SAFELY RETURNING TO THE OFFICE DURING COVID-19

Presented by The New York Committee for Occupational Safety and Health (NYCOSH)
1. Review COVID Basics as they pertain to control methods
2. Virus variants
3. Vaccines
4. --break – 5 min --
5. Controlling the spread / ventilation
6. Organizing response (Chris)
- (Control = controlling or preventing exposure)

- Preventing additional waves is not an individual responsibility, but a community responsibility.

- Controls are required on multiple levels.
COVID BASICS
HOW IS COVID-19 TRANSMITTED?

- **Person-to-person**
  - Between people who are in *close contact* (6 feet) with one another
    - *Respiratory droplets* produced when an infected person coughs or sneezes (can stay in air up to ~3 hrs)
      - Droplets can land in mouths or noses of people who are nearby and be possibly inhaled into the lungs
  - *Airborne aerosol* transmission ([factsheet](#))

- **Contaminated surfaces**
  - Touching a surface or object that has the virus on it and then touching your own mouth, nose, or eyes
SARS-CoV-2 is spread through droplets and aerosols

- Droplets are particles of moisture larger than 300µm and fall to the ground within seconds
  - **When humidity is low, droplets will become aerosols due to evaporation**
- Aerosols are particles of moisture smaller than 100µm and can remain suspended in the air for hours
  - One study found that aerosols can remain in the air and infectious after 16 hours

While masks and social distancing are effective outdoors, indoors, they are a lot less effective

- Graphics based on Spanish public health data and the COVID-19 Airborne Transmission Tool Estimator show the difference in SARS-CoV-2 transmission in ventilated and unventilated indoor spaces.

Will social distancing help decrease the likelihood of airborne transmission?

- Yes.... and no.
  - Outdoors – yes.
  - Indoors – no.

*for droplet transmission (getting sneezed on, for example), social distancing will still help mitigate transmission.

In many indoor spaces, you may see the combination of plexiglass barriers to prevent droplet exposure, AND indoor ventilation to exhaust out airborne particles.

WHAT ABOUT THOSE NEW VIRUS STRAINS?

- Virus mutation is very normal – as the virus population size expands, mutations spontaneously occur.
  - Since Jan. 2020, we know SARS-CoV-2 has already mutated many times. A virus typically mutates every time it moves from host to host, and even within a single host.

- Many virus mutations are inconsequential – the virus still looks and functions just as its parent did before.
  - Over time, sets of mutations can “layer” on top of each other, and the virus can begin to function differently.
    - Some of these may give the virus an advantage – for example, increased transmissibility.

- The more people in a population are vaccinated, the less chance the vaccine has to mutate (because mutations occur when a virus moves from person to person).
  - Therefore, even if vaccines are less effective against specific variants, having a large percentage of the population vaccinate will still help drive down transmission, even among the new variants.

The Delta variant is more transmissible than the viruses that cause MERS, SARS, Ebola, the common cold, the seasonal flu and smallpox, and it is as contagious as chickenpox, according to internal CDC document.\(^1\)

**Why?**

- Although many mutations do not impact virus functionality, Delta has some that do cause significant changes:
  - Increased viral load – the amount of viral load in a person infected with Delta is a thousandfold more than what is seen in people infected with the alpha version of the virus.\(^2\)
  - Denser spike protein, which helps the virus more easily invade cells and evade the body’s defenses.\(^3\)
  - Shorter incubation time – 4 days for Delta vs 6 days for alpha – so people are contagious earlier.\(^4\)

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3. [https://www.salon.com/2021/08/05/this-is-very-much-a-mystery-in-progress-scientists-explain-everything-we-know-about-delta-so-far/](https://www.salon.com/2021/08/05/this-is-very-much-a-mystery-in-progress-scientists-explain-everything-we-know-about-delta-so-far/)
4. [https://www.nature.com/articles/d41586-021-01986-w](https://www.nature.com/articles/d41586-021-01986-w)
### HOW IS DELTA IMPACTING THE PANDEMIC?

- **Delta is spreading FAST** – 50% faster than alpha, which was 50% more contagious than the original strain.
  - “In a completely unmitigated environment—where no one is vaccinated or wearing masks—it’s estimated that the average person infected with the original coronavirus strain will infect 2.5 other people,” Dr. Wilson says. “In the same environment, Delta would spread from one person to maybe 3.5 or 4 other people.”

- **Vaccinated people are becoming infected**
  - Due to the variant’s properties (increased ability to enter mucous lining; increased viral load), vaccinated people are more likely to experience breakthrough infections. (Still, this happens much easier in unvaccinated people, and those who are vaccinated are much better able to combat the variant.)

- **In the short term, we are likely to see COVID resurgences across the country, especially places with low vaccination rates.**
  - Hyperlocal outbreaks – what happens when a low-vaccination area is surrounded by high vaccination areas, so the virus is “contained” within the borders.

1. [https://www.yalemedicine.org/news/5-things-to-know-delta-variant-covid](https://www.yalemedicine.org/news/5-things-to-know-delta-variant-covid)
2. [https://www.salon.com/2021/08/05/this-is-very-much-a-mystery-in-progress-scientists-explain-everything-we-know-about-delta-so-far/](https://www.salon.com/2021/08/05/this-is-very-much-a-mystery-in-progress-scientists-explain-everything-we-know-about-delta-so-far/)
So far, Delta does not appear to cause more severe illness than any other COVID variants – the severity of illness and symptoms is similar to the original strain.

- However, it can still be more lethal in impact, because it can infect so many more people and more quickly, so we may yet see higher death rates.¹

The variant infects unvaccinated people more easily and makes them sicker by being able to replicate with fewer obstructions. But it also seems to be more effective in attacking younger people, pregnant people, and people with chronic diseases who are unvaccinated.²


² [https://www.salon.com/2021/08/05/this-is-very-much-a-mystery-in-progress-scientists-explain-everything-we-know-about-delta-so-far/](https://www.salon.com/2021/08/05/this-is-very-much-a-mystery-in-progress-scientists-explain-everything-we-know-about-delta-so-far/)
Almost certainly yes.

- The nature of a virus is to mutate. New variants are not just likely, they’re inevitable.
- There is a Lambda variant spreading, which originated in Peru and is now in 44 states. We do not know much about it yet, but it appears to be similar to Delta in its ability to be more transmissible.
  - We have not yet seen a huge uptick in Lambda cases, possibly because Delta is preventing Lambda from gaining a foothold.¹

So then what can we do to protect ourselves?

Different types of vaccines

What is available?

What does it mean for us?
There are three main approaches to making a vaccine:

1. Using a whole virus or bacterium
2. Parts that trigger the immune system
3. Just the genetic material

**Oxford-AstraZeneca**

**The whole-microbe approach**

- Inactivated vaccine
- Live-attenuated vaccine
- Viral vector vaccine

**Johnson & Johnson**

**The subunit approach**

Only uses the very specific parts (the subunits) of a virus or bacterium that the immune system needs to recognize.

**Pfizer, Moderna**

**The genetic approach (nucleic acid vaccine)**

Uses the genetic material for specific proteins - the DNA or RNA.

https://www.who.int/news-room/feature-stories/detail/the-race-for-a-covid-19-vaccine-explained


NYCOSH [08.16.2021]
In New York, vaccines are being distributed in phases. At this point, the vaccine is available to people in NYS who are:
- Age 12 and older (for people aged 12 to 17, Pfizer is the only available vaccine)
- Resides in the United States

NYC eligibility & vaccination sites: [https://www1.nyc.gov/site/doh/covid/covid-19-vaccine-eligibility.page](https://www1.nyc.gov/site/doh/covid/covid-19-vaccine-eligibility.page)
- Incentives: [https://www1.nyc.gov/site/coronavirus/vaccines/vaccine-incentives.page](https://www1.nyc.gov/site/coronavirus/vaccines/vaccine-incentives.page)
- NYS appointment scheduling: [https://am-i-eligible.covid19vacine.health.ny.gov/](https://am-i-eligible.covid19vacine.health.ny.gov/)

There is a hotline - 1-833-NYS-4-VAX (1-833-697-4829) - which you can call to schedule an appointment. It is currently operating from 8:00am - 9:00pm, 7 days a week

Walk-in appointments are also accepted at NYS mass vaccination sites.
Should I still be wearing a mask after getting the vaccine?

Yes.

- The WHO has always recommended wearing masks even after full vaccination because:
  - Breakthrough infections will happen with any vaccine
  - The majority of the world has not been vaccinated yet
  - If breakthrough infections spread to an unvaccinated community, there could be new outbreaks
- CDC also issued new guidance on 07/21/2021 in light of spread of Delta.

▪ **New CDC guidance as of 07/27/2021**

 ▪ CDC now recommends that fully vaccinated people wear masks in public indoor settings.

 ▪ CDC recommends masking in areas of high transmission, but adds that fully vaccinated people may choose to mask regardless of transmission level, particularly if immunocompromised, have someone in household who is immunocompromised, are at increased risk for severe disease, or have someone in their household who is at risk or is not fully vaccinated.

 ▪ CDC recommends that fully vaccinated people who have come into close contact with someone suspected or confirmed to have COVID-19 to be tested 3-5 days after exposure, and to wear a mask in public indoor settings for 14 days or until they receive a negative test result.

 ▪ CDC recommends universal indoor masking for all teachers, staff, students, and visitors to schools, regardless of vaccination status.

▪ NY State and City workers will be required to either be vaccinated or wear masks & submit to weekly testing for the virus.

▪ In private sector, push to make vaccination mandatory for variety of indoor activities – indoor dining, gyms, performance & event venues.
  ▪ Mayor de Blasio’s “Key to NYC” plan to mandate vaccines for most indoor activities.
    ▪ 50 NYC businesses¹ have signed on that they will require proof of vaccination for entry. The three acceptable forms of proof are: CDC-issued vaccine card, NYS Excelsior Pass, and the NYC COVID Safe app.

¹ [https://abc7ny.com/key-to-nyc-vaccine-mandate-proof-of-vaccination-delta-variant/10945185/](https://abc7ny.com/key-to-nyc-vaccine-mandate-proof-of-vaccination-delta-variant/10945185/)
CONTROLLING THE SPREAD
SARS-COV-2 IN INDOOR ENVIRONMENTS

In a classroom with 24 students

09:00

The riskiest scenario is a classroom with no ventilation and the teacher – patient 0 – as the infected person.

If two hours are spent in the classroom with an infected teacher, without taking any measures to counter the number of aerosols, there is the risk that up to 12 students could become infected.

Only face masks used

11:00

If everyone is wearing a face mask, the number that could become infected drops to five. In real outbreaks, it has been noted that any of the students could become infected irrespective of their proximity to the teacher as the aerosols are distributed randomly around the unventilated room.

SARS-CoV-2 IN INDOOR ENVIRONMENTS

However, if the windows or door are closed, then it's back to the first scenario.

DO WINDOWS PROVIDE RELIABLE VENTILATION?

- No.

- According to the American Society of Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE):
  - “Many buildings are fully or partially naturally ventilated. They may use operable windows and rely on... openings in the building envelope... Obviously, the airflow in these buildings is variable and unpredictable, as are the resulting air distribution patterns, so the ability to actively manage risk in such buildings is much reduced.” (ASHRAE Position Document on Infectious Aerosols, 04/14/2020)

- When using natural ventilation, air flow depends on the location of doors, windows, other exhaust openings, the configuration of the room, and whether or not it’s windy outside.
WHAT IS RELIABLE VENTILATION?

Comfort systems ventilation

• Used for comfort in commercial and residential buildings
  • Temperature, humidity, indoor air quality

• Professional standards set by the American Society of Heating, Refrigerating, and Air-conditioning Engineers (ASHRAE)
  • ASHRAE 62.1 and 62.2 for Indoor Air Quality

• Most public buildings are designed to this standard, but it is not sufficient for infection control.

Industrial systems ventilation

• Used for control of hazardous airborne substances
  • Toxic fumes, dusts, vapors, etc.

• Professional standards set by the American Conference of Governmental Industrial Hygienists (ACGIH)
  • ACGIH Manual of Recommended Practice

• Laboratories and mechanical shops may already be designed to ACGIH standards

• Healthcare settings – ORs, clean rooms, pharmaceutical compounding rooms, etc. meet other standards that are also designed to control hazardous airborne substances
Consider: If all the HVAC units are at the ceiling level, what does this mean for air circulation in the room?
▪ Diffuser (ceiling) supplies a mix of fresh and recirculated air

▪ Return (right wall) takes air back to the fan

▪ If these are on the ceiling next to each other, what does that mean for the air exchange elsewhere in the room?

http://www.iocis.org/documents/chpt45e.htm
BASICS OF INDOOR MECHANICAL VENTILATION, CONT.

Source: *Industrial Ventilation*, Canadian Centre for Occupational Health & Safety (CCOHS)
http://www.ccohs.ca/oshanswers/prevention/ventilation/
AIR CHANGES AND FILTRATION

Graphic by J. David Krause, PhD, MSPH, CIH


NYCOSH [08.16.2021]
Proper duct and filter maintenance are necessary to a fully functional ventilation system.

Similarly important to understand where the outside air comes from.

http://www.ilocis.org/documents/chpt45e.htm
Window air conditioning units do not provide fresh air; they ONLY provide air cooling.

They filter for dust and similar, not for viral contaminants.
There is positive pressure in front of the fan from the air drawn in and negative pressure outside where the fan is drawing air in.

If there are openings near a fan (such as at the window) where the air can go back out, it will.

For a functional exhaust fan, the only pathway for the air must be through the fan.
FREE-STANDING AIR FILTRATION UNITS

- Portable air cleaners/air purifiers/air sanitizers are designed to filter air in a single room or area.
  - They can reduce indoor air pollutants, including viruses, BUT are not sufficient to protect against SARS-CoV-2 on their own.
  - Portable air cleaners depend on air flow in the room; if the room air is still, the air cleaner will not be able to provide equal filtration throughout the room.
- Placement of air cleaners impacts efficacy.
  - In places with highest airflow (windows, doorways, etc.; NOT in corners)
  - Near source(s) of pollutants
  - 3-5 feet off the ground, to be in breathing zone
- Must be sized to the room.
  - Room sizing needs to include ceiling height; most units are sized for an 8ft ceiling
  - Must calculate filter efficiency at 0.3 microns
- Be mindful that filter only provides filtration, and does not generate ionization or ozone
  - E.g., no UV light units
PPE RECOMMENDATIONS

**Respiratory protection**
- Masks (cloth, surgical/hospital, bandanas, towels, etc.)
- Respirators (N95s, elastomeric, PAPR, etc.)

**Face shields**
- Are NOT a form of respiratory protection. They provide protection from splash only.

**Gloves**
- Be mindful not to touch your face while wearing gloves

**For all PPE, be mindful of:**
- Proper donning/doffing.
- Face coverings should be removed last – be careful to remove by straps only, never by the facepiece
- Gloves turned inside out, take care not to touch your skin; wash hands afterwards
- Proper disposal and/or sterilization

NYCOSH [08.16.2021]
<table>
<thead>
<tr>
<th>MASK</th>
<th>USE</th>
<th>DESCRIPTION</th>
<th>USUAL COST</th>
<th>WHO NEEDS FOR COVID-19</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Homemade mask (reusable if washed)</td>
<td>Recommended for everyone in the US by the CDC, for use in public places, like grocery stores.</td>
<td>Homemade masks can be sewn, cut, or fashioned from a bandana and coffee filter, per the CDC. The masks should be washed routinely.</td>
<td>Low</td>
<td>People in crowded places where it’s difficult to maintain 6 feet of distance between yourself and others.</td>
<td>P100 respirator/gas mask (reusable)</td>
<td>Painting/woodworking, exposure to lead, asbestos, solvents and chemicals.</td>
<td>Protects manual laborers from exposure to lead, asbestos, solvents, and other dangerous chemicals on the job.</td>
<td>$25–$50</td>
<td>Effective for all, but unnecessary</td>
</tr>
<tr>
<td>Surgical mask (disposable)</td>
<td>Surgeons (mainly, so they don’t get germs on their patients)</td>
<td>Can help protect wearers from getting others sick through their spit. Doesn’t protect healthy people from acquiring an illness, and a loose fit leaves room for error.</td>
<td>$0.25</td>
<td>Sick people (to avoid infecting others), and caretakers.</td>
<td>Full face respirator/Powered air-purifying respirator (reusable)</td>
<td>Painting or scenarios where a person needs protection from gases and vapors. Protects the eyes.</td>
<td>Protects people from gases and vapors. Can be a better fit for people with breathing problems or robust facial hair.</td>
<td>Prices vary. Start around $115 for basic models.</td>
<td>Could be for people who have a hard time breathing in a regular mask, as some are powered with an air supply.</td>
</tr>
<tr>
<td>N95 respirator (disposable)</td>
<td>Working with dust, mold, or medical/ environmental emergencies. Only protects against particles, not gases or vapors.</td>
<td>Can help protect healthcare workers from germs by blocking out at least 95% of small airborne particles — if worn correctly.</td>
<td>$2–$4</td>
<td>Healthcare workers</td>
<td>Self-contained breathing apparatus (reusable)</td>
<td>Firefighters</td>
<td>Protects people like firefighters who need clean air in dangerously polluted situations.</td>
<td>$2,500–$4,000</td>
<td>No one</td>
</tr>
</tbody>
</table>

Sources: JAMA; FDA; OSHA, CDC

**ALL THE MASKS, EXPLAINED**
WHAT CAN YOU DO TO PROTECT YOURSELF AS AN INDIVIDUAL?

- Wear a mask that covers your nose **AND** mouth when in public spaces.
- Maintain **at least** 6 feet of distance from people.
- Avoid touching your eyes, nose, and mouth.
- **WASH YOUR HANDS: OFTEN, AND WITH SOAP AND WATER**
  - Handwashing is the most effective method, but if you can’t wash your hands, use sanitizer with at least 60% alcohol.
- Clean and disinfect frequently touched objects and surfaces (using a regular household cleaning spray or wipe).
- Stay home when you are sick.

Source: https://www.instagram.com/p/CADmDiGA8_k/
HOW CAN THIS BE APPLIED TO SARS-COV-2?

▪ Preventing SARS-CoV-2 transmission isn’t a one-and-done deal.

▪ A combination of strategies must be enacted for effective control.
  ▪ Ventilation
    ▪ Filters
  ▪ Portable air cleaners
  ▪ Administrative changes
  ▪ PPE
WORKPLACE GUIDANCES

CDC Guidance

• CDC Guidance to Employers, Business Owners, & Community Leaders
• CDC Guidance for Fully Vaccinated People

New York State

• Forward NY
• Most of the COVID restrictions in NYS have been lifted as of 06/15/2021, as 70% of adult New Yorkers have received their first dose of the vaccine.
Any Questions?