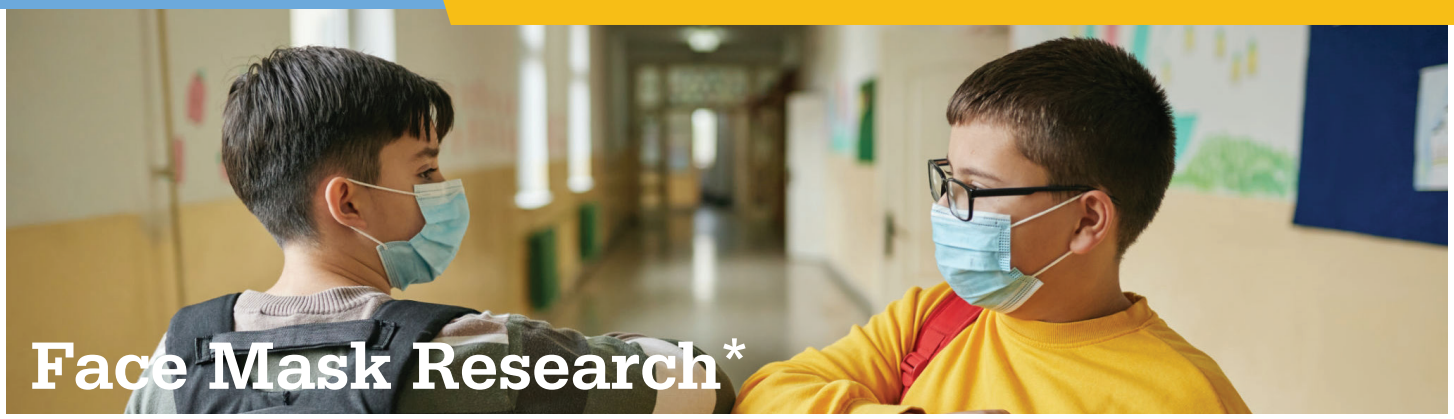

Face Mask Research*

Studies show face masks reduce droplet emission, infection risk, and COVID-19 incidence.

In addition to the studies cited below, the Ohio Schools COVID-19 Evaluation, published Jan. 29, 2021, showed that children who were close contacts and appropriately masked had rates of COVID-19 that were similar to children with no known COVID-19 exposure in school.

Laboratory experiments have found that almost all types of masks can **greatly reduce droplet emission** and viral shedding by infectious wearers.

- Fischer, E. P. *et al.* Low-cost measurement of face mask efficacy for filtering expelled droplets during speech. *Sci. Adv.* **6**(36), 3083 (2020).
- Leung, N. H. L. *et al*. Respiratory virus shedding in exhaled breath and efficacy of face masks. *Nat. Med.* **26**, 676–680 (2020).

Observational studies and systematic reviews focusing on droplet viruses (SARS-1, MERS and influenza) indicate that **masks substantially reduce infection risk to the non-infected wearer**, even when their infectious contact is unmasked. Specifically, Chu et al suggest that the use of a surgical or cotton mask could result in a reduction in infection risk of around 44% (95% CI 11–60%) in a community setting, with stronger associations in a healthcare setting (70% [59–78%]).

- Doung-ngern, P. *et al.* Associations between mask-wearing, handwashing, and social distancing practices and risk of COVID-19 infections in public: A case-control study in Thailand. *MedRxiv*. https://doi.org/10.1101/2020.06.11.20128900 (2020).
- Wang, Y. *et al.* Reduction of secondary transmission of SARS-CoV-2 in households by face mask use, disinfection and social distancing: A cohort study in Beijing, China. *BMJ Glob. Health* **5**, e002794 (2020).
- Chu, D. K. *et al*. 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. *Lancet* **395**(102424), 1973–1987 (2020).
- Chou, R., Dana, T., Jungbauer, R., Weeks, C. & McDonagh, M. S. Masks for prevention of respiratory virus infections, including SARS-CoV-2, in health care and community settings: A living rapid review. *Ann. Intern. Med.* **173**(7), 542–555 (2020).

Epidemiological studies have have shown a **protective effect** of masks.

- Wang, X. *et al*. Association between universal masking in a health care system and SARS-CoV-2 positivity among health care workers. *JAMA* **324**(7), 703–704 (2020).
- Mitze, T., Kosfeld, R., Rode, J. & Wälde, K. Face masks considerably reduce COVID-19 cases in Germany. *PNAS* **117**(51), 32293–32301 (2020).

Mask Safety

Centers for Disease Control and Prevention Science Brief: Community Use of Cloth Masks to Control the Spread of SARS-CoV-2 **addresses health effects of mask wearing.**

Research supports that mask wearing has no significant adverse health effects for wearers. Studies of healthy hospital workers, older adults, and adults with COPD reported no change in oxygen or carbon dioxide levels while wearing a cloth or surgical mask either during rest or physical activity. Among 12 healthy non-smoking adults, there was minimal impact on respiration when wearing a mask compared with not wearing a mask; however, the authors noted that while some respiratory discomfort may have been present, mask use was safe even during exercise. The safety of mask use during exercise has been confirmed in other studies of healthy adults. Additionally, no oxygen desaturation or respiratory distress was observed among children less than 2 years of age when masked during normal play. While some studies have found an increase in reports of dyspnea (difficulty breathing) when wearing face masks, no physiologic differences were identified between periods of rest or exercise while masked or non-masked. (Please see CDC website for associated references.)

Studies Specific to Children

- Lubriano, R. *et al.* Assessment of Respiratory Function in Infants and Young Children Wearing Face Masks During the COVID-19 Pandemic. *JAMA Network Open.* 10.1001/jamanetworkopen.2021.0414 (2021).
    - **Summary:** This cohort study conducted in Italy included 47 healthy children ages 4 months to 12 years and evaluated changes in respiratory parameters with use of surgical masks. Participants were evaluated during 30-minute sessions with no facemask and while wearing a facemask, while engaging in usual play; those aged >24 months also participated in a third session that consisted of walking for 12 minutes while wearing a facemask. Use of facemasks was not associated with changes in oxygen saturation or clinical signs of respiratory distress.

**These resources are not intended to represent an exhaustive review of the literature.*