

Does mask-wearing make a difference in the spread of COVID-19?

6/2/2020

Written by: Mike Haischer, Graduate Student and AHPRC Research Lab Manager

Edited by: Dr. Sandra Hunter and Toni Uhrich

Key Points

- Wisconsin's COVID-19 curve has not been flattened and the state now has one of the worst COVID-19 outbreaks in the nation
- COVID-19 transmission occurs primarily through airborne droplets and the amount of exposure can be effectively reduced by wearing a mask, even if made from cloth
- The amount of exposure to COVID-19 relates to infection risk and even masks made from cloth can reduce viral exposure at least 80%

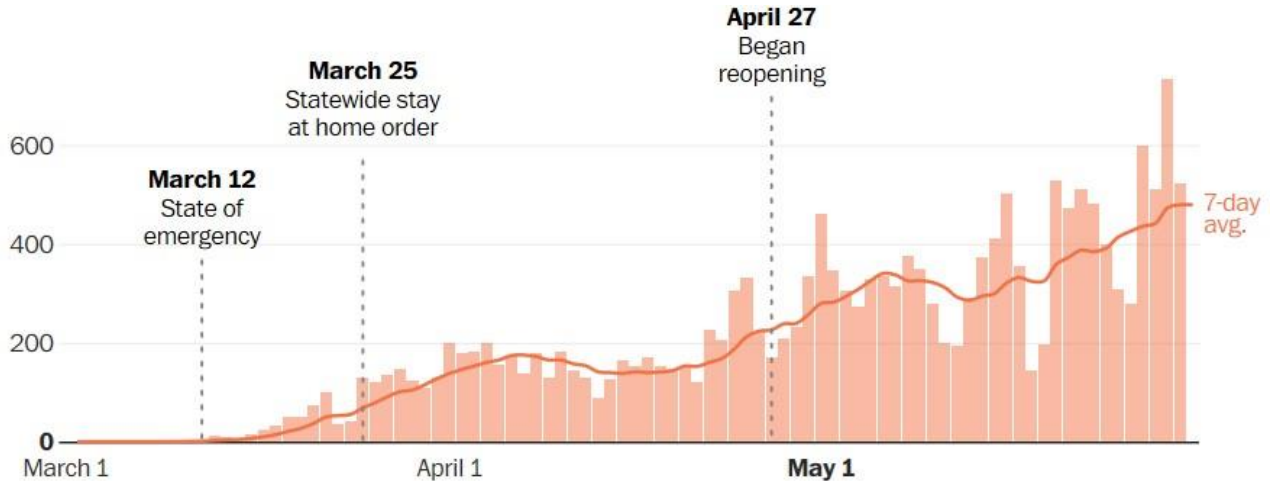


Figure 1: The number of COVID-19 cases in Wisconsin continues to rise (data as of May 31st). Graphic: [Washington Post](#)

Distancing measures, stay-at-home orders, and masks have effectively flattened the COVID-19 curve in many states across the US, but Wisconsin is not one of them. In the week after May 24th, Wisconsin has seen a 19% increase in COVID-19 cases, with only Virginia and Alabama experiencing worse outbreaks over that time⁶. In the past week, Wisconsin has set multiple new records for COVID-19 cases and deaths, and that alarming trend will only continue if citizens do not take individual precautions to slow the spread of the virus. Wearing a mask for protection has become one of the most politicized and polarizing topics of the pandemic, but the scientific evidence is clear: masks work⁴. A quick trip to the grocery store or any public place will display the divide, and in Wisconsin it appears there is a significant portion of the population not wearing masks in public spaces. What is the evidence they work?

COVID-19 can spread through respiratory droplets that are passed directly from person-to-person, but some droplets produced by humans are so small that they may remain airborne for hours^{3,10}. Additionally, identifying infected individuals can be extremely challenging because people can be highly contagious for several days before any symptoms occur^{1,2,5}. For these reasons, masks are essential for reducing the amount of viral transmission and exposure as even those made of cloth are at least 80% effective^{7,8,11}. Importantly, the amount of COVID-19 exposure relates to one's

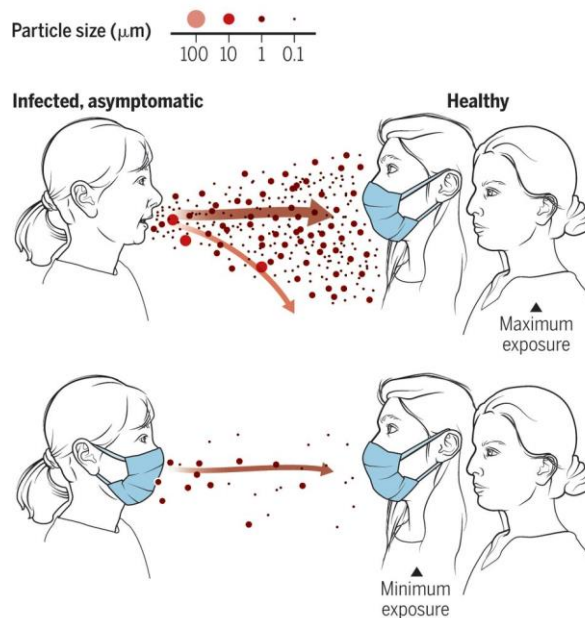
Does mask-wearing make a difference in the spread of COVID-19?

likelihood to become sick², reinforcing the importance of masks as a critical barrier between the wearer and the outside world. It is not surprising, then, the countries that have implemented universal mask wearing (e.g. Taiwan, Hong Kong, and South Korea) have been some of the most effective in stopping the spread of COVID-19.

So, where should you wear a mask? In any public place, wear a mask. Anyone can be unknowingly infected, and with the amount of COVID-19 exposure playing a significant role in infection risk, mask-wearing is essential to help slow the spread of COVID-19.

Masks reduce airborne transmission

Infectious aerosol particles can be released during breathing and speaking by asymptomatic infected individuals. No masking maximizes exposure, whereas universal masking results in the least exposure.



GRAPHIC: V. ALTOUNIAN/SCIENCE

Figure 2: COVID-19 exposure and transmission is minimized through universal mask-wearing. Graphic: [Prather et al., 2020](#).

References

1. Anderson EL, Turnham P, Griffin JR, & Clarke CC. (2020). Consideration of the aerosol transmission for COVID-19 and public health. *Risk Analysis*, 40(5): 902-907. DOI: [10.1111/risa.13500](https://doi.org/10.1111/risa.13500)
2. Asadi S, Bouvier N, Wexler AS, & Ristenpart WD. (2020). The coronavirus pandemic and aerosols: Does COVID-19 transmit via expiratory particles? *Aerosol Science and Technology*, 54(6): 635-638. DOI: [10.1080/02786826.2020.1749229](https://doi.org/10.1080/02786826.2020.1749229)

Does mask-wearing make a difference in the spread of COVID-19?

3. Buonanno G, Stabile L, & Morawska L. (2020). Estimation of airborne viral emission: Quantitative emission rate of SARS-CoV-2 for infection risk assessment. *Environment International*, 141: 105794. DOI: [10.1016/j.envint.2020.105794](https://doi.org/10.1016/j.envint.2020.105794)
4. Chu DK, Akl EA, Duda S, Solo K, Yaacoub S, Schünemann HJ, et al. (2020). Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: A systematic review and meta-analysis. *The Lancet*. DOI: [10.1016/S0140-6736\(20\)31142-9](https://doi.org/10.1016/S0140-6736(20)31142-9)
5. He X, Lau EHY, Wu P, Deng W, Wang J, Hao X, et al. (2020). Temporal dynamics in viral shedding and transmissibility of COVID-19. *Nat Med*, 26(5): 672-675. DOI: [10.1038/s41591-020-0869-5](https://doi.org/10.1038/s41591-020-0869-5)
6. Coronavirus Resource Center: Johns Hopkins University & Medicine. <https://coronavirus.jhu.edu/map.html>
7. Konda A, Prakash A, Moss GA, Schmoldt M, Grant GD, & Guha S. (2020). Aerosol filtration efficiency of common fabrics used in respiratory cloth masks. *ACS Nano*, 14(5): 6339-6347. DOI: [10.1021/acsnano.0c03252](https://doi.org/10.1021/acsnano.0c03252)
8. Leung NHL, Chu DKW, Shiu EYC, Chan K-H, McDevitt JJ, Hau BJP, et al. (2020). Respiratory virus shedding in exhaled breath and efficacy of face masks. *Nature Medicine*, 26: 676-680. DOI: [10.1038/s41591-020-0843-2](https://doi.org/10.1038/s41591-020-0843-2)
9. Mandavilli A. (May 29th, 2020). *It's Not Whether You Were Exposed to the Virus. It's How Much*. New York Times: <https://www.nytimes.com/2020/05/29/health/coronavirus-transmission-dose.html>
10. Mittal R, Ni R, & Seo J-H. (2020). The flow physics of COVID-19. *Journal of Fluid Mechanics*, 894, F2. DOI: [10.1017/jfm.2020.330](https://doi.org/10.1017/jfm.2020.330)
11. Prather KA, Wang CC, & Schooley RT. (2020). Reducing transmission of SARS-CoV-2. *Science*. DOI: [10.1126/science.abc6197](https://doi.org/10.1126/science.abc6197)