



The science is certain: masks work. Policy and practice must support their use

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Summary

A new comprehensive evidence review has concluded that masks have a valuable role in preventing the spread of infectious diseases. We highlight key findings and implications for Aotearoa New Zealand (NZ). We need to upgrade mask policy to align with current evidence. NZ is missing out on the benefits of this effective and versatile protection against seasonal, epidemic, and pandemic infections.

Immediate next steps include:

- Identifying situations and settings where mask wearing can have substantial protective effects during winter 2024 and beyond;
- Providing the public with clear guidelines and resources so that masks are accessible to all, environmental impacts are minimised, and communication difficulties arising from mask-wearing are managed inclusively and well; and
- Ensuring that New Zealanders are wearing appropriate masks. NZ needs to begin the necessary transition from leaky medical (blue) masks to the far more effective respirator masks, starting with those who need them most.

A [new review](#) by an international, multidisciplinary team (including the current authors) concludes that masks are effective in reducing transmission of respiratory diseases.¹ This robust evidence marks an end to the ‘mask wars’ that have made masking a far more complex issue than it needed to be.

The review is broad in scope and includes evaluation of the effectiveness of masking and consideration of the barriers and enablers of population masking. Key findings are [summarised in the Appendix below](#).

The review process included re-analysing previous studies and systematic reviews. This scrutiny unravelled the errors and biasing decisions that led to some studies reporting inconclusive results. Unfortunately, when these earlier pooled analyses did not detect an effect they were [used by bad actors](#) to argue that masks do not work, prompting the Editor-in-Chief of the Cochrane Collaboration to issue an [apology and clarification](#). As authors of one critical analysis noted, “The studies [of mask efficacy] that did not find statistically significant effects prove only that masks cannot offer protection if they are not worn”.²

The current review settles the issue and shows why masks need to be comfortable, sustainable, accessible, and widely worn when indoor air quality is poor and infection risk is high.

Why Aotearoa New Zealand needs to act on the review findings

Evidence from this review indicates that NZ is failing to benefit from the substantial protection provided by high-quality masks. NZ’s outdated mask policies and lack of support for masking in combination with its generally poor indoor air quality from lack of ventilation³ leaves the population exposed to a wide range of airborne infections that spread in crowded indoor spaces.

Covid-19 [continues to evolve and circulate](#) in our population year-round causing high levels

of sickness, including [Long Covid](#).^{4,5} NZ also experiences large numbers of hospitalisations and deaths each year from seasonal influenza, respiratory syncytial virus (RSV), and other infections. The risk of a large [measles epidemic](#) in the near future is very high. There is also growing concern about new pandemics that might arise from the ongoing spread of [influenza A\(H5N1\) influenza](#) (bird flu) or from bioengineered pathogens.⁶ All these diseases are spread by the airborne route, which means that masking will help reduce transmission.

Masks protect against multiple pathogens, including novel pandemic viruses for which there is no test, treatment, or vaccine. When community infection rates are high, masking in crowded indoor settings enables people to continue daily activities more safely. This approach is especially useful for infections such as Covid-19 where people may not have symptoms or know they are infectious.

Although mask uptake was high in NZ during earlier years of the Covid-19 pandemic, lack of Government support for masking meant that the initial high acceptance by the public never evolved into a cultural normality of wearing a mask when potentially infectious or at risk of infection, as happens in many Asian jurisdictions. This gap in our public health protections is seriously undermining our readiness for the winter respiratory season and our pandemic preparedness.⁷

Next steps to bring our policy and practice into line with evidence

NZ needs to develop a practical and equitable approach to masking that maximises the benefits of this protection in four overlapping areas: personal protection of at-risk groups; protection in specific settings, including workplaces and healthcare facilities; protection for seasonal respiratory infections; and protection for pandemics. Facilitating this transition requires actions by Government, researchers, and public health decision-makers:

Implementing a mask policy to improve respiratory infection prevention and control during winter 2024 and beyond.

- This policy should be integrated into a wider respiratory infection disease strategy,⁷ identifying situations and settings where mask recommendations and requirements are warranted.
- There is a strong argument for requiring masks in hospitals and in General Practice and Emergency Department waiting rooms where infectious people are mixing with immune-compromised people, especially when prevalence of respiratory pathogens is high. This action protects healthcare workers, the health system, and clinically vulnerable people accessing healthcare.

Developing public guidelines and resources to enable mask wearing and address barriers.

- Government should provide the public and community leaders (eg, Māori and Pacific providers) with clear guidelines about how and when to wear a mask and how to manage communication difficulties inclusively and well.
- Alongside this information there needs to be generalised and disability-focused communication support in all settings where masks are worn, and financial support to ensure that cost is not a barrier for marginalised groups.
- Addressing environmental impacts will need short-term (eg, reusing respirator masks) and longer-term solutions (eg, adopting more sustainable materials and designs).
- In a public health emergency (eg, an influenza A(H5N1) pandemic) there is likely to be

a global shortage of masks. Government must ensure a secure supply chain of respirators sufficient for the whole population, but particularly essential workers. This stockpile should be located within NZ.

Transitioning to highly effective respirator masks as the default option.

- The public should know that any mask may be better than no mask, but they should also be informed that mask quality matters.
- Unlike medical (blue) or cloth masks, respirator masks (eg, N95, KN94, elastomeric) are designed to control airborne transmission and are far more effective.
- NZ needs to begin the necessary transition to respirator masks as standard protection, starting with those who need them most.

What this Briefing adds

- This new review provides scientific certainty that masks reduce the spread of multiple types of respiratory infections (seasonal and pandemic) in healthcare and community settings. Effectiveness is increased when a higher proportion of people are wearing masks, enabling two-way protection (reducing exhaled virus to protect others, and reducing inhaled virus to protect oneself).
- Respirator masks (eg, N95, KN94) have several advantages over medical (blue) masks or cloth masks. They are substantially more effective at reducing infection risk and they can be re-used several times, reducing environmental waste.
- Mitigation strategies are needed to address adverse effects of masking such as discomfort and barriers to communication.

Implications for policy and practice

- The NZ Government needs to upgrade its mask policy to bring it into line with current evidence so that it provides protection against seasonal, epidemic, and pandemic infections. An important next step for winter 2024 is to identify situations and settings where mask recommendations and requirements are warranted.
- The NZ Government should provide the public with clear guidelines and resources so that masks are accessible to all, environmental impacts are minimised, and communication difficulties arising from mask-wearing are managed inclusively and well.
- Respirators should become the default mask choice for preventing respiratory spread in healthcare and community settings. The Government needs to support this transition by ensuring that respirator masks are immediately available to those who need them most, including healthcare workers and people who are immune compromised.
- NZ needs a secure supply chain of respirators sufficient for the whole population, ideally located within NZ, particularly for public health emergencies (eg, a future pandemic from influenza A(H5N1) or a bioengineered pathogen) when global supply will be limited.

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Appendix: Key findings from the review

The full review can be accessed here: <https://journals.asm.org/doi/10.1128/cmr.00124-23>

- **Masks work.** If they are correctly and consistently worn, masks are effective in reducing transmission of respiratory diseases. An important advantage of masks is that they are pathogen- and variant-proof, enabling them to cover immunity gaps in the population.
 - **Covid-19 is an airborne pathogen.** There is strong and consistent evidence for airborne transmission of Covid-19 as the primary route. Good handwashing technique is useful to prevent other types of infection (eg, gastroenteritis), but it does not stop transmission of Covid-19.
 - **Mask quality matters.** While any mask is better than no mask, respirators are significantly more effective than medical or cloth masks and a protective effect can be seen in both community and healthcare settings.
 - **Population masking works.** Masking does not only benefit individuals; the more people that are wearing masks, the greater the protective effect. Masks offer two-way protection: mask wearers reduce the risk of spreading an infection to others (source control), and they also have a lower risk of becoming infected (respiratory protection).
 - **Mask requirements can help reduce the spread of infectious diseases.** Mask requirements boost the effect of masking by increasing the proportion of people who are masked. Evidence from the early phases of the Covid-19 pandemic shows that mask mandates helped to reduce community transmission of Covid-19 (and conversely that when mandates were lifted, case numbers increased). In high-risk settings, particularly healthcare, mask requirements protect healthcare workers and clinically vulnerable patients.
 - **Masks have symbolic and cultural importance.** Looked at one way, a mask is simply a filter that removes harmful particles from the air that we breathe. But the acceptability or otherwise of masks can become linked to political and ideological beliefs and to mis- or disinformation. These contextual factors can make it difficult for people who need to wear a mask to wear one in public places, or for patients to ask healthcare providers to mask in clinical settings. But masks can also be expressions of collective responsibility when people wear masks to protect themselves and others.
 - **Adverse effects need mitigation strategies.** Improved mask designs are needed. Currently-available masks can cause skin irritation and other discomfort. We did not find evidence that masking is harmful for the general population, but individuals with certain medical conditions may be advised not to wear a mask, and masking is impossible for some people. Masks can also create difficulties with communication, particularly for D/deaf people and others who need to see faces to understand what is being said. We identified a range of solutions to enable access to communication when people are masked.
 - **Improved sustainability is vital to support widespread mask use.** Single-use medical masks and respirators create waste and their components are harmful to the environment. Respirator masks can be reused several times, reducing their environmental impact, but development of biodegradable mask materials and other sustainability improvements is an active area of research.
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References

1. Greenhalgh TC, MacIntyre R, Baker MG, Bhattacharjee S, Chughtai AA, Fisman D, Kunasekaran M, Kvalsvig A, Lupton D, Oliver M, Tawfiq E, Ungrin M & Vipond J. Masks and respirators for prevention of respiratory infections: a state of the science review. *Clinical Microbiology Reviews* 2024; DOI: 10.1128/cmr.00124-23
2. Kollepara PK, Siegenfeld AF, Taleb NN, et al. Unmasking the mask studies: why the effectiveness of surgical masks in preventing respiratory infections has been underestimated. *Journal of Travel Medicine* 2021;28(7):taab144.
3. Bennett J, Shorter C, Kvalsvig A, et al. Indoor air quality, largely neglected and in urgent need of a refresh. *The New Zealand Medical Journal (Online)* 2022;135(1559):136-39.
4. Kvalsvig A, Tuari-Toma B, Timu-Parata C, et al. Protecting school communities from COVID-19 and other infectious disease outbreaks: the urgent need for healthy schools in Aotearoa New Zealand. *The New Zealand Medical Journal (Online)* 2023;136(1571):7-19.
5. Baker MG, Kvalsvig A, Plank MJ, et al. Continued mitigation needed to minimise the high health burden from COVID-19 in Aotearoa New Zealand. *New Zealand Medical Journal* 2023;136(1583):67-91. [published Online First: 20231006]
6. Karger E, Rosenberg J, Jacobs Z, et al. Forecasting Existential Risks Evidence from a Long-Run Forecasting Tournament. *FRI Working Paper* 2023
7. Kvalsvig A, Barnard LT, Summers J, et al. Integrated Prevention and Control of Seasonal Respiratory Infections in Aotearoa New Zealand: next steps for transformative change. *Policy Quarterly* 2022;18(1):44-51.



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