Rapid response to:

Face masks for the public during the covid-19 crisis

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Rapid Response:

Covid-19: important potential side effects of wearing face masks that we should bear in mind

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Dear Editor

In their editorial to the BMJ,[1] Greenhalgh et al. advise that surgical masks should be worn in public to prevent some transmission of covid-19, adding that we should sometimes act without definitive evidence, just in case, according to the precautionary principle. The Authors quote a definition of the precautionary principle found on Wikipedia, "a strategy for approaching issues of potential harm when extensive scientific knowledge on the matter is lacking."

However, while no single formulation of that principle has been universally adopted,[2] the precautionary principle aims at preventing researchers and policy makers from neglecting potentially-harmful side effects of interventions. Before implementing clinical and public health interventions, one must actively hypothesise and describe potential side effects and only then decide whether they are worth being quantified on not.

Most scientific articles and guidelines in the context of the covid-19 pandemic highlight two potential side effects of wearing surgical face masks in the public, but we believe that there are other ones that are worth considering before any global public health policy is implemented involving billions of people.

The two potential side effects that have already been acknowledged are:

(1) Wearing a face mask may give a false sense of security and make people adopt a reduction in compliance with other infection control measures, including social distancing and hands washing.[3]

(2) Inappropriate use of face mask: people must not touch their masks, must change their single-use masks frequently or wash them regularly, dispose them correctly and adopt other management measures, otherwise their risks and those of others may increase.[3,4]

Other potential side effects that we must consider are:

(3) The quality and the volume of speech between two people wearing masks is considerably compromised and they may unconsciously come closer. While one may be trained to counteract side effect n.1, this side effect may be more difficult to tackle.

(4) Wearing a face mask makes the exhaled air go into the eyes. This generates an uncomfortable feeling and an impulse to touch your eyes. If your hands are contaminated, you are infecting yourself.

(5) Face masks make breathing more difficult. For people with COPD, face masks are in fact intolerable to wear as they worsen their breathlessness.[5] Moreover, a fraction of carbon dioxide previously exhaled is inhaled at each respiratory cycle. Those two phenomena increase breathing frequency and deepness, and hence they increase the amount of inhaled and exhaled air. This may worsen the burden of covid-19 if infected people wearing masks spread more contaminated air. This may also worsen the clinical condition of infected people if the enhanced breathing pushes the viral load down into their lungs.

(5B) The effects described at point 5 are amplified if face masks are heavily contaminated (see point 2)

(6) While impeding person-to-person transmission is key to limiting the outbreak, so far little importance has been given to the events taking place after a transmission has happened, when innate immunity plays a crucial role. The main purpose of the innate immune response is to immediately prevent the spread and movement of foreign pathogens throughout the body.[6] The innate immunity's efficacy is highly dependent on the viral load. If face masks determine a humid habitat where the SARS-CoV-2 can remain active due to the water vapour continuously provided by breathing and captured by the mask fabric, they determine an increase in viral load and therefore they can cause a defeat of the innate immunity and an increase in infections. This phenomenon may also interact with and enhance previous points.

In conclusion, as opposed to Greenhalgh et al., we believe that the context of the current covid-19 pandemic is very different from that of the "parachutes for jumping out of aeroplanes",[7] in which the dynamics of harm and prevention are easy to define and even to quantify without the need of research studies. It is necessary to quantify the complex interactions that may well be operating between positive and negative effects of wearing surgical masks at population level. It is not time to act without evidence.

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