Safer In-Person Gatherings

Community Care First

Guidelines for keeping each other safer while gathering in-person during the ongoing COVID-19 Pandemic.

People's CDC

This guide offers strategies for safer in person gatherings.

It is equally important to continue offering remote options and strategies for meaningful participation for those unable or unwilling to accept the risks of attending in-person.

COVID is airborne,[1] and in our efforts to be together, we do not want to leave behind those who cannot access indoor and in-person spaces during this pandemic.

This Guide Includes:

1. The Biden Administration and its CDC are Downplaying the COVID-19 Pandemic and its Risks
    a. COVID-19 is Still Causing Death and Severe and Chronic Illness
    b. The CDC is Misrepresenting the Risks of Contracting and Spreading COVID-19
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The Biden Administration and its CDC are Downplaying the Seriousness of the COVID-19 Pandemic.

COVID-19 is Still Causing Death, Severe Disease, and Chronic Illness

Since mid-June 2022, the U.S. has been experiencing sustained high levels of COVID-19 transmission.[2] The federal government expects 100 million new cases in the fall of 2022.[3]

As of November 2022, an average of over 2,500 people have died of COVID-19 weekly,[4] and almost 29 million US residents are estimated to have Long COVID,[5] with as many as 4 million unable to work.[6]

All are vulnerable to the pandemic,[7] as Long COVID continues to impact previously healthy people[8] - including children[9] - in unknown patterns.[10] Every COVID case has the chance to impact someone vulnerable and/or lead to Long COVID.

COVID-19 has most severely impacted elderly,[11] immunocompromised and disabled people,[12] and Black, Latinx, and Indigenous communities,[13] due to the existing inequities of the U.S. healthcare system and within society.

COVID-19 is Still Causing Death, Severe Disease, and Chronic Illness

Although there is a common idea that COVID's severity is comparable to the flu, COVID is actually far more serious: it is far deadlier than the flu in kids and adults.[14,15]

Children who had a previous COVID case are at increased risk for blood clots, heart problems, diabetes, and renal failure.[16]

Recent COVID infection does not prevent someone from getting COVID again.[17] Because of unmitigated spread, newer variants are constantly emerging, evading vaccine and infection immunity as well as some treatments.[18,19] In adults, multiple reinfections increase adverse health impacts including death, hospitalization, and chronic lung problems and fatigue.[20]

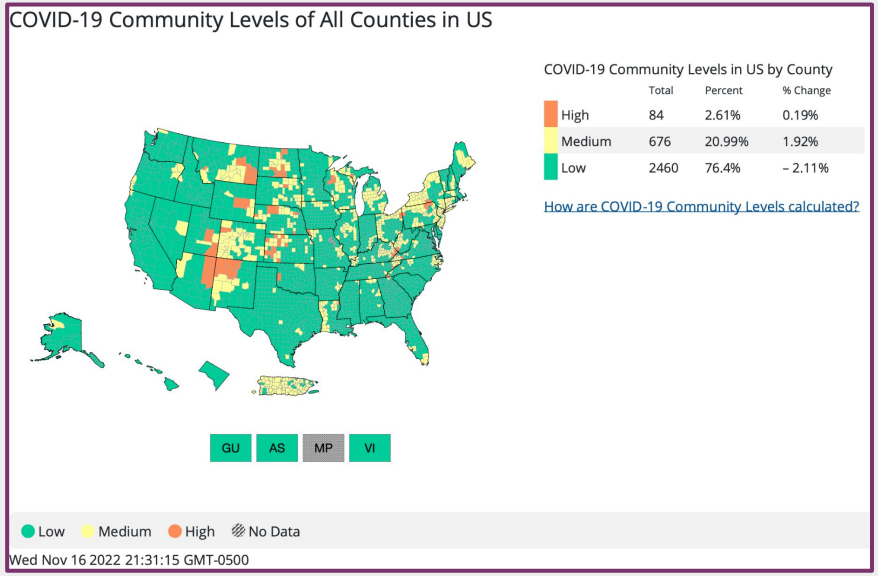
The CDC themselves reported during the Delta wave that up to 1 in 5 COVID cases lead to long term impacts.[21]

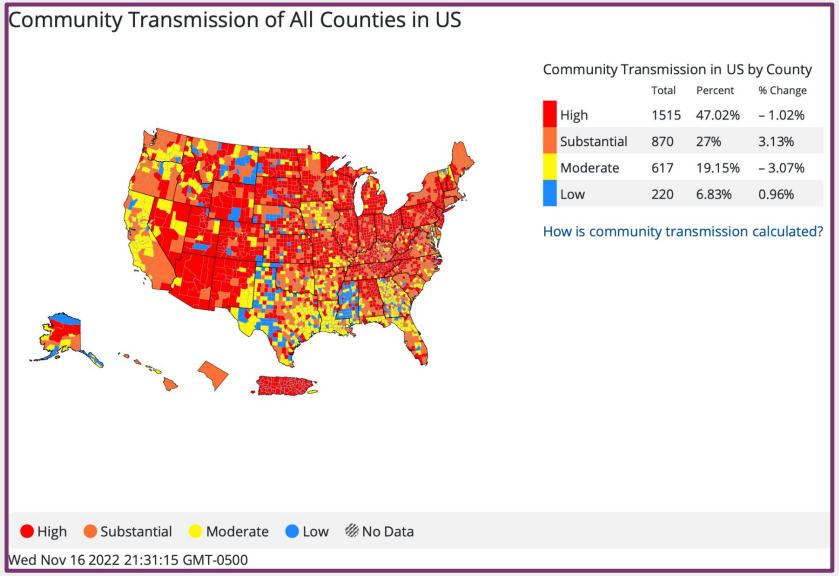
The CDC is Misrepresenting the Risks of Contracting and Spreading COVID-19

Until relatively recently, the CDC communicated about COVID risk using the "Community Transmission Map."[22] This map focused on numbers of COVID cases and on the proportion of people testing positive. In February 2022, The CDC created a new map: the "Community Levels Map."[23] This map is created using convoluted calculations that they say allows them to focus on health system strain, but it does *not* communicate the risk of infection.[24]

Today, the US COVID Transmission Map is still predominantly red, meaning that across the US, the risk of infection remains high.

The CDC is Misrepresenting the Risks of Contracting and Spreading COVID-19





These maps were both pulled from the CDC on November 15, 2022, as indicated on the bottom left of the image. On the left is the Community Levels Map and on the right is the Community Transmission Map.

The CDC is Misrepresenting the Risks of Contracting and Spreading COVID-19

On the previous page, the *Community Levels* map (on the left) which is promoted by the CDC, shows that on November 15, 2022, 76.4% of counties were at a "Low Level." Even the pastel colors make the map softer, further misleading readers about the real danger present. The CDC does not ever accompany their maps with notes that “these maps do not represent COVID cases or COVID transmission.”

Meanwhile, their *Community Transmission* map is harder to find on the CDC's website, obscuring the reality that 74.02% of US counties are experiencing a high or substantial level of transmission.[25] High transmission means high chance of getting COVID. Yet, people believe that they are not at high or substantial risk and are removing masks and attending crowded indoor events. And thus, transmission remains high.

The CDC is Misrepresenting the Risks of Contracting and Spreading COVID-19

In 2021, the CDC said that people can go back to work at Day 5 after an infection. This move was based on pressure from corporate lobbyists, despite robust evidence that the average person would still be contagious five days after the start of infection.[26]

In their August 2022 Guidelines, the CDC eliminated guidance around quarantine, isolation, and masking resulting in businesses limiting WFH and sick day availability and forcing teachers and kids back into the classroom while still infectious.[27] The CDC has instead placed the responsibility onto individuals.

The CDC's latest guidelines allow hospitals and nursing homes to remove mask mandates.[28] This guidance is dangerous: millions of people cannot safely access medical care.[29] Masks should be required in all healthcare settings.[30]

The CDC is Misrepresenting the Risks of Contracting and Spreading COVID-19

The vaccine-only strategy promoted by the CDC is insufficient.

While vaccines and boosters may help reduce COVID transmission, especially in the first 3-4 months post shot, they do not prevent it.[31,32,33]

Vaccination significantly reduces the risk of death and hospitalization across all age groups but it does not eliminate the risks.[34]

Our existing vaccines reduce the risks of Long COVID by 15 percent.[35]

The majority of Americans have not received their first booster, and less than 5% have received the bivalent Omicron-specific booster.[36, 37]

Solidarity Means We Protect Each Other

The Biden Administration and its CDC suggest that each person can assess their own risk and protect themselves. But COVID-19 is an airborne virus, and we all share air, especially in indoor spaces.[38]

The CDC is prioritizing the interests of corporations and politicians over the public's health by removing infection control measures in public spaces and making participation in society dangerous for the most vulnerable.[39,40]

We cannot accept mass infection. We must make our gatherings safer for EVERYONE.

Using multiple layers of protection is the best way to protect each other.

Layers of Protection are Key to Keeping Each Other Safe.[41]

Layers of Protection Reduce COVID-19 in the Air and Lower Transmission

- ☐ **Move Activities Outdoors***
- ☐ **Universal Masking***
- ☐ Pre-event Testing
- ☐ Require Proof of Vaccination and Boosting
- ☐ Request Attendees Avoid Unmasked Indoor Activities Prior to Event
- ☐ Symptoms and Exposure Checklist
- ☐ Ventilate with Outdoor Air, Clean Air with HEPA Filters, Monitor CO2
- ☐ Keep Groups Small and Consistent
- ☐ Small Groups, Social Distancing, & Limit Time Indoors
- ☐ Post-event Testing and Contact Tracing

*As a minimum, your COVID-safer gathering should **Move Activities Outdoors** and/or require **Universal Masking** in addition to other layers.

No single measure is perfect, which is why it is important to use multiple layers of protection.

As a baseline, we recommend:

- ➔ Universal masking
- ➔ Outdoor gatherings wherever possible

The more layers you use, the safer your gathering will be![42]

Move Activities Outdoors

- Hold events in outdoor, open spaces.
  - In outdoor spaces, it is less likely that someone inhales someone else 's exhaled air.
  - In a 2021 systematic review, the odds of indoor transmission was 18.7 times higher than outdoor (95% confidence interval 6.0-57.9).[43] Outdoor transmission seems to be occurring more commonly with newer variants, but still less commonly than indoors.
- Plan for multiple weather conditions or select a rain date if needed.
  - Avoid tents with walls, which block airflow.[44]
- Exercising, singing, and talking expel more aerosols and thus increase risk so plan for these activities to take place entirely outdoors.[45]
  - If this is not an option, shorten the duration of these activities while indoors.
- Transmission can still happen outdoors, especially in crowds and over long periods of time.[46]
- We recommend requiring masks and social distancing in crowded, outdoor spaces.

Universal N95/KN95/KF94 Masking

- Masking with well-fitting, high-filtration masks is a critical layer of protection.
  - Provides source control for infected people.[47]
  - Protects those that are uninfected.[48]
- We recommend universal masking with NIOSH-certified N95/KN94 grade masks or better.
  - If an N95 or KN94 is not accessible, we recommend double masking using surgical and cloth masks, but caution that they will not be as protective.[49]
- We recommend purchasing and offering N95 or KN95/KF94 masks for all attendees.[50] Groups like ProjectN95 may offer mask donations for purposes like this.[51]

Pre-Event Testing

- Tests can help reduce asymptomatic spread at your event.
  - Asymptomatic people can transmit the virus.[52] In fact, some models suggest that at least 50% of transmission was attributed to asymptomatic sources.
  - Depending on timing of exposure, a person will not immediately show a positive result. Testing multiple times increases the chances of detecting an infected person.
- PCR and rapid antigen tests (RAT) can both be good options for one-day events.
  - PCR COVID tests detect viral material in the body, and so are more “sensitive” than RAT tests, especially early in an infection.
  - RATs detect viral shedding in the nose or mouth. A RAT is more likely to produce false negatives, especially if performed only once, immediately after exposure, and in asymptomatic cases.

Pre-Event Testing

- Testing for one day events:
  - With access to same-day PCR testing, one test on the day of the event is sufficient.
  - If there is no access to same-day PCR testing, test the day before.
  - As with all mitigation efforts, a negative PCR does not entirely eliminate the risk of COVID transmission, so implement other layers of protection as well.
  - If using RAT, attendees should test the *day prior* to the event and the *day of* the event. They should use a combined throat and nasal swab strategy to improve sensitivity.[53]
  - While some data suggests that RAT positivity correlates well with contagiousness, (that is, a negative RAT means a person is not contagious), the relationship is not perfect.
- If the event lasts multiple days:
  - Test daily (RAT or PCR) if you have the resources.
  - Testing twice a week (PCR) also decreases risk.[54]

Require Proof of Vaccination and Boosting

- Vaccination can help reduce the likelihood of transmitting COVID.[55]
- All attendees over the age of 5 should be recently boosted (at least two weeks prior to the event) with the bivalent booster, unless they've forgone it due to a recent infection.
- Remind attendees to be vaccinated and boosted at least two weeks in advance of the event so the vaccine has enough time to kick in.

Request Attendees Avoid Unmasked Indoor Activities Prior to Event

- The virus that causes the most common strain of COVID-19 has an incubation period of about 3-4 days.[56] This means that there are about 3-4 days between when someone is exposed to the virus and when they develop symptoms.
- Pre-symptomatic transmission accounts for about a third of COVID-19 spread.[57]
- Requesting avoidance of high-risk activities minimizes the chance that someone brings COVID-19 to your gathering.
- It also increases the accuracy of your pre-event testing since accuracy improves in the days following an exposure.

Symptoms and Exposure Checklist

- ❏ Provide a daily symptom and exposure checklist to all participants.[58]
- ❏ For people exposed to the virus in the days prior to the event, a negative test (ideally, a PCR done same-day) should be performed prior to attending.
- ❏ If someone feels acutely ill or has a fever, they should stay home even if they have a negative test.

Ventilate Air & Monitor Air Quality

- ❏ When indoors, bring in outdoor air by opening all doors and windows whenever temperature, noise, and pollution allow.
  - ❏ Open windows on opposite walls if possible for cross ventilation.[59]
  - ❏ Ensure fresh air comes in by using an intake or exhaust fan in the window.
- ❏ Check with building administrators that HVAC systems are fully functional and serviced.
  - ❏ Use best possible filters, at least MERV 13.
  - ❏ Ensure maximum outside air possible.
  - ❏ Some experts point out that having windows and doors open while running a portable air purifier or HVAC wastes energy cleaning outside air. While we recognize the importance of conservation, we believe* that a dual ventilation plus filtration approach reduces COVID transmission most powerfully.

    *to the best of our understanding, this has not been answered in the literature.

Filter Air

- Covid-19 is airborne, so cleaning air with HEPA filtration and avoiding time indoors is essential to minimize risk and spread.[60,61]
- Use HEPA filters with CADR (clean air delivery rate) appropriate to room size to remove the virus from air.[62,63] When purchasing or making a HEPA air purifier, choose one with CADR at least 2 times the cubic footage of your space,[64,65] aiming for at least six (6) air changes per hour. CR boxes are a cheaper, DIY alternative.[66,67]
- Since almost no HVACs can use HEPA filters, HEPA air purifiers are recommended in almost all rooms.

Monitor Air Quality

- CO_2 levels correspond to the levels of contaminants that can build up in a poorly ventilated room.[68] CO_2 monitors can help assess ventilation in a building with HVAC and/or open windows.
  - Aim for levels no higher than outdoor level at the site, 400-800 ppm.
- If you are in a room without functioning HVAC or where it is impossible to open windows, monitoring CO2 will not help assess air ventilation. HEPA air purifiers are essential in this context.

Keep Groups Small and Consistent

- Limit the number of people in attendance.
- If necessary, divide participants into small groups or cohorts and maintain the same groups throughout the event to minimize spread and make contact tracing easier.

Be Mindful of Distance

- The old 6 ft rule is NOT protective. It was based on approximate distance large particles (droplets) travel before dropping to the ground. It is now understood that the small particles (aerosols) are what we have to worry about because:
  - Aerosols have the highest viral loads.
  - Aerosols travel to the deep lung, where they are trapped and cause disease.
- In a poorly ventilated room, these dangerous, tiny aerosols can linger for hours and spread like smoke to the whole room. Distance doesn't protect you.
- That said, distance DOES matter in some situations:
  - In a well-ventilated room, or outside, if you stay a few feet away from others, moving air can greatly reduce the aerosols you inhale from someone else.
  - In these situations, spacing chairs and tables apart can be helpful.

Post-Event Testing and Contact Tracing

- Keep a list of participants and ask them to test 5 full days after the gathering, reporting any positive results.
- Inform anyone who may have been exposed.
  - While the CDC considers 15 minutes of close contact an exposure, new variants are more highly transmissible than the original COVID virus. This means anyone sharing indoor air with a COVID-positive person may be exposed.

Use Multiple Layers of Protection.

No one Layer is perfect.

We recommend incorporating as many layers as you can.

Stay Informed

This guide was compiled by the People's CDC.

Subscribe on Substack to receive our Weekly Weather Report in your inbox.

For additional resources, such as the Urgency of Equity toolkit, visit our resources page.

Endnotes - Slides 1-5

1. Greenhalgh, T., Jimenez, J. L., Prather, K. A., Tufekci, Z., Fisman, D., Schooley, R. (2021). Ten scientific reasons in support of airborne transmission of SARS-CoV-2. *Comment 397*(10285),1603-1605. https://doi.org/10.1016/S0140-6736(21)00869-2

2. (2022, March 4). COVID-19 Weather Reports. *People's CDC*. https://peoplescdc.org/weatherreports/

3. Abutaleb, Y., & Achenbach, J. (2022, May 9). Coronavirus wave this fall could infect 100 million, administration warns. *Washington Post*. https://www.washingtonpost.com/health/2022/05/06/fall-winter-coronavirus-wave/

4. CDC. (2020, March 28). *COVID Data Tracker*. Centers for Disease Control and Prevention. https://covid.cdc.gov/covid-data-tracker

5. *PASC Dashboard*. (n.d.). from https://pascdashboard.aapmr.org/

6. Bach, K. (2022, August 24). New data shows long Covid is keeping as many as 4 million people out of work. *Brookings*. https://www.brookings.edu/research/new-data-shows-long-covid-is-keeping-as-many-as-4-million-people-out-of-work/

7. *Strokes, heart attacks, sudden deaths: Does America understand the long-term risks of catching COVID?* (n.d.). Fortune. Retrieved November 12, 2022, from https://fortune.com/2022/10/06/strokes-heart-attacks-sudden-death-america-long-term-risks-catching-covid-carolyn-barber/

8. CDC. (2022, September 1). *Post-COVID Conditions*. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html

9. Lopez-Leon, S., Wegman-Ostrosky, T., Ayuzo del Valle, N. C., Perelman, C., Sepulveda, R., Rebolledo, P. A., Cuapio, A., & Villapol, S. (2022). Long-COVID in children and adolescents: A systematic review and meta-analyses. *Scientific Reports*, *12*(1), Article 1. https://doi.org/10.1038/s41598-022-13495-5

10. Xu, E., Xie, Y., & Al-Aly, Z. (2022). Long-term neurologic outcomes of COVID-19. *Nature Medicine*, 1–10. https://doi.org/10.1038/s41591-022-02001-z

11. Dadras, O., SeyedAlinaghi, S., Karimi, A., Shamsabadi, A., Qaderi, K., Ramezani, M., Mirghaderi, S. P., Mahdiabadi, S., Vahedi, F., Saeidi, S., Shojaei, A., Mehrtak, M., Azar, S. A., Mehraeen, E., & Voltarelli, F. A. (2022). COVID-19 mortality and its predictors in the elderly: A systematic review. *Health Science Reports*, *5*(3), e657. https://doi.org/10.1002/hsr2.657

12. *2021 Progress Report: The Impact of COVID-19 on People with Disabilities*. (2021, October 26). https://ncd.gov/

13. Tai, D. B. G., Shah, A., Doubeni, C. A., Sia, I. G., & Wieland, M. L. (2021). The Disproportionate Impact of COVID-19 on Racial and Ethnic Minorities in the United States. *Clinical Infectious Diseases: An Official Publication of the Infectious Diseases Society of America*, *72*(4), 703–706. https://doi.org/10.1093/cid/ciaa815

Endnotes - Slides 6-9

14. *Coronavirus Daily: Covid Is More Lethal to Kids Than The Flu—Bloomberg*. (n.d.). Retrieved November 12, 2022, from https://www.bloomberg.com/news/newsletters/2022-06-03/coronavirus-daily-covid-is-more-lethal-to-kids-than-the-flu

15. Adam, D. (2022). The pandemic's true death toll: Millions more than official counts. *Nature*, *601*(7893), 312–315. https://doi.org/10.1038/d41586-022-00104-8

16. Kompaniyets, L. (2022). Post–COVID-19 Symptoms and Conditions Among Children and Adolescents—United States, March 1, 2020–January 31, 2022. *MMWR. Morbidity and Mortality Weekly Report*, *71*. https://doi.org/10.15585/mmwr.mm7131a3

17. Ren, X., Zhou, J., Guo, J., Hao, C., Zheng, M., Zhang, R., Huang, Q., Yao, X., Li, R., & Jin, Y. (2022). Reinfection in patients with COVID-19: A systematic review. *Global Health Research and Policy*, *7*(1), 12. https://doi.org/10.1186/s41256-022-00245-3

18. Johnson, C. Y. (2022, October 22). XBB, BQ.1.1, BA.2.75.2—A variant swarm could fuel a winter surge. *Washington Post*. https://www.washingtonpost.com/health/2022/10/18/covid-variants-xbb-bq1-bq11/

19. Cao, Y., Jian, F., Wang, J., Yu, Y., Song, W., Yisimayi, A., Wang, J., An, R., Zhang, N., Wang, Y., Wang, P., Zhao, L., Sun, H., Yu, L., Yang, S., Niu, X., Xiao, T., Gu, Q., Shao, F., … Xie, X. S. (2022). *Imprinted SARS-CoV-2 humoral immunity induces convergent Omicron RBD evolution* (p. 2022.09.15.507787). bioRxiv. https://doi.org/10.1101/2022.09.15.507787

20. Bowe, B., Xie, Y., & Al-Aly, Z. (2022). Acute and postacute sequelae associated with SARS-CoV-2 reinfection. *Nature Medicine*, 1–8. https://doi.org/10.1038/s41591-022-02051-3

21. Bull-Otterson, L. (2022). Post–COVID Conditions Among Adult COVID-19 Survivors Aged 18–64 and ≥65 Years—United States, March 2020–November 2021. *MMWR. Morbidity and Mortality Weekly Report*, *71*. https://doi.org/10.15585/mmwr.mm7121e1

22. CDC. (2020, March 28). *COVID Data Tracker*. Centers for Disease Control and Prevention. https://covid.cdc.gov/covid-data-tracker/#county-view?list_select_state=all_states&list_select_county=all_counties&data-type=Risk&null=Risk

23. People's CDC (Director). (2022, June 25). *CDC COVID Maps: What's the difference?* https://www.youtube.com/watch?v=U8y824LVK9k

24 & 25. The CDC is beholden to corporations and lost our trust. We need to start our own. (2022, April 3). *The Guardian*. https://www.theguardian.com/commentisfree/2022/apr/03/peoples-cdc-covid-guidelines

Endnotes - Slides 10-12

26. Adam, D. (2022). How long is COVID infectious? What scientists know so far. *Nature*, *608*(7921), 16–17. https://doi.org/10.1038/d41586-022-02026-x

27. Thomas, J. (2022, August 11). *New COVID-19 Guidelines From CDC Divide Medical Community*. Newsweek. https://www.newsweek.com/new-covid-19-guidelines-cdc-divide-medical-community-1733087

28. CDC. (2020, February 11). *Interim Infection Prevention and Control Recommendations for Healthcare Personnel During the Coronavirus Disease 2019 (COVID-19) Pandemic*. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html

29. *Nowhere is safe: Record number of patients contracted Covid in the hospital in January—POLITICO*. (n.d.). Retrieved November 12, 2022, from https://www.politico.com/news/2022/02/19/covid-hospitals-data-00010283

30. Network, A. (n.d.). *Require masking in all healthcare settings*. Retrieved November 12, 2022, from https://actionnetwork.org/petitions/require-masking-in-all-healthcare-settings

31. Prosser Scully, R. (2022). COVID vaccines slash risk of spreading Omicron—And so does previous infection. *Nature*. https://doi.org/10.1038/d41586-022-02328-0

32. *COVID-19 Bivalent Boosters | Johns Hopkins | Bloomberg School of Public Health*. (n.d.). Retrieved November 13, 2022, from https://publichealth.jhu.edu/2022/covid-19-bivalent-boosters

33. Jung, J., Kim, J. Y., Park, H., Park, S., Lim, J. S., Lim, S. Y., Bae, S., Lim, Y.-J., Kim, E. O., Kim, J., Park, M.-S., & Kim, S.-H. (2022). Transmission and Infectious SARS-CoV-2 Shedding Kinetics in Vaccinated and Unvaccinated Individuals. *JAMA Network Open*, *5*(5), e2213606. https://doi.org/10.1001/jamanetworkopen.2022.13606

34. Tenforde, M. W. (2022). Effectiveness of mRNA Vaccination in Preventing COVID-19–Associated Invasive Mechanical Ventilation and Death—United States, March 2021–January 2022. *MMWR. Morbidity and Mortality Weekly Report*, *71*. https://doi.org/10.15585/mmwr.mm7112e1

35. Al-Aly, Z., Bowe, B., & Xie, Y. (2022). Long COVID after breakthrough SARS-CoV-2 infection. *Nature Medicine*, *28*(7), Article 7. https://doi.org/10.1038/s41591-022-01840-0

36. CDC. (2020, March 28). *COVID-19 Vaccinations in the United States*. Centers for Disease Control and Prevention. https://covid.cdc.gov/covid-data-tracker

37. The US's estimate for uptake of the new covid booster was off by more than 90%. (n.d.). Retrieved November 13, 2022, from https://finance.yahoo.com/news/uss-estimate-uptake-covid-booster-194200568.html

38. Greenhalgh, T., Jimenez, J. L., Prather, K. A., Tufekci, Z., Fisman, D., & Schooley, R. (2021). Ten scientific reasons in support of airborne transmission of SARS-CoV-2. The Lancet, 397(10285), 1603–1605. https://doi.org/10.1016/S0140-6736(21)00869-2

39. The CDC is beholden to corporations and lost our trust. We need to start our own. (2022, April 3). The Guardian. https://www.theguardian.com/commentisfree/2022/apr/03/peoples-cdc-covid-guidelines

40. Faust, J. S., Du, C., Renton, B., Liang, C., Chen, A. J., Li, S.-X., Lin, Z., Nunez-Smith, M., & Krumholz, H. M. (2022). Two years of COVID-19: Excess mortality by age, region, gender, and race/ethnicity in the United States during the COVID-19 pandemic, March 1, 2020, through February 28, 2022 (p. 2022.08.16.22278800). medRxiv. https://doi.org/10.1101/2022.08.16.22278800

Endnotes - Slides 13-20

41. Pageaud, S., Pothier, C., Rigotti, C., Eyraud-Loisel, A., Bertoglio, J.-P., Bienvenüe, A., Leboisne, N., Ponthus, N., Gauchon, R., Gueyffier, F., Vanhems, P., Iwaz, J., Loisel, S., Roy, P., & On Behalf Of The Group CovDyn Covid Dynamics, null. (2021). Expected Evolution of COVID-19 Epidemic in France for Several Combinations of Vaccination Strategies and Barrier Measures. Vaccines, 9(12), 1462. https://doi.org/10.3390/vaccines9121462

42. Donovan, C. V. (2022). SARS-CoV-2 Incidence in K–12 School Districts with Mask-Required Versus Mask-Optional Policies—Arkansas, August–October 2021. MMWR. Morbidity and Mortality Weekly Report, 71. https://doi.org/10.15585/mmwr.mm7110e1

43. Bulfone, T. C., Malekinejad, M., Rutherford, G. W., & Razani, N. (2020). Outdoor Transmission of SARS-CoV-2 and Other Respiratory Viruses, a Systematic Review. The Journal of Infectious Diseases, jiaa742. https://doi.org/10.1093/infdis/jiaa742

44. *Outdoor seating often reduces COVID-19 exposure but not all structures are created equal*. (n.d.). Retrieved November 13, 2022, from https://www.usatoday.com/in-depth/graphics/2021/03/17/indoor-vs-outdoor/6824399002/

45. *Carbon dioxide levels reflect COVID-19 risk: Research confirms value of measuring carbon dioxide to estimate infection risk*. (n.d.). ScienceDaily. Retrieved November 13, 2022, from https://www.sciencedaily.com/releases/2021/04/210407143809.htm

46. Bulfone, T. C., Malekinejad, M., Rutherford, G. W., & Razani, N. (2021). Outdoor Transmission of SARS-CoV-2 and Other Respiratory Viruses: A Systematic Review. *The Journal of Infectious Diseases*, *223*(4), 550–561. https://doi.org/10.1093/infdis/jiaa74

47 & 48. Bagheri, G., Thiede, B., Hejazi, B., Schlenczek, O., & Bodenschatz, E. (2021). An upper bound on one-to-one exposure to infectious human respiratory particles. *Proceedings of the National Academy of Sciences of the United States of America*, *118*(49), e2110117118. https://doi.org/10.1073/pnas.2110117118

49. Andrejko, K. L. (2022). Effectiveness of Face Mask or Respirator Use in Indoor Public Settings for Prevention of SARS-CoV-2 Infection—California, February–December 2021. *MMWR. Morbidity and Mortality Weekly Report*, *71*. https://doi.org/10.15585/mmwr.mm7106e

50. *Master Mask Testing Data Set*. (n.d.). Google Docs. Retrieved November 13, 2022, from https://docs.google.com/spreadsheets/d/1M0mdNLpTWEGcluK6hh5LjjcFixwmOG853Ff45d3O-L0/edit?usp=embed_facebook

51. *Masks for Communities Coalition | ProjectN95*. (n.d.). Retrieved November 13, 2022, from https://www.projectn95.org/masks-for-communities-coalition

52. Johansson, M. A., Quandelacy, T. M., Kada, S., Prasad, P. V., Steele, M., Brooks, J. T., Slayton, R. B., Biggerstaff, M., & Butler, J. C. (2021). SARS-CoV-2 Transmission From People Without COVID-19 Symptoms. *JAMA Network Open*, *4*(1), e2035057. https://doi.org/10.1001/jamanetworkopen.2020.35057

53. Goodall, B. L., LeBlanc, J. J., Hatchette, T. F., Barrett, L., & Patriquin, G. (2022). Investigating the Sensitivity of Nasal or Throat Swabs: Combination of Both Swabs Increases the Sensitivity of SARS-CoV-2 Rapid Antigen Tests. *Microbiology Spectrum*, *10*(4), e0021722. https://doi.org/10.1128/spectrum.00217-22

54. Bilinski, A., Ciaranello, A., Fitzpatrick, M. C., Giardina, J., Shah, M., Salomon, J. A., & Kendall, E. A. (2022). Estimated Transmission Outcomes and Costs of SARS-CoV-2 Diagnostic Testing, Screening, and Surveillance Strategies Among a Simulated Population of Primary School Students. *JAMA Pediatrics*, *176*(7), 679–689. https://doi.org/10.1001/jamapediatrics.2022.1326

55. Tan, S. T., Kwan, A. T., Rodríguez-Barraquer, I., Singer, B. J., Park, H. J., Lewnard, J. A., Sears, D., & Lo, N. C. (2022). *Infectiousness of SARS-CoV-2 breakthrough infections and reinfections during the Omicron wave* (p. 2022.08.08.22278547). medRxiv. https://doi.org/10.1101/2022.08.08.22278547

Endnotes - Slides 21-30

56. Wu, Y., Kang, L., Guo, Z., Liu, J., Liu, M., & Liang, W. (2022). Incubation Period of COVID-19 Caused by Unique SARS-CoV-2 Strains: A Systematic Review and Meta-analysis. *JAMA Network Open*, *5*(8), e2228008. https://doi.org/10.1001/jamanetworkopen.2022.28008

57. Johansson, M. A., Quandelacy, T. M., Kada, S., Prasad, P. V., Steele, M., Brooks, J. T., Slayton, R. B., Biggerstaff, M., & Butler, J. C. (2021). SARS-CoV-2 Transmission From People Without COVID-19 Symptoms. *JAMA Network Open*, *4*(1), e2035057. https://doi.org/10.1001/jamanetworkopen.2020.35057

58. *Abrome AY21-22 pandemic plan (updated)*. (n.d.). Google Docs. Retrieved November 13, 2022, from https://docs.google.com/document/d/1NS_KrkiSYHdW2xdEO7N13mZ0TqG-jqfDBUM3xnYliQA/edit?usp=embed_facebook

59. *Natural Ventilation—Clean Air Stars*. (2021, December 1). https://cleanairstars.com/naturalventilation/

60. Greenhalgh, T., Jimenez, J. L., Prather, K. A., Tufekci, Z., Fisman, D., & Schooley, R. (2021). Ten scientific reasons in support of airborne transmission of SARS-CoV-2. *The Lancet*, *397*(10285), 1603–1605. https://doi.org/10.1016/S0140-6736(21)00869-2

61. US EPA, O. (2020, June 18). *Air Cleaners, HVAC Filters, and Coronavirus (COVID-19)* [Collections and Lists]. https://www.epa.gov/coronavirus/air-cleaners-hvac-filters-and-coronavirus-covid-19

62. CDC. (2020, February 11). *Ventilation in Buildings*. Centers for Disease Control and Prevention. https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html

63. *Portable Air Cleaner (HEPA filter) buying guide—Clean Air Crew*. (2021, June 27). https://cleanaircrew.org/air-cleaners/

64. *Air Filters—Clean Air Stars*. (2021, December 2). https://cleanairstars.com/filters/, https://cleanairstars.com/filters/

65. Tyler Vanzo. (2021, October 18). *How to Choose an Office Air Purifier [Step-by-Step Guide].* https://smartairfilters.com/en/blog/how-to-choose-an-office-air-purifier-guide/

66. *Could a Janky, Jury-Rigged Air Purifier Help Fight Covid-19? | WIRED*. (n.d.). Retrieved November 13, 2022, from https://www.wired.com/story/could-a-janky-jury-rigged-air-purifier-help-fight-covid-19/

67. Rosenthal, J. (2020, August 22). A Variation on the "Box Fan with MERV 13 Filter" Air Cleaner. *Tex-Air Filters*. https://www.texairfilters.com/a-variation-on-the-box-fan-with-merv-13-filter-air-cleaner/

68. *Carbon dioxide levels reflect COVID-19 risk: Research confirms value of measuring carbon dioxide to estimate infection risk*. (n.d.). ScienceDaily. Retrieved November 13, 2022, from https://www.sciencedaily.com/releases/2021/04/210407143809.htm