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Facemasks and similar barriers to prevent respiratory illness such as COVID-19: A rapid systematic review

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ABSTRACT

The current pandemic of COVID-19 has lead to conflicting opinions on whether wearing facemasks outside of health care facilities protects against the infection. To better understand the value of wearing facemasks we undertook a rapid systematic review of existing scientific evidence about development of respiratory illness, linked to use of facemasks in community settings.

Methods We included all study designs. There were 31 eligible studies (including 12 RCTs). Narrative synthesis and random-effects meta-analysis of attack rates for primary and secondary prevention in 28 studies were performed. Results were reported by design, setting and type of face barrier in primary prevention, and by who wore the facemask (index patient or well contacts) in secondary prevention trials. The preferred outcome was influenza-like illness (ILI) but similar outcomes were pooled with ILI when ILI was unavailable. GRADE quality assessment was based on RCTs with support from observational studies.

Greater effectiveness was suggested by observational studies. When both house-mates and an infected household member wore facemasks the odds of further household members becoming ill may be modestly reduced by around 19% (OR 0.81, 95%CI 0.48 to 1.37, I 45%, 5 RCTs, low certainty evidence). The protective effect was very small if only the well person (OR 0.93, 95% CI 0.68 to 1.28, I 11%, 2 RCTs, low uncertainty evidence) or the infected person wore the facemask (very low certainty evidence).

Discussion Based on the RCTs we would conclude that wearing facemasks can be very slightly protective against primary infection from casual community contact, and modestly protective against household infections when both infected and uninfected members wear facemasks. However, the RCTs often suffered from poor compliance and controls using facemasks. Across observational studies the evidence in favour of wearing facemasks was stronger. We expect RCTs to under-estimate the protective effect and observational studies to exaggerate it. The evidence is not sufficiently strong to support widespread use of facemasks as a protective measure against COVID-19. However, there is enough evidence to support the use of facemasks for short periods of time by particularly vulnerable individuals when in transient higher risk situations. Further high quality trials are needed to assess when wearing a facemask in the community is most likely to be protective.

Competing Interest Statement

The authors have declared no competing interest.

Funding Statement

No funder supported this study.

Author Declarations

All relevant ethical guidelines have been followed; any necessary IRB and/or ethics committee approvals have been obtained and details of the IRB/oversight body are included in the manuscript.

Yes

All necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.

Yes

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Footnotes

- **FUNDING** This research was not supported by any funder.

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Julii Brainard • a year ago

108-102 = 6. 6/108 rounds to 6%, so OR 0.94 is correct as change in risk from no exposure to exposure (exposure = wearing masks). We checked all the raw case/sample numbers using ITT and the numbers are correct so the OR & 95%CI are correctly calculated for primary prevention RCTs. -Dr. Julii Brainard, UEA

Marjukka Mäkelä • 2 years ago

Dear Sir

Summaryx Ltd, a company preparing systematic reviews (SRs) and health technology assessment reports, is currently finalizing an SR on the effectiveness of using masks in public for preventing the spread of influenza-like illness (ILI). Our literature search produced 6 primary studies and 6 SRs as material, and one of the SRs was a preprint of "Facemasks and similar barriers to prevent respiratory illness such as COVID-19: A rapid systematic review" by Brainard et al. We believe there is a mistake in their GRADE tabulation (Table 1) that seriously distorts the results. For the first outcome "Primary prevention, well wear masks – RCT data – outcome ILI", they report the risk without masks to be 108 and with masks 102 ILIs per thousand. This is a difference of six per thousand, or six per mil, not per cent, as the abstract tells. When looking at original data, it may be that the numbers ought to be 105 and 102, which gives an even lower effect.

We suggest Brainard et al. should change their conclusion, as formulated in the Abstract: "In 3 RCTs, wearing a facemask may very slightly reduce the odds of developing ILI/respiratory symptoms, by around 6% (OR 0.94, 95% CI 0.75 to 1.19, I2 29%, low certainty evidence)." should be corrected to "In 3 RCTs, wearing a facemask may very slightly reduce the odds of developing ILI/respiratory symptoms, by around 0,6% (OR 0.94, 95% CI 0.75 to 1.19, I2 29%,

Marjukka Mäkelä, MD, PhD,M.Sc.(ClinEpi)
Professor emerita

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