Welcome to Envision by WorldStrides Envisionary Labs!

Dear Scholar,

Welcome to the Envisionary Lab: Viruses and Preventive Medicine Challenge! Get ready to dive into the fascinating world of preventive medicine and discover how a career in public health or research could be the path for you. During this lesson, we will explore the topic of viruses which has become an area of spotlight during the COVID-19 era. This is your chance to take a peek behind the scenes and learn about the work that goes into helping populations to stay safe and healthy.

Today, you will learn about the structure of viruses and work to understand how to prevent infectious diseases from happening using the Epidemiological Triangle model. You will then take on the role of a public health professional in this challenge to develop a Public Awareness Campaign in response to a virus. A lot goes in to successfully getting people to change their behaviors, so your work will examine the social factors of campaigns.

To guide you through the creation process of these challenges, you will use the Design Thinking Process. Professionals in the world of STEM use the Design Thinking Process to solve real-world problems. If you enjoy your role as a medical researcher and public health professional, we encourage you to continue to explore different careers in medicine and healthcare.

By completing this Envisionary Lab, we hope that you have fun and learn something new about the exciting world of preventive medicine!

Good Luck!

Amanda Whitener

Amanda Whitener
Vice President, Educational Experience
National Youth Leadership Forum: Medicine
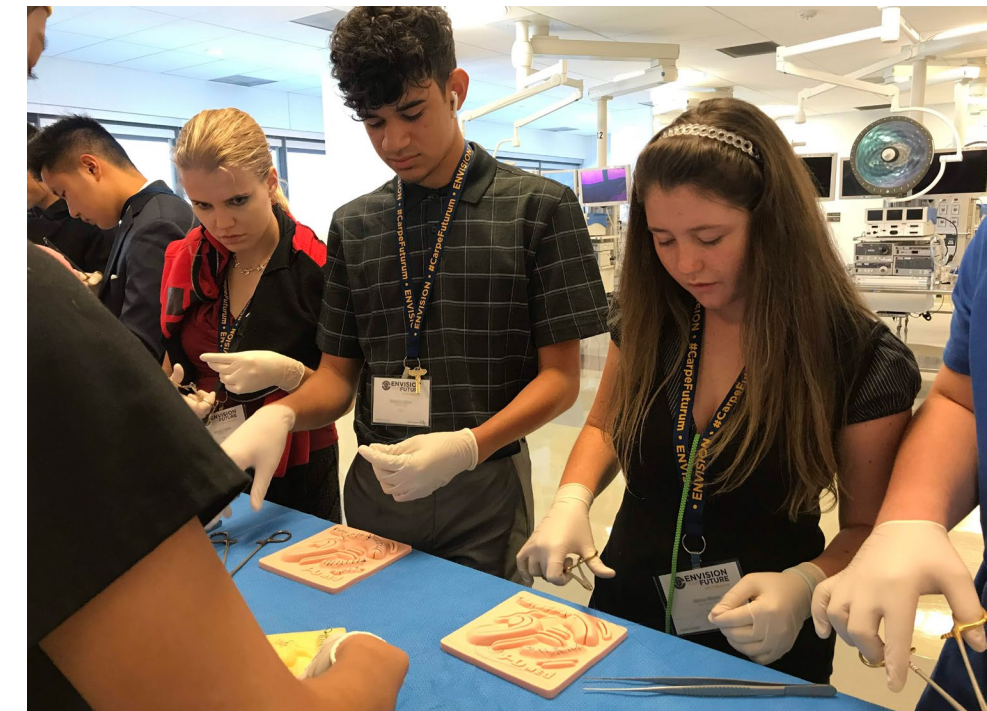
Know Before You Go!

We've all seen the effects COVID-19 has had on the world. Now more than ever, it is important to learn about how to keep people healthy and prevent them from getting sick in the first place. To complete this challenge and develop a public awareness campaign to prevent the spread of disease, let's first get a better understanding of the world of preventive medicine.

> **Step 1: Read and watch the resources in the section below to learn about viruses and preventive medicine.**

Key Terms

Public Health: The branch of medicine dealing with public health, including hygiene, epidemiology, and disease prevention.

Chronic Disease: Conditions that last one year or more and require ongoing medical attention or limit activities of daily living or both (e.g., heart disease, cancer, diabetes).[1]

Infectious Disease: Caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another.

Epidemiology: A branch of medical science that deals with the incidence, distribution, and control of disease in a population.

Epidemiological Triangle: The traditional model for infectious disease and disease causation; consists of an external agent, a susceptible host, and an environment that brings the host and agent together.[2]

Preventive Medicine

Preventive medicine is a medical specialty that promotes health and prevents illness. In the late 20th century, this specialty gained importance as U.S. Public Health officials became concerned about the increasing cost of health care. Preventive medicine strategies can focus on the population or on individuals.

Population-Based Programs

Historically, the first preventive strategies were based on the finding that many diseases are transmitted by organisms and that transmission can be stopped by public hygiene measures, such as quarantining ill persons, removing the dead, and providing sewage systems. A major advance was the discovery that immunization protects most people against many infectious diseases.

Preventive medicine is also concerned with chronic disease and has developed such measures as screening programs to identify individuals with high blood pressure and those who have breast or cervical cancer. Unfortunately, screening for lung cancer has not been as successful.

Governments have attempted to prevent disease by requiring greater purity of air and water, and by prohibiting the use of food additives that cause cancer in animals. U.S. federal regulations also promote safety in the workplace, for example, by requiring the removal of accident hazards and by limiting employees' exposure to chemicals and radiation.

Individual Action

Researchers in human health problems also uncover actions that people can take individually to improve their health. Primary among these are maintaining a nutritious and balanced diet with a low-fat content, getting sufficient sleep and regular exercise, and having periodic medical and dental examinations. Many physicians recommend reducing the intake of cholesterol and salt in the diet to cut down the risk of heart disease, although evidence is not conclusive. Dentists have introduced the application of fluoride to children's teeth to prevent tooth decay.

Public health officials also stress the use of automobile seat belts, especially for children. Physicians and health officials encourage people to stop smoking as the most effective way to combat the increasing occurrence of lung cancer. Some scientists advocate the massive use of vitamin C to prevent colds and the use of vitamins A and E to prevent some cancers, but these measures remain controversial.

Throughout this next section, we will think of preventive medicine specifically in the context of infectious disease and, even more specifically, viruses. In order to prevent viruses from spreading, keep in mind that population-based programs and individual action are important. Now that we have an understanding of the public health aspect of preventive medicine, let's learn about the scientific research side.

What is an Infectious Disease?

An infectious disease means a foreign organism is living inside the body where it shouldn't, causing damage to the body's cells. These pathogens (disease-causing agents, such as bacteria or a virus) try to feed on cell nutrients, destroy body tissue, or even hijack cells to spread the infection.[3]
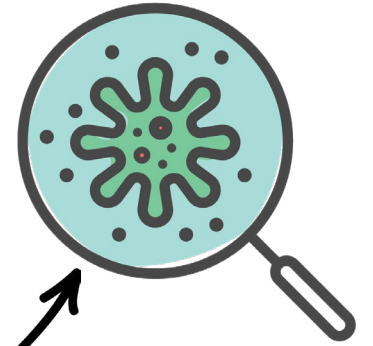
Click on the icon and watch a video to learn more!

What are Viruses?

As mentioned above, one of the major agents of infectious disease is a virus. In this section, we will learn about the characteristics of viruses and dissect how they work.

Viruses are very tiny germs. They are made of genetic material inside of a protein coating. Viruses cause familiar infectious diseases such as the common cold, flu, and warts. They also cause severe illnesses such as HIV/AIDS, Ebola, and COVID-19.

Viruses are like hijackers. They invade living, normal cells and use those cells to multiply and produce other viruses like themselves. This can kill, damage, or change the cells and make you sick. Different viruses attack certain cells in your body such as your liver, respiratory system, or blood.
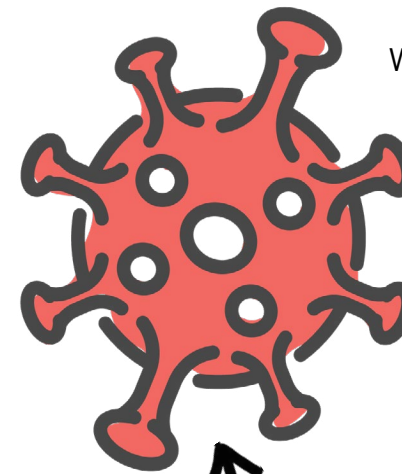
When you get a virus, you may not always get sick from it. Your immune system may be able to fight it off.

For most viral infections, treatments can only help with symptoms while you wait for your immune system to fight off the virus. Antibiotics do not work for viral infections. There are antiviral medicines to treat some viral infections. Vaccines can help prevent you from getting many viral diseases.[4]

Click on the icon and watch a video to learn more!
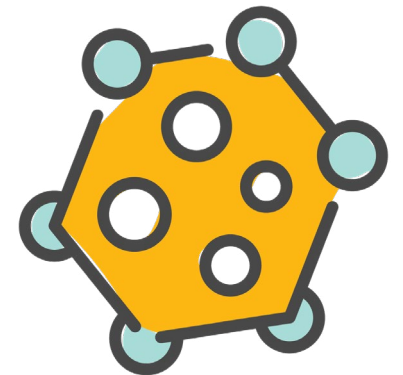
Epidemiological Triangle

Step 2: Read and watch the resources below to learn about the epidemiological triangle.
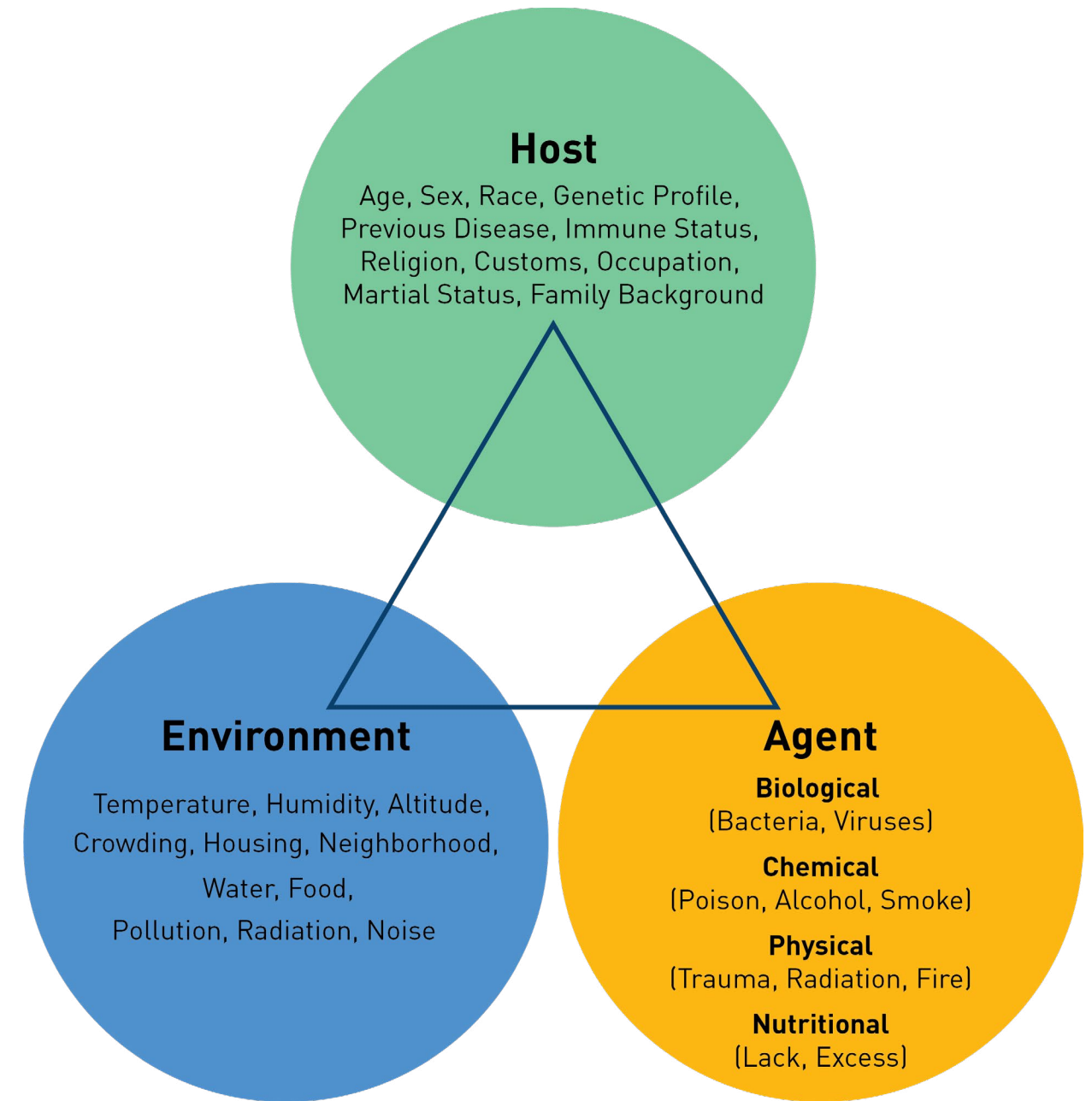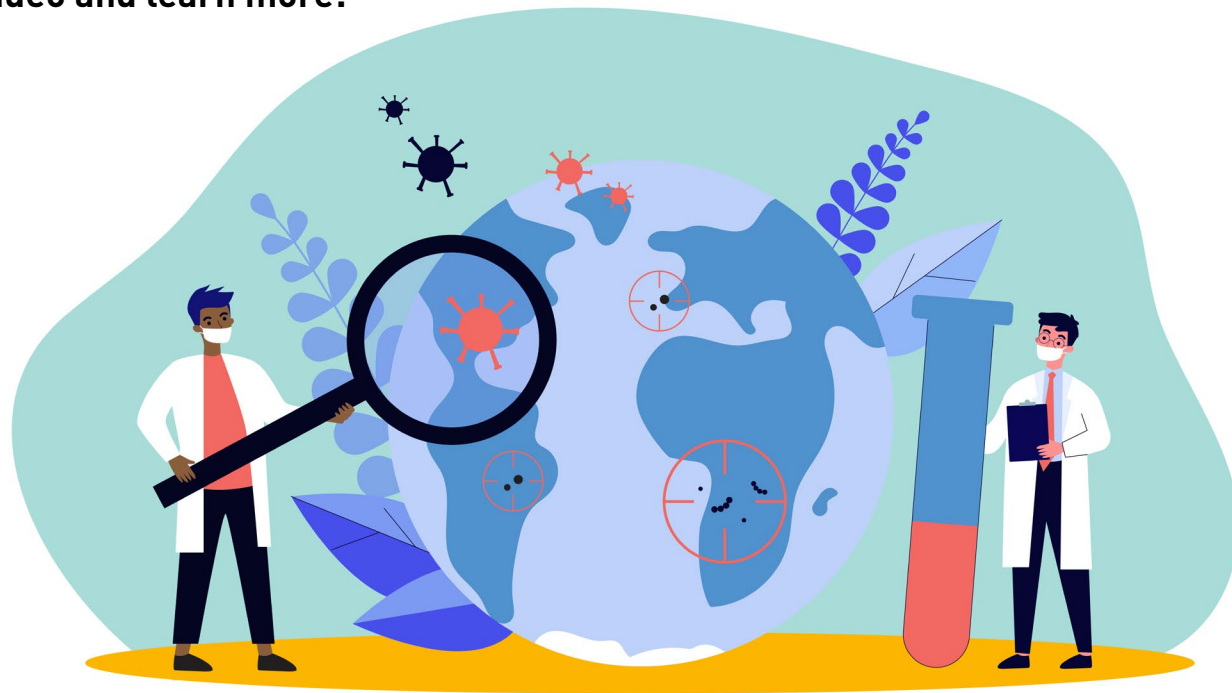
Concepts of Disease Occurrence

A critical premise of epidemiology is that disease and other health events do not occur randomly in a population, but are more likely to occur in some members of the population than others because of risk factors that may not be distributed randomly in the population. As noted earlier, one important use of epidemiology is to identify the factors that place some members at greater risk than others.[5]

Exploring the Epidemiological Triangle

To help understand, then prevent, disease from spreading, epidemiologists often ground their thinking and planning in the Epidemiological Triangle. Here we will look at the epidemiological triangle in the context of viruses.

Click on the image to watch a video and learn more!

Host
Age, Sex, Race, Genetic Profile, Previous Disease, Immune Status, Religion, Customs, Occupation, Martial Status, Family Background

Environment
Temperature, Humidity, Altitude, Crowding, Housing, Neighborhood, Water, Food, Pollution, Radiation, Noise

Agent
Biological
(Bacteria, Viruses)
Chemical
(Poison, Alcohol, Smoke)
Physical
(Trauma, Radiation, Fire)
Nutritional
(Lack, Excess)

Agent: This is the cause of the virus. As you study your virus, consider what microbes may cause the infection to spread.

Host: As you study your virus, consider which animals (organisms) are exposed to and harbor a disease. A host is the organism that gets sick and the organism that serves as a carrier. The carrier may or may not become sick from the disease.

Environment: What surroundings are necessary in order for the virus to thrive and be transmitted?

Exploring Human Viruses

There are 219 virus species that are known to be able to infect humans. The first of these to be discovered was yellow fever virus in 1901, and three to four new species are still being found every year.

Extrapolation of the discovery curve suggests that there is still a substantial pool of undiscovered human virus species, although an apparent slow-down in the rate of discovery of species from different families may indicate bounds to the potential range of diversity.

More than two-thirds of human viruses can also infect non-human hosts, mainly mammals and sometimes birds. Many human viruses also have mammalian or avian origins. Indeed, a substantial proportion of mammalian viruses may be capable of crossing the species barrier into humans, although only around half of these are capable of being transmitted by humans and around half again of transmitting well enough to cause major outbreaks.

A few possible predictors of species jumps can be identified, including the use of phylogenetically conserved cell receptors. This means pathways that share a common function and evolutionary development or biological past.

It seems almost inevitable that new human viruses will continue to emerge, mainly from other mammals and birds, for the foreseeable future. For this reason, an effective global surveillance system for novel viruses is needed.[6]

Virus Pioneer

Walter Reed 1851–1902

U.S. Army pathologist and bacteriologist who led the experiments that proved that yellow fever is transmitted by the bite of a mosquito.

The Walter Reed Hospital in Washington, D.C., is named in his honor.[7]
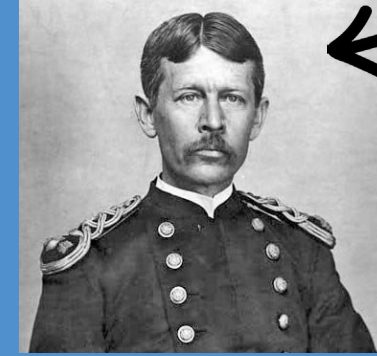
Vaccine Pioneer

Hope Hopps 1926–1988

Specialist in infectious diseases, immunology, cell biology, and vaccine development.

Received two U.S. patents for discoveries related to vaccine development, including the rubella vaccine.[8]

Viral Oncology Pioneer

Sarah Stewart 1905–1976

Co-discoverer of polyomavirus with Bernice Eddy. First woman to earn a medical degree from Georgetown University.

Mexican-American researcher who pioneered the field of viral oncology research. First to show that cancer-causing viruses can spread from animal to animal.[9]

Below you will find introductory information to various human diseases caused by viruses. To learn more about a virus click on the name.

Chicken Pox

- Chickenpox is a highly contagious disease caused by the varicella-zoster virus (VZV). It can cause an itchy, blister-like rash. The rash appears first on the chest, back, and face, and then spreads over the entire body.

Dengue

- Dengue fever is a mosquito-borne viral disease occurring in tropical and subtropical areas. Symptoms include high fever, nausea, vomiting, rash, and muscle/joint pain. Approximately 100 million people worldwide get sick from infection yearly, and 22,000 die from severe dengue.

Ebola

- Ebola Virus Disease (EVD) is a rare and deadly disease in people and nonhuman primates. The viruses that cause EVD are located mainly in sub-Saharan Africa. People can get EVD through direct contact with an infected animal (bat or nonhuman primate) or a sick or dead person infected with Ebola virus.

Epstein-Barr

- Epstein-Barr virus (EBV) is one of the most common human viruses in the world and can cause infectious mononucleosis ("mono") and other illnesses. EBV spreads most commonly through bodily fluids, primarily saliva.

Hepatitis

- Hepatitis is an inflammation of the liver and is often caused by a virus. The condition can be self-limiting or can progress to fibrosis (scarring), cirrhosis or liver cancer.
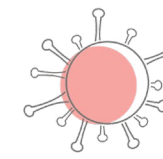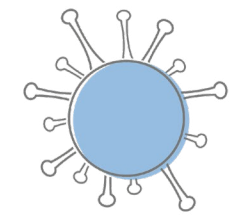
Hantavirus

- Hantaviruses are a family of viruses spread mainly by rodents and can cause varied disease syndromes in people worldwide such as hantavirus pulmonary syndrome (HPS) and hemorrhagic fever with renal syndrome (HFRS).

Human Immunodeficiency Virus (HIV)

- HIV (human immunodeficiency virus) is a virus that attacks the body's immune system. If HIV is not treated, it can lead to AIDS (acquired immunodeficiency syndrome). There is currently no effective cure. Once people get HIV, they have it for life. But with proper medical care, HIV can be controlled.

Human Papilloma Virus (HPV)

- HPV is the most common sexually transmitted infection (STI) and can cause health problems including genital warts and cancers.
- HPV is the most common sexually transmitted infection (STI) with 79 million Americans, most in their late teens and early 20s, infected with HPV. HPV is a different virus than HIV and HSV (herpes).

Influenza (Flu)

- Flu is a contagious respiratory illness caused by influenza viruses that infect the nose, throat, and sometimes the lungs. It can cause mild to severe illness, and at times can lead to death.

Measles

- Measles is a highly contagious respiratory disease caused by a virus. It can result in serious health complications, such as pneumonia and encephalitis (swelling of the brain), and even cause death.

Mumps

- Mumps is a contagious disease that is caused by a virus. It typically starts with a few days of fever, headache, muscle aches, tiredness, and loss of appetite.
- Most people also have swelling of their salivary glands resulting in puffy cheeks and a tender, swollen jaw.

Polio

- Polio, or poliomyelitis, is a disabling and life-threatening disease caused by the poliovirus. The virus can infect a person's spinal cord, causing paralysis.
- Post-polio syndrome (PPS) is a condition that can affect polio survivors decades after they recover from their initial poliovirus infection.

Rubella

- Rubella symptoms typically include a low-grade fever, sore throat, and a rash that starts on the face and spreads to the rest of the body. Rubella can cause a miscarriage or serious birth defects in a developing baby if a woman is infected while she is pregnant.

Rabies

- Rabies is mainly a disease of animals but humans can get it if they are bitten or scratched by infected animals. Rabies infects the central nervous system and is almost always fatal without immediate medical care.

Rhinoviruses (Common Cold)

- Sore throat and runny nose are usually the first signs of a cold, followed by coughing and sneezing.
- Most people recover in about 7-10 days, however, people with weakened immune systems, asthma, or respiratory conditions may develop serious illness, such as bronchitis or pneumonia.

Severe Acute Respiratory Syndrome (SARS)

- Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus called SARS-associated coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003.
- The illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained.

Shingles

- Shingles is a viral infection that causes a painful rash, most often appearing as a single stripe of blisters on one side of the face or body. Shingles is caused by the varicella-zoster virus—the same virus that causes chickenpox.

Smallpox

- Smallpox is significant in global health as it is the first, and so far only, human disease to be successfully eradicated globally. Thanks to the success of vaccination, no cases of naturally occurring smallpox have happened since 1977.
- The disease was associated with fever and a distinctive, progressive skin rash which often left survivors scarred. Approximately 3 out of every 10 people with the disease died.

Zika

- Zika is spread through infected mosquitoes and is most commonly associated with causing birth defects when infection occurs during pregnancy.
- There is no vaccine or specific medication for Zika.

Check out these TED Talks to learn more!

Bill Gates - *The next outbreak? We're not ready*
Ben Longdon - *How do viruses jump from animals to humans?*
Pardis Sabeti - *How we'll fight the next deadly virus*

Puzzle Time
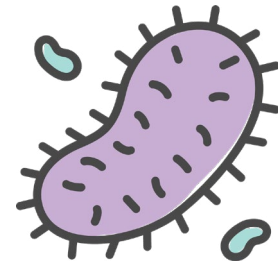
1
2
3   4
6
5
7
8   11
9   10
12
13   14
15
17
16
18
19
20   21
22
23
24
25
26
27   28
29
30

Across

5. Submicroscopic infectious agent that only multiplies within the living cells of a host

9. Type of medication effective against viruses

10. Medical field that promotes health and prevents illness

12. Bacterium, virus, or other microorganism that can cause disease

15. An example of a population-based public health measure used to prevent the spread of a disease

18. The smallest structural and functional unit of an organism

20. The act of concluding something by assuming existing trends will continue

23. Describes a disease that can spread from one organism to another

25. Epidemiology works to do this to disease

26. Localized physical condition in which part of the body reddens, swells, and becomes painful

27. Area of redness and spots on a person's skin

28. The body's natural defense system against viruses

29. Type of medication that cannot treat viruses

30. Considerations for a virus to thrive and be transmitted

Down

1. Type of preventive medicine actions such as a balanced diet and regular exercise

2. The material structure of an individual life form

3. A particular abnormal condition that negatively affects an organism and is not due to any immediate external injury

4. The organism that causes illness

6. A type of fiction or a way of describing a new virus

7. Describes a condition that lasts one year or more

8. The cause of a virus

11. Branch of medicine dealing with the incidence, distribution, and control of disease in a population

13. Likely to spread a disease or infection

14. Physical or mental feature indicating a disease

16. Field of careers that educate the public about health and wellness

17. Describes a condition that is short in duration

19. Medical care given to a patient for an illness or injury

21. Shape of the chart used in epidemiology to visualize the onset of a disease outbreak

22. How a disease is passed from one organism to another

24. Treatment that can help prevent certain viruses

Answers on Page 11 of Lesson Plan

The Challenge!

Challenge Guidelines

One major way to get people to change their behavior is to educate them about why a new way of doing things is better than an old way. In this challenge you will create a public awareness campaign to help educate the public about how to avoid a specific virus. Your campaign must be persuasive enough to convince people to change their behavior around health.

Public Awareness Campaign Criteria for Success

In order for you to successfully complete the challenge, your public awareness campaign should have:

- A specific *target audience*.
- A *value proposition* that tells the target audience what the benefits are and why should they feel compelled to change their behavior.
- A *call to action* that tells the target audience what they should do.
- A "sticky" *catch phrase or slogan*. You want to make sure your message is something easy to remember so the information and behavior is more likely to be adopted.

Public Awareness Campaign Process

1. Decide which virus you will target for your public awareness campaign. You can choose a virus from the list of examples you learned about in the *Exploring Human Viruses* section or another virus from additional research on your own. You should choose a virus that you find interesting and would like to learn more about in terms of how to stop the spread.

2. Complete your Epidemiological Triangle. The Epidemiological Triangle is a tool epidemiologists use to help understand viruses, then prevent disease from spreading. You can use the resources section for links to learn more about different viruses or conduct additional research on your own.

3. Utilize the Design Thinking Process to create your public awareness campaign. This will include, generating ideas for how to prevent the spread of your selected virus. Then, create a catchy slogan or story that will make people want to adopt this behavior.

4. You must create the following campaign content:
   - Print materials (e.g., poster/billboard, flyers, magazine ad, etc.)
   - A social media post (e.g., Instagram, Twitter, Facebook, etc.)
   - A commercial

5. It is important that you ensure accuracy of the information you are presenting in your campaign content.

6. Once complete, share your campaign on social media!
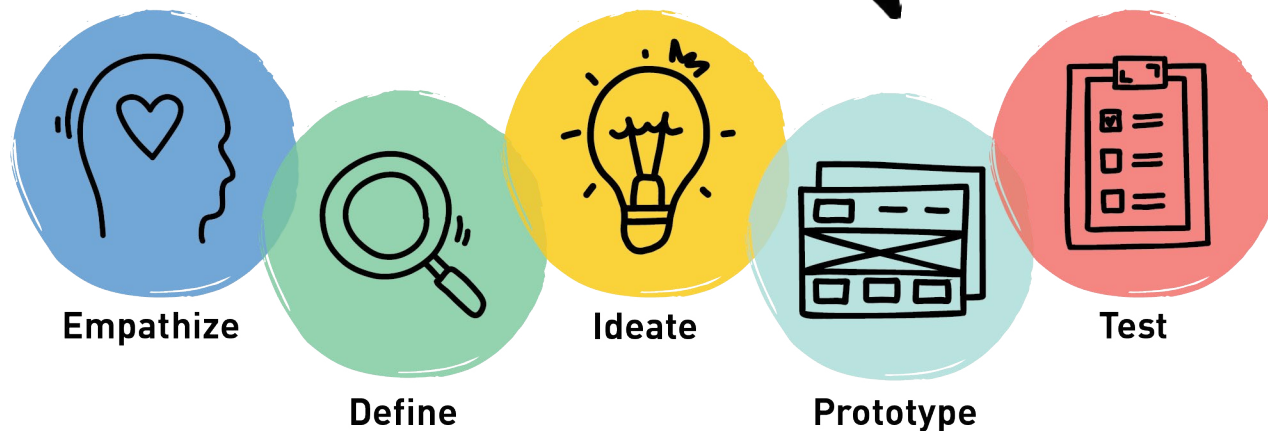
Design Thinking Process

Step 5: Watch the video and read the information below to learn about the Design Thinking Process.

Let's learn about the Design Thinking Process and how it's used. The Design Thinking Process is a five-step process consisting of the following steps:

1. **Empathize**
2. **Define**
3. **Ideate**
4. **Prototype**
5. **Test**

Design Thinking is a creative problem-solving process with an emphasis on the user and the user's needs, and it is primarily used in business, science, and education. Design Thinking promotes innovative and strategic problem solving as one walks through each step in the process. The Design Thinking Process specifically focuses on the human-centered side of creative problem solving.

Click on the graphic below to watch a video about the Design Thinking Process.

Empathize   Define   Ideate   Prototype   Test

Phases of the Design Thinking Process

Empathize: I see a problem. Who does it affect?

The first phase of the Design Thinking Process helps you understand the user who will benefit from the solution you are creating. It is important to try to put yourself in the shoes of the person the problem is affecting to explore how they think, act, work, and feel.

Define: I learned more about the problem. How do I solve it?

This phase of the Design Thinking Process helps you understand the specific problem you are trying to solve. During this phase, you will review all of the information collected during the *Empathize* phase and define the exact problem your users are experiencing. It is also important to imagine the kinds of challenges and constraints you might face as you create your solution.

Ideate: I have a lot of options. Which path do I choose?

Time to brainstorm! Once you have determined the needs of your user and defined the problem, you can start developing ideas that will become your prototype. The *Ideate* stage should have an *anything goes* approach. At this point, it is important to get all your ideas down without evaluating them. Your goal is to get the most amount of possible ideas generated.

Prototype: I found a solution. How do I create or tweak it?

Once you have brainstormed your list of possible ideas, it is time to select the most promising ideas from the *Ideate* phase and begin to build a rough sketch of what your end product will be. During the *Prototype* phase, you may encounter difficulties that require you to revisit your shortlist and revise your plans.

Test: I finished my solution. How well does it work?

Try out your prototype! If your prototype doesn't work the way you want it to, you may need to go back a step and build another prototype to test. Continue prototyping and testing until the solution effectively and efficiently solves the problem.
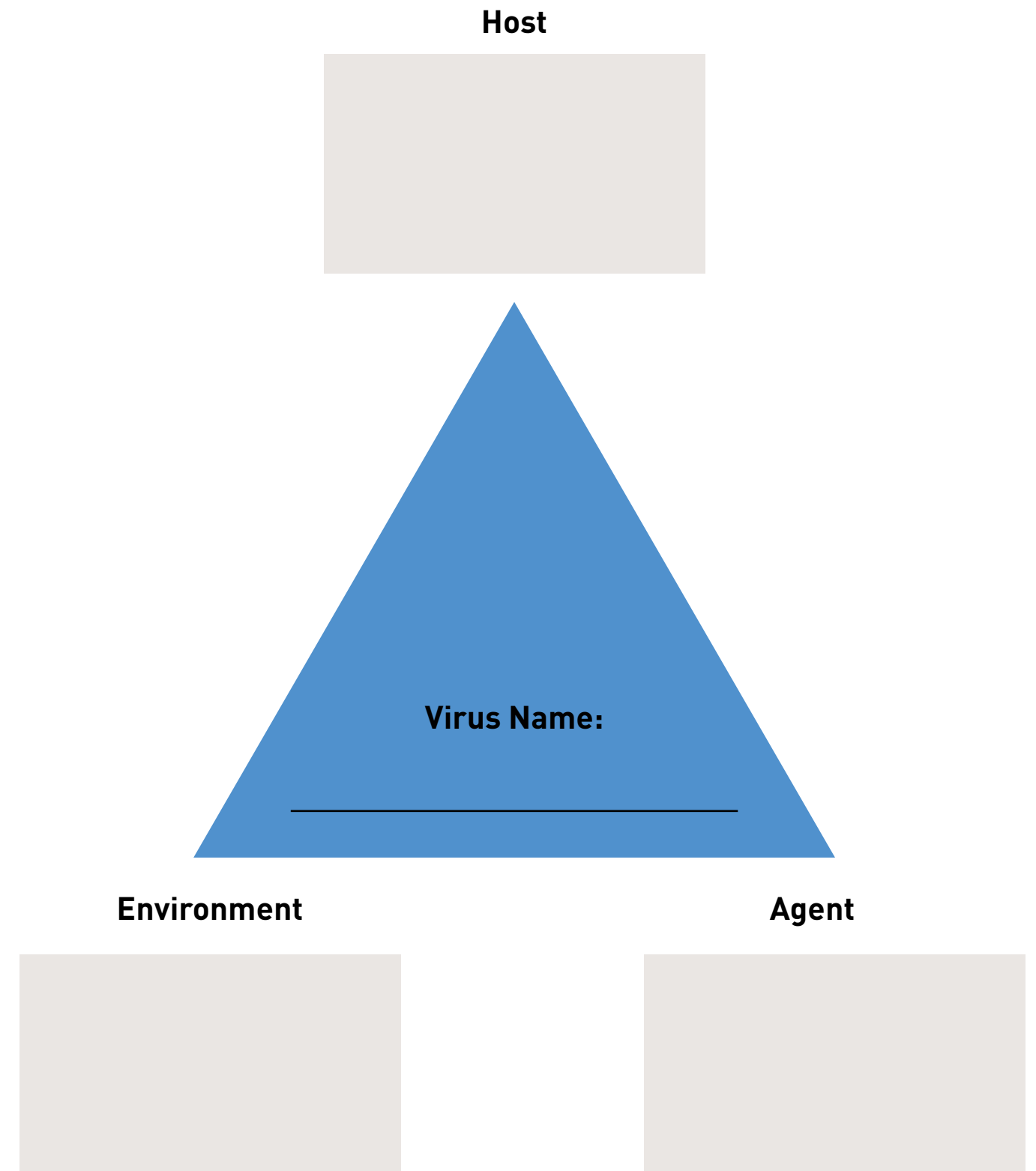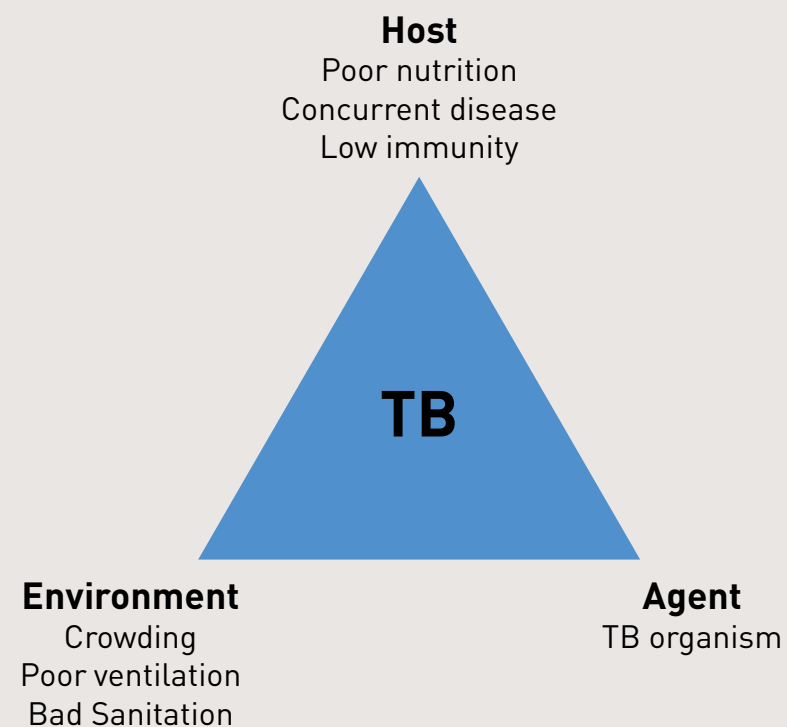
Let's Get Started!

Step 7: Using the example below as a reference, complete the epidemiological triangle study for your selected virus. Keep in mind that this example is for a bacterial infection, not a virus.

Example of an Epidemiological Triangle[10]

For TB: In this model the agent is the TB bacterium; host factors include non-immune, weakened resistance, poor nutrition, and environmental factors include crowded conditions, poor ventilation, and bad sanitation

Host
Poor nutrition
Concurrent disease
Low immunity

TB

Environment
Crowding
Poor ventilation
Bad Sanitation

Agent
TB organism

Host

Virus Name:

_____

Environment

Agent

Time to Understand!

Step 8: Complete the first two phases of the Design Thinking Process using the prompts below. This will help you determine the specific target audience, value proposition, and call to action for your campaign.

Empathize

In order to create your public awareness campaign, you need to determine your target audience. The *Empathize* phase of the Design Thinking Process will help you determine the needs of your audience. Methods of collecting information on your target audience could include conducting interviews and surveys or doing research to find information on studies that have already been conducted with your target population.

During this phase, you want to ask yourself *who are you creating this campaign for*, *what is their problem*, and *what do these people do*?

Use the space below to collect information about your campaign's target audience and answer the questions below.

- Who is most likely to contract this virus?
- Is there a particular group that is most likely to be encouraged to adopt new behaviors due to the campaign?

Define

The *Define* phase is about defining the problem you are trying to solve. It is important to break down the end goal itself and begin to map out a pathway to achieving it. This is not where you start designing—it is where you make sure that you fully understand the problem and constraints that you might face. Ask yourself what the needs, problems, and challenges are of the audience based on what you learned in the *Empathize* phase.

Writing a *problem statement* can be a helpful step in the *Define* phase. A problem statement captures your audience's need or point of view. It is also something you can continue to return to throughout the Design Thinking Process to help ensure you are staying being user-focused.

Your problem statement should include:

1. Your audience
2. The need
3. The goal

Use the space below to write your problem statement.

It is important to think about the kinds of challenges and constraints you might face as you create your public awareness campaign. Some examples could include:

- It might be viewed as less "fun" of a topic than other campaign topics (e.g., new clothes, car, foods).
- Viruses may have a stigma (e.g., the added stigma of HIV as opposed to the flu).
- It can be difficult to get people to change their behavior.

What challenges might you encounter when creating your public awareness campaign?

Once you have determined the audience for your campaign, you need to develop your *value proposition* and *call to action*.

Use the space below to create your *value proposition* by answering the questions below.

- What's in it for your audience?
- Why should they feel compelled to change their behavior?

Use the space below to develop your *call to action*.

- What should they do?

Check out these YouTube channels!

Harvard University T.H. Chan School of Public Health

Johns Hopkins University Bloomberg School of Public Health

American Public Health Association

Time to Brainstorm!

Step 9: Time to ideate! Brainstorm strategies for your public awareness campaign.
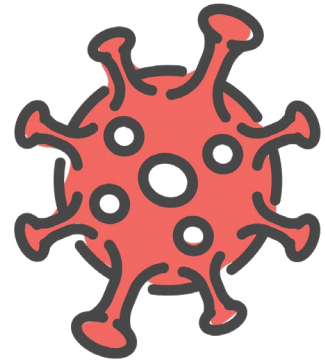
Ideate

This is the fun, creative part, when you brainstorm ideas and potential solutions for the problem. During this time, you want to come up with as many ideas or solutions to a problem as you can. The *Ideate* phase is all about generating a large, diverse list of ideas. It is important to suspend judgment—you can determine the quality of ideas later.

**How can you prevent the spread of your selected virus?**

Public awareness campaigns use many of the same strategies as traditional advertisements. Think about the most memorable ad you have seen recently—what made it memorable?

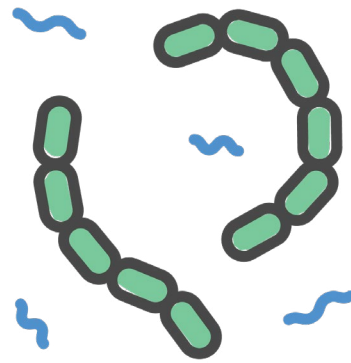**Use the space below to brainstorm.**

Click on the icons below to view examples of various public health awareness campaigns.

WHO Coronavirus PSA
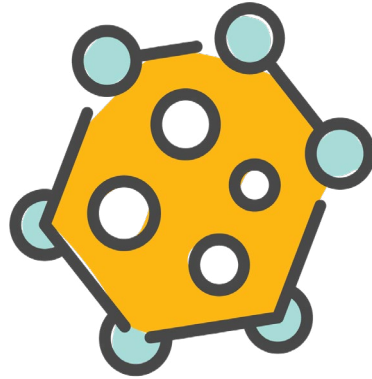
CDC Comic Book

CDC Print Resources

Use the space below to brainstorm ideas on how you will deliver your campaign.

Remember, in order to successfully complete the challenge, you must create the following campaign content:

- Print materials (e.g., poster/billboard, flyers, magazine ad, etc.)
- A social media post (e.g., Instagram, Twitter, Facebook, etc.)
- A commercial

Use the space below to brainstorm ideas for your catchy slogan.
For example, promoting handwashing, keeping clean spaces, wearing masks, and socially distancing becomes "Wash, clean, cover, distance".

Time to Design!

Step 10: Design your campaign content while ensuring accuracy of information throughout. Use reliable public health resources like the CDC and WHO.

Prototype

Now that you have brainstormed your list of possible ideas for your public awareness campaign, it is time to sketch out a few of your most promising ideas. Don't worry if after creating your first prototype you have to revisit your notes from the *Ideate* and *Define* phases and revise your plans. Your first prototype is not expected to be your final product.

Some examples of prototypes you can create for your public awareness campaign include, creating a storyboard for your commercial or a mock up of your print materials.

Use the space below for notes about your prototypes.

Test and Improve!

Step 11: Test your public awareness campaign by sharing it with a focus group and collecting feedback.

Test

The final phase of the Design Thinking Process is the *Test* phase. Now it is time to take your prototype and test it out with real people to see if it effectively solves the problem you identified during the *Ideate* phase. This might not actually be the last step of the process because you can always iterate and revisit the previous phases of the Design Thinking Process.

A great way to test out a public awareness campaign is to use a focus group before you share it with a larger audience. A focus group is a small but demographically diverse group of people whose reactions are studied in discussions about a new product.

Test out your public awareness campaign and take notes below for future improvements.

Notes for future improvements:

Interested in doing more?

Check out DoSomething.org and get inspiration for campaigning for positive change. **DoSomething** is a global non-profit organization with the goal of motivating young people to make positive change both online and offline through campaigns that make an impact.

Congratulations!

There are people in the medical community who do this exact kind of work—educate the public about health and wellness. If this sounds interesting and you enjoyed the work we did today, a career in public health might be a good path to pursue!

Time to Share!

We encourage you to share your creation and showcase your hard work with your family and friends! Share your work with Envision by WorldStrides on social media. Connect with us on Instagram, Twitter, and Facebook by tagging Envision and using hashtag #EnvisionFamilyLabs.

Connect with Us

@envisionexperience   @envisionexp   Envision Experience

Tell Us What You Think

We hope you enjoyed this Envisionary Lab! We encourage you to share it with friends and family. We would love to get your feedback! Please complete this optional two-minute survey and provide us your thoughts. Thank you!

Click here to complete the survey!

Additional Resources

Careers in Public Health

Check out the links below for resources on careers in public health

Public Health Online: A Look into Public Health Careers

This is Public Health: Careers in Public Health

Learn How to Become: Public Health Degrees and Careers

PublicHealth.Org: Careers

Public Health Awareness

Check out the links below for additional resources on creating public health campaigns

George Washington University: Public Health Campaigns That Change Minds

CDC: Gateway to Health Communication: How Do I Do It?

CDC: Gateway to Health Communication: CDCyngery Lite

WHO: Your World Health Day Campaign - Step by Step Planning

Johns Hopkins University: Field Guide to Designing a Health Communication Strategy

Public Health Organizations

Check out the links below to learn more about organizations working in public health

American Public Health Association: https://www.apha.org/

Partners in Health: https://www.pih.org/

Resources Page

Video Links

Infectious Diseases Overview
Let's Learn Public Health. (2017 February 26). *Infectious Diseases - An Introduction* [Video]. YouTube. https://www.youtube.com/watch?v=9axOFtPqS0c

Viruses Overview
Amoeba Sisters. (2018 May 22). *Viruses (Updated)* [Video]. YouTube. https://www.youtube.com/watch?v=8FqlTslU22s

Epidemiology Video
LiveScience. (2020 April 15). *What is Epidemiology?* [Video]. YouTube. https://www.youtube.com/watch?v=q-17icRTMyY

TEDTalk Videos
Gates, Bill. (March 2015). *The next outbreak? We're not ready* [Video]. https://www.ted.com/talks/bill_gates_the_next_outbreak_we_re_not_ready

Longdon, Ben. (August 2019). *How do viruses jump from animals to humans?* [Video]. https://www.ted.com/talks/ben_longdon_how_do_viruses_jump_from_animals_to_humans

Sabeti, Pardis. (May 2015). *How we'll fight the next deadly virus* [Video]. https://www.ted.com/talks/pardis_sabeti_how_we_ll_fight_the_next_deadly_virus?language=en

Design Thinking Process
Sprouts. (2017 October 23). *The Design Thinking Process* [Video]. YouTube. https://www.youtube.com/watch?v=_r0VX-aU_T8

Public Awareness Campaign Examples

World Health Organization. (2020 March 13). *Coronavirus - seven steps to prevent the spread of the virus* [Video]. YouTube. https://www.youtube.com/watch?v=8c_UJwLq8PI

Jeisy-Scott, Victoria & Hobb, Bob. (n.d.). *Ask a Scientist: How Does My Body Fight Disease?* Centers for Disease Control and Prevention. https://www.cdc.gov/healthyschools/bam/pdf/0ADLSSIssue1_Immunologist_FINAL_TAG508.pdf

Centers for Disease Control and Prevention. (6 November 2020). *Coronavirus Disease 2019 (COVID-19) Print Resources*. https://www.cdc.gov/coronavirus/2019-ncov/communication/print-resources.html?Sort=Date%3A%3Adesc

Endnotes

1   Centers for Disease Control and Prevention. (7 October 2020). *About Chronic Diseases* [Webpage]. https://www.cdc.gov/chronicdisease/about/index.htm

2   Centers for Disease Control and Prevention. (18 May 2012). *Principles of Epidemiology in Public Health Practice Lesson 1: Introduction to Epidemiology* [Webpage]. https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section8.html

3   Augusta Health. [23 January 2020]. *What is an Infectious Disease?* (Webpage). https://www.augustahealth.com/health-focused/what-is-an-infectious-disease

4   Medline Plus. [19 October 2020]. *Viral Infections* (Webpage). https://medlineplus.gov/viralinfections.html

5   Centers for Disease Control and Prevention. (18 May 2012). *Principles of Epidemiology in Public Health Practice Lesson 1: Introduction to Epidemiology* [Webpage]. https://www.cdc.gov/csels/dsepd/ss1978/lesson1/section8.html

6   Woolhouse, M., Scott, F., Hudson, Z., Howey, R., & Chase-Topping, M. (19 October 2012). *Human viruses: discovery and emergence.* Philosophical Transactions of the Royal Society B, Volume 367, Issue 1604, 2864-2871. https://royalsocietypublishing.org/doi/10.1098/rstb.2011.0354

7   Image obtained from the following source: Walter Reed. Encyclopædia Britannica. <https://www.britannica.com/biography/Walter-Reed#/media/1/494983/112994>. Accessed 2 November 2020.

8   Image obtained from the following source: Bowen, Ashley. (6 September 2018). Finding Hope: A Woman's Place is in the Lab. NIH U.S. National Library of Medicine. <https://circulatingnow.nlm.nih.gov/2018/09/06/finding-hope-a-womans-place-is-in-the-lab/>. Accessed 2 November 2020.

9   Image obtained from the following source: McNeill, Leila. (17 June 2019). The Woman Who Revealed the Missing Link Between Viruses and Cancer. Smithsonian Magazine. <https://www.smithsonianmag.com/science-nature/woman-who-revealed-missing-link-between-viruses-and-cancer-180972427/>. Accessed 28 October 2020.

10 Naidu, D. (13 February 2017). *Communicable Diseases.* https://slideplayer.com/slide/12644243/76/images/45/D.NAIDU+-Community+Population+Centered+Nursing.jpg