

We urgently need better masks (respirators)

OzSAGE Community Respirator and Mask Update Working Group:

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Background

Australia is an outlier in regards to not yet recommending or [providing](#) high-quality face covering that provide filtration- [respirators](#) (N95/P2/KF94/FFP2) and ensuring they are provided to the community. The particular “masks” we are recommending are technically advanced and are known as respirators and do more than cloth or surgical masks to stop you from breathing the Covid-19 virus. The Covid-19 virus is transmitted through breathing in small particles known as ‘aerosols’ that contain the virus. These small particles are produced by breathing, talking, and coughing, and they float and linger in the air like cigarette smoke. Unlike respirators where air is breathed in through the mask material filtering the air, surgical masks do not seal around the face, so unfiltered air is breathed in via the gaps around the mask. Respirators filter out these small particles containing virus.

On September 2021 OzSAGE issued recommendations on [community mask use](#). The Omicron variant is more transmissible than previous variants, and [cloth or surgical masks may not be protective enough](#). Many countries have already changed their guidelines to recommend better protection. In the US, [400 million N95 respirators](#) are being provided free to Americans.

Covid-19 is an [airborne](#) disease. It is therefore crucial that members of the community have the necessary high-quality masks and information to know how to keep themselves safe from Covid-19. This is especially true in Australia because [two doses of vaccine](#) does not protect well against Omicron and the rates of third dose vaccination are low. Even three doses are not fully protective. Respirators are therefore a key part of a [Ventilation and Vaccine-PLUS strategy](#).

Respirators represent a critical line of defence in preventing the spread of Covid-19. These devices filter virus more effectively than the cloth and simple surgical masks that many of us have been using and provide a better fit. High-quality N95 or equivalent respirators slow the spread of virus, are better than surgical and cloth masks and should be used in the community.

Mixed messaging on the use of high-quality respirators (N95/P2/KF94/FFP2) causes difficulty for the public in understanding how to best protect themselves, their family, and their community. High-quality respirators provide the best protection available. Many people, including children, find them more comfortable to wear and to breathe in, which

means they are more likely to wear them and for longer periods. Respirators can also be re-used, and can therefore be cost-effective and better for the environment. Where people only have access to surgical masks (e.g. blue surgical masks are common), education campaigns should include clear information on how they can be modified to improve them.

25-hour protection when both people are wearing fit-tested N95 respirators

Time to infectious dose for an uninfected person (receiver)*

		Receiver is wearing (%inward leakage)				
		Nothing	Typical cloth mask	Typical surgical mask	Non-fit-tested N95 FFR	Fit-tested N95 FFR
Source is wearing (%outward leakage)		100%	75%	50%	20%	10%
Nothing	100%	15 min	20 min	30 min	1.25 hr	2.5 hr
Typical cloth mask	75%	20 min	26 min	40 min	1.7 hr	3.3 hr
Typical surgical mask	50%	30 min	40 min	1 hr	2.5 hr	5 hr
Non-fit-tested N95 FFR**	20%	1.5 hr	1.7 hr	2.5 hr	6.25 hr	12.5 hr
Fit-tested N95 FFR	10%	2.5 hr	3.3 hr	5 hr	12.5 hr	25 hr

*The data for % inward and outward leakage of cloth and surgical masks were derived from a study by Lindsley et al (2021). Data for non-fit-tested N95 FFRs come from a study by Brosseau (2020). Data for fit-tested N95 FFRs are derived from OSHA-assigned protection factor of 10 for half-facepiece respirators. Also, times were established before wide circulation of more transmissible Delta variant.

**FFR= filtering facepiece respirator; N95 = not oil-proof, 95% efficient at NIOSH filter test conditions



[Mask effectiveness table](#). Lisa M Brosseau, Author provided

To minimise community transmission, cloth and surgical masks should be urgently replaced with respirators. These high-quality respirators are specifically [designed and manufactured to provide protection from airborne hazards](#). They also meet regulatory standards for filtration and fit. In contrast [surgical masks](#) are not designed to provide protection from airborne hazards and without modification have a poor fit.

The filtration effectiveness of cloth masks is generally lower than that of surgical masks. Cloth masks are highly variable in design and many have only one or two layers, which is [inadequate](#). Fit is as important as filtration, meaning if a mask has gaps, unfiltered air will be inhaled and exhaled by the wearer through those gaps. It is important that everyone understands the importance of fit and filtration, to improve the effectiveness of our mask use and reduce community transmission.

There is strong scientific [evidence](#) that [respirators reduce transmission](#). Statements to the contrary are not based on evidence and mislead the public in making informed decisions about how to best protect themselves. Fit-testing of respirators is not required for the general community. Wearing a respirator will still [reduce the risk of infections by two and a half times](#) of wearing a regular surgical mask. The public can also easily be shown how to [assess and improve the adequacy of the seal](#) (a seal check) of respirators.

A Vaccines-Plus strategy is based upon layers of protection. Respirators are one of these layers that the general community can use to protect themselves. Soon almost every one of us will know a friend or family member who has become sick with Covid-19. But this outcome can be prevented if people are given respirators as one of the layers of control in Vaccines Plus. We note that the WHO has stated that Omicron is not mild and people should be actively protecting themselves from transmission.

Recommending the use of respirators in the community is not new. These high-quality masks have been previously recommended in community settings, for example during [bushfire season](#), during the safe removal of asbestos by the [general public](#), and to protect from [legionella in soil and potting mix](#). Government bodies have produced simple and straight forward guidance for the community on the [use of these high-quality masks](#) in those settings. This needs to be urgently expanded to apply to protecting our communities from Covid-19.

We need to slow the spread of Omicron and other Covid-19 variants for many reasons including:

- To allow time to ensure children are vaccinated especially as schools are re-opening with primary school children only just receiving their first dose of the vaccine
- To allow time for adults to receive their boosters, including people with blood cancers and other immunocompromising diseases who are now recommended to have a fourth dose.
- To reduce the risk of adverse health outcomes including long COVID and death
- To protect vulnerable members of society and those serving the public in face-to-face roles
- To reduce pressure on the health and ambulance system, including the short staffing of care for people with disabilities
- To keep the economy functioning

Key current problems

OzSAGE's previous document ['Community Mask Use'](#) described how basic cloth and surgical masks, which most Australians use, are varied in quality and do not adequately protect the wearer. To protect against airborne disease, respirators are required because:

- Physical distancing alone is not sufficient to prevent transmission
- Transmission frequently occurs in shared indoor spaces

- Transmission can occur outdoors when people are close together
- Currently available vaccines are much less effective against the Omicron variant, and vaccinated people are at risk of breakthrough infections. Additional measures are urgently required to keep the community safe, such as high-quality masks, safe indoor air ventilation, reducing crowd numbers and physical distancing and other means such as reducing mixing socially and at work
- Surgical masks and cloth masks have gaps. To get the best protection, you need to have no gaps and the mask should seal against your face. Surgical and cloth masks are not suitable, due to their inability to seal your mouth and nose against transmission. With a respirator you breathe THROUGH the mask, as opposed to surgical and cloth masks where you breathe through the gaps AROUND the masks. Respirators are the only masks that are designed to filter out virus from the air. Surgical and cloth masks allow aerosols to escape through the gaps around the edges of the mask.

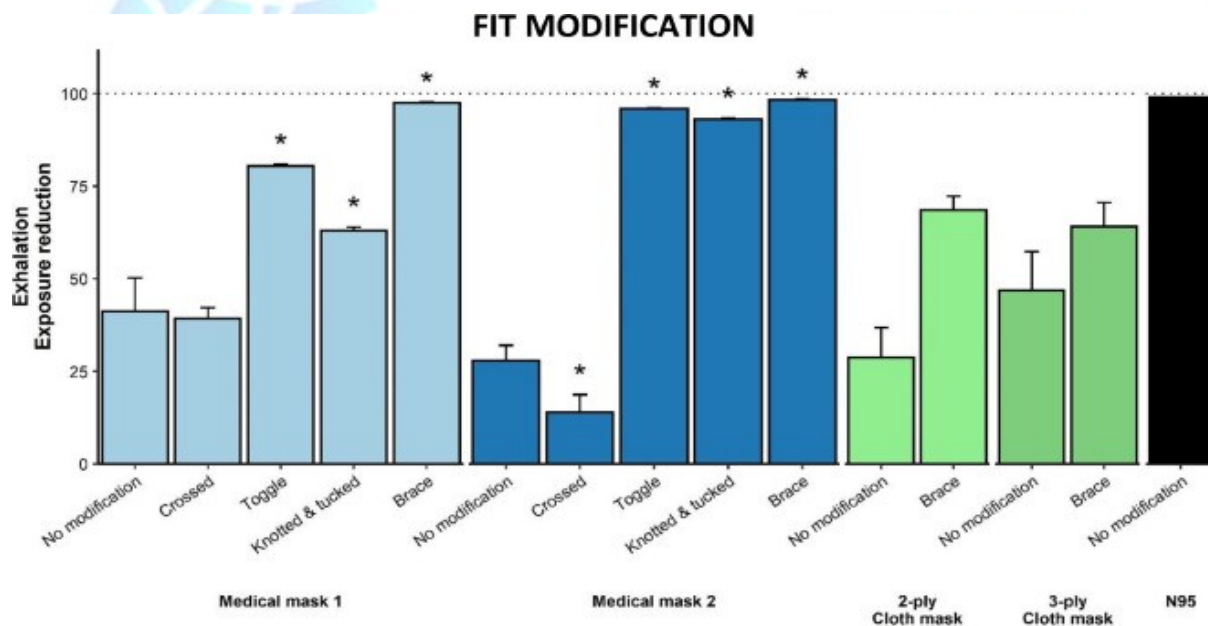
These recommendations are made on best available evidence and any supply issues should be urgently addressed by government.

Recommendations

1. Respirators should be provided free to the community, with special attention to provision for those with disabilities or in residential care.
2. Government-led education campaigns are critical to help communities understand what to look for in a respirator, what types are suitable, and how to wear the respirator including checking the seal, being clean shaven, and washing their hands before and after handling the mask. People need to know it is time to use respirators when the Covid-19 virus is spreading in the community.
3. Guidelines should be developed to assist the community to safely reuse their respirators. You can wear one respirator each day and store it in a breathable paper bag at the end of each day, rotating a respirator each day over 5 days. While disposable respirators are designed to be single-use, they can be safely re-used when undamaged, stored properly between uses and rested for a [minimum of 5 days](#) (allows extra time for virus to cease to be active) by swapping masks every day provided they don't get wet and the straps are not damaged.
4. For those who cannot access a respirator, there is [evidence](#) that the fit of surgical masks can be dramatically [improved by creating a type of seal:](#)
 - Brace – putting a brace, for example one made from three rubber bands that you link together with the centre band spread over your surgical mask to hold the surgical mask to against your face and the other bands each side over your ears to help create a better seal
 - Double masking – wearing a tight-fitting cloth mask over your surgical mask will hold the surgical mask against your face and help create a seal
 - Knot and tuck - tying / knotting the sides of your surgical mask, and tucking and folding the excess fabric inside the knot and smoothing out

the fabric to be flat against your face, pulls the mask closer into your face and reduces air leaking in or out.

- Toggles - Adjustment toggles on the loops of your surgical mask can be used to pull the mask tighter to your head. You can also connect the loops together behind your head with a clip or ear saver device if your surgical mask does not have toggles.



5. Respirators are needed in schools. The CDC [recommends universal indoor masking](#) by all children aged two and older, as well as teachers and visitors to schools, regardless of whether they're vaccinated. Where it is developmentally appropriate, all children in school should wear respirators, and there are child-sized respirators available. As fit is important, the use of appropriately sized respirators such as child-size KF94 respirators should be used instead of cloth or surgical masks. Respirators improve comfort and are more effective to protect the wearer and others around them. Education for parents on how to protect their children as they return to school is urgently needed.
6. Some people with certain medical conditions such as [chronic obstructive airway disease](#) may find breathing difficult with a respirator and a loose surgical mask may be all that is tolerated or recommended by a medical professional such as a GP
7. Some people at higher risk may want to have their respirator [formally fitted to reduce the risk of infection](#) (Fit providers can be found at [RespFit](#)).

[Video showing how to improve fit of respirators and how to modify surgical masks to create a seal against your face](#)

Disclaimer

This position statement has been written with the best available evidence and was last updated on 25 January 2022. No liability is accepted for the outcomes associated with the implementation of the advice contained herein. OzSAGE strongly recommends continuous quality assurance activities and ongoing adaptation to the circumstance

