

COVID-19, Healthy Buildings, and Healthy Workers

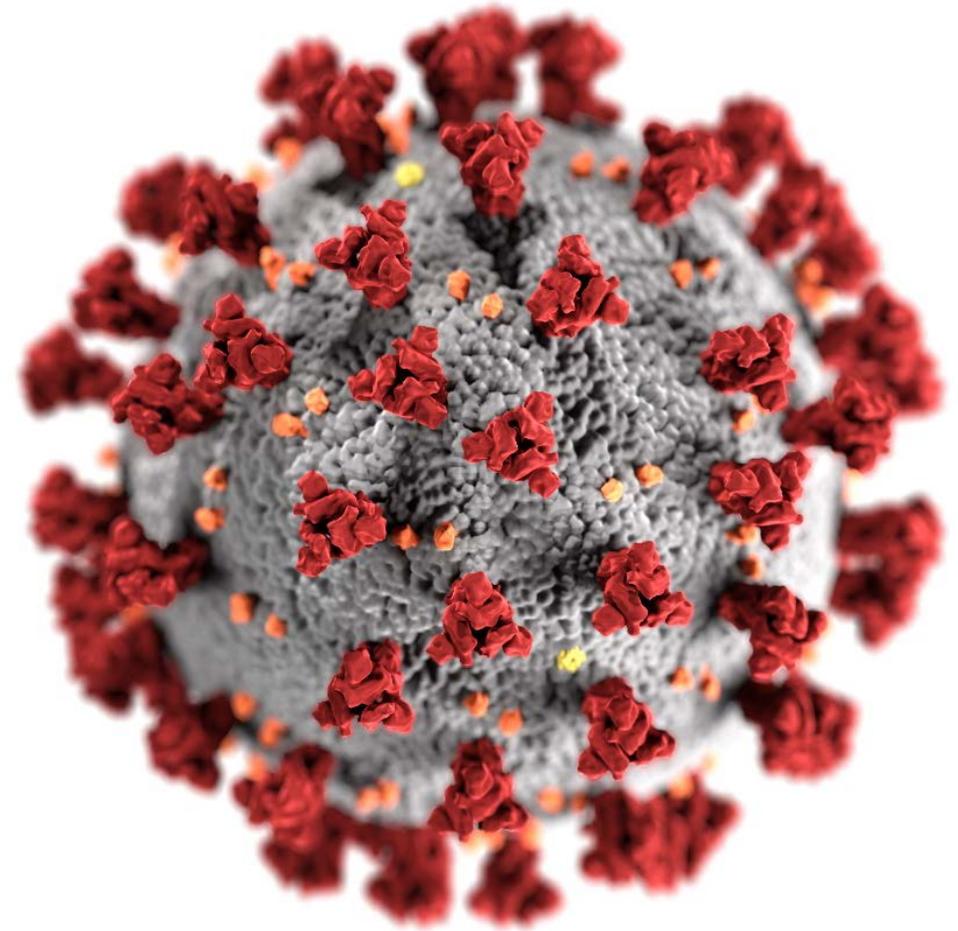
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cdc.gov/coronavirus



Overview

- Introduction
- Spread, Variants
- Worker Exposure
- Prevention, Healthy Work Environment
- Guidance for Manufacturing Workplaces
- Engineering Controls
- Administrative Controls
- Essential Workers and Vaccines
- Where to Find More Information

Coronavirus Disease 2019 (COVID-19)



How it spreads

- The virus is thought to spread mainly from person to person
 - Through respiratory droplets produced when an infected person coughs, sneezes, or talks
 - Between people who are in close contact with one another (within about 6 feet)
- These droplets can cause infection when inhaled into the nose, mouth, airways, and lungs
- This is thought to be the main way the virus spreads
- COVID-19 may be spread by people who are not showing symptoms



How it spreads (con't)

- The virus that causes COVID-19 is spreading very easily and sustainably between people
- Information from the ongoing COVID-19 pandemic suggests that this virus is spreading more efficiently than influenza, but not as efficiently as measles, which is highly contagious
- The virus may be spread in other ways
 - It may be possible for a person to get COVID-19 by touching a surface or object that has the virus on it, then touching their own mouth, nose, or possibly their eyes.
 - Under certain circumstances (for example, in enclosed spaces with poor ventilation), COVID-19 can sometimes be spread by airborne transmission.
 - This is not thought to be the main way the virus spreads, but we are still learning more about how this virus spreads.

COVID-19 Variants

- Viruses constantly change through mutation, and new variants of a virus are expected to occur over time.
- Multiple COVID-19 variants are circulating globally
- CDC is studying these variants quickly to understand whether the variants
 - Spread more easily from person to person
 - Cause milder or more severe disease in people
 - Are detected by currently available viral tests
 - Respond to medicines currently being used to treat people with COVID-19
 - Change the effectiveness of COVID-19 vaccines. Most experts believe this is unlikely to occur because of the nature of the immune response to the virus

Identify where and how workers might be exposed

- Employers are responsible for providing a [safe and healthy workplace](#).
 - Conduct a thorough [hazard assessment](#) of the workplace to identify workplace hazards that could increase risks for COVID-19 transmission.
 - Identify work and common areas where employees could have close contact (within 6 feet) with others.
 - Include all employees in the workplace in communication plans.
 - If contractors are employed in the workplace, develop plans to communicate with the contracting company regarding modifications to work processes and requirements for the contractors to prevent transmission of COVID-19.

Prevent and Reduce Transmission (part 1)

- Actively encourage sick employees to stay home.
- Consider conducting daily in-person or virtual health checks (temperature screening before they enter the facility).
- Identify where and how workers might be exposed to COVID-19 at work.
 - Conduct a hazard assessment of the workplace.
 - Encourage workers to wear a well-fitted **cloth mask** at work if the hazard assessment has determined that they do not require PPE, such as a respirator or medical facemask for protection
- Separate employees who become sick at work and send home.
- Take action if an employee is suspected or confirmed to have COVID-19: separate them from other workers, send home, and require them to stay home for appropriate isolation period.



Prevent and Reduce Transmission (part 2)

- Educate employees about steps they can take to protect themselves at work and at home.
 - Policies to reduce the spread of COVID-19
 - General hygiene
 - Symptoms, what to do if sick
 - Cleaning and disinfection
 - Cloth mask and respirator as appropriate for work duties
 - Social distancing
 - Safe work practices
 - Stress management



Photo by ©Ron Smith/Getty Images

Maintain a Healthy Work Environment (part 1)

- Modify ventilation systems, such as:
 - Increase ventilation rates.
 - Ensure ventilation systems operate properly and provide acceptable indoor air quality for the current occupancy level for each space.
- Ensure the safety of the water system of your building after a prolonged shutdown.
- Supply employees, customers, and visitors what they need to clean their hands and cover their coughs and sneezes.
- Limit travel and advise employees who must travel to take additional precautions and preparations.

Maintain a Healthy Work Environment (part 2)

- Perform routine cleaning and disinfection.
 - Follow the [Guidance for Cleaning and Disinfecting](#) to develop, implement, and maintain a plan.
 - Routinely clean all frequently touched surfaces in the workplace, such as workstations, keyboards, telephones, handrails, and doorknobs.
 - Discourage workers from using each other's phones, desks, offices, or other work tools and equipment, when possible.
 - Provide disposable disinfecting wipes so that employees can wipe down commonly used surfaces before each use.



Photo by ©Ron Smith/Getty Images

Guidance for Manufacturing Workplaces



Exposure Risk for Manufacturing Workers

Exposure risk among manufacturing workers

- Duration of contact
 - Prolonged closeness to coworkers
 - Workers often work 10-12 hours per shift
- Distance between workers
 - Working close together (<6 feet) on the processing line
 - Shared spaces such as break rooms, locker rooms, and entrances/exits
 - Shared transportation to/from work
 - Frequent contact in community settings



Photo by ©Ron Smith/Getty Images

Exposure risk among manufacturing workers

- Type of contact
 - Inhalation of respiratory droplets in the air – for example, when workers in the plant who have the virus cough or sneeze (main)
 - Contact with contaminated surfaces or objects, such as tools, workstations, or break room tables
 - See the full document [here](#) at
 - <https://www.cdc.gov/coronavirus/2019-ncov/community/guidance-manufacturing-workers-employers.html>

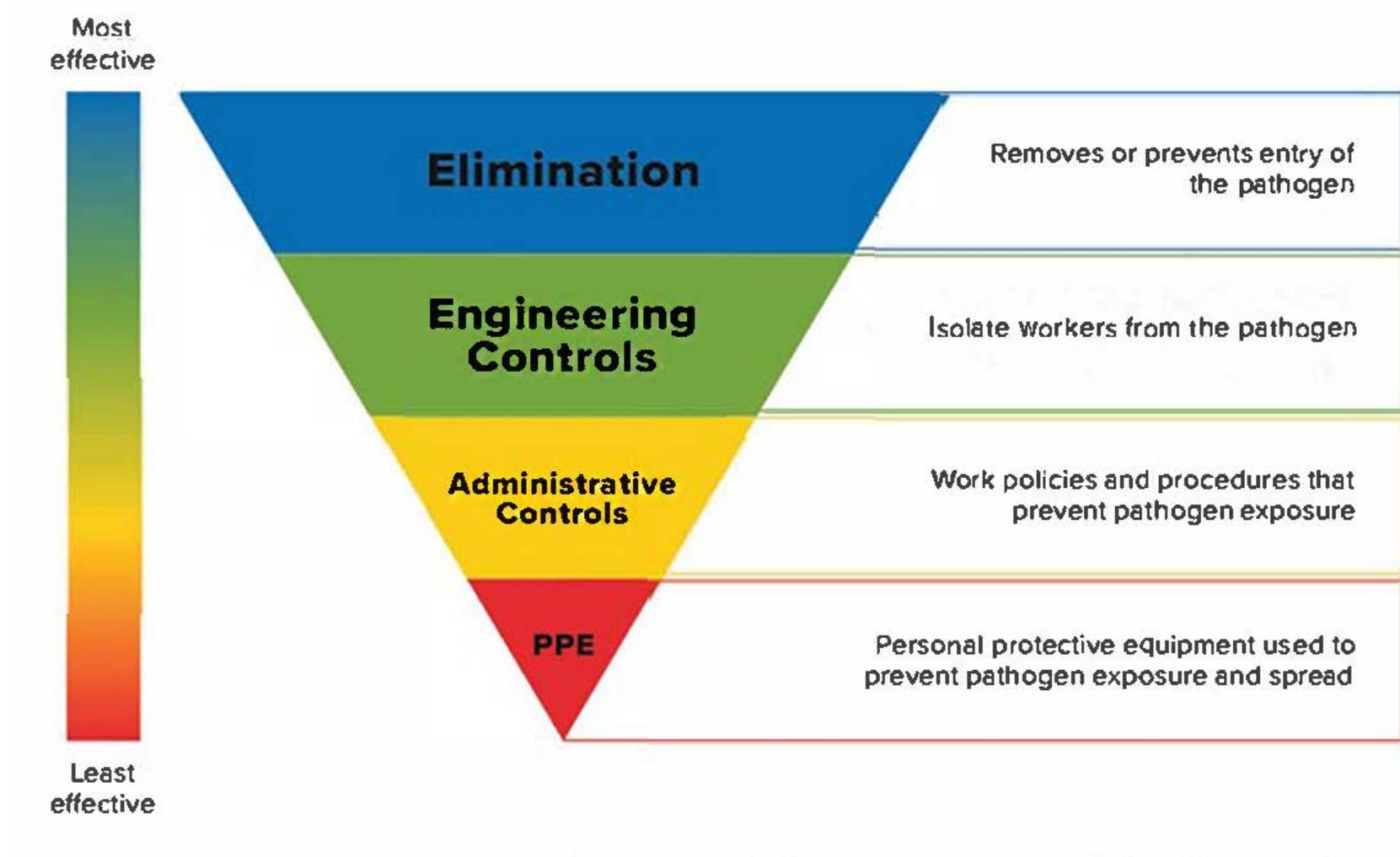


Photo by ©Ron Smith/Getty Images

Create a COVID-19 Assessment and Control Plan

- Qualified Workplace Coordinator (likely EH&S officer)
 - Responsible for creating a COVID-19 assessment and control planning
 - Coordinates with state/local public health and OSH professionals
 - Knowledgeable of public health guidelines and federal regulations
- Workplace Assessment
 - Conduct initial hazard and risk assessment following the exposure risk factors and exposure routes
 - Conduct periodic (e.g., weekly, monthly, quarterly) hazard assessments to identify risks and prevention strategies
 - Consider the role of COVID-19 testing and contact tracing of positive workers

Create a COVID-19 Assessment and Control Plan: Identify Controls

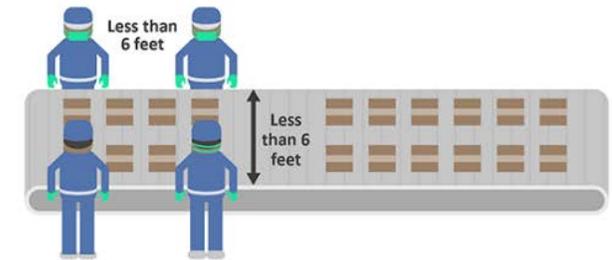


Example Engineering Controls

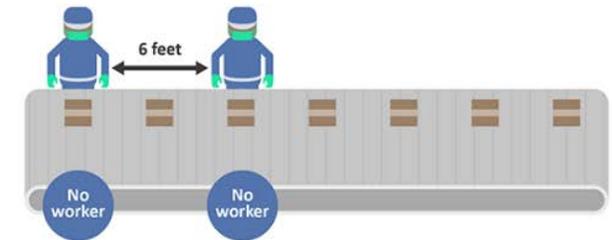
- Modify workstation to maintain 6 feet separation among workers in all directions
- Use markings and signage as reminders to maintain location and practice social distancing (staying 6 feet or more apart)

How to Align Manufacturing Workstations, If Feasible

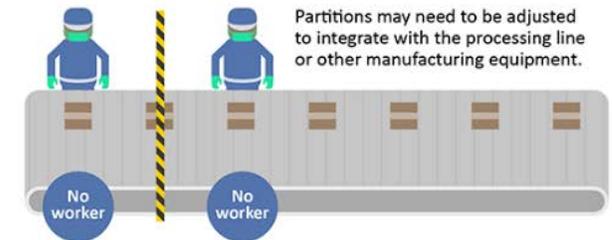
Bad:
Workers are within six feet of one another, including at side-by-side or facing workstations.



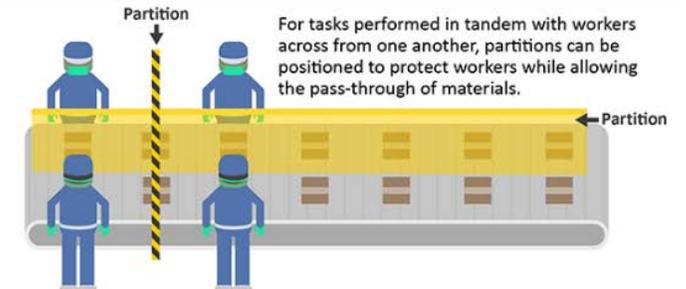
Good:
Workers are spaced at least six feet apart, not facing one another. Another setup may be used to achieve similar distancing between workers.



Good:
Physical barriers, such as partitions, separate workers from each other.



Good:
Physical barriers, such as partitions, separate workers from each other, including where workers need to perform tasks in tandem across from one another.



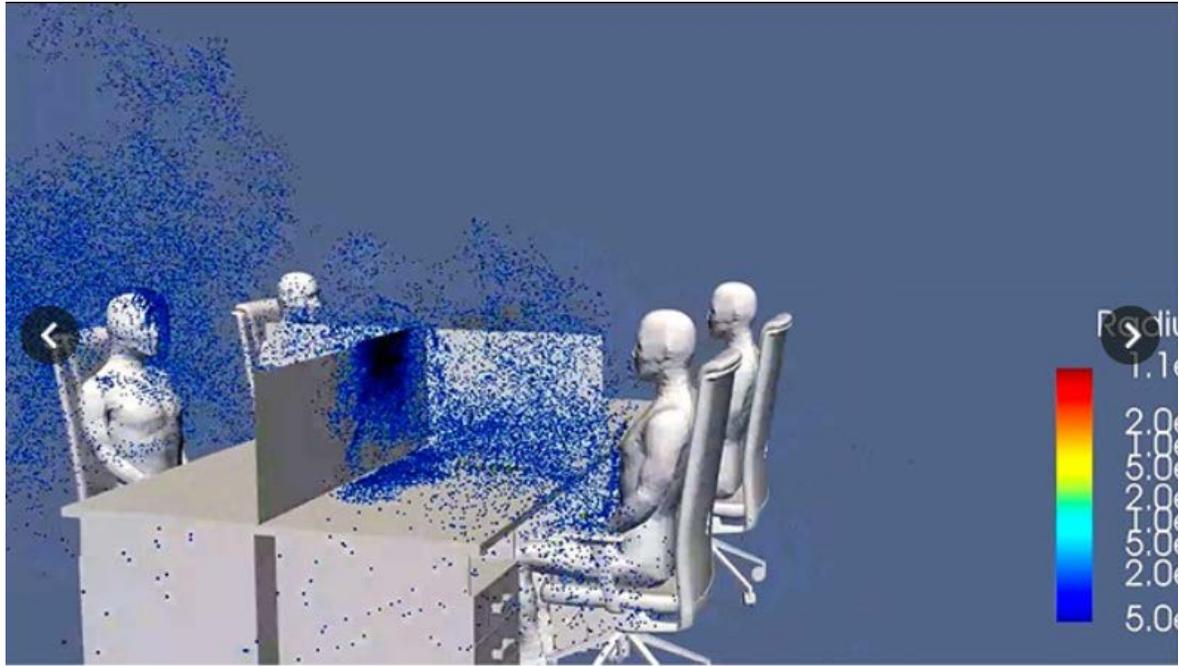
For tasks performed in tandem with workers across from one another, partitions can be positioned to protect workers while allowing the pass-through of materials.

Example Engineering Controls

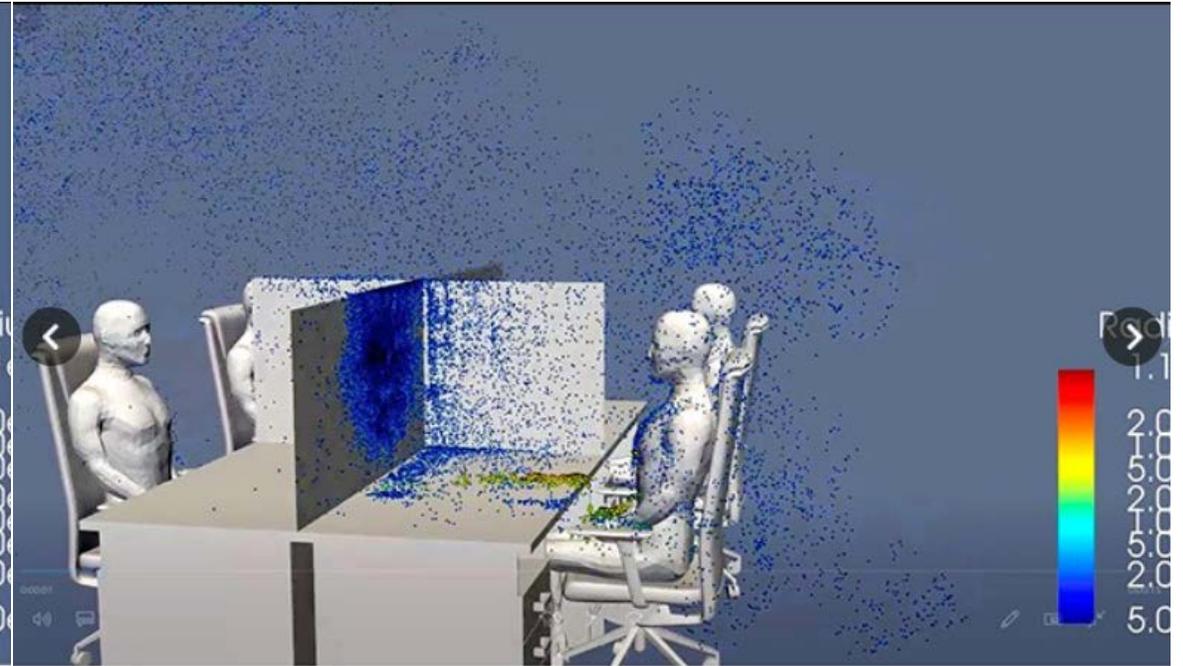
- Use physical barriers between workers such as strip curtains, plexiglass, etc.
- Provide adequate ventilation in work areas; consult with a qualified heating, ventilation, and air conditioning engineer
- Remove personal cooling fans and take steps to minimize air from other fans from blowing from one worker to another; take alternate steps to prevent heat hazards associated with the removal of fans
- Install ample handwashing stations or (touch-free) hand sanitizers ($\geq 60\%$ alcohol)
- Add additional clock in/out stations or stagger times for workers to clock in/out and other touch-free methods to reduce crowding
- Increase worker separation by removing or rearranging chairs and tables in break rooms and other common areas

Barriers

- Barriers must be tall enough to prevent droplet transmission



A simulated image by a supercomputer Fugaku, in which a person at right front coughs and droplets reach others when the height of a partition is 120 centimeters. (Provided by Riken Center for Computational Science and Toyohashi University of Technology. Supported by Kyoto Institute of Technology and Osaka University)



A simulated image by a supercomputer Fugaku, in which a person at right front coughs and droplets rarely reach others when the height of a partition is 140 centimeters. (Provided by Riken Center for Computational Science and Toyohashi University of Technology. Supported by Kyoto Institute of Technology and Osaka University)

Credit: The Asahi Shimbun (<http://www.asahi.com/ajw/articles/13440482>)

Barriers (cont.)

- Minimum design specifications for barriers are lacking – research pending
- Barriers can be enhanced with air pressurization/directional airflow
- Barriers can help designers implement desired directional airflow
 - **Caution:** Barriers can also potentially inhibit good ventilation airflow and mixing if not designed and installed properly

Engineering controls: Isolate workers from the hazard

- Modify or adjust seats, furniture, and workstations to maintain social distancing of at least 6 feet between employees.
 - Install transparent shields or other physical barriers where possible to separate employees and visitors where social distancing is not an option.
 - Arrange reception or other communal seating area chairs by turning, draping (covering chair with tape or fabric so seats cannot be used), spacing, or removing chairs to maintain social distancing.
 - Use methods to physically separate employees in all areas of the facilities.



Take steps to improve ventilation in the building

- Increase the percentage of outdoor air (e.g., using economizer modes of HVAC operations) potentially as high as 100% (first verify compatibility with HVAC system capabilities for both temperature and humidity control as well as compatibility with outdoor/indoor air quality considerations).
- Increase total airflow supply to occupied spaces, if possible.
- Disable demand-control ventilation (DCV) controls that reduce air supply based on temperature or occupancy.
- Additional information on ventilation may be found here:



<https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html>

<https://www.cdc.gov/coronavirus/2019-ncov/community/office-buildings.html>

Engineering controls: Isolate workers from the hazard (Cont.)

- Consider using natural ventilation (i.e., opening windows if possible and safe to do so) to increase outdoor air dilution of indoor air when environmental conditions and building requirements allow. Do not open windows and doors if doing so poses a safety or health risk (e.g., risk of falling, triggering asthma symptoms) to occupants using the facility.
- Improve central air filtration:
 - Increase air filtration to as high as possible (MERV 13) without significantly diminishing design airflow.
 - Inspect filter housing and racks to ensure appropriate filter fit and check for ways to minimize filter bypass
- Consider running the HVAC system at maximum outside airflow for 2 hours before and after occupied times.
- For more information, see ASHRAE <https://www.ashrae.org/technical-resources/resources>

Engineering controls: Isolate workers from the hazard (Cont.)

- [Generate clean-to-less-clean air movement](#) by re-evaluating the position of supply and exhaust air diffusers and/or dampers and adjusting zone supply and exhaust flow rates to establish measurable pressure differentials.
 - Have staff work in areas served by “clean” ventilation zones that do not include higher-risk areas such as visitor reception or exercise facilities.
- Consider using portable high-efficiency particulate air (HEPA) fan/filtration systems to help [enhance air cleaning](#) (especially in higher risk areas).



Photos By: CDC/NIOSH

Engineering controls: Isolate workers from the hazard (Cont.)

- Ensure exhaust fans in kitchens and restroom facilities are functional and operating at full capacity when the building is occupied.
- Consider using [ultraviolet germicidal irradiation \(UVGI\)](#) as a supplement to help inactivate the virus.

Upper Room



Photo Credit: CDC/NIOSH

In-Duct



Photo Credit: UV Resources

Example Administrative Controls to Promote Social Distancing

- Encourage single-file movement with workers separated by six feet
- Designate workers to facilitate social distancing on floor lines
- Provide floor markings and signs (visual cues)
- Stagger break times, arrival/departure times to minimize congregation in parking areas, locker rooms, time clocks
- Encourage workers to avoid carpooling to and from work, if possible;
- If carpooling, practice social distancing, hand hygiene, mask use, disinfection
- Modify process or production lines, shifts schedules, and stagger shifts
 - Add shifts (1 shift may turn into 2 or 3 split shifts)
 - Reserve one shift for cleaning



Photo by ©Ron Smith/Getty Images

Example Administrative Controls



- Consider cohorting (grouping) workers
 - Increases effectiveness of shift schedules
 - Minimizes number of different individuals in close contact
 - May reduce the number of workers exposed if a worker is sick
- Establish reporting system for sharing worker health and COVID-19 contact status while maintaining confidentiality as required by the Americans with Disabilities Act (ADA).
- Educate workers to avoid touching their face (eyes, nose, mouth) with unwashed hands or after removing PPE
- Provide workers access to soap, safe running water, and single use paper towels for handwashing
- Workplace programs to promote personal hygiene

Personal protective equipment (PPE)

- Conduct hazard assessment to determine the need for PPE
- Cloth masks are not PPE but source control regarding COVID-19
- Follow OSHA PPE standard (29 CFR Subpart I)
- Use videos or in-person visual demonstrations of how to properly put on and take off PPE; Maintain social distancing during these demonstrations
- Emphasize that care must be taken when putting on and taking off PPE to ensure that the worker does not become contaminated
- Provide PPE that is either disposable (preferred) or, if reusable, ensure it is properly disinfected and stored in a clean location when not in use
- PPE worn at the facility should not be taken home or shared

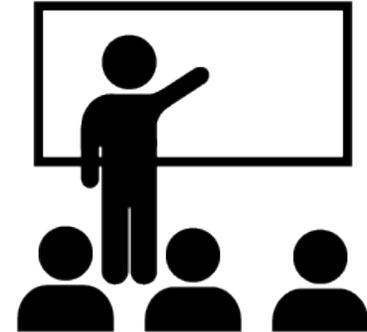


Examples of personal protective equipment (PPE)

- Stress hand hygiene before and after handling all PPE
- Always consider whether PPE is necessary to protect workers
 - When engineering and administrative controls are difficult to maintain and there may be exposure to other workplace hazards, such as splashes or sprays of liquids on processing lines or disinfectants used for facility cleaning
- Consider voluntary use of filtering facepiece respirators (such as an N95, if available) for their workers during COVID-19 outbreak
- PPE such as gloves, face and eye protection, and other types of PPE may be needed when cleaning and disinfecting
- Consider additional hazards created by poorly fitting PPE with respect to the work environment (e.g., machinery in which PPE could get caught)

Educate and train workers and supervisors

- Material should be easily understood, in preferred language, at appropriate literacy level, and contain accurate and timely information
 - Recognizing COVID-19 symptoms, spread, risk at work and ways to prevent exposure to the virus
 - Proper hand washing and hand sanitizer use
 - Cough and sneeze etiquette
 - Infection control measures
- Place posters at building entrance, break and common areas, locker rooms on COVID-19 recognition and prevention
- Posters should be legible at a distance and in languages common in the worker population



Cleaning and disinfection

- [Clean and disinfect](#) tools regularly; as often as workers change workstations or move to new tools
- Use [EPA-registered disinfectants](#) that are effective against SARS-CoV-2; List N: Disinfectants for Use Against SARS-CoV-2
- Establish protocols and provide supplies to disinfect tools, equipment and frequently-touched surfaces in workspaces and common areas (e.g., door handles, handrails and barriers, bathroom faucets and surfaces) at least once per shift
- Cleaning and disinfection workers may require additional PPE and other controls (to comply with applicable OSHA regulations) to protect against chemical hazards.
- Ensure hazard communication program and training in place

In conclusion

Engineering controls are important to prevent the spread of the virus in buildings but should be used in combination with other prevention measures such as:

- [Social distancing](#)
- [Hand hygiene](#)
- [Cloth masks and/or respirators or medical facemasks](#)
- [Cleaning and disinfecting surfaces](#)

Essential Workers and Vaccines



Vaccines

- Currently, two vaccines are authorized and recommended to prevent COVID-19
 - Pfizer-BioNTech COVID-19 vaccine
 - Moderna's COVID-19 vaccine
- Because the supply of COVID-19 vaccine in the United States is expected to be limited at first, CDC recommends that initial supplies be allocated to healthcare personnel and long-term care facility residents
- The goal is for everyone to be able to easily get a COVID-19 vaccination as soon as large quantities of vaccine are available
- Vaccines in Phase 3 clinical trials
 - AstraZeneca's COVID-19 vaccine, Janssen's COVID-19 vaccine, Novavax's COVID-19 vaccine

Vaccines (con't)

- All COVID-19 vaccines in use have gone through rigorous studies to ensure they are as safe as possible
- COVID-19 vaccination will help keep you from getting COVID-19 and COVID-19 vaccination is a safer way to help build protection
- None of the COVID-19 vaccines contain the live virus that causes COVID-19 so a COVID-19 vaccine cannot make you sick with COVID-19
- It's still important to wear a well-fitted mask and avoid close contact with others after 2 doses of the vaccine
- Visit CDC's Vaccine FAQ page for answers to Frequently Asked Questions
 - <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/faq.html>

Essential Workers

Frontline Essential Workers (~30M)

- First Responders (Firefighters, Police Officers)
- Education (Teachers, Support Staff, Daycare Workers)
- Food & Agricultural Workers
- Manufacturing Workers
- Corrections Officers
- U.S. Postal Service Workers
- Public Transit Workers
- Grocery Store Workers

Other Essential Workers (~57M)

- Transportation & Logistics
- Food Service
- Shelter & Housing (Construction)
- Finance
- IT & Communication
- Energy
- Media
- Legal
- Public Safety (Engineers)
- Water & Wastewater

Frontline Essential Workers: workers who are in sectors essential to the functioning of society and are at substantially higher risk of exposure to SARS-CoV-2

Interim List of Categories of Essential Workers Mapped to Standardized Industry Codes and Titles

- Interim list to help state, tribal, local, and territorial officials and organizations prepare for the allocation of initially limited COVID-19 vaccine supply.
- List maps essential industries identified by the U.S. Department of Homeland Security's Cybersecurity and Infrastructure Security Agency (CISA) to [corresponding COVID-19 vaccination phases](#) and workforce categories, as recommended by the Advisory Committee on Immunization Practices.

Table 2. Industries mapped to ACIP Recommended Vaccination Phase 1b

2017 NAICS Code*	2017 NAICS Title	CISA v4.0 Sector	ACIP Recommended Vaccination Phase ^a	ACIP Workforce Category
62423x	Emergency and Other Relief Services	Law Enforcement, Public Safety, and Other First Responders	1b	First Responders
92212x	Police Protection	Law Enforcement, Public Safety, and Other First Responders	1b	First Responders
92216x	Fire Protection	Law Enforcement, Public Safety, and Other First Responders	1b	First Responders
92219x	Other Justice, Public Order, and Safety Activities	Other Community- or Government-based Operations and Essential Functions	1b	First Responders
92214x	Correctional Institutions	Law Enforcement, Public Safety, and Other First Responders	1b	Corrections Workers
11xxxx	Agriculture, Forestry, Fishing and Hunting	Food and Agriculture	1b	Food and Agriculture
311xxx	Food Manufacturing	Food and Agriculture	1b	Food and Agriculture
3121xx	Beverage Manufacturing	Food and Agriculture	1b	Food and Agriculture
44422x	Nursery, Garden Center, and Farm Supply Stores	Food and Agriculture	1b	Food and Agriculture
54194x	Veterinary Services	Other Community- or Government-based Operations and Essential Functions	1b	Food and Agriculture

Sub-prioritization Considerations*

- Where sub-prioritization of **frontline essential workers** is needed due to limited vaccine supply, consider:
 - Workers in locations where high rates of transmission and/or outbreaks have occurred
 - Workers who are at increased risk for severe illness based on age or underlying medical conditions**

*<https://www.cdc.gov/vaccines/covid-19/phased-implementation.html>

**Self-identified medical conditions

Special Considerations and Challenges for Vaccination of Frontline Essential Workers

- Large number of frontline workers
- State and local health authorities may need to sub-prioritize vaccination
- Workers may work in one state but live in another
- Coordination and planning for if, where, and when staff are eligible and can be vaccinated
 - Possible use of worksites to administer vaccine
- Transient workforces or workers whose jobs involve interstate transportation may have difficulty getting 2nd dose

Special Considerations and Challenges for Vaccination of Frontline Essential Workers

- Concerns about vaccine safety among some workers
- Need for culturally appropriate vaccination information in multiple languages
- Rural areas have limited access to health care and health providers
- Methods of communication may be different (e.g. radio, print)
- Rely on community leaders to serve as trusted sources for information
- Some missed days may occur due to post-vaccination side effects
- Critical infrastructure employers have an obligation to manage the continuation of work in a way that best protects the health of their workers and the general public

Workplace Vaccination Program

- Employers considering implementing a workplace COVID-19 vaccination program should contact the [health department in their jurisdiction](#) for guidance.
- The planning process should include input from management, human resources, employees, and labor representatives, as appropriate.
- Other important preliminary steps include:
 - Obtaining senior management support
 - Identifying a vaccine coordinator
 - Enlisting expertise from local public health authorities, occupational health providers, and pharmacies
- Offer the vaccination at no charge and during work hours.
- Offer flexible paid leave policies for those workers that may experience post-vaccination symptoms.

Encourage Employees to Get Vaccinated

- If your business can't offer COVID-19 vaccinations on site, encourage employees to seek COVID-19 vaccination in their community and provide them with information about where they can get the vaccine.
 - Be flexible in your human resources policies. Establish policies that allow employees to take paid leave to seek COVID-19 vaccination in the community. Support transportation to off-site vaccination clinics.
 - Use [promotional posters/flyers](#) to advertise locations offering COVID-19 vaccination in the community. Display posters about COVID-19 vaccination in break rooms, cafeterias, and other high traffic areas.
 - Post articles in company communications (e.g., newsletters, intranet, emails, portals) about the importance of COVID-19 vaccination and where to get the vaccine in the community.



CDC Vaccine Task Force/Essential Workers Team

- **Mission**

- Focuses on vaccine implementation for essential workers through linkages with workers, industry, labor, and other stakeholders

- **Strategic Efforts**

- Disseminating information to enhance vaccine confidence in essential workers
- Supporting jurisdictions to implement vaccination strategies for essential workers

CDC Vaccine Task Force/Essential Workers Team

■ Subject Matter Experts

- Construction
- Food, Agriculture, Forestry, and Fishing
- Healthcare and Social Assistance
- Manufacturing
- Oil and Gas Extraction
- Mining
- Public Safety/First Responders
- Services (including Education)
- Transportation, Warehousing, and Utilities
- Wholesale and Retail Trade



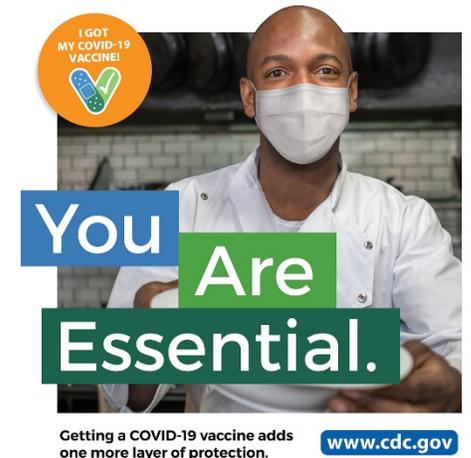
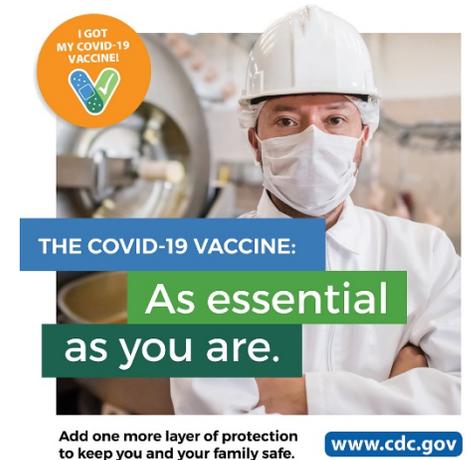
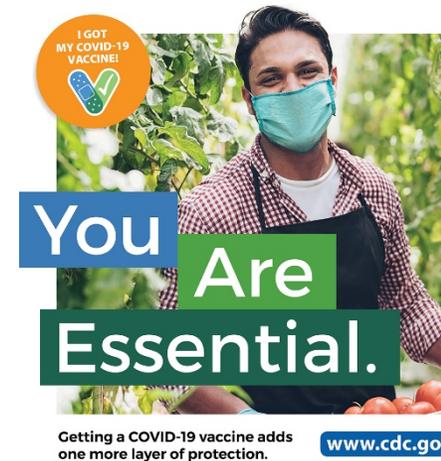
■ Surveillance, Communication, Immunization, and Evaluation Expertise

COVID-19 Vaccine Communication Toolkit for Essential Workers

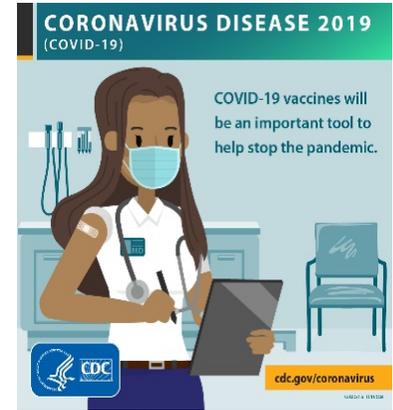
This toolkit will help your organization educate community members about COVID-19 vaccines, raise awareness about the benefits of vaccination, and address common questions and concerns.

- Key messages
- Slide deck
- Frequently Asked Questions
- Posters/Flyers
- Newsletter Content
- Letter to Members
- Social Media Content

<https://www.cdc.gov/coronavirus/2019-ncov/vaccines/toolkits/essential-workers.html>



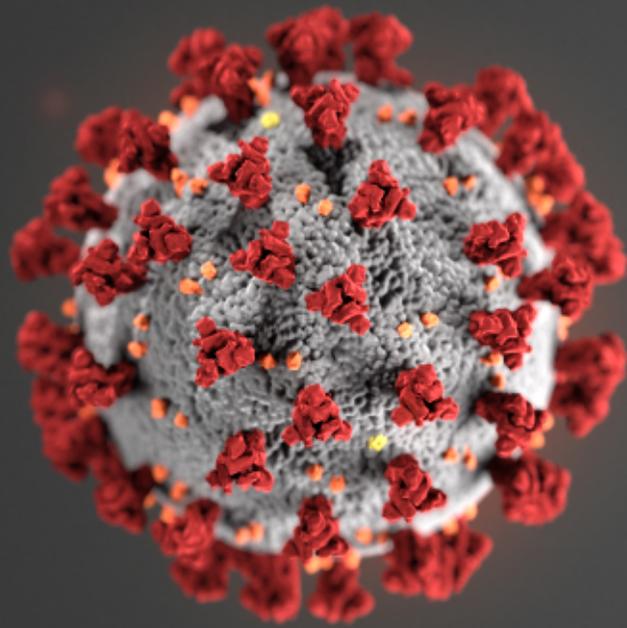
COVID-19 Vaccine Implementation



- This is an **exciting and historic time**, but the work is far from over.
- There will be **unanticipated challenges**, but CDC will continue to work closely with you, our partners, to **find solutions and overcome obstacles**.
- Vaccines are an important tool to control the pandemic, but we need to continue to message the importance of **masks, social distancing, and hand washing, even post-vaccination**.
- After vaccination of essential workers, **workplace safety and health protections implemented for the pandemic need to remain in place**.

Where to get more information

- [COVID-19 Employer Information for Office Buildings](#)
- [CDC Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 \(COVID-19\)](#)
- [CDC Resuming Business Toolkit](#)
- [CDC COVID-19](#)
- [NIOSH COVID-19 Workplace Safety and Health Topic](#)
- [OSHA COVID-19, Control and Prevention](#)
- [OSHA Guidelines on Preparing Workplaces for COVID-19](#)
- [Coronavirus \(COVID-19\) Response Resources from ASHRAE](#)
- [Scientific Brief: SARS-CoV-2 and Potential Airborne Transmission](#)
- [Manufacturing Workers and Employers](#)
- [Agriculture Workers and Employers | CDC](#)
- [COVID-19 Guidance: Businesses and Employers | CDC](#)
- [Protecting Seafood Processing Workers from COVID-19 | CDC](#)



For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

