INFECTIOUS DISEASES IN THE WORKPLACE: INCLUDING COVID-19

SUSAN HARWOOD TRAINING GRANT

FIU

WELCOME

- Please sign the attendance sheet
- Take one handout
- Fill the registration form
- Answer the pre-test

LOCATION

- Emergency Exits
- Emergency Stairs
- Location of restrooms
- Location of water fountains

DISCLAIMER

This material was produced under grant number SH-37148-HA1 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U. S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U. S. Government.

Revisions were made to this material under grant number SH-36979-HA1 from the Occupational Safety and Health Administration, U.S. Department of Labor.

AGENDA

- Welcome
- Introduction to OSHA
- Worker's rights
- Introduction to Infectious Diseases
  - ❑ Respiratory Syncytial Virus (RSV)
  - ❑ Tuberculosis (TB)
  - ❑ COVID-19

➢ Certificates

INTRODUCTION TO OSHA

Overview of anti-retaliation provisions, employee rights, employer responsibilities, whistleblower laws, and OSHA's complaint investigation procedures.

WHY IS OSHA IMPORTANT TO YOU?

- OSHA began because, until 1970, there were no national laws for safety and health hazards.
- On average, 13 workers die every day from job injuries.
- Worker deaths in America are down–on average, from about 38 worker deaths a day in 1970 to 13 a day in 2020.

❖WORKER FATALITIES

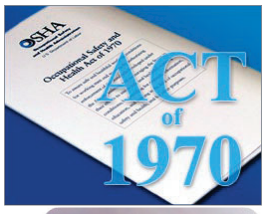
- 4,764 workers were killed on the job in 2020.
- Falls accounted for 805 out of 4,764 total deaths (17%).

DISCUSSION QUESTIONS

- When, during your work experience, did you first hear about OSHA?
- What did you think about OSHA then?
- What do you think OSHA's job is?

HISTORY OF OSHA

- **OSHA** stands for the **Occupational Safety and Health Administration**, an agency of the U.S. Department of Labor.
- OSHA's responsibility is worker safety and health protection.
- On December 29, 1970, President Nixon signed the OSH Act.
- This Act created OSHA, the agency, which formally came into being on April 28, 1971.



OSHA'S MISSION

- To save lives
- To prevent injuries
- To protect America's workers

STRATEGIES TO REDUCE INJURIES AND DEATHS

- Strong, fair, and effective enforcement.
- Outreach, education, and compliance assistance.
- Partnerships and other cooperative programs.

Outreach Training Program

Construction | General Industry | Maritime | Disaster Site

PARTNERSHIP
An OSHA Cooperative Program

Labels for hazardous substances in your workplace

Labels for a hazardous chemical must contain:

- Name, Address and Telephone Number
- Product Identifier
- Signal Word
- Hazard Statement(s)
- Precautionary Statement(s)
- Pictogram(s)

HCS Pictograms and Hazards

Health Hazard • Carcinogen • Mutagenicity • Reproductive Toxicity • Respiratory Sensitizer • Target Organ Toxicity • Aspiration Toxicity	**Flame** • Flammables • Pyrophorics • Self-Heating • Emits Flammable Gas • Self-Reactives • Organic Peroxides	**Exclamation Mark** • Irritant (skin and eye) • Skin Sensitizer • Acute Toxicity (harmful) • Narcotic Effects • Respiratory Tract Irritant • Hazardous to Ozone Layer (Non-Mandatory)
Gas Cylinder • Gases Under Pressure	**Corrosion** • Skin Corrosion/ Burns • Eye Damage • Corrosive to Metals	**Exploding Bomb** • Explosives • Self-Reactives • Organic Peroxides
Flame Over Circle • Oxidizers	**Environment** (Non-Mandatory) • Aquatic Toxicity	**Skull and Crossbones** • Acute Toxicity (fatal or toxic)

OSHA INSPECTIONS

- The OSHA Act authorizes OSHA compliance safety and health officers (CSHOs) to conduct workplace inspections at reasonable times.
- OSHA conducts inspections without advance notice, except in rare circumstances (e.g. Imminent Danger).
- In fact, anyone who tells an employer about an OSHA inspection in advance can receive fines and a jail term.

INSPECTIONS PROCESS

- A typical OSHA on-site inspection includes four stages:

1. Presentation of inspector credentials.
2. An opening conference.
3. An inspection walk-around.
4. A closing conference.

OSHA'S INSPECTION PRIORITIES

Priority	Category of Inspection
1st	**Imminent Danger:** Reasonable certainty an immediate danger exists
2nd	**Fatality/Catastrophe:** Reported to OSHA; inspected ASAP
3rd	**Complaints/Referrals:** Worker or worker representative can file a complaint about a safety or health hazard
4th	**Programmed Inspections:** Cover industries and employers with high injury and illness rates, specific hazards, or other exposures.

OSHA'S COMPLAINT INVESTIGATIONS

- OSHA evaluates each complaint to determine how it can be handled best--an off-site investigation or an on-site inspection.
- Before beginning an inspection, OSHA staff must be able to determine from the complaint that there are reasonable grounds to believe that a violation of an OSHA standard or a safety or health hazard exists.
- If OSHA has information indicating the employer is aware of the hazard and is correcting it, the agency may not conduct an inspection after obtaining the necessary documentation from the employer.

RIGHTS AS A WHISTLEBLOWER

- Employee may file a complain with OSHA under Section 11(c) if your employer retaliates against you by taking unfavorable personnel action because you engaged in protected activity relating to workplace safety and health.
- OSHA requires that complaints must be filed within 30 days after the alleged retaliation.

RIGHTS AS A WHISTLEBLOWER

- Your employer may be found to have retaliated against you if your protected activity was a contributing or motivating factor in its decision to take unfavorable personnel action against you. Such actions may include:

  - ✧ Firing or laying off
  - ✧ Blacklisting
  - ✧ Denying overtime or promotion
  - ✧ Disciplining
  - ✧ Denying benefits
  - ✧ Failing to hire or rehire
  - ✧ Intimidation
  - ✧ Reassignment affecting promotion prospects
  - ✧ Reducing pay or hour

QUESTIONS ABOUT OSHA?

INFECTIOUS DISEASE

RESPIRATORY SYNCYTICAL VIRUS (RSV)

LEARNING OBJECTIVES

A. Understand the basics about Respiratory Syncytial Virus (RSV) and its spread

B. Understand the five key areas of reducing RSV spread
   1) Anticipation: Know about seasonality and be prepared
   2) Recognition: Recognize hazardous situations
   3) Evaluation: Know your OSHA risk level
   4) Control: Effective controls to protect yourself and others
   5) Management: Report illness and monitor success of controls

SECTION 1:

ABOUT RSV AND TRANSMISSION

RSV INFORMATION

- Respiratory syncytial (sin-SISH-uhl) virus, or RSV, is a common respiratory virus that usually causes mild, cold-like symptoms.
- Most people recover in a week or two, but RSV can be serious, especially for infants and older adults.
- RSV is the most common cause of bronchiolitis (inflammation of the small airways in the lung) and pneumonia (infection of the lungs) in children younger than 1 year of age in the United States.

Infant and father (source: CDC - https://www.cdc.gov/rsv/index.html)

RSV INFORMATION

- People of any age can get another RSV infection, but infections later in life are generally less severe. People at highest risk for severe disease include:
- Premature infants.
- Young children with congenital (from birth) heart or chronic lung disease.
- Young children with compromised (weakened) immune systems due to a medical condition or medical treatment.
- Adults with compromised immune systems.
- Older adults, especially those with underlying heart or lung disease.

Children (source: CDC - https://www.cdc.gov/rsv/index.html)

RSV INFORMATION

- RSV can survive for many hours on hard surfaces such as tables and crib rails. It typically lives on soft surfaces such as tissues and hands for shorter amounts of time.
- In the United States and other areas with similar climates, RSV infections generally occur during fall, winter, and spring.

TRENDS AND SURVEILLANCE

❖Each year in the United States, RSV leads, on average, to approximately—

- 2.1 million outpatient visits among children younger than 5 years old.
- 58,000 hospitalizations among children younger than 5 years old.
- 177,000 hospitalizations among adults 65 years and older.
- 14,000 deaths among adults 65 years and older

RSV SEASONAL TRENDS

- CDC analyzes data on RSV activity at the national, regional, and state levels, collected by a surveillance system called the National Respiratory and Enteric Virus Surveillance System (NREVSS).
- For 2016 to 2017, the RSV season onset ranged from mid-September to mid-November, season peak ranged from late December to mid-February, and season offset ranged from mid-April to mid-May in all 10 U.S. Department of Health and Human Services (HHS) regions, except Florida. Florida has an earlier RSV season onset and longer duration than most regions of the country (see figure).
- Seasonal patterns remain consistent with previous years.

SIGN AND SYMPTOMS

- People infected with RSV usually show symptoms within 4 to 6 days after getting infected. Symptoms of RSV infection usually include:

- Runny nose
- Decrease in appetite
- Coughing
- Sneezing
- Fever
- Wheezing

Signs and Symptoms of COVID-19 (Source: CDC)

- These symptoms usually appear in stages and not all at once. In very young infants with RSV, the only symptoms may be irritability, decreased activity, and breathing difficulties.
- Almost all children will have had an RSV infection by their second birthday.
- Call your healthcare professional if you or your child is having difficulty breathing, not drinking enough fluids, or experiencing worsening symptoms.

SEVERE SIGN AND SYMPTONS

❖RSV can also cause more severe infections such as:

- bronchiolitis, an inflammation of the small airways in the lung, and pneumonia, an infection of the lungs. It is the most common cause of bronchiolitis and pneumonia in children younger than 1 year of age.

❖ Seek immediate emergency medical care if someone is showing these symptoms.

CARE AND RELIEF OF SYMPTOMS

❖ Most RSV infections go away on their own in a week or two.

❖ There is no specific treatment for RSV infection, though researchers are working to develop vaccines and antivirals (medicines that fight viruses).

❖ Take steps to relieve symptoms

- Manage fever and pain with over-the-counter fever reducers and pain relievers, such as acetaminophen or ibuprofen. (Never give aspirin to children.
- Drink enough fluids. It is important for people with RSV infection to drink enough fluids to prevent dehydration (loss of body fluids).
- Talk to your healthcare provider before giving your child nonprescription cold medicines. Some medicines contain ingredients that are not good for children.

Infant (Source: CDC)

TRANSMISSION (SPREAD)

❖ RSV can spread when :-

- An infected person coughs or sneezes.
- You get virus droplets from a cough or sneeze in your eyes, nose, or mouth.
- You touch a surface that has the virus on it, like a doorknob, and then touch your face before washing your hands.
- You have direct contact with the virus, like kissing the face of a child with RSV.

Aerosol produced during a sneeze
(Source: Public Health Information Library)

POLL QUESTION #1

Which of these are warning signs of an RSV infection that would require immediate emergency medical care? Select all that apply.

- ❑ Bluish lips or face
- ❑ Persistent pain or pressure in the chest
- ❑ Trouble breathing
- ❑ Diarrhea
- ❑ Headache

INCUBATION PERIOD AND INFECTION RATE

❖ **Incubation Period**: Number of days between infection and symptoms

- Tells us how long individuals should stay away from others during an outbreak.
- People with RSV are usually contagious for **3 to 8 days**.
- However, some infants, and people with weakened immune systems, can continue to spread the virus even after they stop showing symptoms, for as long as 4 weeks.

❖ **Reproductive number (R_0):** Number of cases one infected individual generates

- The basic reproductive number, R_0, is estimated at 3.0 (standard deviation 0.6) across all seasons and locations.

STEPS TO HELP PREVENT SPREAD OF RSV

❖ **Parents of children at high risk** for developing severe RSV disease should help their child, when possible, do the following:

- Avoid close contact with sick people.
- Wash their hands often with soap and water for at least 20 seconds.
- Avoid touching their face with unwashed hands.
- Limit the time they spend in child-care centers or other potentially contagious settings, especially during fall, winter, and spring. This may help prevent infection and spread of the virus during the RSV season.

PROGNOSIS

❖ **Prognosis is a prediction of the likely outcome of a disease as well as treatment and results.**

❖ Most cases of RSV are mild and cause cold-like symptoms. Almost all children under two years of age will be infected with RSV.

❖ Most cases of RSV in adults and healthy children will not require treatment. Infants and older adults at greatest risk of severe RSV can develop pneumonia or bronchiolitis or experience a worsening of their existing heart and lung conditions and may require hospitalization.

MORTALITY (DEATH)

❖ The **mortality rate of RSV in babies** depends on the immunologic status of the child, which resembles the following: In healthy children, the reported mortality rate is about 0.5 to 1.7%. In children with suppressed immunity, the mortality rate is higher (about 60%).

❖ **In adults**, RSV pneumonia is associated with a mortality rate ranging from 11-78%, depending on the severity of underlying immune suppression. In long-term care facilities, 5-27% of respiratory tract infections have been estimated to be caused by RSV, 10% of which will develop into pneumonia and 1-5% of which will be fatal. In immunocompromised patients, particularly **HSCT** (Hematopoietic Stem Cell Transplant) recipients, the mortality rate for RSV pneumonia is high, at 41%.

What Is the Mortality Rate of RSV in Babies?
https://www.medicinenet.com/what_is_the_mortality_rate_of_rsv_in_babies/article.htm

POLL QUESTION #2

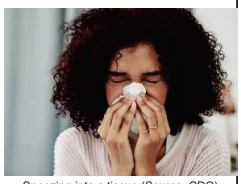
Based on the incubation period for RSV, about how many days should a person stay away from others (quarantine) if he/she has come into close contact with an infected person(s)?

- ❑ 1 day
- ❑ 5 days
- ❑ 7 days
- ❑ 14 days
- ❑ 21 days

SECTION 2:

GENERAL APPROACH TO PROTECTING WORKERS.

GENERAL RECOMMENDATIONS FOR PUBLIC*



Sneezing into a tissue (Source: CDC)

1. Frequent handwashing.
2. Avoid touching your eyes, nose, or mouth.
3. Practice good respiratory etiquette.
4. Practice social distancing.
5. Face coverings (when applicable).
6. Clean and disinfect frequently touched surfaces daily.
7. Monitor your health daily and stay home or get needed medical care if sick.
8. Notify your employer if you are sick.
9. Recognize and plan to address personal risk factors for those at increased risk of severe illness

* *Note these are subject to change; Always check current CDC and/or local recommendations*

USE EPA APPROVED LIST N DISINFECTANTS FOR RSV, WEAR GLOVES, AND PROTECT YOURSELF FROM CHEMICALS. (SOURCE: CDC)

POLL QUESTION #3

RSV <u>most commonly</u> spreads by:

- ❑ Respiratory droplets produced when an infected person coughs, sneezes, talks, or breathes near another person.
- ❑ Touching surfaces that have the virus on it and then touching your mouth, nose, or eyes.
- ❑ The wind carrying the virus great distances from city to city.
- ❑ Coming in contact with infected blood.

SECTION 4:

TESTING AND MONITORING OF RSV

DIAGNOSTIC TEST

❖Two kinds of test are available -

- **Viral test** tells if you have a current infection.
- **Antibody test** might tell if you had a past.

DIAGNOSTIC TESTING

❖ Clinical symptoms of RSV are nonspecific and can overlap with other viral respiratory infections, as well as some bacterial infections. Several types of laboratory tests are available for confirming RSV infection. These tests may be performed on upper and lower respiratory specimens.

❖ The most used types of RSV clinical laboratory tests are:

- Real-time reverse transcriptase-polymerase chain reaction (RT-PCR), which is more sensitive than culture and antigen testing.
- Antigen testing, which is highly sensitive in children but not sensitive in adults.

DIAGNOSTIC TESTING

❖ Less commonly used tests include:

- Viral culture (growth of virus in cell cultures).
- Serology, which is usually only used for research and surveillance studies.

❖ Some tests can differentiate between RSV subtypes (A and B), but the clinical significance of these subtypes is unclear. Consult your laboratorian for information on what type of respiratory specimen is most appropriate to use.

DIAGNOSTIC TESTING

https://www.globalpointofcare.abbott/en/index.html

POLL QUESTION #4

Worker risk of exposure to RSV is mostly based on which of the following? Select all that apply.

- ❑ Close contact with people
- ❑ Frequent contact with people
- ❑ Handling packages and mail
- ❑ Attending virtual meetings

POLL QUESTION #5

A biological virus, such as RSV, can be spread through: (Select all that apply)

- ❑ Contact with droplets from a sneeze or cough.
- ❑ Touching eyes/nose/mouth without washing hands.
- ❑ Talking with someone on the phone.
- ❑ Using the internet.

SECTION 6:

MEDICAL PREVENTION

RSV PREVENTION

- Researchers are working to develop RSV vaccines, but none are available yet.
- A drug called palivizumab (pah-lih-VIH-zu-mahb) is available to prevent severe RSV illness in certain infants and children who are at high risk for severe disease. This could include, for example, infants born prematurely or with congenital (present from birth) heart disease or chronic lung disease.
- The drug can help prevent serious RSV disease, but it cannot help cure or treat children already suffering from serious RSV disease, and it cannot prevent infection with RSV. If your child is at high risk for severe RSV disease, talk to your healthcare provider to see if palivizumab can be used as a preventive measure.

SECTION 7:

REVIEW

POLL QUESTION #6

Which of these are examples of engineering controls for RSV? Select all that apply.

- ❑ Replace face-to-face meetings with virtual ones.
- ❑ Require workers to wear face masks
- ❑ Install physical barriers and sneeze guards.
- ❑ Increase ventilation (fresh air).
- ❑ Install air filters.

GROUP DISCUSSION

REVIEW OF LEARNING OBJECTIVE

A. Understand basics of RSV and its spread

B. Understand the five key areas of reducing RSV spread
   1) Anticipation: Know about RSV disease and be prepared
   2) Recognition: Recognize hazardous situations.
   3) Evaluation: Know your OSHA risk level.
   4) Control: Effective controls to protect yourself and others.
   5) Management: Report illness and monitor success of controls.

INFECTIOUS DISEASE

TUBERCULOSIS (TB)

LEARNING OBJECTIVES

A. Understand basics on tuberculosis (TB) and its spread

B. Understand the five key areas of reducing TB spread

1) Anticipation: Know about seasonality and be prepared.
2) Recognition: Recognize hazardous situations.
3) Evaluation: Know the risk factors of TB.
4) Control: Effective controls to protect yourself & others.
5) Management: Report illness and monitor success of controls.

SECTION 1:

ABOUT TB AND TRANSMISSION

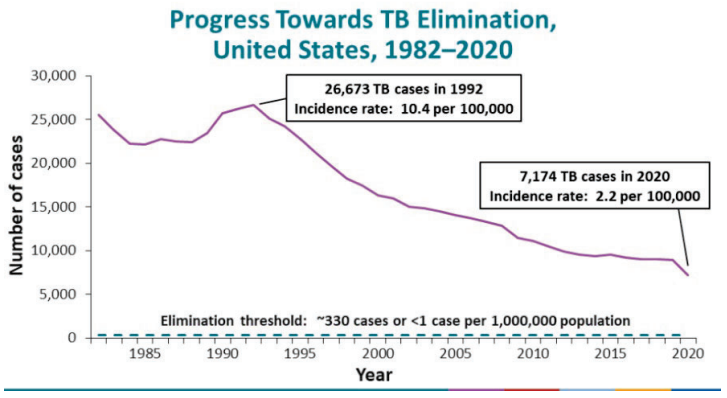
BASIC INFORMATION ABOUT TUBERCULOSIS

- Tuberculosis (TB) is caused by a bacterium called *Mycobacterium tuberculosis*.
- The bacteria usually attack the lungs, but TB bacteria can attack any part of the body such as the kidney, spine, and brain.
- Not everyone infected with TB bacteria becomes sick. As a result, two TB-related conditions exist:
  1. Latent TB infection (LTBI) and
  2. TB disease.
- If not treated properly, TB disease can be fatal.

TRENDS AND SURVEILLANCE

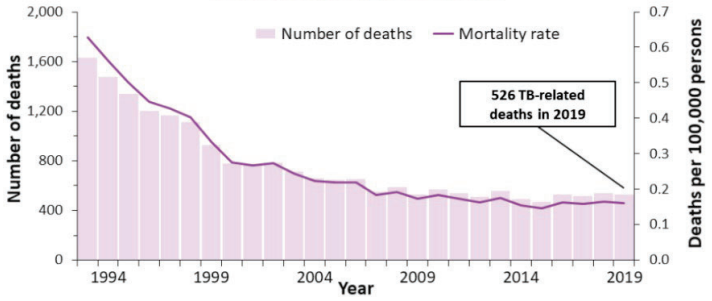
❖ **Tuberculosis (TB) in the United States by the numbers:**

- **7,174**: number of reported TB cases in the United States in 2020 (a rate of 2.2 per 100,000 persons)
- **60**: jurisdictions (states, cities, and U.S. territories) in the United States that report TB data to the CDC
- **Up to 13 million**: estimated number of people in the United States living with latent TB infection.



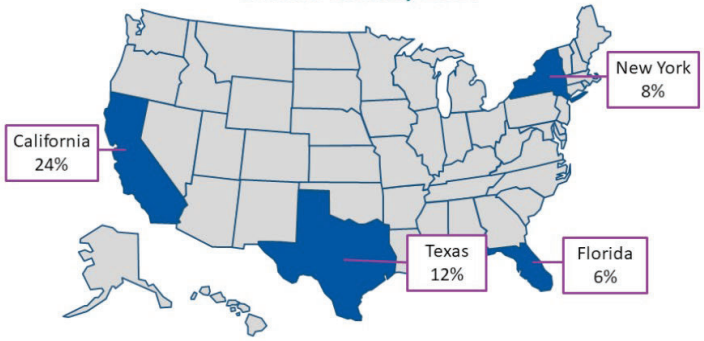
TB elimination in the US (Source: CDC)

TB-Related Deaths* and Mortality Rates, United States, 1993–2019



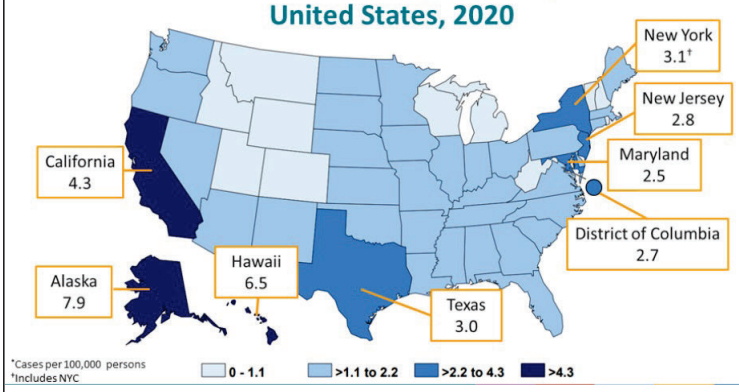
TB-related deaths in the US (National Vital Statistics)

Majority of TB Cases Occur in Four States, United States, 2020



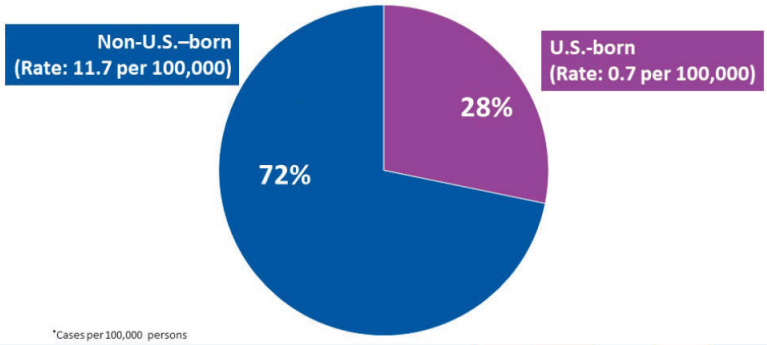
TB in the US (Source: CDC)

TB Incidence Rates* by Reporting Area United States, 2020



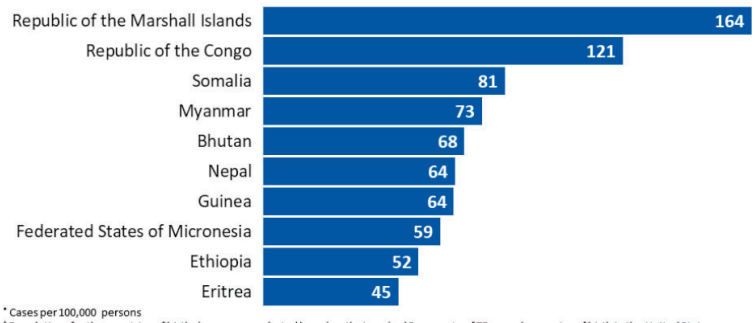
TB incidence rates in the US (Source: CDC)

TB Incidence Rates* and Percentages by Origin of Birth, United States, 2020 (N=7,145)



TB incidence rates in the US (Source: CDC)

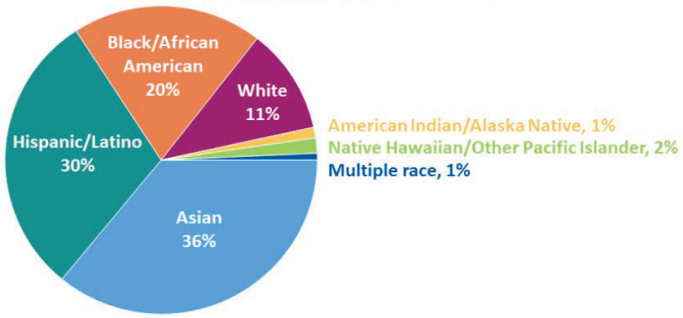
Top 10 TB Incidence Rates,* by Country of Birth,† United States, 2016–2020



* Cases per 100,000 persons
† Populations for the countries of birth shown were selected based on their ranked 5-year rate of TB cases by country of birth in the United States.

TB in the US (Source: CDC)

Percentage of TB Cases by Race/Ethnicity,* United States, 2020 (N=7,174)†

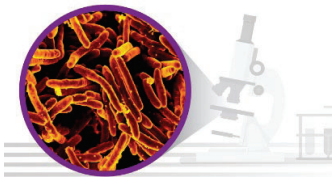


TB in the US (Source: CDC)

BASIC INFORMATION ABOUT TUBERCULOSIS

5 Things that we need to know about Tuberculosis.

https://www.cdc.gov/wcms/video/low-res/tb/2017/577557755ThingstoKnowAboutTBClosedCaption508v2.mp4



TB Bacteria (Source: CDC)

BASIC INFORMATION ABOUT TUBERCULOSIS

- Not everyone infected with TB bacteria becomes sick.
- Therefore, two TB-related conditions exist:
  - Latent TB infection (LTBI)
  - TB disease.
- People with latent TB infection:
  - Have no symptoms.
  - Don't feel sick.
  - Can't spread TB bacteria to others.
  - Usually have a po sitive TB skin test reaction or positive TB blood test.
  - May develop TB disease if they do not receive treatment for LTBI.

A Person with Latent TB Infection (LTBI)	A Person with TB Disease
Has a small amount of TB germs in his/her body that are alive but inactive	Has a large amount of active TB germs in his/her body
Has no symptoms	Has symptoms that may include » a bad cough that lasts 3 weeks or longer » pain in the chest » coughing up blood or sputum » weakness or fatigue » weight loss » no appetite » chills » fever » sweating at night
Cannot spread TB germs to others	May spread TB germs to others
Does not feel sick	May feel sick and may have symptoms such as a cough, fever, and/or weight loss
Usually has a positive TB skin test or TB blood test indicating TB infection	Usually has a positive TB skin test or TB blood test indicating TB infection
Has a normal chest x-ray and a negative sputum smear	May have an abnormal chest x-ray, or positive sputum smear or culture
Should consider treatment for LTBI to prevent TB disease	Needs treatment for TB disease

TB vs LTBI (Source: CDC)

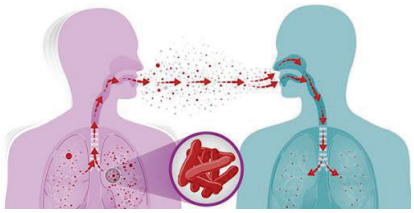
POLL QUESTION #1

TB can spread through: (Select all that apply)

- ❑ Contact with droplets from a sneeze or cough
- ❑ Touching eyes/nose/mouth without washing hands
- ❑ Talking with someone on the phone
- ❑ Using the internet

HOW TUBERCULOSIS SPREADS

- TB bacteria are spread through the air from one person to another.
- The TB bacteria are put into the air when a person with TB disease of the lungs or throat coughs, speaks, or sings.
- People nearby may breathe in these bacteria & become infected.



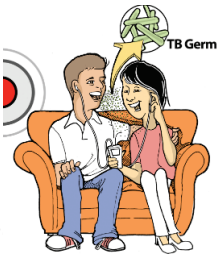
How TB spreads (Source: CDC)

HOW TUBERCULOSIS SPREADS

- When a person breathes in TB bacteria, the bacteria can settle in the lungs and begin to grow. From there, they can move through the blood to other parts of the body, such as the kidney, spine, and brain.
- TB disease in the lungs or throat can be infectious. This means that the bacteria can be spread to other people.
- TB in other parts of the body, such as the kidney or spine, is usually not infectious.
- People with TB disease are most likely to spread it to people they spend time with every day. This includes family members, friends, and coworkers or schoolmates.

HOW TUBERCULOSIS SPREADS

- Tuberculosis (TB) is NOT spread by
  - shaking someone's hand
  - sharing food or drink
  - touching bed linens or toilet seats
  - sharing toothbrushes



Source: CDC

- Video describing the transmission of TB

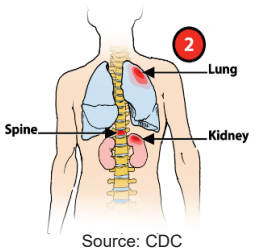
https://www.cdc.gov/tb/video/TB-course-video-CDC.mp4

SYMPTOMS OF TUBERCULOSIS

TB symptoms (Source: CDC)

SYMPTOMS OF TUBERCULOSIS

- Symptoms depend on where in the body the TB bacteria are growing.
- TB bacteria usually grow in the lungs (pulmonary TB). TB disease in the lungs may cause symptoms such as
  - a bad cough that lasts 3 weeks or longer.
  - pain in the chest.
  - coughing up blood or sputum.
- Other symptoms of TB disease are
  - weakness or fatigue.
  - weight loss.
  - no appetite.
  - chills, fever and sweating at night.



Source: CDC

POLL QUESTION #2

Which of the following are the symptoms of TB? (Select all that apply)

- ❑ Coughing up blood or sputum
- ❑ Loss of appetite
- ❑ Fever
- ❑ Night sweats
- ❑ Weight loss

SECTION 2:

GENERAL APPROACH TO PROTECTING WORKERS.

RISK FACTORS OF TUBERCULOSIS

- Some people develop TB disease soon after becoming infected (within weeks) while other people may get sick years later.
- Overall, about 5 to 10% of infected persons who do not receive treatment for latent TB infection will develop TB disease at some time in their lives.
- Generally, persons at high risk for developing TB disease fall into two categories:
  - Persons who have been recently infected with TB bacteria.
  - Persons with medical conditions that weaken the immune system.

RISK FACTORS OF TUBERCULOSIS

❖ **Persons who have been Recently Infected with TB Bacteria**

- Close contacts of a person with infectious TB disease.
- Persons who have immigrated from areas of the world with high rates of TB.
- Children < 5 years of age who have a positive TB test.
- Groups with high rates of TB transmission, such as homeless persons, injection drug users, and persons with HIV infection.
- Persons who work or reside with people who are at high risk for TB in facilities or institutions such as hospitals, homeless shelters, nursing homes, and residential homes for those with HIV.

RISK FACTORS OF TUBERCULOSIS

❖ **Persons with Medical Conditions that Weaken the Immune System:**

- Babies and young children.
- HIV infection (the virus that causes AIDS).
- Substance abuse.
- Silicosis.
- Diabetes mellitus.
- Severe kidney disease.
- Low body weight.
- Organ transplants.
- Head and neck cancer.
- Medical treatments such as corticosteroids or organ transplant.
- Specialized treatment for rheumatoid arthritis or Crohn's disease.

WHAT TO DO IF YOU HAVE BEEN EXPOSED TO TB

❖ You may have been exposed to TB bacteria if you spent time near someone with TB disease.

❖ If you think you have been exposed to someone with TB disease, you should

- Contact your doctor or local health department
- Get a TB skin test or a special TB blood test.
- Be sure to tell the doctor when you spent time with the person who has TB disease.

WHAT TO DO IF YOU HAVE BEEN EXPOSED TO TB

❖ A person who is exposed to TB bacteria is not able to spread the bacteria to other people right away.

❖ Only persons with active TB disease can spread TB bacteria to others.

❖ Before you would be able to spread TB to others, you would have to breathe in TB bacteria and become infected.

❖ Then the active bacteria would have to multiply in your body and cause active TB disease.

❖ At this point, you could possibly spread TB bacteria to others.

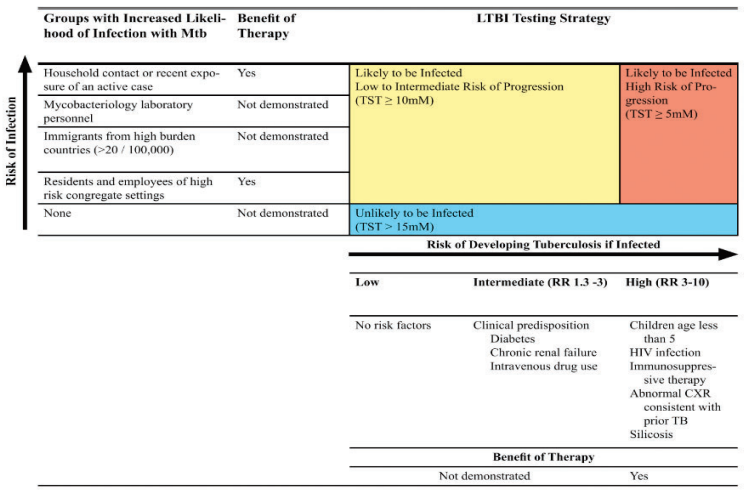
WHAT TO DO IF YOU HAVE BEEN EXPOSED TO TB

❖ People with TB disease are most likely to spread the bacteria to people they spend time with every day, such as family members, friends, coworkers, or schoolmates.

❖ Some people develop TB disease soon (within weeks) after becoming infected, before their immune system can fight the TB bacteria.

❖ Other people may get sick years later, when their immune system becomes weak for another reason.

❖ Many people with TB infection never develop TB disease.



Source: Clinical Infectious Diseases 2017; 64: 111-115.

POLL QUESTION #3

Worker risk of exposure to TB is <u>mostly</u> based on which of the following?

- ❑ Close contact with people
- ❑ Frequent contact with people
- ❑ Handling packages and mail
- ❑ Attending virtual meetings

SECTION 3:

PREVENTIVE MEASURES.

PREVENTING TUBERCULOSIS

❖ **Preventing Exposure to TB Disease While Traveling Abroad**

❖ In many countries, TB is much more common than in the US.

❖ Travelers should avoid close contact or prolonged time with known TB patients in crowded, enclosed environments like

- Clinics
- Hospitals
- Prisons or
- Homeless shelters

❖ Air travel itself carries a relatively low risk of infection with TB.

PREVENTING TUBERCULOSIS

❖ **<u>Preventing Exposure to TB Disease While Traveling Abroad</u>**

- Travelers who anticipate possible prolonged exposure to people with TB should have a TB skin test or a TB blood test before leaving the United States.
- If the test reaction is negative, they should have a repeat test 8 to 10 weeks after returning to the United States.
- Additionally, annual testing may be recommended for those who anticipate repeated or prolonged exposure or an extended stay over a period of years.
- Because people with HIV infection are more likely to have an impaired response to TB tests, travelers who are HIV positive should tell their physicians about their HIV infection status.

PREVENTING TUBERCULOSIS

❖ **<u>Preventing Latent TB Infection from Progressing to TB Disease</u>**

❖ Many people who have latent TB infection (LTBI) never develop TB disease.

❖ But some people who have LTBI are more likely to develop TB than others.

❖ Those at high risk for developing TB disease include:

- People with HIV infection
- People who became infected with TB bacteria in the last 2 years
- Babies and young children
- People who inject illegal drugs
- People who are sick with other diseases that weaken the immune system
- Elderly people
- People who were not treated correctly for TB in the past

PREVENTING TUBERCULOSIS

❖ **<u>Preventing Latent TB Infection from Progressing to TB Disease</u>**

❖ If you have latent TB infection and you are in one of these high-risk groups, you should take medicine to keep from developing TB disease.

❖ You and your doctor must decide which treatment is best for you.

❖ If you take your drug as instructed, it can keep you from developing TB.

❖ Because there are less bacteria, treatment for latent TB infection is much easier than treatment for TB disease. A person with TB disease has a large amount of TB bacteria in the body.

POLL QUESTION #4

What can you do to prevent TB? (Select all that apply)

- ❑ Avoid close contact or prolonged time with known TB patients.
- ❑ Consult infection control or occupational health experts while travelling abroad.
- ❑ Contact your doctor or local health department
- ❑ Have a TB skin test or a TB blood test before leaving the US.
- ❑ Repeat the test 8-10 weeks after returning to the US.

SECTION 4:

TESTING AND MONITORING.

WHO SHOULD BE TESTED?

- People who have spent time with someone who has TB
- People from a country where TB disease is common (most countries in Latin America, the Caribbean, Africa, Asia, Eastern Europe, and Russia)
- People who live or work in high-risk settings (eg. long-term care facilities or nursing homes, & homeless shelters)
- Healthcare workers who care for patients at increased risk for TB disease
- Infants, children and adolescents exposed to adults who are at increased risk for latent tuberculosis infection or TB

WHO SHOULD BE TESTED?

❖ People who have high risk for developing TB
- People with HIV infection
- People who became infected with TB bacteria in the last 2 years
- Babies and young children
- People who inject illegal drugs
- People who are sick with other diseases that weaken the immune system
- Elderly people
- People who were not treated correctly for TB in the past

❖ TB tests are generally not needed for people with a low risk of infection with TB bacteria.

TESTING

❖ There are two kinds of tests that are used to detect TB bacteria in the body:
- TB skin test (TST)
- TB blood tests.

- A positive TB skin test or TB blood test only tells that a person has been infected with TB bacteria.
- A person's health care provider should choose which TB test to use.
- It does not tell whether the person has latent TB infection (LTBI) or has progressed to TB disease.
- Other tests, such as a chest x-ray and a sample of sputum, are needed to see whether the person has TB disease.

TB SKIN TEST

❖ The TB skin test is also called the Mantoux tuberculin skin test (TST).

❖ A TB skin test requires two visits with a health care provider.
- On the 1st visit the test is placed.
- On the 2nd visit the health care provider reads the test.

TB SKIN TEST

- The TB skin test is performed by injecting a small amount of fluid (called tuberculin) into the skin on the lower part of the arm.
- A person given the tuberculin skin test must return within 48 to 72 hours to have a trained health care worker look for a reaction on the arm.
- The result depends on the size of the raised, hard area or swelling.

Administering the TB skin test

Reading the result of a TB skin test

TB Skin Test (Source: CDC)

TB SKIN TEST

- **Positive skin test:** This means the person's body was infected with TB bacteria. Additional tests are needed to determine if the person has latent TB infection or TB disease.
- **Negative skin test:** This means the person's body did not react to the test, and that latent TB infection or TB disease is not likely.
- There is no problem in repeating a TB skin test. If repeated, the additional test should be placed in a different location on the body (e.g., other arm).
- The TB skin test is the preferred TB test for children under the age of five.

TB BLOOD TEST

- TB blood tests are also called interferon-gamma release assays or IGRAs.
- Two TB blood tests are approved by the U.S. Food and Drug Administration (FDA) and are available in the United States:
  - the QuantiFERON®-TB Gold Plus (QFT-Plus)
  - the T-SPOT®.TB test (T-Spot).
- A health care provider will draw a patient's blood and send it to a laboratory for analysis and results.

TB Blood Test (Source: CDC)

TB BLOOD TEST

- **Positive TB blood test:** This means that the person has been infected with TB bacteria.
  - Additional tests are needed to determine if the person has latent TB infection or TB disease.
- **Negative TB blood test:** This means that the person's blood did not react to the test and that latent TB infection or TB disease is not likely.
- TB blood tests are the preferred TB test for:
  - People who have received the TB vaccine bacilli Calmette-Guerin (BCG)
  - People who have a difficult time returning for a second appointment to look for a reaction to the TST.

TESTING IN BCG VACCINATED PERSONS

- Many people born outside of the US have been given a vaccine called BCG.
- Vaccination with BCG may cause a false positive reaction to a TB skin test.
- A positive reaction to a TB skin test may be due to the BCG vaccine itself or due to infection with TB bacteria.
- TB blood tests (IGRAs), unlike the TB skin test, are not affected by prior BCG vaccination and are not expected to give a false-positive result in people who have received BCG.
- TB blood tests are the preferred method of TB testing for people who have received the BCG vaccine.

TESTING DURING PREGNANCY

- There is a greater risk to a pregnant woman and her baby if TB disease is not diagnosed and treated.
- TB skin testing is considered both valid and safe throughout pregnancy.
- TB blood tests also are safe to use during pregnancy but have not been evaluated for diagnosing TB infection in pregnant women.
- Other tests are needed to show if a person has TB disease.

DIAGNOSING LATENT TUBERCULOSIS INFECTION

- Most persons, but not everyone, with TB disease have one or more symptoms of TB disease.
- All persons with either symptoms or a positive TB test result should be evaluated for TB disease.
- If a person has symptoms, but a negative TB test result, they should still be evaluated for TB disease.
- A diagnosis of LTBI is made if a person has a positive TB test result and a medical evaluation does not indicate TB disease.
- The decision about treatment for LTBI will be based on a person's chances of developing TB disease by considering their risk factors.

DIAGNOSING TUBERCULOSIS DISEASE

- TB disease should be suspected in persons with the following symptoms
  - Unexplained weight loss
  - Loss of appetite
  - Night sweats
  - Fever
  - Fatigue
- People suspected of having TB disease should be referred for a complete medical evaluation, which will include the following:
  - Medical History
  - Physical Examination
  - Test for TB Infection
  - Chest Radiograph
  - Diagnostic Microbiology
  - Drug Resistance

DIAGNOSING TUBERCULOSIS DISEASE

Medical History

- Clinicians should ask about the patient's history of TB exposure, infection, or disease.
- It is also important to consider demographic factors (e.g., country of origin, age, ethnic or racial group, occupation) that may increase the patient's risk for exposure to TB or to drug-resistant TB.
- Also, clinicians should determine whether the patient has medical conditions, such as HIV infection or diabetes, that increase the risk of latent TB infection progressing to TB disease.

DIAGNOSING TUBERCULOSIS DISEASE

Physical Examination

- A physical exam can provide valuable information about the patient's overall condition and other factors that may affect how TB is treated, such as HIV infection or other illnesses.

Test for TB Infection

- The Mantoux tuberculin skin test (TST) or the TB blood test can be used to test for *M. tuberculosis* infection.
- Additional tests are required to confirm TB disease.

DIAGNOSING TUBERCULOSIS DISEASE

Chest Radiograph

- A posterior-anterior chest radiograph is used to detect chest abnormalities. Lesions may appear anywhere in the lungs and may differ in size, shape, density, and cavitation.
- These abnormalities may suggest TB but cannot be used to definitively diagnose TB.
- However, a chest radiograph may be used to rule out the possibility of pulmonary TB in a person who has had a positive reaction to a TST or TB blood test and no symptoms of disease.

DIAGNOSING TUBERCULOSIS DISEASE

Diagnostic Microbiology

- The presence of acid-fast-bacilli (AFB) on a **sputum smear** or other specimen often indicates TB disease.
- Acid-fast microscopy is easy and quick, but it does not confirm a diagnosis of TB because some acid-fast-bacilli are not *M. tuberculosis*.
- Therefore, a **culture** is done on all initial samples to confirm the diagnosis. (However, a positive culture is not always necessary to begin or continue treatment for TB.)

DIAGNOSING TUBERCULOSIS DISEASE

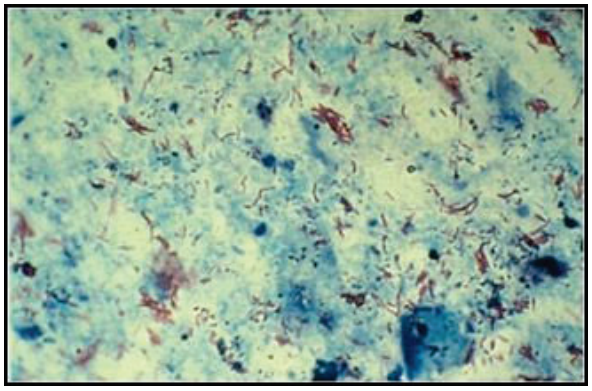
- **Diagnostic Microbiology**

❖ A positive culture for *M. tuberculosis* confirms the diagnosis of TB disease. Culture examinations should be completed on all specimens, regardless of AFB smear results.

❖ Laboratories should report positive results on smears and cultures within 24 hours by telephone or fax to the primary health care provider and to the state or local TB control program, as required by law.

Diagnostic Microbiology (Source: CDC)

DIAGNOSING TUBERCULOSIS DISEASE



Source: CDC - Acid-Fast bacilli stained in smear. Tubercle bacilli are shown in red

DIAGNOSING TUBERCULOSIS DISEASE

- **Drug Resistance**

❖ For all patients, the initial *M. tuberculosis* isolate should be tested for drug resistance.

❖ It is crucial to identify drug resistance as early as possible to ensure effective treatment.

❖ Drug susceptibility patterns should be repeated for patients who do not respond adequately to treatment or who have positive culture results despite 3 months of therapy.

❖ Susceptibility results from laboratories should be promptly reported to the primary health care provider and to the state or local TB control program.

POLL QUESTION #5

Which of the following are used to diagnose TB? (Select all that apply)

- ❑ TB Skin Test
- ❑ TB Blood Test
- ❑ Medical Evaluation
- ❑ Diagnostic Microbiology

SECTION 5: REPORTING TB IN THE WORKPLACE

EMPLOYEE RIGHTS

- Right to report if workplace is unsafe
- Federal law entitles employees to a safe workplace. The employer must keep the workplace free of known health and safety hazards.
- Employees have the right to speak up about hazards **without fear of retaliation.**

EMPLOYEE RIGHTS

- **Safety and Health Complaint:**
  - If one believes working conditions are unsafe or unhealthful, he/she may file a confidential complaint with OSHA and ask for an inspection.
  - If possible, it is recommended you first tell your employer about the concern.
- **Protection from Retaliation:**
  - It is illegal for an employer to fire, demote, transfer or otherwise retaliate against a worker who complains to OSHA and uses their legal rights.
  - If an employee believes he/she has been retaliated against in any way, they can file a whistleblower complaint within 30 days of the alleged retaliation.

SECTION 6: MEDICAL PREVENTION

TREATMENT FOR TB DISEASE

- There are 10 drugs currently approved by the U.S. Food and Drug Administration (FDA) for treating TB.
- Of the approved drugs, the first-line anti-TB agents that form the core of treatment regimens are:
  - isoniazid (INH).
  - rifampin (RIF).
  - ethambutol (EMB).
  - pyrazinamide (PZA).

TB Medications (Source: CDC)

TREATMENT FOR TB DISEASE

- TB disease can be treated by taking several drugs for 6 to 9 months.
- It is very important that people who have TB disease are treated, finish the medicine, and take the drugs exactly as prescribed.
- If they stop taking the drugs too soon, they can become sick again; if they do not take the drugs correctly, the TB bacteria that are still alive may become resistant to those drugs.
- TB that is resistant to drugs is harder and more expensive to treat.

Source: CDC

ADVERSE REACTIONS

- Patients on treatment for latent TB infection (LTBI) or TB disease should report any signs and symptoms of adverse drug reactions to their health care provider, including
  - Unexplained loss of appetite
  - Nausea or vomiting,
  - Brown urine
  - Yellowing of skin or eyes
  - Persistent tingling, numbness, or burning of hands or feet
  - Persistent weakness, or fatigue,
  - Fever,
  - Abdominal tenderness
  - Blurred vision or changed vision

DRUG RESISTANT TUBERCULOSIS

- Tuberculosis (TB) is a disease caused by bacteria that are spread from person to person through the air.
- TB usually affects the lungs, but it can also affect other parts of the body, such as the brain, the kidneys, or the spine. In most cases, TB is treatable and curable; however, people with TB can die if they do not get proper treatment.
- Sometimes drug-resistant TB occurs when bacteria become resistant to the drugs used to treat TB.
- This means that the drug can no longer kill the TB bacteria.

POLL QUESTION #6

How long does it take to treat TB disease?

- ❑ One week
- ❑ Three weeks
- ❑ One month
- ❑ 6 to 9 months

SECTION 7: REVIEW

GROUP DISCUSSION

REVIEW OF LEARNING OBJECTIVES

A. Understand basics of tuberculosis (TB) and its spread

B. Understand the five key areas of reducing TB spread
   1) Anticipation: Know about TB and be prepared
   2) Recognition: Recognize hazardous situations
   3) Evaluation: Know the risk factors of TB
   4) Control: Effective controls to protect yourself and others
   5) Management: Report illness and monitor success of controls

SHORT BREAK

INFECTIOUS DISEASE

COVID-19

DISCLAIMER

This training material was produced under grant numbers SH-99029-SH0 from the Occupational Safety and Health Administration, U.S. Department of Labor. It does not necessarily reflect the views or policies of the U. S. Department of Labor, nor does mention of trade names, commercial products, or organizations imply endorsement by the U. S. Government.

Revisions were made to this material under grant number SH-36979-HA1 from the Occupational Safety and Health Administration, U.S. Department of Labor.

LEARNING OBJECTIVES

A. Understand basics of pandemics, COVID-19 and its spread

B. Understand the five key areas of reducing COVID-19 spread
   1) Anticipation: Know about pandemic and be prepared
   2) Recognition: Recognize hazardous situations
   3) Evaluation: Know your OSHA risk level
   4) Control: Effective controls to protect yourself and others
   5) Management: Report illness and monitor success of controls

SECTION 1: ABOUT COVID-19 AND TRANSMISSION

CONDITIONS RESULTING IN A PANDEMIC: HISTORY

1. Arrival of a new viral strain.

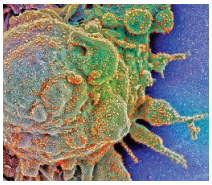
2. The ability of the strain to infect humans and cause serious illness.

3. The ability to spread easily among humans.

Worldwide Pandemic Map (Source Creative Commons)

CORONAVIRUS INFORMATION

- Whether you realize it or not, you have almost certainly had a coronavirus.
- Coronaviruses have been circulating for decades if not centuries.
- Coronaviruses are often mild.
- The common cold can be a coronavirus.
- The world isn't going to eliminate coronaviruses, or any virus for that matter.



Coronaviruses, variant (source: Creative Commons)

SIMILAR CORONAVIRUS EPIDEMICS AND/OR PANDEMICS

- SARS
  - Severe Acute Respiratory Syndrome
  - An Outbreak: 2003
  - Started in China (bats?)
- MERS
  - Middle East Respiratory Syndrome
  - An Outbreak: 2012-2014
  - Started in Saudi Arabia (Camels)
- COVID-19
  - New Corona Virus of 2019
  - A Pandemic: 2019-2021?
  - Started in China (from wild bats)

SARS Pandemic Map (Source: Library of Congress; Creative Commons)

IMPACT OF PANDEMICS ON HEALTH SERVICES

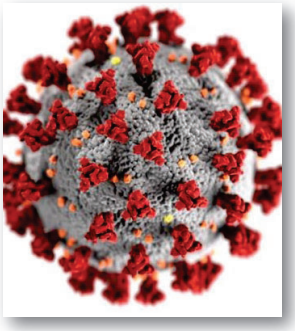
- A lot of the world's population would require medical care.
- Healthcare facilities would be overwhelmed, creating a strain on hospital staff and shortages of beds, ventilators, and supplies.
- Temporary treatment sites may need to be created.
- It will be difficult to provide a vaccine to everyone.
- Difficult decisions would need to be made regarding who gets these vaccines and antivirals.

IMPACT OF PANDEMICS ON THE ECONOMY

- A pandemic may strike in waves, each of which could last up to 6 – 8 weeks.
- A severe pandemic could lead to widespread illness, many deaths, and significant **Economic loss.**
- Everyday life would be disrupted because a lot of people would become seriously ill at the same time.
- Impact would include **school and business closings**, and **interruption of basic services** such as public transportation and food delivery.
- Supplies would be limited.
- Personal and business debt would rise.
- The stock market could fall & a serious recession in the US economy with immediate costs ranging from $500 billion – $675 billion.

WHAT IS COVID-19?

- Coronavirus disease 2019 (COVID-19)
- It is a new coronavirus strain
  - Does not match other coronaviruses seen in humans
  - New strain is now termed severe acute respiratory syndrome CoV-2 (SARS-CoV-2)
- First identified in Wuhan City, China, on December 12, 2019
  - Suspected animal origin that then resulted in human-to-human transmission
- In a matter of three months, this new viral infection was affecting the entire world



SARS-CoV-2 (Source: CDC)

SIGNS AND SYMPTOMS

❖Symptoms for COVID-19 range from mild symptoms to severe illness

❖Can appear 2-14 days after exposure to virus

❖Symptoms may include:

- Fever or chills
- Cough
- Shortness of breath
- Fatigue
- Muscle or body aches
- Headache
- **New loss of taste or smell**
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

Signs and Symptoms of COVID-19 (Source: CDC)

SEVERE SIGNS AND SYMPTOMS

❖ **Severe warning signs for COVID-19 can include:**

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

❖ **Seek immediate emergency medical care if someone is showing these symptoms.**

TRANSMISSION (SPREAD)

- Most commonly spreads when people are within 6 feet of each other (close contact)
- **Direct Transmission** ➔ Spreads through respiratory drops (aerosols) produced when an infected person coughs, sneezes, sings, talks or breathes.
  - Inhaled into nose, mouth, airways & lungs- Main way virus spreads
- **Contact Transmission** ➔ Spread by touching surfaces and objects that have the virus on it and then touching mouth, nose and eye mucous membranes
  - Not thought to be the main way the virus spreads

Source: Tizaoui K, Zidi I, Lee KH, et al. Update of the current knowledge on genetics, evolution, immunopathogenesis, and transmission for coronavirus disease 19 (COVID-19). *Int J Biol Sci*. 2020;16(15):2906-2923. Published 2020 Sep 12. doi:10.7150/ijbs.48812

Aerosol produced during a sneeze (Source: Public Health Information Library)

POLL QUESTION #1

Which of these are warning signs of a COVID-19 infection that would require immediate emergency medical care? Select all that apply.

- ❑ Bluish lips or face
- ❑ Persistent pain or pressure in the chest
- ❑ Trouble breathing
- ❑ Diarrhea
- ❑ Headache

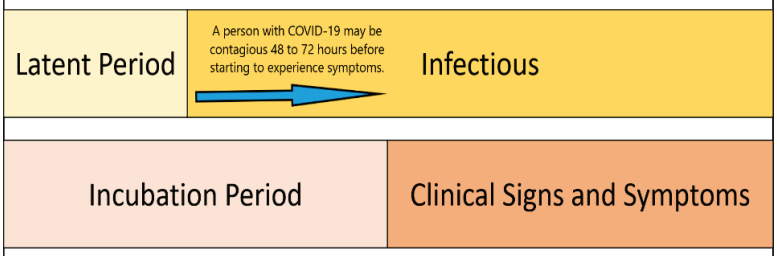
➢ INCUBATION PERIOD AND INFECTION RATE

❖ **Incubation Period**: Number of days between infection and symptoms
- Tells us how long individuals should stay away from others during an outbreak.
- For COVID-19: **14 days** with an average of **4-5 days from exposure to symptoms.**

❖ **Reproductive number (R_0):** Number of cases one infected individual generates
- Estimated R_0 is 2.68
- One person can spread the infection to two or three other people.

FOLLOWING INFECTION, YOU CAN SPREAD IT TO OTHERS BEFORE YOU FEEL SICK

NOTICE THE GAP BETWEEN WHEN SOMEONE IS INFECTIOUS AND WHEN SIGNS AND SYMPTOMS FIRST APPEAR



STEPS TO HELP PREVENT SPREAD OF COVID-19 IF SICK

❖Stay home unless you need to get medical care
- Take care, get rest and staying hydrated
- Can take over-the-counter medicines such as acetaminophen to help feel better
- If any emergency warning signs arise, contact doctor

❖Separate yourself from other people
- Tell close contacts they may have been exposed

❖Monitor symptoms

❖Call before visiting doctor

❖Clean and sanitize all “high touch” surfaces every day

WHEN TO ISOLATE?

❖**Isolation** separates people infected with COVID-19 from others who are not infected
- When in isolation, you should stay home until it is safe to be around others.

❖**Symptomatic (You have symptoms):** You can be around others after:
- Minimum of 10 days since symptoms first appeared AND
- Minimum of 24 hrs of no fever without fever-reducing medication AND
- Other symptoms of COVID-19 are improving.

❖**Asymptomatic (No symptoms):** You can be around others after 10 days have passed since date of positive test.

WHEN TO QUARANTINE?

❖ **Quarantine** keeps someone who might have been exposed to the virus away from close contact with other people

❖ Close contact means:
- Within 6 feet of someone who has COVID-19 for 15 minutes or more
- Provided care at home to someone who is sick with COVID-19
- Direct physical contact
- Shared eating and drinking utensils
- They got respiratory droplets on you (e.g., sneezing coughing, etc.)

❖ Stay home for 14 days after last contact with person who has COVID-19

❖ Watch for signs and symptoms of illness

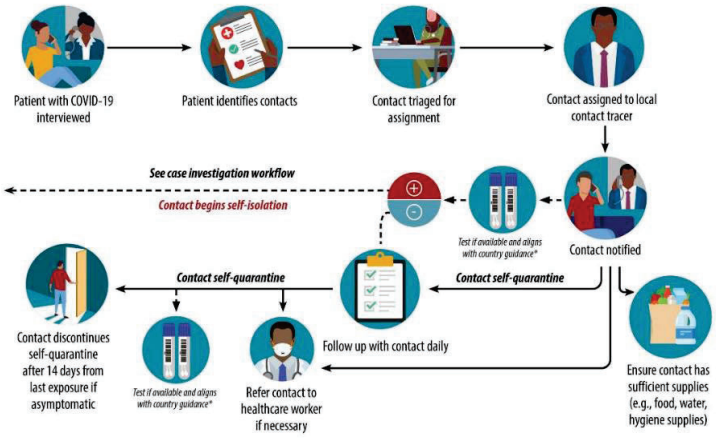

House (Clickart)

CONTACT TRACING

- Contact tracing helps protect co-workers, families and our community by:
  - Letting people know they have been identified as a close contact and should monitor their health for signs and symptoms of COVID-19
  - Helps people who have been exposed to COVID-19 get tested
  - They may ask people to self-isolate if they have COVID-19 or self-quarantine if they are identified as a close contact.

Contact Tracing (Source: CDC)

CONTACT TRACING FLOWCHART (SOURCE: CDC)



CONTACT TRACING AT WORKPLACE

- Contact tracing in the workplace can help protect co-workers
- Contact tracing may need to occur if:
  - **A worker tested positive for COVID-19**
  - **A worker has new symptoms and signs of COVID-19**
- Examples of information to take note of for contact tracing:
  - Names of people identified as close contacts
  - Locations they frequented (decontamination may be needed)
  - The dates person was last on site

PROGNOSIS

- **Prognosis is a prediction of the likely outcome of a disease as well as treatment and results.**
  - At this point, not enough data to determine the long-term outcomes since COVID-19 surfaced in 2019.
- About **80-90%** of cases mild or asymptomatic
- About **10%** of cases become serious
  - Difficulty breathing
  - Low level of oxygen in the blood
  - Signs of lung damage
- In about **5%** of cases a critical condition may develop
  - Respiratory failure
  - Pneumonia
  - Shock and multiorgan failure
  - Death – Almost always caused by progression to Acute Respiratory Distress Syndrome (ARDS) and multiorgan failure

MORALITY (DEATH) RATE

Death rate of Top 10 countries with the highest number of confirmed cases (October 20, 2021)

#	Country, Other	Total Cases	New Cases	Total Deaths	New Deaths	Total Recovered	New Recovered	Active Cases	Serious, Critical	Tot Cases/ 1M pop	Deaths/ 1M pop	Total Tests	Tests/ 1M pop	Population
	World	242,589,365	+279,354	4,932,573	+4,202	219,848,801	+189,818	17,807,991	77,437	31,122	632.8			
1	USA	46,002,053	+5,546	748,827	+175	35,711,559	+1,228	9,541,667	14,797	137,928	2,245	674,015,290	2,020,903	333,521,903
2	India	34,122,920	+14,597	452,796	+112	33,482,219	+11,598	187,905	8,944	24,415	324	594,429,890	425,320	1,397,605,690
3	Brazil	21,664,879		603,902		20,838,188		222,789	8,318	100,992	2,815	63,776,166	297,297	214,520,249
4	UK	8,589,737	+49,139	139,031	+179	7,028,711	+36,802	1,421,995	850	125,675	2,034	323,234,827	4,729,189	68,348,890
5	Russia	8,094,825	+34,073	226,353	+1,028	7,065,712	+25,231	802,760	2,300	55,438	1,550	202,100,000	1,384,098	146,015,725
6	Turkey	7,714,379		68,060		7,143,657		502,662	633	90,209	796	92,726,642	1,084,316	85,516,262
7	France	7,096,043		117,355		6,890,873		87,815	1,049	108,401	1,793	151,204,954	2,309,846	65,461,049
8	Iran	5,821,737	+11,770	124,585	+162	5,361,189	+13,706	335,963	4,559	68,181	1,459	32,619,228	382,016	85,387,081
9	Argentina	5,274,766		115,737		5,141,288		17,741	789	115,336	2,531	24,588,472	537,643	45,733,844
10	Spain	4,993,295	+2,528	87,082	+31	4,844,491	+1,975	61,722	447	106,744	1,862	66,213,858	1,415,482	46,778,296

Reported Cases and Deaths by Country or Territory, October 2021 (Source: CDC & COVID Worldometer)
https://www.worldometers.info/coronavirus/#countries

DIFFERENCE BETWEEN COVID-19 AND THE FLU

1. **Caused by different viruses**
   - COVID-19 caused by new coronavirus, SARS-CoV-2
   - Flu caused by influenza viruses
2. **The time it takes for symptoms to appear**
   - COVID-19 symptoms often develop 5 days after exposure, but can range from 2 to 14 days after infection
   - Flu symptoms often develop 1-4 days after infected
3. **How long virus can be spread**
   - COVID-19, people can spread the virus about 2 days before showing signs or symptoms and remain contagious for at least 10 days after signs and symptoms first appear.
     - If asymptomatic (showing no symptoms) or symptoms go away, it's possible to remain contagious for at least 10 days after testing positive for COVID-19
   - Flu, contagious for first 3-4 days of illness and remain contagious for about 7 days

DIFFERENCE BETWEEN COVID-19 AND THE FLU (CONTINUED)

4. **How it spreads**
   - COVID-19 is more contagious and has more superspreading events than the flu
5. **Approved Treatments**
   - COVID-19- there has been some EUA approved treatments for COVID-19
     - The National Institutes of Health (NIH) has developed guidance on treatment of COVID-19, which is updated regularly
   - Flu- FDA approved prescription influenza antiviral drugs are used to treat the Flu
6. **Vaccines**
   - COVID-19- multiple vaccines approved to prevent COVID-19
   - Flu- multiple FDA licensed influenza vaccines that are produced annually and protects against 3 or 4 flu viruses that scientists anticipate will circulate each year
7. **Symptoms**
   - It is difficult to tell the difference based on symptoms alone
   - In general, COVID-19 symptoms are more intense than the flu
   - Special tests can be performed within first days of illness to determine if an individual has the flu.

POLL QUESTION #2

Based on the incubation period for COVID-19, about how many days should a person stay away from others (quarantine) if he/she has come into close contact with an infected person(s)?

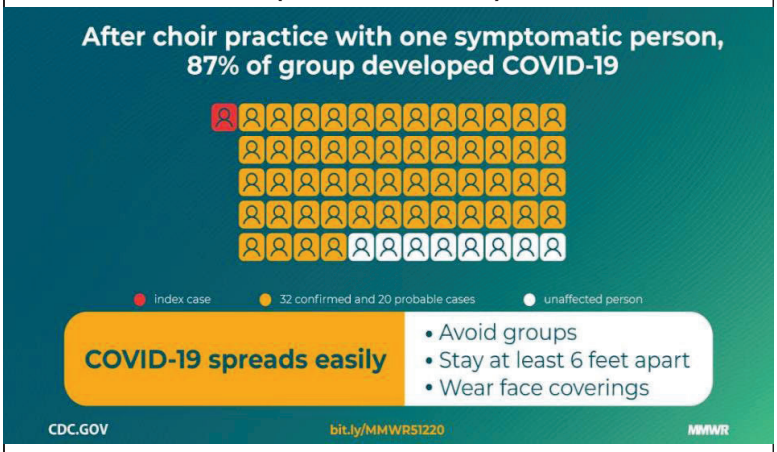
- ❑ 1 day
- ❑ 5 days
- ❑ 7 days
- ❑ 14 days
- ❑ 21 days

SUPERSPREADING EVENTS

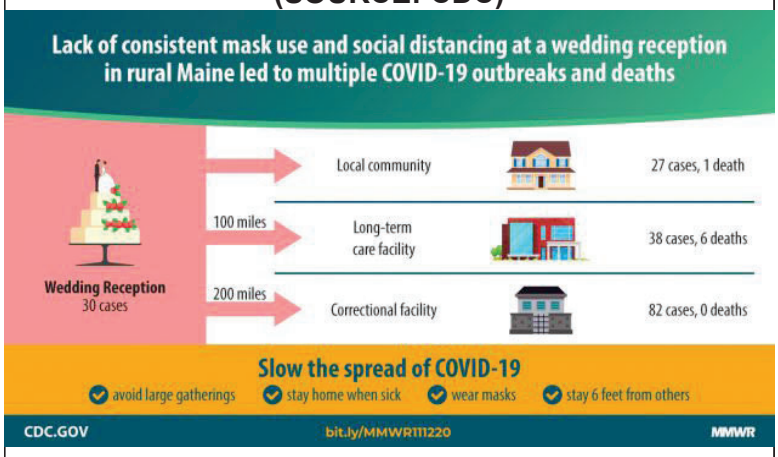
- ❖ When a single infected individual infects a high number of secondary (added) cases.
- ❖ These types of events are small gatherings that lead to many infections.

People connected (Source: Creative Commons) This Photo by Unknown Author is licensed under CC BY-NC-ND

CHOIR SUPERSPREADER EVENT (SOURCE: CDC)



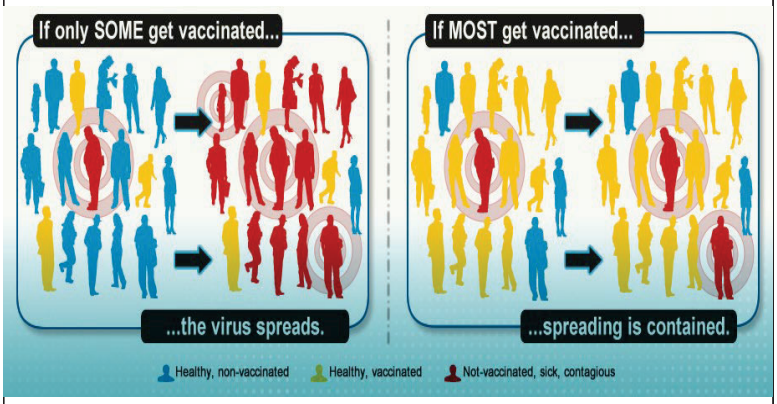
WEDDING SUPERSPREADER EVENT (SOURCE: CDC)



HERD IMMUNITY

- ❖ When new infections will no longer cause large outbreaks because the people in the community are protected from getting a disease
- ❖ Protection occurs if a person already had the disease OR they have been vaccinated.
  - Additional preventive measure must also be in place such as face mask use and social distancing
- ❖ As of now, experts do not know what percentage (how many protected people) it will take to achieve herd immunity to COVID-19.

HERD IMMUNITY (SOURCE: CDC)



MEASURES FOR LIMITING SPREAD OF COVID-19 IN THE WORKPLACE

❖ General OSHA guidance for limiting the spread of COVID-19 -

- Ensuring infected or potentially infected people are not in the workplace,
- Implementing physical (social) distancing,
- Limiting the spread by using face coverings,
- Installing barriers,
- Having workers use appropriate PPE,
- Improving ventilation,
- Practicing good hygiene, and
- Routine cleaning and disinfection.

Read the full text of the guidance document, Mitigating and Preventing the Spread of COVID-19 in the Workplace at osha.gov/coronavirus.

SECTION 2: GENERAL APPROACH TO PROTECTING WORKERS

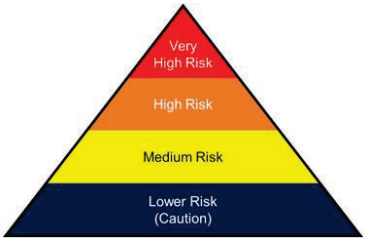
HAZARD RECOGNITION

❖ **Worker risk of exposure to SARS-CoV-2 may depend on:**

- Industry type
- Close contact within 6 feet of people
- Frequency of contact with people
- Communities where employees live and work
- Individual health conditions
- Activities outside of work
- Control measures in place

❖ **OSHA risk levels**

- Lower risk (Caution)
- Medium risk
- High risk
- Very high risk



OSHE Exposure Risk Pyramid (Source: OSHA)

OSHA LOW RISK LEVEL

Examples for Low Risk Level (Caution)

Jobs that **do not require** contact with people known to be, or suspected of being, infected with SARS-CoV-2, such as:

- Remote workers (i.e., those working from home during the pandemic).
- Office workers who do not have frequent close contact with coworkers, customers, or the public.
- Manufacturing and industrial facility workers who do not have frequent close contact with coworkers, customers, or the public.
- Healthcare workers providing only telemedicine services.
- Long-distance truck drivers

OSHA MEDIUM RISK LEVEL

Examples for Medium Risk Level

Jobs that require **frequent/close contact** with people who may be infected, but who are not known to have or suspected of having COVID-19, such as:

- Those who are in frequent/close contact with people (co-workers or other) within a region that is experiencing widespread COVID-19 transmission.
- Those who may have frequent contact with travelers who return from international locations with widespread COVID-19 transmission.
- Those who may have contact with customers in high density work environments (e.g., grocery, convenience stores, restaurants, entertainment, cosmetology, and retail).

Those who may have contact with the general public (e.g., schools, high population density work environments, and high-volume retail settings).

OSHA HIGH RISK LEVEL (*REQUIRES ADDITIONAL PROTECTION*)

Examples for the High-Risk Level

Jobs with a high potential for exposure to known or suspected sources of SAR S-CoV-2, such as:

- Healthcare delivery and support staff (hospital staff who must enter patients' rooms) exposed to known or suspected COVID-19 patients.
- Medical transport workers (ambulance vehicle operators) moving known or suspected COVID-19 patients in enclosed vehicles.
- Mortuary workers involved in preparing bodies for burial or cremation of people known to have, or suspected of having, COVID-19 at the time of death.

OSHA VERY HIGH-RISK LEVEL (*REQUIRES ADDITIONAL PROTECTION*)

Examples for the Very High-Risk Level

Jobs with a very high potential for exposure to known or suspected sources of SARS-CoV-2 during specific medical, postmortem, or laboratory procedures, such as:

- Healthcare workers (e.g., doctors, nurses, dentists, paramedics, emergency medical technicians) performing aerosol-generating procedures (e.g., intubation, cough induction procedures, bronchoscopies, some dental procedures and exams, or invasive specimen collection) on known or suspected COVID-19 patients.
- Healthcare or laboratory personnel collecting or handling specimens from known or suspected COVID-19 patients (e.g., manipulating cultures from known or suspected COVID-19 patients).
- Morgue workers performing autopsies, which generally involve aerosol-generating procedures, on the bodies of people who are known to have, or are suspected of having, COVID-19 at the time of their death.

EXAMPLES OF CONTROL STRATEGIES

Based on either LOW or MEDIUM risk of exposure

Low risk of exposure

➔ Preventative measures like that for the general public

Medium risk of exposure

➔ Requires additional protection and controls

GENERAL RECOMMENDATIONS FOR PUBLIC*

1. Frequent handwashing
2. Avoid touching your eyes, nose, or mouth
1. Practice good respiratory etiquette
2. Practice social distancing
3. Face coverings (when applicable)
4. Clean and disinfect frequently touched surfaces daily
5. Monitor your health daily and stay home or get needed medical care if sick
6. Notify your employer if you are sick
7. Recognize and plan to address personal risk factors for those at increased risk of severe illness.

Sneezing into a tissue (Source: CDC)

** Note these are subject to change; Always check current CDC and/or local recommendations*

PREVENT THE SPREAD OF THE VIRUS

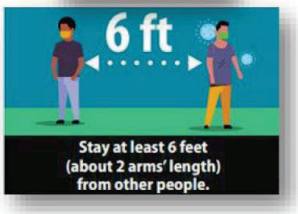
❖ Cover coughs & sneezes ❖ (Source: CDC)

❖ Wash with soap & water for 20 seconds (Source: CDC)

SLOW THE SPREAD OF COVID-19 (SOURCE: CDC)

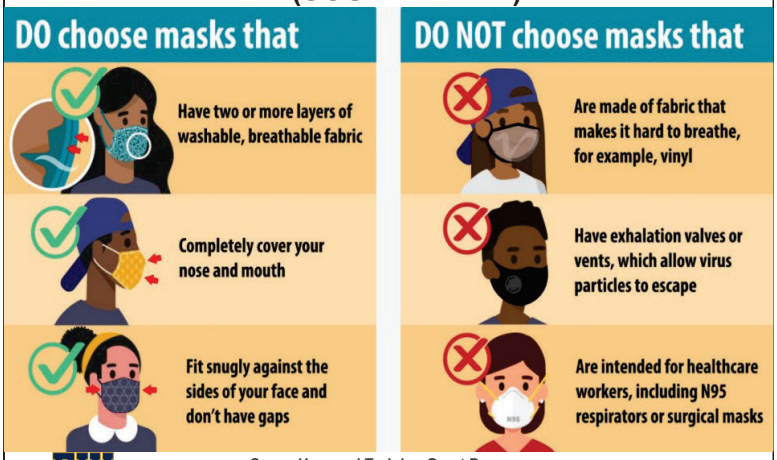
❖ When in public or around others, wear a cloth face covering

❖ Stay at least 6 feet from other people



USING A HAND SANITIZER PROPERLY

CDC FACE MASK RECOMMENDATIONS (SOURCE: CDC)



CDC GUIDELINES ON GAITERS AND FACE SHIELDS (SOURCE: CDC)

Wear a gaiter with two layers, or fold it to make two layers

Not recommended without a face mask. Effectiveness is unknown at this time.

FACE COVERING VS RESPIRATOR

https://www.peacehealth.org/healthy-you/community-cloth-face-covering-instructions

https://www.3m.com/3M/en_US/company-us/all-3m-products/~/3M-Particulate-Respirator-8210-N95-160-EA-Case/?N=5002385+3294780268&rt=rud

EXHALATION VALVES DON'T PROTECT COMMUNITY

https://www.11alive.com/article/news/health/coronavirus/masks-exhalation-valves/85-804a13cc-7619-41ce-8207-b52698842663

POLL QUESTION #3

Which of the following provides the most protection from COVID-19?

- ❑ N95
- ❑ KN95
- ❑ Surgical Mask
- ❑ Neck Gaiter

HOW TO PUT ON YOUR FACE MASK (SOURCE: CDC)

HOW TO REMOVE YOUR FACE MASK (SOURCE: CDC)

EFFECTIVENESS OF FACE MASKS (SOURCE: CDC)

POLL QUESTION #4

How long after a positive test would a person who was sick with COVID-19 but asymptomatic (showing no symptoms of illness) need to stay in isolation?

- ❑ Three days
- ❑ One month
- ❑ Six weeks
- ❑ 10 days

FOR MEDIUM RISK LEVELS ADDITIONAL CONTROLS NEEDED

Control Method	Examples
Eliminating the hazard or risk	Virtual meetings
Reducing the hazard or risk	Reduce frequency of contact with co-workers or customers
Engineering controls	Install physical barriers
Administrative controls	Contact tracing with isolation and quarantine
Safe work practices	Practice good personal hygiene
Personal protective equipment (PPE)	Cloth face coverings and face shields

SECTION 3: CONTROLS, SCREENING & PREVENTIVE MEASURES

HIERARCHY OF CONTROLS

- The hierarchy of controls can be used to remove hazards from the workplace.
- Most effective prevention controls include:
  - Eliminating or reducing hazard
  - Engineering controls
- Control measures SHOULD include a combination of each method to protect workers from exposure.

Hierarchy of Controls

Eliminate Hazard or Risk

↓

Reduce Hazard or Risk

↓

Engineering Controls

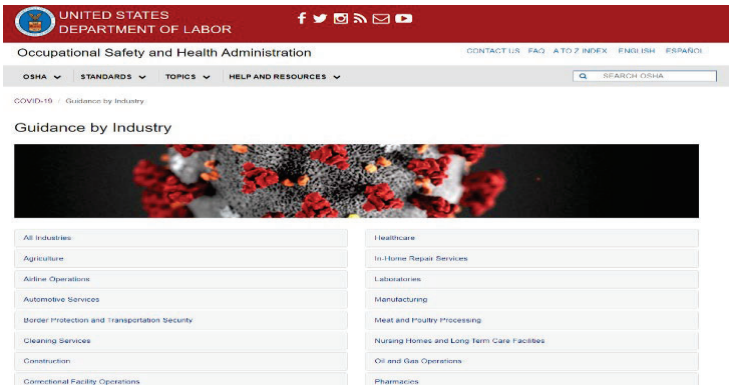
↓

Administrative Controls and Safe Work Practices

↓

PPE Controls

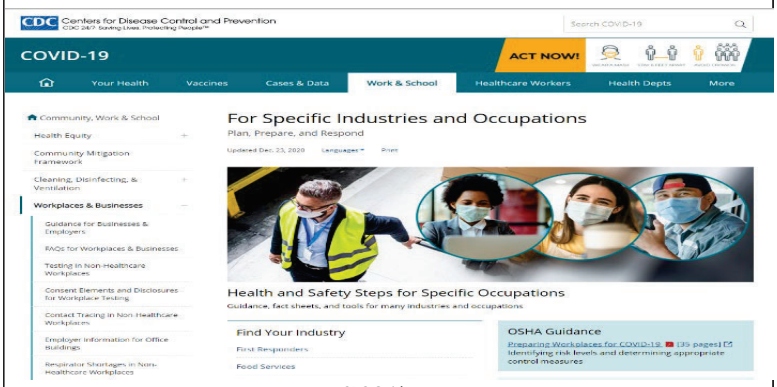
CONTROL METHODS – OSHA GUIDANCE BY INDUSTRY



OSHA Guidance

OSHA COVID-19: Guidance by Industry

CONTROL METHODS – CDC GUIDANCE BY INDUSTRY



CDC Guidance

CDC COVID-19: Health and Safety Steps for Specific Occupations

ENGINEERING CONTROLS

- Isolating employees from work related hazards
- Reduce exposure without relying on human behavior
- Engineering controls include:
  - Installing high-efficiency air filters
  - Increasing ventilation rates in the work environment
  - Installing physical barriers, such as clear plastic sneeze guards

Source: CDC Website

ADMINISTRATIVE CONTROLS

- Often a change in work procedure to reduce exposure, such as:
  - Encourage sick workers to stay at home
  - Minimize contact among workers
  - Reduce number of employees on site by alternating days or by adding extra shifts
  - Discontinue unneeded work travel
  - Increase communication between workers and management

Source: CDC website

ADMINISTRATIVE CONTROLS: TRAINING AND COMMUNICATION

- Providing workers with up-to-date education and training on COVID-19
- Training workers who need to use PPE on how to correctly don, use, and doff
- Signage on proper hygiene controls (i.e., handwashing, social distancing, face coverings, etc.)
  - Face coverings protects those around you and is complementary to social distancing, not a replacement

Source: CDC Website

SAFE WORK PRACTICES

- A type of administrative control that includes procedures for safe operation to reduce time, frequency or intensity of exposure to hazard
- Safe Work Practices include:
  - Good personal hygiene in the workplace
  - Providing tissues, hand soap, alcohol-based hand sanitizer (at least 60% alcohol), EPA approved disinfectants and other cleaning supplies to clean work surfaces.

Source: CDC website

USE EPA APPROVED LIST N DISINFECTANTS FOR COVID-19 VIRUS, WEAR GLOVES, AND PROTECT YOURSELF FROM CHEMICALS. (SOURCE: CDC)

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Source: CDC Website

- All types of PPE must be:
  - Selected based on the hazard
  - Properly fitted and re-fitted as needed (e.g., respirators)
  - Used by workers and properly worn
  - Regularly inspected and maintained
  - Replaced as needed
  - Properly, cleaned, stored and disposed of to avoid spread of virus
- Examples of PPE include gloves, goggles, face shields, and respiratory protection, when needed

POLL QUESTION #5

COVID-19 most commonly spreads by:

- ❑ Respiratory droplets produced when an infected person coughs, sneezes, talks, or breathes near another person
- ❑ Touching surfaces that have the virus on it and then touching your mouth, nose, or eyes
- ❑ The wind carrying the virus great distances from city to city
- ❑ Coming in contact with infected blood

ADDITIONAL CONTROL OPTIONS FOR CUSTOMER SERVICE

1. Offer phone-in, mobile, or online ordering, and payment options
2. Offer curbside, doorstep or delivery/mail service options
3. Ask customers to self-screen for symptoms
4. Ask customers to wear a cloth face covering
5. Close or limit customers in reception areas and waiting rooms
6. Do not shake hands with customers
7. Avoid direct hand-off of items to customer (e.g., food items)
8. Provide a physical barrier (e.g., plexiglass shield) at point of purchase
9. Provided hand sanitizer at the point of purchase
10. Clean and disinfect all touchpads, countertops, and seating areas before & after service
11. Increased cleaning and disinfection of commonly touched surfaces
12. Stock displays and shelves during shifts when store is closed or during slow periods

SCREENING TESTS

- CDC recommends screening employees, but it is optional for employers
- Due to asymptomatic or people with non-specific symptoms, screening or health checks may not be effective.
  - Some may not realize they are infected and still pass screening checks.
- Screening and health checks should not replace other protective measures

EXAMPLES OF SCREENING QUESTIONS

- Screening questions should focus on "new" or "unexpected" symptoms
- Typical symptoms to include in screening:
  - **Fever or feeling feverish (chills, sweating)**
  - **New cough**
  - **Difficulty breathing**
  - **Sore thoat**
  - **Muscle aches or body aches**
  - **Vomiting or diarrhea**
  - **New loss of taste or smell**

CDC SCREENING QUESTIONNAIRE

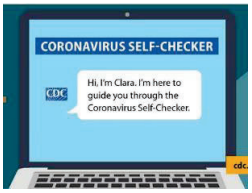
CDC FACILITIES COVID-19 SCREENING

Accessible version available at *https://www.cdc.gov/screening/*

PLEASE READ EACH QUESTION CAREFULLY	PLEASE CIRCLE THE ANSWER THAT APPLIES TO YOU	
Have you experienced any of the following symptoms in the past 48 hours: • fever or chills • cough • shortness of breath or difficulty breathing • fatigue • muscle or body aches • headache • new loss of taste or smell • sore throat • congestion or runny nose • nausea or vomiting • diarrhea	YES	NO
Within the past 14 days, have you been in close physical contact (6 feet or closer for a cumulative total of 15 minutes) with: • Anyone who is known to have laboratory-confirmed COVID-19? OR • Anyone who has any symptoms consistent with COVID-19?	YES	NO
Are you isolating or quarantining because you may have been exposed to a person with COVID-19 or are worried that you may be sick with COVID-19?	YES	NO
Are you currently waiting on the results of a COVID-19 test?	YES	NO

SELF SCREENING

- You can self-screen prior to coming on site and not enter workplace if experiencing the following:
  - Symptoms of COVID-19
  - Waiting for the results of a viral test to confirm
  - Have been diagnosed with COVID-19 and not yet cleared to discontinue isolation



CDC COVID-19 Self-Check Website

SECTION 4: TESTING AND MONITORING FOR COVID-19

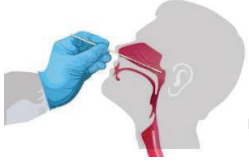
DIAGNOSTIC TESTS

- Two kinds of test are available
  - **Molecular test** detects the virus that causes COVID-19. SARS-CoV-2.
  - **Antigen test** detects specific proteins made by the virus.

https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/covid-19-frequently-asked-questions#:~:text=There%20are%202%20different%20types,made%20by%20the%20virus

DIAGNOSTIC TEST: VIRAL TESTING

- Viral testing detects SARS-COV-2 markers
- Samples are collected from respiratory system (nasal/oral swabs or saliva) to determine if SARS-COV-2 infection present
- Recommended to diagnose acute infection of symptomatic or asymptomatic person
  - This guides contact tracing, treatment options and isolation requirements
- Tests results may be available at testing site in less than an hour
- Other tests sent to lab for processing may take 1-2 days



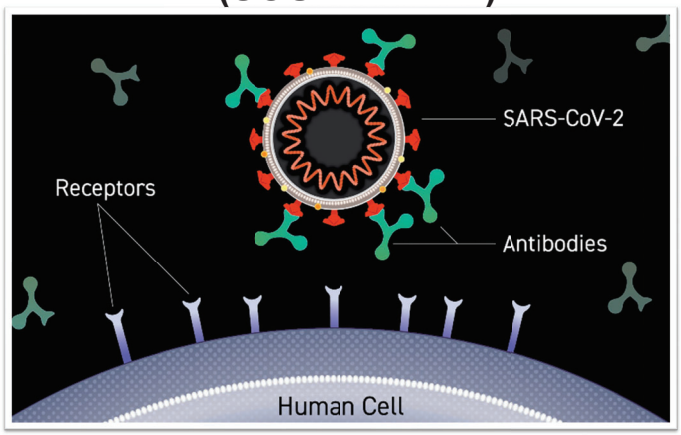
Nasal Swab (Source: CDC)

TESTING FOR PAST INFECTION: ANTIBODY TESTING

- Antibody test may tell of a past infection.
- Performed by checking the blood for antibodies.
- Antibodies are proteins that help fight infections and can provide immunity by protecting you against getting the disease again.
- **An antibody test should not be used to diagnose a current COVID-19 infection unless viral testing is delayed.**
- It can also take 1-3 weeks after infection for your body to make antibodies.

Antibody Test
(Source: CDC)

SARS-COV-2 ANTIBODIES (SOURCE: NIH)



CHECKING YOUR TEMPERATURE FOR FEVER

- Normal temperature 98.6 °F
- With fever > 100.4 °F

OXYGEN SATURATION

- Pulse Oximeter measures how well oxygen is binding to red blood cells
- Oximeters report blood oxygen levels
  - Breathing allows oxygen to enter your lungs and enter the blood stream
  - Oxygen is then picked up by red blood cells and circulates throughout the body
- COVID-19 can cause direct injury to the lungs causing inflammation and pneumonia
  - Both have a negative impact on how well oxygen is transferred to the bloodstream

Pulse Oximeter
(Source: Creative Commons/Clipar

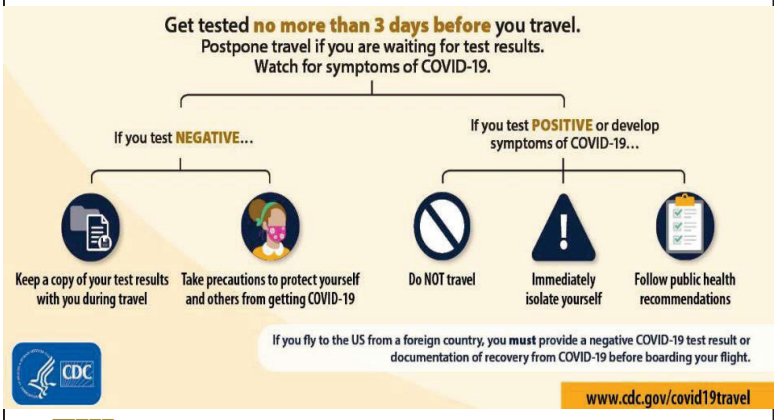
Source: Shenoy, N., Luchtel, R. & Gulani, P. Considerations for target oxygen saturation in COVID-19 patients: are we under-shooting?. BMC Med 18, 260 (2020). https://doi.org/10.1186/s12916-020-01735-2

MORE ON OXYGEN SATURATION

- Testing positive for COVID-19 does not mean a person will develop low oxygen levels.
- NIH recommends a current target saturation range of 92-96% for patients with COVID-19.
- People with COVID-19 can have low oxygen levels, even when they are feeling well.
  - Low level signs can be an early indication that medical care is needed.
- An oximeter can be a helpful tool for checking oxygen levels.

Pulse Oximeter

COVID-19 TESTING BEFORE TRAVEL (SOURCE: CDC)



POLL QUESTION #6

Worker risk of exposure to SARS-CoV-2 is mostly based on which of the following? Select all that apply.

- ❑ Close contact with people
- ❑ Frequent contact with people
- ❑ Handling packages and mail
- ❑ Attending virtual meetings

REPORT INFECTION OR CLOSE CONTACT WITH AN INFECTED PERSON

It is important to let your employer know if:

- You have symptoms of COVID-19 and could be sick
- You tested positive for COVID-19 infection (viral test)
- You were in close contact with someone who was recently diagnosed with COVID-19

SECTION 5: REPORTING COVID-19 IN THE WORKPLACE

EMPLOYEE RIGHTS

1. Right to report if workplace is unsafe during the COVID-19 pandemic
2. Federal law entitles employees to a safe workplace. The employer must keep the workplace free of known health and safety hazards. Employees have the right to speak up about hazards **without fear of retaliation**
3. **Safety and Health Complaint:** If one believes working conditions are unsafe or unhealthful, he/she may file a confidential complaint with OSHA and ask for an inspection. If possible, it is recommended you first tell your employer about the concern.
4. **Protection from Retaliation:** It is illegal for an employer to fire, demote, transfer or otherwise retaliate against a worker who complains to OSHA and uses their legal rights. If an employee believes he/she has been retaliated against in any way, they can file a whistleblower complaint within 30 days of the alleged retaliation.

POLL QUESTION #7

A biological virus, such as COVID-19, can be spread through: (Select all that apply)

- ❑ Contact with droplets from a sneeze or cough.
- ❑ Touching eyes/nose/mouth without washing hands.
- ❑ Talking with someone on the phone
- ❑ Using the internet.

SECTION 6: MEDICAL PREVENTION

CDC RECOMMENDATIONS FOR WHO SHOULD BE VACCINATED FIRST

- CDC recommends giving vaccinations in phases (may overlap):
  - **1a**: Healthcare personnel **and** long-term care facility residents
  - **1b:** Frontline essential workers **and** People aged ≥ 75 years
  - **1c:** People aged 65–74 years **and** people aged 16—64 years with underlying medical conditions **and** other essential workers
- Each state also has its own plans for deciding who will be vaccinated first and how vaccine can be received.
- Contact local health department for more information on COVID-19 vaccination in your area.

Vaccination Shot (Source: CDC)

CHRONIC MEDICAL CONDITIONS INCLUDE BUT ARE NOT LIMITED TO:

Cancer	**Chronic kidney disease**	**COPD (chronic obstructive pulmonary disease)**
Heart conditions, such as heart failure, coronary artery disease or cardiomyopathies	**Solid organ transplantation**	**Obesity and severe obesity (BMI ≥ 30 kg/m²)**
Pregnancy	**Sickle cell disease**	**Type 2 diabetes mellitus**

THINGS TO KNOW ABOUT THE COVID-19 VACCINE

1. Safety is a top priority
2. The vaccines are highly effective. Likely need two doses and a booster dose for full protection.
   - Both vaccines must be from the same manufacturer.
   - Overall full protection from 2 doses takes over a month.
   - Side effects from COVID-19 vaccine are generally mild.
3. You cannot get COVID-19 from the vaccine.
4. Florida is distributing the vaccine now and will continue as more become available.
5. Booster vaccines are available.

SIDE EFFECTS FROM COVID-19 VACCINE

- Side effects come from immune system responding to the vaccine. Side effects include;
  - **Pain, redness at the injection site**
  - **Fatigue**
  - **Headache**
  - **Body Aches**
  - **Fever**
- This means the vaccine is working!
- If side effects are severe or still experiencing after a couple of days, then contact your healthcare provider

Vaccine Shot (Source: CDC)

SECTION 7: REVIEW

POLL QUESTION #8

Which of these are examples of engineering controls for COVID-19? Select all that apply.

- ❑ Replace face-to-face meetings with virtual ones.
- ❑ Require workers to wear face masks
- ❑ Install physical barriers and sneeze guards.
- ❑ Increase ventilation (fresh air).
- ❑ Install air filters.

GROUP DISCUSSION

DISCUSSION QUESTION #9

Your employee, Bill, called you to report that he woke up this morning with a cough and fever. He also mentioned that last week one of the delivery truck drivers had been coughing when Bill was helping him unload the shipment. Bill has decided to get tested and will let you know when he receives his test results. Because Bill is showing symptoms you advise him to stay home until he receives his test results.

If Bill tests positive, it is ok to assume that he was NOT infected in the workplace because of the high community spread of COVID-19.

True or False

DISCUSSION QUESTION #10

Your employee, Jasmine, calls you to let you know that she tested positive for COVID-19.

True or False: When you notify Jasmine's close contacts of their exposure to another positive employee it is OK to share Jasmine's name.

ADA
Americans with Disabilities Act

DISCUSSION QUESTION #11

After some investigation you determine that Jasmine was NOT exposed to COVID-19 in the workplace. Do you need to record her illness in OSHA 300 log?

A. Yes, you must record her illness in your OSHA 300 log.
B. No, you do not need to record her illness in your OSHA 300 log.
C. You only need to record her illness in your OSHA 300 log if she works in a healthcare setting.
D. You only need to record her illness in your OSHA 300 log if she works in a non-healthcare setting.
E. Only A and D are correct.

REVIEW OF LEARNING OBJECTIVES

A. Understand basics of tuberculosis (TB) and its spread
B. Understand the five key areas of reducing TB spread
   1) Anticipation: Know about TB and be prepared
   2) Recognition: Recognize hazardous situations
   3) Evaluation: Know the risk factors of TB
   4) Control: Effective controls to protect yourself and others
   5) Management: Report illness and monitor success of controls

TB REFERENCES

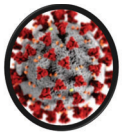
- Centers for Disease Control and Prevention, Publications on Tuberculosis, https://www.cdc.gov/tb/publications/default.htm.
- Centers for Disease Control and Prevention. Guidelines for Environmental Infection Control in Healthcare Facilities *MMWR* 2003; 52 (No. RR-10)
- Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention Clinical Practice Guidelines: Diagnosis of Tuberculosis in Adults and Children. *Clinical Infectious Diseases* 2017; 64: 111-115.
- Horsburgh and Rubin. Clinical practice: latent tuberculosis infection in the United States. *N Engl J Med* 2011; 364:1441–8
- Deutsch-Feldman M, Pratt RH, Price SF, Tsang CA, Self JL. Tuberculosis – United States, 2020. MMWR Morb Mortal Wkly Rep. 2021 Mar 26; 70(12):409–414. doi: 10.15585/mmwr.mm7012a1.
- Kim S, Cohen T, Horsburgh CR, Miller JW, Hill AN, Marks SM, Li R, Kammerer JS, Salomon JA, Menzies NA. Trends, mechanisms, and racial/ethnic differences of tuberculosis incidence in the US-born population aged 50 years or older in the United Statesexternal icon. Clin Infect Dis. 2021 Jul 29:ciab668. doi: 10.1093/cid/ciab668.
- Mirzazadeh A, Kahn JG, Haddad MB, Hill AN, Marks SM, Readhead A, Barry PM, Flood J, Mermin JH, Shete PB. State-level prevalence estimates of latent tuberculosis infection in the United States by medical risk factors, demographic characteristics and nativityexternal icon. PloS One. 2021 Apr 1;16(4):e0249012. doi: 10.1371/journal.pone.0249012. eCollection 2021. PMID: 33793612.

COVID-19 REFERENCES

- **Slide :15** Tizaoui K, Zidi I, Lee KH, et al. Update of the current knowledge on genetics, evolution, immunopathogenesis, and transmission for coronavirus disease 19 (COVID-19). *Int J Biol Sci*. 2020;16(15):2906-2923. Published 2020 Sep 12. doi:10.7150/ijbs.48812
- **Slide 17:** Nazario, Brunilda. "Coronavirus Incubation Period: How Long and When Most Contagious." *WebMD*, WebMD, 20 Apr. 2020, www.webmd.com/lung/coronavirus-incubation-period.
- "Management of Patients with Confirmed 2019-NCoV." *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-guidance-management-patients.html#:~:text=The%20incubation%20period%20for%20COVID,from%20exposure%20to%20symptoms%20onset.&text=One%20study%20reported%20that%2097.5,SARS%2DCoV%2D2%20infection.
- **Slide 25:** Nazario, Brunilda. "Coronavirus Incubation Period: How Long and When Most Contagious." *WebMD*, WebMD, 20 Apr. 2020, www.webmd.com/lung/coronavirus-incubation-period.
- He, Feng, et al. "Coronavirus Disease 2019: What We Know?" *Wiley Online Library*, John Wiley & Sons, Ltd, 28 Mar. 2020, onlinelibrary.wiley.com/doi/full/10.1002/jmv.25766.
- Mark Otto, Jacob Thornton. *Off-Campus Login*, www-ncbi-nlm-nih-gov.libproxy.uhcl.edu/pmc/articles/PMC7267177/#joim13091-bib-0036.
- ARDS- Mark Otto, Jacob Thornton. *Off-Campus Login*, www-ncbi-nlm-nih-gov.libproxy.uhcl.edu/pmc/articles/PMC7267177/#joim13091-bib-0036.
- Mortality rate-"Mortality Analyses." *Johns Hopkins Coronavirus Resource Center*, coronavirus.jhu.edu/data/mortality.
- **Slide 30:** "What Is a Superspreader Event?" *Mass General Advances in Motion*, advances.massgeneral.org/pulmonary/article.aspx?id=1285.
- Adam, Dillon C., et al. "Clustering and Superspreading Potential of SARS-CoV-2 Infections in Hong Kong." *Nature News*, Nature Publishing Group, 17 Sept. 2020, www.nature.com/articles/s41591-020-1092-0.
- "Clustering and Superspreading Potential of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infections in Hong Kong." *Research Square*, 21 May 2020, www.researchsquare.com/article/rs-29548/v1.
- **Slide 74:** DK. Chu, LH. Kim, et al. "Considerations for Target Oxygen Saturation in COVID-19 Patients: Are We under-Shooting?" *BMC Medicine*, BioMed Central, 1 Jan. 1970, bmcmedicine.biomedcentral.com/articles/10.1186/s12916-020-01735-2.
- **Slide75:** "Can an Oximeter Help Detect COVID-19 at Home?" *Houston Methodist On Health*, www.houstonmethodist.org/blog/articles/2020/aug/can-an-oximeter-help-detect-covid-19-at-home/.
- "Oxygen Levels, Pulse Oximeters, and COVID-19." *Minnesota Dept. of Health*, www.health.state.mn.us/diseases/coronavirus/pulseoximeter.html.
- **OSHA:** "UNITED STATES DEPARTMENT OF LABOR." *Home | Occupational Safety and Health Administration*, www.osha.gov/.
- **CDC:** *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, www.cdc.gov/.

PHOTO SOURCES

1. Bureau of Labor Statistics (BLS)
2. California Occupational Safety and Health Administration (Cal OSHA)
3. Centers for Disease Control and Prevention (CDC)
4. Department of Defense (DOD)
5. Department of Labor (DOL)
6. National Institute for Occupational Safety and Health (NIOSH)
7. Occupational Safety and Health Administration (OSHA)
8. Public Health Information Library (PHIL)



THANK YOU FOR YOUR TIME…

Social Distancing (Source: OSHA)