

Masking the Facts: Addressing Misinformation and Masking During the COVID-19 Pandemic

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Since the emergence of SARS-CoV-2 in early 2020 in the United States, Rhode Island has reported over 400,000 cases of COVID-19 and over 4,000 associated fatalities. In clinical settings, masking is considered an essential aspect of infection control and prevention for SARS-CoV-2 and other respiratory viruses. However, significant misinformation on social media and other online sources has distorted some of the public's perception of masking and COVID-19. Here, we review current evidence and provide an update on common sources of misinformation.

The history of mask use is a recent development. While there are paintings of masked doctors (Figure 1) during times of the bubonic plague, masks were not routinely used in healthcare until the 20th century.^{2,3} There appears to have been an intuitive use of masks during times of respiratory infections – masks were distributed during the influenza epidemic in 1918–1919 and regulations requiring their use were enacted throughout the country.^{5,6,7} However, the recognition of the infectious origins of disease and respiratory illness, and the importance of reducing “hospital gangrene” led to the increasingly customary use of cloth masks in the operating room in the 1920s and 1930s.^{2,4} Routine use of disposable masks began in the 1960s.²

Data related to masking and COVID-19 often centers around the belief that there are no evidence-based studies demonstrating that masks are effective. Research on the effectiveness of masks in preventing COVID-19 transmission has been limited, partly because masks are often studied in conjunction with other infection-control methods and because monitoring correct mask usage in community settings can be difficult. Furthermore,

the dynamic nature of the pandemic and the emergence of new variants have continued to complicate research on masking and COVID-19. A major concern surrounding masks is the potential for adverse health effects, as misinformation has centered on the belief that masks can trap exhaled carbon dioxide and reduce oxygen levels for the wearer. Another concern is that masks can interfere with learning, particularly in children, as covering the lower half of the face may hinder speech recognition, interpretation of emotions, and overall communication skills.

Although data on masking for COVID-19 continues to be limited, the mechanism of transmission of SARS-CoV-2 is well established. A susceptible individual can acquire COVID-19 when infectious particles are inhaled (i.e., airborne transmission) or when droplets come into direct contact with an individual's eyes, nose, or mouth (i.e., droplet transmission).⁸ Historically, the primary purpose of masks has been “source control” to minimize the release of virus-containing droplets into the environment by the infected wearer. Additionally, masks provide a layer of protection for the wearer by reducing the inhalation of droplets from the surrounding environment. The effectiveness of masks in controlling the spread of COVID-19 can be attributed to the combined impact of these two functions. In addressing concerns and subsequent



Figure 1. Paul Furst, engraving, c. 1656, of a plague doctor of Marseilles. The nose case is filled with herbal material to ward off the plague. [WIKIPEDIA: PLAGUE DOCTOR, IN THE PUBLIC DOMAIN]

propagation of misinformation related to masking, clinical and public health guidance needs to be grounded in science. Communication with the public needs to include current scientific-based evidence and also address the fact that science is constantly evolving. Some concerns related to masking may be valid, and clinical and public health institutions need to appropriately and objectively study these concerns to determine ideal approaches to mitigate COVID-19 and other respiratory viruses.

A recent Cochrane Review published in January 2023 reviewed the effectiveness of interventions to interrupt or

reduce the spread of acute respiratory viruses. This review reported, with moderate certainty, that wearing a mask would “probably make little or no difference” in the transmission of COVID-19-like or influenza-like illnesses.⁹ This review has been referenced as evidence that masking is ineffective. In a rare occurrence, the editor-in-chief of the Cochrane Library issued a statement on March 10, 2023, clarifying that the interpretation of the review as “masks don’t work” was both inaccurate and misleading.¹⁰ The statement emphasized the study’s limitations, including a relatively low adherence with interventions, particularly with mask usage. This represented a significant study limitation, as masks can only be effective when worn correctly and consistently. Other limitations included that the review did not specifically focus on masking for COVID-19, as only six of the 78 trials were conducted during the COVID-19 pandemic. Additionally, the review focused on interrupting the spread of viruses, without addressing whether masks reduce an individual’s risk of contracting or spreading the virus. As clarified by the editors, the review did not provide sufficient evidence to support the claim that masks were ineffective.

A recent analysis of mask effectiveness reached different conclusions. A systematic review in the *Annals of Internal Medicine* used data from three randomized controlled trials (RCTs) and 21 observational studies, specifically focusing on

the effectiveness of masks in preventing SARS-CoV-2 infection.^{11,12} The results of this review, which varied significantly from the Cochrane Review, were that masks may be associated with a small reduction in risk (around 10–18%) for SARS-CoV-2 infection in community settings. Although this review examined more up-to-date evidence, including studies published through January 2023, it was also limited by a lack of high-quality RCTs focused on masking and COVID-19. However, it is important to not misconstrue “an absence of evidence for effectiveness, with evidence for the absence of effectiveness.”¹³ Further research is necessary to investigate the effectiveness of masks, including a comparison of different mask types, in preventing COVID-19 infection. Additionally, and importantly, a valid critique of both the Cochrane Review and the study in *Annals* is that RCTs are a significantly flawed methodology for studying mask efficacy.¹⁴ As several authors note, many effective policies that reduce illness have been instituted without RCTs, including speed limits, seat belts, placing babies on their backs to reduce sudden infant death syndrome, and (facetiously) the use of parachutes for jumping out of planes!^{14,15}

In terms of adverse health effects from masks, numerous studies have established that masking is safe and does not demonstrate any clinically significant impacts on respiration or gas exchange under most circumstances.¹⁶ While one

study published in *JAMA Pediatrics* was commonly cited as support of the belief that masks can reduce oxygen levels for the wearer, this study was retracted due to issues raised by the scientific community regarding the validity of the study’s conclusions.¹⁷ Additionally, there is no clear evidence of masking impairing emotional or language development in children, although available data is still limited. Overall, this information highlights the general safety of mask-wearing as a preventive measure against COVID-19.

Current CDC guidelines recommend the use of well-fitting masks or respirators in areas that are experiencing high hospital admission levels for COVID-19.¹⁸ The current science on mask-wearing suggests that masking mitigates the spread of COVID-19 with little to no harm but is likely dependent on correct use of masks in the community. Continued investigation is needed to evaluate and quantify the effectiveness of masks across different populations and settings, as well as in the context of other respiratory diseases. While resistance to mask regulations is not new – resistance to mask-wearing and public health measures was recognized during the 1918–1919 influenza pandemic – obtaining the necessary data to inform evidence-based public health measures and protect the well-being of individuals and communities will contribute to better preparation for future pandemics.⁴ ♦

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