

The use of masks by asymptomatic people to reduce transmission of COVID-19

An Evidence Snapshot brokered by the Sax Institute for the Australian Commission on Safety and Quality in Health Care.
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This report was prepared by: Moore G, Rudge S, Jameson B, Du Toit A, Taha H, Jenkin R. May 2020.
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Enquiries regarding this report may be directed to the:

Principal Analyst
Knowledge Exchange Program
Sax Institute
www.saxinstitute.org.au
knowledge.exchange@saxinstitute.org.au
Phone: +61 2 9188 9500

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Introduction

This Evidence Snapshot was commissioned by the Australian Commission on Safety and Quality in Health Care and prepared by the Sax Institute. Note that it was completed within 3 days, so while a rigorous process for searching was followed it is possible that some peer reviewed or grey literature may have been missed.

As the COVID-19 pandemic in Australia is slowing, actions to manage the longer-term response and to prepare if the incidence should increase again, are under consideration. The Commission is interested in the evidence on the efficacy of wearing masks for the general public to reduce the transmission of COVID-19. Current recommendations in Australia and New Zealand do not support the use of masks by the general public who are asymptomatic. Other jurisdictions apply a risk-based approach and prioritise the use of medical masks by healthcare workers (WHO, ECDC, US CDC); or when physical distancing is not possible (Canada, Scotland, Germany). The US CDC recommends that cloth masks be worn in the community.

This review does not consider the wearing of masks by staff in healthcare settings.

Review question

What is the evidence that wearing masks by the public (asymptomatic people) reduces the transmission of COVID-19?

Methods

We searched PubMed; Google Scholar; collections of COVID-19 related research (Oxford University Centre for Evidence Based Medicine, CDC, Cochrane, ScienceDirect, Lancet, BMJ) as well as an extensive grey literature search including jurisdictions and major international organisations from Australia, New Zealand, UK, US and Canada. Additional key reports from other countries were included as identified by the content expert. We reviewed the title and abstracts of 650 peer reviewed papers. The searches were undertaken on 2–3 May 2020, and peer-reviewed and grey literature was sourced by 4 pm on 3 May. The included studies were reviewed by a content expert. We report the peer reviewed literature in Table 1 and full results in Appendix 1–6.

Summary of findings

We identified 13 peer reviewed studies and 14 commentary articles and agency reports. Although the evidence overall is very limited and of low certainty, **10 out of 13 peer reviewed studies indicated that wearing masks in community settings is likely to reduce transmission of COVID 19.**¹⁻¹⁰ **This finding appears to apply at both early^{2,5} and later phases of the pandemic.^{4,9} Where supply is limited, higher risk individuals should be prioritised.¹¹**

Key Messages

Peer reviewed literature

- We found insufficient evidence that masks are effective in reducing transmission among asymptomatic people in community settings. There was a lack of high-level evidence, with small measures of effect found in some studies. This evidence was considered of low certainty due to heterogeneity and bias.
- Nine studies tested mask use only and three studies tested masks in combination with other approaches, including handwashing and social distancing. Six studies recommended using masks in combination with other measures.
- Studies did not specify whether masks were more effective at some stages of the pandemic, however, some noted that: use should be early as possible^{2,5,6}; when measures such as social isolation are relaxed⁹; when large scale community transmission occurs or to prevent a second wave of infections.⁴
- Two modelling studies found that using masks had a significant impact when adoption was nearly universal (80% of the population), when masks were adopted early (before day 50), and there was high compliance (> 50%).^{2,6}
- Some studies suggested that wearing masks on public transport and in workplaces where social distancing is less feasible may be useful at reducing transmission; the use of masks in recreational and mass gatherings was not found to be effective.^{1,11}
- The general public appears to be amenable to masks use if it is coupled with the prospect of loosening of other restrictions, for example enabling a return to work.
- There is no evidence that mask wearing reduces adherence to other measures such as hand washing and social distancing; but public health campaigns could further emphasis the importance of these protections used together.
- Where there are insufficient masks or universal use is not implemented, high risk groups should be targeted, including the elderly, people living in high risk regions¹², people who are immunocompromised⁹, those who are particularly vulnerable.¹¹

Jurisdiction and country responses

- Current recommendations in Australia and New Zealand do not support the use of masks by the general public who are asymptomatic.

<https://www.health.gov.au/resources/publications/coronavirus-covid-19-information-on-the-use-of-surgical-masks>; <https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-novel-coronavirus-health-advice-general-public/covid-19-face-mask-and-hygiene-advice>

- While the WHO has stated that universal mask wearing is not recommended for the public, its guidance on the issue published on 6 April 2020 suggests that use of masks by the general public may be beneficial. WHO does emphasise the importance of prioritising PPE for health professionals and those caring for affected individuals.
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks>
- Some jurisdictions apply a risk-based approach and prioritise the use of medical masks by healthcare workers (WHO, ECDC); or when physical distancing is not possible (Canada, Scotland). <https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-use-face-masks-community.pdf><https://www.ecdc.europa.eu/en/publications-data/using-face-masks-community-reducing-covid-19-transmission>; <https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks/about-non-medical-masks-face-coverings.html>; <https://www.gov.scot/publications/coronavirus-covid-19-public-use-of-face-coverings/>
- In some countries mask wearing in public is legally mandated with financial and other penalties (Singapore, China including Hong Kong). <https://www.gov.sg/article/when-should-i-wear-a-mask>; <https://www.coronavirus.gov.hk/eng/health-advice.html>
- Germany has provided changing advice, with the latest position that mask wearing where social distancing is difficult, for example on public transport or shopping, should be adopted. <https://de.usembassy.gov/german-mask-regulations-state-by-state/>
- The UK government has shifted its position with advice this week that it is considering recommending or mandating mask wearing as social restrictions are eased.
- In the US, the wearing of cloth face covers for the public has been recommended by the CDC, on April 24: <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html>
- More locally, NZ advises that mask wearing by the general public is probably not required, noting however, that WHO advice suggests that wearing a mask may protect against infection.
<https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-novel-coronavirus-health-advice-general-public/covid-19-face-mask-and-hygiene-advice>

Appendices

Appendix 1: Included publications

Research

1. Brainard JS, Jones N, Lake I, Hooper L, Hunter P. Facemasks and similar barriers to prevent respiratory illness such as COVID-19: A rapid systematic review. medRxiv. 2020 Jan 1.
2. Cheng VC, Wong SC, Chuang VW, So SY, Chen JH, Sridhar S, To KK, Chan JF, Hung IF, Ho PL, Yuen KY. The role of community-wide wearing of face mask for control of coronavirus disease 2019 (COVID-19) epidemic due to SARS-CoV-2. *Journal of Infection*. 2020 Apr 23.
3. Eikenberry SE, Mancuso M, Iboi E, Phan T, Eikenberry K, Kuang Y, Kostelich E, Gumel AB. To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic. *Infectious Disease Modelling*. 2020 Apr 21.
4. Harapan H, Itoh N, Yufika A, Winardi W, Keam S, Te H, Megawati D, Hayati Z, Wagner AL, Mudatsir M. Coronavirus disease 2019 (COVID-19): A literature review. *Journal of Infection and Public Health*. 2020 Apr 8.
5. Howard J, Huang A, Li Z, Tufekci Z, Zdimal V, van der Westhuizen HM, von Delft A, Price A, Fridman L, Tang LH, Tang V. Face masks against COVID-19: an evidence review.
6. Juneau CE, Pueyo T, Bell M, Gee G, Potvin L. Evidence-based, cost-effective interventions to suppress the COVID-19 pandemic: a rapid systematic review. medRxiv. 2020 Jan 1.
7. Kai D, Goldstein G-P, Morgunov A, Nangalia V, Rotkirch A. Universal Masking is Urgent in the COVID-19 Pandemic: SEIR and Agent Based Models, Empirical Validation, Policy Recommendations. 2020.
8. Ma QX, Shan H, Zhang HL, Li GM, Yang RM, Chen JM. Potential utilities of mask-wearing and instant hand hygiene for fighting SARS-CoV-2. *Journal of Medical Virology*. 2020 Mar 31.
9. MacIntyre RC, Chughtai AA. A rapid systematic review of the efficacy of face masks and respirators against coronaviruses and other respiratory transmissible viruses for the community, healthcare workers and sick patients. *International Journal of Nursing Studies*, 2020, 103629, ISSN 0020-7489, <https://doi.org/10.1016/j.ijnurstu.2020.103629>. (<http://www.sciencedirect.com/science/article/pii/S0020748920301139>)
10. Ngonghala CN, Iboi E, Eikenberry S, Scotch M, MacIntyre CR, Bonds MH, Gumel AB. Mathematical assessment of the impact of non-pharmaceutical interventions on curtailing the 2019 novel Coronavirus. arXiv preprint arXiv:2004.07391. 2020 Apr 15.
11. Worby CJ, Chang HH. Face mask use in the general population and optimal resource allocation during the COVID-19 pandemic. medRxiv. 2020 Jan 1.
12. Stern D, López-Olmedo N, Pérez-Ferrer C, González-Morales R, Canto-Osorio F, Barrientos-Gutiérrez T. Revisión rápida del uso de cubrebocas quirúrgicos en ámbito comunitario e infecciones respiratorias agudas. *Salud Pública de México*. 2020.

Commentary and technical reports

1. Cheng KK, Lam TH, Leung CC. Wearing face masks in the community during the COVID-19 pandemic: altruism and solidarity. *The Lancet*. 2020 Apr 16.

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2. Cowling BJ, Chan KH, Fang VJ, Cheng CK, Fung RO, Wai W, Sin J, Seto WH, Yung R, Chu DW, Chiu BC. Facemasks and hand hygiene to prevent influenza transmission in households: a cluster randomized trial. *Annals of internal medicine*. 2009 Oct 6;151(7):437-46.
 3. de Bruin YB, Lequarre AS, McCourt J, Clevestig P, Pigazzani F, Jeddi MZ, Colosio C, Goulart M. Initial impacts of global risk mitigation measures taken during the combatting of the COVID-19 pandemic. *Safety Science*. 2020 Apr 15:104773. Harapan
 4. European Centre for Disease Control. Using face masks in the community: A technical report, 2020
 5. Feng S, Shen C, Xia N, Song W, Fan M, Cowling BJ. Rational use of face masks in the COVID-19 pandemic. *The Lancet Respiratory Medicine*. 2020 Mar 20.
 6. Garcia LP. Use of facemasks to limit COVID-19 transmission. *Epidemiologia e Serviços de Saúde*. 2020 Apr 22;29:e2020023.
 7. Gandhi M, Havlir D. The Time for Universal Masking of the Public for Coronavirus Disease 2019 Is Now. In *Open Forum Infectious Diseases* 2020 Apr (Vol. 7, No. 4, p. ofaa131). US: Oxford University Press.
 8. Greenhalgh T, Schmid MB, Czypionka T, Bassler D, Gruer L. Face masks for the public during the covid-19 crisis. *BMJ*. 2020 Apr 9;369.
 9. Keshtkar-Jahromi M, Sulkowski M, Holakouie-Naieni K. Public Masking: An Urgent Need to Revise Global Policies to Protect against Novel Coronavirus Disease (COVID-19).
 10. MacIntyre CR, Hasanain SJ. Community Universal Face Mask Use during the COVID 19 pandemic—from households to travelers and public spaces. *Journal of Travel Medicine*. 2020 Apr 18.
 11. Mahase E. Covid-19: What is the evidence for cloth masks?. *BMJ* 2020
 12. Pleil JD, Beauchamp JD, Risby TH, Dweik RA. The scientific rationale for the use of simple masks or improvised face coverings to trap exhaled aerosols and possibly reduce the breathborne spread of COVID-19. *Journal of Breath Research*. 2020 Apr 17.
 13. World Health Organisation
 14. Wu E, Qi D. Masks and thermometers: Paramount measures to stop the rapid spread of SARS-CoV-2 in the United States. *Genes & Diseases*. 2020 Apr 25.
 15. Wu HL, Huang J, Zhang CJ, He Z, Ming WK. Facemask shortage and the novel coronavirus disease (COVID-19) outbreak: Reflections on public health measures. *EClinicalMedicine*. 2020 Apr 3:100329.

Appendix 2: Search strategy

Key concepts

Concept 1	Concept 2	Concept 3	Concept 4
Mask*	Coronavirus	Infect*	People/Public
Facemask*	COVID*	Transm*	Community
	CoV	Prevention	Universal

Timeframe

- Last 12 months

Inclusion and exclusion criteria

We **included** combinations of the following key words: mask, face mask, coronavirus, COVID, transmission, infection, universal, community. We included: systematic reviews, narrative reviews, and primary research. We also included peer reviewed commentaries. Agency and jurisdictional searchers are listed in Appendix 5 and 6.

We **excluded** studies that examined the use of masks in hospitals, outpatients, primary care and dental setting; by healthcare workers, symptomatic people or people diagnosed with COVID-19; studies that described the design of masks or tested their effectiveness or comparative effectiveness; studies focusing on mask shortages; studies on the re-use or disposal of masks; legal or regulatory related studies and studies that examined influenza only. We excluded correspondence, new, letters, editorials and protocols.

We did not critically appraise the included studies and note that some studies may have been published before peer review was completed.

Sources

1. PubMed
 - Search: (((coronavirus[Title/Abstract] OR COVID[Title/Abstract] OR COVID*[Title/Abstract]) AND mask[Title/Abstract] OR face mask[Title/Abstract])
 - Limited to articles published from 30 April 2019 to 30 April 2020.
 - Excluded editorials, news, correspondence, letters
2. Cochrane Collaboration
 - Keywords: Masks and COVID,

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- Limited to articles published from 30 April 2019 to 30 April 2020.
3. Lancet COVID Collection
 - Keywords: Masks and COVID,
 - Limited to articles published from 30 April 2019 to 30 April 2020.
 4. BMJ COVID Collection
 - Keywords: Masks and COVID,
 - Limited to articles published from 30 April 2019 to 30 April 2020.
 5. ScienceDirect COVID Collection:
 - Keywords: Masks and COVID,
 - Selected review articles, mini review, and research articles limited to 2020
 6. Google Scholar
 - Keywords: Effectiveness Mask COVID
 - First 6 pages of 10 articles per page.

Appendix 3 Search results

A Database	B Results	C Excluded after title & abstract screening	D Remove duplicates	E Full text review	F Excluded after full text review	G FINAL INCLUDED
	n=	n=	n=	n=	n=	n=
1 PubMed	252	227	0	25	12	13
2 Cochrane COVID	10	9	0	1	1	0
3 Lancet COVID	6	0	5	1	1	0
4 BMJ COVID	1	1	0	0	0	0
5 Science direct COVID	330	320	4	6	2	4
6 Google Scholar	60	43	7	10	1	9
7 CEBM	1	0	0	1	0	1
TOTAL	660	600	16	45	18	Total n=27

Appendix 4: Data extraction tables

4.1 Peer reviewed studies

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
Brainard JS et al. 2020	Rapid systematic review and meta-analysis	The protective effect of wearing facemasks in community settings.	<p><i>“Wearing a facemask may very slightly reduce the risk of developing ILI [primary infection], by around 6%.”</i></p> <p>For studies based in the general community, facemask wearing was <i>“consistently protective [i.e. the] point-estimates of all included studies favoured facemask wearing”</i>.</p>	No	No, except <i>“facemasks for short periods of time by particularly vulnerable individuals when in transient higher risk situations.”</i>	<p>Outcome variable was <i>“influenza-like illness (ILI)”</i>, not COVID-19 per se although study addresses COVID-19.</p> <p>The studies included had high heterogeneity of effects and noted considerable methodological problems. Evidence was of low to very low certainty.</p>

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
Cheng VC-C et al. 2020	Comparative study	The effect of community-wide mask usage to control COVID-19 in Hong Kong, compared to similar countries.	<p>COVID-19 incidence in HK (129.0 per million) was significantly lower ($p < 0.001$) than that of other developed countries chosen as comparisons, despite HK's population density. The countries with the next highest incidence were South Korea (200.5 p.m.), and Singapore (259.8 p.m.).</p> <p>Further, of 14 identified clusters of infection (totalling 124 cases of 961 total), 11 were associated with "mask off activities" (e.g. restaurants and gyms) and only 3 clusters were associated with "mask on activities".</p>	No	<p>Yes.</p> <p>Recommend community-wide mask usage.</p>	Very high rates of compliance for face mask use in HK noted (estimated over 96%).
Eikenberry SE et al. 2020	Modelling	<p>Nonlinear differential equation SEIAR models (deterministic).</p> <p>(A=asymptomatic infectious)</p>	<i>"Model simulations ... suggest that broad adoption of even relatively ineffective face masks may meaningfully reduce community transmission of COVID-19 and decrease peak hospitalizations and deaths. Moreover, mask use decreases the effective transmission rate in nearly linear proportion to the product of mask effectiveness (as a fraction of potentially infectious</i>	No	<p>Yes.</p> <p>Adoption earlier in the pandemic is preferable.</p> <p><i>"The community-wide benefits are likely to be greatest when face masks are used in conjunction with other non-pharmaceutical</i></p>	

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
			<i>contacts blocked) and coverage rate (as a fraction of the general population), while the impact on epidemiologic outcomes (death, hospitalizations) is highly nonlinear, indicating masks could synergize with other nonpharmaceutical measures. Notably, masks are found to be useful with respect to both preventing illness in healthy persons and preventing asymptomatic transmission."</i>		<i>practices (such as social-distancing), and when adoption is nearly universal (nation-wide) and compliance is high."</i>	
Cui et al. 2020	Modelling	Two models: 1. Dynamic network based compartmental SEIR (stochastic) 2. Individual-level ABM (agent-based model)	1) Significant impact under (near) universal masking when > 80% of population wears masks, vs minimal impact when only < 50% of population wears masks 2) significant impact when universal masking is adopted early, by Day 50 of a regional outbreak, vs minimal impact when universal masking is adopted late. These effects hold even at the lower filtering rates of homemade masks.		Yes. ".. our theoretical models and empirical results argue for urgent implementation of universal masking in regions that have not yet adopted it."	"Combined with other NPIs including social distancing and mass contact tracing, a "mouth-and-nose lockdown" is far more sustainable than a "full body lockdown", from economic, social, and mental health standpoints."

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
Ngonghala CN et al. 2020	SEIR model with elaborations for quarantining and asymptomaticity, implemented as a Kermack-McKendrick-type mathematical model, i.e. deterministic nonlinear differential equations.	"[Assess] the population-level impact of ...control and mitigation strategies", i.e. "social-distancing, contact-tracing, quarantine, isolation, and the use of face-masks in public".	"This study shows that the use of face-masks in public is always useful, and their population-level impact increases [with] increases [in] efficacy and coverage. In particular, even the use of low efficacy masks will greatly reduce the burden of the pandemic if the coverage in their usage in the community is high enough. Furthermore, our study shows that combining the masks-based strategy with the strict social distancing strategy is more effective than the singular implementation of either strategy."		Implicitly, Yes. <i>"COVID-19 is a disease that appears to be controllable using basic non-pharmaceutical interventions, particularly social-distancing and the use of face masks in public (especially when implemented in combination)."</i>	Model was parameterised on NY state and US data. Shares 3 authors with Eikenberry paper, and results are consistent with that paper.

Worby CJ et al. 2020	SEIR models coupled with economic models of face mask distribution.	<i>“[E]xamined the role of face masks in mitigating the spread of COVID-19 in the general population... [and] the optimal deployment of face masks when resources are limited.”</i>	<i>“[F]ace masks, even with a limited protective effect, can reduce infections and deaths, and can delay the peak time of the epidemic. We consistently found that a random distribution of masks in the population was a suboptimal strategy when resources were limited. Prioritizing coverage among the elderly was more beneficial, while allocating a proportion of available resources for diagnosed infected cases provided further mitigation.”</i>	<p>Yes (implicitly).</p> <p>Re: mask distribution, the authors note: <i>“...prioritizing the elderly population and retaining a supply of masks for identified infectious cases generally leads to a larger reduction in total infections and deaths than a naïve allocation of resources.”</i></p> <p>Re: relaxation of social distancing, they note: <i>“Face mask use could be a particularly important component of transmission mitigation once social distancing measures are relaxed, and potential exposures rapidly increase. Preparing an adequate supply of face masks for such a transitional period could help to prevent a potentially costly second peak.”</i></p>
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Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
Harpan et al. 2020	Literature review (COVID-19).	Reviewed the causative agent, pathogenesis and immune responses, epidemiology, diagnosis, treatment and management of the disease, control and preventions strategies.	N/A	N/A	Yes. If large-scale community transmission occurs, wearing personal protective equipment such as facemask should also be enforced in combination with other measures.	
Howard et al. 2020	An Evidence Review	synthesize the relevant literature to inform: 1. transmission characteristics of 2. COVID-19, 3. filtering characteristics and efficacy of masks, 4. estimated population impacts of widespread community mask use. 5. sociological considerations for	Near-universal adoption of non-medical masks when out in public, in combination with complementary public health measures could successfully reduce effective-R to below 1.0, thereby stopping community spread.	N/A	Yes. Face masks are a valuable tool to reduce community transmission when used in conjunction with widespread testing, contact tracing, quarantining of anyone that may be infected, hand washing, and physical distancing. All of these measures have the potential to reduce the	

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
		policies concerning mask-wearing.			period of lockdown required. Mask wearing may be critical to preventing a second wave of infections from overwhelming the health care system – Further research is urgently needed here.	
Juneau et al. 2020	Rapid systematic review	Provide a comprehensive summary of the evidence on epidemic control, with a focus on cost-effectiveness.	Face masks, when combined with hand washing, swift contact tracing & case isolation and protective equipment measures, is likely the most cost-effective strategy.	N/A	Yes. Wearing face mask as early as possible with other measures.	
Qing-Xia Ma et al 2020	1. Support of experiments 2. Literature review 3. Control experiences	1. Efficacy of three types of masks and instant hand wiping was evaluated using the avian influenza virus to mock the coronavirus.	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	Yes. 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	

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
		2. Previous studies on mask-wearing were reviewed.		to erroneous judgment.	experiences of seven countries in fighting against COVID-19	
Machida et al. 2020	Cross-sectional study based on internet-based survey. A total of 2400 people (50% male: 20–79 years) were selected between February 25 and 27, 2020, from registrants of an Internet research company, to complete a questionnaire.	Implementation status of personal protective measures by ordinary citizens in Japan during the coronavirus disease 2019 (COVID-19) outbreak.	The author did not consider face mask per se and discussed the personal protective measure in general.	The protective measures implemented by ordinary citizens are insufficient.	Further public awareness activities are required	
MacIntyre & Chughtai 2020	Systematic review of randomised	The use of respiratory protection by healthcare workers,	In the community, masks appeared to be more effective than hand hygiene alone, and both together are more protective.	The use of masks by sick patients	Yes. The study suggests that community mask use by well people	

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
	controlled clinical trials (n=19)	sick patients and community members.		is likely protective. Medical masks were not effective, and cloth masks even less effective when used by sick patients.	could be beneficial, particularly for COVID-19, where transmission may be pre-symptomatic. Masks may be more protective for well people.	
Stern D et al. 2020	Rapid Review. 21 papers including 6 systematic reviews.	Assessed effectiveness of using surgical masks in community settings to reduce COVID-19 infection or other acute viral respiratory infection, compared to not using surgical masks.	Did not find sufficient evidence to support the general use of surgical masks to reduce the number of viral respiratory infections.	No	No.	
Marasinghe et al. 2020	Systematic review	Investigated the effectiveness of face mask use in limiting the spread of this specific virus, COVID-	The systematic review found no studies that investigated the effectiveness of face mask use in limiting the spread of COVID-19 among people	No	NA	

Author, year	Study design n=	What did they test or review?	Results	Unexpected consequences (Y/N)	Authors recommend Y/N and with what conditions (if any) or timing (stage of pandemic)	Other
		19 among this specific population, those who are not medically diagnosed with COVID-19.	who are not medically diagnosed with COVID-19.			

4.2 Peer reviewed commentary and organisation commentaries

Author, Year	Summary	Authors recommend mask use?
Chan and Yuen 2020	Paper addresses three questions: 1. Can infected individuals reduce the risk of spreading the virus to others by wearing facemasks? 2. Can uninfected people reduce the risk of infection by wearing facemasks? 3. Can widespread use of facemasks in a population can facilitate the control of an epidemic? And discusses cost versus benefit.	In high risk regions: along with other measures wearing a facemask might assist to reduce spread. Low risk regions (no sustained human-to- human transmission): might not be necessary or cost effective.
Cheng, Lam, Luen 2020	Discusses the need for masking wearing by community members to increase source (airborne particles) control.	Yes, complementary to social distancing and hand washing.
De Bruin et al. 2020	Overview of lessons learnt on the effectiveness of measures used to reduce spread of COVID-19.	Yes, proper use of face masks by the public along with other measures such as hand hygiene and isolation of infected people could offer additional benefit.
Feng et al. 2020	Comparison of face mask use recommendations by different health authorities.	No, universal use of face masks could be considered if supplies permit.
Garcia 2020	Overview of the potential benefits of using facemasks to stop the spread of COVID-19.	No, recommendation on use. Recommends there needs to be more research.
Ghandi and Havlir 2020	Paper recommending the universal masking of the US public during the coronavirus disease.	Yes, within the U.S context.
Greenhalgh et al. 2020	A paper recommending the use of facemasks based on the idea there is little to lose and potentially a significant amount to gain.	Yes, policy makers should encourage public use of facemasks on precautionary grounds.
Keshtkar-Jahromi, Sulkowski and Holakouie-Naieni 2020	A paper calling for a global review by WHO and country leaders on the wearing of facemasks for the general public.	No recommendation, however calls for evidence to be reviewed.
MacIntyre & Hasanain 2020	Overview of available evidence on universal face mask use (UFMU) to reduce spread of COVID-19.	Yes, if epidemic control is poor, until an effective vaccine is available.
Mahase 2020	Examination of the evidence for wearing cloth masks.	No recommendation.

Pleil et al. 2020	An overview of community use of a variety of facemasks to prevent the spread of COVID-19.	Yes, in addition to other measures such as social distancing.
Wu & Qi 2020	Overview on why the wearing of masks in public and the use of thermometers should be added to the US president's coronavirus guidelines for America " <i>15 Days to Slow The Spread.</i> "	Yes, in the US context.
Pradhan	Implementation of preventive protective measures.	Yes.
Wu and Huang	To effectively curb the rapid spread of SARS-CoV-2, two more control measures, facemasks and temperature taking are proposed for inclusion.	Yes.

Appendix 5: McMasters guide to COVID-19 evidence sources

Webpage and link	Summary of contents
World Health Organization	Technical guidance
National Institutes of Health	Treatment guidelines
National Institute for Health and Care Excellence	Rapid guidelines
BIGG	International database of GRADE guidelines
National COVID-19 Living Evidence Task Force	Guidelines for healthcare professionals
Johanna Briggs Institute	Infection control and prevention measures for health professionals and for health organisations
Cochrane systematic reviews	Specialised collection of COVID-19
US Veterans' Affairs (VA) Evidence Synthesis Program	Inventory of systematic reviews (completed and in progress) focused on COVID-19, with flags for reviews meeting minimum quality standards and for living reviews
Evidence Aid	Summaries of systematic reviews that may be relevant to COVID-19 in eight broad areas (infection prevention and control; clinical characterization and management; therapeutics and vaccines; public-health interventions; health systems and services; epidemiology; ethical considerations; and social science in response)
New South Wales' Agency for Clinical Innovation	COVID-19 Critical Intelligence Unit
National Collaborating Centre for Methods and Tools	COVID-19 Rapid Evidence Review
Ontario Health's Quality Business Unit	Special Reports: Health Quality Ontario's reports and publications.
SPOR Evidence Alliance	Methods and Applications Group in Indirect Comparisons (MAGIC) Network Meta-Analysis team (part of the CIHR Drug Safety and Effectiveness Network) – Coming soon, but with existing rapid reviews listed below
Knowledge to Policy Center	Knowledge to Policy Centre - Lebanon
Norwegian Institute of Public Health	Live map of COVID-19 evidence

National Institute for Health and Care Excellence (NICE)	COVID-19 related material
COVID-NMA	Living evidence map and living network meta-analysis
EPPI Centre	Living evidence map of human studies organised by 11 areas of focus
Norwegian Institute of Public Health	Living evidence map of human, animal, in vitro and in silico studies organised by eight areas of focus,
COVID-19+ by McMaster PLUS	Critically appraised systematic reviews and single studies organised by quality level and document type
DistillerSR	Curated, tagged and downloadable references to single studies
L*VE by Epistemonikos	Existing systematic reviews of effects and the primary studies, including trials, that were included in the reviews
LitCovid from PubMed	Systematic reviews and single studies organised by mechanism, transmission, treatment, case report, and epidemic forecasting
TRIP database	Includes systematic reviews and single studies organised by document type
World Health Organization database	Single studies
BMJ	Coronavirus Hub
CellPress	Coronavirus Hub
EBSCO	COVID Information Portal
Elsevier	Novel Coronavirus Information Centre
Lancet	COVID Resource Centre
New England Journal of Medicine	A collection of articles and other resources on the Coronavirus (COVID-19) outbreak, including clinical reports, management guidelines, and commentary
Sage	COVID-19 specific research
SpringerNature	COVID-19 specific research
SSRN	Coronavirus and Infectious Disease Research page
Wiley	COVID-19: Novel Coronavirus Content
Wolters Kluwer	COVID-19 Resources & Tools (Coronavirus Resources)
Centers for Disease Control and Prevention	Sources of data contained in systematic reviews and single studies

<u>COVID-19 Open Research Dataset Challenge (CORD-19)</u>	Articles from a broader range of sources presented in a way that supports natural-language processing
<u>Doctor Evidence</u>	Articles from a broader range of sources presented in a way that supports natural-language processing
<u>Rayyan</u>	Articles from similar sources and presented in a way that supports natural-language processing
<u>EPI-WIN</u>	WHO Information for Network for Epidemics
<u>Africa Evidence Network</u>	COVID-19 related content
<u>WHO Regional Office for Europe</u>	Technical guidance
<u>Government of Canada</u>	COVID information for Canada
<u>CanCOVID</u>	COVID information for Canada
<u>Government of Ontario</u>	COVID information for Ontario, Canada
<u>Public Health Ontario</u>	Information from Public Health Ontario on COVID.
<u>Chinese Center for Disease Control and Prevention</u>	COVID information
<u>Health Information and Quality Authority</u>	COVID related publications
<u>American University of Beirut</u>	COVID related material
<u>CHAIN</u>	COVID related material
<u>Public Health England</u>	Collection of COVID material
<u>Center for Disease Control</u>	COVID communication resources
<u>Johns Hopkins Medicine POC-IT Guide</u>	Collection of COVID material

Appendix 6: Jurisdictions

National Governments	
Australia	https://www.health.gov.au/resources/publications/coronavirus-covid-19-information-on-the-use-of-surgical-masks
Canada	https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks/about-non-medical-masks-face-coverings.html
New Zealand	https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-novel-coronavirus-health-advice-general-public/covid-19-face-mask-and-hygiene-advice
United Kingdom (Scotland)	https://www.gov.scot/publications/coronavirus-covid-19-public-use-of-face-coverings/
United Kingdom (Ireland, England and Wales)	Nil.
United States CDC	https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/cloth-face-cover.html https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html
Other jurisdictions and organisations	
European Centre for Disease Prevention and Control	https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-use-face-masks-community.pdf https://www.ecdc.europa.eu/en/publications-data/using-face-masks-community-reducing-covid-19-transmission
World Health Organization	https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/when-and-how-to-use-masks
Singapore	https://www.gov.sg/article/when-should-i-wear-a-mask

Hong Kong	https://www.coronavirus.gov.hk/eng/health-advice.html
NZ	https://www.health.govt.nz/our-work/diseases-and-conditions/covid-19-novel-coronavirus/covid-19-novel-coronavirus-health-advice-general-public/covid-19-face-mask-and-hygiene-advice
Germany	https://de.usembassy.gov/german-mask-regulations-state-by-state/

Appendix 7: Authors

This report was prepared by Gabriel Moore, Sian Rudge, Rebekah Jenkin, Brydie Jameson, Anton Du Toit, and Haitham Taha.

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