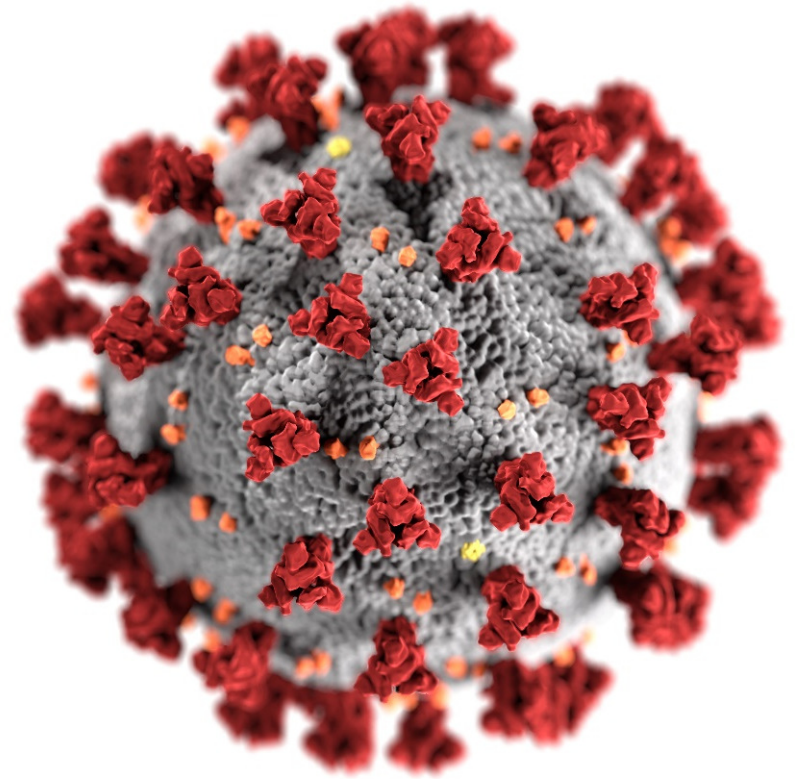# Listening Session: Understanding Community Mask Usage

John T. Brooks, MD
Senior Science Advisor, CDC Emergency COVID-19 Response
Chief Medical Officer, CDC Division of HIV Prevention

Michael Bell, MD
Deputy Director of CDC's Division of Healthcare Quality Promotion

cdc.gov/coronavirus

Dr. John T. Brooks is an internist and clinical infectious diseases expert who normally serves as the Chief Medical Officer to the CDC's Division of HIV/AIDS Prevention where he coordinates the division's activities related to the national "Ending the HIV Epidemic" initiative. He presently serves as the Senior Science Advisor the CDC's COVID-19 Response, Dr. Brooks has led teams during CDC emergency responses to anthrax, SARS, Ebola, and Zika. He was the CDC Incident Commander for the agency's response to the 2015 outbreak of HIV and hepatitis C in Scott County, Indiana. Dr. Brooks came to CDC as an EIS officer in 1998 after completing medical school, residency in internal medicine, and a fellowship in infectious diseases through Harvard Medical School.

Dr. Michael Bell is the Deputy Director of CDC's Division of Healthcare Quality Promotion. Prior to that he served as the Associate Director for Infection Control and was the Executive Secretary for the US Healthcare Infection Control Practices Advisory Committee. His career has focused on investigating and preventing transmission of healthcare-associated illness, development of evidence-based infection control guidelines, and optimizing systems of care. Prior to his current position at CDC, he was the Chief of the Epidemiology Unit at the Viral Special Pathogens Branch, addressing control of high-risk pathogens.

He received his medical degree from the University of Washington and trained in Infectious Diseases at the University of California San Francisco.

How it spreads

- COVID-19 is spread in three main ways
    - By breathing when close to an infected person who is exhaling small droplets and aerosols that contain the virus

    - Having these small droplets and aerosols that contain virus land on the eyes, nose, or mouth, especially through splashes and sprays like a cough or sneeze

    - Touching eyes, nose, or mouth with hands that have the virus on them

Prevention for unvaccinated people

Take these steps to prevent the spread of COVID-19

- Wear a mask over your nose and mouth
- Stay at least 6 feet away from people who don't live with you
- Get a COVID-19 vaccine as soon as you can
- Avoid crowds and poorly ventilated spaces
- Wash your hands often
- Avoid touching your eyes, nose, and mouth

The more steps you can take, the safer you will be

Community masking isn't something new

ILLUSTRATED CURRENT NEWS

To Prevent Influenza!

- Do not take any person's breath.
- Keep the mouth and teeth clean.
- Avoid those that cough and sneeze.
- Don't visit poorly ventilated places.
- Keep warm, get fresh air and sunshine.
- Don't use common drinking cups, towels, etc.
- Cover your mouth when you cough and sneeze.
- Avoid Worry, Fear and Fatigue.
- Stay at home if you have a cold.
- Walk to your work or office.
- In sick rooms wear a gauze mask like in illustration.

Distance

Ensure interior ventilation

Isolate

Avoid crowded settings

Most COVID-19 infections are spread by people without symptoms

Among infected people:

- Over 30% never develop symptoms (asymptomatic)
- Among people who do develop symptomatic illness
  - Transmission risk peaks before symptom onset and a few days after
- Over 50% of infections are transmitted from people without symptoms
- Thus, at least half of new infections come from people likely unaware they are infectious to others because they have no symptoms

He et al. 2002, Nat Med; 26(5):672-675 and 26(9):1491-1494. Moghadas et al. 2020, Proc Natl Acad Sci USA;117(30):17513-17515. Johansson et al. 2021. JAMA Network Open;4(1):e2035057. Oran and Topol 2021; Ann Intern Med. doi:10.7326/M20-6976

How cloth masks work

- CDC is emphasis universal masking to reduce spread of COVID-19.

- Masks slow and disperse air flow from coughs and exhalations by an infected *source*.

- Masks also provide some *wearer protection*, although this effect is more limited.

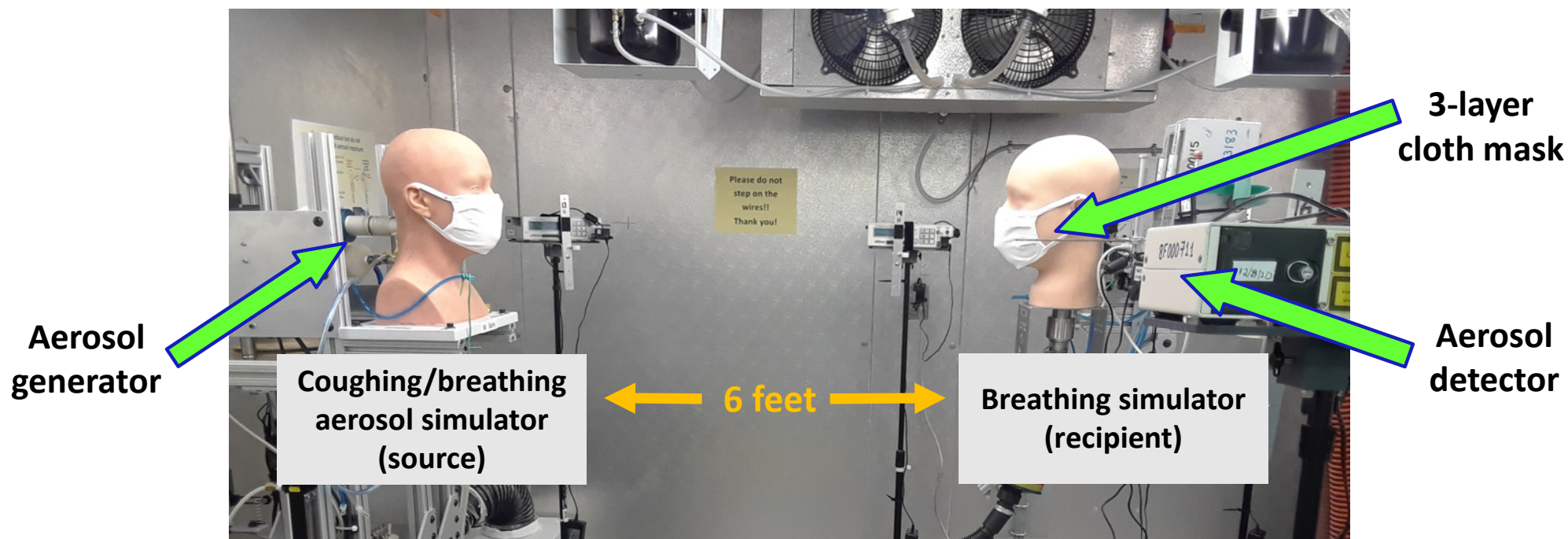 – **Source**: person expelling respiratory aerosols.
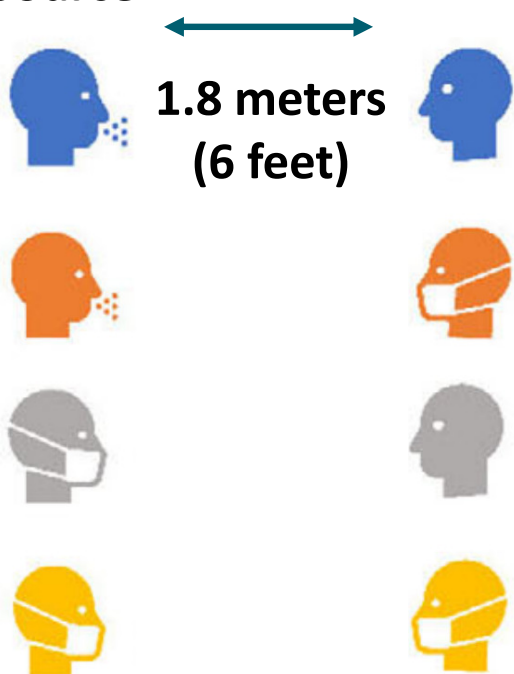
  – **Recipient**: person exposed to exhalations.

"Source control"

"Wearer protection"

How do we know cloth masks can protect us?

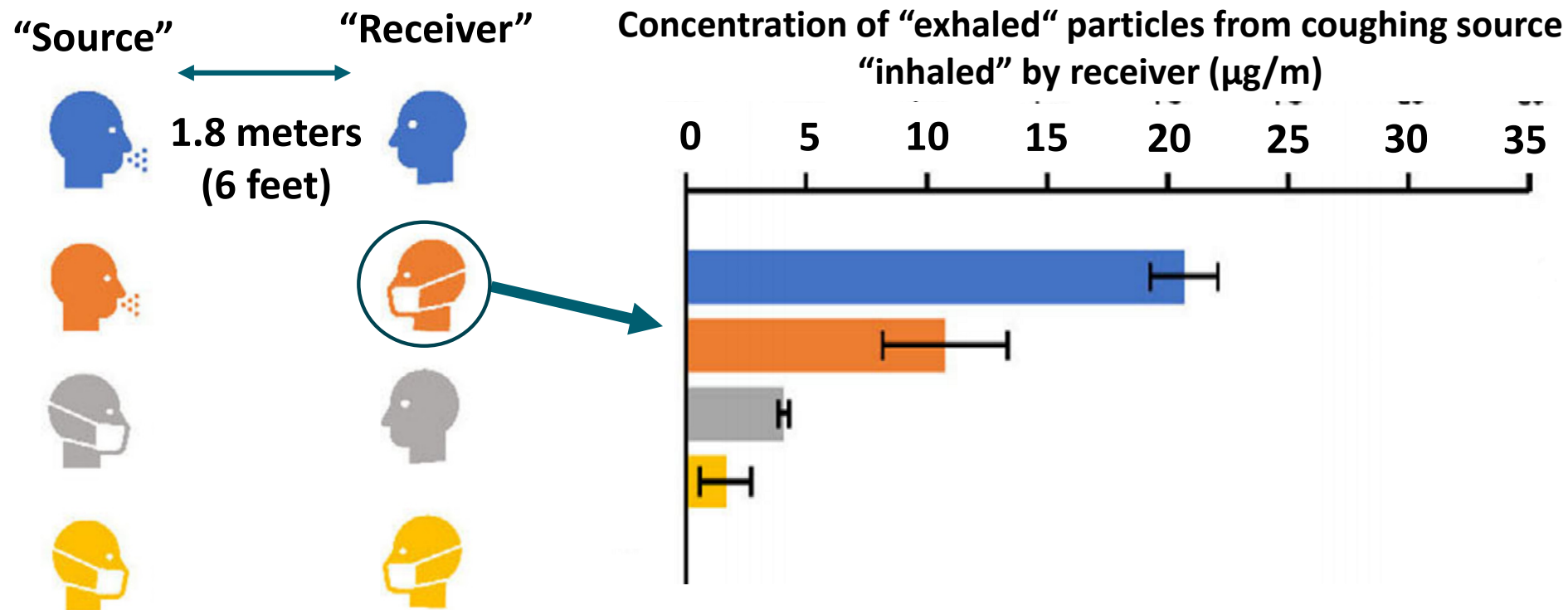# "Masking Together Protects Each of Us Individually"

"Source" "Receiver"

1.8 meters
(6 feet)

Concentration of "exhaled" particles from coughing source "inhaled" by receiver (µg/m)

"Masking Together Protects Each of Us Individually"

"Source"   "Receiver"

1.8 meters (6 feet)

Concentration of "exhaled" particles from coughing source "inhaled" by receiver (μg/m)
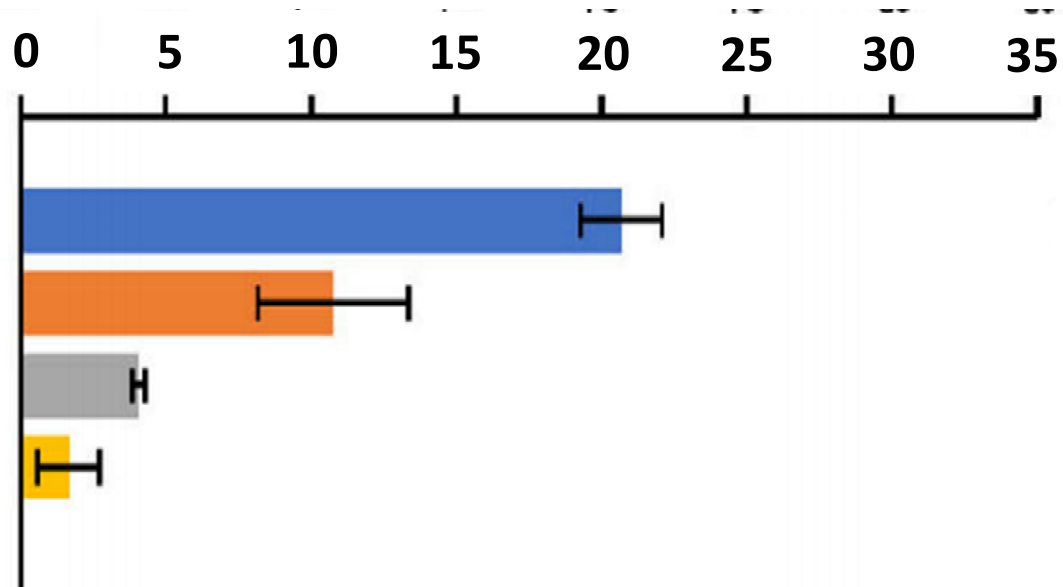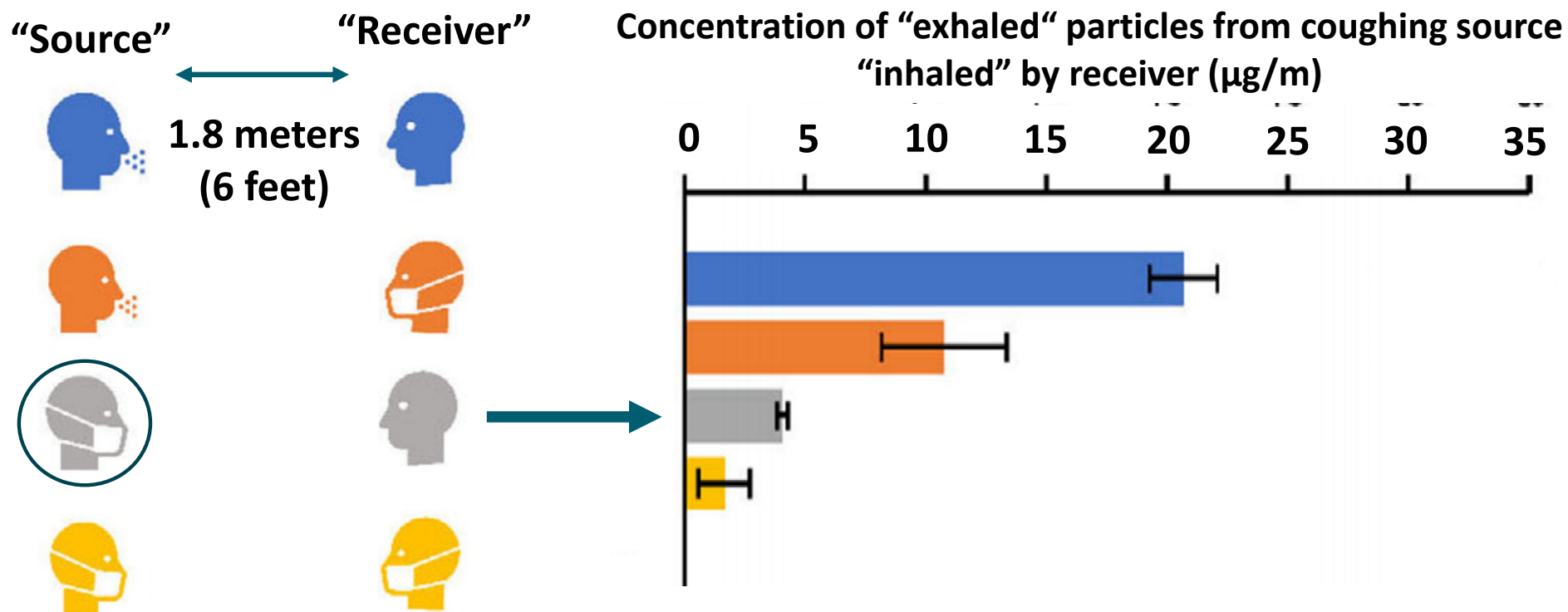
"Masking Together Protects Each of Us Individually"

# "Masking Together Protects Each of Us Individually"
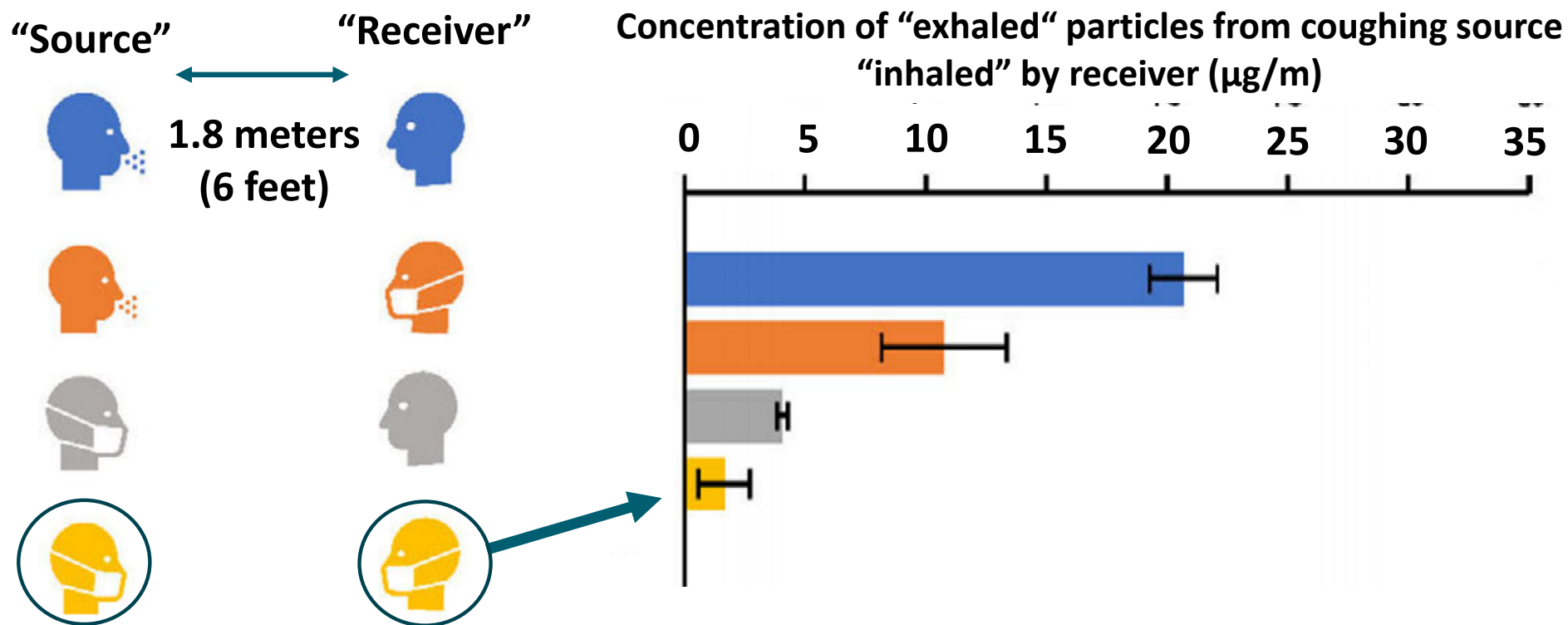
Masks

- Reduce the spread of COVID-19 to others and protect the wearer

- Are most likely to reduce the spread of COVID-19 when widely used by people in public settings

- Should NOT be worn by children under the age of 2 or anyone who has trouble breathing, is unconscious, incapacitated, or otherwise unable to remove the mask without assistance

Masks (cont'd)

- **How to wear and remove**
  - Wash your hands before putting on face covering
  - Put it over your nose and mouth and secure it under your chin
  - Try to fit it snugly against the sides of your face
  - Make sure you can breathe easily
  - When you're home, carefully untie strings behind your head or stretch the ear loops
  - Handle only by the ear loops or ties
  - Be careful not to touch your eyes, nose, and mouth when removing
  - Wash hands immediately after removing
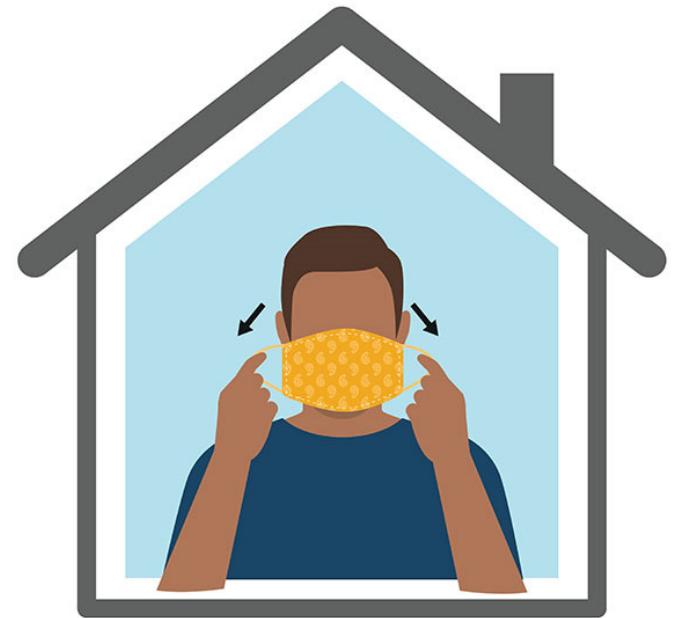
Masks (cont'd)

- **How to wash masks**
  - Washing machine
    - You can include your face covering with your regular laundry
    - Use regular laundry detergent and the warmest appropriate water setting for the material used to make the face covering
  - Wash by hand with tap water and laundry detergent or soap. Rinse with clean water to remove detergent or soap

Masks (cont'd)

- **How to dry**

  – Use the highest heat setting on your dryer and leave in the dryer until completely dry

  – Lay flat and allow to completely dry. If possible, place the mask in direct sunlight

How can we boost the effectiveness of masks?

Rothamer 2021, medRxiv: https://doi.org/10.1101/2020.12.31.20249101

How can we boost the effectiveness of masks?

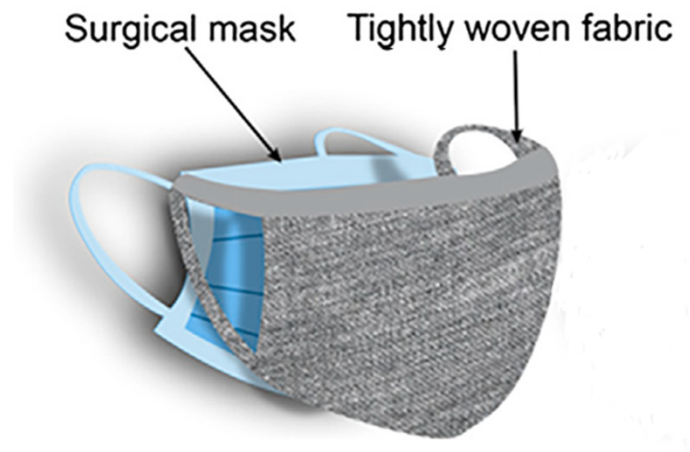- **Improve How Your Mask Protects You**
  - When choosing a mask, look at how well it fits, how well it filters the air, and how many layers it has
  - Make sure your mask fits snugly against your face. Gaps can let air with respiratory droplets leak in and out around the edges of the mask
  - Pick a mask with layers to keep your respiratory droplets in and others' out. A mask with layers will stop more respiratory droplets getting inside your mask or escaping from your mask if you are sick.
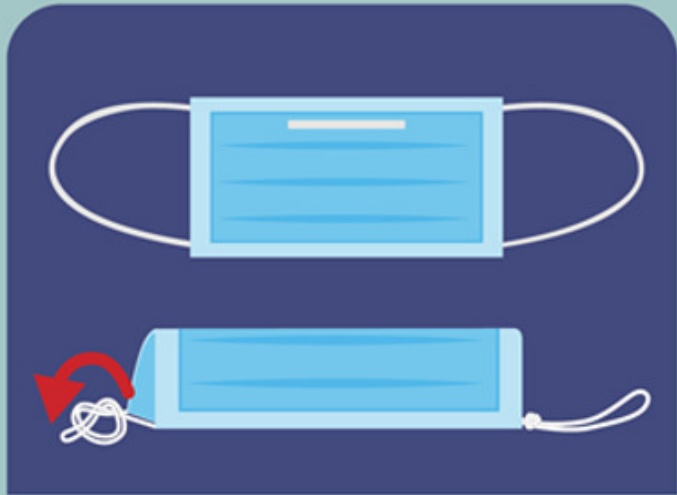
How can we boost the effectiveness of masks?

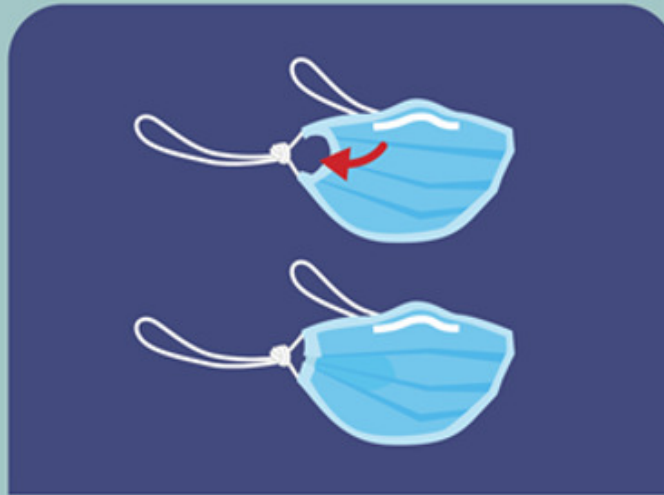- **Improve How Your Mask Protects You**
  - Wear one disposable mask underneath a cloth mask that has multiple layers of fabric. The second mask should push the edges of the inner mask snugly against the face and beard
  - Do not wear two disposable masks

Surgical mask   Tightly woven fabric

Gandhi 2021, Cell Medicine; https://doi.org/10.1016/j.medj.2020.12.008

How can we boost the effectiveness of masks?

Knot the ear loops

Fold and tuck in unneeded material

Check for close fit

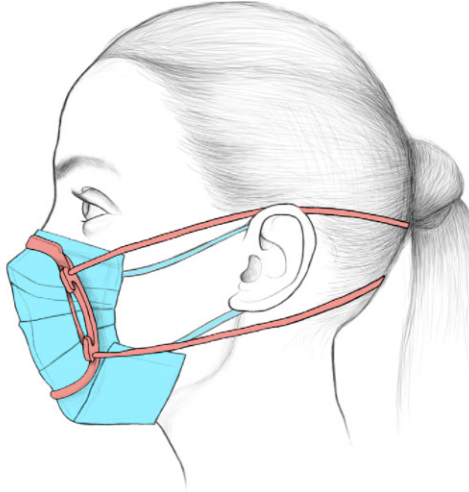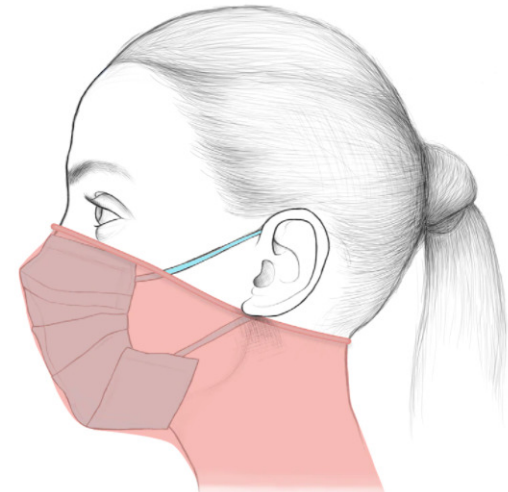# How can we boost the effectiveness of masks?

"Knot-and-Tuck"   "Cloth-over-Surgical"   "Brace or Fitter"   "Nylon Sleeve"

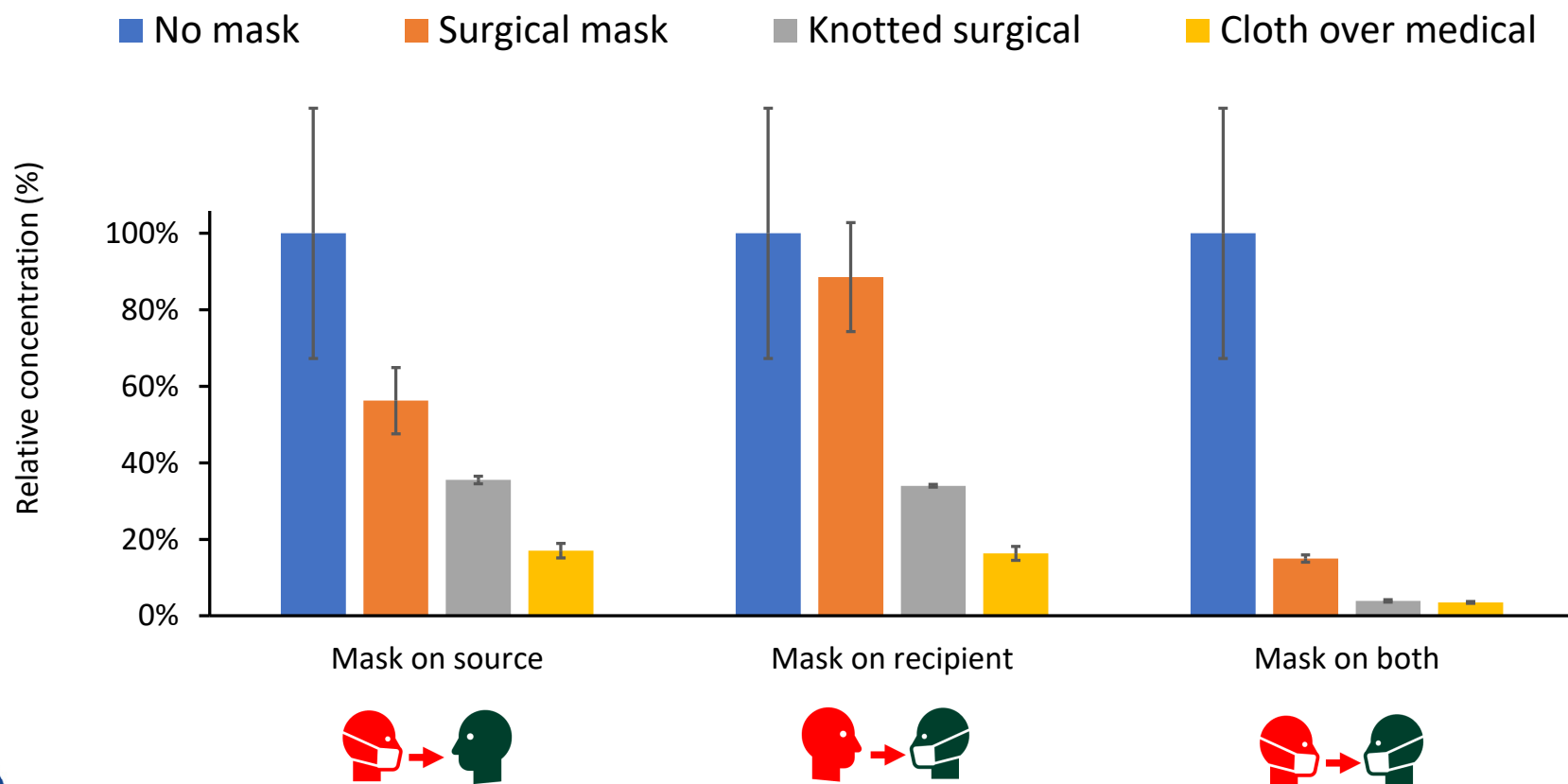# How can we boost the effectiveness of masks?

Use "Barrier Face Coverings" (aka cloth/fabric masks) that meet a new standard and have been tested for filtration and breathability

- MEETS ASTM F3502

- MEETS WORKPLACE PERFORMANCE

- MEETS WORKPLACE PERFORMANCE PLUS
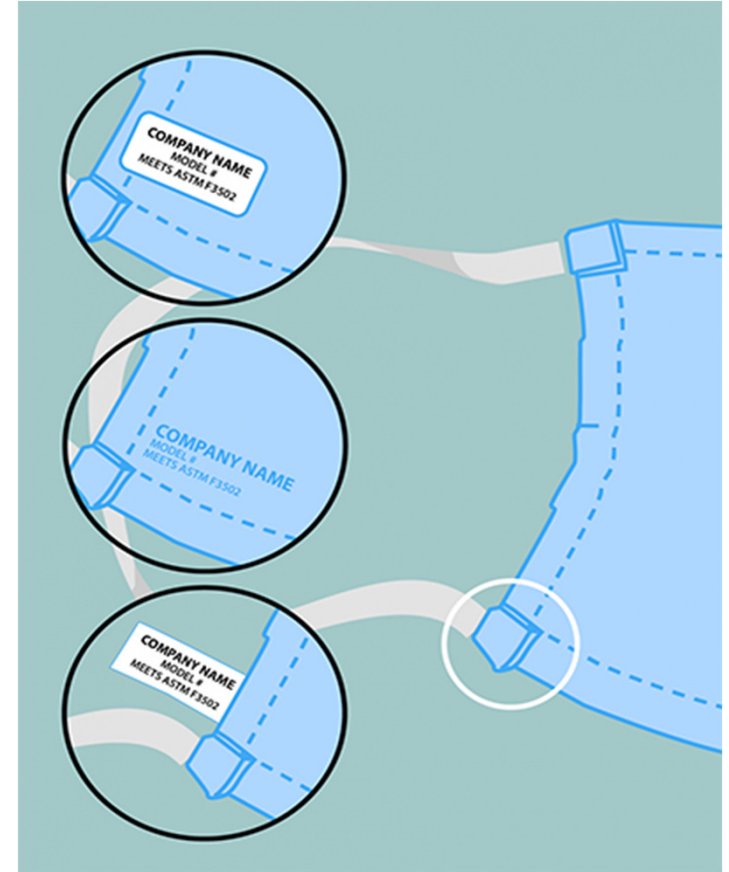
How can we boost the effectiveness of masks?

Brooks 2021, MMWR; 70(7);254–257

How can we boost the effectiveness of masks?

Legend: No mask, Surgical mask, Knotted surgical, Cloth over medical

Source control > Wearer protection

Y-axis: Relative concentration (%)

Categories: Mask on source, Mask on recipient, Mask on both

Brooks 2021, MMWR; 70(7);254–257

How can we boost the effectiveness of masks?

Legend: No mask | Surgical mask | Knotted surgical | Cloth over medical

Dual masking the best for recipient
Reduces exposure 85-95%

Y-axis: Relative concentration (%)

X-axis categories: Mask on source | Mask on recipient | Mask on both

Brooks 2021, MMWR; 70(7);254–257

February 19, 2021

Effectiveness of Mask Wearing to Control Community Spread of SARS-CoV-2

John T. Brooks, MD; Jay C. Butler, MD

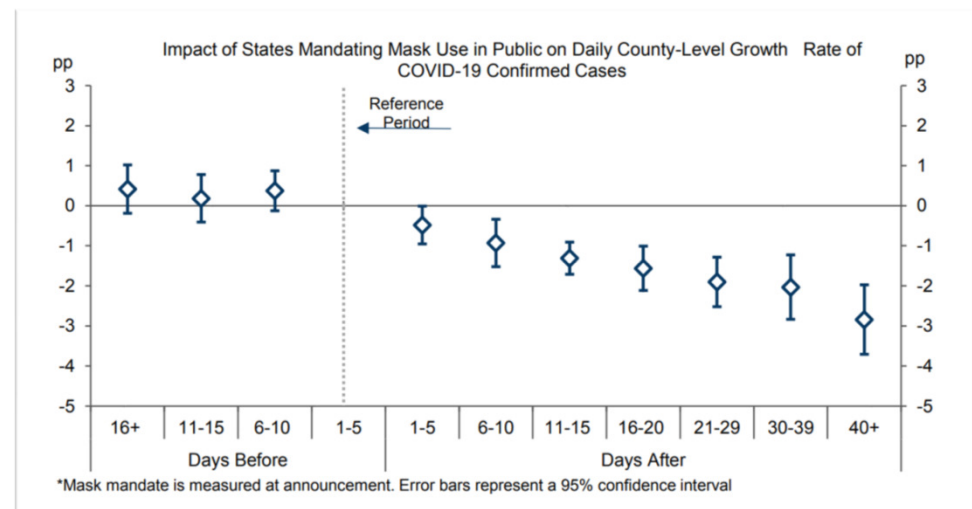Multiple studies of "real-world" effectiveness have confirmed that use of community masks prevents spread of COVID-19, including in schools

- Outbreak investigations
- Epidemiologic studies
- Community level analyses

Impact of States Mandating Mask Use in Public on Daily County-Level Growth Rate of COVID-19 Confirmed Cases

*Mask mandate is measured at announcement. Error bars represent a 95% confidence interval

Hatzius 2021, Goldman Sachs – https://www.goldmansachs.com/insights/pages/face-masks-and-gdp.html

Safety of masking

- Use of cloth/fabric masks safe for children and adults
- Any subjective respiratory distress not mirrored by physiological changes
  - Oxygen, carbon dioxide, heart rate, breathing rate
- No effect on cognition or memory documented
  - Mostly adolescents and young adults

Science Brief: Community Use of Cloth Masks to Control the Spread of SARS-CoV-2 | CDC.
Tornero-Aguilera 2021, Physiol Behav; https://doi.org/10.1016/j.physbeh.2021.113342.
Lubrano 2021, J Pediatr; 85. https://doi.org/10.3390/ ijerph18115885.
Lubrano 2021, JAMA Network Open. 2021;4(3):e210414. doi:10.1001/jamanetworkopen.2021.0414.
Slimani 2021, Int J Environ Res Public Health; https://doi.org/10.3390/ ijerph18115885.

Questions from you!

What Types of Mask to Use?

- Our "program" is interested in purchasing masks for our immunocompromised patients. Which mask provides the best protection for those unable to be vaccinated or severely immunocompromised?

- What is the difference between a KN95, N95, and KF94 mask?

- I am a teacher. Would you recommend double or triple masking?

- Does the CDC plan to update guidance to include the use of face shields?

Mask Fit

- Is it true that glass fogging is an indication that the mask is leaking and not providing adequate protection?

Mask Safety

- Is it true that carbon dioxide builds up in surgical masks?

- Does wearing a mask deprive your body of oxygen?

Mask Certification

- What is the significance of registration, listing, and clearance versus approval?

- I ordered an N95 mask set from Amazon, and my order came with a certificate. Is that the standard?

Counterfeit Masks

- How can I tell my face mask is real and not a counterfeit?

- How can I tell the difference between a quality mask versus a fake?

- Is Amazon a reputable place to buy face masks?

- What website or app can I use to confirm the manufacturer is NIOSH-approved before purchasing?

- I heard most of the fake KN95s and N95s are individually wrapped.

Caring for Masks

- CDC guidance states we should wash reusable masks as soon as they become dirty or at least once a day. Please explain,

- Please define reusable mask: is it a homemade cloth fabric mask or a surgical mask? We have students wearing the same surgical mask each day of the week.

- Should we purchase a mask in boxes of ten or fifteen over individually wrapped?
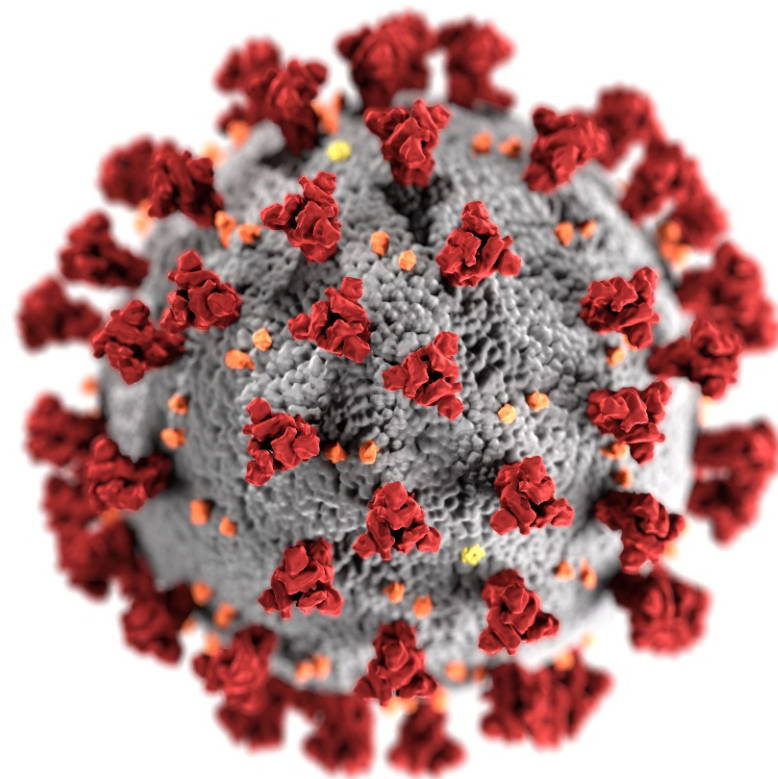
Future Variants

- Does the CDC expect another variant like Omicron in the future?

Helpful CDC Websites

- **Use Masks to Slow the Spread of COVID-19**: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/diy-cloth-face-coverings.html

- **Your Guide to Masks**: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/about-face-coverings.html

- **Types of Masks**: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/types-of-masks.html

- **Science Brief: Community Use of Cloth Masks to Control the Spread of SARS-CoV-2**: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/masking-science-sars-cov2.html

Thank you

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.