70% of Southern farmers are tenants. Many small-farm owners and tenant farmers are caught in a cycle of debt peonage.</p> | |
| 1901 | <p>Walter Reed discovers that yellow fever is caused by a virus spread by mosquitoes.</p> | | |

| Date | Medical History | U.S. History | History of Pellagra |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1902 | Life cycle of the malaria parasite is documented | Pennsylvania coal workers strike and win a nine-hour day, and unions are strengthened. | |
| 1903 | | | |
| 1904 | | | |
| 1905 | <p>Robert Koch receives the Nobel Prize for his work on isolating the bacillus (bacteria) that causes tuberculosis.</p> <p>A Yellow Fever epidemic hits New Orleans but is contained by the U.S. government control of the mosquito population.</p> | Supreme Court decides that the federal government may legally require vaccinations. | |
| 1906 | The bacterial strain that causes whooping cough (pertussis) is discovered. | <p>The Meat Inspection Act passed by Congress.</p> <p>The Pure Food and Drug Act requires that content labels be placed on packaged foods.</p> | |
| 1907 | <p>Louis W. Sauer begins work that will lead to a vaccine for whooping cough by the 1920s.</p> <p>Chromosomes are discovered to direct heredity.</p> <p>Sir Frederick Hopkins makes advances in understanding the role of vitamins in good health.</p> | Financial panic grips the country as the stock market falls. | |
| 1908 | | <p>Congress passes regulations on child labor, but the law is not binding on the states. Child labor and long hours remain prevalent in Southern textile mills.</p> <p>The Supreme Court upholds an Oregon state law that limits the working hours of women.</p> | |

| Date | Medical History | U.S. History | History of Pellagra |
|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1909 | <p>Researchers discover that typhus is caused by a strain of bacteria spread by body lice.</p> <p>The Rockefeller Sanitary Commission for the Eradication of Hookworm Disease is organized, greatly benefiting eleven Southern states. The worms are killed using thymol, then cleared from the body by imbibing Epsom salts.</p> <p>A Danish botanist introduces the use of the word “gene.”</p> | <p>National Association for the Advancement of Colored People (NAACP) is founded to fight for the rights of African Americans.</p> | |
| 1910 | <p>Thomas Hunt Morgan shows that genes reside on chromosomes.</p> | <p>Since 1900, 8.7 million immigrants have arrived.</p> <p>Less than half the U.S. population of 91.9 million graduates from high school.</p> | |
| 1911 | <p>Marie Curie wins a Nobel Prize for her discovery of radium and polonium.</p> | <p>Illinois passes the first child welfare act.</p> <p>After the Triangle Shirtwaist Factory fire in New York, the International Ladies Garment Workers Union succeeds in winning better working conditions for its members.</p> | |
| 1912 | | <p>U.S. Public Health Service is founded.</p> <p>Congress approves an eight-hour work day for federal employees.</p> <p>Massachusetts passes the first minimum wage law for women and children. (It is later invalidated by the Supreme Court.)</p> | |
| 1913 | | <p>Federal Reserve Act establishes a central bank in an attempt to stabilize markets and the banking industry.</p> <p>Federal income tax law is instituted through a Constitutional amendment.</p> | |
| 1914 | | <p>The Clayton Antitrust Act limits mergers and certain anti-competitive actions of corporations.</p> | |
| 1915 | | | |

| Date | Medical History | U.S. History | History of Pellagra |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| 1916 | | <p>South Carolina raises the minimum age of child laborers from twelve to fourteen years of age.</p> <p>The Federal Farm Loan Bank Act makes it easier for farmers to get credit.</p> <p>The Adamson Act establishes an eight-hour day for railroad workers, the first federal law to regulate hours of employees of private companies.</p> | |
| 1917 | | | |
| 1918 | <p>An influenza epidemic breaks out, taking nearly 500,000 U.S. lives before ending in 1919.</p> | | |
| 1919 | | <p>Stock market crash begins two-year economic depression.</p> | |
| 1920 | | <p>Corn prices plummet.</p> | |
| 1921 | <p>Pure insulin is isolated for the first time.</p> <p>Insulin is used to treat diabetes in dogs.</p> | <p>The Emergency Quota Act (also known as the Johnson Act) passes Congress, vastly restricting immigration</p> <p>As depression continues following World War I wartime business boom, wages are cut in many industries.</p> <p>The Ku Klux Klan is ascendant in many states. Segregation approaches its peak.</p> <p>American Birth Control League is founded by Margaret Sanger.</p> | |
| 1922 | <p>Herbert M. Evans and K. S. Bishop discover vitamin E.</p> <p>Elmer McCollum discovers vitamin D in cod liver oil and uses it in the treatment of rickets.</p> | | |

ACTIVITY 3: USING PRIMARY SOURCE DOCUMENTS TO PIECE TOGETHER THE TRUTH ABOUT PELLAGRA

Purpose: To learn about the cause of pellagra based on an analysis of primary source documents.

Thus far, students have made only hypotheses about what caused pellagra. In this activity, they will find out what actually caused it. U.S. Public Health Service researcher Joseph Goldberger identified the disease's causes in 1915, but it took years for his findings to be widely recognized.

This section of the lesson plan works as a “jigsaw” activity.⁴ Divide students into groups of six, which will be their jigsaw (primary) group. Assign each member of each jigsaw group to read a different one of the six articles from the *New York Times* archive. Tell the jigsaw group that they will work as a team to piece together the story of pellagra and how the riddle of its cause was solved.

These articles can also be accessed through *The New York Times Article Archive* at <http://www.nytimes.com/ref/membercenter/nytarchive.html> by searching the title.

1. South's Crusade Against Pellagra. March 15, 1909. 1500 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9C04E4DE1131E733A25756C1A9659C946897D6CF>
2. More Causes of Pellagra. October 9, 1909. 250 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9D00EFD1539E733A2575AC0A9669D946897D6CF>
3. Pellagra Victim Shown to Doctors. December 17, 1909. 1000 words.
http://query.nytimes.com/mem/archive-free/pdf?_r=1&res=9C00E6D61630E733A25754C1A9649D946897D6CF&oref=slogin
4. Insect Carries Pellagra. September 13, 1913. 350 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9B06E0DA163DE633A25750C1A96F9C946296D6CF>
5. 100,000 Cases of Pellagra. October 10, 1915. 300 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9E0CE2DB1431E733A05753C1A9669D946496D6CF>
6. Find Pellagra Cure in Change of Diet. September 8, 1916. 2000 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9B05E4DC103DE333A2575BC0A96F9C946796D6CF>

After everyone has read their assigned articles, have members of the jigsaw group

⁴ For a general guide to implementing the jigsaw strategy, go to <http://www.jigsaw.org/steps.htm>.

break up into “expert groups”: secondary groups in which all students have read the same article. Expert group members should work together to complete Worksheet #3 with information about their article.

After all students have completed their charts, ask them to reassemble in their primary jigsaw groups. They should then discuss each of the articles *in chronological order*, with each student referencing the chart he or she has completed. Each group then prepares to report to the entire class the story of how the pellagra riddle was solved.

Debriefing question for the entire class:

What were the arguments behind the following theories about the cause of pellagra?

- That it was caused by the mechanization of corn harvesting, which led to rotting.⁵
- That it was carried by insects.
- That it was waterborne (due to poor or non-existing sewage systems).
- That it was due to a poor diet, which led to nutrient deficiencies. In other words, corn itself was not the cause, but rather an over-reliance on eating corn due to poverty and lack of access to a varied diet.

For a primary source summary of the history of pellagra and an understanding of its causes, read:

Puzzling Pellagra. July 31, 1921. 2,500 words.

[http://query.nytimes.com/mem/archive-free/pdf?
res=9B03EEDB153AEF33A25752C3A9619C946095D6CF](http://query.nytimes.com/mem/archive-free/pdf?res=9B03EEDB153AEF33A25752C3A9619C946095D6CF)

⁵ Note that the problem was related to mechanical processing, but because it led to rotting. Rather, the new mechanical processing method stripped corn of its nutrients.

Worksheet #3: Using Primary Source Documents to Discover the Truth about Pellagra

Complete this chart with information from your article. Note that not all articles will provide information for each topic, but be as thorough as possible.

| | |
|---------------------------------------------------------------------------------------------------------|--|
| Date and title of article | |
| Symptoms of the disease | |
| Information on who suffered from the disease (social class, gender, age, race, employment, etc.) | |
| Favored theory about the cause of the disease | |
| Supporters of the theory | |
| Evidence/experiments in support of that theory | |
| Alternative theories | |
| Your assessment of who was right and why | |

ACTIVITY 4: GOVERNMENT RESPONSES AND THE POLITICIZATION OF PELLAGRA

Purpose: To understand how the medical debate about pellagra's causes became politicized and why Dr. Goldberger's recommendations were resisted.

If Dr. Joseph Goldberger proved that the cause of pellagra was poor nutrition and that the remedy was a balanced diet, why did the disease persist? In Activity 4, the goal is to answer the following questions using the articles that appeared in *The New York Times* in 1921. Run through a jigsaw activity or assign the articles to individual readers and ask them to report back to the whole group after completing Worksheet #4.

1. Plague Threatens 100,000 Victims in the Cotton Belt. July 25, 1921. 1500 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9B0DE5D81731EF33A25756C2A9619C946095D6CF>
2. Orders Relief for Pellagra Victims. July 26, 1921. 1960 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9505E0D81731EF33A25755C2A9619C946095D6CF>
3. South Resents Alarm Over Pellagra. July 27, 1921. 3000 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9401E5D71731EF33A25754C2A9619C946095D6CF>
4. Pellagra in South. July 27, 1921. 683 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9A03E4D71731EF33A25754C2A9619C946095D6CF>
5. Pellagra Conference Opens in Washington. August 5, 1921. 350 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=9C00E7D9173EEE3ABC4D53DFBE66838A639EDE>
6. Surprise in Washington. July 27, 1921. 500 words.
<http://query.nytimes.com/mem/archive-free/pdf?res=940CE5D71731EF33A25754C2A9619C946095D6CF>

Questions to discuss with the entire class:

- Why did pellagra make a comeback in the early 1920s?
- Why was the toll highest among workers in the cotton mills?
- Why did many Southern officials deny the gravity of the situation in 1921?
- What caused the cotton market to crash? Were there any policy alternatives that could have protected farmers and mill workers?
- Can you see any parallels to the financial crisis of 2007-2008?

Teacher's summary of information presented in the articles:

The 1921 pellagra epidemic began with the crash of the cotton market in 1920, which brought chaos and deprivation to people's lives. The price of cotton, driven up by World War I and speculation, suddenly fell by nearly 80%. The incomes of farm owners and planters fell drastically. Furthermore, banks refused to lend farm owners money, making it impossible to get the loans they needed to carry them through hard times. Because of the drop in cotton prices, tenant farmers could not pay off the previous year's debt and thus fell into even greater debt. Because of over-reliance on a cash crop—cotton—they were left destitute and ill-fed or starving. Cotton mill workers were also hit hard by the cotton market collapse when mill owners cut wages or laid off workers. Many suffered nutritional deprivation and, hence, pellagra.

Although nutrient deprivation was blamed for the recurrence of the pellagra, some parties still stood by the Thompson-McFadden Commission's earlier findings that the disease was caused by exposure to sewage and transmissible from one person to the next.

President Harding requested a report from the Public Health Service, called a conference on the subject in Washington, D.C., and pledged to provide aid through the Red Cross and governmental agencies. The state of Mississippi refused to accept Red Cross aid. Southern authorities insisted that their farms were not monocultures or overly reliant on cotton, and claimed that farmers had learned to diversify their crops by growing food along with cash crops.

Southern states denied the gravity of the situation in part because admitting to starvation in the South would scare away business interests, empower reformers demanding wage increases and limits on child labor, and threaten the lock on political power held by business and landowners. However, one could expect that the South would have difficulty attracting new investments if the pellagra epidemic were left unaddressed. To improve conditions and prevent pellagra, mill owners would have to pay their workers more, and landowners would have to share profits more equitably with their tenants.

Worksheet #4: Government Responses and the Politicization of Pellagra

Complete this chart with information from your article. Again, not all articles will provide information for each topic.

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Date and title of article | |
| Geographical scope and number of cases of pellagra | |
| Acceptance/rejection of Goldberger's theory (that the disease is nutrition-based) | |
| Given explanation(s) of why pellagra has recurred at this time | |
| Plans at the federal level (president, federal agencies, congress) to combat the disease | |
| Reactions of the Southern states, including plans to combat the disease. | |
| What were the economic incentives for successfully combating pellagra? What were the economic incentives for ignoring the problem? Who stood to benefit in each scenario? | |

ACTIVITY 5: LEGISLATING TO IMPROVE CONDITIONS IN THE SOUTH

Purpose: To understand how economic and social policies can affect population health.

Why the South with its copious rainfall, good soil, and a climate permitting work all year should be agriculturally poor baffled many thinking Southerners.

Elizabeth W. Etheridge in *The Butterfly Caste: A Social History of Pellagra in the South*, Greenwood Press: 1972

The pellagra epidemic brought to light conditions in the South that were overlooked by many Americans living elsewhere. Southern business leaders were reluctant to admit that the South had a dependent underclass of tenant farmers and low-wage mill workers at risk of death from malnutrition. State laws written primarily for the benefit of white property owners proved a legal impediment to improving conditions.

In this activity, students analyze three sets of primary and secondary source documents that describe the problems affecting southerners at the turn of the last century. They then write legislation that, if passed by Congress, would help to rectify these problems.

Note: All source documents are online. You will need to provide Internet connection during class or print out all of the source documents. If you do the latter, please be sure to provide appropriate citations.

The documents address three general areas of concern:

- Land and animal distribution in the South.
- Over-reliance on cotton as a cash crop.
- Working conditions and union suppression in southern mills.

Divide the class into thirds and assign to each group one of the document sets. After answering the questions on their document sets, each student should write a piece of legislation that has as its aim the improvement of population health in the South (see Worksheet #5). Once the legislation is written, ask each group to come together to select the best piece of legislation presented by a group member. Good legislation addresses and resolves the problem at hand, and is both Constitutional and feasible.

The three selected bills are then submitted for debate⁶ to the entire class, which acts as the Congress in 1920. The federal government has money to pass only two of the three proposals at this time, so Congress will need to rigorously debate and evaluate the plans.

Speeches made during debate should draw on what students have learned about the

⁶ Preferably using rules of parliamentary debate

epidemic of pellagra facing the South and should demonstrate how overall improved health for southerners will result if the legislation is passed.

Document Set 1: Land and Animal Distribution in the South

“From Slave Labor to Free Labor.”

America's Reconstruction: People and Politics After the Civil War.

Digital History, University of Houston

http://www.digitalhistory.uh.edu/reconstruction/section3/section3_intro.html

Read the entire sequence through image 19 in order to answer these questions.

1. Why did so few freedpeople (former slaves) become landowners after the Civil War?
2. Explain the sharecropping system and why it kept both freedpeople and many whites (one third of whom were tenant farmers) in a cycle of debt.
3. Why did farmers increasingly turn to growing cotton, rather than diversifying their crops?
4. Compare the economic conditions of rice and sugar planters to that of workers growing cotton. Why were cotton-growers the most oppressed?
5. How did conditions change for children after the Civil War?
6. What differences existed in the employment of white workers and freedpeople in the post-war South? What opportunities were closed to freedpeople?
7. Who benefited from the political economy of racial bias, tenant farming, and low wage mill workers?

Answers:

1. Following the Civil War, white landowners tried to maintain absolute control. Whites were reluctant to sell land to blacks, and the federal government failed to institute a land redistribution policy in the South.
2. Tenant farmers rented their land and borrowed money for necessities, using the coming crop as collateral. The owners of cotton and tobacco farms took half to two-thirds of what was planted, leaving the tenant the remainder—after deducting for the loan, plus interest. The system provided more autonomy than slavery but left most sharecroppers in poverty and impeded the South's economic development.
3. The Civil War left many small farmers in poverty, and cotton provided cash income. The introduction of fertilizers and railroads made it increasingly profitable for farmers to grow and transport cotton and other cash crops.
4. Before and after the war, most rice plantations operated under the task system, allowing workers to enjoy greater autonomy than most former slaves. Sugar plantations continued to use work gangs and held their workers under much tighter control, though they did begin to pay their workers in cash. Cotton sharecroppers had minimal control over their own crop production (they could not grow food) and lacked the ability to organize for better conditions. They also tended to become locked into debt to the land owners.
5. Following the war, freed children could attend school, and many did. However, sharecropping made the labor of the entire family extremely valuable. Many white children worked in tobacco and textile factories.

6. For the most part, African Americans did not become landowners, largely because white landholders wouldn't sell to them. Many black women became domestic servants. Black men were barred from most factory jobs, and thus held only menial jobs in the cities. Many became sharecroppers.
7. White landowners and mill owners benefited from the system. Despite complaints of a "labor shortage," the political economy limited the power of southern labor for collective bargaining.

"A Poorer South After All."

The American Civil War: An Environmental View

Jack Temple Kirby, Miami University, for the National Humanities Center

<http://nationalhumanitiescenter.org/tserve/nattrans/ntuseland/essays/amcware.htm>

Read the web page and respond to these questions.

1. How did the actions of Civil War soldiers change the economy of southern rural life?
2. Explain how the "open range" provided small farmers with an inexpensive source of animal protein. How did this system change following the war?
3. What happened to the hog population in parts of Virginia and North Carolina between 1860 and 1920?
4. How did the need to import pork lead to deteriorating health conditions of Southerners?
5. How did sharecropping lead to what the author calls "medical pathology"?

Document Set 2: Over-reliance on Cotton as a Cash Crop

“Boll Weevil Honored.” Today in History: December 11

American Memory, The Library of Congress

<http://memory.loc.gov/ammem/today/dec11.html>

Follow the link and read the full text.

Excerpt from “An Evening in the Smith Home.”

American Life Histories: Manuscripts from the Federal Writers Project, 1936-1940

<http://memory.loc.gov/ammem/wpaintro/wpahome.html>

We lived on rented land most of our lives. Pa was a sharecropper, moving from one farm to another. Like Mattie told you, we rent the little place we have our cows and other stock on a few miles out here in the country. I never owned a foot of land, but I mean to before I die. That's why the old lady and me's willing to work so steady now. I want to have a shelter over our heads and not be dependent on the other fellow. I don't know, though, we don't save a great deal, but we all work hard all the time. We never would have left the farm if old Mr. Boll Weevil hadn't come along when he did. Why, he just eat us out of everything. We held on a few years. We've been here in the Winnsboro Mill seventeen years. Ten years in this same house. I liked the farm fine when we were making money, but, as things were, we couldn't get along at all. I like it here in the Winnsboro Mills. I do get blue sometimes shut in here...

Read the rest of the interview with Mr. Tally Smith on his family's decision to abandon farming for work in a South Carolina textile mill after arrival of the boll weevil:

<http://memory.loc.gov/cgi-bin/query/r?ammem/wpa:@field%28DOCID+@lit%28wpa330120112%29%29>

Then, search the *American Life Histories* collection,

<http://memory.loc.gov/ammem/wpaquery.html>, for the term “boll weevil” and read these recollections, noting different responses to the boll weevil plague: “John B. Culbertson,” “Women and the Changing Times,” and “Fish, Hominy, and Cotton.”

Answer the following questions:

1. The boll weevil infestation had some devastating consequences, but it also compelled some beneficial changes to the southern economy. What kinds of changes?
2. In the 1920s many farmers were devastated by the boll weevil. What happened to Mose Austin's employer as a result?
3. The life of Mr. Tally Smith also changed as a consequence of the boll weevil (see excerpt above). What is his primary goal in life? Did he want to leave his life as a tenant farmer? How did his family support themselves after they left the farm?
4. How do you think crop diversification could have benefited the land and the farmers?

“July Cotton Drops to New Low Level.” New York Times. June 14, 1921

Abstract: <http://query.nytimes.com/gst/abstract.html?res=9F0CE0DB163EEE3ABC4C52DFB066838A639EDE>

Full text (pdf): <http://query.nytimes.com/mem/archive-free/pdf?res=9F0CE0DB163EEE3ABC4C52DFB066838A639EDE>

“Year’s Cotton Crop Lowest in 25 Years.” New York Times. July 2, 1921

Abstract: <http://query.nytimes.com/gst/abstract.html?res=9B03E1D8163EEE3ABC4A53DFB166838A639EDE>

Full text (pdf): <http://query.nytimes.com/mem/archive-free/pdf?res=9B03E1D8163EEE3ABC4A53DFB166838A639EDE>

Many factors influenced the price of cotton on the commodities market, including the introduction of new synthetic fabrics in the 1920s, speculation, and changes in supply and demand in the global market for cotton. Read the two articles from the *New York Times* to answer the following questions. Note that the first article discusses price changes in cotton futures for different months. Futures are valued and traded like other stocks, based on their expected value.

1. What events or markets abroad affected cotton prices in the United States?
2. How small was the cotton crop in 1921 relative to other years?
3. Name three factors within the United States that reduced the cotton crop.
4. Explain the situation the tenant farmer faces in the following situation: A tenant farmer or sharecropper buys on credit what he or she needs to plant next year’s cotton crop. The cotton crop sells for half the price the farmer expected.

Answers:

1. The cotton market in Liverpool and a coal strike in England affected American cotton markets. Silver and wheat prices also appear to have had effects on cotton prices.
2. In May 1921, the crop was 66 percent of normal, and looked to be the smallest in a quarter-century. The planted acreage was the smallest since 1900.
3. Factors affecting cotton production included: a late and wet spring, boll weevil infestation, shortage of fertilizer, low price (which discouraged production), and abandonment of cultivation (owing to poor conditions).
4. The tenant farmer finds himself with considerably less money than expected. He may be unable to pay his debts and have enough money to feed his family. He will likely abandon cropping in favor of mill work or another steadier source of income.

Document Set 3: Working Conditions and Union Suppression in Southern Mills

“Civilization in Southern Mills.”

Mother Jones, *International Socialist Review*. March 1901

<http://digital.library.upenn.edu/women/jones/MJ-article.html>

Mother Jones was a socialist and union organizer at the turn of the century who visited a variety of southern mills in 1901. Read the linked article, then answer the following questions:

1. Why do you think that Mother Jones uses the terms “slaves” and “serfs” to refer to the workers in the mills she visits?
2. Briefly describe some of the conditions for children in the mills observed by Mother Jones.
3. What conditions prompted the strike of 1896?
4. Why did some members of the Alabama legislature repeal the law that prohibited children of less than twelve years of age from working more than eight hours a day?
5. How did the conditions in the mills affect the health of adults and children?
6. Given their desperate situation in the mills, why do you think mill workers were the primary victims of pellagra?

Answers:

1. Mother Jones is using the terms “slaves” and “serfs” metaphorically to make the point that the mill workers were little better off than legally held slaves in the antebellum American South or the serfs of Russia.
2. Children as young as six or seven worked up to 14 hours a day, beginning at 5:30 am, with a half hour lunch. They ate very poorly. Some lost limbs in the machines and were thrown out of work.
3. When they learned that workers were saving 10 percent of their earnings, the mill owners cut wages by 10 percent, prompting the strike.
4. Some believed that families could not support themselves if their children worked only eight hours a day. The Gadston Company lobbied heavily for the law’s repeal, refusing to open their mill with it in place.
5. Mother Jones blames lack of sleep and endless work for the workers’ “wrecked” bodies and minds, along with “abnormal appetites, indigestion, shrinkage of stature, [and] bent backs.”
6. Mill workers appear to suffer from extreme poverty and malnutrition, leaving them vulnerable to diet-related illnesses such as pellagra.

The Fulton Bag and Cotton Mill Strike, 1914-1915

“Developing Titles and Captions for Images from the Smith Scrapbook”

Special Collections & Archives, Georgia State University Library

<http://www.library.gsu.edu/spcoll/labor/wnp/wnpdocument/fultonbag/TitleAndCaptionWritingActivityRevised.pdf>

Read this background information on the strike:

Despite the early prosperity of the Fulton Bag and Cotton Mill, the company was troubled by periods of labor unrest. A wage dispute resulted in a two-day strike in November 1885. A second brief strike occurred in August 1897, when white workers protested the hiring of black women. The 1897 strike was settled after five days. A lengthier strike took place in 1914-1915, triggered by management's disapproval of the growing efforts among the workers to join the United Textile Workers. Besides the issue of unionization, the strikers demanded an increase in wages, a 54-hour work week, and a decrease in the use of child labor. The strike gained national notoriety when it drew the attention of the newly formed U.S. Commission on Industrial Relations, who sent representatives to Atlanta to gather testimonies in March 1915. The strike ultimately failed in May of that year.

Excerpt from "History of the Fulton Bag and Cotton Mills"
Georgia Institute of Technology Archives
http://www.library.gatech.edu/fulton_bag/history.html

Open the linked pdf. The photographs in this document were taken by Mrs. E.B. Smith, a union organizer who was documenting her efforts on behalf of striking mill workers at the Fulton Bag and Cotton Mills in Georgia in 1914-1915⁷. Look at photographs, read the titles and captions, and skim the authors' descriptions of the images. Then answer the following questions.

1. What were goals of the strikers at the Fulton Bag and Cotton Mill?
2. Why do you think that Mrs. E.B. Smith wanted to photograph her work among the mill workers? If the mill owners had taken photographs, what story do you think they would have told? Why does Mrs. Smith believe that mill owners tried to impede her efforts to take photographs?
3. Under what conditions are children working at the mills? Why was there an endless supply of cheap child labor in the state of Georgia at this time?
4. What type of housing did mill workers live in? Why were some of them evicted from their homes? Look closely at a photograph of an eviction and describe the owner's household possessions.
5. Why do you think that workers resorted to the use of tents to organize their strike?
6. One concern of Mrs. Smith is that the conditions in the mills will lead to a breakdown in workers' health. Whom does she worry about most? What disease concerns her?
7. Why do you think this strike failed, and what do you think were the consequences for the workers?

⁷ For more information about these photographs go to

<http://www.library.gsu.edu/spcoll/pages/pages.asp?ldID=105&guideID=511&ID=4125>

Document Set Answers:

Set 1: Land and Animal Distribution in the South

“From Slave Labor to Free Labor.”

8. Following the Civil War, white landowners tried to maintain absolute control. Whites were reluctant to sell land to blacks, and the federal government failed to institute a land redistribution policy in the South.
9. Tenant farmers rented their land and borrowed money for necessities, using the coming crop as collateral. The owners of cotton and tobacco farms took half to two thirds of what was planted, leaving the tenant the remainder—after deducting for the loan, plus interest. The system provided more autonomy but left most sharecroppers in poverty and impeded the South’s economic development.
10. The Civil War left many small farmers in poverty, and cotton provided cash income. The introduction of fertilizers and railroads made it increasingly profitable to grow and transport cotton and other cash crops.
11. Before and after the war, most rice plantations operated under the task system, allowing workers to enjoy greater autonomy than most former slaves. Sugar plantations continued to use work gangs and held their workers under much tighter control, though they did begin to pay their workers in cash. Cotton sharecroppers had minimal control over their own crop production (they could not grow food) and lacked the ability to organize for better conditions. They also tended to become locked into debt to the land owners.
12. Following the war, freed children could attend school, and many did. However, sharecropping made the labor of the entire family extremely valuable. Many white children worked in tobacco and textile factories.
13. For the most part, African Americans did not become landowners, largely because white landholders wouldn’t sell to them. Many black women became domestic servants. Black men were barred from most factory jobs, and thus held only menial jobs in the cities. Many became sharecroppers.
14. White landowners and mill owners benefited from the system. Despite complaints of a “labor shortage,” the political economy limited the power of southern labor for collective bargaining.

“A Poorer South After All.”

1. During the Civil War, soldiers burned most of the wooden farm fences for firewood and ate many of the animals, leading to the end of the “open range” system of keeping animals.
2. Before the war, in much of the South animals roamed and fed freely on the land. Farmers didn’t need to buy feed. After the war, animals were fenced off and enclosed. Most poor farmers couldn’t afford feed to keep their own animals.
3. The hog population of the South declined, and consumers had to rely on imported pork from the mid-West.
4. Pork from the North was both more expensive and more fatty than range hogs had been. Though malnourished, poor southerners began suffering high rates of heart

disease and strokes.

5. Sharecropping kept tenant farmers (especially African Americans) in dependency and debt. Their poverty and inability to produce their own food caused sharecropping families to suffer poor nutrition as well as the kind of chronic stress that can lead to ill-health.

Set 2: Over-reliance on Cotton as a Cash Crop

“Boll Weevil Honored” and American Life Histories

1. The destruction of the cotton crops ended the South’s dependence on cotton, forcing them to adopt mixed farming and manufacturing. Many farmers began growing food crops instead of or along with cotton.
2. Mose Austin’s employer lost his crop to the boll weevil two years in a row and left his farm for California.
3. Mr. Tally Smith wants to own a piece of land and his home. He didn’t want to leave the farm. Tally now works at the mills. His daughter works in a store. The family rents a farm and has hired black workers to keep it. They also garden and keep chickens at their mill home, and have a cow on the company’s common land.
4. Diversifying crops was better for the land, which had been depleted by decades of cotton monocultures. Increased food production in the South improved the nutrition of farm families and made locally produced food more available for other southern residents.

“July Cotton Drops to New Low Level” and “Year’s Cotton Crop Lowest in 25 Years.”

1. 1. The cotton market in Liverpool and a coal strike in England affected American cotton markets. Silver and wheat prices also appear to have had effects on cotton prices.
2. 2. In May 1921, the crop was 66 percent of normal, and looked to be the smallest in a quarter-century. The planted acreage was the smallest since 1900.
3. 3. A late and wet spring, boll weevil infestation, shortage of fertilizer, low price (discouraged production), abandonment of cultivation (owing to poor conditions).
4. 4. The tenant farmer finds himself with considerably less money than expected. He may be unable to pay his debts and have enough money to feed his family. He will likely abandon cropping in favor of mill work or another steadier source of income.

Set 3: Working Conditions and Union Suppression in Southern Mills

“Civilization in Southern Mills.”

1. Mother Jones is using the terms “slaves” and “serfs” metaphorically to make the point that the mill workers were little better off than legally held slaves in the antebellum American South or the serfs of Russia.
2. Children as young as six or seven worked up to 14 hours a day, beginning at 5:30

am, with a half hour lunch. They ate very poorly. Some lost limbs in the machines and were thrown out of work.

3. When they learned that workers were saving 10 percent of their earnings, the mill owners cut wages by 10 percent, prompting the strike.
4. Some believed that families could not support themselves if their children worked only eight hours a day. The Gadston Company lobbied heavily for the law's repeal, refusing to open their mill with it in place.
5. Mother Jones blames lack of sleep and endless work for the workers' "wrecked" bodies and minds, along with "abnormal appetites, indigestion, shrinkage of stature, [and] bent backs."
6. They appear to suffer from extreme poverty and malnutrition, leaving them vulnerable to diet-related illnesses such as pellagra.

The Fulton Bag and Cotton Mill Strike, 1914-1915

1. The mill workers were fighting for the right to unionize, a 54-hour work week, better wages, and decreased use of child labor.
2. Through her photographs, Mrs. Smith wanted to reveal the abysmal working and living conditions of the mill workers, and present the strikers in a positive light. Mill owners would have tried to present the strikers as isolated trouble-makers, and the vast majority of workers as content and well taken care of. Smith believed that mill owners didn't want the outside world to see the truth about mill conditions.
3. Child laborers appear to be worked very hard. Children at this time were not required by the state of Georgia to attend school, and they worked for a fraction of the cost of adult labor.
4. The families appear to be living near the mills, probably in mill-owned row houses on dirt roads. The strikers were evicted. Bedding and a bare minimum of household goods is all that we can see in the evictions photographs.
5. Mill workers lived in company owned homes, so strikers who were fired quickly became homeless.
6. Mrs. Smith was particularly worried that the conditions under which children lived and worked. They were left, leaving them "pinched and tired," and made them vulnerable to tuberculosis.
7. From the information given, we do not know exactly why this strike failed, but we can guess that some workers resisted unionizing for fear of being evicted from their company-owned homes and that the company was able to contract enough desperate replacement workers (possibly African American) to keep the mills running during the strike.

Worksheet #5: Legislating to Improve Conditions in the South

Sample Bill Form

Title: An act to _____

Respectfully Submitted by:

Preamble: The purpose of this bill is to

Content:

Section 1:

Section 2: (etc.)

Funding:

Enforcement:

Effective Date:

ACTIVITY 6: APPLYING THE LESSONS OF PELLAGRA TO TYPE II DIABETES

Purpose: To make visible underlying political and economic power structures and understand how power structures can shape conditions for population health.

Like the epidemic of pellagra in the American South, the recent emergence of diabetes among the Pima and Tohono O'odham Indians of southern Arizona has baffled scientists. Today half of the tribes' adult population suffers from Type II diabetes, whereas in the 19th century diabetes was virtually unknown. What changed? What can we learn from the pellagra epidemic of the last century about the sudden explosion of Type II diabetes?

Read or distribute this quotation from “Bad Sugar,” episode four of *UNNATURAL CAUSES*. Ask the class to discuss this statement in light of what they have learned about the pellagra epidemic.

NARRATOR: Diet and exercise, drugs and medical care... These are what we usually associate with health. But what we don't think about are structures. Not just physical structures, but economic, political and social structures. They may be hard to see, yet they can be powerful determinants of our health.

Now show students the episode “Bad Sugar” in its entirety (27 minutes), or up to Chapter 6: Staying Hopeful, if you are short on time. As they watch or after the film clip, ask students to fill in Worksheet #6.

Worksheet #6: Comparing Pellagra to Type II Diabetes

| Point of Comparison | Pellagra in the South | Diabetes on Reservations |
|-----------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------|
| How does the distribution of land and natural resources play a role in setting the stage for the disease? | | |
| What changes in diet played a role in the epidemic? | | |
| Who suffers most from the lack of resources and nutritious food? | | |
| Who, if anyone, stands to profit in the short term from the distribution of resources? | | |
| Beyond the disease itself, what negative effects do these conditions have on society? | | |
| Who has the power to enact laws? | | |
| What generates and reproduces poverty in the affected population? | | |
| What natural, social, or technological changes led to improvements in population health? | | |

Worksheet #6 – Key

Comparing Pellagra to Type II Diabetes

| Point of Comparison | Pellagra in the South | Type II Diabetes on Reservations |
|-----------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| How does the distribution of land and natural resources play a role in setting the stage for the disease? | Tenant farmers comprised up to 70% of all farmers by 1900. Through the cycle of debt incurred by this system, tenant farmers were forced to grow only cash crops (cotton). | The establishment of Indian reservations forced native peoples to give up the methods they had used for generations to live off the land. Dams and water diversion deprived the Pima of their water sources. They could no longer grow crops. |
| How does a change in diet play a role? | Neither tenant farmers nor mill workers had sufficient funds to eat a nutritious diet in times of economic depression. The cheapest food, corn, was mechanically processed, mainly in the mid-West, depriving it of nutrients. | Food once grown locally must now be purchased. Impoverished tribes became dependent on government commodity and surplus foods (which did not provide a nutritious diet) or relatively inaccessible supermarkets with poor produce sections. |
| Who suffers most from the lack of resources and nutritious food? | The poor, especially mill workers and tenant farmers, suffered from pellagra in the South. | The Pima and Tohono O’odham Indians, many reduced to poverty, suffer most from diabetes. |
| Who, if anyone, stands to profit in the short term from the distribution of resources? | The mill owners, the mass producers of grain and animal protein, and the largest landholders stood to profit most. | Profiting most are upstream ranchers and miners, as well as the influx of Americans who have moved to Phoenix and Arizona (cities made possible by the diversion of water resources), as well as companies that mass-produce cheap food products. |
| Beyond the disease itself, what negative effects do these conditions have on society? | As long as it remained dependent on cotton as its principle crop, the entire South’s economic health | Development in the American Southwest is now dependent on sources of water that will ultimately |

| | | |
|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>was at stake.</p> <p>The deep poverty of mill workers and tenant farmers discouraged investment in the South.</p> | <p>fail to support an increase in population.</p> <p>The cost of treating Type II diabetes ultimately affects all Americans.</p> |
| Who has the power to enact laws? | <p>The mill owners and the large landowners had the most political power. African Americans had been disenfranchised by a series of Jim Crow voting laws. Women did not have the right to vote until 1920.</p> | <p>The state and federal government has historically favored the demands of white ranchers, miners and developers, not the tribes.</p> |
| What generates and reproduces poverty in the affected population? | <p>Tenant farming locked many into debt. A large and desperate workforce suffered low wages and poor working conditions. There were no protections such as minimum wage laws or welfare. Unions had little power. Black and white people were divided, and discrimination institutionalized through Jim Crow laws.</p> | <p>The tribes were dispossessed of their land and driven to reservations, then had their water diverted upstream. With no way to make a living, they became dependent on government commodity food programs, with no connection to their traditional ways of life and little hope for the future.</p> |
| What natural, social, or technological changes led to improvements in population health? | <p>Manmade and natural disasters compelled the South to diversify somewhat away from cotton. The New Deal helped many families. Significant changes to improve the lives of African Americans had to await the Civil Rights movement.</p> | <p>Historically, tribes were largely powerless to fight the demands of upstream developers and settlers who wanted their water. When the tribes had enough unity and political power to challenge the water diversions, they were eventually able to win in court.</p> |

EXTENSIONS:

Research

- Ask students to research another disease that made an impact on U.S. history. In a research paper or essay, analyze the epidemic in light of its social and economic determinants, rather than from a medical perspective.
- Write an essay comparing the AIDS epidemic of the 1980s to the pellagra epidemic in the early decades of the 1900s. How did the medical community and the government (both federal and state) respond to each disease? How and why did some of these responses become politicized?
- Study the Progressive Era with a focus on how the Progressives tried to improve health by changing social policies, especially for women and children.

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ASSESSMENT

Activities 1 and 2: Medical and U.S. History Timeline Worksheets

| | | | | |
|--------------------------------------------------|-----------------------|---------------------|-------------------------|-----------------|
| 1 ⇒ 4 | Task not accomplished | Reasonably good job | Thoughtful and thorough | Outstanding job |
| Selected appropriate facts | | | | |
| Selected a wide array of appropriate facts | | | | |
| Made thoughtful deductions based on the evidence | | | | |

Activities 3 and 4: Primary Source Analysis Worksheets

| | | | | |
|----------------------------------------------|-----------------------|---------------------|-------------------------|-----------------|
| 1 => 4 | Task not accomplished | Reasonably good job | Thoughtful and thorough | Outstanding job |
| Pulled appropriate facts from articles | | | | |
| Understood competing theories | | | | |
| Drew inferences based on evidence | | | | |
| Contributed to class discussion and teamwork | | | | |

Activities 5 and 6: Document Set Questions, Legislation, and Diabetes Worksheet

| | | | | |
|---------------------------------------------------|-----------------------|---------------------|-------------------------|-----------------|
| 1 => 4 | Task not accomplished | Reasonably good job | Thoughtful and thorough | Outstanding job |
| Contributed to class discussion and teamwork | | | | |
| Submitted piece of legislation | | | | |
| Wrote effective speech to present the legislation | | | | |
| Answered questions in Activity 5 | | | | |
| Compared pellagra to diabetes in chart | | | | |

RELEVANT STANDARDS

National Standards for History, National Center for History in the Schools.

<http://nchs.ucla.edu/standards/>

Era 5, 3B:

- Explain the economic and social problems facing the South [after the Civil War] and appraise their impact on different social groups.

Era 6, 1C:

- Explain how commercial farming differed in the Northeast, South, Great Plains, and West in terms of crop production, farm labor, financing, and transportation.
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- Analyze the role of the federal government – particularly in terms of land policy, water, and Indian policy – in the economic transformation of the West.

Era 6, 3A:

- Analyze how working conditions changed and how the workers responded to new industrial conditions.
-
- Analyze the causes and consequences of the industrial employment of children.
-
- Explain the ways in which management in different regions and industries responded to labor organizing workers.

Era 6, 4A

- Compare the survival strategies of different Native American societies during the “second great removal.”

Fourth Edition Standards and Benchmarks, Level IV (Grades 9–12).

Mid-continent Research for Education and Learning.

<http://www.mcrel.org/compendium/browse.asp>

Health, Standard 2. Knows environmental and external factors that affect individual and community health

Benchmark 1. Knows how the health of individuals can be influenced by the community (e.g., information offered through community organizations; volunteer work at hospitals, food banks, child care centers). [BD\(HE.17.20;CE.138\)](#)

Benchmark 2. Knows how individuals can improve or maintain community health

(e.g., becoming active in environmental and economic issues that affect health, assisting in the development of public health policies and laws, exercising voting privileges). [BD\(HE,19;CE,138-139\)](#)

Benchmark 3. Understands how the environment influences the health of the community (e.g., environmental issues that affect the food supply and the nutritional quality of food). [BD\(HE,17;CE,139\)](#)

Benchmark 5. Knows how public health policies and government regulations (e.g., OSHA regulations, Right to Know laws, DSS regulations, licensing laws) impact health-related issues (e.g., safe food handling, food production controls, household waste disposal controls, clean air, disposal of nuclear waste). [BD\(HE,17;CE,138;ME,25,30\)](#)

United States History, Standard 16. Understands how the rise of corporations, heavy industry, and mechanized farming transformed American society.

Benchmark 3. Understands influences on economic conditions in various regions of the country (e.g., effects of the federal government's land, water and Indian policy; the extension of railroad lines, increased agricultural productivity and improved transportation facilities on commodity prices; grievances and solutions of farm organizations; the crop lien system in the South, transportation and storage costs for farmers, and the price of staples). [BD\(BE,105;AE,143;LI,125,126\)](#)

United States History, Standard 18. Understands the rise of the American labor movement and how political issues reflected social and economic changes.

Benchmark 1. Understands influences on the workforce during the late 19th century (e.g., gender, race, ethnicity, and skill; how big business and the impersonal nature of factory work affected workers; inroads made by women in male-dominated jobs; legal status of women; the type of work children performed; occupations in which children were employed; dangers they faced during the workday). [BD\(BE,107;AE,153;NI,23,24\)](#)