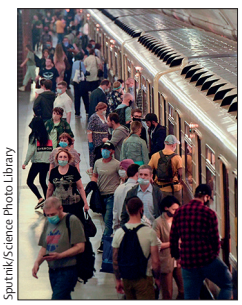
Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Use of facemasks during the COVID-19 pandemic



Sputnik/Science Photo Library

Published **Online** August 3, 2020 https://doi.org/10.1016/S2213-2600(20)30352-0

For **worldwide data on COVID-19 cases** see https://www.worldometers.info/coronavirus/

For a **history of the medical mask** see **Perspectives** *Lancet* 2020; **396:** 19–20

For the **report on asymptomatic transmission** see *N Engl J Med* 2020; **382:** 970–71

For more on **asymptomatic transmission of COVID-19** see https://www.nytimes.com/2020/06/27/world/europe/coronavirus-spread-asymptomatic.html

For **contract tracing by the CDC** see https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/contact-tracing.html

For more on **aerosol transmission of SARS-CoV-2** see *Clin Infect Dis* 2020; published online July 6. DOI:10.1093/cid/ciaa939, *JAMA* 2020; published online July 13. DOI:10.1001/jama.2020.12458, and **Viewpoint** *Lancet Respir Med* 2020; **8:** 914–24

For an **example of a systematic review of the evidence on the use of facemasks** see **Articles** *Lancet* 2019; **395:** 1973–87

For more on **facemask use in Norway** see https://www.fhi.no/globalassets/dokumenterfiler/rapporter/2020/should-individuals-in-the-community-without-respiratory-symptoms-wear-facemasks-to-reduce-the-spread-of-covid-19-report-2020.pdf

As of July 26, 2020, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has infected more than 16 000 000 individuals worldwide and caused over 600 000 deaths from COVID-19. Despite advances in pharmacological treatment and early vaccine development, reducing transmission of the virus with the use of facemasks (referring to medical or surgical masks, N-95 and similar respirators, cloth masks, and bandannas) by health-care workers and the public alike remains a hotly debated topic due to politicisation of discourse and decision making.

At the beginning of the pandemic, many experts advised against the use of facemasks by the public due to a sense that their potential risks, such as self-contamination, could outweigh the potential benefits, and that public use would lead to depletion of the supply needed for health-care workers. Experts then shifted their thinking about potential benefits of masks to include protecting others against infection with SARS-CoV-2 (source control), similar to how surgical masks in the operating room protect patients. However, self-protection is the main reason why infection prevention and control experts recommend health-care workers to wear a facemask when entering a patient's room who may have a viral respiratory infection. With COVID-19, however, facemasks might be beneficial for protection of both health-care workers and the public.

On Jan 30, 2020, Rothe and colleagues described SARS-CoV-2 in a number of individuals infected by a person reported to be asymptomatic who had travelled from China. This report was questioned because the index case had taken acetaminophen for jetlag, which could have masked COVID-19 symptoms. Hence, the scientific community became and remained doubtful about transmission by presymptomatic and asymptomatic individuals for some time. It has since become evident that people are infectious for at least 48 h before symptom onset (presymptomatic), that some people have only minor symptoms (paucisymptomatic), and others remain entirely asymptomatic. These individuals can transmit the virus without knowing they are infectious—the main argument for use of facemasks as a source control. In addition, there continues to be disagreement about the risk of transmission through aerosolised SARS-CoV-2. These perceived conflicts, in turn, continue to fuel the conflicting advice about the potential role and type of facemasks in the COVID-19 pandemic for health-care workers and the public.

Systematic reviews of facemask use suggest relative risk (RR) reductions for infection ranging from 6–80%, including for betacoronavirus infection (eg, COVID-19, SARS, MERS). This inconsistency might be a result of different inclusion and exclusion criteria of the type of studies; the type of included population—eg, health-care workers or the general public; possibly the type of facemask used; the outcomes considered, including laboratory-confirmed virus versus symptoms alone, as well as undesirable consequences; and the setting—eg, epidemic versus non epidemic scenarios. For COVID-19, this evidence is of low or very low certainty because it is derived from observational studies with important risk of various biases, or indirect evidence from randomised studies of other (non-betacorona) respiratory viruses with methodological limitations.

Despite the uncertainty, the range of possible RR reduction must be considered in the context of the local epidemiology and be translated into absolute risk reductions. In Norway, for example, it was estimated that 200 000 people would need to wear facemasks to prevent one new infection per week. They assumed a 40% RR reduction with the use of surgical masks. This large number needed to prevent is due to the low prevalence or baseline risk for infection. From a population perspective, one can argue that wearing a facemask would neither be worth the public's money nor outweigh any potential harms, and the decision to wear a facemask be left to the individual, depending on the values they place on the outcomes. Yet, in a setting with high baseline risks, such as a health-care workers caring for a superspreading patient with COVID-19, wearing a mask (applying the same relative effect as above) prevents the infection in up to one out of two health-care workers, and a strong recommendation that all such individuals should wear a facemask might be warranted, despite uncertainty in the evidence. The reason for this stark contrast is the context and baseline risk, not a difference in the relative effect facemasks provide. It is not yet clear where the exact threshold is for the baseline risk that justifies using facemasks in the community (or mandating them), but given the paucity of evidence for severe adverse effects that more invasive interventions have, wearing a facemask might be acceptable in many situations, despite the need for more evidence.

Where does this leave us? Acknowledgment of current uncertainty about the quality of evidence and understanding the difference between relative and absolute reductions in risk is key to sort out the many questions and the confusion about facemasks. Those developing recommendations and policy makers can make choices about the type of facemask, influenced by baseline risk, cost, equity, acceptability, and feasibility, but they should be transparent about the context and criteria they consider in their recommendations. Public health measures to implement facemask use will be more crucial in settings with higher baseline risk for transmission. There is evidence of beneficial effects in medical mask studies, and such effects might also exist for optimally designed cloth masks, although the direct evidence is currently limited to observational and droplet studies. WHO advises several populations to wear facemasks, including people with symptoms and vulnerable populations. Even

if additional studies show that facemasks have small relative effects or no effect when used broadly, framing the precautionary principles when baseline risk is high might suggest that facemasks use in community settings with reduced physical distancing might be justified. The paradigmatic situation about equity in infectious conditions such as COVID-19 is that even if some people do not have access to a facemask, those who do might prevent the spread of infection to disadvantaged populations. Furthermore, risk aversion and values will determine if people wear facemasks in low-risk settings with conditional recommendations against using a mask.

No single intervention gives invulnerability to SARS-CoV-2. From a public health perspective, it is important to emphasise the importance of other risk mitigation strategies, aimed at reducing the number, proximity, and duration of interpersonal contacts, respiratory and hand hygiene measures, and engineering measures in built environments. Facemask use should not substitute for these risk mitigation strategies, but might offer benefit. For example, in high baseline risk settings where it might be difficult to maintain physical distancing, such as work and school environments.

Future steps should include conducting high quality studies, including use of standardised cloth masks, for both the estimates of effects and contextual factors in tandem with ongoing evidence synthesis. Clearly, collaborative efforts are needed over polemicism and division for rapid scientific progress to address the current global crisis. In this regard, the Norwegian and Canadian governments have funded initiatives that map evidence and will provide a catalogue of trustworthy recommendations, including for the use of masks and will provide information to allow contextualisation to different settings. This catalogue will be strengthened by controlled trials of facemask use (eg, NCT04337541). However, the arrival of trial results should not lead to a fruitless return to the ongoing debate between risk of bias due to adherence and contamination and applicability of the findings. Indeed, these studies should prevent reliance on ecological data that cannot determine causality and they should provide the needed quantitative estimates that highly controlled laboratory studies cannot provide despite their value in understanding transmission.

In summary, the current best evidence includes the possibility of important relative and absolute benefits of wearing a facemask. Depending on the pandemic situation in a given geographical setting, the desirable consequences of wearing a facemask may or may not outweigh the undesirable consequences. These considerations should influence policy makers' recommendations starting with the involvement of the relevant stakeholders. In highly populated areas that have high infection rates—eg, USA, India, Brazil, or South Africa—the use of masks will probably outweigh any potential downsides. If larger relative effects of masks are confirmed by forthcoming trials, and the entire population wants to make a contribution to reduce transmission, then a few months of universal facemask wearing would achieve a lot, but it will come at a cost. That cost might be lower than not reopening businesses and schools once baseline risk achieves acceptable levels. As no intervention is associated with affording complete protection from infection, a combination of measures will always be required, now and during the next pandemic.

DKC is a CAAIF-CSACI-AllerGen Emerging Clinician-Scientist Research Fellow, supported by the Canadian Allergy, Asthma and Immunology Foundation (CAAIF), the Canadian Society of Allergy and Clinical Immunology (CSACI) and AllerGen NCE Inc. (the Allergy, Genes and Environment Network). ML and DM are investigators of an ongoing clinical trial on medical masks versus N95 respirators for COVID-19 in a clinical setting (NCT04296643). HJS, IN, EAA, DKC, ML, and RC were authors of a systematic review on the topic. RAM is a co-author on the IDSA COVID-19 prevention guidelines, which addresses facemasks. All other authors declare no competing interests.

Holger J Schünemann, Elie A Akl, Roger Chou, Derek K Chu, Mark Loeb, Tamara Lotfi, Reem A Mustafa, Ignacio Neumann, Lynora Saxinger, Shahnaz Sultan, Dominik Mertz
schuneh@mcmaster.ca

Department of Health Research Methods, Evidence and Impact (HJS, DKC, ML, DM, TL, EAA), and Department of Medicine (HJS, DKC, ML, DM), McMaster University, Hamilton, ON L8N 3Z5, Canada; The Research Institute of St Joe's Hamilton, Hamilton, ON, Canada (DKC); Department of Internal Medicine, and Clinical Research Institute, American University of Beirut, Beirut, Lebanon (EAA); Department of Internal Medicine, Pontificia Universidad Catolica de Chile, Santiago, Chile (IN); Division of Gastroenterology, Hepatology, and Nutrition, University of Minnesota, Minneapolis VAHCS, Minneapolis, MN, USA (SS); Department of Medicine University of Alberta, Edmonton, AL, Canada (LS); Department of Medical Informatics and Clinical Epidemiology, Oregon Health and Science University, Portland, OR, USA (RC); and Department of Internal Medicine, University of Kansas Medical Center, Kansas City, KS, USA (RM)

For more on **certainty in evidence and recommendations during the COVID-19** pandemic see *J Clin Epidemiol* 2020; published online June 6. DOI:10.1016/j.jclinepi.2020.05.030

For more on **the spread of COVID-19 in a high baseline risk situation** see *MMWR Morb Mortal Wkly Rep* 2020; **69:** 606–10

For more on **beneficial effects of face coverings** see *Thorax* 2020; published online July 24. DOI:10.1136/thoraxjnl-2020-215748

For **WHO advice on the use of masks** see https://www.who.int/publications/i/item/advice-on-the-use-of-masks-in-the-community-during-home-care-and-in-healthcare-settings-in-the-context-of-the-novel-coronavirus-(2019-ncov)-outbreak

For more on **hierarchy of controls** see https://www.cdc.gov/niosh/topics/hierarchy/default.html

For an **evidence map and a catalogue of recommendations** see www.nornesk.no/forskningskart/NIPH_mainMap.html and https://covid19.evidenceprime.com/

For more on **understanding COVID-19 transmission** see *J Gen Intern Med* 2020 (in press) https://ucsf.app.box.com/s/blvolkp5z0mydzd82rjks4wyleagt036

Hypersensitivity pneumonitis: the first diagnostic guidelines

Published **Online** August 11, 2020 https://doi.org/10.1016/S2213-2600(20)30359-3

The field of interstitial lung diseases (ILDs) is one of the most challenging in terms of diagnosis and management. Hypersensitivity pneumonitis represents a major diagnostic conundrum. The disappointing agreement (kw=0·29) between seven multidisciplinary teams from different countries on the diagnosis of hypersensitivity pneumonitis vividly reveals the magnitude of the problem. The problem is further exaggerated by the fact that although the prevalence of hypersensitivity pneumonitis varies substantially depending on geography and local ways of practice, it is frequently a major component in the differential diagnosis of ILDs.

The recently published clinical practice guidelines on the diagnosis of hypersensitivity pneumonitis in adults