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Face Coverings FAQ:

Overview:

This document was created to answer claims the author has seen on social media and in real life which may dissuade people from acquiring truly protective masks in light of the coronavirus pandemic. It is not meant to be a comprehensive treatise on the landscape of PPE throughout the country. In particular, it is here to provide a starting point for laymen that may be required to make decisions on obtaining respiratory protection for themselves, their employees, and other stakeholders. None of this is meant to be taken as specific medical advice. Please consult with the relevant experts when in doubt. That would be aerosol scientists, HVAC and other indoor air quality engineers, occupational hygiene therapists, etc.

Any inaccuracies or additional questions can be sent to the email above to be incorporated into future versions.

Q1: Are surgical or medical masks good for blocking coronavirus particles?

A1: No! Surgical masks or medical masks are not designed to fit a person's face. Coronavirus is an airborne respiratory disease. Its particles can hang around in the air for hours and can then be breathed in by occupants in that space.



A protective face covering needs to fit a person's face so that air passes through the filter material instead of leaks around the edges of the mask. That fit can be provided using a mask brace.

<https://www.popularmechanics.com/science/health/a35520817/what-is-a-mask-brace/>



Many surgical masks are using a certification process like ASTM 2100 which tests masks along 5 dimensions, 2 of which are related to filtration efficiency. ASTM level 1 for example requires at least 95% filtration of all particles in the 3 micron size range (bacteria) and for the 0.1 micron size (viruses). But none of these tests confirm the ability to seal around one's face. And without that, dangerous aerosols will skip the filter and sneak into the lungs through the edges.

	ASTM Level 1	ASTM Level 2	ASTM Level 3
Bacterial Filtration Efficiency @ 3 μm	$\geq 95\%$	$\geq 98\%$	$\geq 98\%$
Differential Pressure ($\text{mm H}_2\text{O}/\text{cm}^2$)	< 4.0	< 5.0	< 5.0
Sub-Micron Particulate Filtration @ 0.1 μm	$\geq 95\%$	$\geq 98\%$	$\geq 98\%$
Resistance to Penetration by Synthetic Blood (mmHg)	80	120	160
Flammability	Class 1	Class 1	Class 1

[Understanding ASTM Levels for Facemasks.](#)

Q2: Then what masks work?

A2: Masks that are certified both on fit and filtration. Many countries have their own standards such as NIOSH N95 for the States, CAN95 for Canada, KF94 for Korea, KN95 for China, and FFP2 for Europe. These certifications test for leakage as well as the filter material.

Understanding the Difference	 Surgical Mask	 N95 Respirator
Filtration	Does NOT provide the wearer with a reliable level of protection from inhaling smaller airborne particles and is not considered respiratory protection	Filters out at least 95% of airborne particles including large and small particles
Intended Use and Purpose	Fluid resistant and provides the wearer protection against large droplets, splashes, or sprays of bodily or other hazardous fluids. Protects the patient from the wearer's respiratory emissions.	Reduces wearer's exposure to particles including small particle aerosols and large droplets (only non-oil aerosols).
Face Seal Fit	Loose-fitting	Tight-fitting
Leakage	Leakage occurs around the edge of the mask when user inhales	When properly fitted and donned, minimal leakage occurs around edges of the respirator when user inhales
https://www.cdc.gov/niosh/npptl/pdfs/UnderstandDifferenceInfographic-508.pdf		

Surgical masks or medical masks should not be confused with surgical N95 respirators. The latter achieves great fit and filtration through the material. The word surgical is usually meant to

convey some degree of fluid resistance. It's useful for surgical procedures in the event of arterial spray from the patient. The 3M Aura 1870+ is an example of a surgical N95.

[VLOG: Fluid Resistance Testing for Surgical Masks and Respirators - Transforming Outcomes](#)

Q3: But not all faces are the same!

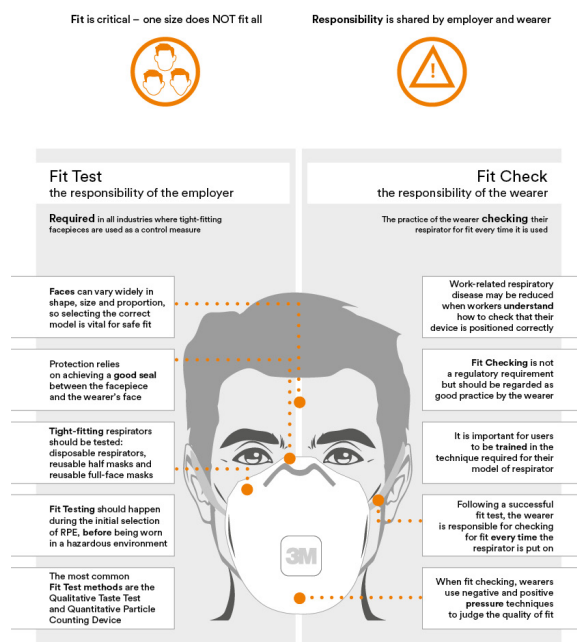
A3: Agreed. That's why a fit check which identifies obvious leaks in the interface between your face and the respirator fabric is key. The fit check should always be performed after donning a respirator.

- ▶ Performing a Seal Check When Donning an N95 Mask
- ▶ How long can you wear a KF94 or KN95? How to get a good face fit and more!

[Let's Up Your Mask Game! – Masks4Canada](#)

Q4: Don't we need to do a fit test too?

A4: A fit test (qualitative or quantitative) confirms with a higher degree accuracy the level of effectiveness a specific respirator will have for a given person. It's a legal requirement in certain work settings. But our goal is maximizing respiratory protection. In many cases, a fit test will not be appropriate because resources are limited. So we do the best that we can given the constraints we're operating in.



From my limited research, fit tests can range from \$30 to \$70 in Calgary. They're offered by distributors of safety equipment, safety certification organizations, hospitals, etc.

There are even instructions for how to perform qualitative fit tests from home.

<https://www.medrxiv.org/content/10.1101/2020.08.04.20168344v1.full.pdf>

If you have the resources to perform a fit test, by all means do! It will give you greater confidence that your respirator will protect against viral aerosols.

But we can't let the perfect be the enemy of the good. Procedure masks provide some protection but it's not enough and if we can find an N95 type of respirator that we're happy with, we should upgrade as soon as possible.

Q5: I heard N95's are uncomfortable though.

A5: N95's and equivalent respirators can come in many shapes and sizes. It's important that people find the right respirator for themselves as opportunity allows. But there are many brands and models that seem to be universally liked by those that wear them. For example the 3M Aura series (1870+, 9205+, and 9210+) have consistently received great reviews. I'm also considering the Vitacore line of CAN95/CAN99 masks.

<https://twitter.com/omarshahine/status/1321550467281899523>

<https://twitter.com/michaelzlin/status/1477395266386870273>

<https://twitter.com/AbraarKaran/status/1475248779649421313>

When evaluating comfort, we will need to see how it feels around our ears (if using ear loops), around our face, breathability, odor, and other measures to make sure that respirators are chosen with care for the person that needs it.

There are hundreds of respirators out there and we shouldn't settle for ones that cause us discomfort.

Q6: What's the deal with ear loops versus head straps?

A6: In general, head straps will be able to create greater tension for the user. This can translate into better fit/less leakage. They also remove the back of the ears as a source of strain. Will they be the best solution every time? Well that depends on your head shape and facial structure. In order to reduce strain on the ears when wearing ear loops, one can purchase ear savers which will remove tension from one's ears transferring it to the tool. It's important that the mask has a strong connection between the facepiece and ear loops or risk them coming off at an

inopportune moment. A tension test by tugging on the ear loops to confirm they can handle the strain can be useful. The NIOSH N95 standard doesn't allow for ear loops to be used. They are common with other aerosol filtering respirators such as KN95s. Ear loops do have a specific advantage. Namely, ease of use. Donning and doffing masks may happen frequently for people that use them in their day to day errands. A respirator with headbands will be harder to take off or put on.

[KN95 and 3M N95 - Differences, Uses, and Performance Data](#)

Q7: Aren't these masks in short supply? Shouldn't we save them for health care workers that are exposed to covid?

A7: Any supply shortage is artificial as government/hospital authorities limited the use of N95s in health care settings requiring them only in the case of when specific procedures are being performed. There are plenty of Canadian and American companies ready to increase manufacturing and distribution of masks to consumers. This has been confirmed by industry associations like the American Mask Manufacturer Association and Canadian Association of PPE Manufacturers.

[AMMA Response to Health Industry Distributors Call for Increased Access to Low-Quality Foreign PPE](#)

[CAPPEM supports Auditor General's recommendations on Ontario PPE](#)

Q8: How expensive are they?

A8: On a per unit level, we're looking at around \$1 to \$2. But these masks can withstand multiple uses. Many rotate through a set of 5 or 7 masks that are stored in brown paper bags indicating day of the week. So someone can store them in bags labeled Monday to Friday allowing them to air out odors and for existing viral particles to reduce concentration in the filter fabric. The last is not required as N95s use their electrostatic property to trap particles in the filtration layer. It would take a lot of energy to shake them loose. Orders of magnitude more than that expended by moving them around casually.

▶ The Astounding Physics of N95 Masks

The frequency with which masks change will depend on the straps/loops holding to one's head and the amount of dirt buildup on the material itself. In many office environments, the latter will not be much of an issue.

▶ How long can you wear a KF94 or KN95? How to get a good face fit and more!

Q9: If they're so good and so cheap, why is the Alberta government and the CMOH not advocating and providing them to workers and students around the province?

A9: And that's the million dollar question. Plenty of countries and lower jurisdictions around the world have acknowledged airborne transmission. And with that acknowledgement comes recommendations by their respective public health authorities that airborne threats require airborne protections. I can't answer that question without any inflammatory replies so I would implore you to read the resources pasted below. Many are linked to scientific papers or supported by experts in those domains.

Further Resources:

<https://twitter.com/ppetoheros/status/1453138868451037192>