

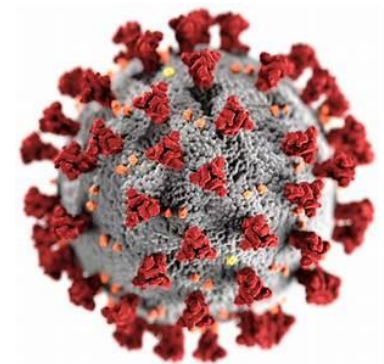
# COVID-19 & Vaccines

## Merle Carter, MD, FACEP

February 17, 2021  
Urban Affairs Coalition  
Philadelphia, PA

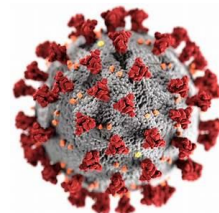
# Roadmap for Today

- Coronavirus-19
- COVID-related Healthcare Disparities
- Vaccines
- Myths & Misconceptions
- Where to Find Information



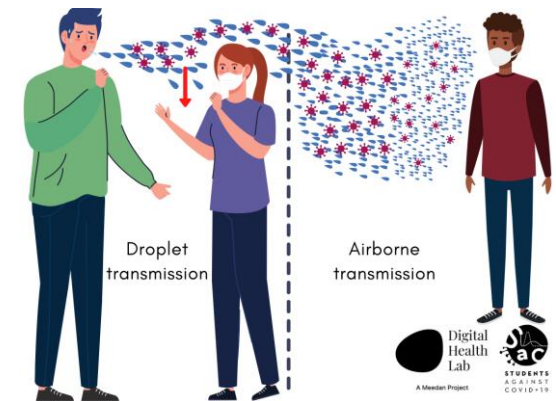
# Coronavirus-19

- **Coronaviruses have been around for decades**
  - Human coronaviruses were first identified in the 1960's
- Coronaviruses cause diseases in mammals and birds.
  - In humans:**
    - **Many types of coronavirus**
    - **Typically use respiratory infections, including the common cold**
- Usually mild, though rare forms such as SARS (including COVID-19) and MERS can be lethal
- Severe Acute Respiratory Syndrome coronavirus (SARS-CoV) first emerged in 2002 in China
  - Recent examples of coronavirus outbreaks:
    - SARS-CoV in 2003
    - MERS-CoV in 2012
- **COVID-19 is a novel (or new) variant of coronavirus not previously been seen in humans**

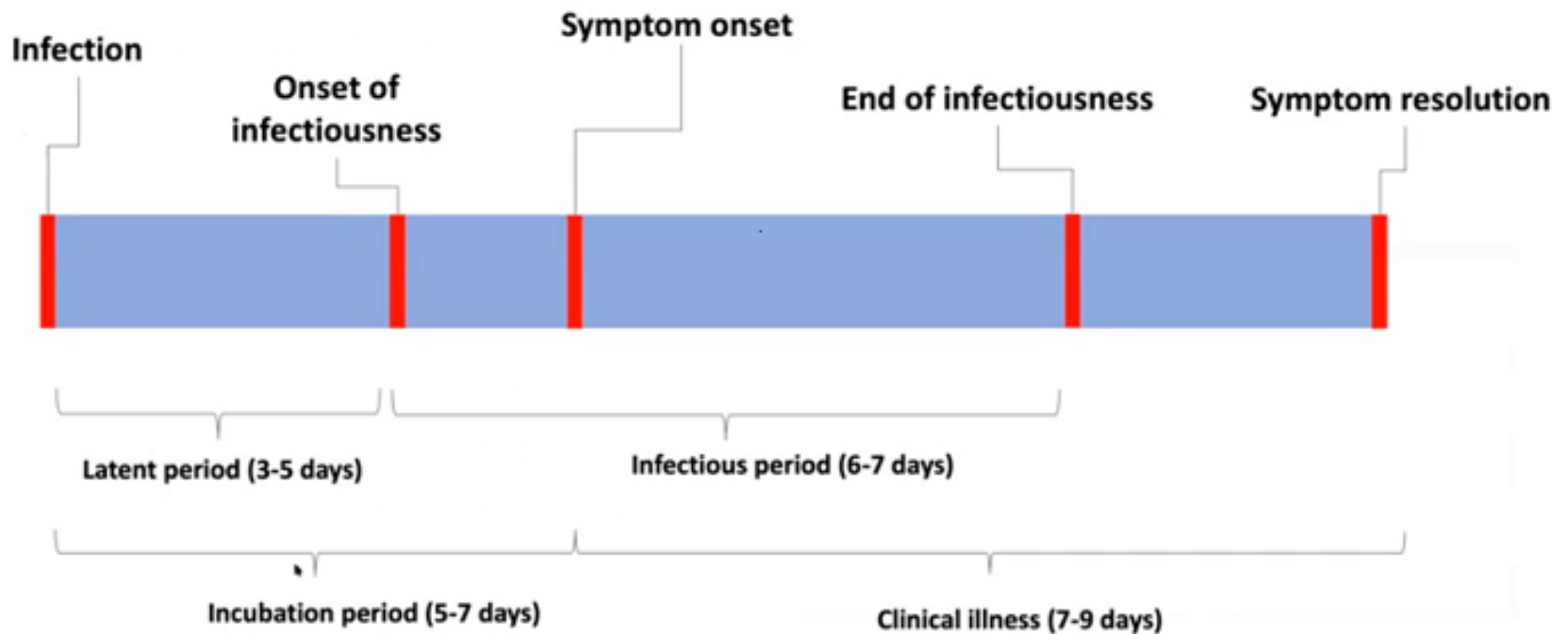


# Coronavirus-19 Transmission

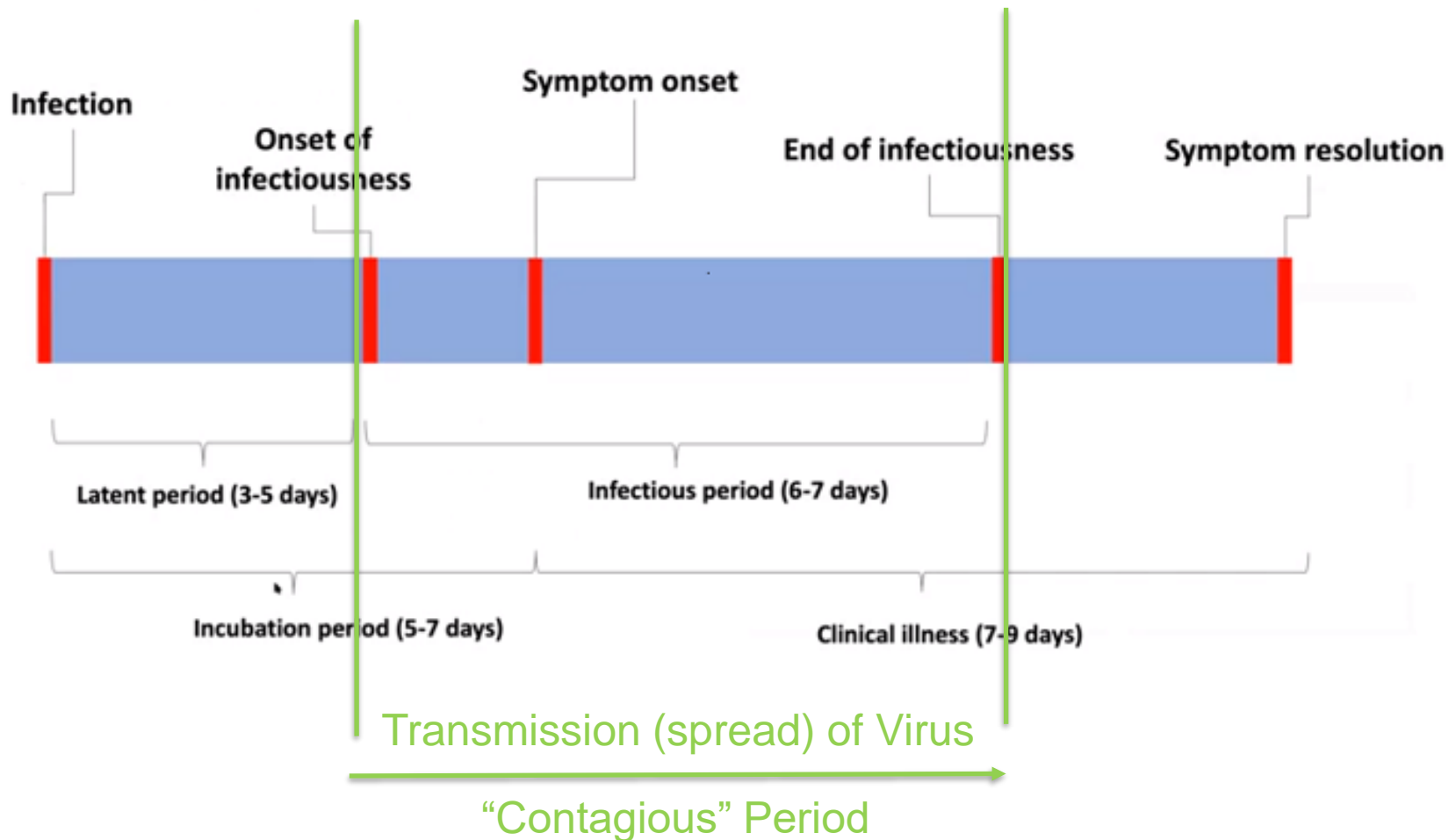
- Close contact (within 6 ft) of someone carrying the virus
- Droplets carrying virus from respiratory tract (nose, mouth) can travel
  - Cough, sneeze, singing, talking, breathing, laughing, exercising, speaking loudly/shouting
- Droplets can linger in the air (“airborne”) or surfaces for minutes to hours
  - Larger droplets travel within seconds to minutes
  - Smaller ones can linger in the air minutes to hours and travel far from source on air currents
- Viruses gain entry through your mouth, nose, or eyes
- Increasing transmission
  - Poorly ventilated spaces (e.g. airplanes, crowded spaces)
  - Enclosed spaces (e.g. cruise ships, nursing homes)
  - Touching surfaces with COVID-19 droplets, then touching your face, nose, mouth, eyes



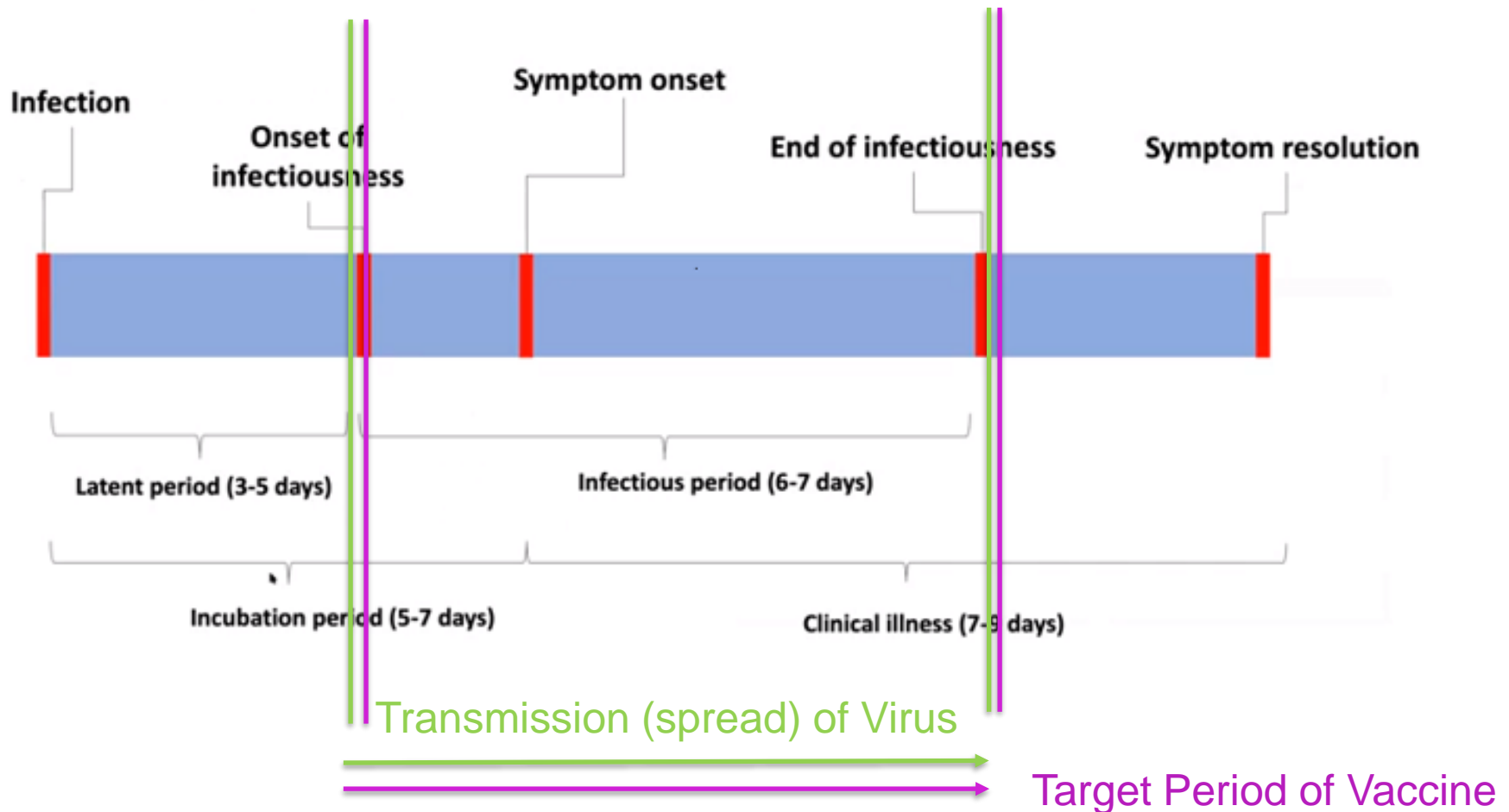
# Time course of infection: COVID-19



## Time course of infection: COVID-19

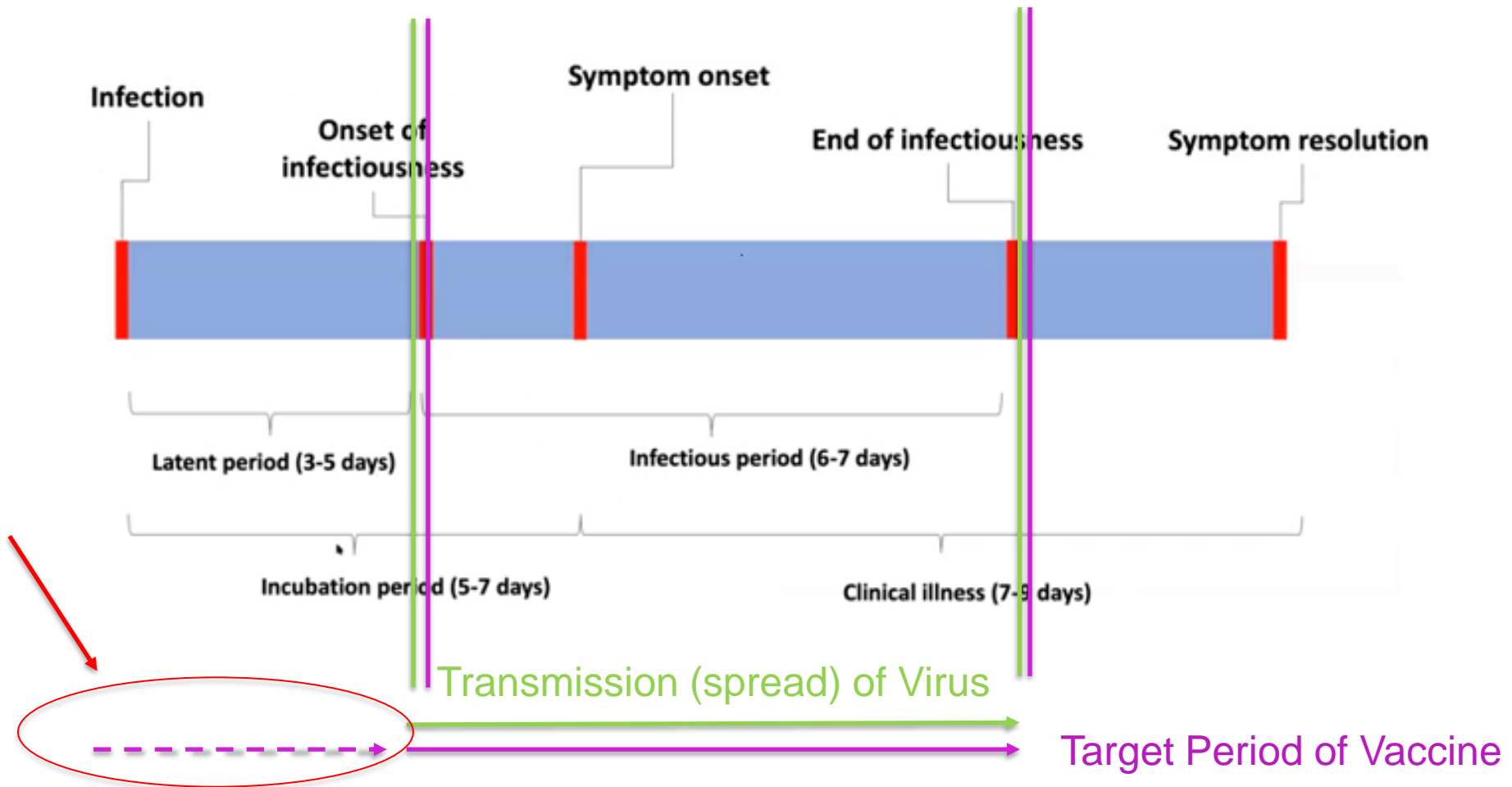


# Time course of infection: COVID-19



# What we don't know

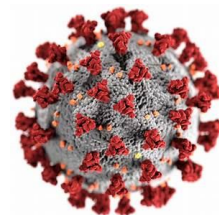
## Time course of infection: COVID-19



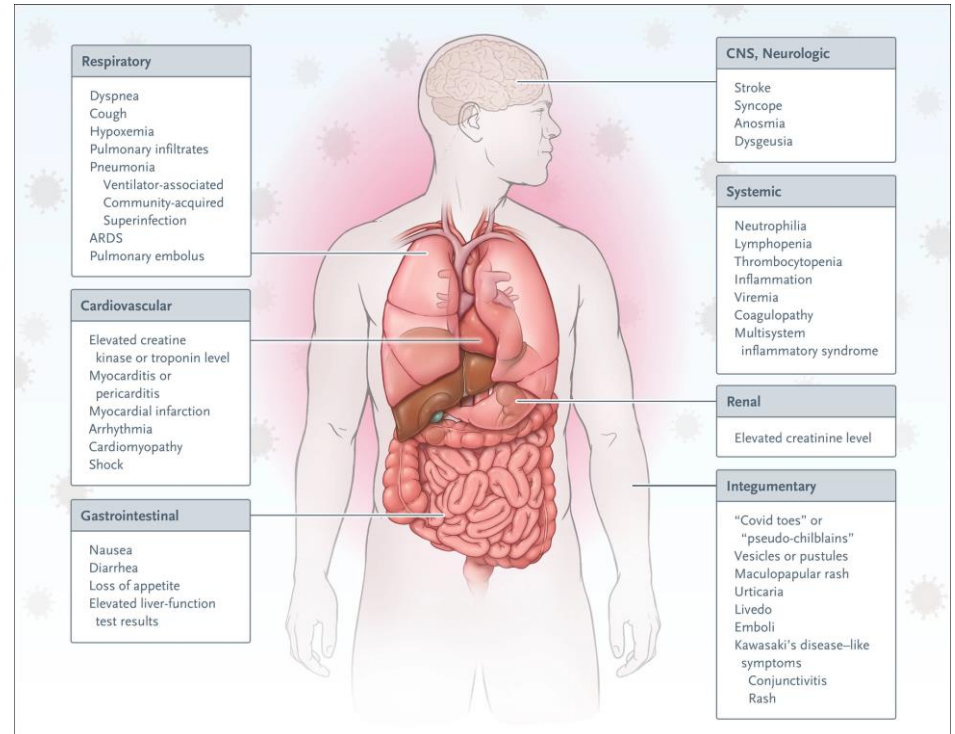
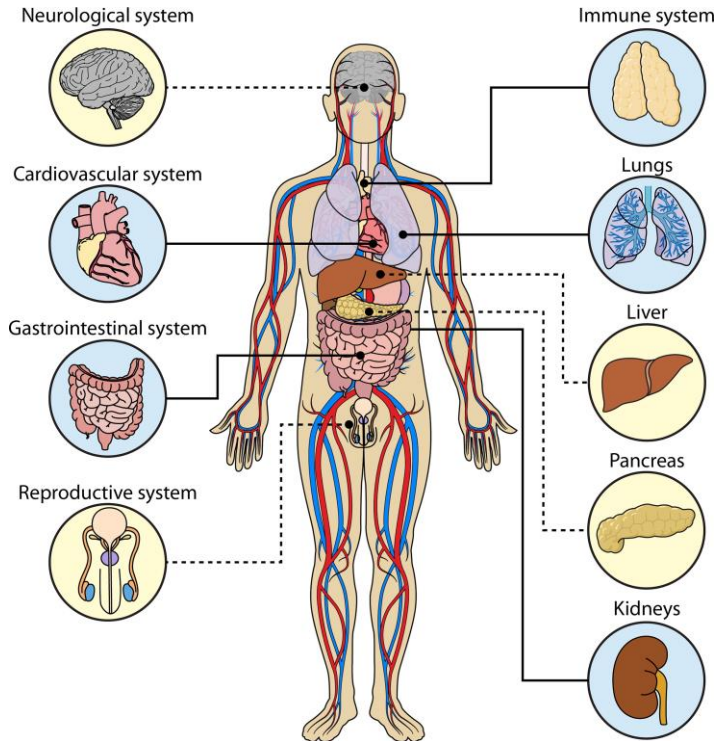


# Symptoms & Disease

- **Clinical Symptoms (2 – 14 days after exposure)**
  - Fever (83-99%)
  - Cough (59-82%)
  - Fatigue or weakness (44-70%)
  - No appetite (40-84%)
  - Shortness of breath (31-40%)
  - Body aches (11-35%)
- **Other common symptoms reported:**
  - Sore throat
  - Nasal or head congestion
  - Headache
  - Diarrhea
  - Nausea/vomiting
  - Loss of smell and/or taste (often precedes onset of respiratory symptoms)

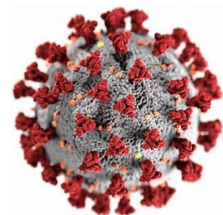


# Symptoms & Disease



Look for emergency warning signs for COVID-19. If someone is showing any of these signs, seek emergency medical care immediately:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Bluish lips or face



# Symptoms & Disease

## COVID-19

### HOW DOES IT AFFECT YOU?

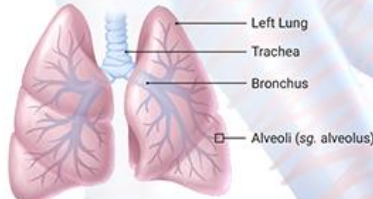
Coronavirus Disease 2019 (COVID-19) is a pandemic caused by Severe Acute Respiratory Syndrome Coronavirus 2, also called SARS-CoV-2. Despite the widespread awareness regarding COVID-19, many are still unaware about how it affects the human body.

Designed by Avesta Rastan

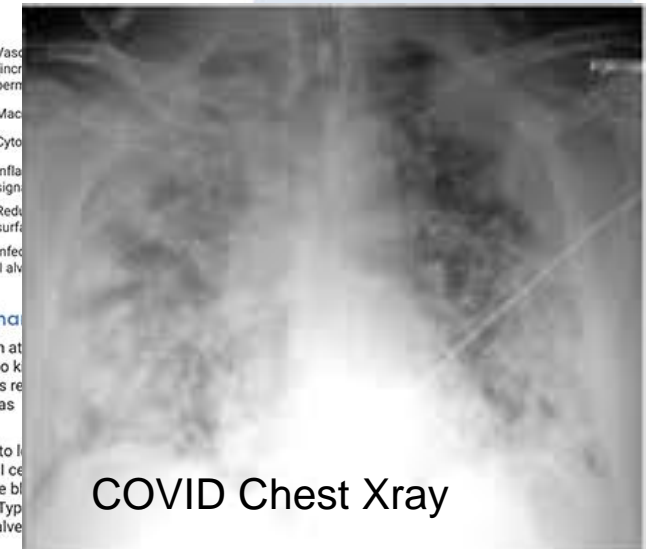
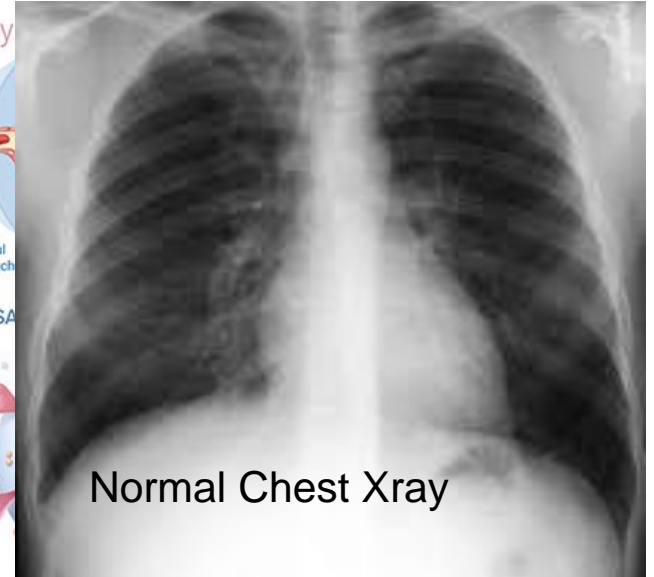
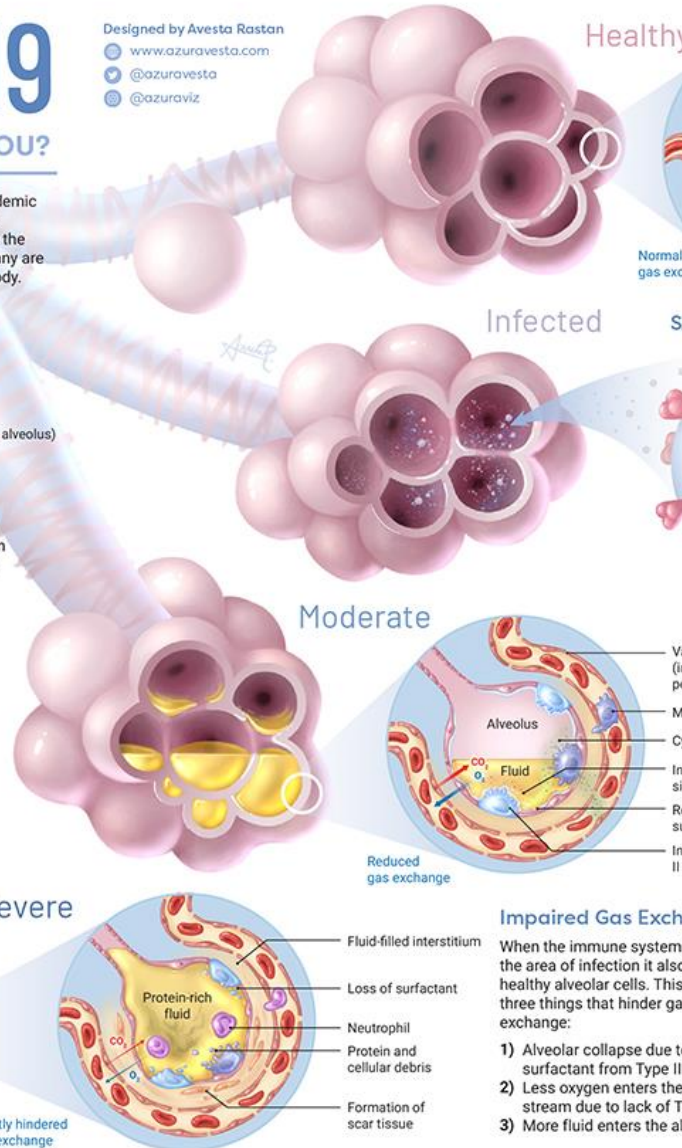
www.azuravesta.com

@azuravesta

@azuraviz



SARS-CoV-2 starts its journey in the nose, mouth, or eyes and travels down to the alveoli in the lungs. Alveoli are tiny sacs of air where gas exchange occurs.



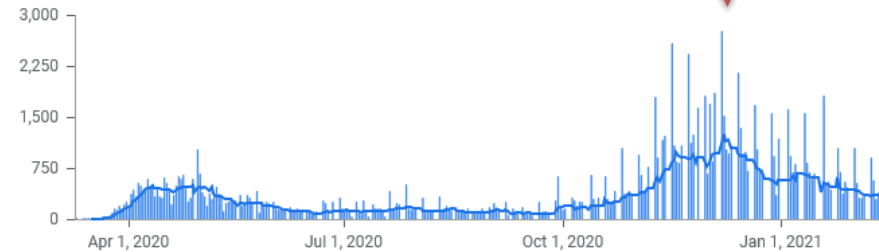
# Current State

United States: 27.6 million cases 484,000 deaths

## Cases

Philadelphia County

Cases:  New  Total



Each day shows new cases reported since the previous day

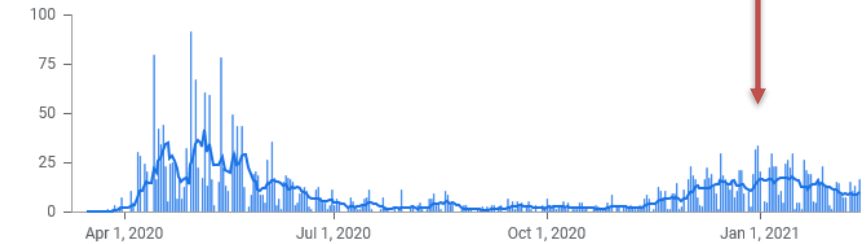
Updated less than 22 hours ago • [About this data](#) • Source: [The New York Times](#)

Second Peak \*

## Deaths

Philadelphia County

Deaths:  New  Total



Updated less than 22 hours ago • [About this data](#) • Source: [The New York Times](#)

Second Peak \*

Total  United States  Pennsylvania

Cases

**897K**

+3,679

Deaths

**23,114**

+107

Location

Cases ↓

Deaths

**Philadelphia County**

**114K**

**3,026**

+0

+16

Allegheny County

73,005

1,643

+306

+13

Montgomery County

51,429

1,476

+232

+14

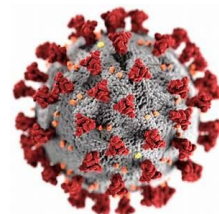
Bucks County

42,819

1,081

+214

+2

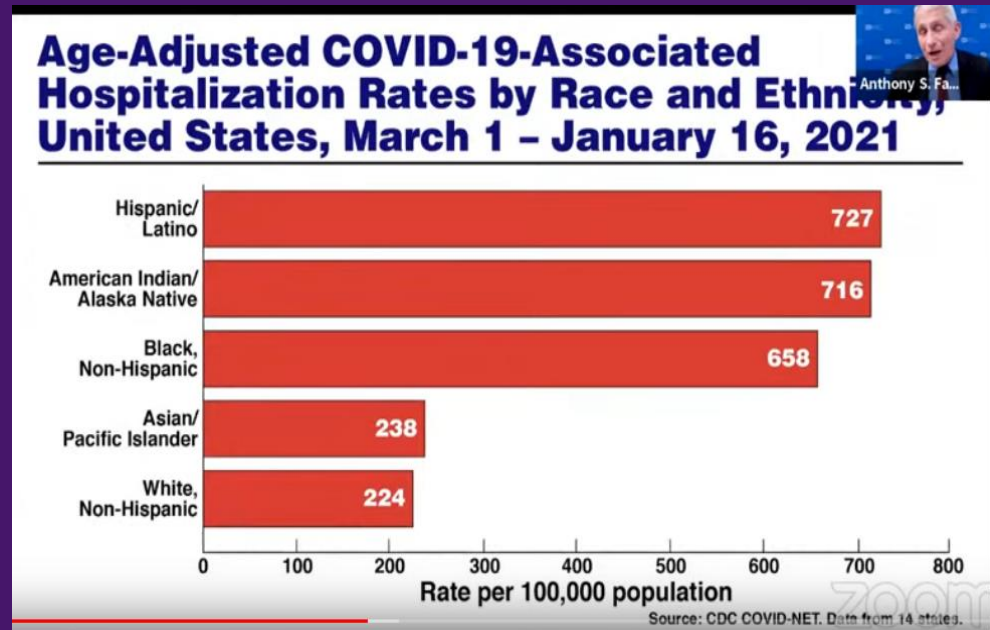
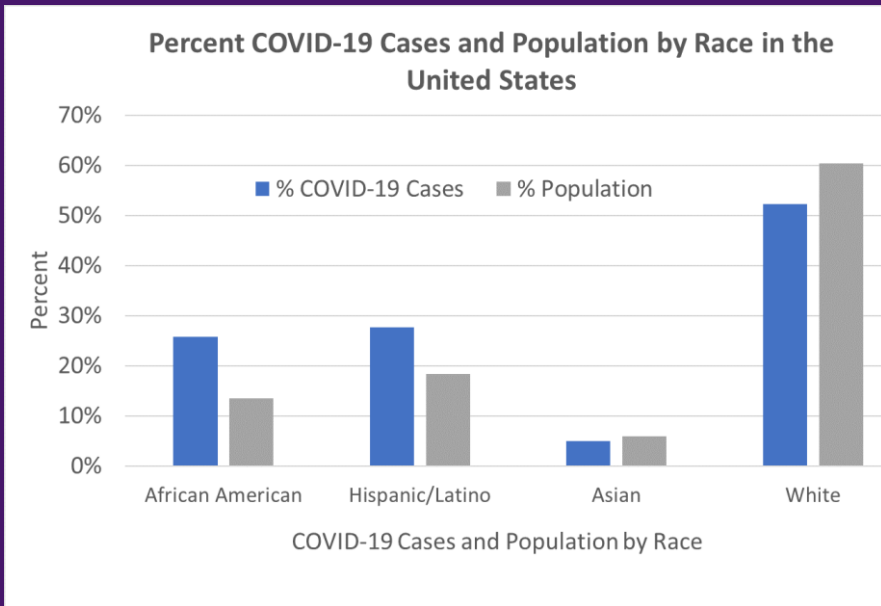


# COVID-related Disparities

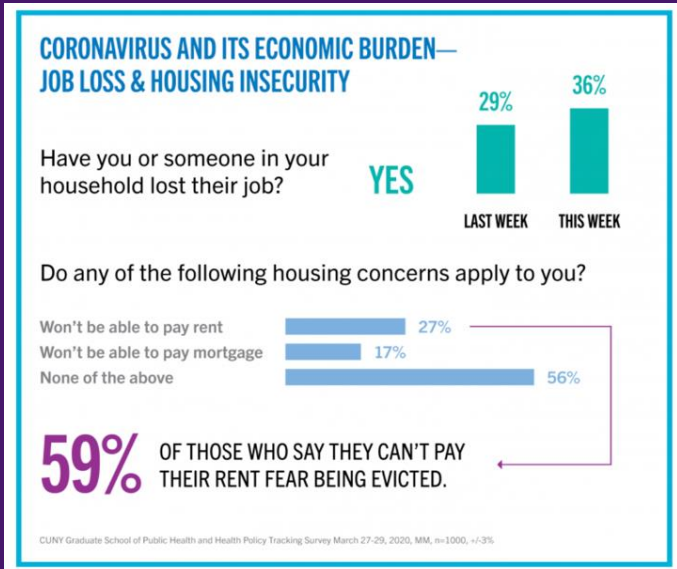
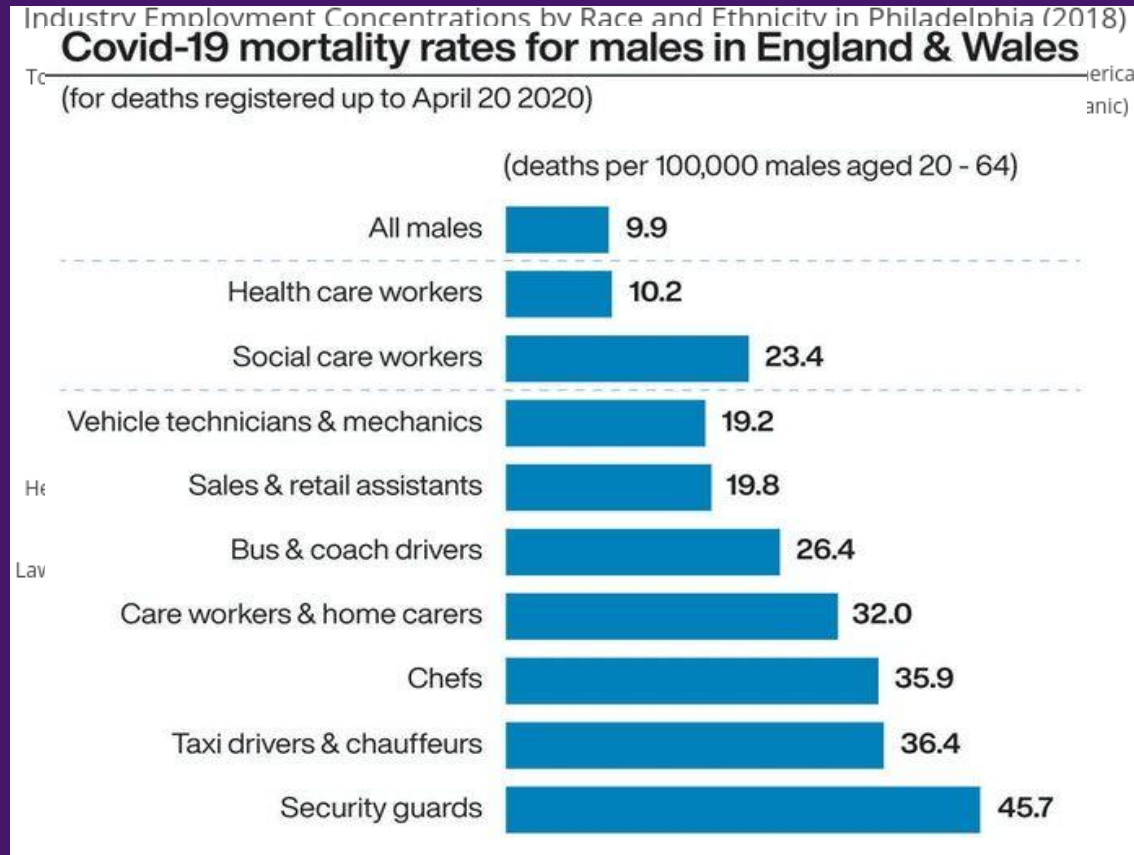
JAMA  
The Journal of the American Medical Association  
May 11, 2020  
Anthony S. Fauci

**Viewpoint**  
**COVID-19 and Racial/Ethnic Disparities**  
MW Hooper, AM Nápoles and EJ Pérez-Stable

*“The most pervasive disparities are observed among African American and Latino individuals, and where data exist, American Indian, Alaska Native, and Pacific Islander populations.”*

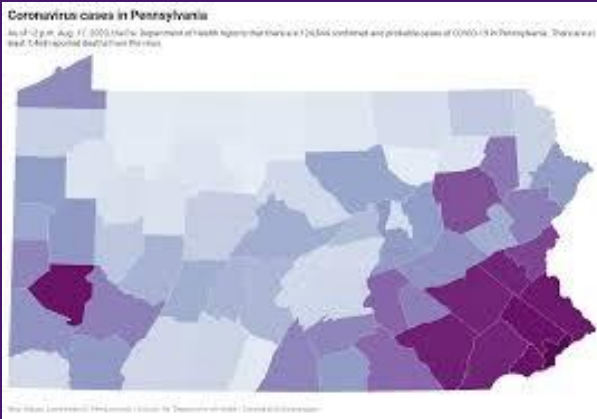


# COVID-related Disparities



PA graphic. Source: ONS. Figures are age-adjusted estimates

# COVID in PA & Philadelphia



**Gross, Essien, et al 2020**  
**Racial and Ethnic Disparities in Population Level Covid-19 Mortality**

**28 states and NYC**  
 reported race and ethnicity-stratified Covid-19 mortality

CDC COVID-19 data are missing race and ethnicity on 65% of patients

**Missing data**

- < 5%
- 5-10%
- 11-19%
- 20-39%
- > 40%

**Black population**

**22 states (+NYC)**  
 significantly higher risk of COVID-related death than white population

**3.57x** relative risk of death compared to white population

**Latinx population**

**12 states (+NYC)**  
 significantly higher risk of COVID-related death than white population

**1.88x** relative risk of death compared to white population

Journal of General Internal Medicine  
 DOI: 10.1007/s11606-020-06081-w

Gross: @cpgYALE  
 Essien: @UREssien @PittGIM  
 Yale University School of Medicine  
 University of Pittsburgh School of Medicine

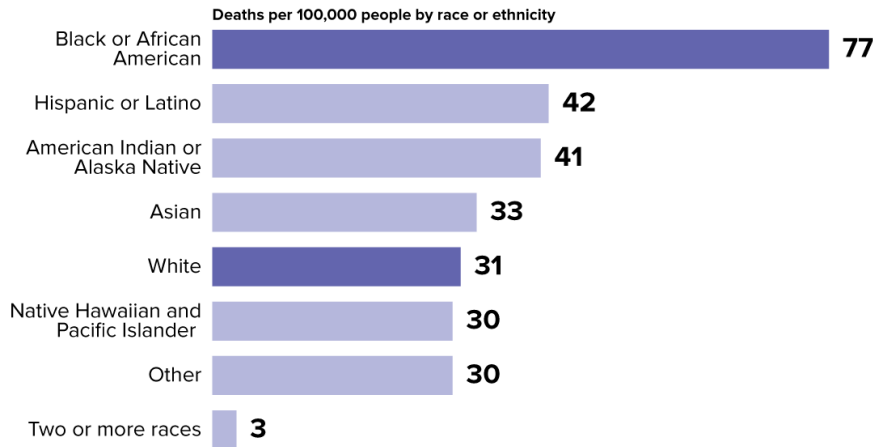
# COVID Death Rates by Race

COVID-19 Cases, Hospitalizations, and Deaths by Race/Ethnicity				
Rate ratios compared to White, Non-Hispanic persons	American Indian or Alaska Native, Non-Hispanic persons	Asian, Non-Hispanic persons	Black or African American, Non-Hispanic persons	Hispanic or Latino persons
Cases <sup>1</sup>	1.9x	0.7x	1.1x	1.3x
Hospitalization <sup>2</sup>	3.7x	1.1x	2.9x	3.2x
Death <sup>3</sup>	2.4x	1.0x	1.9x	2.3x

Race and ethnicity are risk markers for other underlying conditions that affect health, including socioeconomic status, access to health care, and exposure to the virus related to occupation, e.g., among frontline, essential, and critical infrastructure workers.

## Stark COVID-19 Disparities

Nationally, Black people have died at 2.5 times the rate of white people.

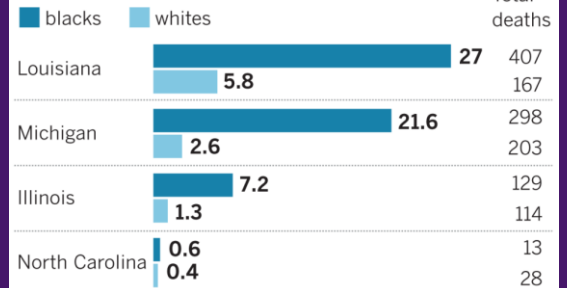


Sources: The COVID Racial Data Tracker and the U.S. Census Bureau.

## Coronavirus deaths and race

COVID-19 is disproportionately killing black Americans, according to data released by several states.

### Deaths per 100,000



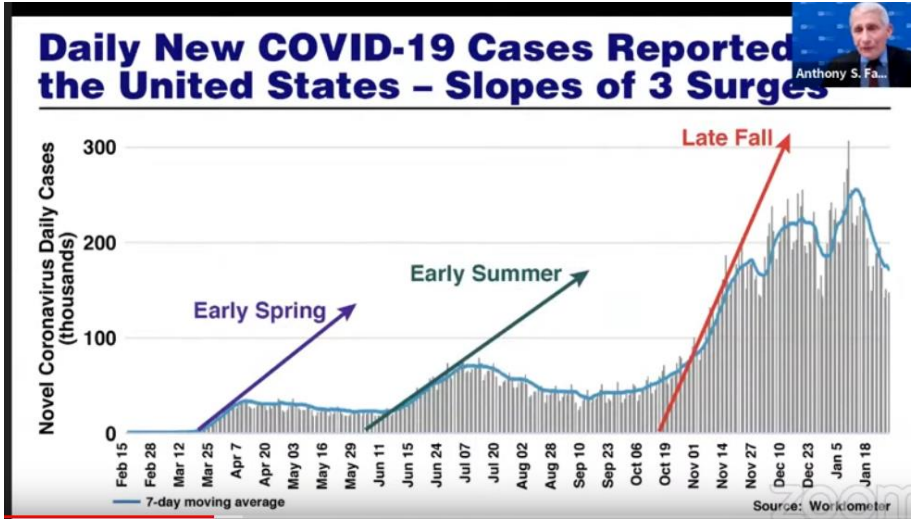
Death totals as of Tuesday afternoon.

State governments, U.S. Census Bureau

Lorena Elebee / Los Angeles Times



# Current State



## Pa. coronavirus deaths by month

This graphic tracks fatalities by when the death was reported by the Pa. Dept. of Health

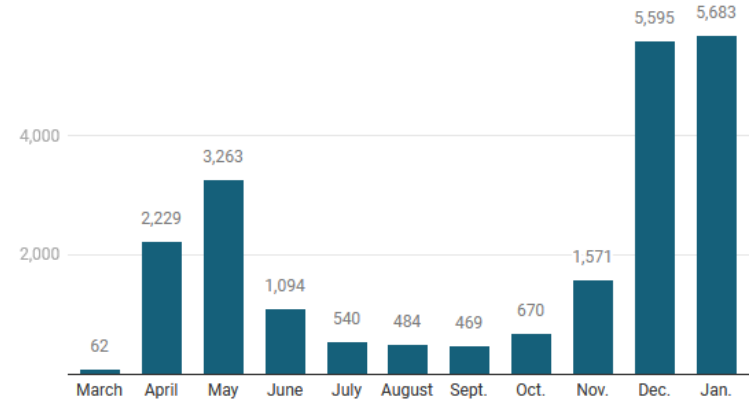
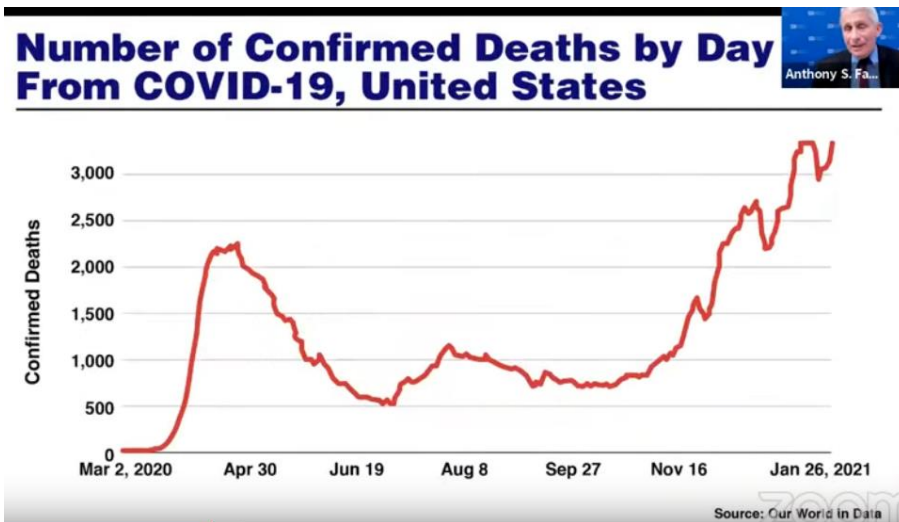


Chart: Megan Lavey-Heaton | PennLive.com • Source: Pa. Dept. of Health • [Get the data](#) • Created with [Datawrapper](#)



## Pa. daily COVID-19 hospitalizations

The number of coronavirus patients reported by the Pa. Department of Health who are currently hospitalized, in the ICU or on a ventilator.

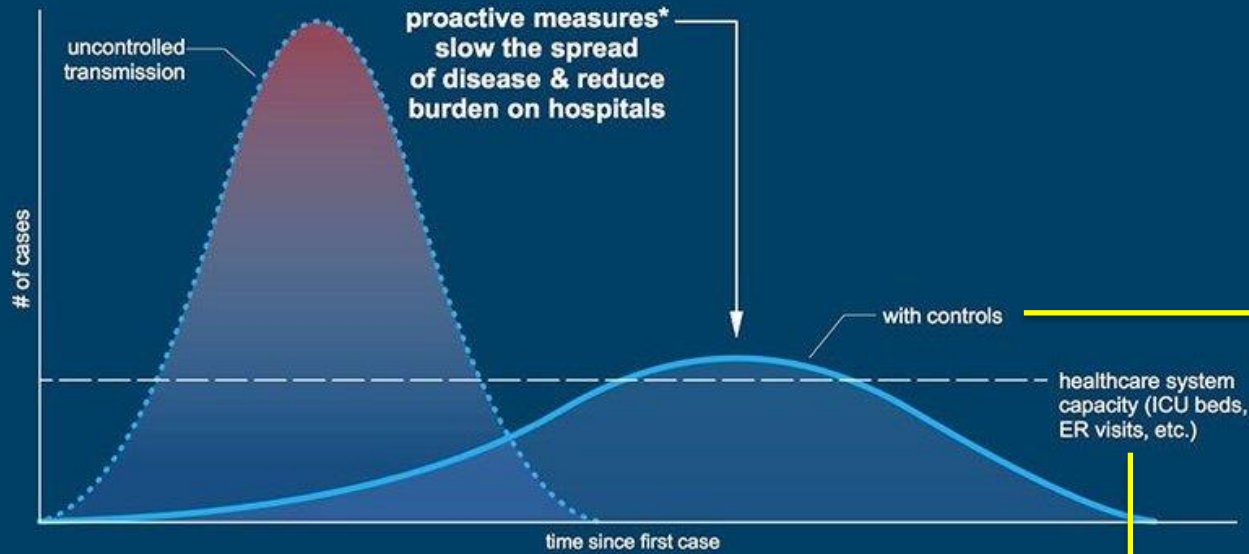


Note: historic ICU data not available before Nov. 3.

Chart: Megan Lavey-Heaton | mheaton@pennlive.com • Source: Pa. Dept. of Health • [Get the data](#) • Created with [Datawrapper](#)

# “Flattening the Curve”

## LOWER AND DELAY THE EPIDEMIC PEAK



\*social distancing such as teleworking, limiting large gatherings, reducing travel or more assertive approaches.

CC BY 4.0 Esther Kim @K\_thos  
Carl T. Bergstrom @CT\_Bergstrom



Hospital  
Admissions



Beds  
in Use



ICU Beds  
in Use

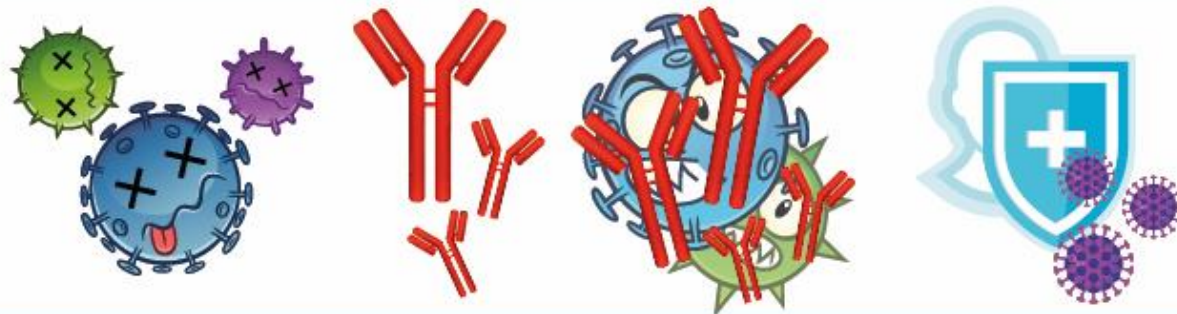
# Einstein

# COVID-19 Vaccines

- How do they work ?
- Effectiveness
- Which vaccines are available and the differences ?
- Frequent concerns & frequently asked questions
- Side effects and how to manage
- What to do after you've been vaccinated



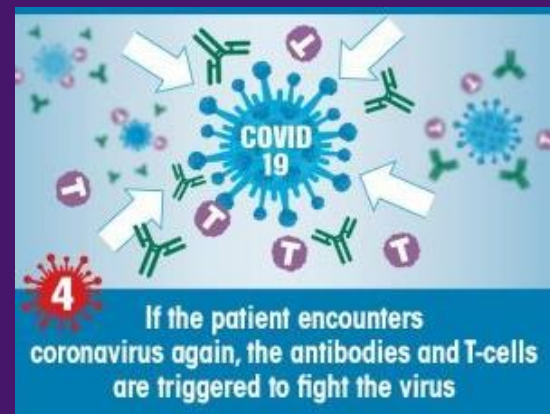
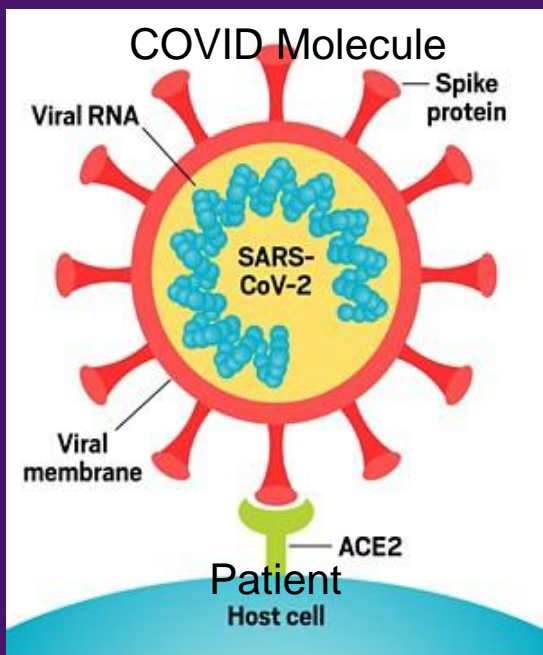
# HOW VACCINES WORK



A weak or dead form of the germ is introduced

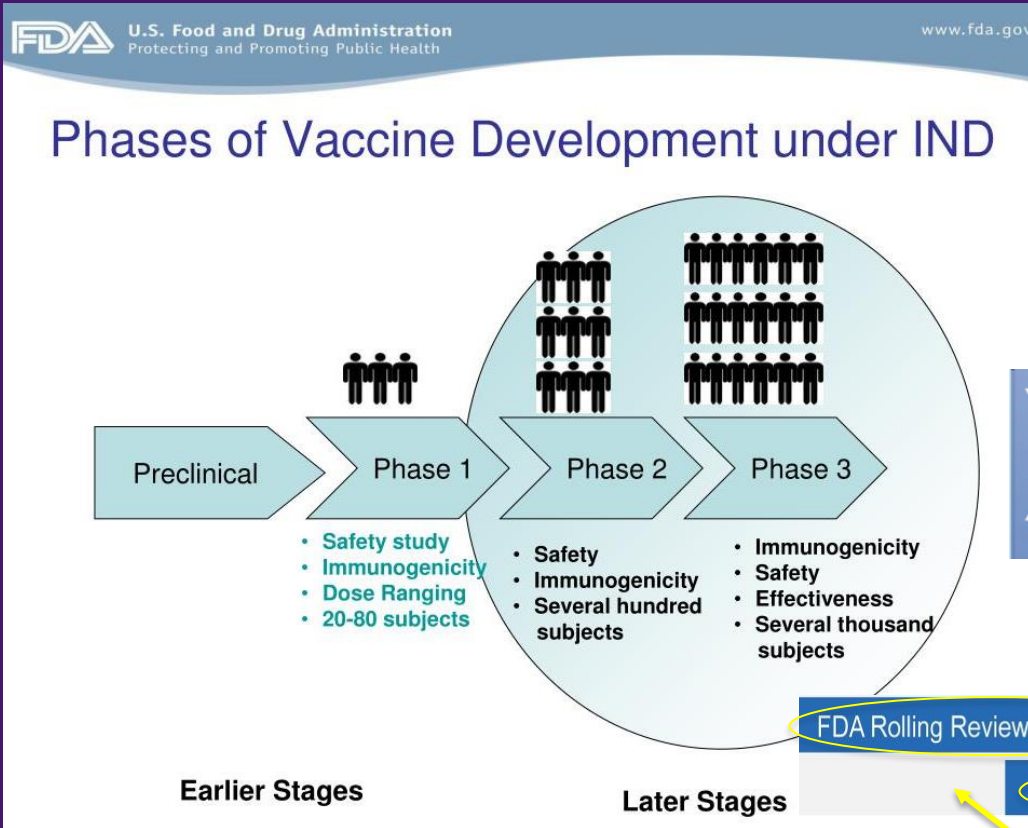
This sparks your immune response to develop antibodies that remember the germ

The antibodies fight off the germ if it invades again



4 If the patient encounters coronavirus again, the antibodies and T-cells are triggered to fight the virus

Average length of process: 8 – 17 years



We Are Here !



That's me !

Coronavirus Vaccines Development

Public Notified of Availability  
(summer / fall 2020)

# A Strategic Approach to COVID-19 Vaccine R&D

L Corey, JR Mascola, AS Fauci & FS Collins

- Unprecedented collaboration and resources will be required to research and develop safe and effective vaccines for COVID-19 that can be manufactured in the scale of billions of doses to people globally.

1lm.nih.gov/?term=COVID+VACCINE+SAFETY

Help

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National Library of Medicine  
National Center for Biotechnology Information

PubMed.gov

COVID VACCINE SAFETY

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Sorted by: Best match Display options

MY NCBI FILTERS

669 results

Find articles referencing SARS-CoV-2 and COVID-19

[COVID-19 and PubMed Clinical Queries](#)

[Treatment](#) [Mechanism](#) [Transmission](#) [More categories](#)

[NCBI SARS COV-2 literature, sequence, and clinical content](#)

## Efficacy and Safety of the mRNA-1273 SARS-CoV-2 Vaccine

LR Baden et al. for the COVE Study Group

- 2-dose regimen of mRNA-1273 conferred 94.1% protection against COVID-19 in persons aged 18 years or older
- N=30,420
- No cases of severe Covid-19 in vaccine group; 30 in placebo group
- Incidence of serious adverse events was low and similar in vaccine and placebo groups



### Vaccine Safety

Learn more about how CDC is ensuring the safety of COVID-19 vaccines in the United States.

Are COVID-19 vaccines safe?

All the COVID-19 vaccines being used have gone through rigorous studies to ensure they are as safe as possible. Systems that allow CDC to watch for safety issues are in place across the entire country.

The U.S. Food and Drug Administration (FDA) has granted Emergency Use Authorizations for COVID-19 vaccines that have been shown to meet rigorous safety criteria and be effective as determined by data from the [manufacturers](#) and findings from large clinical trials. [Watch a video describing the emergency use authorization.](#) Clinical trials for all vaccines must first show they meet rigorous criteria for safety and effectiveness before any vaccine, including COVID-19 vaccines, can be authorized or approved for use. The known and potential benefits of a COVID-19 vaccine must outweigh the known and potential risks of the vaccine. Learn more about [how federal partners are ensuring the safety of COVID-19 vaccines in the United States.](#)

# COVID-19 Vaccine Availability & Effectiveness

Most Widely Used: Pfizer & Moderna

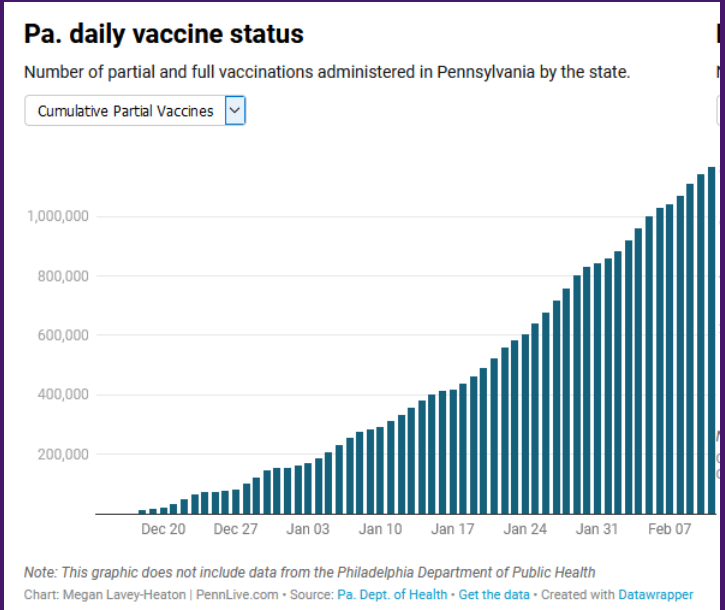
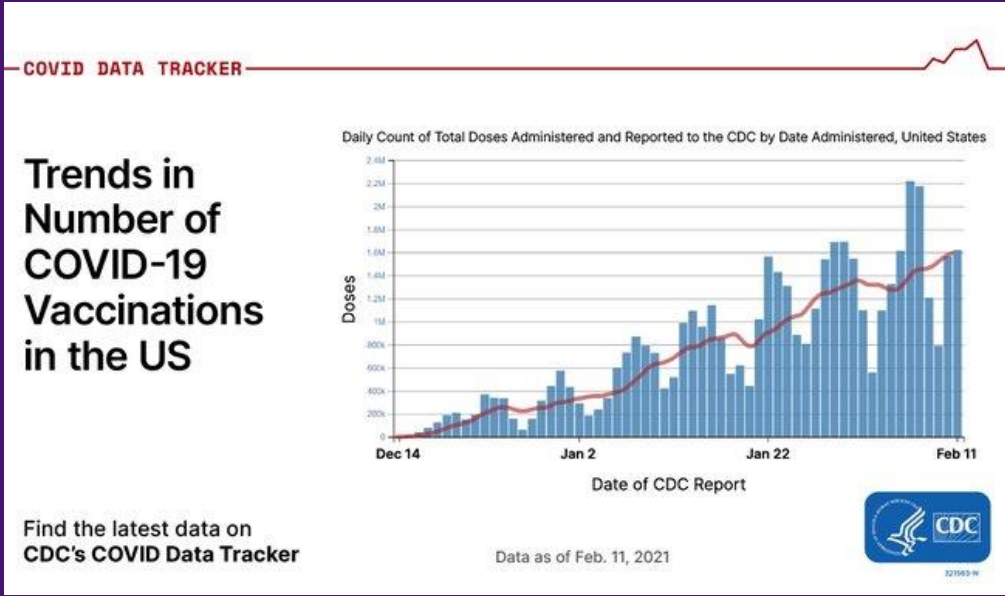


COMPARING THE COVID-19 VACCINES		
Pfizer-BioNTech	Both	Moderna
Granted Emergency Use Authorization (EUA) on <b>DEC. 12</b>	Are mRNA vaccines Will help prevent 9.5 out of 10 COVID-19 infections	Granted Emergency Use Authorization (EUA) on <b>DEC. 18</b>
Needs to be stored in ultra-cold freezers (94 degrees below zero)	<b>Two-shot series</b> Cause minor side effects, most likely after the second dose Were tested on thousands of people in clinical trials	Can be stored in regular freezers (four degrees below zero)
Two shots given <b>21 DAYS APART</b>	Are proven to be safe and effective	Two shots given <b>28 DAYS APART</b>
For people <b>16 AND OLDER</b>	<b>SANFORD HEALTH</b>	For people <b>18 AND OLDER</b>

**95% Effective**

**94.1% Effective**

*Next up for authorization in US: Johnson & Johnson\*, AstraZeneca (UK), Janssen\**





# Vaccination Roll-Out

## Total adults - 288 million

### Phase 1a (~24M)

- Health care personnel
- Long-term care facility residents

### Phase 1b (~49M)

- Frontline essential workers
- Persons aged 75 years and older

### Phase 1c (~129M)

- Persons aged 65-74 years
- Persons aged 16-64 years with high-risk conditions
- Essential workers not recommended in Phase 1b

### Phase 2 (~86M)

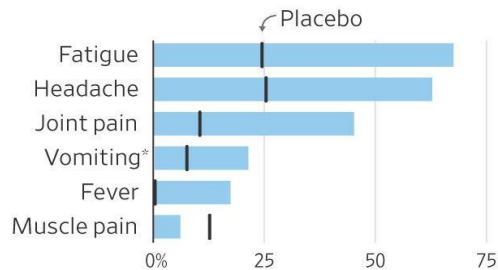
- All people aged 16 years or older not in Phase 1, who are recommended for vaccination

# Vaccine Side Effects

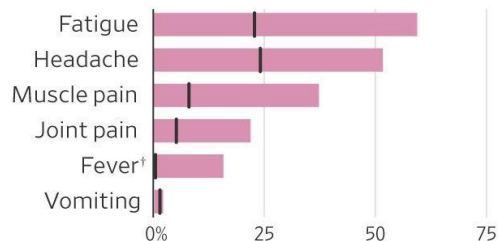
## Side Effects

Frequency of adverse reactions within seven days after the second dose of Covid-19 vaccines, in Phase 3 clinical trials. Most side effects were mild or moderate.

### MODERNA VACCINE



### PFIZER



\*Including nausea †100.4°F or higher  
Note: For ages 18–64 for Moderna, 18–55 for Pfizer  
Source: FDA

Most say, I would rather have a few side effects for less than 1-2 days, than COVID.”

## COVID-19 SYMPTOMS

### COMMON SYMPTOMS

fever or chills  
cough  
shortness of breath or difficulty breathing  
fatigue  
body aches  
headache  
new loss of smell or taste  
sore throat  
runny nose or congestion  
nausea or vomiting  
diarrhea

### SYMPTOMS IN CHILDREN

fever  
abdominal pain  
vomiting  
diarrhea  
neck pain  
rash  
bloodshot eyes  
feeling extra tired

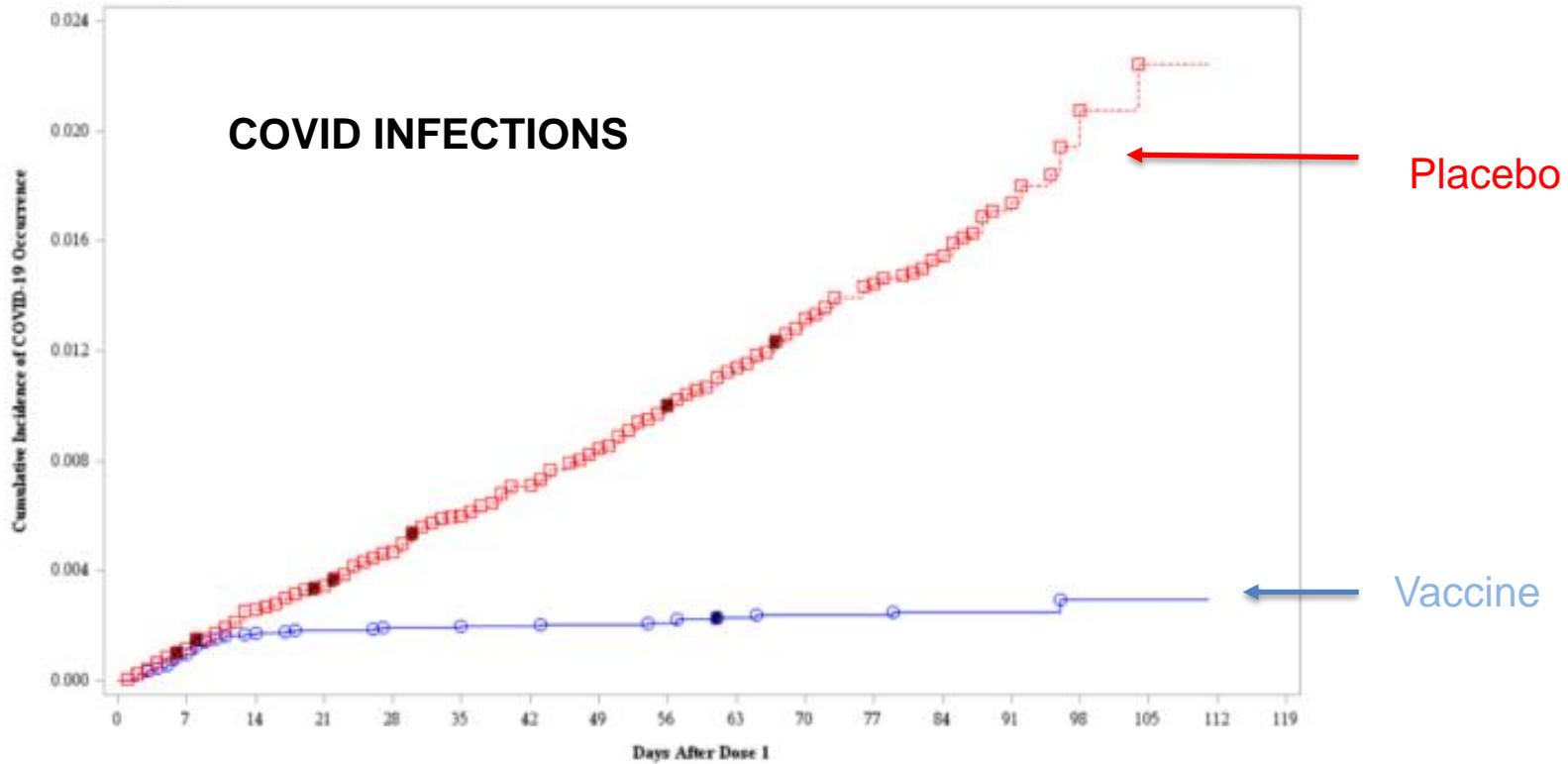
[beaumont.org/coronavirus](https://beaumont.org/coronavirus)

**Beaumont**

## COVID Warning Signs:

- Trouble breathing
- Persistent pain or pressure in the chest
- New confusion
- Inability to wake or stay awake
- Bluish lips or face

**Figure 13 Cumulative Incidence Curves for the First COVID-19 Occurrence After Dose 1 – Dose 1 All-Available Efficacy Population**



No. with events/No. at risk

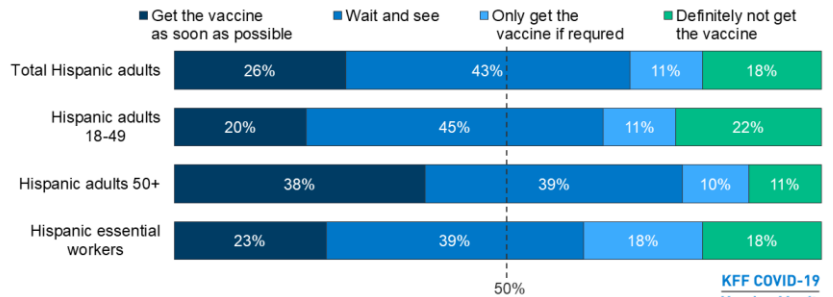
A:	0/21314	21/21230	37/21054	39/20481	41/19314	42/18377	42/17702	43/17186	44/15464	47/14838	48/12359	48/9591	49/6403	48/3374	50/1463	50/998	50/0
B:	0/21258	25/21170	55/20970	73/20386	97/19209	123/18218	143/17578	166/17025	192/15290	212/13876	235/11994	249/9471	257/6294	267/3301	274/1440	275/998	275/0

—○— A: BNT162b2 (30 µg)    - - - □ - - - B: Placebo

# Vaccine Hesitancy

Figure 3  
**Among Hispanics Larger Shares Of Younger Adults And Essential Workers Express Vaccine Hesitancy**

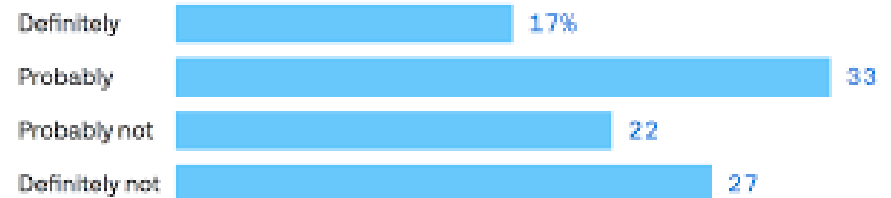
When a vaccine for COVID-19 is approved and widely available to anyone who wants it, do you think you will...?



SOURCE: KFF COVID-19 Vaccine Monitor (KFF Health Tracking Poll, Nov. 30-Dec. 8, 2020). See topline for full question wording.

**Among black adults, if a coronavirus vaccine was determined to be safe by scientists and available for free to everyone who wanted it, would you get it?**

777 Black U.S. adults surveyed Aug. 20 to Sept. 14, 2020



# Reasons for Vaccine Hesitancy

**Table 1: Reasons For Vaccine Hesitancy By Party Identification, Age, and Race/Ethnicity**

AMONG THOSE WHO WOULD DEFINITELY NOT OR PROBABLY NOT GET VACCINATED: Percent who say each of the following is a <b>major reason</b> why:	Total	Party ID		Age		Race/Ethnicity	
		Independent	Republican	18-49	50+	Black	White
Worried about possible side effects	59%	59%	54%	58%	63%	71%	56%
Do not trust the government to make sure the vaccine is safe and effective	55	52	56	55	53	58	54
Vaccine is too new and want to wait and see how it works for other people	53	54	41	57	46	71	48
Politics has played too much of a role in the vaccine development process	51	46	53	47	59	54	49
The risks of COVID-19 are being exaggerated	43	40	57	40	51	33	49
Don't trust vaccines in general	37	43	31	37	38	47	36
Do not trust the health care system	35	34	36	32	42	28	36
Worried that they may get COVID-19 from the vaccine	27	30	18	26	26	50	21
Don't think they are at risk of getting sick from COVID-19	20	18	23	18	26	20	19

NOTE: Sample size too small to report separately among Democrats and Hispanics who say they definitely or probably won't get vaccinated. See Appendix A for tables based on total.

FACTS

MYTHS

# COMMON COVID-19 & COVID VACCINE MYTHS

- True or False ? You can get COVID from the COVID-19 vaccine.

**FALSE:** NONE of the vaccines in development or currently available in the US contain the live virus. The vaccine CANNOT make you sick with COVID. It takes a few weeks for the body to build full immunity, so it is possible for people to become infected before or just after the vaccine before it's had a chance to work.

- True or False? If I already had COVID-19 and recovered I do not need to get the vaccine.

**FALSE:** Because of severe health risks and that re-infection is possible after several months because the virus may have mutated from the variant you had, it is important to get a vaccine for continued protection.

# COMMON COVID-19 & COVID VACCINE MYTHS

- True or False? COVID is no worse than the flu

**FALSE:** It is more dangerous and attacks more parts of the body than the virus that causes the flu (influenza).

- True or False ? The vaccine will alter my DNA.

**FALSE:** The current vaccines in use & in development are mRNA vaccines. mRNA vaccines teach our cells how to make the proteins that trigger an immune response. The mRNA never enters cells (where DNA is kept) and cannot interact with our DNA in any way.



# COMMON COVID-19 & COVID VACCINE MYTHS

- True or False? If I am pregnant, I should definitely not have the vaccine.
  - **FALSE:** No data exist that this vaccine causes problems with pregnancy or other fertility-related side effects. But studies are ongoing. On the other hand, the COVID ILLNESS increases risk of preterm labor, other adverse pregnancy outcomes. Bottom line: infection risks, etc should be discussed with PCP or Obstetrician.
- True or False ? After I get vaccinated, I do not have to wear a mask or socially distance.
  - **FALSE:** You still may come in contact with it, become a carrier without symptoms and spread it to someone else for whom it might be lethal. Also, you are not fully protected until a few weeks AFTER the 2<sup>nd</sup> dose.

# COMMON COVID-19 & COVID VACCINE MYTHS

- True or False? We cannot trust the COVID-19 vaccines because they were rushed into use.

**FALSE**

- True or False ? If I get sick with COVID, I should ask for an antibiotic.

**FALSE:** Antibiotics ONLY work for bacterial infections (e.g. strep, staph, etc) and DO NOT WORK on viruses like COVID or the viruses that cause the flu or common cold.

# COMMON COVID-19 & COVID VACCINE MYTHS

- True or False? Since the COVID-19's survival rate is so high, I do not need the vaccine.

**FALSE**

- True or False? You have to be with someone for at least 10 minutes to catch the virus.

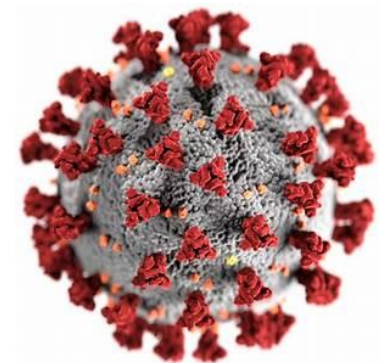
**FALSE**

- True or False ? Children cannot get COVID

**FALSE**

# Summary

- Coronavirus-19
- COVID-related Healthcare Disparities
- Vaccines
- Myths & Misconceptions
- Where to Find Information





## Getting 'Back to Normal' Is Going to Take **All of Our Tools**

If we use all the tools we have, we stand the best chance of getting our families, communities, schools, and workplaces "back to normal" sooner:

Get vaccinated.



Wear a mask.



Stay 6 feet from others,  
and avoid crowds.



Wash  
hands often.



[www.cdc.gov/coronavirus/vaccines](https://www.cdc.gov/coronavirus/vaccines)

# COVID-19

Information & Resources

- **PA COVID Hotline:**  
1-877-PA Health
- **Philadelphia COVID Helpline:**  
1-800- 722-7112
- **Blackdoctorsconsortium.com**  
484-270-6200
- **Centers for Disease Control**  
[cdc.gov/coronavirus](https://cdc.gov/coronavirus)  
[cdc.gov/vaccines/covid-19](https://cdc.gov/vaccines/covid-19)

## Mental Health Help During COVID-19

**Crisis Text  
Line**



Text 'PA'  
to 741741

**National Suicide  
Prevention  
Lifeline**



1-800-273-8255

**Preventing  
suicide in PA**



[preventsuicide  
pa.org/](https://preventsuicidepa.org/)

**Disaster  
Distress  
Helpline**



800-985-5990

**Get Help Now  
for substance  
use disorder**



1-800-662-4357

**Veterans  
in crisis**



[veterans  
crisisline.net](https://veteranscrisisline.net)

**PA's support  
helpline**



855-284-2494

**Coping with  
COVID-19 stress**



[bit.ly/covid-coping](https://bit.ly/covid-coping)

**COVID-19  
resources**



[mhanational.  
org/covid19](https://mhanational.org/covid19)



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