

Covid-19: Reasons for everyone to wear homemade face masks in public and in the care situation amid the Covid-19 pandemic lockdown

Pieter E. Streicher PhD Engineering

Introduction

The spread of the Covid-19 virus will slow down considerably if everyone wears homemade face masks when going out in public or when caring for a potential Covid-19 positive relative in a household. Homemade face masks will prevent asymptomatic and pre-symptomatic people from spreading droplets containing the virus. When you speak, there are always droplets coming out of your mouth (Cohen, 2020).

This intervention was implemented by the Czech Republic since 18 March 2020 and should be followed closely. This measure should not replace other physical distancing, hand washing, isolation or lockdown measures.

There are several misconceptions concerning face masks amongst the public and the media that might put everyone at higher risk. Some of these misconceptions are well intended in that they aim to maximise the availability of medical masks for medical personnel. Then there is the observation that non-medical people do not know how to wear and handle face masks, putting themselves at higher risk. These factors result in the public being actively discouraged to wear all types of masks. This is a fatal mistake.

By limiting medical face masks to the exclusive use by medical personnel, the availability problem is addressed.

While non-medical people currently do not know how to wear and handle homemade face masks, they can learn to do so. We will soon have a situation where an increasing number of non-medical people would have to care for Covid-19 positive individuals in their households and the skilling up of everyone in the best practices is imperative.

The primary benefit of wearing a homemade facemask is the protection of others. The secondary benefit is the protection of yourself. My mask protects you, your mask protects me.

The virus is spread while people are asymptomatic

We should all consider the possibility that we might already be infected, but are not showing any symptoms, and that we might actively be infecting others (Pueyo, 2020). Not only when you cough or sneeze, but simply when you are talking there are always droplets coming out of your mouth. These droplets then contaminate all surfaces they land on. Advising that masks should only be worn by those with the virus is not helpful, as you might not know if you are infected or not.

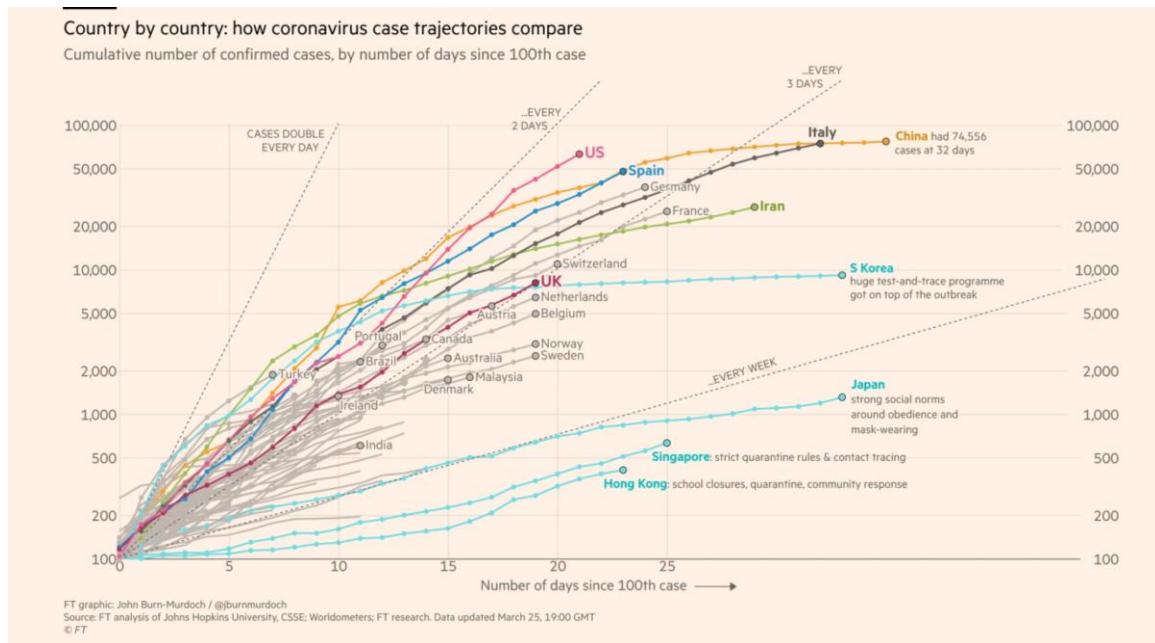
The main route of contamination with the Covid-19 virus

People are most likely to contract the virus by touching a contaminated surface and then touching their face. For this reason, people are well-advised to regularly wash their hands. However, each person should consider the likelihood of touching potentially contaminated surfaces when going out in public and then inadvertently touching their faces. Any barrier between your hands and your face will have a benefit according to David Price (2020), ICU Pulmonologist currently actively treating Covid-19 patients. Contracting the virus from the air is possible but unlikely. Normal medical masks would not protect against airborne viruses either, and in hospitals with Covid-19 cases, only personnel performing procedures such as intubation or those who are in close contact with coughing patients are at risk of contracting the virus via the air, and they should wear N95 masks (Price, 2020). Wearing a homemade face mask and keeping a two-meter physical distance from others in public is effective in slowing down contamination.

Countries able to contain the virus

Hong Kong, Singapore, Japan and Taiwan have all been able to contain the virus. In all these countries, people have been wearing face masks for weeks now (Myburgh, 2020). The public Covid-19 posters in Hong Kong prominently display the use of face masks when in public. Taiwan is producing 10 000 000 masks per workday. Taiwan does not have enough cases to appear on the graph below. This measure was not

adopted in Italy, USA, Germany, Spain, France or South Africa. In fact, it was actively discouraged in the USA, UK and SA.



FT analysis of John Hopkins University, CSSE, Worldometers; FT research

Czech Republic made masks mandatory in public

The Czech Republic made masks mandatory in public on 18 March 2020 (Euronews), and now more than a week later, they have a high level of compliance. This country needs to be monitored closely. As on 29 March, the known cases were growing at an average of 14% per day from 23-29 March. As on 29 March they had 2743 known Covid-19 cases and 16 deaths (death rate by known cases = 0.58 %).



Public posters in Hong Kong – obtained from the James Myburg article “The coming winter flood”.



Czech campaign (<https://www.youtube.com/watch?v=BoDwXwZXsDI&t=94s>)

Shortage of medical masks

The main reason masks have not been advocated for as a method to prevent contamination is that people have stockpiled masks, which has a detrimental effect for medical staff. Masks are critical to protect medical staff when treating infected patients. All members of the public that have access to medical masks should provide this to their nearest hospital. The general public should be encouraged to only wear homemade masks. In this way the supply of medical masks to medical staff will not be affected, while at the same time providing protection to the general public.

Non-medical people do not know how to wear homemade face masks putting them at higher risk

According to a medical expert on SA radio,

“The evidence is that, as masks dampen with prolonged wear, they become quite good at conveying viral particles deposited onto their surfaces (both inside and out). Also, based on observation, most people do not use masks effectively. They also tend to touch the mask more often, to adjust it or for eating and drinking, potentially depositing virus onto the surfaces.

Consequently, the authority view is that members of the public should not use masks because they will derive no benefit from them. They may even increase their own risk. Therefore, masks out in public really aren't that helpful, unfortunately.

You are right to highlight the dangers of transmission in a care setting. The close and prolonged contact that such care necessitates results in significant risk escalation. We estimate that 80% of transmissions occur in the household settings.”

Non-medical people do not currently know how to handle and wear homemade face masks. There is no reason why they will not be able to learn the correct practices. One way to practice to not touch your face would be to wear a homemade face mask at home (Price, 2020). The face mask will make you more aware of when you touch your face. This needs to be practiced long before you wear a homemade facemask in public, or long before you need to care for a Covid-19 patient in your household.

During the lockdown period, the intention is for you to only go out to buy food or medicine. This should be a short mission avoiding the prolonged wear risks. There should be no eating or drinking during this mission. When returning home, it must be assumed that the homemade mask is contaminated, and it must be washed immediately.

Homemade masks

Masks can be made from variety of readily available materials. T-shirt material and pillowcase material have been shown to adequately filter droplets and has good breathability according to the scientific paper by Davies and others (2013). In poorer countries, where physical distancing is more difficult, everyone still has access to T-shirts.

@Tshirtmasks

Anyone can wear a T-shirt as a mask. A t-shirt head opening can be worn at eye level, with the sleeves tied behind the head. Make sure that you cover your chin with the mask.

There is a proliferation in DIY face mask solutions on the internet. When you go out, put on a clean homemade mask and focus on not touching your face. When arriving home, take off the mask and wash both your mask and your hands with soap and water.

Misconceptions regarding face masks

Hospitals and medical staff absolutely need medical masks, and they are running out of masks quickly. This has resulted in a misleading message to the public, stating that face masks do not help the general public. While well-intended, this is not true. Below find a table with common misconceptions amongst the public, with suitable corrections.

| Misconceptions and corrections regarding face masks | |
|---|---|
| Misconception | Correction |
| Masks are ineffective unless you are sick or a doctor. | You might be sick and not know it. Masks when used correctly are effective for all humans. |
| Only medical personnel should wear masks. | Only medical personnel should wear medical masks , everyone else should wear home made masks , when in public or in the care situation. |
| The general public do not know how to wear masks, and should therefore not wear masks. | The general public must learn how to wear masks properly. |
| Home made masks could let the virus through. | Medical masks could also let the virus through. Home made masks when used correctly will reduce the risk of transmitting the virus from your hands to your face . Airborn viruses are mainly a risk doctors in close contact with patients and they should wear N95 masks. |
| Medical masks are superior to home-made masks, hence you should not wear home-made masks. | The comparison should be with wearing nothing. Wearing a home-made mask and using it correctly is much more effective than wearing nothing. |
| Even if I did use a home-made mask correctly it would make a small difference. | If everyone wears home made masks in public and follow the correct procedures, it would make a massive difference as the group benefit goes up exponentially. |

Comparing the individual benefit to the group benefit

While there is a benefit to the individual wearing a homemade mask in public, one should really consider the benefit of everyone following this practice. If everyone follows this practice and everyone practices rigorous hand hygiene, fewer surfaces will be contaminated and the likelihood of hand to face contamination will be reduced. As more people follow this practice, the benefit will be compounded exponentially. This benefit should be modelled mathematically in the same way that lockdown measures were modelled in the article by Harry Stevens, 2020.

Conclusion

By making it compulsory for all to wear homemade masks in public and by creating awareness of proper mask wearing practices, the growth in Covid-19 infections will be slowed down dramatically, without putting medical staff at risk due to a shortage

of medical masks. The Czech Republic introduced this practice on 18 March 2020, and the early signs are positive and need to be monitored closely. To ensure that medical staff have access to medical masks, the public should be encouraged to hand all medical masks over to hospitals.

Homemade face masks are an affordable and effective way to limit the spread of Covid-19. Many people are asymptomatic and are actively spreading the virus simply by speaking. When you speak there are always droplets coming out of your mouth.

Be an example to others during lockdown, by publicising your homemade face masks on social media and encouraging others to do the same. By doing this, this habit could potentially spread faster than the virus itself.

My mask protects you, your mask protects me.

References

Cohen, J 2020. Not wearing masks to protect against coronavirus is a 'big mistake,' top Chinese scientist says. *Sciencemag* 27 March 2020.

<https://www.sciencemag.org/news/2020/03/not-wearing-masks-protect-against-coronavirus-big-mistake-top-chinese-scientist-says>

Davies, Anna & Thompson, Katy-Anne & Giri, Karthika & Kafatos, George & Walker, James & Bennett, Allan. (2013). Testing the Efficacy of Homemade Masks: Would They Protect in an Influenza Pandemic?. *Disaster medicine and public health preparedness*. 7. 413-418.

10.1017/dmp.2013.43. https://www.researchgate.net/publication/258525804_Testing_the_Efficacy_of_Homemade_Masks_Would_They_Protect_in_an_Influenza_Pandemic

Euronews 24 March 2020. Coronavirus: Czechs facing up to COVID-19 crisis by making masks mandatory <https://www.euronews.com/2020/03/24/coronavirus-czechs-facing-up-to-covid-19-crisis-by-making-masks-mandatory>

FT analysis of John Hopkins University, CSSE, Worldometers; FT research.

Country by country: how coronavirus case trajectories compare

<https://www.ft.com/coronavirus-latest>

#Masks4all campaign <https://www.youtube.com/watch?v=BoDwXwZXsDI&t=94s>

Myburg, James 2020. "The coming winter flood"

<https://www.biznews.com/undictated/2020/03/20/herd-immunity-control-covid-19-james-myburgh>

Pueyo, Tomas 2020. "Coronavirus: The Hammer and the Dance". Medium.com

<https://medium.com/@tomaspueyo/coronavirus-the-hammer-and-the-dance-be9337092b56>

<https://www.economist.com/graphic-detail/2020/03/19/how-long-can-the-novel-coronavirus-survive-on-surfaces-and-in-the-air>

Price, David 2020. Empowering and protecting your family during the Covid-19 pandemic (video)

https://vimeo.com/399733860?fbclid=IwAR1hEkGPhowvsuDtx5cUsCrtYbCcaCVAGLzMXaPDwh77ntPgmlHdZcbx_u8

Stevens, Harry 2020. Why outbreaks like coronavirus spread exponentially, and how to flatten the curve. https://www.washingtonpost.com/graphics/2020/world/corona-simulator/?fbclid=IwAR2aAMsqhM1qz3rrAcGRQk2kL4MXre2w6aAI4yNfCGauWIzgn11-UsJ7LNw&utm_campaign=wp_main&utm_medium=social&utm_source=facebook

ADDITIONAL INFORMATION

- Before putting on a mask, clean hands with alcohol-based hand rub or soap and water.
- Cover mouth and nose with mask and make sure there are no gaps between your face and the mask.
- Avoid touching the mask while using it; if you do, clean your hands with alcohol-based hand rub or soap and water.
- Replace the mask with a new one as soon as it is damp and do not re-use single-use masks.
- To remove the mask: remove it from behind (do not touch the front of mask); discard immediately in a closed bin; clean hands with alcohol-based hand rub or soap and water.

MANAGING YOURSELF AT HOME WHILE AWAITING COVID-19 TEST RESULTS

Suspected COVID-19 cases who are medically well, or who are assessed as having only mild disease, may be managed at home while awaiting test results.

Such patients should be instructed to self-isolate at home and be given appropriate advice about reducing possible transmission to others:

- At home, the patient should stay in a specific room and use his/her own bathroom (if possible). If they live in shared accommodation (university halls of residence or similar) with a communal kitchen, bathroom(s) and living area, they should stay in their room with the door closed, **only coming out when necessary, wearing a facemask if they do so.**
- Patients should avoid unnecessary travel and unnecessary contact with other people.
- **Where contact is unavoidable, the patient should wear a facemask, and maintain a distance of at least 1 metre (preferably 2 metres) from other people**
- Patients should clean their hands with soap and water frequently. Alcohol-based sanitizers may also be used, provided they contain at least 70% alcohol.
- Make sure that shared spaces in the home have good air flow, such as by an

opened window

- Patients should practice good cough and sneeze hygiene, by using a tissue, and then immediately discarding the tissue in a lined trash can, followed by washing hands immediately.
- Patients should not have visitors in their home. Only those who live in their home should be allowed to stay.
- Patients should avoid sharing household items like dishes, cups, eating utensils and towels. After using any of these, the items should be thoroughly washed with soap and hot water.
- All high-touch surfaces like table tops, counters, toilets, phones, computers, etc. should be appropriately and frequently cleaned.
- If patients need to wash laundry at home before the results are available, then they should wash all laundry at the highest temperature compatible for the fabric using laundry detergent. This should be above 60° C. If possible, they should tumble dry and iron using the highest setting compatible with the fabric. Disposable gloves and a plastic apron should be used when handling soiled materials if possible and all surfaces and the area around the washing machine should be cleaned. Laundry should not be taken to a laundrette. The patient should wash his/her hands thoroughly with soap and water after handling dirty laundry (remove gloves first if used).
- Patients should know who to call if they develop any worsening symptoms, so that they can be safely reassessed.