



BIO SAFETY



About Me

- Have been a Pathfinder since a child
- Support Coordinator in Ohio
- Pathfinder director
- Coordinate the Wiki
- AY Honors committee



GOALS

- **Earn the new Biosafety Honor**
- **Learn biosafety terminology**
- **Know about several different diseases and pandemics or outbreaks**
- **Know and practice various safety measures to guard against diseases**
- **Discover what God tells us in His Word about sicknesses and illnesses**



**1. DEFINE THE
FOLLOWING TERMS:**



A. BIOSAFETY

- **Biosafety is defined as the discipline addressing the safe handling and containment of infectious microorganisms and hazardous biological materials; procedures intended to protect humans or animals against disease or harmful biological agents.**



B. BIOHAZARD

- A biohazard is a biological substance that's dangerous to people or the environment. Many biohazards are made of bacteria or other microorganisms. Some biohazards are an unintentional side effect of biologists working with or studying toxins or viruses.



B. BIOHAZARD

- One common type of biohazard is medical waste – things like used syringes or other tools contaminated with human blood, bacteria, or other microorganisms. The word biohazard was first used around 1973, from the Greek bio-, "life," and hazard, from the Old French hasard, "game of chance."



C. RISK FACTOR



- **A risk factor is something that increases a person's chances of developing a disease. For example, cigarette smoking is a risk factor for lung cancer and obesity is a risk factor for heart disease.**



D. BIOLOGICAL MATERIAL

- **Biological materials are unsterilized specimens of human and animal tissues (such as blood, cell lines, body discharges, fluids, excretions or similar material) containing or suspected to contain an etiologic agent. Etiologic agents are microorganisms and microbial toxins that cause disease in humans.**



E. CHEMICAL OR BIOLOGICAL ACCIDENT



- **A biological or chemical accident is the unintentional release of one or more hazardous substances which could harm human health and the environment. Such events include fires, explosions, leakages or release of toxic or hazardous materials that can cause people illness, injury, or disability. It may occur due to natural or human-made sources.**



F. CHEMICAL OR BIOLOGICAL INCIDENT

- **An incident is more general and accident is more specific, regarding hazardous materials. An incident can refer to any event – big or small, good or bad, intentional or unintentional. Accidents are always unintentional and they usually result in some damage or injury.**



G. PATHOGEN



- **A pathogen is a bacterium, virus, or other microorganism that can cause disease. A pathogen may also be referred to as an infectious agent, or simply a germ.**



H. AEROSOLS

- **Aerosols are a suspension of fine solid or liquid particles in gas. It is an abbreviation of "aero-solution." Smoke, fog, and mist are aerosols.**



I. PPE



- **Personal protective equipment (PPE) is protective clothing, helmets, goggles, or other garments or equipment designed to protect the wearer's body from injury or infection. The hazards addressed by protective equipment include physical, electrical, heat, chemicals, biohazards, and airborne particulate matter.**



**2. DESCRIBE WHICH PPEs
ARE USED BY HEALTH
PROFESSIONALS. WHAT ARE
THEY FOR?**



Gloves

- Prevent the hands from coming into contact with contaminated material.

Face mask

- Reduces the possibility of inhaling airborne pathogens. Also reduces the chances of an infected healthcare worker from contaminating others.

Face shield

- Protects the face from being sprayed by contaminated material or bodily fluids.

Gown/scrubs

- Protects the body from coming into contact with contaminated materials.

Hazmat suit

- Also called Positive Pressure Personnel Suit (PPPS). Offers maximum protection against biohazards. This equipment is typically used in research laboratories.



**2. DISCUSS AT LEAST FIVE OTHER
NON-HEALTH CARE FIELDS THAT
ROUTINELY USE PPE FOR
PROTECTION FROM BIOHAZARDS
AND WHY THEY ARE NEEDED.**



Examples of Non-Healthcare professions that use PPE

- **Wastewater (sewage)
Engineer/technician/laborer**
- **Waste management
(garbage)**
- **Cleaning Services**
- **Law Enforcement**
- **Firefighter**
- **Agriculture**
- **Veterinary**



- **Manufacturing**
- **Coroners**
- **Property Management**
- **Food Preparation**
- **Laboratory**
- **Hazmat Operations**
- **Correctional Facilities**



**3. DIFFERENTIATE
BETWEEN OUTBREAK,
EPIDEMIC, PANDEMIC
AND ENDEMIC.**



- **Outbreak**: Refers to the number of cases (disease) that exceeds what would be expected.



- **Endemic**: An infection or disease that exists permanently in a particular region or population. For example, Malaria is a constant worry in parts of Africa.



- **Epidemic**: An outbreak of a disease that is actively spreading over a wide geographic area and affects an exceptionally high proportion of the population.



- **Pandemic**: A global endemic. It relates to geographic spread and is used to describe a disease that affects a whole country or the entire world.





ENDEMIC



EPIDEMIC



PANDEMIC



3. MAKE A VENN DIAGRAM OR CHART THAT SHOWS THE THINGS THAT ARE THE SAME AND THOSE THAT ARE DIFFERENT.



PANDEMIC

- Affects a much larger number of people
- Spreads across a much larger region
- Affects most of a certain population
- Higher Deaths
- Higher Social Disruptions, Economic Loss and General Hardships

SIMILARITIES

- Spread of disease/infection at an unusual scale
- Same infectious disease

EPIDEMIC

- Affects a smaller a smaller number of people
- Spreads across a small region
- Affects more people than you would expect under normal conditions
- Specific to a certain time



4. DEVELOP A LIST OF PRECAUTIONS THAT SHOULD BE TAKEN DURING AN EPIDEMIC / PANDEMIC.



- **Frequent hand washing**
- **Avoid touching your face**
- **Disinfecting**
- **Social distancing**
- **Face masks**
- **Water treatment**
- **Mosquito control**



**5. CHART, LIST, OR
ILLUSTRATE THE DIFFERENCES
BETWEEN ISOLATION AND
QUARANTINE.**



Isolation

- *Isolation separates sick people with a contagious disease from people who are not sick. Hospitals use isolation for patients who have a known infectious disease that can be spread easily to others. Household members should use a separate bedroom and even a separate bathroom if possible.*





Quarantine

- *Quarantine separates and restricts the movement of people who were exposed to a contagious disease to see if they become sick. Quarantine helps to limit the spread of communicable disease. Quarantining means staying home and away from other people as much as possible for at least a 14-day period.*





6. CHOOSE TWO OF THE FOLLOWING HISTORIC DISEASES AND ANSWER: WHEN DID IT OCCUR? HOW MANY WERE INFECTED? HOW WAS IT SPREAD? WHAT WERE THE SYMPTOMS? WHAT WERE THE BIOSAFETY PRECAUTIONS USED? HOW WAS IT ABATED?



- **SMALLPOX**
- **TYPHUS**
- **1918 INFLUENZA
(SPANISH FLU)**
- **POLIO**
- **SWINE FLU**



Spanish Flu (1918 Flu)



- *The 1918 influenza, originally known as the Spanish flu, occurred from January 1918 to December 1920, it infected 500 million people.*
- *The close quarters and massive troop movements during World War I hastened the pandemic, and probably both increased transmission and augmented mutation. Some speculate the soldiers' immune systems were weakened by undernourishment, as well as the stresses of combat and chemical attacks, increasing their susceptibility. A large factor in the worldwide occurrence of this flu was increased travel. Modern transportation systems made it easier for soldiers, sailors, and civilian travelers to spread the disease.*



Spanish Flu (1918 Flu)

- The sick experienced such typical flu symptoms as chills, fever and fatigue.
- When the flu hit, doctors and scientists were unsure what caused it or how to treat it. Unlike today, there were no effective vaccines or antivirals, drugs that treat the flu. Officials in some communities imposed quarantines, ordered citizens to wear masks and shut down public places, including schools, churches and theaters.
- According to The New York Times, during the pandemic, Boy Scouts in New York City approached people they'd seen spitting on the street and gave them cards that read: "You are in violation of the Sanitary Code."



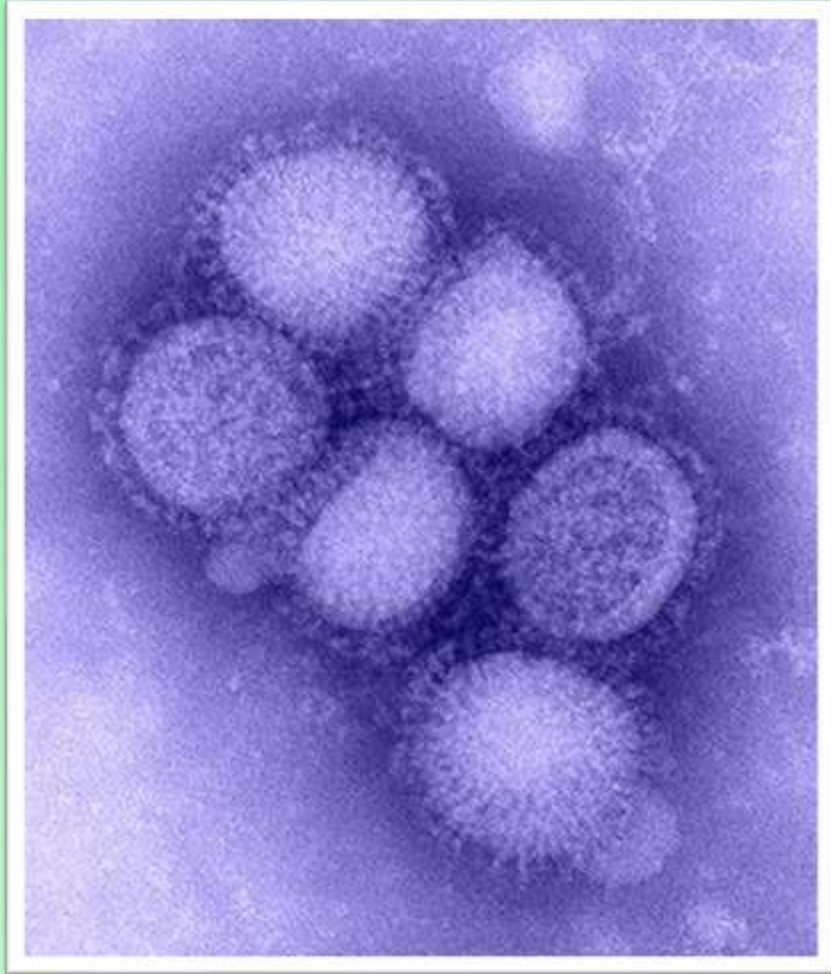
Spanish Flu (1918 Flu)



- After a lethal second wave struck in late 1918, new cases dropped abruptly – almost to nothing after the peak in the second wave. One explanation for the rapid decline in the lethality of the disease is that doctors became more effective in prevention and treatment of the pneumonia that developed after the victims had contracted the virus.
- Another theory holds that the virus mutated extremely rapidly to a less lethal strain. This is a common occurrence with influenza viruses: there is a tendency for pathogenic viruses to become less lethal with time, as the hosts of more dangerous strains tend to die out.



Swine Flu



- The Swine Flu, also known as H1N1, began in January 2009. From April 12, 2009 to April 10, 2010, it is estimated that around 700 million to 1.4 billion people, contracted the illness—more in absolute terms than the Spanish flu pandemic. Spread of the 2009 H1N1 virus is thought to occur in the same way that seasonal flu spreads. Flu viruses are spread mainly from person to person through coughing, sneezing or talking by people with influenza. Sometimes people may become infected by touching something – such as a surface or object – with flu viruses on it and then touching their mouth or nose.



Swine Flu

The signs and symptoms of swine flu are similar to those of infections caused by other flu strains and can include:

- Fever (but not always)
- Chills
- Cough
- Sore throat
- Runny or stuffy nose
- Watery, red eyes
- Body aches
- Headache



Swine Flu



- The best way to prevent swine flu is to get a yearly flu vaccination. Other easy ways to prevent swine flu include: frequently washing hands with soap or hand sanitizer, not touching your nose, mouth, or eyes (the virus can survive on surfaces like telephones and tabletops.)
- On August 10, 2010, WHO declared an end to the global 2009 H1N1 influenza pandemic. However, (H1N1)pdm09 virus continues to circulate as a seasonal flu virus, and cause illness, hospitalization, and deaths worldwide every year.



7. CHOOSE TWO OF THE FOLLOWING DISEASES AND ANSWER: WHAT ARE THE SYMPTOMS? HOW IS IT SPREAD? IS THERE A CURE TODAY? WHERE AND WHEN WAS THERE AN OUTBREAK/ EPIDEMIC/ PANDEMIC? IS THERE A PREVENTION FOR THIS DISEASE? WHAT ARE THE BIOHAZARD SAFETY METHODS USED TO COMBAT THE SPREAD OF THIS DISEASE?

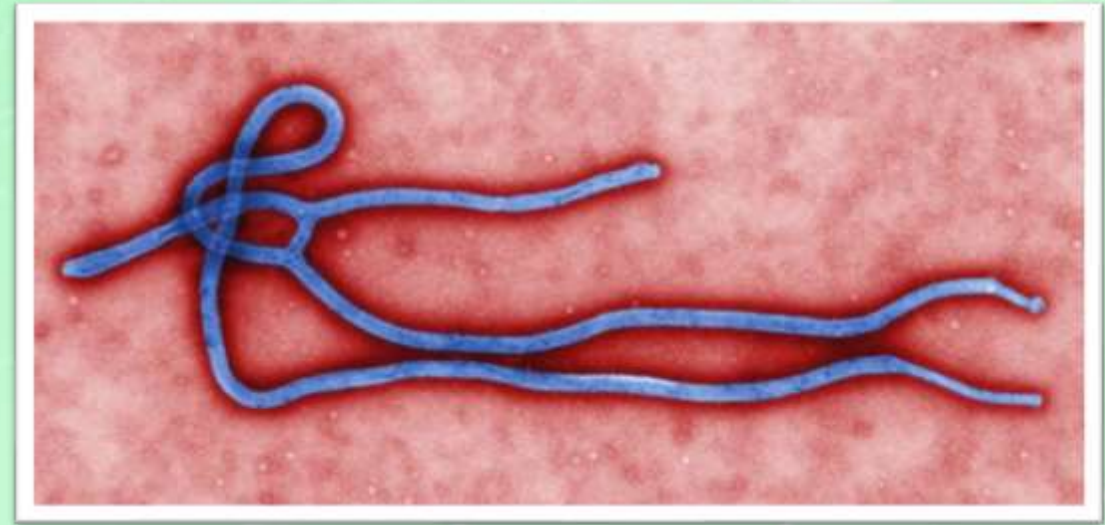


- **CHOLERA**
- **TUBERCULOSIS**
- **YELLOW FEVER**
- **MEASLES**
- **MALARIA**
- **EBOLA**
- **AIDS**
- **COVID-19**



Ebola

- **Symptoms appear usually 8-10 days after virus exposure, but as early as 2 days and as late as 21 days after exposure. Symptoms usually start with “dry” symptoms initially (such as fever, aches and pains, and fatigue), and then progress to “wet” symptoms (such as diarrhea and vomiting) as the person becomes sicker.**
- **Usually people with Ebola show several of the following symptoms: Fever; Aches and pains, including headache, body aches, and stomach aches; Weakness and fatigue; diarrhea and vomiting; stomach pain; Unexplained hemorrhaging, bleeding or bruising**



Ebola



- It is spread from infected fruit bats and monkeys to people. People spread it through bodily fluids. It can only be transmitted from people who are demonstrating symptoms of Ebola.
- There is no cure/antiviral medication as of 2020. Symptoms are treated, in hopes that the person's immune system can fight off the virus.



Ebola

- **The largest outbreak of Ebola (as of 2020) was in West Africa (Zaire strain) with over 28,600 cases. The Democratic Republic of the Congo has an ongoing case that began in late 2019 and is ravaging that country.**
- **There is a vaccine for the Zaire Ebola virus. It was approved in 2019.**
- **Eliminating contact with bodily fluids of infected persons or contact with tools/tables/clothing/bedding etc. that the bodily fluids have contacted. Usage of gloves, gowns, sterilization and etc. are all used by clinicians.**

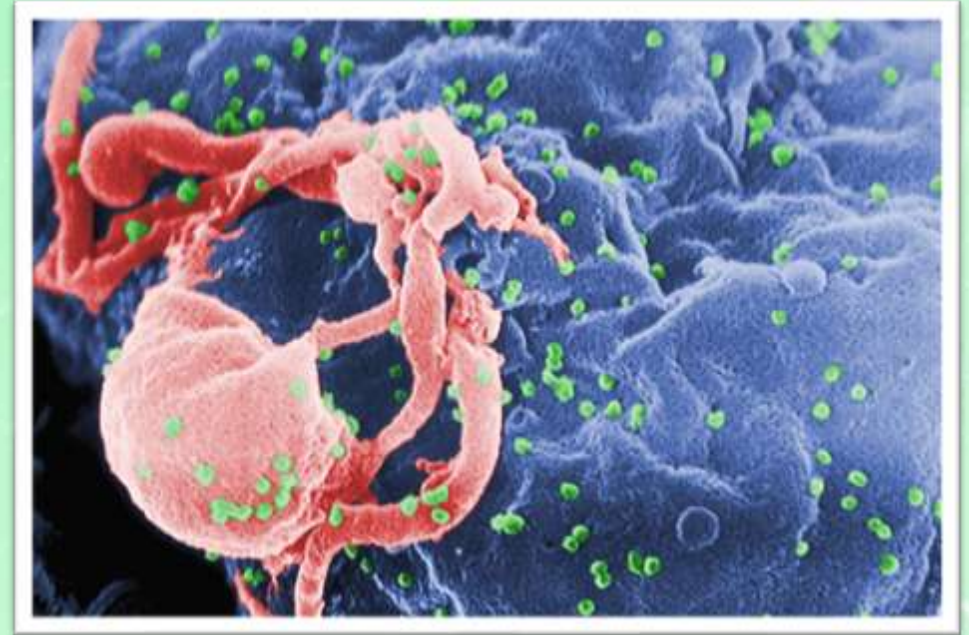


AIDS

- *There are several symptoms of AIDS. Not everyone will have the same symptoms. It depends on the person and what stage of the disease they are in.*

Symptoms of AIDS can include:

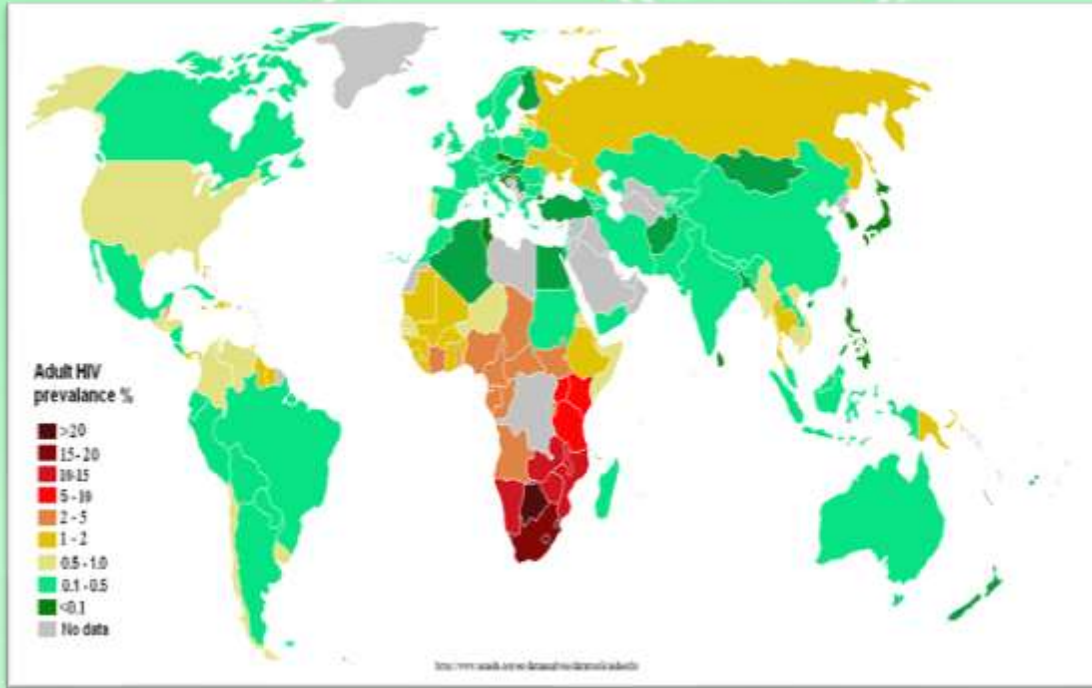
- *Rapid weight loss*
- *Recurring fever or profuse night sweats*
- *Extreme and unexplained tiredness*
- *Prolonged swelling of the lymph glands in the armpits, groin, or neck*
- *Diarrhea that lasts for more than a week*
- *Sores of the mouth, anus, or genitals*
- *Pneumonia*
- *Red, brown, pink, or purplish blotches on or under the skin or inside the mouth, nose, or eyelids*
- *Memory loss, depression, and other neurologic disorders*



- *Each of these symptoms can also be related to other illnesses. The only way to know for sure if a person has HIV is to get tested.*
- *Many of the severe symptoms and illnesses of HIV disease come from the opportunistic infections that occur because the body's immune system has been damaged.*



AIDS

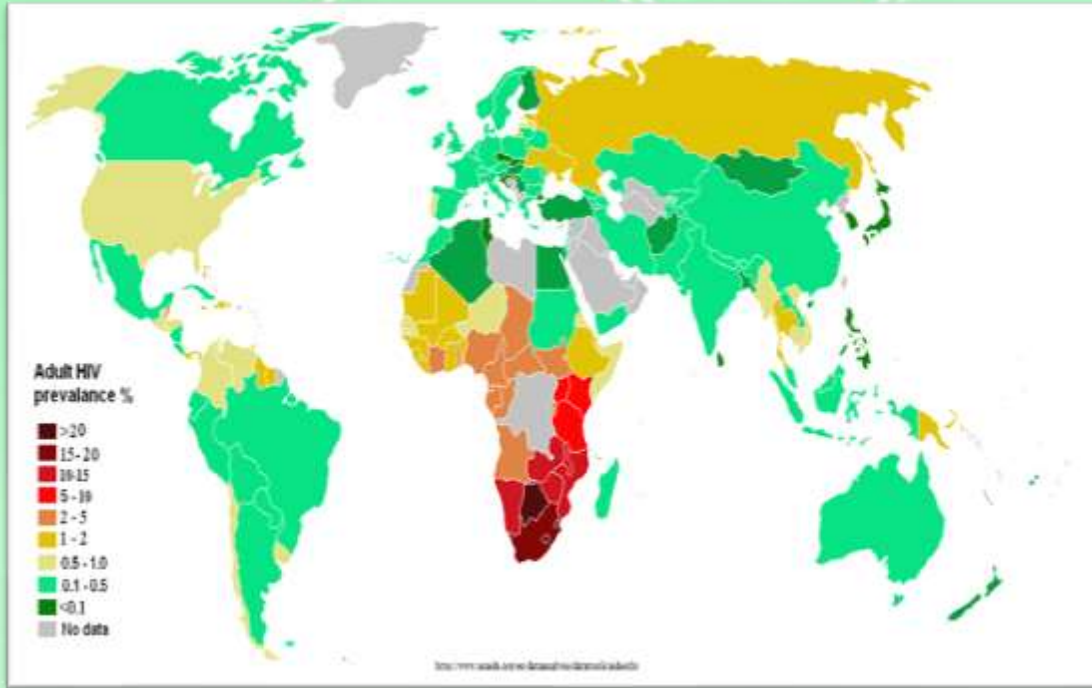


You can only get HIV by coming into direct contact with certain body fluids from a person with HIV who has a detectable viral load. These fluids are:

- Blood
- Semen and pre-seminal fluid
- Rectal fluids
- Vaginal fluids
- Breast milk



AIDS



HIV is **NOT** spread by:

- Air or water
- Mosquitoes, ticks or other insects
- Saliva, tears, or sweat that is not mixed with the blood of a person with HIV
- Shaking hands; hugging; sharing toilets; sharing dishes, silverware, or drinking glasses; or engaging in closed-mouth or “social” kissing with a person with HIV
- Drinking fountains



AIDS

- At this time, there is no cure for AIDS, but medications are effective in fighting HIV and its complications. Treatments are designed to reduce HIV in your body, keep the immune system as healthy as possible and decrease the complications that may develop.
- HIV crossed from chimps to humans in the 1920s in what is now the Democratic Republic of Congo. This was probably as a result of chimps carrying the Simian Immunodeficiency Virus (SIV), a virus closely related to HIV, being hunted and eaten by people living in the area.
- In the 1960s, HIV spread from Africa to Haiti and the Caribbean when Haitian professionals in the colonial Democratic Republic of Congo returned home. The virus then moved from the Caribbean to New York City. It was first noticed after doctors discovered clusters of Kaposi's sarcoma and pneumocystis pneumonia in homosexual men in Los Angeles, New York City, and San Francisco in 1981.



AIDS

Anyone can get HIV, but you can take steps to protect yourself from HIV.

- *Get tested for HIV.*
- *As Christians, God teaches us to wait until being married to have sex. This will ensure that you've only ever been with one person and drastically reduce risk of obtaining HIV.*
- *Don't inject drugs, especially illicit ones. If you do because of a prescription, use only sterile drug injection equipment and water, and never share your equipment with others.*



AIDS

The following are a set of guidelines many microbiological and biomedical laboratories follow when dealing with HIV:

- Use of syringes, needles, and other sharp instruments should be avoided if possible. Used needles and disposable cutting instruments should be discarded into a puncture-resistant container with a lid. Needles should not be re-sheathed, bent, broken, removed from disposable syringes, or otherwise manipulated by hand.
- Protective gloves should be worn by all personnel engaged in activities that may involve direct contact of skin with potentially infectious specimens, cultures, or tissues. Gloves should be carefully removed and changed when they are visibly contaminated. Personnel who have dermatitis or other lesions on the hands and who may have indirect contact with potentially infectious material should also wear protective gloves. Hand washing with soap and water immediately after infectious materials are handled and after work is completed--EVEN WHEN GLOVES HAVE BEEN WORN as described above--should be a routine practice.
- Generation of aerosols, droplets, splashes, and spills should be avoided. A biological safety cabinet should be used for all procedures that might generate aerosols or droplets and for all infected cell-culture manipulations.



8. COMPLETE THE FOLLOWING:

A. WHICH OF THE PREVIOUS DISEASES STUDIED ARE OR WERE ENDEMIC TO YOUR LOCAL AREA?

- Smallpox
- Typhus
- 1918 Influenza (Spanish Flu)
- Polio
- Swine flu
- Cholera
- Tuberculosis
- Yellow Fever
- Measles
- Malaria
- Ebola
- AIDS
- COVID-19



B. WHICH OF THE PREVIOUS DISEASES ARE CURRENT TRAVEL CONCERNS AND WHAT LOCATIONS ARE GREATER RISKS TO ENCOUNTER THEM?

- **Smallpox**
- **Typhus**
- **1918 Influenza (Spanish Flu)**
- **Polio**
- **Swine flu**

- **Cholera**
- **Tuberculosis**
- **Yellow Fever**
- **Measles**
- **Malaria**
- **Ebola**
- **AIDS**
- **COVID-19**



C. CHOOSE A PLACE IN THE WORLD YOU WOULD POTENTIALLY LIKE TO TRAVEL TO AND LEARN OF THE OUTBREAKS AND DISEASES THAT REQUIRE OR RECOMMEND A VACCINE.



**9. HOW DO VACCINES WORK?
WHY IS IT IMPORTANT TO BE
UP TO DATE WITH YOUR
IMMUNIZATIONS?**





- ***A vaccine is medicine given by a doctor or nurse and makes a person less likely to get a disease. It gives immunity to an infectious disease caused by a particular germ (bacteria or virus). For example, the flu vaccine makes it less likely that a person will get the flu. A flu vaccine is often called a flu shot.***
- ***Vaccines are usually made from something that is alive, or was alive.***



- The word "vaccine" comes from the Latin words *vaccīn-us* (from the word *vacca*, meaning "cow"). In 1796, Edward Jenner used cows infected with cowpox (*variolae vaccinae*) to protect people against smallpox.
- The use of vaccines is called vaccination. Vaccines work because they train the person's body to "learn how to fight off" the full-strength disease.
- It is important to be up to date with immunizations because most vaccines don't last forever but need "boosted." If a person misses part of an ongoing schedule of vaccines, they may lose their immunity or partial immunity to the virus or bacteria that the vaccine was protecting them from.



10. NAME A NATIONAL OR GLOBAL ENTITY THAT ASSISTS IN DEVELOPING AND APPLYING DISEASE PREVENTION AND CONTROL.

A. WHERE IS THIS ORGANIZATION LOCATED?

B. WHAT INFORMATION DOES IT RELAY AND WHY IS IT IMPORTANT TO KNOW HOW TO ACCESS THAT INFORMATION?



WHO

- *The World Health Organization is a specialized agency of the United Nations responsible for international public health.*
- *It is located in Geneva, Switzerland.*
- *The WHO works to collect data from regional, state, national, and global sources and data points to track any diseases or situations that affect or could effect public health. Information is available on its website: <https://www.who.int>*



**World Health
Organization**



ECDC



- **The European Centre for Disease Prevention and Control is an independent agency of the European Union (EU) whose mission is to strengthen Europe's defences against infectious diseases.**
- **The Centre was established in 2004 and is located in Solna, Sweden.**



11. EXPLAIN WHY IT IS SO IMPORTANT TO REMOVE MEDICAL GLOVES PROPERLY.



- **Your skin protects your organs and acts as a barrier that guards against micro-organisms and chemicals; but as protective as skin is, it needs protection, too. While skin is working hard to keep contaminants out, some actually absorb through unless you're wearing PPE. Even if you were wearing gloves while working with the contaminant, if you remove disposable gloves incorrectly, it can deposit the very same hazard back onto the skin that you thought you'd protected.**



11. DEMONSTRATE THE PROPER WAY TO REMOVE MEDICAL GLOVES WITHOUT TRANSFERRING PATHOGENS FROM THE GLOVES TO YOUR HANDS THROUGH THE FOLLOWING EXERCISE:

- A. COAT YOUR GLOVED HANDS WITH A SIMULATED “PATHOGEN” (SUCH AS GLO-GERM, COOKING OIL, KETCHUP, CORN SYRUP, TEMPERA PAINT, ETC.) .**
- B. REMOVE THE GLOVES USING PROPER TECHNIQUE WITHOUT TRANSFERRING ANY OF THE SIMULATED “PATHOGEN” TO YOUR SKIN OR CLOTHING.**
- C. DISPOSE OF THE GLOVES.**
- D. CLEAN UP THE MESS.**



https://www.youtube.com/watch?v=xTYioOo_6U



12. REGARDING THE CLEANING OF HANDS:

A. WHY IS HAND WASHING RECOMMENDED RATHER THAN HAND SANITIZING WHENEVER POSSIBLE?

- *Hand sanitizers may not be as effective when hands are visibly dirty or greasy. When hands are heavily soiled or greasy, hand sanitizers may not work well.*
- *Hand sanitizers also might not remove harmful chemicals, like pesticides and heavy metals, from hands.*



B. WHAT STEPS SHOULD BE TAKEN TO MAKE SURE ALL PARTS OF THE HANDS ARE CLEAN? EXPLAIN WHY IT IS IMPORTANT TO FOLLOW EACH STEP.

• Follow this link to watch the video by the WHO:

<https://www.youtube.com/watch?v=lisgnbMfKvI>



Summary of Steps

Duration of entire procedure: 40-60 seconds



Wet hands with water;



Apply enough soap to cover all hand surfaces;



Rub hands palm to palm;



Right palm over left dorsum with interlaced fingers and vice versa;



Palm to palm with fingers interlaced;



Backs of fingers to opposing palms with fingers interlocked;



Rotational rubbing of left thumb clasped in right palm and vice versa;



Rotational rubbing, backwards and forwards with clasped fingers of right hand in left palm and vice versa;



Rinse hands with water;



Dry hands thoroughly with a single use towel;



Your hands are now safe.



Use towel to turn off faucet;



C. WHAT SONG HAVE YOU FOUND THAT IS LONG ENOUGH THAT YOU CAN SING IT COMPLETELY WHILE SCRUBBING YOUR HANDS?



D. WHY IS THE USE OF PAPER TOWELS PREFERABLE OVER CLOTH TOWELS THAT WILL BE USED SEVERAL TIMES?



- It's possible to leave germs behind on what ever you use to dry your hands (especially if you don't do a great job of washing them). Since paper towels are used once and thrown away, they are unlikely to infect anyone.



E. MAKE A VIDEO OR OTHER PRESENTATION TO DEMONSTRATE TO YOUR INSTRUCTOR HOW TO PROPERLY WASH AND DRY YOUR HANDS.



13. REGARDING HAND SANITIZER:

A. WHY IS 70% ISOPROPYL ALCOHOL THE MOST EFFECTIVE CONCENTRATION AS THE MAIN CLEANSING SANITIZER INGREDIENT?

- 70% alcohol takes a longer time to evaporate from any surface, hence there is enough contact time. In the case of 100% alcohol, evaporation will be very fast, contact time will be less and it will not be so effective against microbes.



B. WHAT IS THE CORRECT WAY TO USE HAND SANITIZER?

- Apply about a teaspoon (5 ml) of hand sanitizer to your hands. Rub it in thoroughly, being sure to get the palms, the backs of the hands, between the fingers, and the finger tips. Do not wipe the hands dry, but rather, allow the sanitizer to evaporate. This leaves the sanitizer in contact with any germs long enough for it to disinfect the hands.



C. EXPLAIN WHEN IT IS APPROPRIATE TO USE HAND SANITIZER INSTEAD OF SOAP AND WATER.

- *Hand sanitizer can be used when soap and water are not readily available. Using soap and water is always the more effective way to wash your hands.*



14. REGARDING FACE MASKS:

A. EXPLAIN THE RATIONALE FOR USING A HOMEMADE MASK.



- A simple mask can help lower the risk of infection.
- It's important to note that wearing a homemade mask alone will not guarantee protection, but its effectiveness is better when combined with basic safety precautions, such as regular hand-washing and social distancing.



B. LEARN HOW TO IMPROVISE A FACE MASK USING MATERIALS COMMONLY FOUND AROUND YOUR HOME.



<https://www.youtube.com/watch?v=tPx1yqvJgf4>



C. RESEARCH AND MAKE A FACE MASK USING IDEAL FABRIC AND DESIGN PER INSTRUCTIONS.

<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-to-make-cloth-face-covering.html>



D. UNDER WHAT CONDITIONS WOULD IT BE ADVANTAGEOUS TO UPGRADE TO A CERTIFIED COMMERCIAL FACE MASK?



- If you work within the medical or health field, you must wear appropriate face protection. If you work with any biohazardous material or going into an area where it is known that there are contagious diseases, a cloth covering will not suffice.



15. REGARDING COUGHING:

A. PERFORM THE FOLLOWING:

- POSITION YOURSELF 12 INCHES (30 CM) IN FRONT OF A CLEAN PANE OF GLASS OR A MIRROR AND COUGH ON IT. OBSERVE THE AMOUNT AND DISTRIBUTION OF THE DROPLETS PRODUCED BY THE COUGH. CLEAN THE GLASS.
- WHILE MAINTAINING THE SAME DISTANCE FROM THE GLASS AS WITH THE UNCOVERED COUGH, REPEAT BY COUGHING INTO THE CROOK OF YOUR ARM. COMPARE THE AMOUNT AND DISTRIBUTION OF DROPLETS. CLEAN THE GLASS.
- REPEAT THIS EXERCISE WHILE WEARING A MASK. COMPARE THE AMOUNT AND DISTRIBUTION OF DROPLETS. CLEAN THE GLASS WHEN YOU ARE FINISHED.

B. BASED ON YOUR OBSERVATIONS, IDENTIFY WHAT ACTIONS SHOULD BE TAKEN WHEN COUGHING OR SNEEZING TO AVOID CONTAMINATING OTHER PEOPLE.



16. STUDY THE PROTOCOL THAT THE LORD GAVE MOSES CONCERNING LEPROSY IN LEVITICUS 13:1-46. HOW DO THE SOCIAL DISTANCING AND QUARANTINE PRINCIPLES OF THIS PASSAGE COMPARE TO MODERN RECOMMENDATIONS?



• “4 But if the bright spot is white on the skin of his body, and does not appear to be deeper than the skin, and its hair has not turned white, then the priest shall isolate the one who has the sore **seven days**. 5 And the priest shall examine him on the seventh day; and indeed if the sore appears to be as it was, and the sore has not spread on the skin, then the priest shall isolate him **another seven days**.”



• “46 He shall be unclean. All the days he has the sore he shall be unclean. He is unclean, and he shall dwell alone; his dwelling shall be **outside** the camp.”



17. ACCORDING TO MATTHEW
24:3–8, WHAT DOES THE
BIBLE SAY ABOUT END–TIME
DISEASES?





Now as He sat on the Mount of Olives, the disciples came to Him privately, saying, "Tell us, when will these things be? And what will be the sign of Your coming, and of the end of the age?"

*And Jesus answered and said to them: "Take heed that no one deceives you. For many will come in My name, saying, 'I am the Christ,' and will deceive many. And you will hear of wars and rumors of wars. See that you are not troubled; for all these things must come to pass, but the end is not yet. For nation will rise against nation, and kingdom against kingdom. **And there will be famines, pestilences, and earthquakes in various places.** All these are the beginning of sorrows.*



18. ACCORDING TO 1 CORINTHIANS
15:51–58 AND REVELATION 21:1–5,
WHAT WILL HAPPEN TO SICKNESSES
AND DISEASES WHEN WE GO TO
HEAVEN?



Behold, I tell you a mystery: We shall not all sleep, but we shall all be changed— in a moment, in the twinkling of an eye, at the last trumpet. For the trumpet will sound, and the dead will be raised incorruptible, and we shall be changed. For this corruptible must put on incorruption, and this mortal must put on immortality. So when this corruptible has put on incorruption, and this mortal has put on immortality, then shall be brought to pass the saying that is written: “Death is swallowed up in victory.”

“O Death, where is your sting?

O Hades, where is your victory?”

The sting of death is sin, and the strength of sin is the law. But thanks be to God, who gives us the victory through our Lord Jesus Christ.

Therefore, my beloved brethren, be steadfast, immovable, always abounding in the work of the Lord, knowing that your labor is not in vain in the Lord.



Now I saw a new heaven and a new earth, for the first heaven and the first earth had passed away. Also there was no more sea. Then I, John, saw the holy city, New Jerusalem, coming down out of heaven from God, prepared as a bride adorned for her husband. And I heard a loud voice from heaven saying, "Behold, the tabernacle of God is with men, and He will dwell with them, and they shall be His people. God Himself will be with them and be their God. And God will wipe away every tear from their eyes; **there shall be no more death, nor sorrow, nor crying. There shall be no more pain, for the former things have passed away.**"

Then He who sat on the throne said, "Behold, I make all things new." And He said to me, "Write, for these words are true and faithful."



STILL TO DO

- **8c:** A place in the world you would like to travel to and learn of the outbreaks and diseases that require a vaccine.
- **11:** Glove-removing exercise with simulated “pathogen.”
- **12e:** Make a video or other presentation to demonstrate to your instructor how to properly wash and dry your hands.
- **14c:** Make a face mask.
- **15:** Coughing experiment.





BIO SAFETY