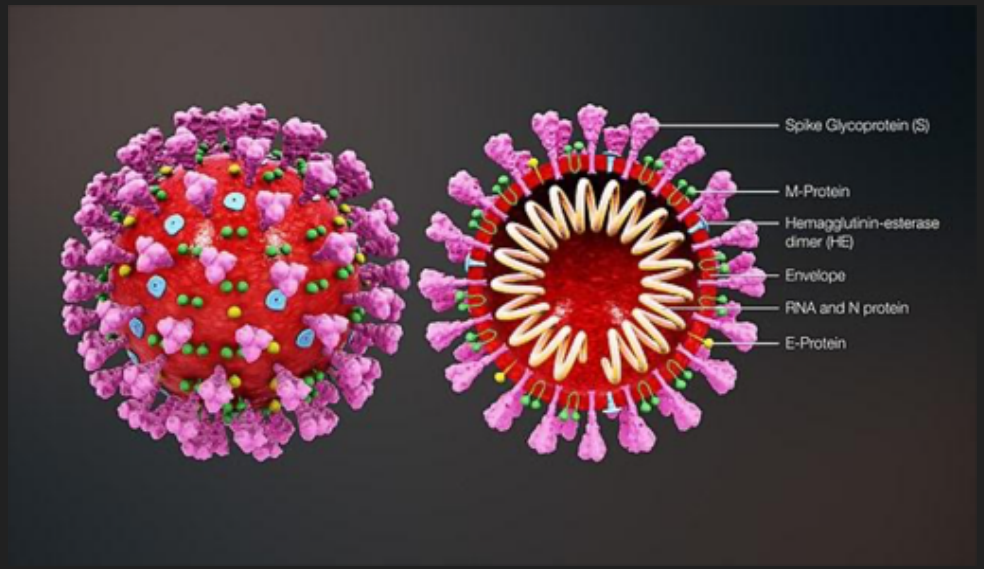
Evolution of the Healthcare Response to the COVID-19 Pandemic



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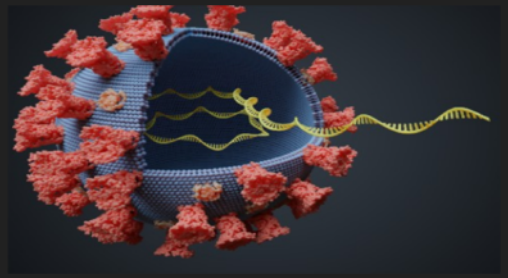
What is COVID-19

- February 11th, 2020, the World Health Organization (WHO) announced official name for the novel virus causing a 2019 outbreak
- Formally known as “2019 novel coronavirus” or “2019-nCoV.” Abbreviated as COVID-19- “CO”=corona, “VI”=virus, “D”= disease.
- First identified in Wuhan, China
- There are many types of human coronaviruses, including some that cause upper respiratory tract illnesses. COVID-19 is a new type of coronavirus not previously seen in humans: (CDC, 2020)

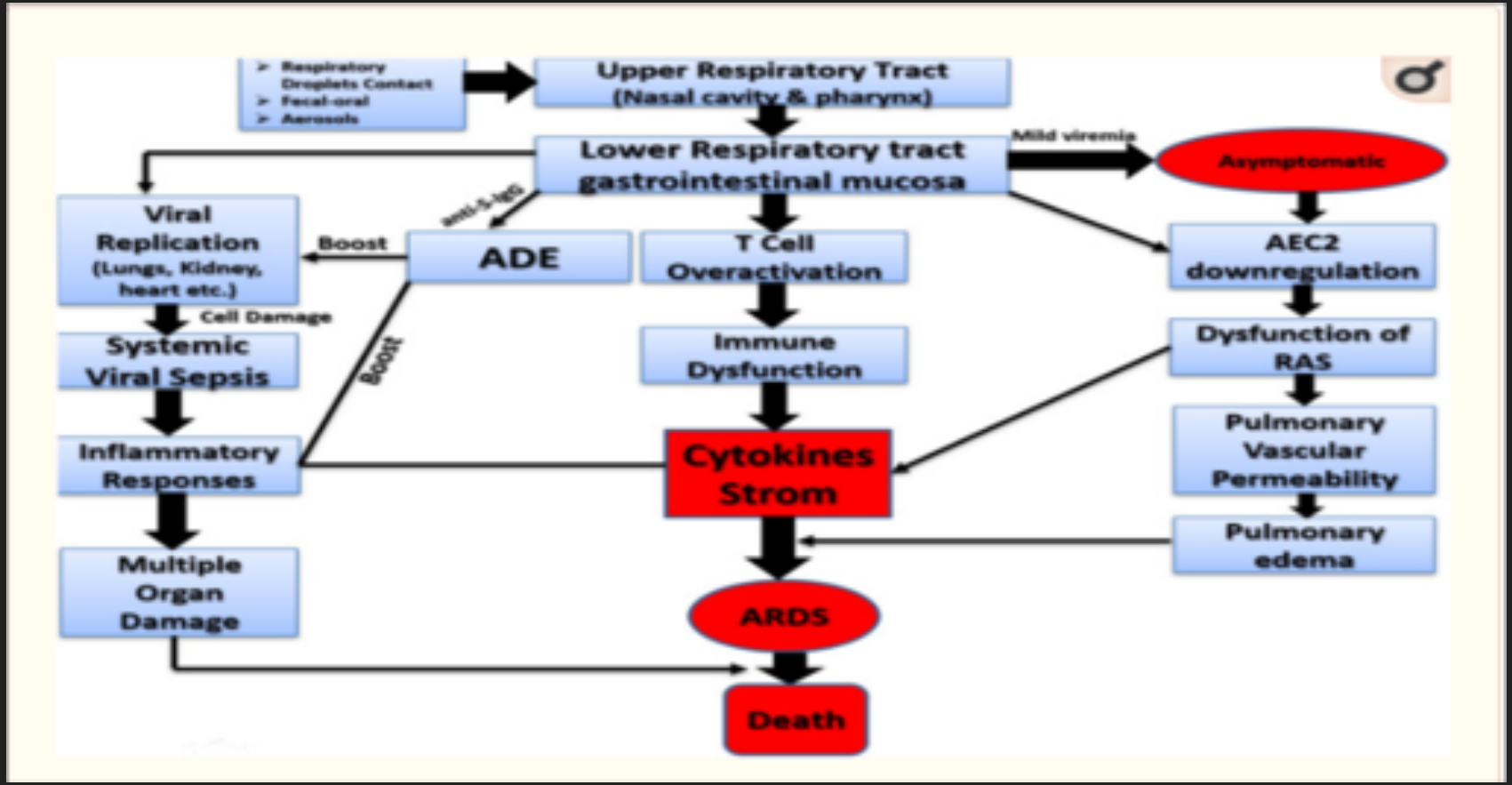


- Enveloped, positive-sense(stranded), single-stranded RNA virus
- Consist of four structural proteins: spikes, membranes, envelope, nucleocapsid.
- Undergoes a five step process: Attachment, Penetration, Biosynthesis, Maturation, Release
- Family of Coronaviridae are divided into two subfamilies-Coronaviruses and Toroviruses,all identified CoV’s are categorized into 4 parts; Alpha coronavirus, Beta coronavirus, gamma coronavirus, Delta coronavirus
- COVID-19 is a beta coronavirus with unknown etiology.
- It is related to severe acute respiratory syndrome (SARS) and Middle East Respiratory Syndrome (MERS-CoV) but leads to ARDS due to the severity of the viral replication of a new strand in a human host.
- Acute respiratory disease can lead to multiple organ dysfunction syndrome (MODS) in immunocompromised, humans with comorbidities, and the older adult.
- Recent evolution of the science of COVID-19 is suggesting that it can affect all ages and the outcomes vary depending upon how the virus replicates in the human host.

(Juneio, Y., Ozaslan, M., et al 2020)

Pathogenesis

(Juneio, Y., Ozaslan, M., et al 2020)



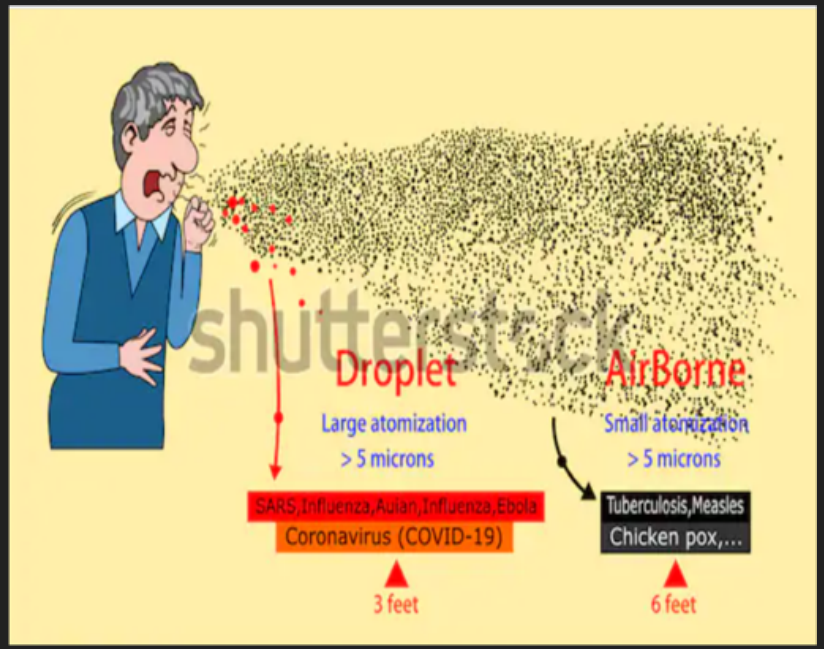
How COVID-19 is spread/transmitted

1. Most commonly spreads between people who are in close contact with one another; (within about 6 feet, or 2 arm lengths) person to person.
2. Spread is through respiratory **Droplets or small particles-ie.aerosols,** produced when an infected person **coughs, sneezes, sings, talks or breathes.** These particles can be inhaled into the nose, mouth, airways, and lungs and cause infection. This is thought to be the main way the virus spreads. Droplets can also land on surfaces and objects and can be transferred by touch. (touching a surface with the virus on it and then touching their own mouth, nose or eyes), However, this not thought to be the main way of spread.
3. There is growing evidence that droplets and airborne particles can remain suspended in the air and be breathed in by others, and travel distances beyond 6 feet (ex. choir practice, restaurants, and in fitness classes).
4. As the respiratory droplets travel further from the person infected with COVID, the concentration of these droplets decreases. Larger droplets fall out of the air due to gravity, and smaller droplets and particles spread apart in the air.
5. Indoor environments without proper ventilation increase the risk.
6. It is not yet known if weather and temperature affect the spread
7. CDC has no evidence that COVID-19 is spread through mosquitoes or ticks

(CDC, 2020)

Airborne VS Droplet particles/spread and transmission

A)



B)

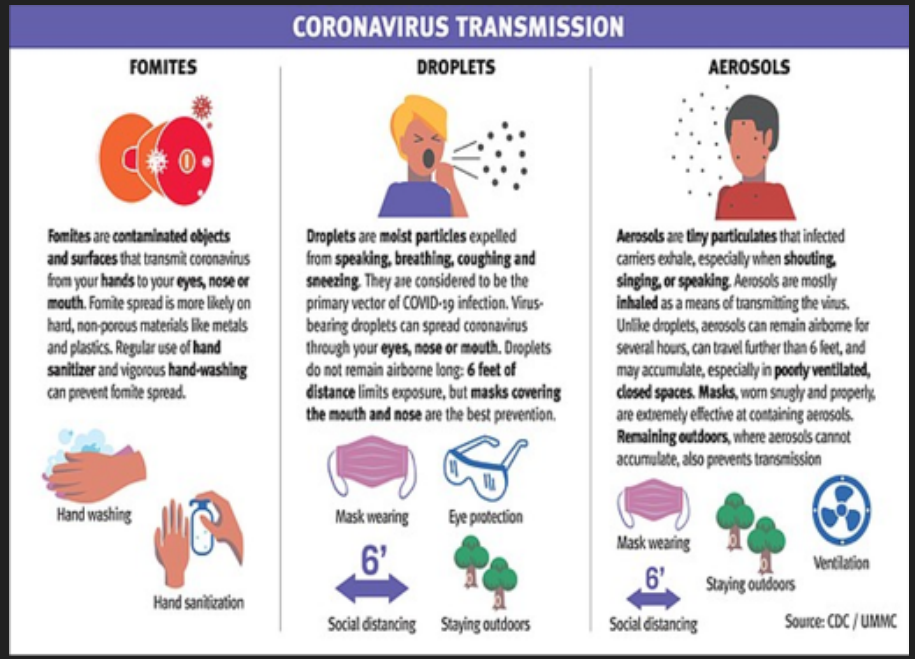


Image A: retrieved from:https://www.shutterstock.com/image-vector/transmission-covid19occurs-aerosol-form-spread-coronaviruscovid19-1682595574

Image B: retrieved from:https://www.jacksonfreepress.com/photos/2020/sep/15/37636/

Signs and Symptoms of COVID-19: Diversity of and evolution of presentation over time

- When the initial cases of COVID-19 started to appear around the world, the symptoms were thought to only consist of fever, dry cough and shortness of breath. Several months later we have learned that the symptoms have become wide ranged and vary from mild to severe.
- Symptoms may appear 2-14 days after exposure to the virus. People may also experience no symptoms, making them an asymptomatic carrier of the virus.
- The most common symptoms include: fever or chills, cough, shortness of breath, fatigue, muscle or body aches, headache, loss of smell or loss of taste, sore throat, congestion, runny nose, nausea, vomiting, diarrhea, chest pain and abdominal pain.

It's important to know when to seek emergency medical care. If experiencing the following symptoms, seek immediate help; trouble breathing, persistent chest pain, confusion and inability to stay awake.

Symptoms of Coronavirus. (n.d.). Retrieved December 06, 2020, from https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

COVID-19 Risk Factors and Vulnerable Populations

Patients at risk for more severe cases of COVID-19:

- Adults 65 years and older
- Heart disease
- Lung disease such as COPD, emphysema, asthma and lung cancer
- Diabetes
- Peoples with weakened immune systems and or autoimmune diseases
- Obesity (BMI of 30 or higher)
- Smoking
- Sickle Cell Anemia
- Chronic Kidney or liver disease
- Hypertension

COVID-19: Who's at higher risk of serious symptoms? (2020, August 21). Retrieved December 06, 2020, from https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/coronavirus-who-is-at-risk/art-20483301

Treatment: Medical Management & Nursing Intervention for COVID-19 & its complications

- Most individuals will be able to recover at home with mild symptoms
  - Stay home and isolate from others
  - Stay hydrated
  - Take over the counter medicine (acetaminophen, ibuprofen)
  - Get plenty of rest
- For severe cases the FDA has approved an antiviral to slow the virus
  - Remdesivir (Veklury)
  - Given by infusion through the veins
- Treat the complications
  - COVID-19 can damage the heart, blood vessels, kidneys, brain, skin, eyes and gastrointestinal organs
  - Supportive care
  - Blood thinners

Treatments Your Healthcare Provider Might Recommend if You Are . Retrieved December 5, 2020, from https://www.cdc.gov/coronavirus/2019-ncov/your-health/treatments-for-severe-illness.html

Treatment continued...

- Reduce overactive immune response
  - dexamethasone
    - Steroid medication recommended for patients who need supplemental oxygen
    - Prevents or reduces injury to the body for patients with severe COVID-19
- Support body’s immune system
  - Convalescent plasma
    - Plasma from patients who recovered from COVID-19
    - Can contain antibodies to the virus
    - Currently not enough evidence to recommend this treatment
- It is important to note that treatment should be prescribed by your healthcare provider. People have been seriously harmed and even died after taking products not approved for COVID-19, even products approved or prescribed for other uses.

Treatments Your Healthcare Provider Might Recommend if You Are . Retrieved December 5, 2020, from https://www.cdc.gov/coronavirus/2019-ncov/your-health/treatments-for-severe-illness.html

Nursing Diagnoses related to COVID-19

- INFECTION related to failure to avoid pathogen secondary to exposure to COVID-19
- DEFICIENT KNOWLEDGE related to unfamiliarity with disease transmission
- HYPERTHERMIA related to increase in metabolic rate
- IMPAIRED BREATHING PATTERN related to shortness of breath
- IMPAIRED GAS EXCHANGE related to ventilation-perfusion imbalance
- IMPAIRED SPONTANEOUS VENTILATION related to respiratory muscle fatigue
- SOCIAL ISOLATION related to inability to engage in satisfying personal relationships
- ANXIETY related to unknown etiology of the disease

(Belleza, 2020)

Major complication of COVID-19 is ARDS

(Wiggermann, N., Zhou, J.,Kumpar, D. 2020)

What is ARDS and how does it relate to COVID-19:

- ARDS was first recognized during the Vietnam war in 1960
- ARDS is characterized by poor gas exchange as a result of alveolar damage and excess fluid in the lungs that prevents oxygen from reaching vital organs.
- A disease state that can result from pneumonia, aspiration of gastric contents, sepsis, and COVID -19.
- Characteristics in COVID-19 patients with ARDS are the similar to that of patients with underlying causes of ARDS but there are some physiological differences that have been observed and details are still emerging.
- Responsible for 10% of all ICU patients worldwide and occurs in 23% of patients who are mechanically ventilated. Hospital mortality rate for patients with ARDS is 46% and ICU mortality rate is 38%.
- In hospitalized patients with COVID-19, 42% develop ARDS, and those patients have a mortality rate of 52%.
- A characteristic treatment/intervention for ARDS is called “Proning”

What is proning and why do we do it:

- Increases the likelihood of survival of patients with coronavirus (COVID-19) by, “proning” or moving the patient from lying on their back to lying face down, and is considered early management of severe ARDS.
- Prone positioning is recommended for 12-16 hours each day

Major complication of COVID-19 is ARDS continued… (Wiggermann, N., Zhou, J.,Kumpar, D. 2020)

What is proning and why do we do it continued:

- Prone positioning allows gravity to aid in mobilizing secretions from the posterior aspect of the lung field.
- Alveolar recruitment occurs as a result of drainage of secretions, allowing improved ventilator performance and blood oxygenation.
- Proning for COVID-19 patients is being widely adopted and recommended for patient who have developed ARDS, and is now being recommended for patients with COVID-19 who are not ventilated by some clinicians.

Barriers to proning:

- Patient safety is imperative due to special care for intubation and ventilator safety. Safeguard against endotracheal dislodgement, hemodynamic compromise, disconnecting lines, eye injuries and pressure injuries while maintaining access to the chest, central lines, arterial lines, and urinary catheters.
- Requires a highly trained care team of five to seven staff nurses and respiratory therapists during the task of proning a patient.
- Gathering so many healthcare workers around a patient to use the proning technique is challenging. It is particularly difficult due to staff and PPE shortages , and places many staff at risk of exposure to COVID-19.
- Manual proning techniques include pushing, pulling, and lifting a patient which can lead to musculoskeletal injuries to staff.
- The COVID-19 pandemic has refocused the medical community on the need for proning and interest is high for identifying appropriate techniques for moving a patient between supine and prone, hence the increase use and need for rotoprone beds.

Proning Methods:

(Wiggermann, N., Zhou, J.,Kumpar, D. 2020 p.1072)

TABLE 1: Proning Methods Identified and Key Characteristics

Category	Method	Equipment Required	Estimated Staff Required	Physical Exposure Concern			Patient Descent	Comments	Source
				Lateral Repo.	Lift/Rotate	Lowering			
Manual	Manual technique: Draw sheet	Draw sheet and flat sheet	5 to 7	Y	Y	Y	Manual	Sometimes referred to as the "Burrito" technique	https://youtu.be/yb1ppe8Y-70 https://youtu.be/qx2z2i6L6g8
	Manual technique: Friction-reducing device	Friction-reducing sheet and flat sheet	5 to 7	N	Y	Y	Manual	Some vendors include foam or fluidized prone positioners	https://youtu.be/lcBPaHQUvXY https://youtu.be/wvCnTsZeKxo
	Manual technique: Air-assisted lateral transfer device	Flat sheet and 2x air-assisted sheets	5 to 7	N	N	Y	Manual	Device assists with lateral repositioning and may also be inflated for patient rotation. Rotation may be less controlled	https://www.linkedin.com/feed/update/urn:li:activity:6651526505816031232/
	Volman prone positioner	Volman prone positioner	5 to 7	Y	Y	Y	Manual	No longer commercially available	Vollman and Bander (1996)
Lift-assisted	Repositioning sheet for rotation	Mechanical lift and 1x or 2x sheets	5	N	N	Y	Manual	The 2nd sheet is used to reposition back to supine. Video shows fewer caregivers than required in clinical environment	https://youtu.be/0ksD7B64T7A
	Repositioning sheet and positioning sling	Mechanical lift, 2x sheets, positioning sling	5	N	N	Y	Manual	Positioning sling can also be used for repositioning for skin	https://youtu.be/Gh9JDmETtyI
	Lift straps for rotation	Mechanical lift and 2x straps	3	N	N	N	Mechanically controlled	It may be possible to feed straps under patient without turning	https://youtu.be/72QO3X9_Lus
Specialized bed	RotoProne	RotoProne Bed	2 to 3	N	N	N	Mechanically controlled	350 lb weight limit. Requires a transfer to the bed	

Manual/Mechanical Proning

(Wiggermann, N., Zhou, J.,Kumpar, D. 2020 p.1073)

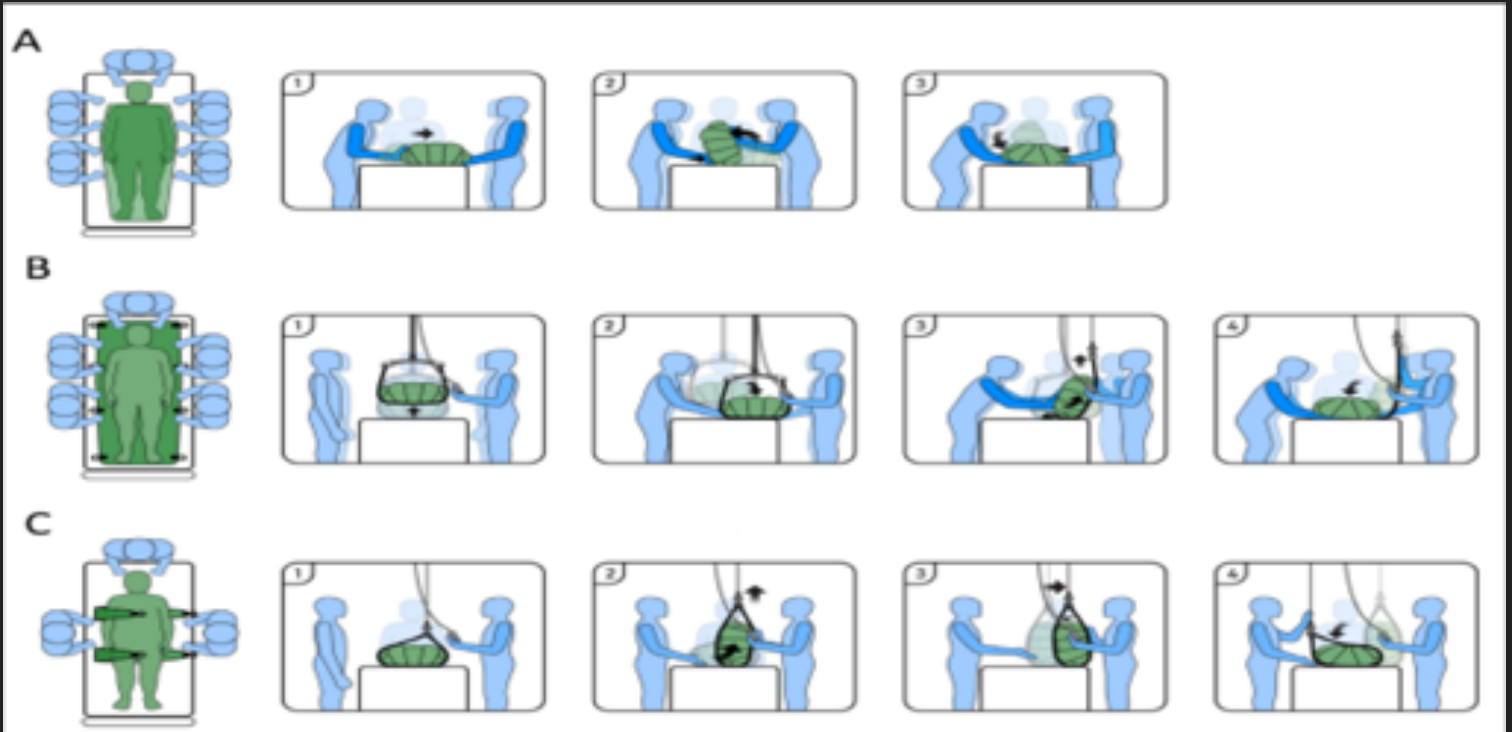


Figure 1. Process steps for the proning methods. *Manual proning* (A). The patient is laterally repositioned (1), lifted and rotated (2), and lowered (3). All steps are manual but friction-reducing sheets may be used to assist with (1). *Lift-assisted proning with repositioning sheet* (B). The patient is laterally repositioned (1 & 2), lifted and rotated (3), and lowered (4). The lift assists with all steps except lowering (4). *Lift-assisted proning with straps* (C). The patient is lifted and rotated (1 & 2), laterally repositioned with most of the weight supported by the lift (3), and lowered (4). All steps are mechanically assisted by the lift.

Increase in use of the proning position and Rotoprone bed (YouTube, 2020)

Critically ill patients diagnosed with COVID-19 may develop ARDS as a respiratory complication. ICU's are treating some patients using the prone positioning manually or the rotoprone bed shown in the video link below.

https://www.youtube.com/watch?v=qP25GJg_eRM-proning patient in a rotoprone bed.

https://www.youtube.com/watch?v=E_6jT9R7WJs-proning patient in a hospital bed.

Patient Education and Prevention of COVID-19

- Transmission of the virus can be spread through respiratory droplets and also by contact of hands to other surfaces
- Virus can remain on surfaces for several hours to days
- Wash hands with soap & water or use alcohol-based hand rub for at least 20 seconds
- Use disinfectant or sanitizer to clean surfaces by leaving solution to dry for 10 minutes

(Enos, 2020)
(World Health Organization, 2020)

Community Response to COVID-19 Pandemic

- The requirements for COVID-19 safety are always changing Social distancing is very important such as gatherings should be no more than 10 people, wear a mask, keep a 6 foot distance and only travel when necessary
- Currently for Lucas county there is a stay at home order due to the rise in COVID-19 cases and an order that grades 7-12 are to do virtual learning due to the increase risk of spread with these age groups
- If a person is positive, they are required to isolate for 10 days and if they are exposed it is 14 days of isolation.
- Currently PPE is still an issue among the community with little supply
- Washing your hands is one of the most important steps of stopping the spread

Toledo Lucas County Health Department | Stay informed. Stay healthy.

Correct Handwashing Technique

WASH HANDS WHEN VISIBLY SOILED! OTHERWISE, USE HANDRUB

Duration of the entire procedure: 40-60 seconds

0

Wet hands with water;

1

Apply enough soap to cover all hand surfaces;

2

Rub hands palm to palm;

3

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

4

Palm to palm with fingers interlaced;

5

Backs of fingers to opposing palms with fingers interlocked;

6

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

7

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

8

Rinse hands with water;

9

Dry hands thoroughly with a single use towel;

10

Use towel to turn off faucet;

11

Your hands are now safe.

Changes in Patient Access to Healthcare

- Telehealth is becoming more popular especially among high risk groups of individuals, although there is still in person appointments.
- Elective surgeries were put on hold for some time to reserve resources and beds in the hospital for ill patients with COVID-19- they have since resumed doing elective surgeries.
- Currently, there are 15,151,472 cases of COVID-19 in the US as of 12/8/2020

https://coronavirus.jhu.edu/map.html

Healthcare Employer Responses to COVID19 Pandemic and Impact on Health Care Workers

- Some employers are offering Hazard Pay to Health Care Professionals working during the COVID -9 Pandemic
    - Hazard pay is additional compensation for performing duties that involve physical hardship or that place workers in potentially dangerous situations. There are currently no federal regulations that would secure hazard pay or any additional compensation for the essential workers during COVID-19.
- Hazard pay is currently being considered to address the challenging employment situation brought about by COVID-19 and has garnered bipartisan support by lawmakers of both local and federal governments
    - Determining who would receive hazard pay is perhaps the most challenging aspect of creating any legislation, be it at the local or federal level. This is in large part because hazard pay does not occur because of legislation; rather, it is agreed upon through negotiations between labor groups, workers, and employers. The hazard pay that is currently up for consideration is intended to support workers who are essential and do not have the flexibility to regularly work remotely. The term “essential worker” is not clearly defined, and therefore the group of workers who would receive hazard pay is different in every proposal.
- Some healthcare systems who are hit extremely hard by the COVID -19 pandemic are offering pay incentives and travel stipends to Healthcare Professionals willing to temporarily relocate to help during the pandemic

(Cleveland Clinic Journal of Medicine, 2020)

Healthcare Workers Rights and Ethical Issues

- Healthcare workers have a duty to care for the sick even when this places them at greater risk of harm. To mitigate these elevated risks, healthcare workers should be prioritized when distributing personal protective equipment.
- Conservation and reallocation of resources make utilization more efficient and allow appropriate PPE to be made available to healthcare workers across settings such as the hospital, outpatient, long-term acute care facilities, and hospice.
- Healthcare personnel caring for patients with confirmed or possible COVID-19 should adhere to CDC recommendations for infection prevention and control (IPC): • Assess and triage these patients with acute respiratory symptoms and risk factors for COVID-19 to minimize chances of exposure, including placing a facemask on the patient and placing them in an examination room with the door closed in an Airborne Infection Isolation Room (AIIR), if available. • Use Standard Precautions, Contact Precautions, and Airborne Precautions and eye protection when caring for patients with confirmed or possible COVID-19. • Perform hand hygiene with alcohol-based hand rub before and after all patient contact, contact with potentially infectious material, and before putting on and upon removal of PPE, including gloves. Use soap and water if hands are visibly soiled. • Practice how to properly don, use, and doff PPE in a manner to prevent self-contamination. • Perform aerosol-generating procedures, in an AIIR, while following appropriate IPC practices, including use of appropriate PPE (CDC, 2020).

(Soto, 2020)

(CDC, 2020)

Healthcare Workers Rights and Ethical Issues continued...

According to the CDC Health Care Professionals (HCP) should use the Symptom-based strategy to determine their return to work status. It is as follows:

HCP with mild to moderate illness who are not severely immunocompromised:

- At least 10 days have passed since symptoms first appeared and
- At least 24 hours have passed since last fever without the use of fever-reducing medications and
- Symptoms (e.g., cough, shortness of breath) have improved

HCP who are not severely immunocompromised and were asymptomatic throughout their infection may return to work when at least 10 days have passed since the date of their first positive viral diagnostic test.

HCP with severe to critical illness or who are severely immunocompromised

- At least 10 days and up to 20 days have passed since symptoms first appeared
- At least 24 hours have passed since last fever without the use of fever-reducing medications and
- Symptoms (e.g., cough, shortness of breath) have improved
- Consider consultation with infection control experts

HCP who are severely immunocompromised but who were asymptomatic throughout their infection may return to work when at least 10 days and up to 20 days have passed since the date of their first positive viral diagnostic test.

(CDC, 2020)

Healthcare Workers Rights and Ethical Issues continued...

- An estimated 95% of severely or critically ill patients, including some with severe immunocompromise, no longer had replication-competent virus 15 days after onset of symptoms; no patient had replication-competent virus more than 20 days after onset of symptoms. The exact criteria that determine which HCP will shed replication-competent virus for longer periods are not known. Disease severity factors and the presence of immunocompromising conditions should be considered in determining the appropriate duration for specific HCP. For example, HCP with characteristics of severe illness may be most appropriately managed with at least 15 days before return to work.

(CDC, 2020)

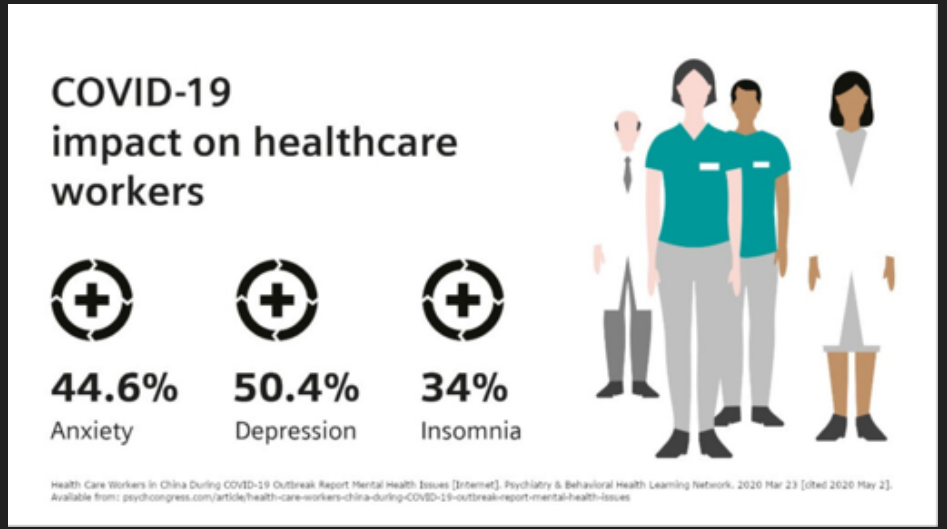
How Nurses Can Protect Themselves During COVID-19

- Wash your hands! **One of the most important tools to preventing the spread of infection.*
- Wear correct PPE when coming into contact with persons suspected to be infected with COVID-19 (Gown, gloves, mask/respirator, goggles/face shield)
- Correctly don PPE ⟹ Gown, mask, goggles, gloves
- Correctly doff PPE ⟹ Gloves, goggles, gown, mask
- Avoid touching your face/eyes
- Stay current with CDC guidelines
- Disinfect surfaces with approved cleaners
- *It is also very important for nurses to monitor their mental health and wellbeing during this stressful time.**

Burnout and PTSD in Healthcare Workers

- HCWs working on frontlines in departments more impacted by COVID-19 (ie, emergency department, intensive care unit, infectious disease) were at greater risk for anxiety and depression and psychological disorder such as PTSD (Benfante et al, 2020)
- These aspects can trigger psychopathologies such as acute stress disorder (ASD) and posttraumatic stress disorders (PTSD). Healthcare workers (HCWs) have been faced with unprecedented demands, both professionally and personally, in efforts to manage a disease with unclear etiology and pathology, no cure, no vaccine, and a high mortality rate (Benfante et al, 2020)

- Early symptoms of psychological trauma, together with symptoms of anxiety, depression, and insomnia, must be recognized, so that appropriate interventions can consider the organizational needs of HCWS, risk and protective factors, and possibly include actions to promote post-traumatic growth. (Shreffler et al, 2020)



Public Health Policy Changes: Summary for Healthcare Facilities: Strategies for optimizing the supply of PPE during Shortage

CONTINUE TO NEXT SLIDE FOR SUGGESTIONS FROM THE CDC IN REGARDS TO PPE.

https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/strategies-optimize-ppe-shortages.html

	conventional	CONTINGENCY	CRISIS
 **ALL PPE**	• Limit number of patients going to hospital or outpatient settings • Use telemedicine whenever possible • Exclude all HCP not directly involved in patient care • Limit face-to-face HCP encounters with patients • Exclude visitors to patients with known or suspected COVID-19 • Cohort patients and/or HCP	Selectively Cancel elective and non-urgent procedures and appointments for which PPE is typically used by HCP •Decrease length of hospital stay for medically stable patients with COVID-19	• Cancel all elective and non-urgent procedures and appointments for which PPE is typically used by HCP
N95 Respirators 	• Implement just-in-time fit testing • Limit respirators during training • Implement qualitative fit testing • Use alternatives to N95 respirators such as other filtering facepiece respirators, elastomeric respirators, and powered air purifying respirators	• Temporarily suspend annual fit testing • Use N95 respirators beyond the manufacturer-designated shelf life for training and fit testing • Extend the use of N95 respirators by wearing the same N95 for repeated close contact encounters with several different patients	• Use respirators beyond the manufacturer designated sh life for healthcare delivery • Use respirators approved under standards used in other countries • Implement limited re-use of N95 respirators. During tim of crisis, it may be needed to practice limited re-use on t of extended use • Use additional respirators beyond the manufacturer-designated shelf life that have not been evaluated by NIOSH • Prioritize the use of N95 respirators and facemasks by activity
FACEMASKS 	• Use facemasks according to product labeling and local, state, and federal requirements	•Place facemasks in a secure and monitored site •Provide facemasks to symptomatic patients upon check-in at entry points •Implement extended use of facemasks •Restrict facemasks for use by HCP; rather than asymptomatic patients (who might use cloth face coverings) for source control	• Use facemasks beyond the manufacturer-designated she life during patient care activities • Implement limited re-use of facemasks • Prioritize facemasks for selected activities such as essen surgeries, activities where splashes and sprays are anticipated, prolonged face-to-face contact with an infectious patient, and aerosol-generating procedures • **When no facemasks are available:** Use a face shield that covers the entire front (that extends to the chin or below and sides of the face with no facemask
Gowns 	• Use isolation gown alternatives that offer equivalent or higher protection	• Shift gown use toward cloth isolation gowns • Consider the use of coveralls • Use gowns beyond the manufacturer-designated shelf life for training	• Extend the use of isolation gowns • Re-use cloth isolation gowns • Prioritize gowns for activities where splashes and sprays are anticipated and during high-contact patient care • **When no gowns are available:** Consider using gown alternatives that have not been evaluated as effective
Eye Protection 	•Use eye protection according to product labeling and local, state, and federal requirements	•Shift eye protection supplies from disposable to re-usable devices •Extend the use of eye protection	• Use eye protection devices beyond the manufacturer-designated shelf life • Prioritize eye protection for activities where splashes an sprays are anticipated or prolonged face-to-face or close contact is unavoidable • Consider using safety glasses that cover the sides of eye
Gloves 	• Continue providing patient care as in usual infection control practice	• Use gloves past their manufacturer-designated shelf life for training activities • Use gloves conforming to other U.S. and international standards	• Use gloves past their manufacturer-designated shelf life for healthcare delivery • Prioritize the use of non-sterile disposable gloves • Consider non-healthcare glove alternatives • Extend the use of disposable medical gloves

Changes to Healthcare Process from a Legal and Policy Perspective

The jump to Telehealth

Currently, 76 percent of U.S. hospitals connect with patients and consulting practitioners at a distance through the use of video and other technology.

State policymakers are increasingly focusing their attention on telehealth. Today, 35 states and the District of Columbia have enacted “parity” laws, which generally require health insurers to cover services provided via telehealth the same way they would reimburse for services provided in person.

Significant federal and state legal and regulatory issues will determine whether and how providers can offer specific telehealth services. In general, the provision of telehealth services requires compliance with an array of federal and state rules. Legal and regulatory challenges abound in the following areas: • Coverage and payment • Health professional licensure • Credentialing and privileging • Online prescribing, including for controlled substances • Medical malpractice and professional liability insurance • Privacy and security and • Fraud and abuse.

Congress introduced *The Protecting Access to Post COVID-19 Telehealth Act of 2020* (H.R. 7663), extending telehealth access to Medicare beneficiaries after the public health emergency declaration expires.

(AHA, 2020)

Disaster Preparedness Changes Since COVID-19 Pandemic

Johns Hopkins University School of Medicine COVID-19 dashboard has become one of the gold standards for monitoring real time data about the disease worldwide. (https://coronavirus.jhu.edu/map.html)

Increase in resources and support given to organizations such as the American College of Emergency Physicians, which recognizes specific disaster management fellowship programs

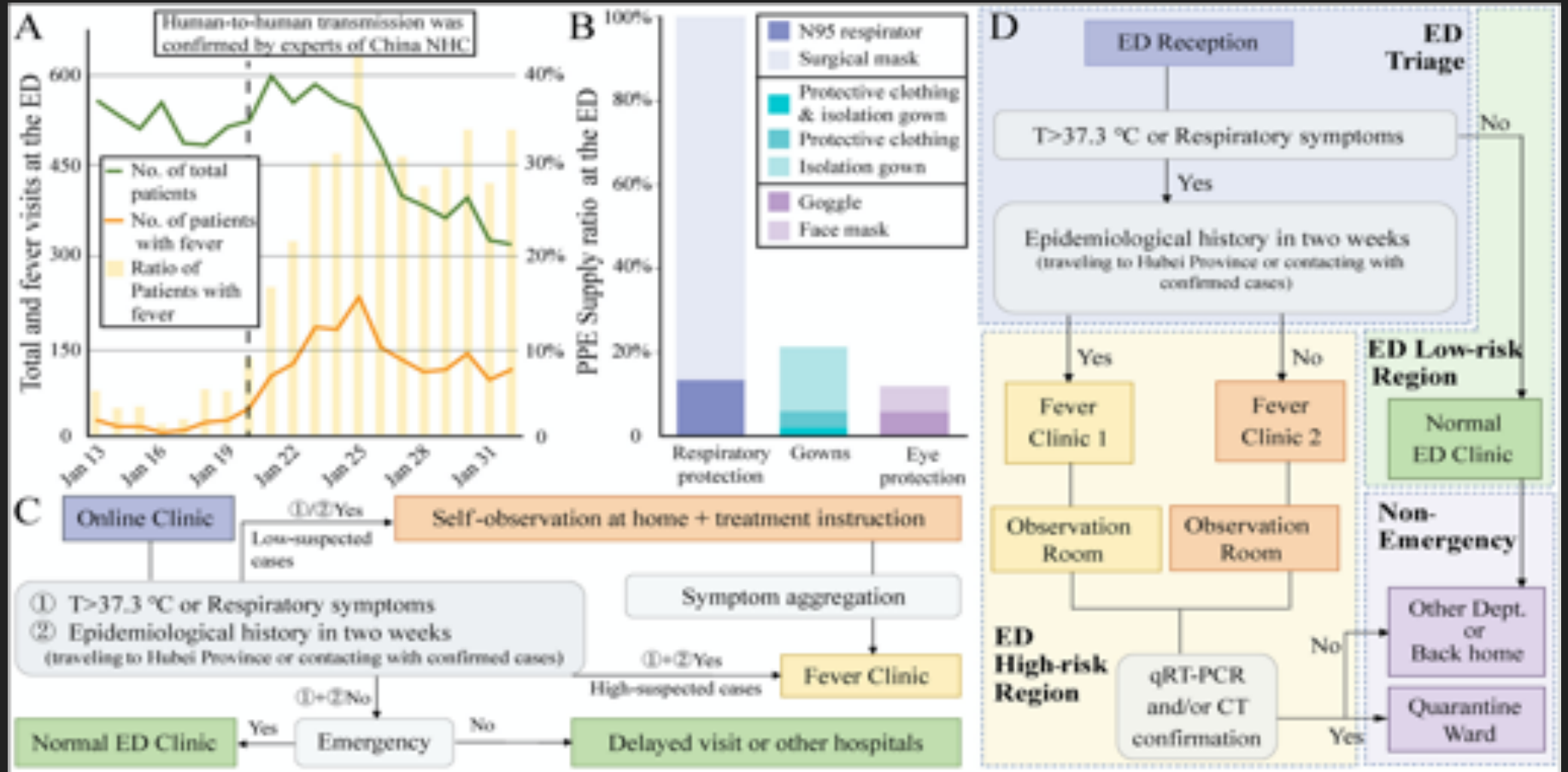
More attention given to critical infrastructure that communities require- factors such as increasing access to equitable housing, creating models to alleviate food and resource poverty, and making available preventative and acute healthcare services.

New disaster plans for hospitals created to help manage ED workload, PPE shortage, and overall hospital management, such as designating full units to COVID-19.

(Cao et al, 2020)


Johns Hopkins | Coronavirus Resource Center
Home
Tracking
Testing
Tracing
Vaccines
By Region
News & Resources
About
Tracking Home
Critical Trends
Global Map
U.S. Map
Data in Motion
COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU)
Global Cases
67,516,683
Cases by Country/Region/Sovereignty
14,933,247 US
9,677,203 India
6,673,911 Brazil
2,466,961 Russia
2,349,859 France
1,742,557 Italy
1,742,534 United Kingdom
1,702,335 Spain
1,466,309 Argentina
1,327,101 Colombia
1,290,801 Germany
1,175,858 Mexico
1,067,879 Poland
1,051,374 Iran
973,913 Peru
868,432 Turkey
843,899 Ukraine
817,878 South Africa
Admin0
Admin1
Admin2
Last Updated at (M/D/YYYY)
12/7/2020, 6:26 PM
Global Deaths
1,543,027
283,568 deaths
US
177,317 deaths
Brazil
140,573 deaths
India
109,717 deaths
Mexico
61,331 deaths
United Kingdom
60,606 deaths
Italy
55,413 deaths
France
50,394 deaths
Iran
Global Deaths
Global Recovered
US State Level
Deaths, Recovered
35,034 deaths, 61,949 recovered
New York US
23,179 deaths, 1,606,716 recovered
Texas US
19,916 deaths, recovered
California US
19,282 deaths, recovered
Florida US
17,336 deaths, 44,021 recovered
New Jersey US
14,214 deaths, recovered
Illinois US
11,319 deaths, 226,660 recovered
Pennsylvania US
11,035 deaths, 149,809 recovered
Massachusetts US
US Deaths Recovered
Cumulative Cases
Active Cases
Incidence Rate
Case-Fatality Ratio
Testing Rate
191
countries/regions
Lancet Inf Dis Article: Here. Mobile Version: Here. Data sources: Full list. Downloadable database: GitHub, Feature Layer.
Lead by JHU CSSE. Technical Support: Esri Living Atlas team and JHU APL. Financial Support: JHU, NSF, Bloomberg Philanthropies and Stavros Niarchos Foundation. Resource support: Slack, Github and AWS. Click here to donate to the CSSE dashboard team, and other JHU COVID-19 Research Efforts. FAQ. Read more in this blog. Contact US.
Daily Cases
Daily Deaths
Cumulative Cases
Cumulative Deaths
Log Cases

ED workload, PPE shortage, and hospital management plan during the COVID-19 epidemic. (A) The daily number and ratio of fever visits at the ED from January 13 to February 1, 2020. (B) The PPE supply ratio at the ED of West China Hospital on January 25. (C) The illustration of online clinic triage of West China Hospital. (D) The illustration of ED triage and region separation. NHC = National Healthcare Commission; T = temperature. (Cao et al, 2020)



COVID19 Vaccines - Did you know…?

HOW VACCINES ARE DEVELOPED & TESTED & THE PHASES OF CLINICAL TRIALS	
Vaccine Developed	The **vaccine has been engineered**.
Preclinical Testing	The vaccine is tested on cells in a lab, then on animals such as mice or monkeys to see if it **produces an immune response** and to **test its safety** before being given to humans
Phase 1: Safety Trials	The vaccine is given to a **small number of people** to (1) see **what dosage is effective** in stimulating the immune system and (2) to test for **safety in humans**
Phase 2: Expanded Trials	The vaccine is given to **hundreds of people** of diverse ages and populations, to see if the vaccine **acts differently in subgroups of the population** (children, the elderly, etc.). More data is collected on safety and the vaccine's effectiveness in stimulating the immune system.
Phase 3: Efficacy Trials	In a blinded research trial, **thousands of people** voluntarily sign up to receive the vaccine or a placebo. The number of vaccinated people infected is compared with those who received the placebo. This is how we test how well the vaccine protects people against infection by the virus. Phase 3 trials are very large and show rare side effects that few people in the population will experience so this data can be reported. **In the U.S., the FDA stated in June 2020 they expect a COVID19 vaccine to be at least 50% effective in preventing COVID19 infection.*
Early or Limited Approval	*Some governments have overridden the scientific process of clinical trials, **administering vaccines to their populations without the results of Phase 3 clinical trials**. This is very dangerous because vaccines can have severe side effects. China and Russia have enacted emergency authorization to bypass complete testing.*
Approval	Regulatory bodies (scientific organizations that study whether vaccines and medicines are safe and effective, such as the FDA in the United States) in each country review whether the vaccine is safe and effective and give formal approval for its use or not. Even after approval, the researchers continue to monitor for safety and effectiveness.
Combined Phases	During emergencies, such as a pandemic, phases can be combined such that both take place at the same time, such as phases 1 and 2, or phases 2 and 3.
Paused	If investigators see any concerning symptoms, they can place the trial on pause until an investigation is completed. Depending on the investigation findings, the trial can be resumed or abandoned.

The development of a COVID-19 vaccine is highly anticipated, making headlines as different vaccines get closer to approval for use. **However, did you know what it takes to produce a safe and effective vaccine?** To the left is an overview of the clinical trial phases a vaccine goes through to make sure it is safe and effective.

(Zimmer, Corum, & Wee, 2020)

Current COVID-19 Vaccines

As of 12/8/2020, the Pfizer/BioNTech vaccine is approved for emergency use in the U.S. It requires 2 doses 21 days apart.

Did you know that you may be able to sign up for a COVID19 vaccine clinical trial? Doing so is voluntary, requires you to meet specific criteria, and requires follow up participation.

Multiple companies throughout the world are working to produce and test COVID19 vaccines. The table to the right shows several of these vaccines in or near stage 3 of clinical trials, several of which have received early, limited, or emergency use approval.

Current as of 12/5/2020
(Zimmer, Corum, & Wee, 2020)

CURRENT MAJOR COVID19 VACCINE CLINICAL TRIALS

This list is not all-encompassing and attempts to identify the major vaccine clinical trials in Phase III. Other vaccines are in development.

Company/Vaccine	Current Research Phase	Effectiveness
BNT162b2 (mRNA receptor full spike protein). Produced by Pfizer & BioNTech (US & Germany)	**Combined Phase 2/3 Trials. Emergency use approved** in UK. **Request for emergency use** in U.S.	95% effective (94% if over age 65).
ChADOX1 NCOV-19 AZD1222: (viral vector with spike code protein). Produced by AstraZeneca & University of Oxford (UK)	**Phase 3 Clinical Trials.**	Preliminary data from phase 3 clinical trials indicates >90% effective.
mRNA-1273 (mRNA code for spike protein). Produced by Moderna (U.S.)	**Phase 3 Clinical Trials.**	Preliminary data from phase 3 clinical trials indicates >90% effective.
GSK-SARS-CoV-2 Vaccine (spike protein antigen). Produced by Sanofi Pasteur & GlaxoSmithKline (France & England)	**Phase 1/2 Clinical Trials**	Plan to start Phase 3 Trials Dec. 2020; safety & efficacy data expected mid 2021
NVX-CoV2373 (prefusion protein antigen). Produced by Novavax (U.S.)	**Phase 3 Clinical Trials.**	More temperature-stable than the Pfizer/Moderna/AstraZeneca vaccines.
Ad26.COV2-S (intranasal, viral vector w/ spike protein code). Produced by Johnson & Johnson (U.S.)	**Phase 3 Clinical Trials.**	Phase 3 clinical trials administered single dose of vaccine. Now testing the effectiveness of 2 doses in phase 3 trial.
CureVac's CVnCoV (self-amplifying mRNA based on spike protein). Produced by CanSino Biologics (China)	**Phase 3 Clinical Trials. Approved for limited use in China by Chinese government.**	Phase 3 trials incomplete; data for safety and effectiveness not yet available.
BetaCoV/Wuhan/AMMS01/2020 and others. Produced by Sinopharm w/ Wuhan & Beijing Institutes of Biological Products (China).	**Phase 3 Clinical Trials. Approved for emergency use in China.**	Phase 3 trials incomplete; data for safety and effectiveness not yet available.
Sinovac's CoronVac (inactivated virus vaccine). Produced by Sinovac (China).	**Approved for limited use in China.**	Phase 3 trials incomplete; data for safety and effectiveness not yet available.
Gam-Covid-Vac, renamed **Sputnik V** (from adenoviruses Ad5 and Ad26) Produced by Gamaleya (Russian government institute)	**Phase 3 Clinical Trials. Approved for early use in Russia.**	Phase 3 trials incomplete; data for safety and effectiveness not yet available.
EpiVacCorona (peptide-antigen) Produced by BekTop (Russian government institute)	**Phase 3 Clinical Trials. Approved for early use in Russia.**	Phase 3 trial expected to start late 2020.

All but Johnson and Johnson's Ad26.COV2-S vaccine require 2 doses. J&J trialed single dose but now testing effectiveness of 2 doses.

Moving Forward: Future Solutions

COVID-19 VACCINES: Further Data is Needed

- Will the vaccines prevent **transmission** of the virus? (Can a person who receives the vaccine feel healthy but shed the virus and possibly infect other people?)
- **How long** will **vaccine-induced immunity** last?
- **How effective** are the vaccines in **subsets** of the population (i.e. pregnant women, children, elderly, and individuals with obesity), especially **over time**?
- Will the virus **mutate** to the point of the vaccines becoming ineffective? The CoV-2 genome appears relatively stable (compared with the influenza virus, for example), but multiple strains of the virus exist, and the vaccine may not be effective against all of them, especially if they mutate.
- How will scientists monitor for **long term safety concerns**? The vaccines are new and we have yet to see all the **long-term side effects**.

(Ledford, Cyranoski, & Noorden, 2020)

COVID-19 TREATMENTS

- Antiviral treatment development, availability, and approved usage (ex. Remdesivir, Veklury)
- Supportive treatments such as zinc, vitamin C, L-lysine
- Social changes such as social distancing, capacity limitations, mask requirements, temperature screening - where, when, and how long will it last?

MORE ETHICAL ISSUES

- Who gets vaccines & treatments first?
- Who decides?
- Will vaccinations be mandatory? This is a major ethical issue, especially when long term risks and long term effects have yet to be fully studied.

2020: The Year of the Nurse

“Save one life, you’re a hero. Save a hundred lives, you’re a nurse.” -Unknown

The year 2020 created desperate times for everyone. When individuals were advised to stay home, healthcare workers were unable to go home, filled with fear they would spread COVID-19 to their loved ones.

While all healthcare workers worked day and night to care for people infected with the virus, the nurses are the ones who held the hands of patients who took their last breath alone. During this time, nurses were quickly named the “unsung heroes” of the 2020 pandemic. It was unveiled to everyone the important role nurses play in the healthcare system. They saved lives, advocated for their patients, and answered the call to serve their communities during this time of crisis. This is why nurses have been names the “Heroes of COVID-19” and why year 2020 will always be remembered as “The Year of the Nurse”.

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