

A systematic review investigating the effectiveness of face mask use in limiting the spread of COVID-19 among medically not diagnosed individuals: shedding light on current recommendations provided to individuals not medically diagnosed with COVID-19

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Systematic Review

Keywords: COVID-19, coronavirus, 2019-nCoV, face mask, N95 respirator, surgical mask, medical mask, personal protective equipment, global health

Posted Date: March 27th, 2020

DOI: <https://doi.org/10.21203/rs.3.rs-16701/v2>

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Version of Record: A version of this preprint was published on September 2nd, 2020. See the published version at <https://doi.org/10.14202/IJOH.2020.109-117>.

Abstract

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.

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.

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.

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 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.

Background

Medical or surgical masks¹ or N95 respirators,² hereinafter referred to as face masks, are being used by individuals who are not medically diagnosed with Coronavirus disease 2019 (COVID-19)³ as a means to limit the spread of the virus in several countries across the globe. The use of face masks as a means to limit the spread of COVID-19 has been discouraged or not recommended for certain populations such as

individuals who are not medically diagnosed with COVID–19 in various countries. While countries such as Australia, Canada and the United States of America do not recommend that this specific population wear face masks as a means to limit the potential spread of COVID–19, health officials in countries like China, Indonesia, and the Philippines have supported the use of face masks to limit the spread of COVID–19 among this specific population. [1] [2] [3] [4] [5] [6] [7] [8]

Recommendations that have been provided by health professionals in regard to wearing a face mask to limit the spread of COVID–19 among this specific population include a mix of varying information. These recommendations were collected through news outlets and web pages of public health entities to describe the background of the issue in this paper because using news outlets and web pages have been the primary method of sharing recommendations with the public. In an interview with the former health secretary of the Philippines, on Cable News Network (CNN) Philippines, a quote states as follows: “It [surgical mask] is not 100 percent effective because there are still gaps where air can flow through, but it’s better than not wearing any’, adding it’s about 90 percent effective.” [5] Further, the interviewee clarified to CNN Philippines that “it may be safe not to wear face masks in areas where one is sure that no person with coronavirus has entered.” [5] However, the former health secretary of Philippines further added by saying, “If you are at the mall, you don’t know who else are there if they came from China and has the coronavirus.” [5] It was reported on January 30, 2020, that “at least two Chinese provinces now require face masks to be worn in public.” [7] Further, in an interview with the secretary of the Health Ministry Disease Control and Environmental Health Directorate General in Indonesia, a recommendation states that “as long as we use it correctly, a [surgical] mask is enough protection from the virus or bacteria.” [8] The recommendation continued on to say that, “the masks should be used mainly by sick people to prevent the spread of the virus while coughing. The mask also protects healthy people from being infected while in public places.” [8] It is evident from the above quotes that health officials in China, Indonesia, and the Philippines are in support of face mask use to limit the spread of COVID–19 among those who are not medically diagnosed with COVID–19.

Meanwhile in Canada, the British Columbia Centers for Disease Control and Prevention’s (BCCDC) public recommendation was for face masks to be used by only those who are already ill. [3] “It may be less effective to wear a mask in the community when a person is not sick themselves. Masks may give a person a false sense of security and are likely to increase the number of times a person will touch their own face—to adjust the mask, etc.” [3] The chief medical officer of Ontario, Canada said, “‘We never recommend wearing a mask in public’ because many people don’t use them properly: Reaching underneath them to touch your face, for instance, spreads germs. N95 respirator masks (so named because they’re designed to stop 95 percent of small particles from reaching the nose and mouth) only work if they fit properly, which they won’t for children or people with facial hair.” [1] An immunology professor at the University of Toronto, Canada said that “the issue with [the surgical mask] is it obviously doesn’t protect your eyes and they’re loosely fitting” and that “there’s an opportunity for something to come within areas where it’s not tightly fitted, through your nose or neck.” [9] The interviewee further added that “the coronavirus is transmitted through human-to-human contact, which includes droplets produced while sneezing or coughing” noting that “wearing a surgical mask, that is very well-fitted, would

reduce the amount of virus you'd be exposed to.” [9] In the USA, the Center for the National Center for Immunization and Respiratory Diseases said in a briefing on January 30, 2020 “‘we don't routinely recommend the use of face masks by the public to prevent respiratory illness. And we certainly are not recommending that at this time for this new virus’ and ‘we want our actions to be evidence-based and appropriate to the current circumstance’ which did not justify the use of face masks for people who have not been directly exposed to the virus”. [2] The state of New South Wales also does not recommend the use of masks for the general population. [4] These quotes and information provided to the public in countries like Australia, Canada, and the United States of America provide a mixture of recommendations but mostly not in support of face mask use among individuals who are not medically diagnosed with COVID-19.

The concern is around the contradicting public health recommendations provided to those who are not medically diagnosed with COVID-19, which is a large population. Due to contradicting recommendations provided by public health professionals and entities of different countries, there is confusion and lack of clarity about the effectiveness of wearing face masks in limiting the spread of COVID-19 among those who are not medically diagnosed with COVID-19 globally. Therefore, 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 gathered through this systematic review. To the author's knowledge, there have been no previous systematic reviews done on the effectiveness of face mask use in limiting the spread of COVID-19 among individuals who are not medically diagnosed with COVID-19 to shed light on current recommendations provided to individuals medically not diagnosed with COVID-19.

Prior to continuing, it is important to make a note of the population this paper focuses on: Individuals who are not medically diagnosed with COVID-19. Individuals who are “not medically diagnosed with COVID-19” include those who may have been exposed to the virus and are asymptomatic; pre-symptomatic; symptomatic but have not yet been diagnosed with COVID-19 by a healthcare professional, therefore, may not be aware that they have COVID-19 and; those who have not been exposed to the virus. The first three groups of individuals are impossible to distinguish from one another in terms of whether they carry COVID-19 and a risk of spreading the virus in public spaces. This paper will only focus on individuals who are not medically diagnosed with COVID-19 as this population has been provided with varying recommendations.

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 (1993 - 2nd week of February 2020), EMBASE (1974 - 2nd week of February 2020), Google Scholar (2004-2nd week of February 2020), PubMed (1950 - 2nd week of February 2020) and Scopus

(1966 - 2nd week of February 2020) were searched by one reviewer for relevant studies. Two groups of keywords were combined: those relating to COVID-19 and face masks (Figure 1). Retrieved articles were searched for relevant articles by screening the title and abstract by one reviewer.

Inclusion criteria

1) Randomized control trials (RCTs), cohort, retrospective or prospective studies; 2) studies that evaluated the effectiveness of face masks in limiting the spread of COVID-19 in community settings; and 3) studies that were in English.

Exclusion criteria

If the abstract did not relate to the effectiveness of face masks in limiting the spread of COVID-19 in community settings, the study was excluded. Commentaries were excluded.

Results

This systematic review search did not find any studies that investigated the effectiveness of face masks in limiting the spread of this specific virus, COVID-19 among this specific population, those who are not medically diagnosed with COVID-19 (Figure 2). The lack of research on the effectiveness of face masks in limiting the spread of COVID-19 among individuals who are not medically diagnosed with COVID-19 and how these findings have an effect on the current recommendations will be discussed in the discussion below.

Discussion

This systematic review that searched for scientific evidence around the effectiveness of face masks in limiting the spread of COVID-19 among individuals who are not medically diagnosed with COVID-19, did not find any research studies that focused on the effectiveness of face mask use in tackling this specific virus in this specific population. Although the findings of this systematic review did not find any studies, having found that there is no scientific evidence that the current public health recommendations are based on regarding the use of face masks among this specific population, is an important finding that needs to be shared with the scientific community and the public. It is important to bring attention to the lack of scientific evidence because the lack of scientific evidence questions the basis of contradicting and varying public health recommendations on face mask use that have been provided to those who are not medically diagnosed with COVID-19 around the world since the beginning of COVID-19 outbreak (provided in the background). In addition, bringing attention to the lack of scientific evidence on the effectiveness of face masks in limiting the spread of COVID-19 among this specific population can encourage novel and innovative research approaches to further investigate the subject. In this section, the author discusses the importance of the finding of this systematic review, in the context of providing public health recommendations amid an outbreak and the need for further research.

Evidence-based recommendations

The most important requirement for further research on this subject is the need for evidence-based recommendations on widely used precautionary methods such as face mask use during an outbreak like COVID-19. According to experts in the field of public health, there are multiple benefits to practicing evidence-based approaches in public health such as the increased availability of higher quality information on best practices, increased likelihood of successful prevention programs and policies, and increased efficiency in the use of public and private resources. [10] [11] [12] [13] [14] Current literature states that ideally public health professionals should always incorporate scientific evidence when planning and implementing programs, developing policies and evaluating progress, which also applies to when providing public recommendations. [14] [15] Therefore, it is best that recommendations are based on best available scientific evidence whether the recommendation is to wear or not to wear face masks in community settings among different types of sample populations. Recommendations that are not supported by scientific evidence can create controversy and confuse the public as well as health authorities around the world, creating contradicting and inconsistent recommendations. Such recommendations not only create confusion and controversy but also increase the risk of unnecessary spread of the infection.

As an example, in a situation where a pre-symptomatic or symptomatic individual with COVID-19 who has not yet been medically diagnosed, who is not wearing a face mask, coughs or sneezes without covering his/her face, they could be releasing respiratory droplets. The World Health Organization (WHO) states that “people can also catch COVID-19 if they breathe in droplets from a person with COVID-19 who coughs out or exhales droplets. This is why it is important to stay more than 1 meter (3 feet) away from a person who is sick.” [16] If these individuals are not wearing a face mask, the risk of spreading the infection through coughing or sneezing out droplets is higher. On the other hand, if healthy individuals in close proximity are not wearing face masks, they may be at a higher risk of contracting COVID-19 through respiratory droplets since transmission through droplets is one of the common methods of transmission of COVID-19. [16] Such kind of potential transmission is not rare especially in public transit during rush hour in any part of the world.

Health authorities in some countries may be implying that wearing a face mask may not be effective in protecting a healthy individual in this situation. [1] [2] [3] Meanwhile some health officials in countries like the Philippines have brought attention to the possibility of this kind of transmission and recommended the use of face masks. [5] The WHO provides a recommendation stating that “relatives or caregivers to individuals with suspected 2019-nCoV infection with mild respiratory symptoms should wear a medical mask when in the same room with the affected individual” suggesting that wearing a medical mask is useful in preventing the transmission of COVID-19 to those who are not medically diagnosed with the virus in some scenarios. [17] Although again, there is no scientific evidence to support this recommendation for this specific coronavirus according to the findings of this review. This recommendation has likely been provided to err on the side of caution by public health entities. However, it is questionable why the same recommendation does not apply to those who have not yet been exposed

to the virus and are not relatives of an individual suspected with COVID-19, who can still be exposed to an infected individual in public spaces such as in the above public transit scenario. If face masks recommended above are effective in keeping out droplets between a sick family member and healthy family member, why are the same face masks ineffective in public spaces where there might be infected individuals who are not wearing face masks? Does wearing a face mask protect healthy individuals in close proximity in public spaces at least to some extent? Is not wearing a face mask at all in the situation in public transit beneficial than wearing one? These are questions that the general population likely have and should have clear answers to.

Currently, there is no known effective approach to prevent such type of transmission to healthy individuals other than to assume that pre-symptomatic or symptomatic individuals who have not yet been medically diagnosed follow recommended precautionary methods such as hand hygiene, cough and sneeze etiquette, and wearing a face mask. It is important to note here that asymptomatic, pre-symptomatic or symptomatic individuals who have not been medically diagnosed are impossible to distinguish from one another in terms of whether they carry COVID-19 and a risk of spreading the virus in public spaces. To be unsure of how to prevent the above type of transmission is dangerous during an outbreak like COVID-19 or a similar but worse type of coronavirus that humans may face in the future.

As demonstrated in the above information, the evidence behind recommendations provided regarding face mask use to those who are not medically diagnosed with COVID-19 is somewhat unclear and inconsistent, bringing some uncertainty around the current recommendations. Further scientific research on face mask use is imperative to answer the above questions and concerns to resolve the controversy and lack of clarity around face mask use and to provide evidence-based public health recommendations on whether to wear or not to wear face masks among different populations amid a fast-spreading outbreak like COVID-19.

Providing recommendations on the use of face masks in the absence of evidence

When providing recommendations in the absence of evidence regarding a novel virus, where the knowledge about the virus is still evolving, there are important things to keep in mind. To answer concerns associated with the use of face masks, researchers and health care professionals must question if the potential risks associated with wearing face masks incorrectly outweigh the potential benefits of wearing face masks correctly when followed by other precautionary practices. Potential risks of face mask use as identified by health professionals around the world include: increased possibility of spreading germs due to the misuse of face masks such as touching the outside of the face masks and retouching underneath the face mask to touch the face; increased likelihood of people touching their own faces because of the face masks, for example to adjust the masks; establishment of a false sense of security among those who wear face masks; and ineffectiveness due to unfitting of face masks especially among children and those with facial hair. [17] [1] [2] [3] [9] [18] In the case where potential benefits of wearing face masks appropriately cannot be outweighed against the risks of wearing face masks due to the lack of evidence, taking actions to eliminate potential risks associated with wearing

face masks may be a safer approach rather than recommending the public not to wear a face mask at all—that is only if face masks are effective in limiting the spread of COVID–19.

Furthermore, when providing recommendations to the public about the use of face masks to limit the transmission of COVID–19, it is important to give special consideration to vulnerable populations and those who are often around these vulnerable populations such as individuals in the community who have immunocompromised family members. People with pre-existing conditions such as cancer, diabetes, heart disease and renal or chronic lung disease appear to be more vulnerable to becoming severely ill with COVID–19 directly or through a family member. [19] [20] It may be best to err on the side of caution when making recommendations to the public regarding face mask use in the absence of evidence to reduce the risk of potential transmission to the most vulnerable populations.

Evidence and knowledge transparency of current recommendations with the public

According to public health experts, transparency during a health emergency is extremely important because information plays a vital role in promoting core public health objectives. [21] During a situation where the public is at risk of a real or potential health threat, there may be a lack of immediate treatment options, interventions may take time and resources may also be limited. [21] Public recommendations and guidelines, therefore, is the most important tool available in managing a risk in such a situation. [21] According to public health professionals, “proactive announcements and transparency in this context is seen not just as an organizational responsibility but as also the most effective way of seizing control of media reports, public discourse and customer relations associated with the event.” [21] Scholars in the field of public health ethics and pandemic influenza planning emphasize specifically the importance of transparency in managing infectious disease outbreaks. [21][22] During an infectious disease outbreak, “transparency not only provides individuals and communities with information needed to survive an emergency, but it is also an element of procedural fairness in decision-making and priority setting.” [21] [23] [24] Scholars further state that “it is also a necessary, if not sufficient, condition for accountable decision-making and for the promotion of public trust.” [21] Transparency about what is not known is as equally important as transparency about what is known to build and promote public trust. [21]

Therefore, in the case of the COVID–19 outbreak, whether recommendations are provided in the absence of evidence or whether they are evidence-based must be transparent to the public. Current confusion about the effectiveness of face mask use can be partially explained by the lack of evidence transparency of the recommendations with the public. Where there is evidence transparency, the public is more likely to understand what scientific evidence recommendations are based on and therefore, be more confident in adhering to provided recommendations. For example, in the case of medical professionals’ request to halt the hoarding of face masks among the public, merely saying “masks do not help” has not been helpful in preventing the public from continuing to buy face masks, perhaps unnecessarily. [25] [26] With scientific evidence of their ineffectiveness in limiting the spread of COVID–19 among those who are not medically diagnosed with COVID–19, public health professionals and entities can be consistent and confident when

recommending the public not to buy face masks and as a result avoid situations such as running out of face masks for healthcare workers.

Similarly, knowledge transparency with the public is equally important in an outbreak. Some of the recommendations provided to the public suggest that the incorrect use of face masks may have potential risks which were discussed earlier. These potential risks can be minimized by educating the public about the potential risks and how to correctly use face masks to prevent the risks associated. A common concern brought up when providing current recommendations is about the false sense of security that face masks may bring to those who use them. [17] [2] [3] A false sense of security is the feeling of being safer than one really is. [27] In the context of COVID-19 and face mask use, a false sense of security means that the individuals may feel that they are safe from contracting COVID-19 because they are wearing face masks while that may not be the case. In the case of such concern, the public must be educated about the “false sense of security” that wearing a face mask may bring to individuals and how it may contribute to the increased risks associated with wearing face masks or neglecting other precautionary actions. In addition, some recommendations emphasize that other precautionary methods are more important than wearing a face mask while some suggest face masks are only effective in combination with other precautionary practices. [2] [9] All of the above information must be shared widely and effectively with the public worldwide through reliable media when making recommendations regarding the use of face masks. It is imperative to be transparent with the public about the current evidence and knowledge public recommendations are based on in order to successfully achieve the goals associated with the recommendations.

Global alignment on public health recommendations

Public health recommendations must align globally. Varying recommendations can have a negative effect on countries around the world, especially in developing countries. In some developing countries, there is a severe lack of dissemination of credible information to the public as well as a concerning lack of knowledge among the general population to be able to identify and distinguish credible information from noncredible information. In these populations, most people tend to trust what is typically seen on social media or other online platforms. For example, a consult physician in Sri Lanka says that, “containing the panic and dissemination of misinformation has proved tougher than fighting the actual disease [COVID-19].” [28] According to Health Analytics Asia, in Sri Lanka, India and Singapore, messages including false information regarding prevention methods of COVID-19 had widely circulated through online platforms such as WhatsApp. [29]

In the case of face mask use, when people in developing countries observe on online platforms a wide use of face masks to limit the spread of COVID-19 or recommendations advising the use of face masks, they may be likely to follow these recommendations without questioning the evidence behind the practices or recommendations. This may be the case especially when recommendations are coming from sources from developed countries. Some people may assume that the practices are evidence-based because they are coming from developed countries. Influenced by what they see on online platforms, the

public of countries around the world may assume that merely wearing face masks will protect them from contracting COVID-19. Similarly, if there are recommendations to not wear face masks, those recommendations might also be followed without taking into consideration other advice that follow along such as practicing hand hygiene and respiratory hygiene.

In developing countries with less advanced health care systems, confusion due to varying recommendations can lead to having a worse negative impact on their population as well as healthcare systems. Considering these factors, global alignment on public health recommendations and decisions among public health professionals and entities is crucial when proving recommendations amid an outbreak such as COVID-19.

Future research

Further investigation into the effectiveness of face mask use among those who are not medically diagnosed with COVID-19 is important and timely for many reasons. If currently available face masks are not effective in limiting the spread of COVID-19 among this specific population or have significant limitations to its effectiveness, with advanced technology and innovations, researchers can investigate novel research approaches to invent and improve the efficiency of face masks to prevent the transmission of COVID-19 and similar or worse coronaviruses that the world may face in the future. It is important to note that only having a face mask as a physical barrier may not be sufficient as eyes are also exposed to viruses including COVID-19. [9] While investigating into the effectiveness of face masks will be beneficial in limiting the spread of COVID-19, further research can open doors to investigating, understanding, and designing more advanced personal protective equipment (PPE) for worse situations where PPE may be required in community settings. Furthermore, additional research can help identify and distinguish between the types of face masks that are best for different sample populations, and also address possible stigma and existing cultural differences associated with face mask use. Moreover, information about the effectiveness of face masks will provide health professionals insight into whether there is a need to advise global manufacturers to increase the production of face masks worldwide, which addresses growing concerns such as face mask hoarding among the public, limited availability of face masks for healthcare workers, and the need for mandatory control over supply and price of face masks through legislation in countries that recommend the use of face masks to limit the spread of COVID-19. [30] [31] [32]

Although COVID-19 has not been declared as a pandemic at the moment (25 Feb 2020), in case of a pandemic, knowing the effectiveness of masks ahead of time of the crisis would be extremely useful. While research surrounding the biology, epidemiology and behaviour of the new virus is extremely important and a priority at the moment, studying every method of prevention is equally important as prevention will not only provide the public with knowledge and instructions that they can rely on and confidently practice, but also save lives and reduce suffering and the expenditure of healthcare resources. This research is important, especially today because there is an immense use of face masks among the

public around the world despite the uncertainty around the effectiveness of face masks. Such popular practices must be given immediate attention and studied thoroughly.

Limitations

Limitations of the systematic review: The search being limited to the English language is a limitation of this review. It is a possibility that there are research studies published in other languages that have not been translated to English and therefore, are not included in this review. This review being conducted by one reviewer might be a limitation as well, as having more than one reviewer may be advantageous. Despite the limitations, the findings are important and timely as discussed above and highlight the immediate need for research around the effectiveness of face masks in limiting the spread of COVID-19 among those who are not medically diagnosed with COVID-19.

Limitations of the paper: The author had to use information outside of academic literature such as information from media outlets and newspapers (all cited) due to the lack of specific information in academic literature, such as public health recommendations provided to those who are not medically diagnosed with COVID-19 regarding face mask use. While this may be a limitation, sometimes it is imperative to use any type of reliable information available to bring attention to certain matters.

Conclusions

In light of the finding of this review, which is a lack of scientific evidence on the effectiveness of face mask use in limiting the spread of COVID-19 among those who are not medically diagnosed with COVID-19, the significance of this finding is highlighted and extensively discussed in the context of current public health recommendations. The findings of 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 of current recommendations with the public; 4) global alignment on recommendations; and 5) further research to investigate the effectiveness of face mask use in limiting the spread of COVID-19 among those who are not medically diagnosed with COVID-19.

List Of Abbreviations

British Columbia Centers for Disease Control and Prevention (BC CDC)

Cable News Network (CNN)

Centers for Disease Control and Prevention (CDC)

Coronavirus disease 2019 (COVID-19)

Food and Drug Administration (FDA)

Middle East respiratory syndrome coronavirus (MERS-CoV)

Novel Coronavirus (2019-nCoV)

Randomized control trials (RCTs)

World Health Organization (WHO)

Declarations

Ethics approval and consent to participate: Not applicable.

Consent for publication: Not applicable.

Availability of data and materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests: The author declares that they have no competing interests.

Funding: No funding received.

Authors' contributions

Keshini Madara Marasinghe led and conducted the review and discussed the findings.

Acknowledgements

The author would like to thank the following individuals for their professional advice and feedback, technical input, and review of this literature review.

Dr. Jostacio Moreno Lapitan, WHO

Loïc Garçon, WHO

Bridget Lee, MPH

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Footnotes

¹United States, Centers for Disease Control and Prevention (CDC) describes a surgical mask as a face mask that provides barrier protection against large particle droplets that can be released when a wearer talks, coughs, or sneezes. [33]CDC notes that medical or surgical masks do not effectively filter inhaled

small particles, fumes, or vapors.[33] They are “primarily used to protect patients and healthcare workers from people who may have a respiratory infection” according to CDC.[33]

²The Food and Drug Administration (FDA) of the United States, describes N95 respirators as masks that are designed to “achieve a very close facial fit and very efficient filtration of airborne particles.”[34] N95 respirators block at least 95 percent of very small (0.3 micron) test particles minimizing the wearers’ respiratory exposure to airborne infectious agents.[34] [35] FDA also states that if N95 masks are properly fitted, the filtration capabilities of N95 respirators surpass those of surgical masks.[34] However, even a properly fitted N95 respirator does not completely eliminate the risk of illness or death according to FDA. [34]

³Individuals who are “not medically diagnosed with COVID–19” include those who may have been exposed to the virus and are asymptomatic; pre-symptomatic; symptomatic but have not yet been diagnosed with COVID–19 by a healthcare professional therefore may not be aware that they have COVID–19 and; those who have not been exposed to the virus.

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Figures

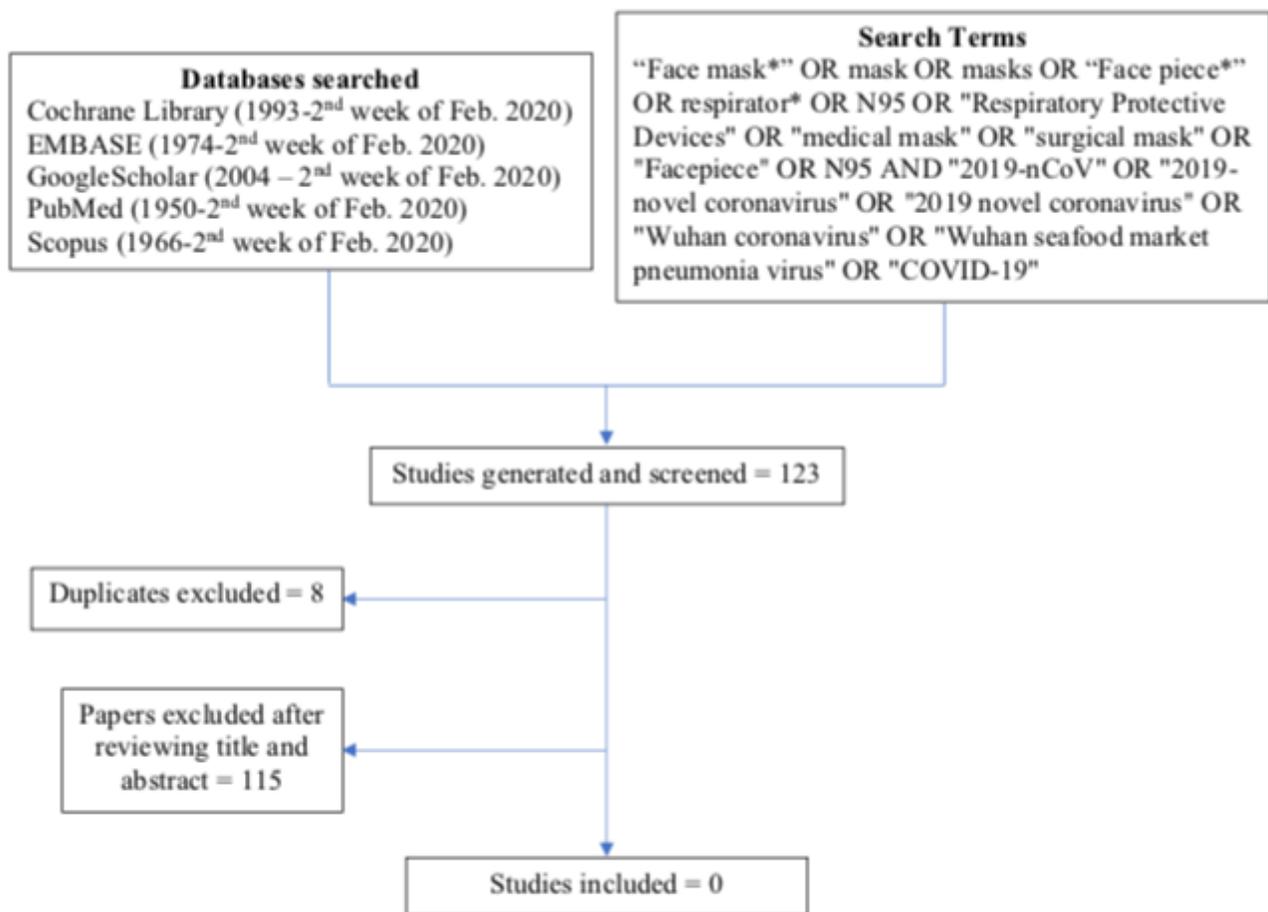


Figure 2: Schematic diagram of the literature search.

Figure 1

Database search terms.

EMBASE and Cochrane Library (1974 – 2nd week of February 2020) and Cochrane Library (1993 – 2nd week of February): face piece.mp. or exp protective equipment/ OR exp mask/ or exp surgical mask/ or exp face mask/ or Respirator*.mp. or N95.mp. or Respiratory Protective Devices.mp. or Medical Mask.mp. AND 2019-nCoV.mp. or 2019-novel coronavirus.mp. or 2019 novel coronavirus.mp. or covid-19.mp

GoogleScholar (2004 - first week of February 2020): "Face mask" OR mask* OR "Facepiece" OR Respirator* OR N95 OR "Respiratory Protective Devices" OR "Medical Mask" OR "surgical mask" AND "2019-nCoV" OR "2019-novel coronavirus" OR "2019 novel coronavirus" OR "COVID-2019"

PubMed (1950 – 2nd week of February 2020): (((((((((((Face mask[Title/Abstract]) OR mask[Title/Abstract]) OR Face piece[Title/Abstract]) OR respirator[Title/Abstract]) OR N95[Title/Abstract]) OR "Respiratory Protective Devices"[Title/Abstract]) OR "Medical Mask"[Title/Abstract]) OR "surgical mask"[Title/Abstract]) AND "2019-nCoV"[Title/Abstract]) OR "2019-novel coronavirus"[Title/Abstract]) OR "Wuhan coronavirus" [Title/Abstract]) OR "Wuhan seafood market pneumonia virus"[Title/Abstract]) OR "2019 novel coronavirus"[Title/Abstract]) OR "COVID-2019"[Title/Abstract]

Scopus (1966 – 2nd week of February 2020): (TITLE-ABS-KEY ("Face mask" OR mask* OR "Facepiece" OR Respirator* OR N95 OR "Respiratory Protective Devices" OR "Medical Mask" OR "surgical mask") AND TITLE-ABS-KEY ("2019-nCoV" OR "2019-novel coronavirus" OR "2019 novel coronavirus" OR "COVID-19"))

Figure 1: Database search terms.

Figure 2

Schematic diagram of the literature search.

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