

COVID-19 Rapid Evidence Profile #4 (29 April 2020)

Question

What are the most effective non-medical masks (e.g., homemade cloth masks and other types of non-medical face coverings) for preventing community transmission of COVID-19, and should they be required for all of society?

What we found

We identified 11 documents that provide highly relevant evidence to answer the question:

- 1) one highly relevant systematic review;
- 2) three highly relevant rapid reviews; and
- 3) seven guidelines that were developed using some type of evidence synthesis and/or expert opinion and by seven groups, namely two groups of multi-country teams of researchers (one publishing in BMJ and the other in The Lancet Respiratory Medicine), the Centers for Disease Control and Prevention (U.S.), the Emergency Care Research Institute (U.S.), the European Centre for Disease Prevention and Control, the Joanna Briggs Institute, and the World Health Organization.

The abstracts for the highly relevant documents are included in Appendix 1 (except for the four guidelines that did not contain an abstract).

We also identified experiences related to non-medical masks in Canada and eight other countries (China, France, Germany, Italy, New Zealand, South Korea, United Kingdom and United States), as well as current Canadian recommendations.

Evidence about effectiveness of different types of non-medical masks and whether everyone should wear them

The highly relevant but low-quality systematic review found:

- [A lack of evidence about the use of masks by those not diagnosed with COVID-19 to limit spread.](#)

Box 1: Our approach

We identified evidence addressing the question by searching the guide to COVID-19 evidence sources on 27-29 April 2020 (www.mcmasterforum.org/find-evidence/guide-to-covid-19-evidence-sources).

We identified experiences by searching jurisdiction-specific sources of evidence on the same website. Jurisdictions were chosen for one or more of the following reasons: 1) countries with high infection rates (U.S., Spain, Italy and France); 2) countries that have begun to relax some public-health measures that had been put in place to prevent the spread of COVID-19 (China, South Korea and New Zealand); and/or 3) countries that are typical comparators to Canada, given similarities in demographics and health and social systems (U.S., U.K. and New Zealand).

We searched for guidelines that were developed using a robust process (e.g., GRADE), full systematic reviews (or review-derived products such as overviews of systematic reviews), rapid reviews, protocols for systematic reviews, and titles/questions for systematic reviews or rapid reviews that have been identified as either being conducted or prioritized to be conducted. Single studies were only included if no relevant systematic reviews were identified.

We appraised the methodological quality of full systematic reviews and rapid reviews using AMSTAR. Note that quality appraisal scores for rapid reviews are often lower because of the methodological shortcuts that need to be taken to accommodate compressed timeframes. AMSTAR rates overall quality on a scale of 0 to 11, where 11/11 represents a review of the highest quality. It is important to note that the AMSTAR tool was developed to assess reviews focused on clinical interventions, so not all criteria apply to systematic reviews pertaining to delivery, financial or governance arrangements within health systems or to broader social systems.

Three highly relevant rapid reviews, of which the first two were of medium quality and the last of low quality, found:

- [No evidence that cloth masks in the community setting prevent viral respiratory illness](#)
- [Evidence is not strong enough to recommend universal wearing of masks, but such masks may be slightly protective against infection from casual community contact, modestly effective against household infections when both infected and non-infected people wear them, and useful for high-risk individuals in transient situations](#)
- [The use of cloth masks in healthcare settings might increase the rates of infection, and it should be used as last resort.](#)

Key findings from the seven highly relevant guidelines that were developed using some type of evidence synthesis and/or expert opinion include:

- [Precautionary principle drawing on best-available evidence should be used to recommend everyone wear face masks during COVID-19 pandemic](#) (guideline produced by a multi-country team of researchers)
- [Recommendations for face-mask use among the general public in community settings were inconsistent in a comparison of recommendations from different jurisdictions](#) (review of guidelines prepared by a multi-country team of researchers)
- [It is recommended to wear cloth face coverings in public settings where other social distancing measures are difficult to maintain \(e.g., grocery stores and pharmacies\), especially in areas of significant community-based transmission](#) (Centers for Disease Control and Prevention, U.S.)
- [Evidence is inconclusive about effectiveness of cloth face coverings worn by the public](#) (Emergency Care Research Institute, U.S.)
- [Non-medical face masks are less effective than medical face masks, and when asymptomatic cases in the community are assumed to be high, masks could be considered in high-risk settings \(e.g., taking public transport and visiting busy stores\)](#) (European Centre for Disease Prevention and Control)
- [Cloth masks \(e.g., cotton or gauze\) are not recommended under any circumstances, to prevent the transmission of respiratory infection in low-risk community settings](#) (Joanna Briggs Institute Evidence Summary)
- [There is no current evidence to make a recommendation for or against the use of non-medical masks made of other materials \(e.g., cotton fabric\) in the community setting, and if decision-makers proceed with advising the use of non-medical masks, the features to consider include numbers of layers of fabric/tissue, breathability of material used, water repellence/hydrophobic qualities, shape of mask, and fit of mask](#) (World Health Organization).

We provide in Table 1 (below) an overview of the type and number of documents that were identified. In addition, we provide in Table 2 a listing of each of the documents (organized by document type and sorted by relevance to the question and COVID-19), with the colour gradient used to reflect high (darkest blue) to low (lightest blue) relevance to the question and to COVID-19. We provide in Appendix 2 a list of documents excluded at the final stage of reviewing.

International and Canadian experiences related to the use of non-medical masks and whether should they be required for all of society

We summarize experiences related to using non-medical masks for preventing community transmission of COVID-19 from Canada and eight other countries (China, France, Germany, Italy, New Zealand, South Korea, U.K., and U.S.) in Table 3.

We found that all countries except New Zealand recommend some degree of face covering in limited circumstances, including when using public transit or in smaller retail stores where maintaining social distance may be difficult. China and South Korea are the only two countries among the jurisdictions examined that have recommended wearing a mask more broadly in public. A few jurisdictions (France, Germany and Italy) were found to have changed their recommendations since mid-March, however it remains unclear the extent to which these decisions were informed by changing evidence.

Table 1: Overview of type and number of documents that were identified*

Type of document	Effectiveness of different types of non-medical masks	Evidence about whether everyone should wear masks
Guidelines developed using a robust process (e.g., GRADE)	0	0
Full systematic reviews	1	3
Rapid reviews	2	3
Guidelines developed using some type of evidence synthesis and/or expert opinion	5	7
Protocols for reviews that are underway	2	0
Titles/questions for reviews that are being planned	2	0
Single studies in areas where no reviews were identified	5	12

*Note that some documents address both facets of the question and are counted in both columns

Table 2: Documents that address the question, organized by document type and sorted by relevance to the question and COVID-19

Type of document	Relevance to question	Focus	Recency or status
Guidelines developed using a robust process (e.g., GRADE)		No guidelines developed using robust processes were found	
Full systematic reviews	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Lack of evidence about use of masks by those not diagnosed with COVID-19 to limit spread (AMSTAR rating 3/6)	10 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	While face masks provide protection against infection in various community settings (subject to compliance and early use) there is no clinical research to inform their use, but their use is recommended in crowded settings (e.g., public transport)	Last searched 31 July 2014

Type of document	Relevance to question	Focus	Recency or status
		and for those at high-risk of infection during a pandemic or outbreak	
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Public perceptions of non-pharmaceutical interventions for reducing transmission of respiratory infections are mixed, with some perceiving them to be effective while others perceive them to indicate infection and worry about attracting discrimination	Literature searched 26 February 2013
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	No studies identified about the effectiveness of face mask to limit the spread of COVID-19 among undiagnosed individuals	Literature searched 15 February 2020
Rapid reviews	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks Evidence about whether everyone should wear them 	No evidence that cloth masks in the community setting prevent viral respiratory illness and may present a risk to the wearer (AMSTAR rating 6/9)	Literature searched 31 March 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	The use of cloth masks in healthcare settings might increase the rates of infection, and it should be used as last resort (AMSTAR rating 1/9)	Last search 7 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Evidence not strong enough to recommend universal wearing of masks, but may be slightly protective against infection from casual community contact, modestly effective against household infections when both infected and non-infected people wear them, and useful for high-risk individuals in transient situations (AMSTAR rating 7/11)	6 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Evidence about effectiveness of face masks was based mostly on medical-grade masks and is not sufficiently strong to support widespread use as a protective measure against COVID-19, but there is enough evidence to support the use of face masks for short periods of time (e.g., by	Literature searched 31 January 2020

Type of document	Relevance to question	Focus	Recency or status
		vulnerable individuals)	
Guidance developed using some type of evidence synthesis and/or expert opinion	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks Evidence about whether everyone should wear them 	<p>Non-medical face masks are less effective than medical face masks</p> <p>When asymptomatic cases in the community are assumed to be high, masks could be considered in high-risk settings (e.g., public transport, visiting busy stores) (European Centre for Disease Prevention and Control)</p>	8 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks Evidence about whether everyone should wear them 	<p>There is no current evidence to make a recommendation for or against the use of non-medical masks made of other materials (e.g., cotton fabric) in the community setting, and if decision-makers proceed with advising the use of non-medical masks, the features to consider include numbers of layers of fabric/tissue, breathability of material used, water repellence/hydrophobic qualities, shape of mask and fit of mask (WHO technical guidance)</p>	6 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	<p>Evidence is inconclusive about effectiveness of cloth face coverings worn by the public (U.S. - Emergency Care Research Institute)</p>	6 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	<p>Precautionary principle drawing on best-available evidence should be used to recommend everyone wear face masks during COVID-19 pandemic (guideline produced by a multi-country team of researchers)</p>	9 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear masks 	<p>Recommendations for face-mask use among the general public in community settings were inconsistent in a comparison of recommendations from different jurisdictions (multi-country comparison of guidelines)</p>	Published 20 March 2020

Type of document	Relevance to question	Focus	Recency or status
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	It is recommended to wear cloth face coverings in public settings where other social distancing measures are difficult to maintain (e.g., grocery stores and pharmacies) especially in areas of significant community-based transmission (U.S. CDC)	13 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Cloth masks (e.g., cotton or gauze) are not recommended under any circumstances, to prevent the transmission of respiratory infection in low-risk community settings (Joanna Briggs Institute Evidence Summary)	19 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	When worn properly, homemade masks may help reduce the spread of COVID-19 from infected people to non-infected people (Government of Canada)	16 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	In making recommendations for conserving N95 supply, the use of homemade masks with full face shield is considered as last resort (U.S. - Emergency Care Research Institute)	Not reported
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Guidelines for selection and use of masks to prevent COVID-19 in different populations (China's Joint Prevention and Control Mechanism of the State Council)	Last updated 4 February 2020
Protocols for reviews that are underway	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Evaluating the protective effect of homemade and cloth face masks against viral respiratory illness	Anticipated completion 31 May 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Effect of medical masks, respirators and cotton masks to prevent respiratory infections in healthcare and household settings	Anticipated completion date 29 April 2020
Titles/questions for reviews that are being planned	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Cloth masks for community compared to medical grade masks or nothing to prevent spread of respiratory viruses	Underway
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Forms of non-standard PPE (e.g., homemade masks) and evidence of their efficacy	Question under review

Type of document	Relevance to question	Focus	Recency or status
Single studies in areas where no reviews were identified*	Most of the single studies listed below acknowledge that cloth or homemade masks are less effective than medical masks, but most indicate that they should be recommended as wearing one is better than not wearing one, and they could be slightly protective and reduce the spread in community settings when combined with hand hygiene and social distancing.		
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Aerosol filtration efficiency of common fabrics used in respiratory cloth masks (lab-based study not involving humans)	Published 25 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Mask is the possible key for self-isolation in COVID-19 pandemic	Published 9 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Evidence for using cloth masks for COVID-19	Published 9 April 2020
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	Potential utilities of mask-wearing and instant hand hygiene for fighting COVID-19	Published 2 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	The role of community-wide wearing of face masks for control of COVID-19	Published 27 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	An urgent need to revise global policies about public masking to protect against COVID-19	Published 24 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Role of community-wide wearing of face masks for control of COVID-19	Published 23 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Expert opinion in Canada about who should wear a face mask	Published 22 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Hand hygiene, mask-wearing behaviours and its associated factors during the COVID-19 epidemic	Published 22 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Community universal face-mask use during the COVID-19 pandemic	Published 21 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Wearing face masks in the community during the COVID-19 pandemic	Published 20 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	The scientific rationale for the use of simple masks or improvised face coverings to trap exhaled aerosols and possibly reduce spread of COVID-19	Published 18 April 2020

Type of document	Relevance to question	Focus	Recency or status
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Possibly critical role of wearing masks in general population in controlling COVID-19	Published 16 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	Public use of face masks to prevent COVID-19	11 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear masks 	Widespread use of face masks in public may slow the spread of respiratory infections	Pre-print (non peer reviewed) posted on 6 April 2020
	<ul style="list-style-type: none"> Evidence about whether everyone should wear masks 	Face masks and human-to-human transmission of COVID-19	Published 29 March 2020

*Given that we identified several highly relevant systematic reviews, rapid reviews and guidelines, we categorized all the studies as moderately relevant and only include hyperlinked titles (not findings) along with a brief overview of the key findings from the studies.

Table 3. Statements from other jurisdictions on the use of cloth masks

Country	Statement on whether everyone should wear cloth masks
Canada	<ul style="list-style-type: none"> On 16 April 2020 Health Canada indicated that when worn properly and following guidance on the use of appropriate material, wearing a non-medical mask or face covering can reduce the spread of his or her own infectious respiratory droplets. However, it is also emphasized that wearing masks is not a substitute for other prevention mechanisms including staying at home, maintaining a two-metre physical distance from others, and avoiding touching the face.
China	<ul style="list-style-type: none"> As of 4 February 2020, people have been divided into risk levels with those at low risk and above being asked to wear a disposable medical mask, and those at very low risk of infection do not have to wear a mask or can wear a cloth mask. Those deemed to be of very low risk of infection include people who mostly stay indoors and who work or study in well-ventilated areas
France	<ul style="list-style-type: none"> The initial response in France was that it was not useful for everyone to use a mask, but the government later noted that this was informed by concerns about scarcity of medical masks. On 15 April 2020, the prime minister announced general principles for the end of the lockdown period which will include mandatory use of non-medical masks on public transportation.
Germany	<ul style="list-style-type: none"> On 15 April 2020, the national government announced as part of the easing of restrictions that non-medical masks are being recommended to be worn on public transit and in shops. On 20 April 2020, most federal states announced a requirement to wear non-medical face masks on public transportation and in retail stores, with the exception of Berlin, which has only made it mandatory on public transportation.

Country	Statement on whether everyone should wear cloth masks
Italy	<ul style="list-style-type: none"> • On 5 March 2020, the Ministry of Health suggested that homemade face masks should be used only if there is suspicion of being sick or when assisting somebody who is. • However, in easing lockdown restrictions, the Scientific and Technical Committee has since stated that safety measures including the use of cloth face masks can reduce the risk of infection among workers returning to their places of employment.
New Zealand	<ul style="list-style-type: none"> • As of 25 April 2020, the New Zealand government does not support the widespread use of face masks by healthy people in the community. • If individuals choose to purchase or make their own masks, the government has published information about how to safely do so and how to wear them, which is accompanied by an outline of the risks of using masks poorly.
South Korea	<ul style="list-style-type: none"> • Since the beginning of the outbreak, South Korea has promoted the use of masks in public. • However, the use of masks in South Korea was common prior to the pandemic, mainly as a result of air pollution.
United Kingdom	<ul style="list-style-type: none"> • As of 28 April 2020, the Scottish Government has recommended that members of the public consider using face coverings in limited circumstances including public transportation and entering small shops, but has noted that they do not need to be worn outdoors unless there is an unavoidable crowded situation.
United States	<ul style="list-style-type: none"> • The Centers for Disease Control and Prevention is recommending the use of cloth face coverings in public settings where other social-distancing measures are difficult to maintain, especially in areas of significant community-based transmission.

Wilson MG, Gauvin FP, Moat KA, Waddell K, Mansilla C, Wang Q, Lavis JN. COVID-19 rapid evidence profile #4: What are the most effective non-medical masks for preventing community transmission of COVID-19, and should they be required for all of society? Hamilton: McMaster Health Forum, 29 April 2020.

The McMaster Health Forum is one of the three co-leads of RISE, which is supported by a grant from the Ontario Ministry of Health to the McMaster Health Forum. To help Ontario Health Team partners and other health- and social-system leaders as they respond to unprecedented challenges related to the COVID-19 pandemic, the Forum is preparing rapid evidence responses like this one. The opinions, results, and conclusions are those of the McMaster Health Forum and are independent of the ministry. No endorsement by the ministry is intended or should be inferred.



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Appendix 1. Abstracts for highly relevant documents

Note that the table below only includes the abstracts for the documents that we identified on page 1 as being highly relevant to the question.

Type of document	Relevance to question	Abstract and link to full text
Full systematic reviews	<ul style="list-style-type: none"> Evidence about whether everyone should wear them 	<p>Lack of evidence about use of masks by those not diagnosed with COVID-19 to limit spread</p> <p>Background: Face masks are being used by individuals who are not medically diagnosed with COVID-19 as a means to limit the spread of COVID-19 in several countries around the world. While some countries recommend the use of face masks, other countries do not recommend their use to limit the transmission of COVID-19 among this specific population. Because of contradicting recommendations provided by health authorities of different countries, this paper aims to investigate the availability of scientific evidence on the effectiveness of face-mask use in limiting the spread of COVID-19 among individuals who are not medically diagnosed with COVID-19, through a systematic review search. This paper will further discuss concerns around current recommendations provided to those who are not medically diagnosed with COVID-19, regarding face-mask use in the context of available evidence.</p> <p>Methods: To carry out the systematic review on the effectiveness of face-mask use in limiting the spread of COVID-19 among individuals who are not medically diagnosed with COVID-19, databases Cochrane Library, EMBASE, Google Scholar, PubMed, and Scopus were searched for relevant studies. Two groups of keywords were combined: those relating to face masks and COVID-19.</p> <p>Results: The systematic review search did not find any studies that investigated the effectiveness of face-mask use in limiting the spread of this specific virus, COVID-19, among this specific population, those who are not medically diagnosed with COVID-19.</p> <p>Conclusions: In light of the finding of this systematic review search, which is a lack of scientific evidence on the effectiveness of face masks in limiting the spread of COVID-19</p>

		among those who are not medically diagnosed with COVID-19, the significance of this finding is highlighted and extensively discussed in this paper. This paper calls for, but does not limit to: 1) evidence-based recommendations; 2) considerations when providing recommendations in the absence of evidence; 3) evidence and knowledge transparency on current recommendations with the public; 4) global alignment on recommendations; and 5) further research.
Rapid review	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks Evidence about whether everyone should wear them 	<p>No evidence that cloth masks in the community setting prevent viral respiratory illness and may present a risk to the wearer</p> <p>Key findings</p> <ul style="list-style-type: none"> No trials exist which compare cloth masks to medical masks or no covering in the community setting. A single, large, well-conducted cluster trial in 15 hospitals in Vietnam compared respiratory infection in healthcare workers wearing cloth masks compared with medical masks for a five-week period. These results were assessed for relevance to the community setting. There is moderate certainty evidence that clinical and laboratory-confirmed respiratory infections are increased approximately 1.5 times when wearing cloth masks compared with medical masks. 28 more people per 1,000 may develop clinical respiratory infections if they wear a cloth mask compared to a medical mask. This could be 0 to 71 per 1,000 more infections. 22 more people per 1,000 may develop laboratory-confirmed respiratory infections if they wear a cloth mask compared to a medical mask. This could be 2 fewer to 63 per 1,000 more infections. There is very low certainty evidence that influenza-like illness is increased approximately 1.6 times when wearing cloth masks compared with medical masks. The uncertainty is due to the low rate of influenza-like infections observed in the trial. Compliance with wearing masks and levels of discomfort are similar in both groups.
	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	<p>The use of cloth masks in healthcare settings might increase the rates of infection, and it should be used as last resort (AMSTAR rating 1/9)</p> <p>Key Messages</p>

		<p>This supplemental information was generated to support decision-making and to provide information on cloth (fabric) masks during the novel coronavirus disease (COVID-19) pandemic.</p> <p>We examined the recommendations from national and international health authorities and organizations and completed a targeted search of published literature. We found the following:</p> <ul style="list-style-type: none"> • Only one randomized trial assessed cloth masks in a healthcare setting and found significantly higher rates of infection in the cloth mask group compared with the medical mask group. Guidance advises that cloth masks should be the last resort in a healthcare setting.
	<ul style="list-style-type: none"> • Evidence about whether everyone should wear them 	<p><u>Evidence not strong enough to recommend universal wearing of masks, but may be slightly protective against infection from casual community contact, modestly effective against household infections when both infected and non-infected people wear them, and useful for high-risk individuals in transient situations</u></p> <p>Abstract</p> <p>The current pandemic of COVID-19 has lead to conflicting opinions on whether wearing face masks outside of healthcare facilities protects against the infection. To better understand the value of wearing face masks we undertook a rapid systematic review of existing scientific evidence about development of respiratory illness, linked to use of face masks in community settings. METHODS: We included all study designs. There were 31 eligible studies (including 12 RCTs). Narrative synthesis and random-effects meta-analysis of attack rates for primary and secondary prevention in 28 studies were performed. Results were reported by design, setting and type of face barrier in primary prevention, and by who wore the face mask (index patient or well contacts) in secondary prevention trials. The preferred outcome was influenza-like illness (ILI), but similar outcomes were pooled with ILI when ILI was unavailable. GRADE quality assessment was based on RCTs with support from observational studies. RESULTS: Where specific information was available, most studies reported about use of medical grade (surgical paper masks). In three RCTs, wearing a face mask may very slightly reduce the odds of developing ILI/respiratory symptoms, by around 6% (OR 0.94, 95% CI 0.75 to 1.19, I2 29%, low certainty evidence). Greater effectiveness was suggested by observational studies. When both house-mates and an infected household member wore face masks the odds of further household members becoming ill may be modestly reduced by</p>

		<p>around 19% (OR 0.81, 95%CI 0.48 to 1.37, I 2 45%, 5 RCTs, low certainty evidence). The protective effect was very small if only the well person (OR 0.93, 95% CI 0.68 to 1.28, I2 11%, 2 RCTs, low uncertainty evidence) or the infected person wore the face mask (very low certainty evidence). DISCUSSION: Based on the RCTs we would conclude that wearing face masks can be very slightly protective against primary infection from casual community contact, and modestly protective against household infections when both infected and uninfected members wear face masks. However, the RCTs often suffered from poor compliance and controls using face masks. Across observational studies the evidence in favour of wearing face masks was stronger. We expect RCTs to underestimate the protective effect and observational studies to exaggerate it. The evidence is not sufficiently strong to support widespread use of face masks as a protective measure against COVID-19. However, there is enough evidence to support the use of face masks for short periods of time by particularly vulnerable individuals when in transient higher risk situations. Further high-quality trials are needed to assess when wearing a face mask in the community is most likely to be protective.</p>
<p>Guidance developed using some type of evidence synthesis and/or expert opinion</p>	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks Evidence about whether everyone should wear them 	<p>Evidence is inconclusive about effectiveness of cloth face coverings worn by the public</p> <p>Abstract Cloth face coverings, combined with good hand hygiene and social distancing, are intended to reduce the transmission risk of viral respiratory infection in the general population during an outbreak. In light of the COVID-19 outbreak, the U.S. Centers for Disease Control and Prevention (CDC) recommend the general population wear cloth face coverings in public spaces where social distancing is difficult (e.g., grocery stores, pharmacies). Cloth face coverings include any reusable, washable garments, such as hand-sewn masks, scarves, bandanas, and commercially available biking and pollution masks. This report focuses on the general public's use of these face coverings for reducing the transmission risk of viral respiratory infection.</p> <p>Recommendations for face-mask use among the general public in community settings were inconsistent in a comparison of recommendations from different jurisdictions</p> <p>Abstract Since the outbreak of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the virus that caused coronavirus disease 2019 (COVID-19), the use of face masks has become ubiquitous in China and other Asian countries such as South Korea and Japan. Some</p>

		<p>provinces and municipalities in China have enforced compulsory face-mask policies in public areas; however, China's national guideline has adopted a risk-based approach in offering recommendations for using face masks among healthcare workers and the general public. We compared face-mask-use recommendations by different health authorities (panel). Despite the consistency in the recommendation that symptomatic individuals and those in healthcare settings should use face masks, discrepancies were observed in the general public and community settings. For example, the US Surgeon General advised against buying masks for use by healthy people. One important reason to discourage widespread use of face masks is to preserve limited supplies for professional use in health-care settings. Universal face-mask use in the community has also been discouraged with the argument that face masks provide no effective protection against coronavirus infection.</p>
	<ul style="list-style-type: none"> • Evidence about whether everyone should wear them 	<p>One of the characteristics of pandemics is the high incidence of infections in all age groups. Non-pharmacological interventions have been proposed to decrease the risk of respiratory infection, including influenza and other viruses, when vaccination or specific anti-infective treatments are unavailable. There are two main types of respiratory personal protective equipment (PPE): masks designed to protect the wearer from large respiratory droplets; and respirators (N95 [United States], FFP2 [Europe], KN95 [China] and P2 [Australia and New Zealand]) designed to prevent the inhalation of small airborne particles. This evidence summary is focused on the use of masks and respirators to reduce transmission of respiratory infection in community settings.</p> <ul style="list-style-type: none"> • A systematic review found limited evidence for effectiveness of disposable medical face masks (also known as surgical masks), either worn by infected persons or by uninfected persons, for protection against influenza transmission in community settings. The review did not consider the use of respirators. An earlier systematic review examined the use of disposable masks and respirators to prevent transmission of influenza in community and healthcare settings. Among the included randomized controlled trials (RCTs), community data showed disposable medical face-mask wearing coupled with hand sanitizer use, reduced the transmission of upper respiratory infection, influenza-like illness, and/or laboratory-confirmed influenza among crowded, urban households, compared with education or hand sanitizer alone. Those in contact with an infected index case in their household who wore a P2 respirator (equivalent rating to an N95 respirator) ‘all’ or ‘most’ of the time for the first five days, were less likely to develop an influenza-like illness compared with less frequent users, or those who began hand hygiene, or hand hygiene plus a mask, within 36 hours of the confirmed index case. Observational (case-control) studies that evaluated mask and respirator use following the outbreaks of severe acute

		<p>respiratory syndrome (SARS) in 2003 produced unclear results. The authors of this systematic review concluded that limiting the transmission of influenza in community settings requires a multifaceted approach, of which masks and respirators are but one component, and continued research on their effectiveness remains an urgent priority.</p> <ul style="list-style-type: none"> • A systematic review examined the effectiveness of respiratory PPE measures, including hand hygiene and surgical face masks in preventing human-to-human influenza transmission during the 2009 A(H1N1)pdm09 pandemic. A significant protective effect was found in the one RCT where a face mask was used, in conjunction with intensified hand hygiene, in households with an infected individual over the age of two years. In a meta-analysis of moderately heterogenous observational studies, a non-significant protective effect in preventing influenza infection was also observed. Although the evidence regarding face-mask use was mixed, using face masks in situations with high risk of exposure to influenza infection was effective when used in conjunction with intensified hand hygiene and the intervention was implemented within 36 hours after symptom onset of the index case.
<p>Single studies in areas where no reviews were identified</p>	<ul style="list-style-type: none"> • Evidence about whether everyone should wear them 	<p>Widespread use of face masks in public may slow the spread of respiratory infections</p> <p>Abstract Background: The reasons for the large differences between countries in the sizes of their SARS CoV2 epidemics is unknown. Individual-level studies have found that the use of face masks was protective for the acquisition and transmission of a range of respiratory viruses including SARS CoV1. We hypothesized that population-level usage of face masks may be negatively associated SARS CoV2 spread. Methods: At a country level, linear regression was used to assess the association between COVID-19 diagnoses per inhabitant and the national promotion of face masks in public (coded as a binary variable), controlling for the age of the COVID-19 epidemic and testing intensity. Results: Eight of the 49 countries with available data advocated wearing face masks in public: China, Czechia, Hong Kong, Japan, Singapore, South Korea, Thailand and Malaysia. In multivariate analysis face-mask use was negatively associated with number of COVID-19 cases/inhabitant (coef. -326, 95% CI -601- -51, P=0.021). Testing intensity was positively associated with COVID-19 cases (coef. 0.07, 95% CI 0.05-0.08, P<0.001). Conclusion: Whilst these results are susceptible to residual confounding, they do provide ecological-level support to the individual-level studies that found face-mask usage to reduce the transmission and acquisition of respiratory viral infections.</p>

	<ul style="list-style-type: none"> Effectiveness of different types of non-medical masks 	<p><u>Medical masks are not fully protective in hospitals, but are useful for use in community settings, and when medical masks are in shortage, homemade masks made of four-layer kitchen paper and layer of polyester cloth should be helpful</u></p> <p>The surge of patients in the pandemic of COVID-19 caused by the novel coronavirus SARS-CoV-2 may overwhelm the medical systems of many countries. Mask-wearing and handwashing can slow the spread of the virus, but currently, masks are in shortage in many countries, and timely handwashing is often impossible. In this study, the efficacy of three types of masks and instant hand wiping was evaluated using the avian influenza virus to mock the coronavirus. Virus quantification was performed using real-time reverse transcription-polymerase chain reaction. Previous studies on mask-wearing were reviewed. The results showed that instant hand wiping using a wet towel soaked in water containing 1.00% soap powder, 0.05% active chlorine, or 0.25% active chlorine from sodium hypochlorite, removed 98.36%, 96.62%, and 99.98% of the virus from hands, respectively. N95 masks, medical masks, and homemade masks made of four-layer kitchen paper and one-layer cloth could block 99.98%, 97.14%, and 95.15% of the virus in aerosols. Medical mask-wearing which was supported by many studies was opposed by other studies possibly due to erroneous judgment. With these data, we propose the approach of mask-wearing plus instant hand hygiene (MIH) to slow the exponential spread of the virus. This MIH approach has been supported by the experiences of seven countries in fighting COVID-19. Collectively, a simple approach to slow the exponential spread of SARS-CoV-2 was proposed with the support of experiments, literature review, and control experiences.</p>
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Appendix 2: Documents excluded at the final stages of reviewing

Type of document	Focus
Guidelines developed using a robust process (e.g., GRADE)	
Full systematic reviews	
Rapid reviews	3D printing of N95 respirators and face shields
Guidance developed using some type of evidence synthesis and/or expert opinion	A guide on how to create, use and remove an appropriate non-medical mask (Government of Canada)
Protocols for reviews that are underway	
Titles/questions for reviews that are being planned	
Single studies in areas where no reviews were identified	