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## **Contagion film worksheet answers**

6, 7, 8, 9, 10, 11, 12, Higher Education, Adult Education, Homeschool, StaffPage 2 This guide has been revised in March 2020 to make the 2020 Covid-19 corona pandemic the impact of the 2020 Lesson. SUBJECTS – Health (infectious disease; flu; pandemics); Medicine; Science-Technology; SOCIAL AND EMOTIONAL LEARNING – surviving; MORALLY ETHICAL EMPHASIS – Responsibility. AGE; 13+ MPAA Rating: PG-13 (for disturbing content and some language – during the Covid-19 coronavirus pandemic, TWM recommends at least age 16 years, because the pandemic in a visible film is about 10 times more lethal than a Covid-19 pandemic; scenes of sick and dying people in a movie will be particularly disturbing during a pandemic; Drama; 106 minutes in 2011; Color. Available from Amazon.com. One of the best! This film is on TWM's list of the top ten best movies to complement the class health, High School Level. This film describes a fictional influenza pandemic: the origin of the virus, the human toll, the reaction of public health agencies and the various reactions of people to the public health emergency. The film is a reasonable prognosis of what could happen in a moderately fatal influenza pandemic. (Note that the virus shown in the movie is about 10 times more lethal, more lethal than the Covid-19 corona virus that causes a pandemic in 2020, i.e. more than 20% of people who receive a viral movie die from it, but in this writing only about 2- 3% of people receiving Covid-19 die from it.) Selected Awards: None. Featured Actors: Gwyneth Paltrow as Beth Emhoff; Matt Damon as Mitch Emhoff; Laurence Fishburne as Dr. Ellis Cheever; John Hawkes as Roger; Jude Law as Alan Krumwiede director: Steven Soderbergh. Students will understand the risks to today's society from a moderately lethal viral pandemic. Students will be able to discuss some ethical issues related to response to a pandemic. They will learn to use the Internet to obtain information about diseases from various websites, including www.cdc.gov from the Centers for Disease Control (CDC) and www.flu.gov from the U.S. Department of Health and Human Services (HHS). Small. Scenes of people dying from the flu may disturb some students. Tell your children that the film is a sensible approximation of what could occur in an out-of-control flu pandemic, which is about 10 times more fatal than the 2020 Covid-19 corona virus pandemic. The film doesn't predict what will happen to Covid-19 unless it mutates to become a more fatal infection. For authoritative information about the Covid-19 corona virus, go to the CDC Website, go to websites maintained by your state or municipalities for local information. The university has developed a film to do a series of public service announcements on how to control infection. Differences and similarities between the 2020 Covid-19 Corona virus pandemic and the fictional MEV-1 Virus shown in Film 1. Lethality – The virus seen in the movie was about 10 times more lethal to the Covid-19 Corona virus. At the time of this writing, the exact lethality of the Covid-19 corona virus is unknown, but is estimated to be about 2%. The MEV-1 virus in the film has estimated lethality of more than 20%. 2. Covid-19 attacks the lungs. The film virus caused brain swelling. 3. Covid-19 has an estimated incubation period of about 2 - 14 days. (This is a CDC calculation based on similar viruses.) The virus in the film multiplied much faster and caused death quickly. This is unrealistic. The mechanism of death from viruses is often the bodies of the victims of the protection mechanisms. For example, a 1918 flu pandemic killed because a fast replicating virus kicked the immune system into overdrive, turning the body toward itself. The victims drowned from within because their lungs filled with fluid and blood. It is not clear what causes the brain swelling in the film. As for Covid-19, we do not yet know how the Covid-19 virus kills its victims, except to say that it is attacking the lungs. 4. Both viruses are spread by breathing droplets and fomites: items such as clothing, bags, or door handles that the virus can live on. People touch the fomites and then put their hands on their faces. The virus enters through the nose, mouth or eyes. Discussion Questions/Essay Prompts: Note to Teachers: Do students research online for the latest information to answer the following questions. Check your sources to make sure they are reliable, such as the CDC or other public or academic sources. 1. What are the latest therapies shown by doctors? 2. What is the mechanism behind the development of severe symptoms in the Covid-19 epidemic? 3. What is the difference between an epidemic and a pandemic? 4. What is the role of disease control centres in responding to the US epidemic? 5. What is the BEI resource repository and how does it help respond to the epidemic? 6. What is the current progress in developing the vaccine Covid-19 corona virus? 7. What are our current defenses for the Covid-19 pandemic? 8. What is the role of developing a virus test in the event of a pandemic? 9. What types of people are at increased risk of death during a Covid-19 pandemic? 10. What is the role of people who are only at risk of developing Covid-19 in response to a pandemic? 11. What is the origin of the word quarantine? The recommended answer: During a plague pandemic called The Black Death 1347-1351 the port city of Ragusa in Italy tried to prevent the plague from reaching the city by requiring sailors to stay on their ships for 40 to prove they are not sick. As five of history's worst pandemics finally ended - History Channel. 12. Write a document describing the severity and impact of the three previous pandemics: influenza pandemic 1918/1919, Black Death 1347 to 1351; and the Smallpox outbreak among the Indians after Europeans crossed the Atlantic. [This is the end of chapter 19 of the Covid-19 manual.] Despite vaccines and advances in modern medicine, three hundred million to one billion people worldwide fall ill from seasonal influenza every year; between 5 and 15% of the population. Seasonal flu is a mild to severe disease. Some years are worse than others, but seasonal flu causes between 250,000 and 500,000 deaths each year. The most enterable are the elderly, chronically ill and very young. In fact, spread around the world, the number of deaths from influenza is less than one-tenth of one percent of the population (or less than 1 in 1,000). The US is not immune to influenza. The Centers for Disease Control (CDC) estimates that every year 41,400 Americans die from seasonal flu. Vaccines protect people from getting sick, but they don't kill viruses that continue to live in different animal populations in reservoirs. Animals that get out of the flu virus, such as wild birds, pigs and chickens, may have few or no symptoms. Viruses often mutate, and some of these mutations allow them to cross from one species to another. Other mutations can make an existing human virus more infectious or more deadly. Every year scientists are on the lookout for new flu viruses. They produce vaccines for these new viruses and put vaccinations into flu shots that many people receive every fall. Hopefully doctors will find all the new viruses, but sometimes they don't. It is also possible that a new virus, which is highly infectious and very lethal, such as the virus portrayed in movie poisoning, will spread before doctors even know it exists. An example of how close a disaster can come is the H5N1 avian influenza virus, which first appeared in 2002. Scientists assess the risk of straining the virus through two measures: how infectious it is (how easy it goes from one person to another) and how lethal it is (how many percent of people die when they become ill). The World Health Organisation (WHO) confirms that as of February 2012, 584 people had been hired for H5N1 and that 345 of these people died from the disease. This is a mortality rate of 59%. However, and very fortunately, it is very difficult for this virus to spread from one person to another - it can not spread through the air or occasional contact between humans. The virus is found in some populations of migratory birds. Recently, some scientists have suggested that this level is too high on the grounds that only serious cases will be reported to international public health authorities, see Dread Reckoning: H5N1 Bird Flu may be less deadly to humans than before ne Helen Helen Scientific American, 14 February 2012. But even if the H5N1 mortality estimate is excluded by 75%, as a result, the mortality rate of 14% would be about 5 times higher than the 1918/1919 pandemic, which had a mortality rate greater than 2.5%, because the H5N1 virus has not developed the ability to spread easily from person to person, and that has been around since 1997, scientists took the time to develop a vaccine against it that is safe and effective. If the virus mutates in a way that makes the vaccine ineffective, it will take several months to develop a new vaccine and at that time millions of people could die. However, just as it is not possible to accurately predict how deadly and infectious the next mutation in the flu virus might be, there is no way to predict the effectiveness of a new way to combat its spread or new ways to treat the disease. As the film shows, modern life with international air traffic has made flu outbreaks more difficult to control. However, modern medicine, with vaccines and antibiotics, has worked in the opposite direction and has also made flu easier to survive. An influenza pandemic over the last 100 years of a Pandemic A is a disease that occurs in a large geographical area and affects an extremely large part of the human population. There have been four pandemics of influenza in the last 100 years. They are compared to seasonal influenza in the table below. \* Some estimates are that as many as 100 million people died of the Spanish flu. \*\* These are from verified laboratory results and may be significantly under-reported. The actual figures are thought to be much higher. While the Spanish flu was the worst flu pandemic in modern history, in some ways the world was happy. Although it was 20 times more lethal than normal seasonal flu, the Spanish flu was not as infectious as other diseases such as colds, smallpox or measles. However, more people died from the Spanish flu pandemic than from hostilities during The First World War. It is estimated that half of the U.S. soldiers who died in Europe were killed by the flu virus, and a total of 675,000 people died from a pandemic in the US (550,000 of them had excess deaths, that's a death that would not have happened but for the flu.) Life expectancy in the US was reduced by 11.8 years due to the Spanish Flu. Flu epidemics can have a variety of infectious patterns from seasonal flu that kill the elderly, chronically ill, and very young children. The Spanish flu was the most deadly in people between the ages of 20 and 40 years. It struck down strong and energetic people sometimes died of rapid death, sometimes within hours of the onset of symptoms. All families were wiped out; in other families, only one or two people survived. Children lost their parents, parents lost their children, husbands their wives, etc. The emotional toll on the survivors was devastating. The deaths were painful. One doctor described his patients as dying while struggling to clear blood-dried foam, sometimes gushed from the nose and mouth. The diary of Isaac Starr, a third-day medical student at work to treat victims of outbreaks swept the world. In India, the death rate was 50 deaths per 1000 people. Doctors from the time were powerless to the disease. The influenza virus was not identified until 1933. Public health officials in the affected areas could not stop the spread of the disease. They tried everything they could think of from the distribution of gauze masks to ban shops from keeping sales, limiting the funeral to 15 minutes, banning meetings, restricting entry to the city, to name a few. Nothing worked. Health workers were also missing due to illness or death. There was also a lack of coffins and bodies piled up in morgues and funeral homes. Scientists now think that most of the deaths from the 1918/1919 flu pandemic were the result of secondary bacterial pneumonia. Bacteria from the nose and throat were able to infect the lungs because the virus damaged the bronchial tubes and lung mucosa. With the development of antibiotics that can treat pneumonia, later pandemics have caused far fewer deaths lasting just over a year and killing between 20 million and 50 million people, the Spanish flu was one of the worst pandemics in history. It is comparable to the monthly 541-590 D.C. plague, in which 25 - 100 million lost their lives over 50 years, the Black Death in 1348-1351, in which 62 million lives were lost in about three years, and the current AIDS epidemic, in which 34 million have died over 20 years. All these figures are approximate. The 1918/1919 outbreak was named for the Spanish Flu because reporters in Spain, a country that was not a combative WWI, were not focused on reporting on the war and were the first to understand that a new and terrible disease was killing people. The influenza strain responsible for the pandemic does not originate in Spain or worse than in other places. Scientists have recently been able to reconstruct the Spanish Influenza virus from samples of preserved wax and tissue from people who were frozen in Alaskan permafrost and recently unearthed. There seem to be bird genes, which means it jumped from birds to humans. Every century there are three flu pandemics. Dr. Robert Webster, a renowned virologist, has stated that all influenza virus genes in the world are maintained in aquatic birds, and periodically they are transmitted to other species. . . . The viruses of 1918 are still maintained in the bird reservoir. So even though these viruses are very ancient, they still have the ability to evolve to acquire new genes for new hosts. The potential remains for the disaster of 1918 to happen again. The Spanish influenza pandemic of 1918 and the new swine flu pandemic from NinthDay.com; 12 February 2012. NATIONAL STRENGTH PEOPLE AND COMMUNITIES WITH INFECTIOUS DISEASES, when people, acting with their government, enact laws or act to protect peace, security, security, morals, health and well-being in society, they are said to be acting under the police force. This power is wide and flexible. It has no clear restrictions allowing the State to act as necessary to protect the well-being of society. Other examples of police power include zoning ordinances, building codes, sanitation regulation in homes and businesses, traffic laws, and safety regulations in the workplace. The government's powers of quarantine for persons with contagious disease stem from the police power of the state. In the United States, police power restricts those rights reserved to individuals by a bill of rights (for the federal government), the Fourteenth Amendment to the Constitution (which requires states to recognize most of the provisions of the bill of rights), and various state constitutional provisions that sometimes confer more rights than the U.S. Constitution. The Fifth Amendment and the Fourteenth Amendment specifically prohibit the federal government and states from taking away their lives, freedoms or property from individuals without due process of rights. This means that the government cannot punish, imprison or kill anyone unless that person has been convicted of a crime. Police power often conflicts with these individual rights. The courts of the United States must decide on a permanent basis the disputes that will prevail in specific situations: the power of the state to ensure the general well-being or the rights of individuals reserved to them by various constitutional rules. (Another film that creates a conflict between the power of people in general and the rights of individuals is Inherit the Wind. Quarantine deprives people of their freedom not because they have committed a crime, but because they are subjected to a dangerous infectious disease. The state's strength to impose quarantine has been recognized for many hundreds of years. In the past, there have been situations where the government has suspended or ignored constitutional rights. Usually they happen during the war. During the Civil War, President Lincoln suspended the rights of the habeas corpus. (Habeas corpus rights are exercised when a person who has been arrested by a government petitions court to review the correctness of government action.) Another example was the detention of Japanese Americans during The Second World War. Step 1 (Before Watching the Film): Making students aware of past pandemics: This can be accomplished in several ways. The teacher can provide direct instructions on the pandemic using to the film; see the pandemic below. Students or groups of students at the school's meeting can be divided into research and classroom presentations on topics such as: (a) each of the influenza pandemics of the last 100 years, (b) H5N1 Avian influenza, (c) The Spanish influenza pandemic 1918/1919 and write a short essay. The length of the paper, its structure and the necessary scaffolding will depend on the level of the class. Use the section commonly used in written work or get it from an ELA teacher. At least before students watch the film, they should be informed that: (1) Mortality from H5N1 avian influenza virus is very high, from 30% to 80% of infected people have died of the disease. Fortunately, it has spread only to several hundred people. (2) The pandemic of 1918/1919 was more contagious, but much less lethal (anything more than 2.5%); it infected about 500 million people, killing 20 to 50 million people. Step 2: Get Students Thinking: Ask students how they watch the movie, think about how they will react in different situations seen in the movie? With Step 3: Play Movie: Teachers who want to use the movie worksheet can download the TWM movie training worksheet documentary. The only modification you need will be to change the name and delete the following language from question #4: Nonfiction can enrich viewers in several important ways. Otherwise, the worksheet is well suited for this movie without further changes. Step 4: Class Discussion: Immediately after the movie, start a discussion about whether the right thing to do in a pandemic situation is to obey the authorities' instructions or do their best for your family or loved ones, even if it interferes with the efforts of the authorities. You can raise this issue with the following question: In this film, people from Chinese villagers took the law into their own hands in their attempts to survive. One of the characters, Dr. Cheever, gave a female relative's advance notice to leave the city going to quarantine. Will these efforts survive wrong? What would you have done? Step 5: Flu Internet research: Are students looking online for short authoritative information on the following issues covered by the awareness test, which is presented below: flu symptoms, flu symptoms, flu treatment, why flu shots change each year, the most common complication of influenza, seasonal flu, new strains of flu virus sources, two criteria for assessing the virus strain hazards and flu pandemics over the last 100 years. Students should use the CDC and HHS websites, as well as other sources. Students must take notes of what they have found by referring to their sources. These notes must be rotated to make sure that the work has been done. Step 6: Students can conduct in-depth research on toll on the 1918/1919 Spanish flu pandemic and then choose from several projects: (1) create artwork such as song, story, poem, drawing, dance or collage photos, describing the impact of a pandemic or (2) write a research report on experiences in their hometown during a pandemic. BEYOND Test or Concluding Assignment: Climax lessons can be an awareness test. Another option to conclude the challenge is to require students to write an essay on the results of their research from Step 5 divided into sections on symptoms, prevention and treatment, citing sources. Students must obtain information from the CDC and HHS websites, as well as others. An example of a good answer (except that citations are not included) is described in the Useful information section below. 1. Influenza is a respiratory disease that lasts for one or two weeks. Name five of the seven most common symptoms of the disease. One type of symptoms are most common in children; identify it in your reply. Recommended answer: Here are seven types of symptoms: 1) fever or fever (although not everyone with flu has a fever); 2) cough and/or sore throat; 3) runny or stuffy nose; 4) Headache and/or body pain; 5) Chills; 6) Fatigue; 7) Nausea, vomiting, and/ or diarrhea (most often in children) 2. Describe two main ways in which the flu spreads. Recommended answer: 1) inhaling drops into the air from a person who is sneezed or coughed and 2) touching an object or surface that has a virus on it and then touching the mouth, eyes or nose. 3. What is the usual treatment for influenza? Recommended response: Bed rest, moisturizing, and relief of symptoms with over-the-counter medications. 4. Flu shots are changed annually to include protection from recent mutated versions of the flu virus. How does vaccination level compared to other methods to avoid getting seasonal flu? Recommended response: Vaccination is the best way to avoid flu. 5. The most common complication of influenza is pneumonia. What are the types of symptoms of a flu attack that indicate that an immediate visit to a doctor or emergency number is required? There are ten types of these symptoms. Give eight of them. Recommended response: ten types of symptoms are: 1) Fever above 102 degrees or fever lasts more than three days; 2) difficulty breathing, wheezing during breathing or shortness of breath 3) purple or blue-colored lips; 4) Pain or pressure in the chest, abdomen or neck severe headaches; 5) Sudden dizziness; 6) Confusion; 7) severe or persistent vomiting; 8) Seizures; 9) Flu symptoms that worsen daily; and 10) Flu-like symptoms but then come back with fever and worse cough. 6. What is seasonal flu, and on average a year, how many people catch, and how much does it kill in the world and the U.S.? Recommended response: seasonal influenza is a mild to severe disease caused by a mutation in the influenza virus. It causes diseases of 300,000 to one billion people worldwide and kills between 250,000 and 500,000 people each year, with about 41,400 people dying in the U.S. each year from seasonal flu. 7. What are the sources of new influenza virus strains that appear each year? Recommended answer: There are two. 1) Viruses that continue to live in different animal population reservoirs are one. Animals that harbor influenza viruses such as wild birds, pigs and chickens may have few symptoms, or they may not be sick at all. Influenza viruses often mutate, and some of these mutations allow them to cross from one species to another. 2) Other mutations can make existing human influenza viruses more infectious or more deadly. 8. There are two main criteria used to assess the threat to humanity of the flu virus. What are they? The recommended answer: The first is how the infectious virus is, i.e. how easy it goes from one person to another. The second is lethality, i.e. how many people who fall ill will die. 9. What is a pandemic and how often have flu pandemics appeared in the last century? Recommended response: a pandemic is a disease that occurs in a large geographical area and affects an extremely large proportion of the human population. Some pandemics have high lethality, but most do not. There have been at least three influenza pandemics in the last 100 years. 10. The Spanish flu in 1918/1919 was the worst pandemic in the last 100 years, infecting around 500 million people, more than one third of the world's population at the time. How many people died worldwide from The Spanish Flu, and what was the mortality rate among the infected? The recommended answer: 20 to 50 million people died of The Spanish flu. The mortality rate was estimated to be above 2.5%. 11. What is avian influenza, also called avian influenza? What is its mortality rate and why has it not become a pandemic? Your response relates to both lethality and infectivity. The recommended response: H5N1, a virus that exists in migratory birds, has mortality in humans ranges from 30 to 80% of those who contract the disease. Some scientists believe that this number is too high, because in many cases when people are better off on their own are not reported. However, the H5N1 virus has not developed the ability to spread easily from person to person. 12. Now there is the vaccine H5N1, why are doctors still worried that it could become the next pandemic? Recommended response: If the virus is in the mouth in a way that makes the existing vaccine ineffective, and if the virus also mutates become infectious, it will take several months to develop a new vaccine that would be effective against it. At this time, people could die. Click here for a copy of the Awareness Test in word processing format. 1. In this film, people from a Chinese village took the law into their own hands in their attempts to survive. One of the letters gave the female relative a pre-notification to leave the city infected with the virus. Will these efforts survive wrong? What would you have done? Suggested answer: The purpose of this question is to create a discussion about whether the right thing to do is to control your panic and obey the authorities' instructions, whether it's ok to do everything possible for your family or loved ones, even if it interferes with the efforts of the authorities. Discussion questions for ELA class ELA classes, see discussion questions about use with any film that is fiction work. See the discussion issue of the health class, above. Discussion issues related to ethical issues will make it easier to use this film to teach ethical principles and critical reviews. Further questions are set out below. LIABILITY (Or what you are supposed to do; Persevere: keep on trying! Always do your best; Use self-insur; Be self-disciplined; Think before you act - consider the consequences; You're making your choices) See the health class discussion, above. Seasonal Flu - symptoms of Flu.gov, U.S. Department of Health and Human Services; access 2/12/12; Seasonal Flu - Prevention of Flu.gov, U.S. Department of Health and Human Services; access 2/12/12; Clinical signs and symptoms of influenza from CDC; Influenza: What to do if you are sick from the CDC; HHS pandemic influenza plan - Part 1: Strategic plan available 2/12/12; Next Flu Pandemic: What to Expect from the U.S. Dept. health and human services, 2.12.12.2012. Deadliest pandemic of the 20th century from CNN Health accessed 2/12/12; 2009 flu pandemic from Wikipedia, available 2/12/12; The dangers of swine flu seem to be ebbing; 2009 Swine Flu Epidemic from the CDC; Updated CDC estimates for 2009 H1N1 flu cases, Hospitalizations and Deaths in the United States, April 2009 - April 10, 2010; 1918 killer flu secrets revealed by BBC; The Spanish influenza pandemic of 1918 and the new swine flu pandemic from NinthDay.com; Economic impact of the influenza epidemic of 1918\* Study by Elizabeth Brainerd and Mark V. Siegler, published in June 2002 and brought closer to 12 February 2012; What we learned from the Medical News.net; Influenza pandemic morbidity/mortality GlobalSecurity.org; Single-dose H5N1 vaccine safe and effective for adults and the elderly from Science Daily; Flu: What to do if you are sick of the CDC; Real threat of infection by W. Ian Lipkin, New York Times, 9/12/11; This is a Learning Guide was written by James Frieden. This guide was last revised in 2015. March 2006 2020.