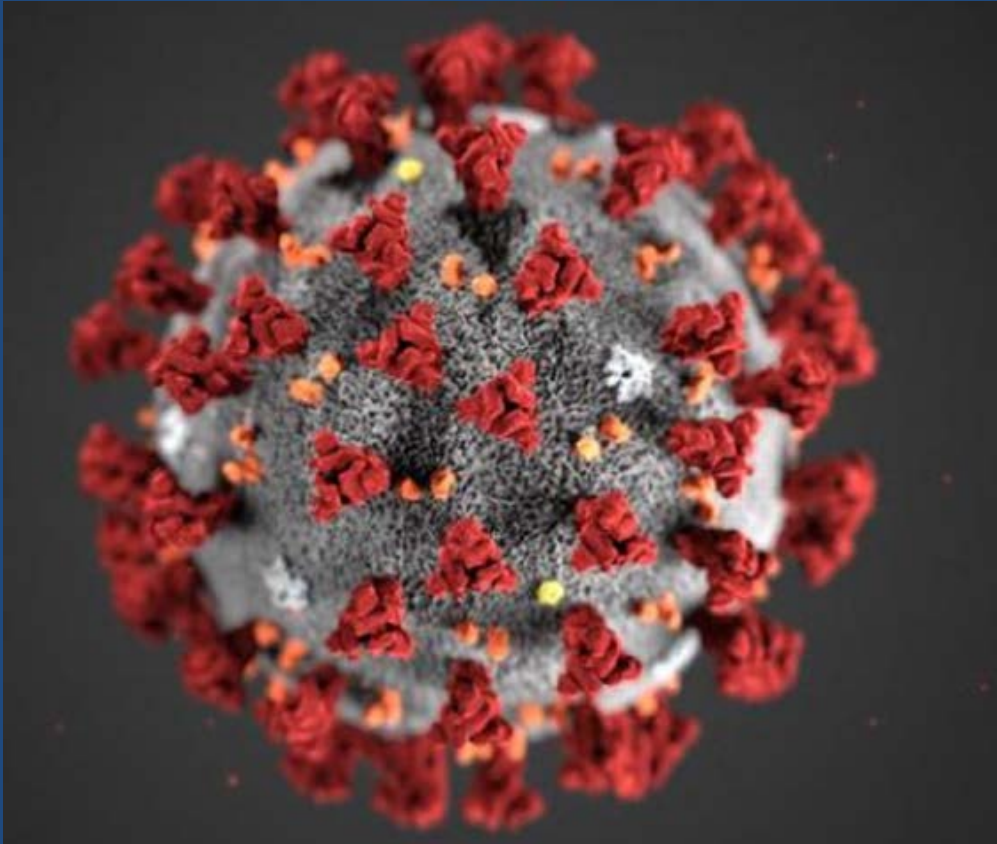


SARS-CoV-2 in the Construction Workplace



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U.S. Department of Health and Human Services

22 April 2020

**Disclaimer: The information contained in this presentation
was accurate on the date it was presented.**

Nomenclature

- **COVID-19** is an abbreviation. ‘CO’ stands for “corona,” ‘VI’ stands for ‘virus,’ ‘D’ stands for ‘disease,’ and 19’ refers to 2019 when the viral disease was first identified in December.
- The virus that causes COVID-19 is referred to as **SARS-CoV-2** which stands for “severe acute respiratory syndrome—coronavirus—two.”

Coronavirus Family

- The family of coronaviruses has seven members that cause disease in humans:
 - SARS-CoV-1
 - SARS-CoV-2
 - MERS (Middle Eastern Respiratory Syndrome)
 - Coronaviruses causing common cold (i.e., 229E; H15U1; NL63; OC43)

What is a Pandemic?

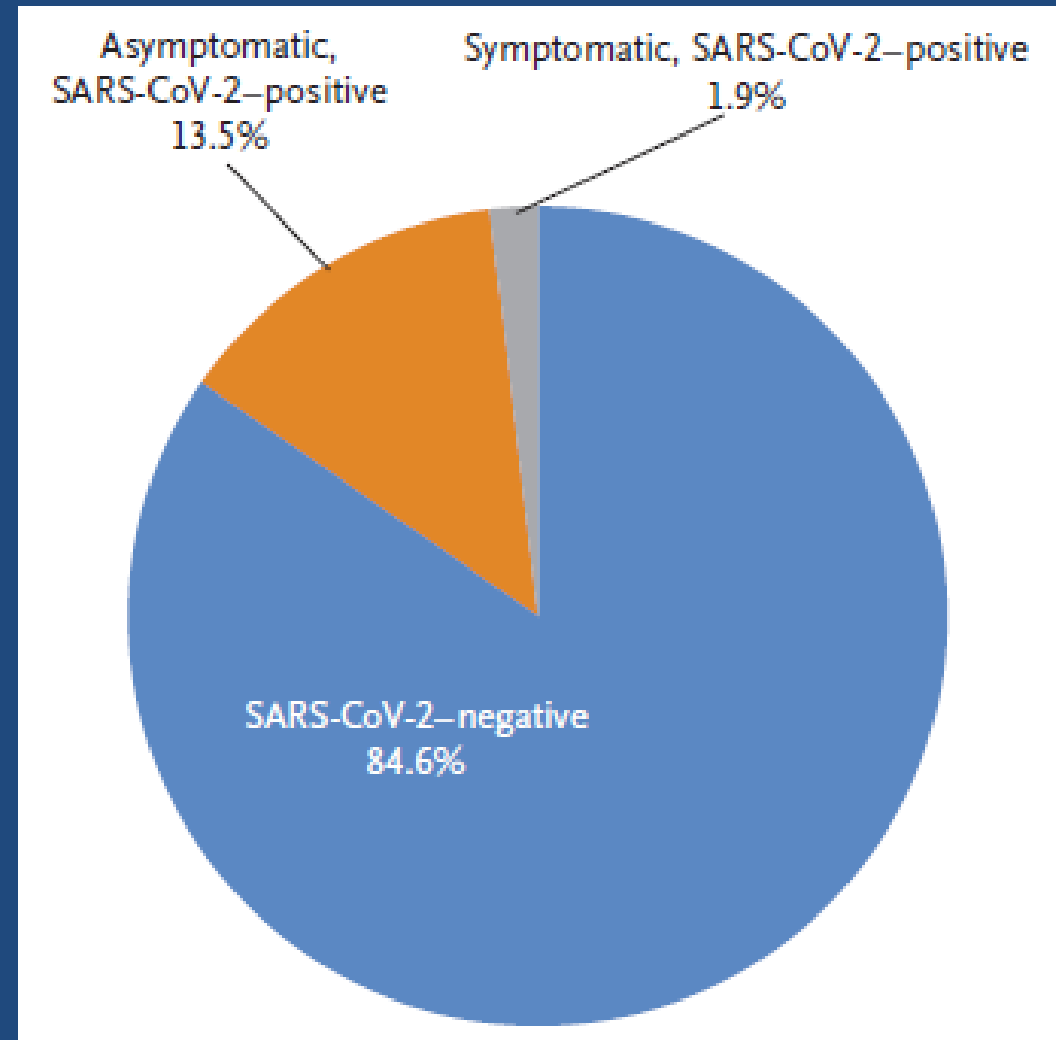
- World Health Organization declared COVID-19 to be a pandemic on March 11, 2020.
- There are three elements that must exist for a pandemic to be declared:
 - Novel virus
 - Virus that has not previously circulated in the population—no one in the population has any immunity to the virus.
 - Sustained community spread
 - Virus spreads from person to person
 - Not associated with travelers entering from a source country
 - Worldwide distribution

COVID-19 Basics

- COVID-19 is a respiratory disease.
- Primary presenting symptoms
 - Fever, cough, and trouble breathing.
- Average incubation period = is 5.2 days
 - 99% of individuals exhibiting symptoms within 12.5 days to 14 days.
- There are people who get COVID-19, but do not require hospitalization for respiratory distress.
- Persons may become infected with SARS-CoV-2, yet not feel sick.
 - Pre-symptomatic or asymptomatic.

Asymptomatic and Pre-Symptomatic

- Symptom Status and SARS-CoV-2 Test Results among 215 Obstetrical Patients Presenting for Delivery
 - Sutton D et al. *NEJM*, 16 April 2020
- Asymptomatic, but SARS-CoV-2 +
 - 13.5%
- Pre-symptomatic
 - Infectiousness peaks on or before symptom onset
 - He X et al. *Nature*, 16 April 2020



Transmission

- *Droplets*

- Transmission from person to person occurs primarily between people in close contact with each other (about 6 feet).
- Respiratory droplets carrying the virus transmit infection when they travel directly *from* the respiratory tract of the infected individual *to* the mucosal surfaces—the eyes, nose and mouth of the uninfected person.
- Droplets are produced when infected person coughs, sneezes or speaks forcibly.

- *Contact*

- Contact between an uninfected person and surface or object, which has been recently (within hours) contaminated with SARS-CoV-2, can occur.
- When a person touches a contaminated surface or object with their hands, and then touches their hands to their mouth, nose, or eyes, contact transmission occurs.

Transmission by Aerosols

- Transmission by small particles—called aerosols—which remain airborne for a longer time and over a longer distance than droplets—may occur.
- **Close Contact Aerosols**
 - Airborne spread can occur especially in a relatively closed environment, involving high concentrations of aerosols over a prolonged period, and where the uninfected person is *close* to the source. This is especially true in **healthcare settings**.



Infectious Disease Epidemiology—SEIR Model

How a SEIR model shows what's to come

One of the most established ways of modelling epidemics divides the population into four groups: those **susceptible to infection (S)**, **exposed to the virus (E)**, **infectious (I)** or **recovered (R)**—a category which also, oddly, includes the dead. Conditions are then set for how people move from one group to the next and thus how the groups change in size over time

Transmission rate

Incubation period

Duration of illness

Dead

Susceptible



Exposed



Infectious



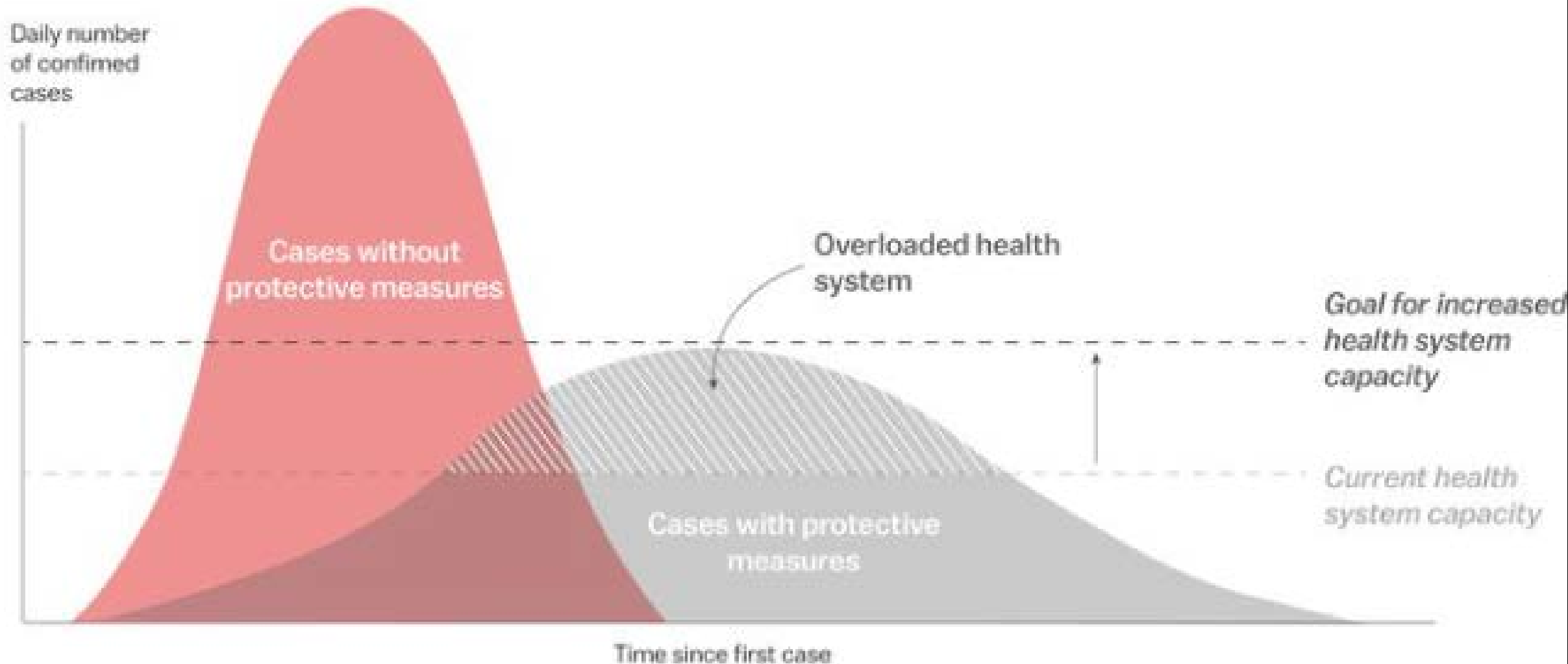
Recovered

no longer susceptible

Epidemiology—Case Count

- **Susceptible**
- **Exposed**
 - Asymptomatic (SARS-CoV-2 status unknown)
 - Asymptomatic + SARS-CoV-2
 - Symptomatic + SARS-CoV-2
- **Infectious**
 - At home
 - Hospitalized
 - Ventilator-dependent
- **Recovered**
- **Fatality**

Raising the line while flattening the curve



Testing

- There are now two types of tests:
 - **Diagnostic Test**
 - The more common test you hear about is a **nucleic acid amplification test** for SARS-CoV-2 RNA.
 - The *viral test* measures current infection with SARS-CoV-2
 - **Antibody Test**
 - The other test is called the **antibody detection test**

Tests for SARS-CoV-2/COVID-19 and Potential Uses

Type of Test

Measure

Value

Beneficiary



Nucleic acid amplification test for viral RNA

(nasopharyngeal swab, oropharyngeal swab, sputum, bronchoalveolar lavage fluid, others)

Current infection with SARS-CoV-2

- Inform individual of infection status so they can anticipate course of illness and take action to prevent transmission
- Inform patient management and actions needed to prevent transmission
- Inform actions needed to prevent transmission

- Individual
- Healthcare or long-term care facility
- Public health



Antibody detection

Past exposure to SARS-CoV-2

- Detect susceptible individuals (antibody negative) and those previously infected
- Identify individuals with neutralizing antibodies
- Facilitate contact tracing and surveillance

- Identify those potentially immune to SARS-CoV-2 (if tests can detect protective immunity, individuals could be returned to work)
- Healthcare facilities: Experimental therapy
- Public health

PRIORITIES FOR TESTING PATIENTS WITH SUSPECTED COVID-19 INFECTION



- **Priority 1**
 - Hospitalized patients
 - Healthcare facility workers with symptoms
- **Priority 2**
 - Patients in long term care facilities with symptoms
 - Patients 65 years of age and older with symptoms
 - Patients with underlying conditions with symptoms
 - First responders with symptoms
- **Priority 3**
 - Critical infrastructure worker with symptoms
 - Individuals not in above categories with symptoms
 - Healthcare facility workers and first responders
 - Individuals with mild symptoms in communities experiencing high COVID-19 cases
- **Non-priority**
 - Individuals without symptoms
- March 24, 2020

Mitigation

Community Mitigation Strategies

Non-pharmaceutical Interventions

- What are community mitigation strategies?
 - Actions that persons and communities can take to slow the spread of infectious diseases
- 3 Major Categories
 - Physical distancing
 - Personal protective measures
 - Decontamination of environmental surfaces

Community Mitigation: Physical Distancing

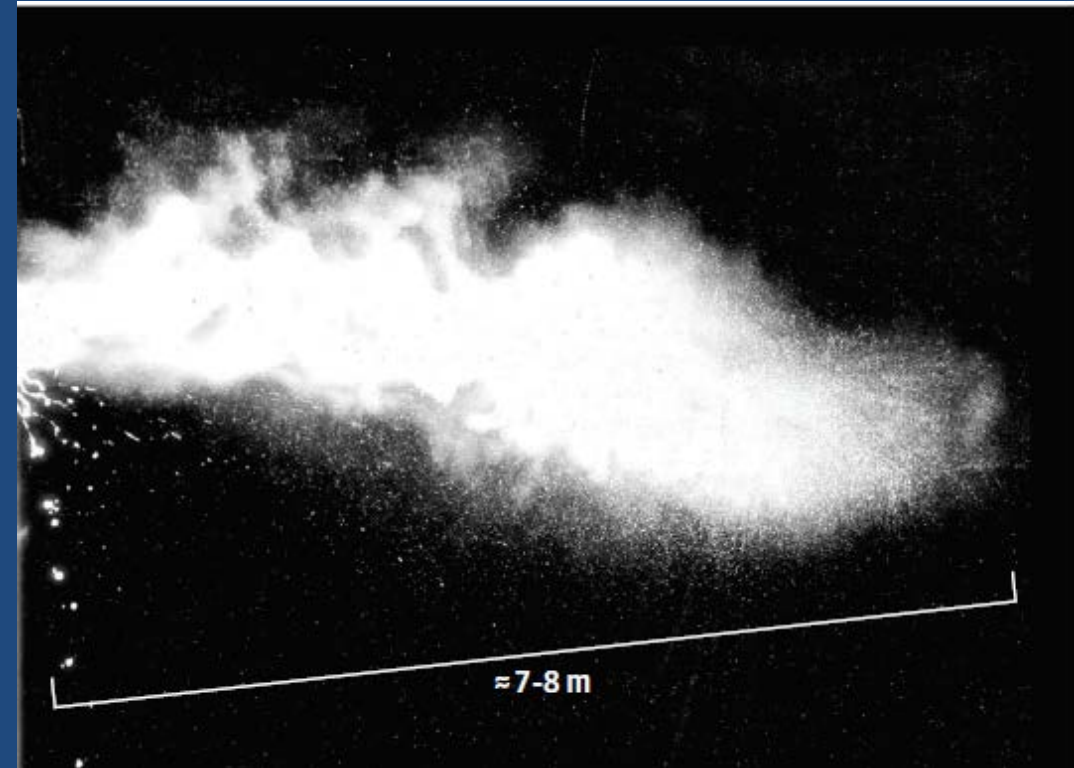
- Interrupting the spread of COVID-19 by physical distancing is based on a simple idea:
 - Keep infected individuals separated from uninfected individuals
 - Virus does not have wings or feet!
- Physical distancing
 - Stay at home if sick
 - Maintaining a *minimum* 6-foot separation between people
 - When working
 - During daily life

Mitigation—Personal Protective Measures

- Cough etiquette
- Handwashing
- Face coverings

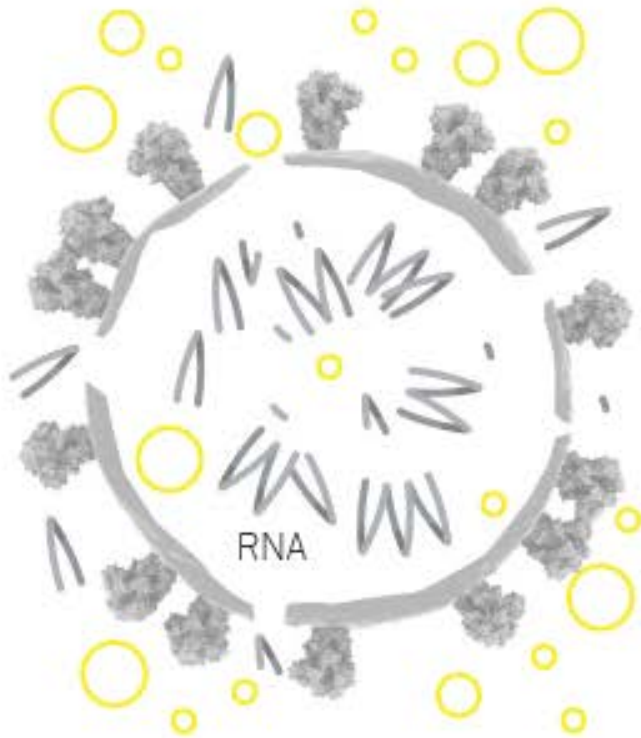
Personal Protective Measures—Cough Etiquette

- Cough etiquette is a series of actions to take if you are **coughing** or sneezing, which are designed to reduce the spread of respiratory illness to others.
 - Given various combinations of an individual patient's physiology and environmental conditions, such as humidity and temperature, the gas cloud and its payload of pathogen-bearing droplets of all sizes can travel 23 to 27 feet (7-8 meters).
 - Bourouiba L. *JAMA* (March 26, 2020)
- Sneeze, blow your nose or **cough** into a disposable tissue, and discard the tissue immediately into a bin.

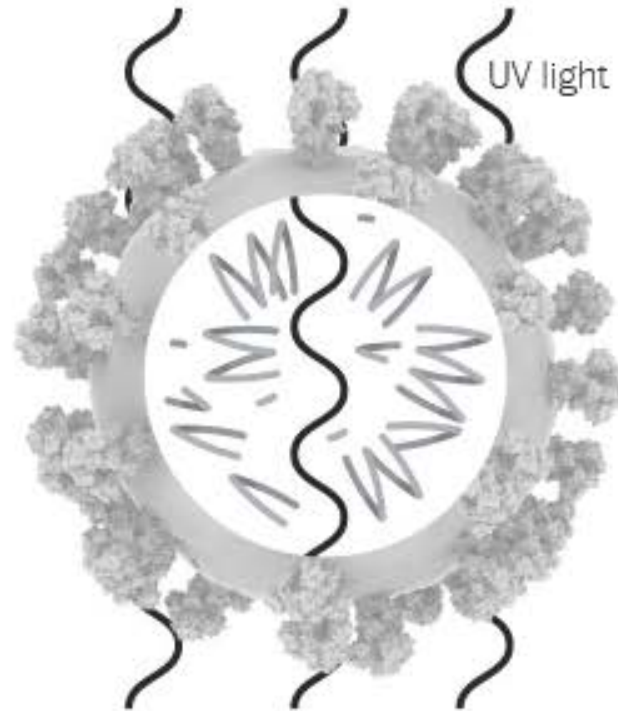


Personal Protective Measures—Handwashing

Soap and water break the virus membrane.



Ultraviolet light disrupts the genetic material.



Heat breaks the structure of spike.



Personal Protective Measures—Decontamination

- Environmental persistence of SARS-CoV-2
 - Limited studies have led to concerns about the persistence of SARS-CoV-2 on environmental surfaces. For example, viral RNA could be detected:
 - Up to 3 hours in aerosols
 - Up to 4 hours on copper
 - Up to 24 hours on cardboard
 - Up to 2-3 days on plastic
 - Up to 2-3 days on stainless steel
- **CAUTION:**
 - While detection of viral RNA *may* indicate that viral shedding occurred at some point in the past, equating detection of viral RNA with *viable* virus—virus which can cause infection—can be misleading.
 - Primary concern NIOSH has with most of the environmental studies being published to date.

Decontamination

- The good news is that exposures can be minimized without the use of any environmental sampling. Environmental contamination can be minimized with routine cleaning and disinfection practices with readily available and affordable products.
- Currently, 287 products are registered with the EPA that can be used for COVID-19. See the EPA **List N: Disinfectants for Use Against SARS-CoV-2**
 - <https://www.epa.gov/pesticide-registration/list-n-disinfectants-use-against-sars-cov-2>
- For example, contaminated surfaces and objects can be disinfected using:
 - 70% ethanol-containing products;
 - 50% isopropanol-containing products; or
 - 0.5% sodium hypochlorite-containing products.
 - Contact time with the surface or object should not be brief!

Decontamination

N95 Respirators in Healthcare Settings

- N95 respirators are in short supply
- Decontamination and Reuse of Filtering Facepiece Respirators using Contingency and Crisis Capacity Strategies
 - *<https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/decontamination-reuse-respirators.html>*
- Methods:
 - Vaporous Hydrogen Peroxide
 - Ultraviolet Germicidal Irradiation (UVGI)
 - Heat & Humidity

Personal Protective Measures—Face Coverings

- “Recommendation Regarding the Use of Cloth Face Coverings, Especially in Areas of Significant Community-Based Transmission”
 - <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html>
- Recent studies indicate that a significant portion of individuals with coronavirus lack symptoms (“asymptomatic”), and that even those who eventually develop symptoms (“pre-symptomatic”), can transmit the virus to others *before* showing symptoms.
- This means that the virus can spread between people interacting in close proximity—for example, coughing, or sneezing—even if those people are not exhibiting symptoms.
- In light of this new evidence, CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies) **especially** in areas of significant community-based transmission.

Personal Protective Measures—Face Coverings

- Sew and Non-sew Instructions
 - <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html>
- **Should cloth face coverings be washed or otherwise cleaned regularly? How regularly?**
 - They should be routinely washed depending on the frequency of use.
- **How does one safely sterilize/clean a cloth face covering?**
 - A washing machine with soap should suffice in properly washing a face covering.
- **How does one safely remove a used cloth face covering?**
 - Individuals should be careful not to touch their eyes, nose, and mouth when removing their face covering and wash hands immediately after removing.



NIOSH Guidance For Respiratory Protection

<https://www.cdc.gov/niosh/index.htm>

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Supply of PPE



Healthcare Supply of Personal Protective Equipment

Stockpiled N95 Respirators



Release of Stockpiled N95 Filtering Facepiece Respirators: Considerations for the COVID-19 Response

PPE FAQs



Frequently Asked Questions about Personal Protective Equipment

Decontamination and Reuse



Decontamination and Reuse of Filtering Facepiece Respirators

Medical Countermeasures

Pharmaceutical Interventions—Medications

- Currently, there are no proven medications to treat COVID-19.
 - However, several medications are undergoing trials to see if they are safe to use and if they work to kill SARS-CoV-2.
 - See <https://clinicaltrials.gov/>
- FDA
 - *Coronavirus Treatment Acceleration Program* to assist manufacturers in navigating administrative requirements and to expedite the review process.
- Investigational Categories:
 - Antivirals
 - Remdesivir
 - Anti-parasitic agents
 - Hydroxychloroquine and chloroquine
 - Anti-inflammatory agents
 - Corticosteroids
 - Convalescent plasma

Vaccine

- Vaccine candidates are currently in development
- 3 phases to a vaccine trial:
 - Safety
 - Efficacy
 - Large population trial
- Timeline—12 to 18 months (Spring of 2021)
- Herd immunity
 - When enough people in a given community have immunity to a given virus, then the rest of the population becomes a lot less *susceptible* to becoming infected.
 - As a consequence of herd immunity, the herd effect is the decrease in infection rate in the part of the community that is not immune to the virus.
 - Typically, at least 60% is the bare minimum for the most viruses that needs to be achieved before herd immunity can become a possibility

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**Focus on the Future—
Framework for Re-Opening America**

Staged Re-Opening

Community Mitigation Categories

- **Low Mitigation**
 - Communities where significant spread was never observed, can “re-open” soon.
- **Moderate Mitigation**
 - Former hot spots entering controlled recovery, limited mitigation communities observed increased, but contained transmission.
- **Significant Mitigation**
 - Current or emerging hot spots, moderate mitigation communities showing signs of strained capacity.

Framework for Re-Opening America

- **Prioritization and Timing**
 - Reopen community settings where children are cared for to allow workforce to return to work.
 - Other community settings will follow with careful monitoring for increased transmission that exceeds public health and health care systems.
- **Continuous Monitoring and Mitigation Adjustment**
 - Continuous monitoring of dashboard indicators, e.g., + cases, hospital admissions
 - Prepare for return to increased mitigation at earliest signs of increased transmission
 - All communities should be ready to move between significant and moderate mitigation over time as community conditions improve or deteriorate

Thank You!



Construction

Construction—Healthy Business Ops

- Designate a safety officer or someone else to be responsible for responding to COVID-19 concerns at every jobsite. Workers should know who this person is and how to contact them.
- Implement flexible sick leave and supportive policies and practices. Consider drafting non-punitive emergency sick leave policies if sick leave is not offered to some or all employees.
- Provide information on who to contact if employees become sick. If an employee is confirmed to have COVID-19 infection, employers should inform fellow employees of their possible exposure to COVID-19 in the workplace but maintain confidentiality under the Americans with Disabilities Act.
- Reach out to local public health officials to establish ongoing communications to facilitate access to relevant information before and during a local outbreak.

Construction—Pre-Shift

- Job forepersons:
 - Ask workers to self-identify symptoms of fever, coughing, or shortness of breath each day. Those exhibiting symptoms should be sent home.
 - Ask workers if they have had known close contact with a COVID-19 positive or person sick with COVID-19
 - Ask workers if they have been asked to self-isolate by their doctor.
 - Screen all visitors to the jobsite.
- Temperature Checks
 - Temperature screening when working in close contact (confined space or inside an unventilated, closed building envelope) when physical distancing is not possible. There should be 'no touch' or 'no contact' thermometers.

Construction—How to Protect Myself?

- Notify your supervisor and stay home if you are having symptoms (fever, cough, or shortness of breath).
- Follow CDC-recommended steps if you are sick. You should not return to work until the criteria to discontinue home isolation are met, in consultation with healthcare providers and state and local health departments.
- Follow CDC recommended precautions and notify your supervisor if you are well but have a sick family member at home with COVID-19.
- Limit close contact with others by maintaining social distancing, when possible.
- CDC recommends wearing cloth face coverings in public settings where other social distancing measures are difficult to maintain, especially in areas of significant community-based transmission

Construction—Physically Separate and Distance

- Maintain a minimum 6-ft separation when possible. Modify work schedules to stagger work, provide alternating workdays or extra shifts to reduce the total number of workers on a job site at any given time.
- Restrict access to reduce the number of workers in enclosed and confined areas at one time. Confined and enclosed areas (e.g., trailers) should be identified and access restricted to essential personnel. Enclosed spaces (e.g., toilets, elevators/hoists, break areas) are potential transmission areas. Workers and time spent in these areas should be minimized.
- Cancel or postpone in-person meetings/trainings whenever possible. If you must meet, maintain social distancing.

Construction—Hygiene and PPE

- Avoid touching face—eyes, nose and mouth
- Cover coughs and sneezes with arm or tissue (then throw tissue away and wash hands)
- Gloves should always be worn while on-site. The type of glove worn should be appropriate to the task. Employees should avoid sharing PPE. Eye protection should always be worn while on-site.
- If physical distancing cannot be used, workers in close contact with each other or working confined areas should wear appropriate face coverings.

Construction—Hand Washing & Decontamination

- Provide training to employees on proper hand washing practices and other routine measures to prevent the spread of many diseases, including COVID-19.
-
- Provide employees with access to soap, clean running water, and materials for drying their hands, and provide alcohol-based hand sanitizers at stations for use by workers and customers.
 - Place hand sanitizers in multiple locations to encourage hand hygiene.
- Explore alternative ways to promote hand washing, if there is difficulty sourcing hand sanitizer and running water is not available on site at portable hand washing stations.
- Each job site should develop cleaning and decontamination procedures covering tools, trailers, gates, equipment, vehicles, door handles, handrails, porta-potty stations at least once a day or more often if feasible

Construction—More Information

- Stay informed. Talk to your employer, supervisor, or union representative who are responsible for responding to COVID-19 concerns.
- CDC Interim Guidance for Businesses and Employers to Plan and Respond to Coronavirus Disease 2019 website: www.cdc.gov/coronavirus/2019-ncov/community/guidance-business-response.html
- CDC Prepare your Small Business and Workers for the Effects of COVID-19 website: www.cdc.gov/coronavirus/2019-ncov/community/guidance-small-business.html
- NIOSH Workplace Safety and Health Topic website: www.cdc.gov/niosh/emres/2019_ncov.html
- CDC COVID-19 website: www.cdc.gov/coronavirus/2019-ncov/
- OSHA COVID-19 website: www.osha.gov/SLTC/covid-19/controlprevention.html
- CDCINFO: 1-800-CDC-INFO (1-800-232-4636) | TTY: 1-888-232-6348 | website: www.cdc.gov/info

COVID-19 and the Construction Industry

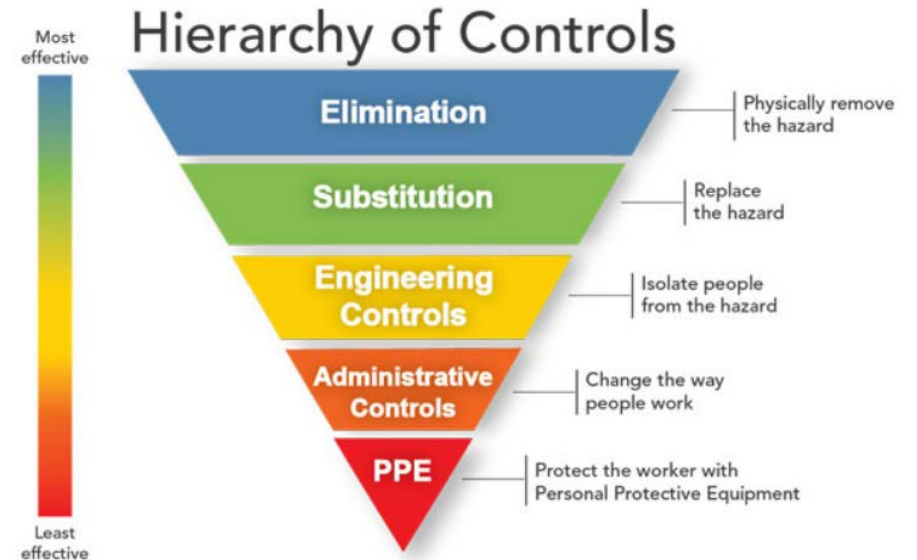
**Recommendations on how to put in place
an exposure control plan**

Chris Cain, Executive Director

Webinar 22 April 2020

Why Should Employers Have a Plan?

- The hazard exists on all jobsites.
- Recognized hazards must be controlled.
- The hierarchy of controls should be followed.
- Designate a site-specific COVID-19 officer at every job site.
- Training on hazards and controls.



Hierarchy of Controls: Elimination

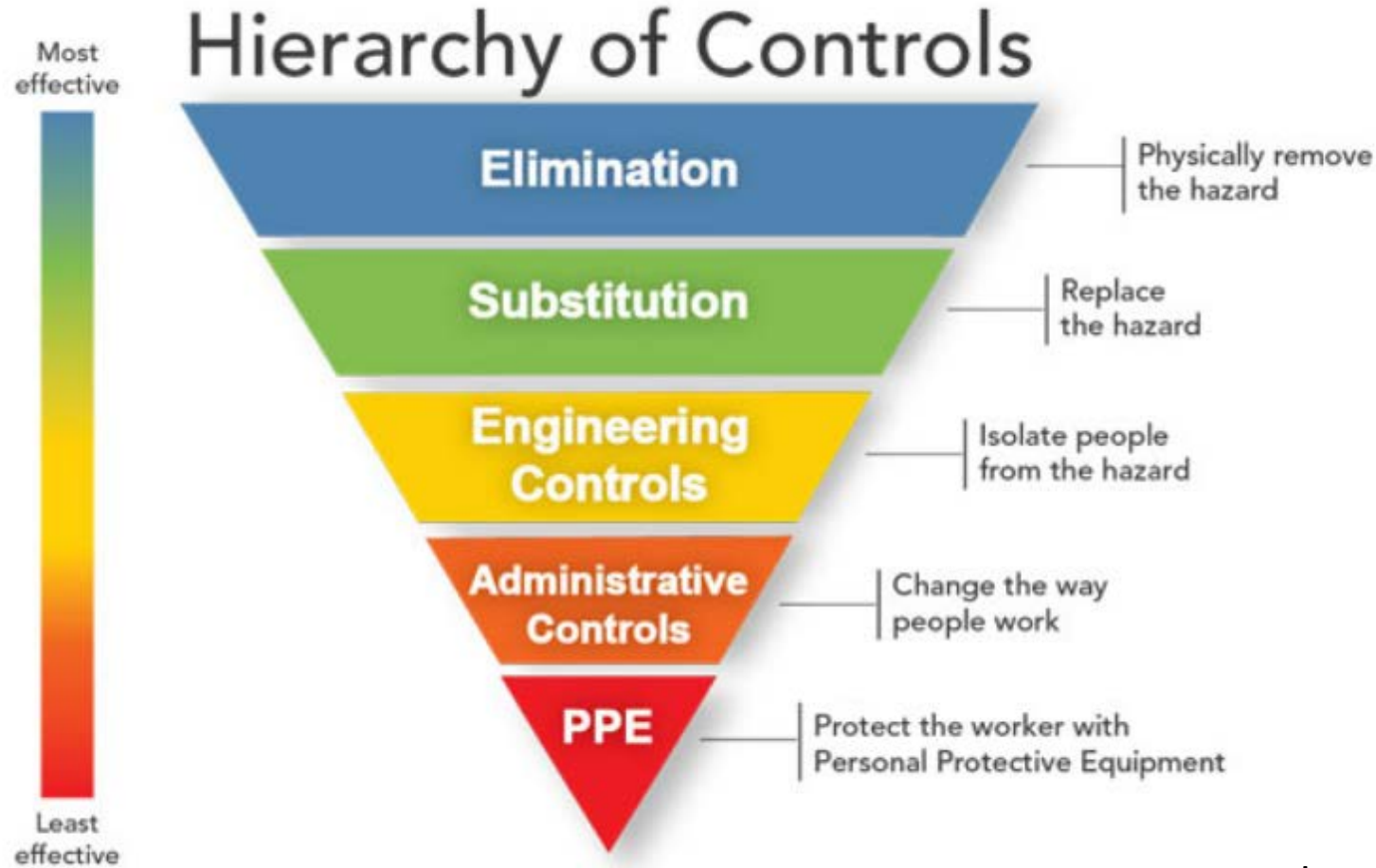


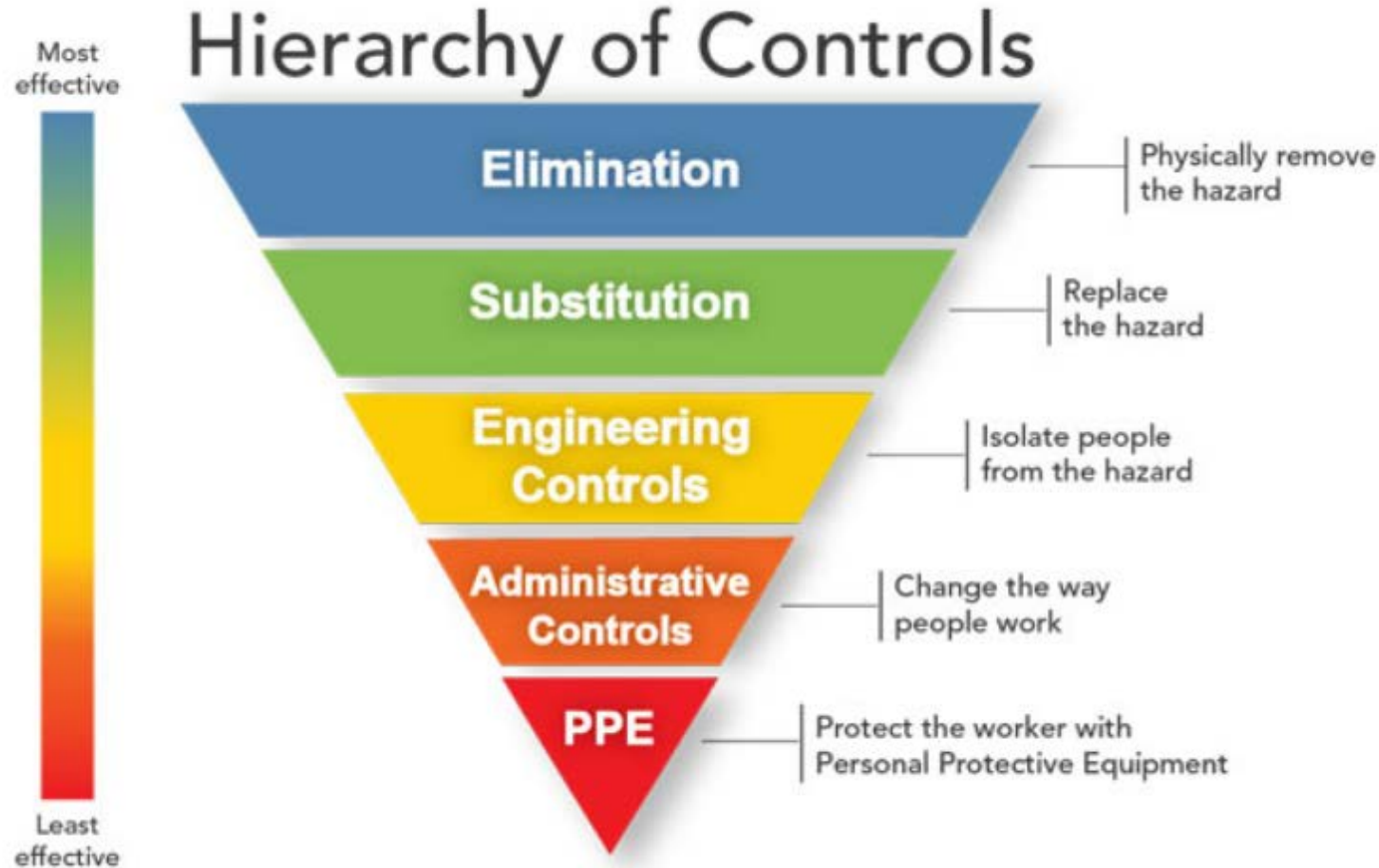
Image courtesy of NIOSH

Elimination: Screening Workers

- Ask workers to self-identify symptoms of fever, coughing, or shortness of breath.
- No-touch or no-contact thermometers should be used.
- Infected workers should be removed from the jobs.
- Work areas should be disinfected.
- Contact tracing should be done.



Hierarchy of Controls: Administrative Controls



Administrative Controls: Distancing

- Create at least 6 feet of space between workers by staging/staggering crews.
- Modify work schedules to stagger work, provide alternating workdays or extra shifts to reduce the total number of employees on a job site at any given time.
- Identify jobsite choke points and eliminate them
 - Ingress/egress
 - Hoists/elevators
 - Break areas
 - Transportation

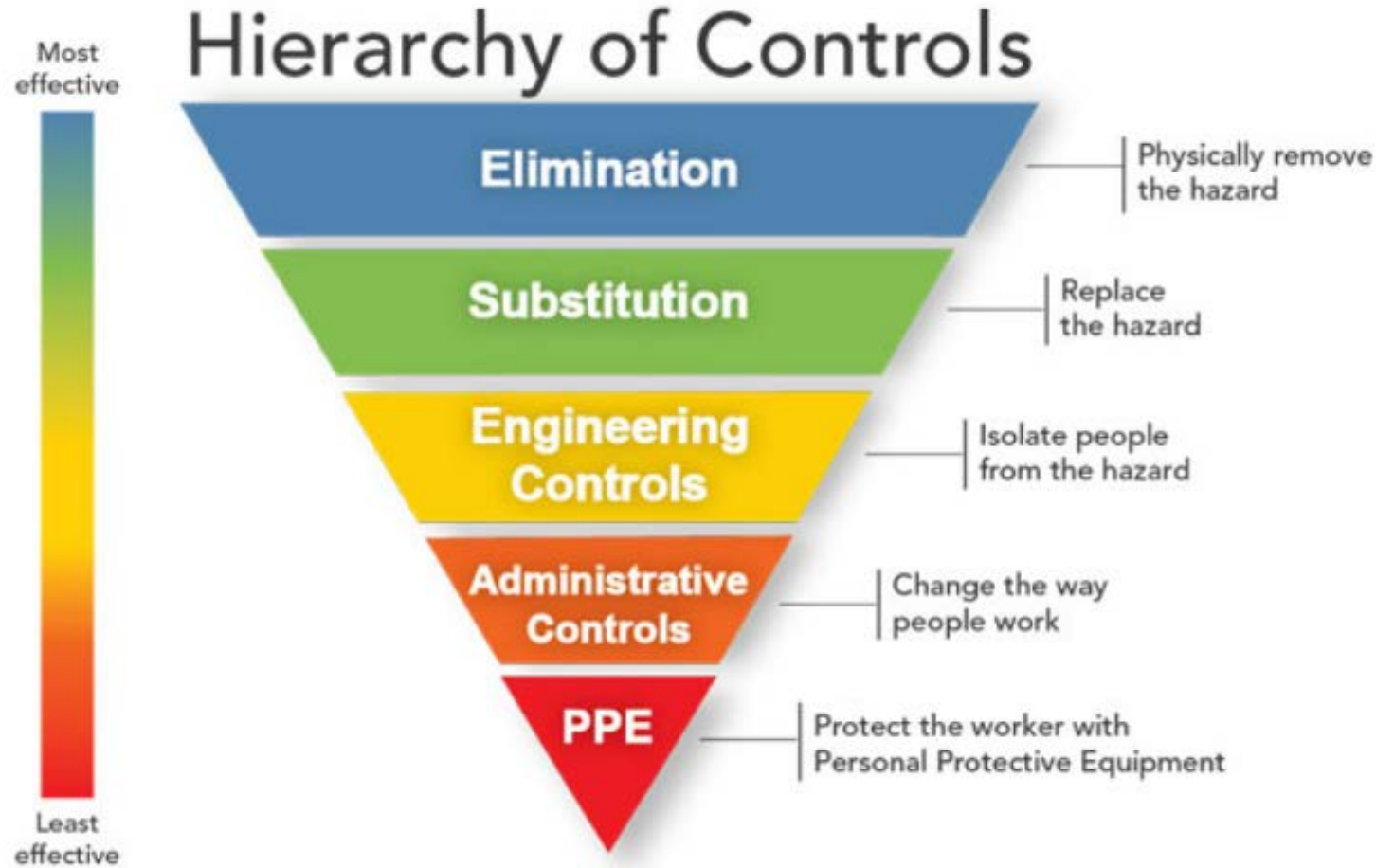
Administrative Controls: Cleaning

- Clean and disinfect all high-touch surfaces
 - Doorknobs
 - Tools
 - Hand rails
 - Portable toilets
- Ensure disinfectants are available and replenished throughout jobsite

Administrative Controls: Handwashing

- Provide running water and soap for frequent handwashing
- Provide alcohol-based hand sanitizers with greater than 60% ethanol or 70% isopropanol as a backup only if providing running water is impossible.
- Encourage workers to leave their workstations to wash their hands before and after going to the bathroom, before eating, and after coughing, sneezing, or blowing their nose.

Hierarchy of Controls: PPE



PPE

- Where close work is unavoidable, provide NIOSH-approved respirators
- A complete respiratory protection program must be used
- Cloth face masks are not respirators



PPE

- Acceptable respirators are filtering facepiece and elastomeric negative or positive pressure half or full facepiece respirators equipped with N95, N99, N100, R95, P95, P99, or P100 filters



Full face powered air purifying respirator



Full face negative pressure air purifying respirator with P100 filters



Half face negative pressure air purifying respirator with P100 filters



N95 filtering facepiece respirator