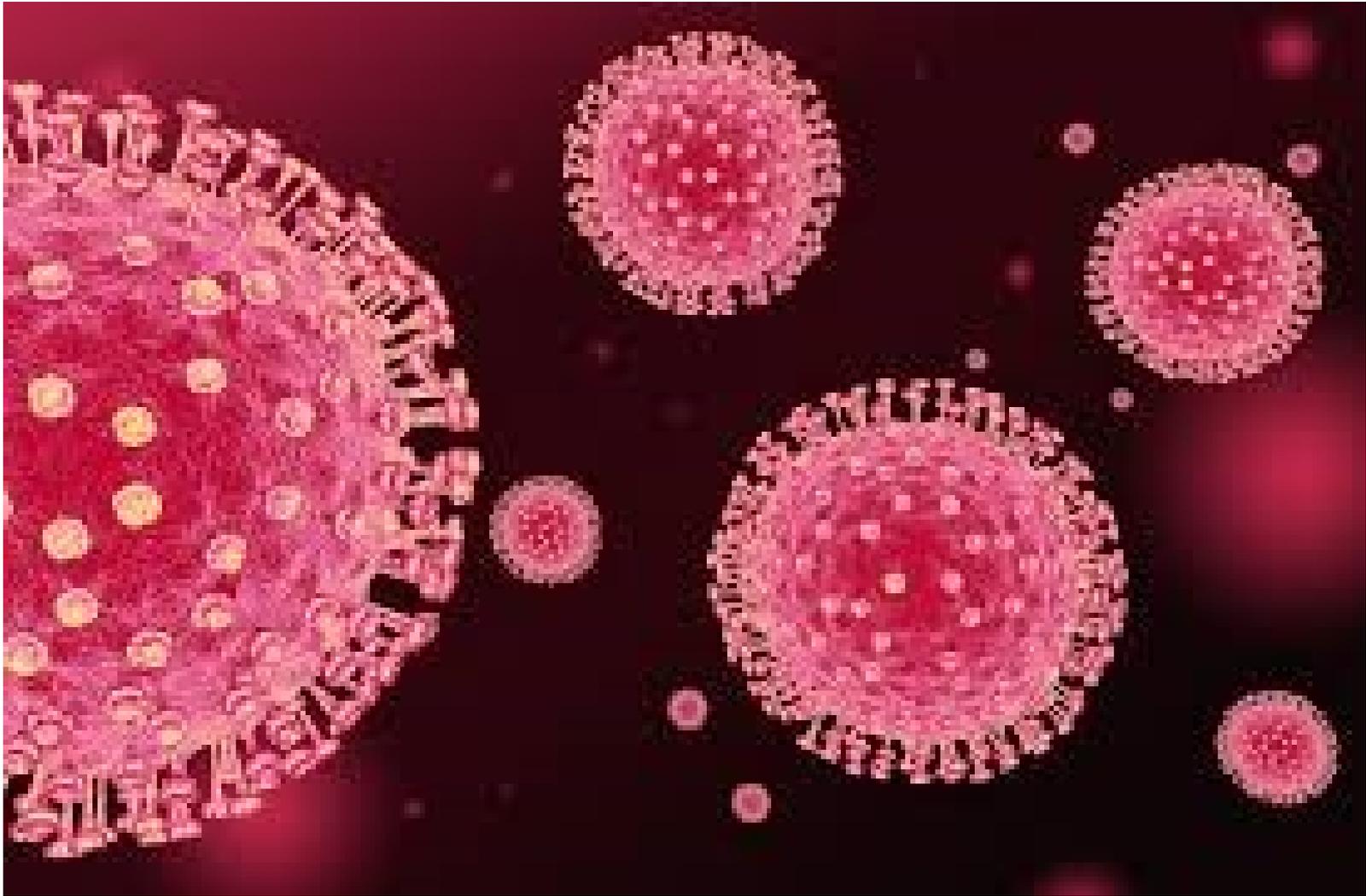


**WHAT YOU NEED TO KNOW ABOUT  
2019 NOVEL CORONAVIRUS (2019-  
NCoV) UPDATE.**

**Dr. Ziba Hooshdaran**

# 2019 Novel Coronavirus (COVID-19)



# INDEX

- Viral Structures
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- Source of COVID-19
- How 2019-nCoV Spreads
- COVID-19 VS Flu
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- Diagnostic
- Prevention
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# GENERAL CHARACTERISTICS OF VIRUS

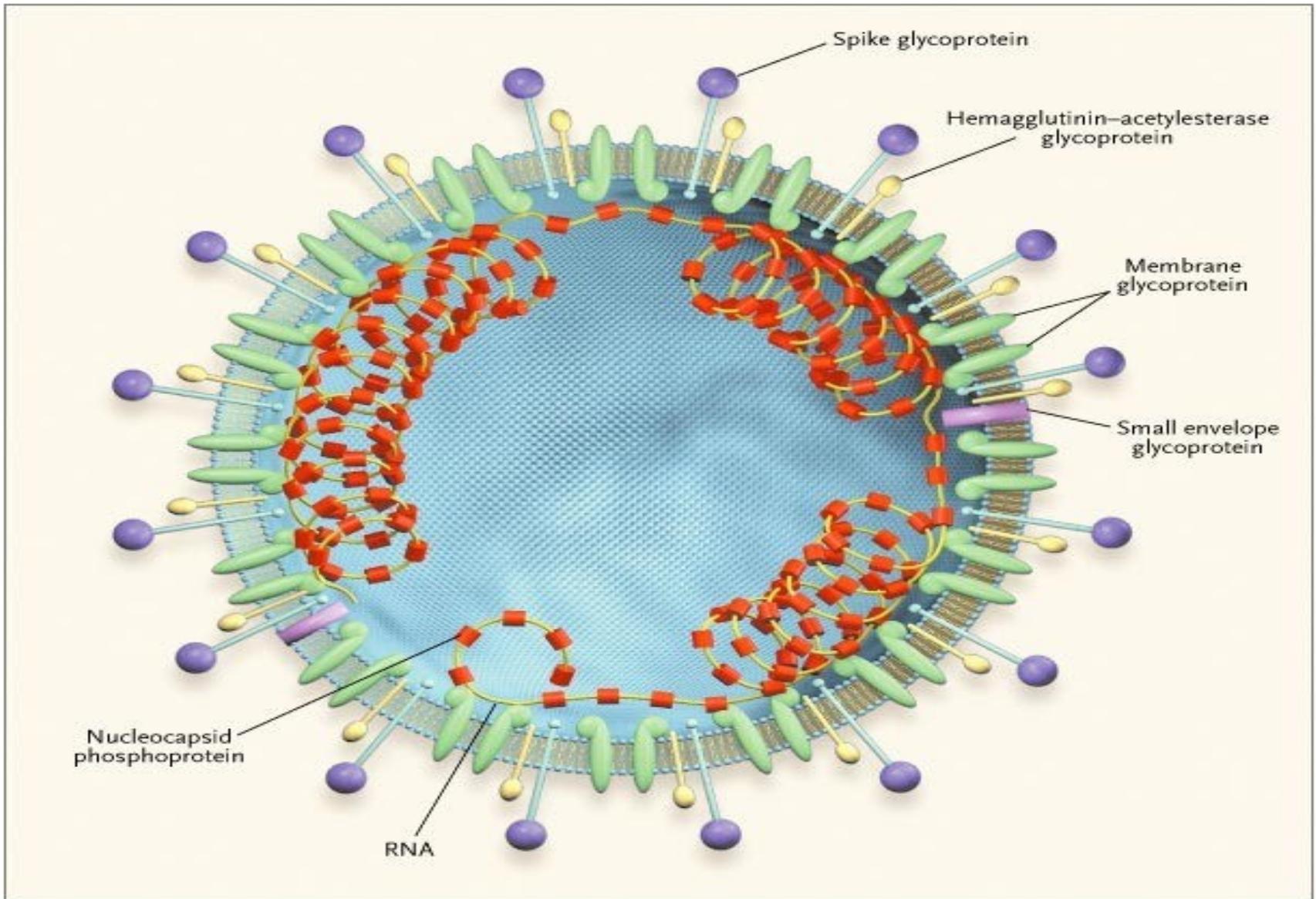
- Obligate intracellular parasites (are completely inert when not in a host cell)
- very small
- **Acellular**
- Viruses cannot replicate without a host cell.
- **Multiply inside living cells by using the cell's own molecular machinery.**
- Diseases caused by viruses include **Rabies, Herpes, and Ebola, HIV.....**
- **Most viruses infect only specific types of cells in one host**
- **As we can not use antibiotic for viruses, vaccination is thus the only feasible method of controlling viral disease**



# CORONAVIRUS CHARACTERISTICS

- Coronaviruses are responsible for about a third of all common cold cases (**rhinoviruses, adenoviruses, and also cause the common cold**).
- Animal and human pathogens that can cause lethal **zoonotic infections like SARS and MERS**.
- The COVID-19 virus is a beta coronavirus, like MERS-CoV and SARS-CoV. All three of these viruses have their origins in **bats**.  
(CDC)
- Coronaviruses are large, lipid-enveloped, **positive-sense, single-stranded RNA viruses**.





Kathryn V. Holmes, Ph.D.

# HISTORY

- Coronavirus disease was first described in 1931.
  - The first coronavirus (HCoV-229E) isolated from humans in 1965 and is responsible for the common cold
  - By 2002 only two human coronaviruses (HCoV) were known – HCoV-229E and HCoV-OC43.
  - **Severe acute respiratory syndrome (SARS-CoV) in late 2002.**
  - **Middle East respiratory syndrome (MERS-CoV) 2012.**
- 

# THE SEVEN CORONAVIRUSES THAT CAN INFECT PEOPLE ARE:

- **Common human coronaviruses**

- 229E (alpha coronavirus)

- NL63 (alpha coronavirus)

- OC43 (beta coronavirus)

- HKU1 (beta coronavirus)

} Common Cold

- **Other human coronaviruses (Pathogen to human)**

- SARS-CoV (the beta coronavirus that causes severe acute respiratory syndrome, or SARS)

- MERS-CoV (the beta coronavirus that causes Middle East Respiratory Syndrome, or MERS)

- 2019 Novel Coronavirus (2019-nCoV)

<https://www.cdc.gov/>



# SARS CORONAVIRUS (SARS-CoV)



- Identified in November 2002.
- SARS-CoV is thought to be an animal virus **possibility from bats, that spread to other animals (civet cats)** and infected humans in the Guangdong province of southern China in 2002.(WHO).
- The main way that SARS seems to spread is by close person-to-person contact.
- **An epidemic of SARS affected 26 countries and resulted in a total of 8,098 cases and 774 deaths in 2003.**
- In the United States, **only eight people** had laboratory evidence of SARS-CoV infection.
- **The SARS pandemic was brought to an end by basic public-health and infection-control measures.**
- <https://www.cdc.gov/>



# MERS CORONAVIRUS(MERS-CoV.)



- **First reported in Saudi Arabia in September 2012.**
- later identified that the first known cases of MERS occurred in Jordan in **April 2012.**
- **MERS-CoV most likely came from an animal. In addition to humans, it has been found in camels and in bat (CDC)**
- The largest outbreak of MERS outside the Arabian Peninsula occurred in the **Republic of Korea in 2015.** The outbreak was associated with a returning traveler from the Arabian Peninsula.
- **An epidemic of MERS affected 27 countries and resulted in a total of 2494 cases and 858 deaths in September 2012.**
- <https://www.cdc.gov/>

# 2019 NOVEL CORONAVIRUS (2019-nCoV)

- 2019 Novel Coronavirus (2019-nCoV) is a virus belong to coronavirus family.
- **Identified as the cause of an outbreak of respiratory illness.**
- Early on, many of the patients in Wuhan, China had some link to a large **seafood and animal market, suggesting animal-to-person spread at least in first 27-40 victim.**
- Later many patients have not had exposure to animal markets, which is indicating **person-to-person spread is occurring.**
- some people have been infected **who are not sure how or where they became infected.**



# IS COVID-19 THE SAME AS THE MERS-CoV OR SARS VIRUS?

- **No.**
- The recently emerged 2019-nCoV is not the same as **Middle East Respiratory Syndrome (MERS)** or **Severe Acute Respiratory Syndrome (SARS)**.
- **However, genetic analyses suggest this virus might emerged from a virus related to SARS.**
- This particular strain of coronavirus **has not been** previously identified in humans
- There is very limited information on transmission, severity and clinical impact



	Lab-confirm	Death	% of death	Country involved	
SARS	8098	774	1%	26	
MARS	2494	858	3.4%	27	
COVID-19	147800	5540	3.7%	144	

([www.cdc.gov/ncov](http://www.cdc.gov/ncov))  
 (Johns Hopkin hospital)



# How COVID-19 TRANSMITTERS

- **Person-to-person spread**
  - Between people who are in close contact with one another (**within about 6 feet**).
  - Through respiratory droplets when an infected person coughs or sneezes.
- **Spread from contact with infected surfaces or objects.**
  - It might be possible that a person can get COVID-19 by touching a surface infected with the virus on it and then touch their mouth, nose, or eyes, but this is not the main way the virus spreads.
- **Can someone spread the virus without being sick?**
  - People are contagious when they are most symptomatic (sick).
  - Some spread might be possible before people show symptoms; (new for this virus), **That make it difficult or even impossible to control it.**
- Some people who become infected are called “**super spreaders**” can spread virus more rapidly than the average person. ( one infected MERS to 81 people).
  - Initial dose they got was high
  - They got virulence one
  - Or virus mutated in their body

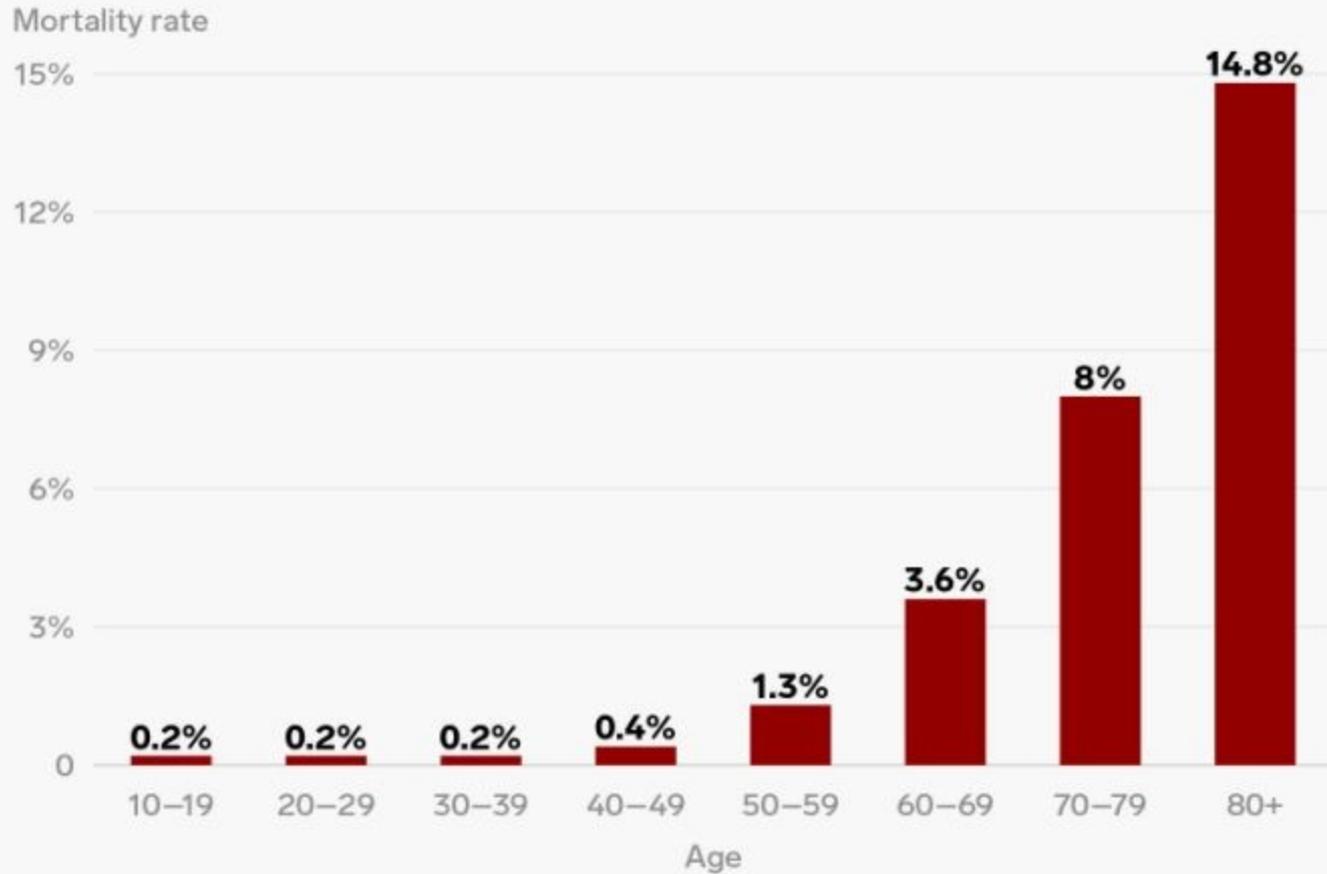


# WHO IS AT RISK?

- According to the CDC, older adults and people with underlying health conditions may be at increased risk for the virus.
- **people** over age 45, with men more are at **risk**.
- A new report “coronavirus cases in children “have been rare” and the median age of patients is between 49 and 56 years of age”.
- “We know that pediatric cases (individuals under the age of 15) are rare, but I know they are not unheard of,”.



## COVID-19 mortality rate by age



Source: Chinese Center for Disease Control and Prevention

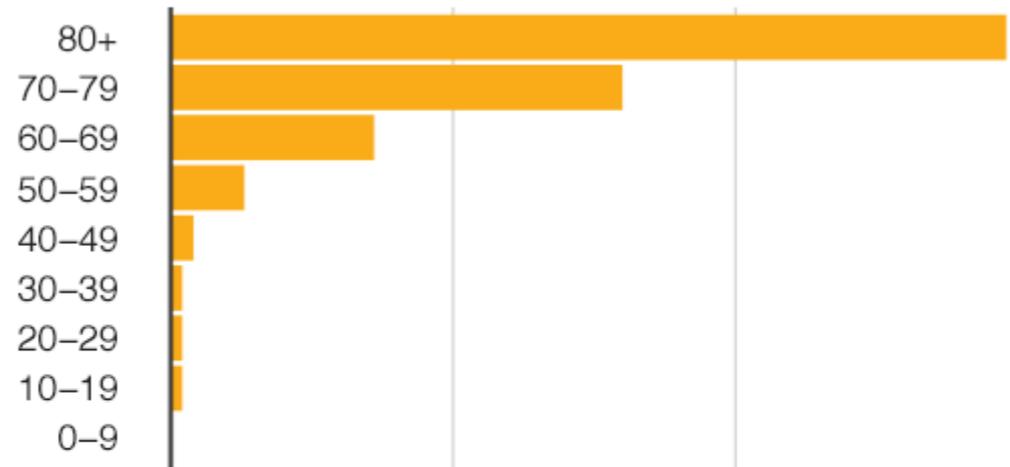
BUSINESS INSIDER



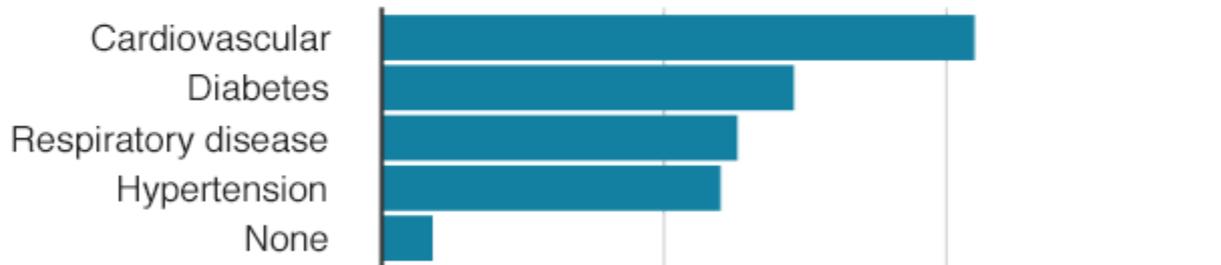
# Death rate varies by age, health and sex

Proportion of deaths among confirmed cases

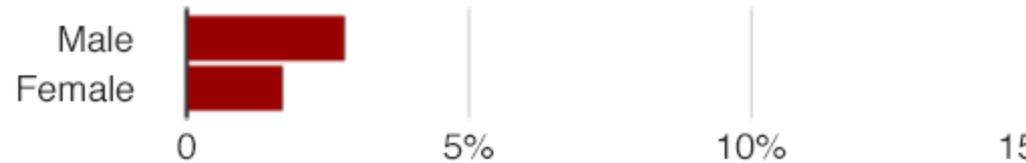
## Age



## Health condition



## Sex



# PREGNANT WOMEN

- **Are pregnant women with COVID-19 at increase risk for adverse pregnancy outcome?**
  - No information of adverse effect or miscarriage or stillbirth.
  - High fever in the first trimester of pregnancy can increase the risk of certain birth defects.
- **Are pregnant healthcare personnel at increase risk for adverse outcome if they have patient with COVID-19?**
  - Information's are very limited, Facilities may consider limiting exposure of pregnant HPC with confirmed or suspected COVID-19.
  - Can pregnant women with COVID-19 pass the virus to their fetus or newborn?
- **Can pregnant women with COVID-19 pass the virus to their fetus or newborn?**
  - Because it is not by close contact , (before, during or after delivery) it is still unknown. But in limited papers, infant born from COVID-19 positive mom no virus cause COVID-19 was detected.
  - Also no virus was detected in amniotic fluid or breast milk.



# Wuhan coronavirus

Coronaviruses are a family of infections that include the common cold, and viruses such as SARS and MERS

## Common symptoms

Headache and malaise

Runny nose

Cough or sore throat

Muscle pain

## Potential complications

High fever (above 38°C or 100.4°F)

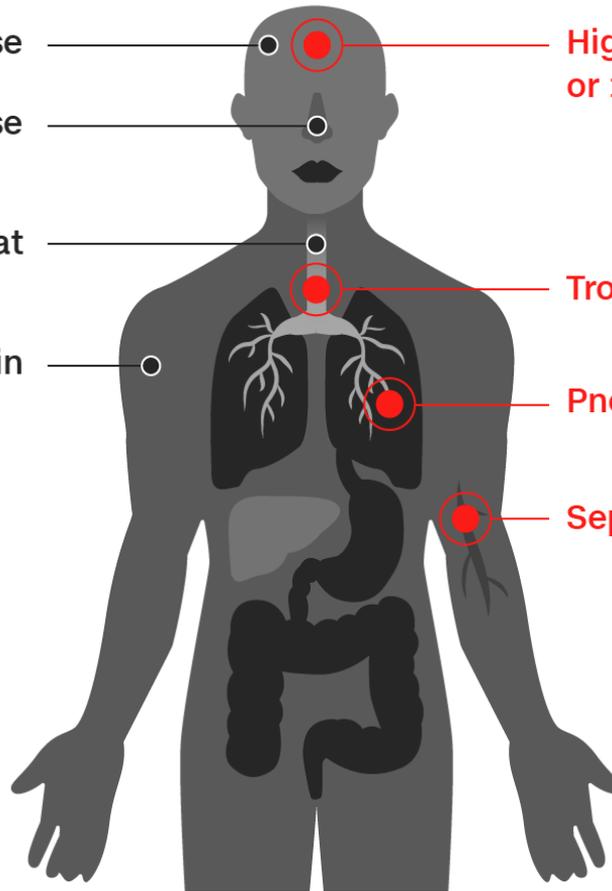
Trouble breathing

Pneumonia

Sepsis or even death

## Spread

**Human-to-human transmission** has been confirmed. People advised to wear masks, wash hands frequently and avoid close contact with anyone who has fever and cough.



**Manifestations of severe disease included severe pneumonia, acute respiratory distress syndrome, septic shock, and multi-organ failure**

# COUNTRIES WITH LAB CONFIRMED COVID-19

- Countries with cases
- Country with travel –associated cases.
- <https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>



# WHAT TO DO IF YOU ARE SICK WITH CORONAVIRUS DISEASE 2019 (COVID-19)

- Stay home except to get medical care
- Separate yourself from other people and animals in your home
- Call ahead before visiting your doctor
- Wear a facemask
- Cover your coughs and sneezes
- Clean your hands often
- Avoid sharing personal household items
- Clean all “high-touch” surfaces everyday
- Monitor your symptoms



# INFORMATION FOR TRAVELERS

- **CDC recommends that travelers**
- **avoid all nonessential travel to countries on next slide. Travel Notice Warning Level 3**
- All travelers from those country, following steps:
- **First, watch for any changes in your health for 14 days after leaving.**
- If you get a fever or develop a cough or difficulty breathing during this 14-day period, avoid contact with others.
- Call your doctor or healthcare and tell them about your symptoms and your recent travel.
- They will provide further instruction about steps to take before your medical visit to help to reduce the risk that you will spread your illness to other people in the office or waiting room, if that is what has made you sick.
- **Don't travel while you are sick.**



# INFORMATION FOR TRAVELERS: CONTINUE

- **CDC has issued the following travel guidance related to COVID-19:**
  - China — Level 3, Avoid Nonessential Travel — updated February 22;
  - Hong Kong — Level 1, Practice Usual Precautions — issued February 19;
  - Iran — Level 3, Avoid Nonessential Travel— updated February 28;
  - Italy — Level 3, Avoid Nonessential Travel — updated February 28;
  - Japan — Level 2, Practice Enhanced Precautions
    - — updated February 22;
  - South Korea — Level 3, Avoid Nonessential Travel
    - — updated February 24.
- CDC also recommends that all travelers reconsider cruise ship voyages into or within Asia.



# WILL WARM WEATHER SLOW DOWN THE CORONAVIRUS?

- Unfortunately no one know for sure!
  - But warm weather effect on other viruses such as flu virus.
  - As the temperature rise, people spend less time inside , where virus can more easily spread. (hypothesis)
- **Sun light**
  - Cut the virus ability to grow in half, so half live will be 2.5 minutes and in dark it is about 13-20 minutes.
  - UV kill the virus.
- **3-Humidity( no humidity they like)**
  - viruses survive the longest in low-temperature, low-humidity environments, **"that is why you see lots of respiratory viruses during the winter."**



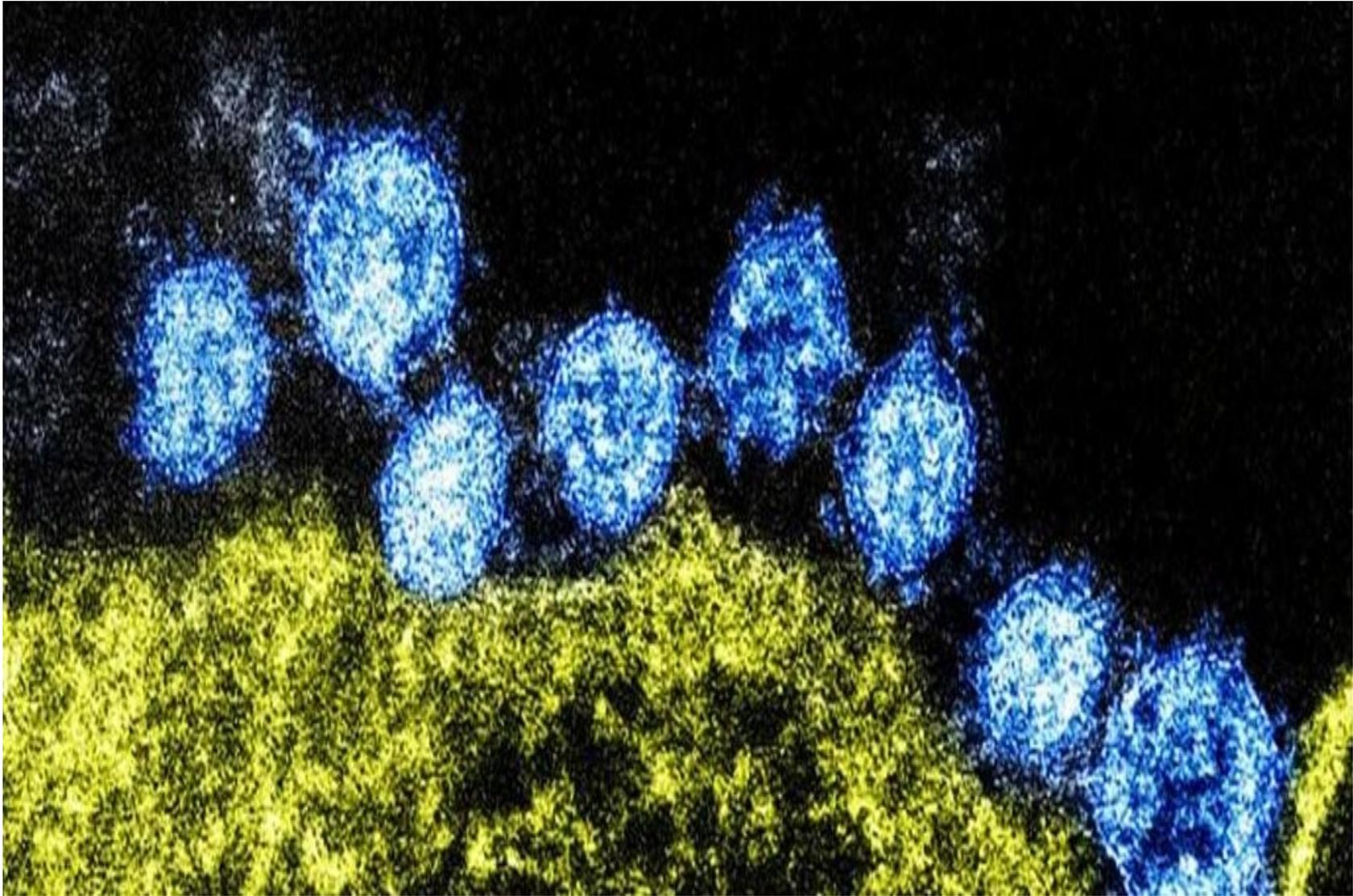
# COVID-19 VS FLU

- **Flu virus bind to sialic acid , a molecule often find in the upper airway.**
- **COVID-19 bind to ACE2 (angiotensin converting enzyme II) , which can be found in the deeper in the lung.** ( as well as human cells with ACE2 proteins from Chinese horseshoe bats and Pigs)(Zheng-Li Shi)
- **Cause**
  - **COVID-19:** Caused by one virus, the novel 2019 coronavirus, now called severe acute respiratory syndrome coronavirus.
  - **Flu:** Caused by any of several different types and strains of influenza viruses ( A,B or C).
- **Vaccine**
  - **COVID-19:** No vaccine is available at this time.
  - **Flu:** A vaccine is available and effective to prevent and reduce the severity of the flu.
  - ([Lisa Lockerd Maragakis, M.D., M.P.H.](#) John Hopkins Hospital)



Symptom	COVID-19	Flu	COLD	Allergy
Effective site	Lower respiratory	Upper Respiratory	Upper Respiratory	
Fever	Common	Common	Rare	
Fatigues	Common	Common	Some times	Common
Dry Cough	Common	Common		Some times
<b>Difficulty Breathing</b>	<b>Sever</b>			<b>Some times</b>
Aches and Pains	Some times	Some times		
Sneezing	Common	Common		Some times
Runny Nose	Some times	Some times		Common
Stuff Nose		Some times	Common	Common
Sore Throat	Some times	Some times	Common	





# TREATMENT

- **There is no specific antiviral treatment recommended for 2019-nCoV infection.**
- People infected with 2019-nCoV should receive **supportive care** to help relieve symptoms.
- For severe cases, treatment should include care to support vital organ functions.
- People who think they may have been exposed to 2019-nCoV should contact your healthcare provider immediately.
- **There is currently no vaccine to prevent 2019-nCoV infection.**
- Chinese health authorities were the first to post the **full genome** of the 2019-nCoV in GenBank.
- **CDC is posting the full genome** of the 2019-nCoV viruses detected in U.S. patients to GenBank as sequencing is completed.



# WHAT TEST CAN BE DONE

- CDC has developed a new laboratory test kit for use in testing patient specimens contaminated with COVID-19.
- The test kit, (**CDC 2019-nCoV Real Time RT-PCR**).
- Designed for use with an existing RT-PCR testing instrument that is commonly used to test for seasonal influenza.
- This test is use with upper and lower respiratory specimens collected from persons who meet CDC criteria for 2019-nCoV testing.
- The test kit has not been FDA cleared or approved, however distribution and use of the test kits follows the U.S policy.





# WHERE WE GET SAMPLE FROM

- A swab can be taken from the nose.
- A swab from the throat.
- Phlegm that is coughed up may be used.
- A blood test



## HOW DO WE TEST A PERSON FOR COVID-19.

- At this time, diagnostic testing for COVID-19 can be conducted **only at CDC**.
- State and local health departments who have identified a **person under investigation (PUI)** should immediately notify CDC's **Emergency Operations Center (EOC)** to report the PUI and determine whether testing for 2019-nCoV at CDC is indicated.
- The EOC will collect, store, and ship specimens appropriately to CDC, including during afterhours or on weekends/holidays.
- **TN contact: (615) 741 7247**



# HERE ARE 10 THINGS YOU CAN DO TO PREVENT COVID-19:

- 1- Clean your hands regularly – wash with soap and water, or clean with alcohol-based hand rub
- 2- Clean surfaces regularly with disinfectant – for example kitchen benches and work desks;
- 3- Educate yourself about COVID-19. Make sure your information comes from reliable sources;
- 4- Avoid traveling if you have a fever or cough, and if you become sick while on a flight, inform the crew immediately. Once you get to your destination, make contact with a health professional and tell them about where you have been;
- 5- Cough or sneeze into your sleeve. If using a tissue, dispose of the tissue immediately into a closed rubbish bin, and then clean your hands;



# HERE ARE 10 THINGS YOU CAN DO TO PREVENT COVID-19:

- 6- Avoid crowded areas if you are over 60 years old, or if you have an underlying condition;
- 7- If you feel unwell, stay at home and call your doctor or local health professional;
- 8- If you are sick, stay at home, and eat and sleep separately from your family, use different utensils and cutlery to eat.
- 9- If you develop shortness of breath, call your doctor and seek care immediately;
- 10- It's normal and understandable to feel anxious, especially if you live in a country that has been affected.
- ([WHO South-East Asia](#))



# WHAT YOU SHOULD DO

- Stay informed : CDC is updating its website daily.  
([www.cdc.gov/ncov](http://www.cdc.gov/ncov))
- Avoid close contact with people who are sick.
- Avoid touching your eyes, nose, and mouth.
- Stay home when you are sick.
- Cover your cough or sneeze with a tissue, then throw the tissue in the trash.
- Clean and disinfect frequently touched objects and surfaces using a regular household cleaning spray or wipe.
- Follow CDC's recommendations for using a facemask
- **Consumption of raw or undercooked animal products should be avoided.**



# WHEN TO USE A MASK

- If you are healthy, you only need to wear a mask if you are taking care of a person with suspected 2019-nCoV infection.
- Wear a mask if you are coughing or sneezing.
- Masks are effective only when used in combination with frequent hand-cleaning with alcohol-based hand rub or soap and water.
- If you wear a mask, then you must know how to use it and dispose of it properly.



## WHAT YOU SHOULD NOT DO

- Do not travel to area that CDC prohibited.
- Do not use facemasks. CDC does not recommend the use of facemasks for the **general public** to prevent the spread of 2019-nCoV.
- Do not show **prejudice** to people of Asian descent, because of fear of this new virus.
- Do not assume that someone of Asian descent is more likely to have 2019-nCoV.



- **Awareness and prevention are key to reducing possible exposure.**
- (CDC) : it's clear that the novel coronavirus (COVID-19) , along with the anxiety surrounded it, is not going anywhere soon.



# REFERENCES

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- [Peng Zhou, Xing-Lou Yang, Zheng-Li Shi](#)

