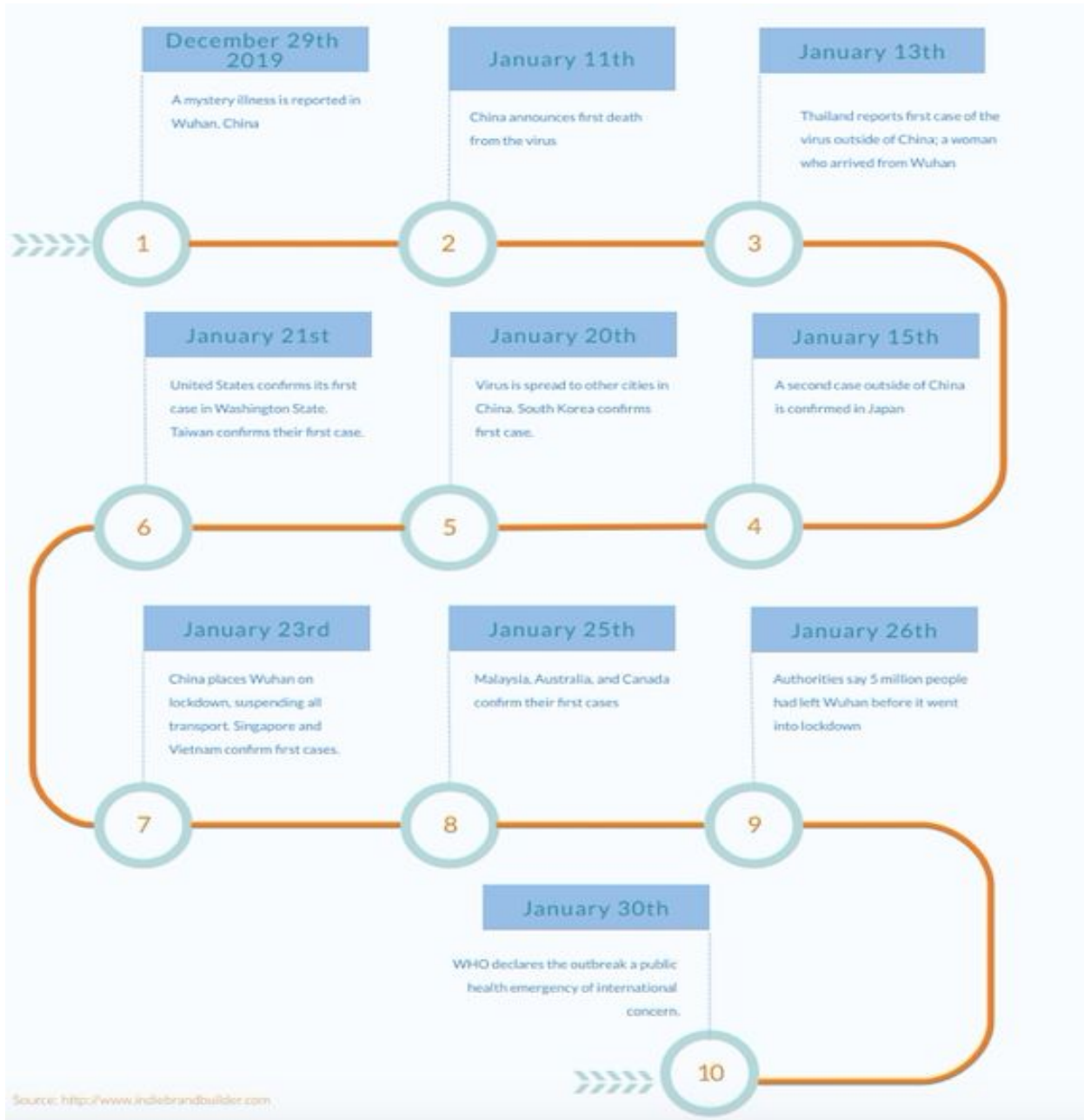


COVID-19, Coronavirus Pandemic

PART 1:

Infectious diseases are caused by tiny germs, such as bacteria or viruses, that get into the body and cause problems. Infectious diseases that spread from person to person are said to be contagious.

Below is a timeline that outlines how the pandemic of COVID-19 began, dating back to December 29, 2019 in China.



Make a prediction of **how** this infectious disease spread across the world within the month of January.

On Tuesday, March 10, 2020, Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, issued a warning regarding the recent COVID-19, AKA coronavirus, outbreak. Click [here](#) to watch the video, or read what he had to say below:



"Whenever you have an outbreak that you can start seeing community spread, which means by definition that you don't know what the index case is, and the way you can approach it is by contact tracing — when you have enough of that then it becomes a situation where you're not going to be able to effectively and efficiently contain it.

Whenever you look at the history of outbreaks, what you see now in an uncontained way — and although we are containing it in some respects, we keep getting people coming in from the country that are travel-related. We've seen that in many of the states that are now involved and then when you get community spread it makes the challenge much greater.

So I can say we will see more cases and things will get worse than they are right now. How much worse it will get will depend on our ability to do two things: to contain the influx of people who are infected coming from the outside, and the ability to contain and mitigate within our own country.

Bottom line, it's going to get worse."

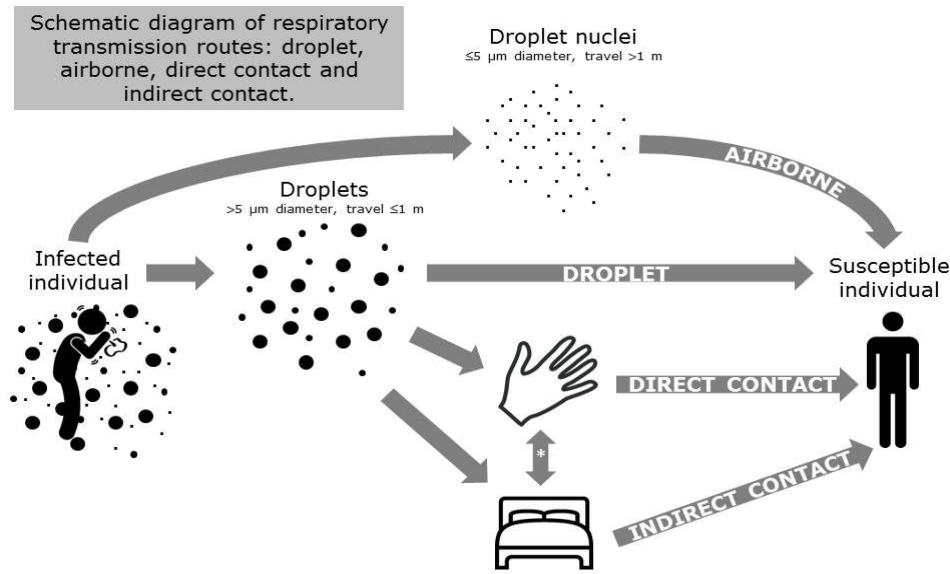
In closing, Dr. Fauci said, there are a number of things that can be done to "interfere with the natural flow" of an outbreak such that it infects less people, leading to less deaths. But ultimately, Americans everywhere need to change the way they live their lives. Right now. "We would like the country to realize that as a nation, we can't be doing the kinds of things we were doing a few months ago. It doesn't matter if you're in a state that has no cases or one case."

Based on the information provided from Dr. Fauci, as well as what you have heard in the media, complete the table below.

My current understanding of COVID-19	My feelings about COVID-19	My questions about COVID-19

PART 2:

Everyday we are exposed to many different things that can lead to illness. It may be somebody sneezing next to you on the bus, your little brother coughing on you without covering his mouth, or something as simple as touching the same countertop at McDonalds that a sick individual touched over an hour ago while placing their order. Below is a diagram and table describing 3 possible ways bacteria or viruses can be transmitted (or transferred) between people and cause illness:



* Transmission routes involving a combination of hand & surface = indirect contact.

Definition of 'Droplet' and 'Droplet nuclei' from Annex C: Respiratory droplets, in Natural Ventilation for Infection Control in Health-Care Settings, Atkinson J., et al., Editors. 2009: Geneva.

© Jon Otter

Type	Description	Transmission
Direct contact	Direct contact transmission requires physical contact between an infected person and a non-infected person, and the physical transfer of the bacteria or virus. This type of transmission requires close contact with an infected individual, and will usually occur between members of the same household or close friends and family.	Direct contact includes: - touching an infected individual - kissing - contact with body lesions (wounds)
Indirect Contact	Indirect contact transmission refers to situations where a non-infected person is infected from contact with a contaminated surface. Some organisms are capable of surviving on surfaces for an extended period of time.	Frequent touch surfaces include: - Door knobs, door handles, handrails - Tables, beds, chairs - Cups, dishes, forks, spoons, trays - Computer keyboards, electronic devices with buttons - Pens, pencils, phones, office supplies - Children's toys
Droplet Contact	Droplet contact transmission refers to when certain diseases can be transferred by infected droplets contacting surfaces of the eye, nose, or mouth.	Droplets containing bacteria or viruses can be generated when an infected person - coughs - sneezes - talks Droplets are too large to be airborne for long periods of time, and quickly settle out of air.

Let's review the three types of transmission:

1. If a bacteria or virus is transmitted through physical contact with another person, this is classified as direct / indirect / droplet (circle one) contact.
2. If a bacteria or virus is transmitted through a contaminated surface, this is classified as direct / indirect / droplet (circle one) contact.
3. If a bacteria or virus is transmitted through inhalation through that mouth or nose, this is classified as direct / indirect / droplet (circle one) contact.
4. Complete the table below by selecting (✓) which type of transmission each interaction between people classifies as to transmit disease causing bacteria and/or viruses.

Interaction	Direct Contact	Indirect Contact	Droplet Contact
Giving a high five to a teammate			
Sharing your water bottle with your friend			
Kissing your significant other			
Sneezing at a crowded movie theater			
Borrowing a cell phone to call someone			
Ex:			
Ex:			

5. Select one type of transmission, and create a 3 "scene" cartoon that demonstrates how a bacteria or virus is transmitted from one person to another. *Note: Stick figures are OK to draw!*

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PART 3:

While the COVID-19 is a novel, or new, virus that is impacting the world, different types of viruses have been around for a long time. Review the table below and then use it to see if we can diagnose patients based on their current symptoms. (Questions 1-5)

Infectious Disease	Description	Symptoms	Common Causes		Are antibiotics needed?
			Bacteria	Virus	
Strep Throat	Strep throat is caused by the <i>bacterium streptococcus</i> . There is no vaccine for strep.	<ul style="list-style-type: none"> - Sore throat - Fever - Swollen neck glands - Usually NO cough or runny nose <p>Children may develop scarlet fever:</p> <ul style="list-style-type: none"> - Skin rash with small red spots 	X		Yes
Influenza "Flu"	The flu is caused by a virus. The flu is acquired by inhaling the virus. There is a flu vaccine.	<ul style="list-style-type: none"> - Headache - Dry cough - Runny nose - Sore throat - Muscle ache - Exhaustion - Fever up to 104°F 		X	No
Meningitis	Viral meningitis is caused by a virus. There is no vaccine.	<ul style="list-style-type: none"> - Fever - Severe headache - Stiff neck - Sensitivity to bright lights - Drowsiness or confusion - Nausea or vomiting 		X	No
Common Cold	The common head cold is caused by any one of more than 200 different viruses. There is no vaccine.	<ul style="list-style-type: none"> - Sneezing - Runny nose - Scratchy throat 		X	No

1. Infectious Disease Case Study: Ruby

History: 12 year old female. Her tetanus vaccine is up-to-date, but she has not had a flu shot this year. She attends school.

Symptoms: She currently has a fever of 103 °F. She is tired and weak. She has a headache, muscle aches, and a cough.

Lab results: Positive for elevated antibodies; positive for antigens

- a. Based on the history and symptoms, identify the infectious disease: _____
- b. Treatment: Should the doctor prescribe antibiotics: Yes / No (circle one)

2. **Infectious Disease Case Study: Tony**

History: 14 year old male. He attends school. He has received his flu vaccine this year.

Symptoms: He currently has a fever of 102 °F. His throat is very sore and shows signs of swelling.

Lab results: Elevated antibodies are a sign of infection, whether it is caused by bacteria or a virus. When antigens are not present, this is a sign that the infection is also caused by a bacteria.

- a. Based on the history and symptoms, identify the infectious disease: _____
- b. Treatment: Should the doctor prescribe antibiotics: Yes / No (circle one)

3. **Infectious Disease Case Study: Jerry**

History: 45 year old male. He has two children, both in daycare. He did not have a flu shot this year.

Symptoms: He has a runny nose, scratchy throat, and is sneezing. He does not have a fever.

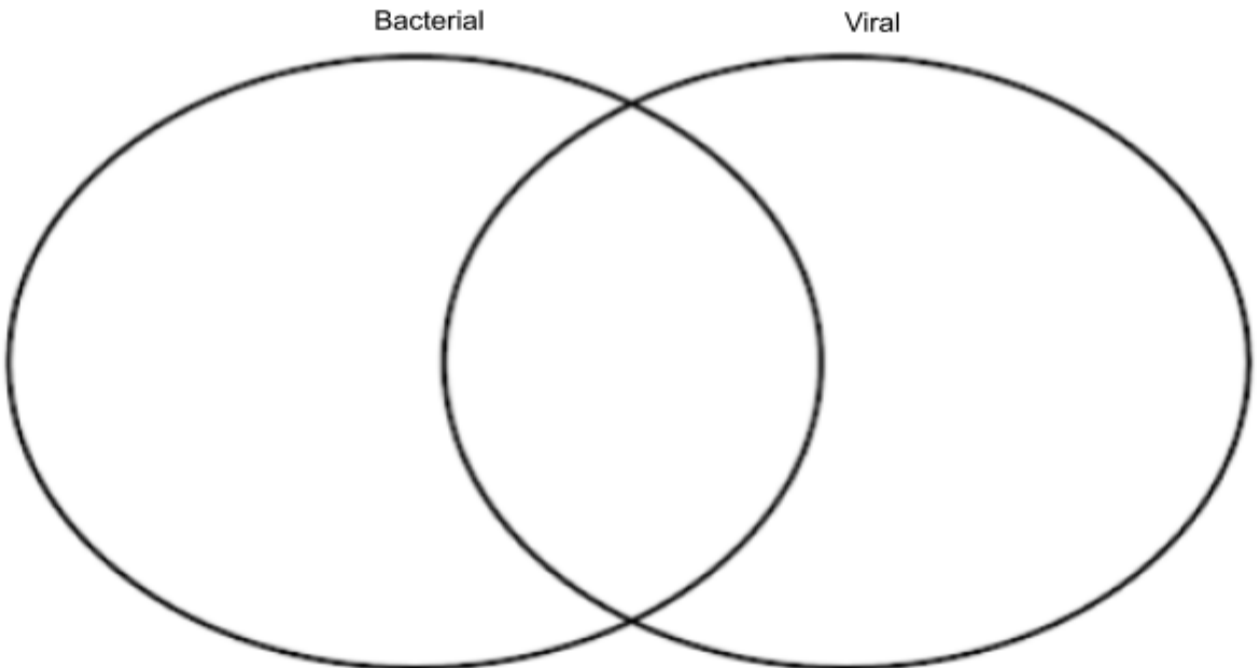
Lab results: Positive for elevated antibodies; positive for antigens.

- a. Based on the history and symptoms, identify the infectious disease: _____
- b. Treatment: Should the doctor prescribe antibiotics: Yes / No (circle one)

4. How are infectious diseases, such as colds and influenza, most commonly spread?

- a. Breathing viruses in air
- b. Hand-to-face contact
- c. Drinking infected water
- d. Eating contaminated food

5. Complete the Venn Diagram below, to compare and contrast the similarities and differences seen in infectious diseases caused by bacterial and viral infections.



As seen in the case studies, antibiotics are a way to help our immune system fight off bacterial infections that in the past may have resulted in death. They work by attacking the cell wall of the bacteria and interfering with the processes it needs to multiply. Before people began using antibiotics to treat bacterial infections in the 1930s, even a small scratch could be deadly if it became infected. Nowadays, antibiotics save millions of lives. We use them to treat common bacterial infections and to make surgery safer.

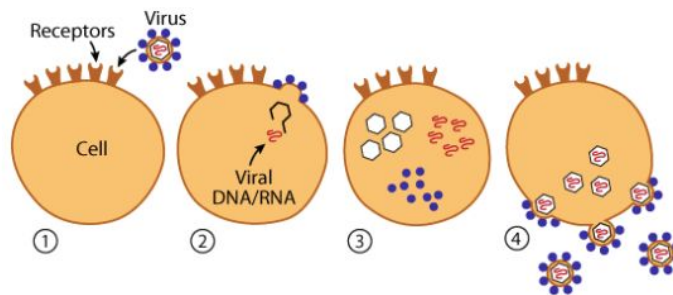
So, why are antibiotics only useful for illnesses and diseases caused by bacteria and **not** viruses?

Viruses are different from bacteria; they have a different structure and a different way of surviving. In the figure below you will see that viruses don't have cell walls that can be attacked by antibiotics; instead they are surrounded by a protective protein coat.



Figure: (a) Components of virus, (b) components of bacteria

Unlike bacteria, which attack your body's cells from the outside, viruses actually move into, live in and make copies of themselves in your body's cells. Viruses can't reproduce on their own, like bacteria do, instead they attach themselves to healthy cells and reprogram those cells to make new viruses. It is because of all of these differences that antibiotics don't work on viruses.



Proteins on the virus bind to receptors on the outside of a cell (1). Once inside, the virus releases its DNA or RNA into the cell (2) which instructs the cells to build more copies of the virus (3). These new viruses are released (4), either through budding (shown here) or through destruction of the cells.

6. Explain why Tony was prescribed an antibiotic to treat his infectious disease, but an antibiotic would not be an appropriate treatment for Ruby and Jerry.

PART 4:

On Wednesday, March 10, the World Health Organization (WHO) declared that the COVID-19 disease had reached characteristics of a pandemic. Read their statement below.

"WHO has been assessing this outbreak around the clock and we are deeply concerned both by the alarming levels of spread and severity, and by the alarming levels of inaction.

We have therefore made the assessment that COVID-19 can be characterized as a pandemic.

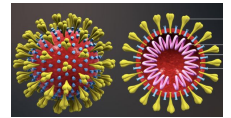
Pandemic is not a word to use lightly or carelessly. It is a word that, if misused, can cause unreasonable fear, or unjustified acceptance that the fight is over, leading to unnecessary suffering and death.

Describing the situation as a pandemic does not change WHO's assessment of the threat posed by this virus. It doesn't change what WHO is doing, and it doesn't change what countries should do.

We have never before seen a pandemic sparked by a coronavirus. This is the first pandemic caused by a coronavirus. And we have never before seen a pandemic that can be controlled, at the same time."

So, where did the COVID-19 outbreak initially start? And how has it grown to infect people worldwide? On December 29th, 2019 Chinese authorities identified a group of similar cases of pneumonia (fluid in the lungs) in the city of Wuhan in China. Wuhan is a city with 11 million people.

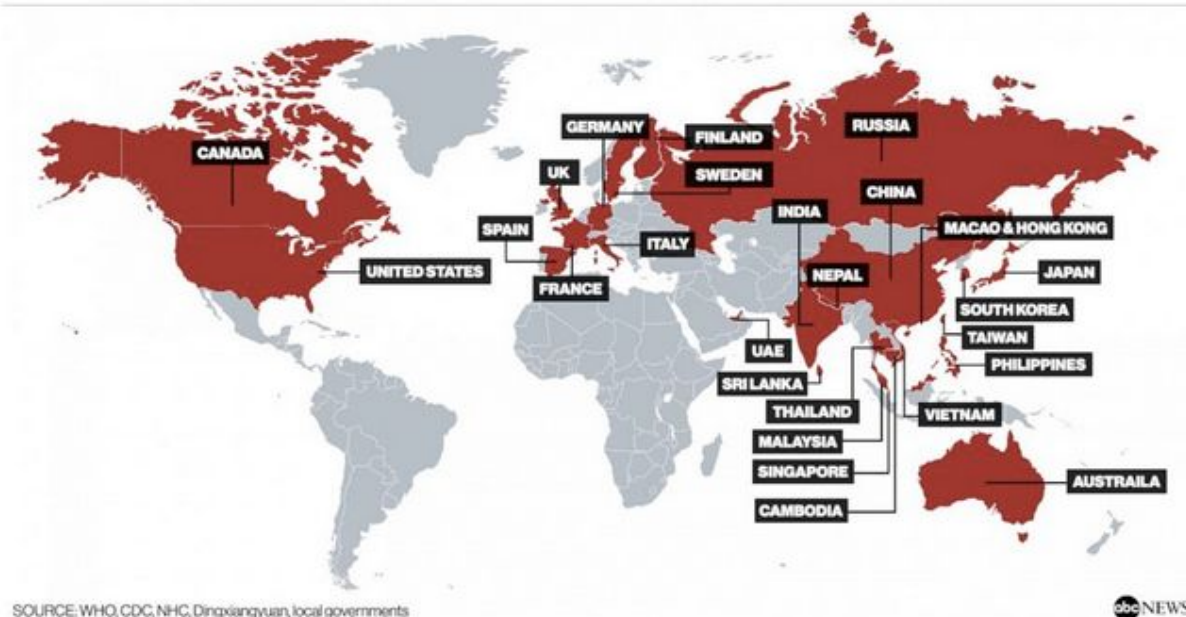
These cases were soon determined to be caused by a new type of coronavirus that was later named SARS-CoV-2. Coronaviruses are not a new disease. They are a group of viruses that are common in humans and are responsible for up to 30% of common colds. Corona is Latin for "crown" and this group of viruses is named such as its surface looks like a crown under an electron microscope.



Two outbreaks of new diseases in recent history were also caused by coronaviruses – SARS in 2003 that resulted in around 1000 deaths and MERS in 2012 that resulted in 862 deaths.

The first cases of COVID-19 outside of China were identified on January 13th in Thailand and on January 16th in Japan. On January 23rd the city of Wuhan and other cities in the regions were placed on lockdown by the Chinese Government. Since then COVID-19 has spread to many more countries – cases have been reported in all world regions.

COUNTRIES WITH CONFIRMED CORONAVIRUS CASES



1. Wuhan is a city of 11 million people, and Los Angeles has 4 million people. How do you predict the cities of Wuhan and Los Angeles are similar and different?

Wuhan	Los Angeles

2. The image below is a cartoon representation of what an urban environment - *much like the cities of Wuhan and Los Angeles*- look like. List and describe three factors that might promote the transmission of the disease between people.



Example: In many urban environments, people use the gym to exercise. The gym is a breeding ground for disease because many people touch and sweat on the equipment without properly cleaning after use. So it would be easy for a disease to be transmitted through indirect contact or droplet contact.

3. In the city of Wuhan, these people were placed on a lockdown. In the media we hear people suggesting we self-quarantine (isolation) in Los Angeles. Why might isolation help reduce the transmission of the disease in urban environments?

4. The first cases of COVID-19 were observed in China in late December (2019). The next reported cases outside of China occurred January 13, 2020 in Thailand and January 15 in Japan. Using the map and the text above, list three other countries or regions that have reported cases of COVID-19 and propose a prediction as to how the virus was transmitted to people in those other countries or regions.

PART 5:

In that last map, it was easy to see how COVID-19 has slowly spread from China to many other countries around the world. But, what exactly did WHO mean, when they said this is now a pandemic? This section will look at the terminology used by epidemiologists - *a scientist who studies the causes of diseases* - and other scientists used to describe the occurrence and spread of the disease.

Using the image below, match the description that best describes an endemic, epidemic, and pandemic.



1. _____: of a disease or a condition, regularly found and very common among a particular group or in a particular area
2. _____: of a disease or a condition, a widespread occurrence of an infectious disease that is prevalent (common) over a whole country or the world.
3. _____: of a disease or a condition, a widespread occurrence of an infectious disease in a community - an interacting group from a common location.

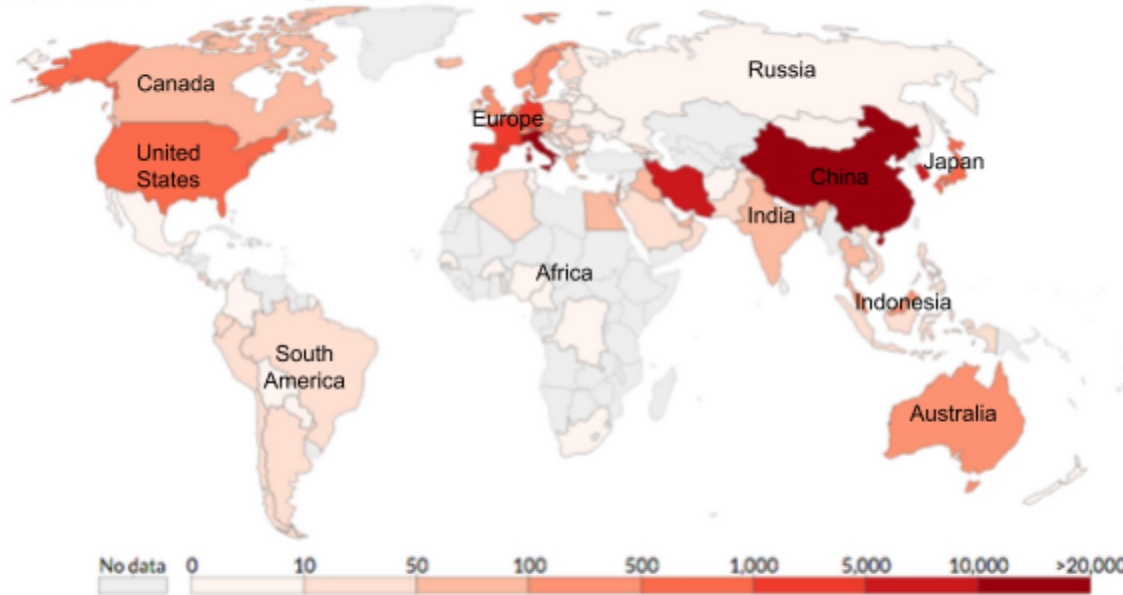
4. Describe the similarities and differences between endemic, epidemic, and pandemic based on the image.

Even though people are at risk of infection by sometimes dangerous viruses at any moment, the idea of a pandemic is particularly worrisome to most. The main concerns about a pandemic are its scale, speed, and severity.

You may wonder how a pandemic starts. One contributing factor is the current ease of global travel. A single infected person can carry a virus to a new continent, and, if conditions are right, the infection can spread. Viruses mutate fairly rapidly; this characteristic can lead to a pandemic. Mutations can change the route of infection, the target of infection, or the virulence (ability to infect or damage a host) of the infection for a virus. With improvements in DNA sequencing technology, scientists are better able to characterize mutations, an ability that may lead to better prevention strategies or responses, such as new vaccines. However, the novelty, or newness, of COVID-19, epidemiologists and other scientists are playing catch up and trying to understand how this virus works and a vaccine will not be developed anytime soon. For more information about how pandemics work, watch this [video](#).

Total confirmed COVID-19 cases, Mar 11, 2020

The large increase in the number of cases globally and in China on Feb 17 is the result of a change in reporting methodology. It is explained at OurWorldInData.org/Coronavirus



Source: World Health Organization daily Situation Reports [COVID-19]

CC BY

▶ Jan 21, 2020 Mar 12, 2020

1. According to the key, the lighter the region the fewer / more (circle one) cases of COVID-19 have been reported.
2. According to the key, the darker the region the fewer / more (circle one) cases of COVID-19 have been reported.
3. According to the map, there have been fewer reported cases in Africa / Australia (circle one).
4. According to the map, there have been more reported cases in Europe / South America (circle one).
5. Using this map, explain why COVID-19 has been classified as a pandemic. Use at least three examples of regions to support your claim.

Part 6:

In an outbreak of an infectious disease it is important to not only focus on the number of cases, but also the growth rate at which the number of cases is increasing.

The growth rate is an essential measure to understand and to monitor. This is because a fast growth rate can lead to very large numbers rapidly, even if the current numbers of cases and deaths are small when compared with other diseases.

A helpful metric to measure the rate of change is to look at each country and ask: How long did it take for the number of confirmed cases to double?

Let's take an example: if the number of confirmed cases as of today is 1000, and there were only 500 cases three days ago, then we would say that it took three days for the number of confirmed cases to double.

It is important to keep focusing on the doubling time. As long as cases are doubling at a constant rate the growth is exponential.

Under exponential growth 500 cases grow to more than 1 million cases after 11 doubling times. And after 10 more doubling times it would be 1 billion cases. Although it would be wrong to make projections based on the assumption that this stays constant, as the doubling will change during the outbreak.

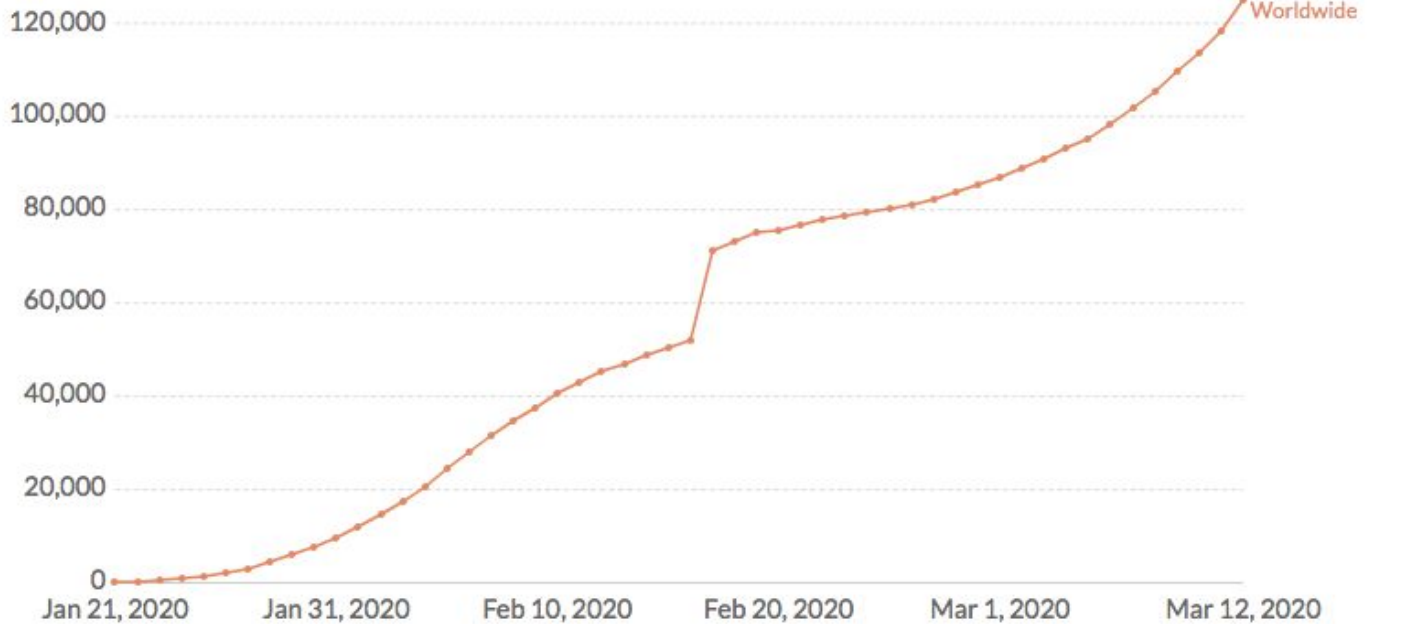
Total confirmed COVID-19 cases

Our World
in Data

The large increase in the number of cases globally and in China on Feb 17 is the result of a change in reporting methodology.

It is explained at OurWorldInData.org/Coronavirus

LINEAR



Source: World Health Organization daily Situation Reports [COVID-19]

CC BY

▶ Jan 21, 2020  Mar 12, 2020

1. Along the X-axis (bottom) of the graph, time / number of COVID-19 cases (circle one) is/are measured.
2. Along the Y-axis (left side) of the graph, time / number of COVID-19 cases (circle one) is/are measured.
3. If there are 10 reported cases of COVID-19, at what number would it be doubled?
Hint: In order to double a number, you must multiply by 2! So, $10 \times 2 = ?$
4. If there are 20,000 cases of COVID-19, at what number of cases would it be doubled?
Hint: In order to double a number, you must multiply by 2! So, $20,000 \times 2 = ?$
5. According to the graph, approximately on what date did 20,000 cases of COVID-19 double?
6. According to the graph, and using the calendar below, approximately how many days did it take the 20,000 cases of COVID-19 to double to 40,000?

January 2020							February 2020						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4							1
5	6	7	8	9	10	11	2	3	4	5	6	7	8
12	13	14	15	16	17	18	9	10	11	12	13	14	15
19	20	21	22	23	24	25	16	17	18	19	20	21	22
26	27	28	29	30	31		23	24	25	26	27	28	29

7. As of March 12, 2020 the number of reported cases of COVID-19 reached 120,000. If our behavior does not change, as suggested by Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, predict if the graph will continue to exponentially grow upwards, slow down and flatten, or begin to decline. Explain your reasoning.

Part 7:

The virus that causes COVID-19 seems to be spreading easily and sustainably in the community.

The virus is thought to spread mainly from person-to-person. This means between people who are in close contact with one another (*within about 6 feet*).

The virus may also be spread through respiratory droplets produced when an infected person coughs or sneezes. These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs. When a person sneezes, the sneeze may travel as far as 26 feet and a cough can travel as far as 19 feet. These droplets can also stay floating in the air for up to 10 minutes.

Lastly, it may also be possible that a person can get COVID-19 by touching a surface or object that has the virus on it and then touching their own mouth, nose, or possibly their eyes, but this is not thought to be the main way the virus spreads.

Draw a model that demonstrates how the COVID-19 virus is transmitted through a sneeze or cough.

With the knowledge of how COVID-19 spreads, the Center for Disease Control (CDC) and WHO have recommended “social distancing”.

The term “social distancing” describes actions like cancelling sporting events and closing schools in an attempt to slow the spread of airborne infections, which can help officials track and control its transmission.

Individuals can practice their own versions of social distancing, like completing school work from home when possible and trying to keep 6 feet between them and sick people, to boost their chances of keeping themselves, and their communities, safe during an outbreak.

Dr. Anthony Fauci said we cannot continue “doing the kinds of things we were doing a few months ago” Provide three examples of how you have “socially distanced” yourself and changed your behavior.

- *Example: School has closed so I no longer go to classes to learn and see my friends. I am now learning on my own at home.*

1)

2)

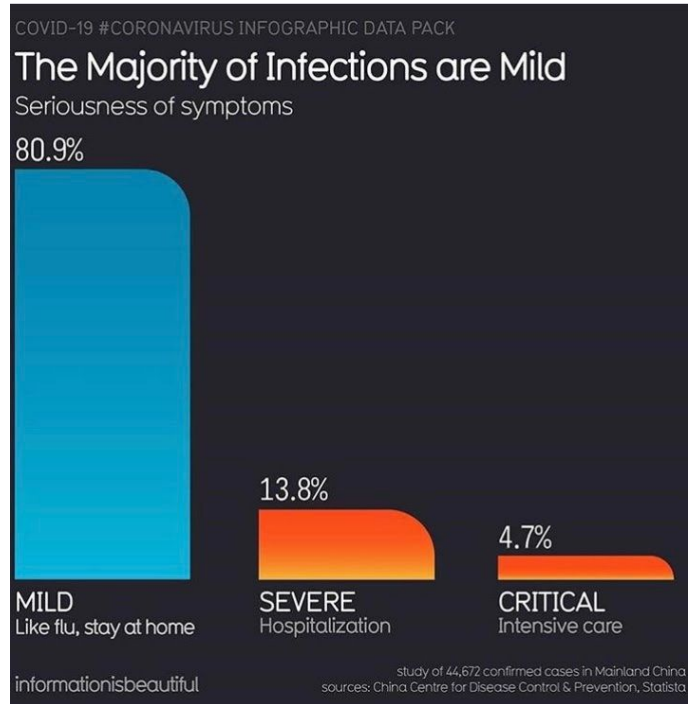
3)

Part 8:

Since a pandemic cannot be stopped once it has started, and because health experts do not know how much warning there will be, once a pandemic is found in an area, social distancing measures should be used early on to slow the spread of the disease and provide communities with the valuable time needed to be better prepared.

The total mortality- death rate - of an epidemic can be high even if the symptoms for the vast majority are mild. Although it sounds weird, it can be the case that two things are true at the same time:

- For the majority of people, the symptoms are mild and in some cases similar to the common flu.
- And an epidemic of the same disease can cause a very high number of deaths.



Use the graph and information above to answer the following questions.

1. What percentage of individuals infected with COVID-19 have mild symptoms?
2. What percentage of individuals infected with COVID-19 have severe **and** critical symptoms that require hospitalization?
3. True / False (circle one) If you have mild symptoms and have been asked to quarantine (isolate), you should stay home and watch TV or read a book by yourself.
 - a. Explain why you selected true or false.

4. True / False (circle one) If you have mild symptoms and have been asked to quarantine (isolate), you should still go to your friend's birthday party.
 - a. Explain why you selected true or false.

Part 9:

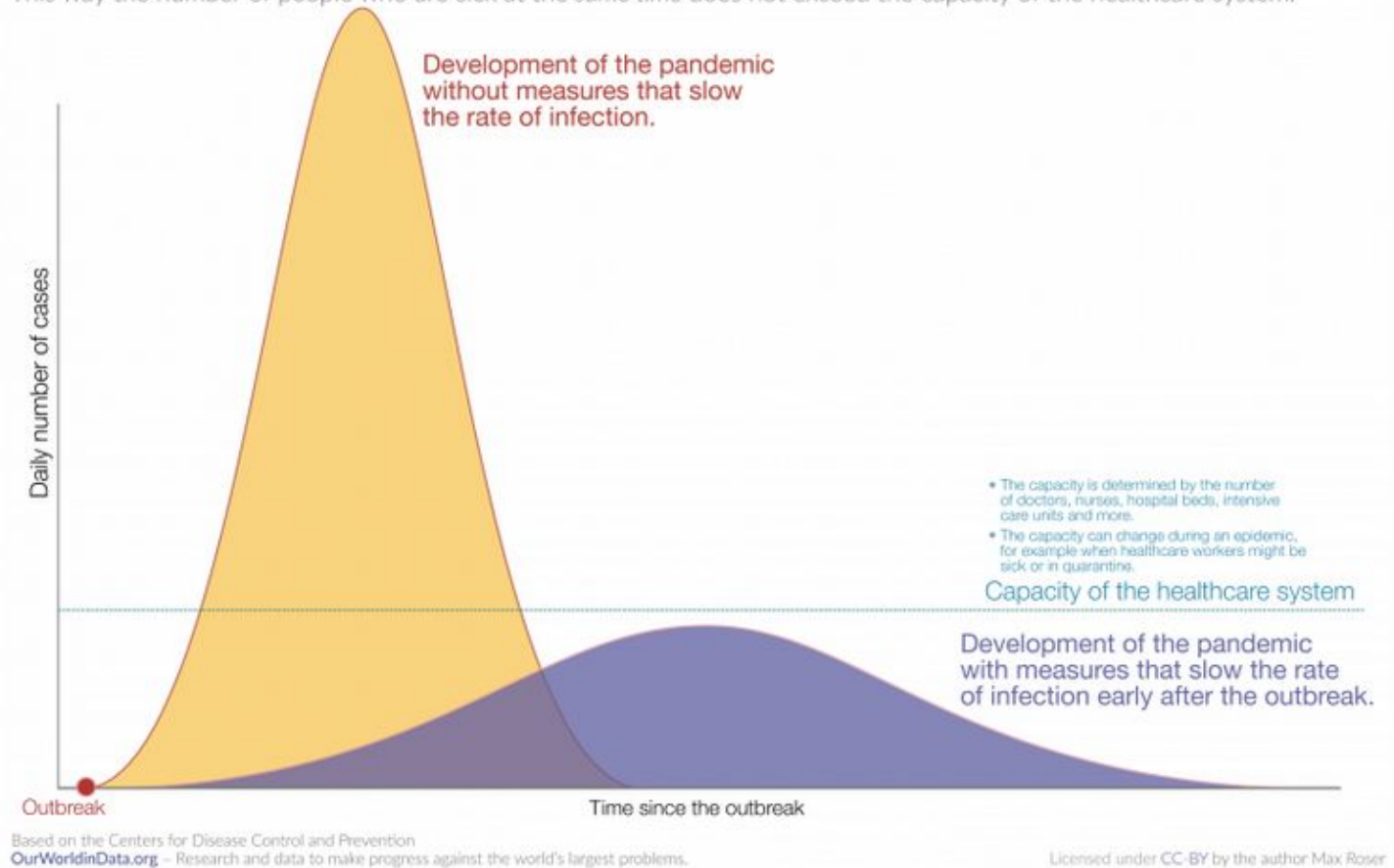
The intention of social distancing is to lower the rate of infection so that the epidemic is spread out over time and the peak demand for the healthcare system is lower. This will allow the healthcare system to provide care for all who need it.

While the total number who get infected might not change, the containment measures intend to avoid an outbreak in which a large number of people get sick at the same time. This is what the visualization shows.

In the outbreak of an epidemic *early* counter measures are important



Their intention is to 'flatten the curve': to lower the rate of infection to spread out the epidemic. This way the number of people who are sick at the *same time* does not exceed the capacity of the healthcare system.



This is the reason that limiting the height of peak incidence of an outbreak is important – health systems can care for more patients when the number of cases is spread out over a long period and it is not peaking in a very short period.

A worst-case scenario for a pandemic of COVID-19 is that the number of patients at one point in time is so large that health systems would fail to provide the required care for some of them.

1. From the initial outbreak of COVID-19, if **no** measures, such as social distancing, are in place and adhered to (followed), the number of individuals infected grows rapidly / slowly (circle one) exceeding the capacity of the healthcare system.
2. From the initial outbreak of COVID-19, if measures, such as social distancing, are in place, and adhered to (followed), the number of individuals infected grows rapidly / slowly (circle one) allowing the healthcare system to meet the needs of infected individuals.

3. The implementation of measures, such as social distancing, allow for flattening of the curve. Explain what this means.

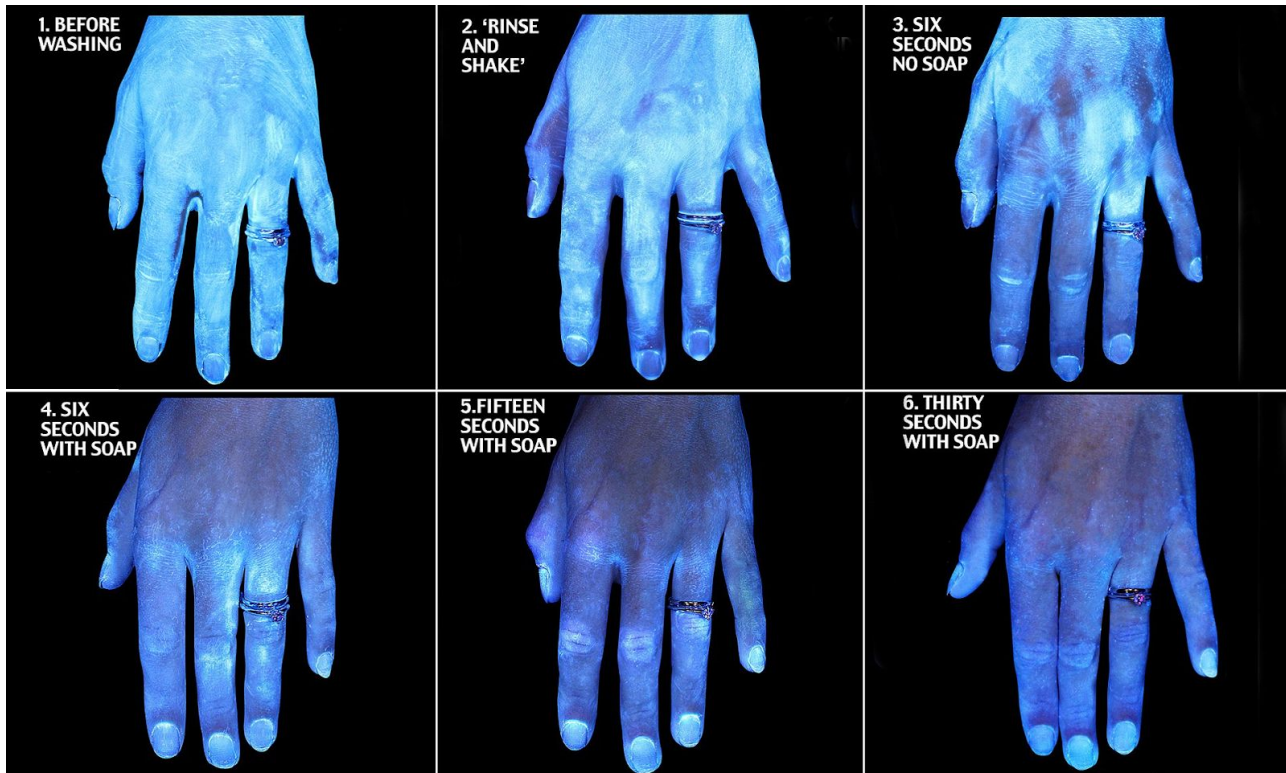
4. Explain why it is important to flatten the “curve.”

Part 10:



Besides social distancing, washing your hands and avoiding the urge to touch your face are the best ways to protect yourself. So, does it really matter if a person washes their hands for 20-30 seconds?

Below is an image that captured how many “germs” remained after testing different hand-washing techniques. The whiter the hands are, the more germs remain, the darker the hands are, the more germs were removed.



1. Rank the hand-washing techniques in order from most effective (1) to least effective (5).

_____ Rinse and shake

_____ 15 seconds with soap

_____ 30 seconds with soap

_____ 6 seconds no soap

_____ 6 seconds with soap

2. Explain how washing your hands for 30 seconds with soap reduces the transmission of germs.

Not only is washing your hands important, but you also need to dry your hands thoroughly. Research has found 85 percent of germs are transmitted by moist hands, compared with 0.06 percent by dry hands.

3. If you do not dry your hands thoroughly, you increase the chances of transmitting germs from 0.06% to _____ %.



Want to learn more? Watch these videos.

Title	URL
How Far Do Sneezes and Vomit Travel?	https://tinyurl.com/grosscience1
What Actually Happens if you get Coronavirus?	https://tinyurl.com/alliancecovid1
How do Viruses Jump from Animals to Humans?	https://tinyurl.com/alliancecovid2
Epidemics vs. Pandemics	https://tinyurl.com/alliancecovid3
WHO: How to Handwash?	https://tinyurl.com/alliancecovid4
Novel Coronavirus Overview	https://tinyurl.com/alliancecovid5
How to Protect Yourself from COVID-19	https://tinyurl.com/alliancecovid6

Tired of watching TV? Here are some infectious disease word searches and crossword puzzles.

HAND WASHING WORD SEARCH

Find and circle the eight words in the puzzle below.

GERMS

DISEASE

SOAP

WASH HANDS

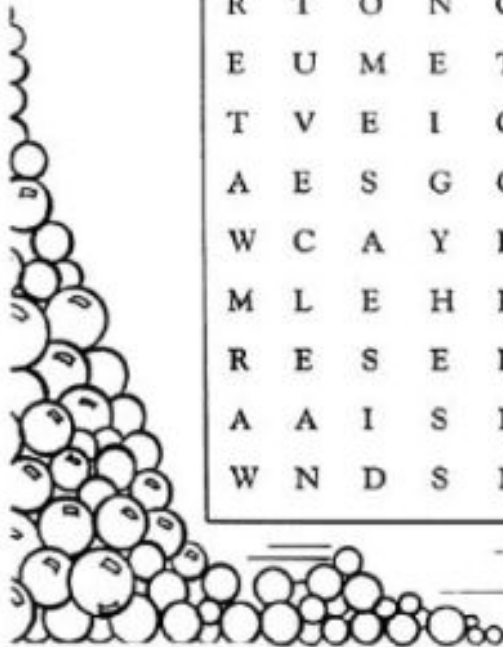
WARM WATER

HYGIENE

CLEAN

HEALTH

O	Z	S	E	I	M	J	K	I
R	T	O	N	C	P	A	O	S
E	U	M	E	T	X	B	D	T
T	V	E	I	G	Q	N	I	V
A	E	S	G	O	A	F	C	H
W	C	A	Y	H	B	P	X	R
M	L	E	H	E	A	L	T	H
R	E	S	E	B	U	R	K	O
A	A	I	S	F	F	B	L	M
W	N	D	S	M	R	E	G	N



Infectious Diseases

R J L W D T S V V G N A D F V I S X V J J Y Q P
T H C Q R P O I Y M J P F R M Y V S Q E R V Q U
D K H A Y R Q Q V N E S A E S I D S Y D E T Q K
L G R D T V W H G Q V K H X X B Z H K C D B O B
I Q K Q L X E E L C S J U L A X T Y T J S Z J Y
N E L P P V R O U W X Y A V T L H O C Y E U K M
F D G W N M B C W K A E X T A F R N H D T P X D
E J G R S C Y H C G P C L E S M M S F Y H T J E
C O V W R A G M G O H T H I M Y R Q I J X T Y G
T E X N T K R A M Y N S B E S O Y X Y C P X F X
I X F L Q U X N G B H T B Z I W J K Q F K Q Q F
O R Y H H T M N I D J K A B W Z R V Y Z S F S L
U G X J F J J D B S A U C G Q E H B Z X U J W B
S X L H A C Y C S V E M S K I G N B N X A G R M
G U N G W D K J B A Y L D F U O O T V Z B T B V
E N R T E L K T W A M N Y O C D U P A L N C V R
P X P I B Q I M F O L U C T Y Q G S E H J Z S F
I H P N V U L L W V F T I Y N B O Q T B W S N P
D M Y L P C L E A N W W E M V U Z D Y A L W E K
E L M B N Y F D A R A V V C O F O G G N G A E C
M Z R T I H Y C G L S T Z U H J V B Z J B J Z P
I C M J S I M W S S E N L L I E D S Z B D S E I
C F R A B F V P K P I A X Z B F I J B L Z G I W
N J F U W Z Q M D G Q A Q U N H E A L T H Y A Y

Clean Unhealthy Body Illness Epidemic Contagious Sick Healthy Virus Sneeze
 Cough Germs Vector Disease Infectious