https://www.folkhalsomyndigheten.se/smittskydd-beredskap/utbrott/aktuella-utbrott/covid-19/statistik-och-analyser/analys-och-prognoser/litteraturlista-for-munskydd/

Literature about face masks

The Swedish Public Health Agency monitors daily all new reviewed literature on covid-19 and SARS-CoV-2 cited in the search engine PubMed. Publications in the bibliography below have been deemed relevant to the use of mouth guards in society. In addition to the articles that have been systematically identified via PubMed, there are also articles in the list that have been sporadically found via other information channels. Literature is assessed on an ongoing basis, which means that the bibliography is changing.

The Swedish Public Health Agency is not responsible for the content of external sources.

1. Jefferson T, Jones M, Ansari LAA, Bawazeer G, Beller E, Clark J, et al. Physical interventions to interrupt or reduce the spread of respiratory viruses. Part 1 - Face masks, eye protection and person distancing: systematic review and meta-analysis. medRxiv. 2020 Apr 7;2020.03.30.20047217.
   CONCLUSIONS: Most included trials had poor design, reporting and sparse events. There was insufficient evidence to provide a recommendation on the use of facial barriers without other measures. We found insufficient evidence for a difference between surgical masks and N95 respirators and limited evidence to support effectiveness of quarantine. Based on observational evidence from the previous SARS epidemic included in the previous version of our Cochrane review we recommend the use of masks combined with other measures.
2. Aggarwal N, Dwarakanathan V, Gautam N, Ray A. Facemasks for prevention of viral respiratory infections in community settings: A systematic review and meta-analysis. Indian J Public Health. 2020 Jun;64(Supplement):S192–200.
   Conclusion:
   There was no significant reduction in ILI either with facemask alone (n = 5, pooled effect size: -0.17; 95% confidence interval [CI]: -0.43-0.10; P = 0.23; I^2 = 10.9%) or facemask with handwash (n = 6, pooled effect size: (n=6, pooled effect size: -0.09; 95% CI: -0.58 to 0.40; P = 0.71, I^2 = 69.4%). Existing data pooled from randomized controlled trials do not reveal a reduction in occurrence of ILI with the use of facemask alone in community settings.
3. Brainard JS, Jones N, Lake I, Hooper L, Hunter P. Facemasks and similar barriers to prevent respiratory illness such as COVID-19: A rapid systematic review. medRxiv. 2020 Jan 1;2020.04.01.20049528.
   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.

4. Chou R, Dana T, Jungbauer R, Weeks C, McDonagh MS. Masks for Prevention of Respiratory Virus Infections, Including SARS-CoV-2, in Health Care and Community Settings: A Living Rapid Review. Ann Intern Med. 2020 Jun 24;

   Conclusion: Evidence on mask effectiveness for respiratory infection prevention is stronger in health care than community settings. N95 respirators might reduce SARS-CoV-1 risk versus surgical masks in health care settings, but applicability to SARS-CoV-2 is uncertain.

5. Chou R, Dana T, Jungbauer R, Weeks C, McDonagh MS. Update Alert: Masks for Prevention of Respiratory Virus Infections, Including SARS-CoV-2, in Health Care and Community Settings. Ann Intern Med. 2020 Jul 20;

   Same as 4

6. Chu DK, Akl EA, Duda S, Solo K, Yaacoub S, Schünemann HJ, et al. Physical distancing, face masks, and eye protection to prevent person-to-person transmission of SARS-CoV-2 and COVID-19: a systematic review and meta-analysis. The Lancet. 2020 Jun;S0140673620311429.

   Findings: Face mask use could result in a large reduction in risk of infection (n=2647; aOR 0·15, 95% CI 0·07 to 0·34, RD −14·3%, −15·9 to −10·7; low certainty), with stronger associations with N95 or similar respirators compared with disposable surgical masks or similar (eg, reusable 12–16-layer cotton masks; $p_{interaction}$=0·090; posterior probability >95%, low certainty).

7. Liang M, Gao L, Cheng C, Zhou Q, Uy JP, Heiner K, et al. Efficacy of face mask in preventing respiratory virus transmission: A systematic review and meta-analysis. Travel Medicine and Infectious Disease. 2020 May;101751.

   Conclusions

   This study adds additional evidence of the enhanced protective value of masks, we stress that the use masks serve as an adjunctive method regarding the COVID-19 outbreak.

8. MacIntyre CR, Chughtai AA. A rapid systematic review of the efficacy of face masks and respirators against coronaviruses and other respiratory transmissible viruses for the community, healthcare workers and sick patients. Int J Nurs Stud. 2020 Apr 30;108:103629.

   Conclusion

   The study suggests that community mask use by well people could be beneficial, particularly for COVID-19, where transmission may be pre-symptomatic. The studies of masks as source control also suggest a benefit, and may be important during the COVID-19 pandemic in universal community face mask use as well as in health care settings. Trials in healthcare workers support the use of respirators continuously during a shift. This may prevent health worker infections and deaths from COVID-19, as aerosolisation in the hospital setting has been documented.

9. Goscé L, Phillips PA, Spinola P, Gupta DRK, Abubakar PI. Modelling SARS-COV2 Spread in London: Approaches to Lift the Lockdown. J Infect. 2020 Aug;81(2):260–5.

   Conclusions

   A combination of NPIs such as universal testing, contact tracing and mask use while under lockdown would be associated with least deaths and infections. This approach would require high uptake and sustained local effort but it is potentially feasible as may lead to elimination in a relatively short time scale.

10. Mitze T, Kosfeld R, Rode J, Wälde K. Face Masks Considerably Reduce COVID-19 Cases in Germany: A Synthetic Control Method Approach [Internet]. IZA – Institute of Labor Economics; 2020. Available from: http://ftp.iza.org/dp13319.pdf
    Depending on the region we analyse, we find that face masks reduced the cumulative number of registered Covid-19 cases between 2.3% and 13% over a period of 10 days after they became compulsory. Assessing the credibility of the various estimates, we conclude that face masks reduce the daily growth rate of reported infections by around 40%.
11. Stutt ROJH, Retkute R, Bradley M, Gilligan CA, Colvin J. A modelling framework to assess the likely effectiveness of facemasks in combination with 'lock-down' in managing the COVID-19 pandemic. Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences. 2020 Jun 24;476(2238):20200376.
    Even if facemask use began after the start of the first lock-down period, our results show that benefits could still accrue by reducing the risk of the occurrence of further COVID-19 waves. We examine the effects of different rates of facemask adoption without lock-down periods and show that, even at lower levels of adoption, benefits accrue to the facemask wearers. These analyses may explain why some countries, where adoption of facemask use by the public is around 100%, have experienced significantly lower rates of COVID-19 spread and associated deaths. We conclude that facemask use by the public, when used in combination with physical distancing or periods of lock-down, may provide an acceptable way of managing the COVID19 pandemic and re-opening economic activity
12. Eikenberry SE, Mancuso M, Iboi E, Phan T, Eikenberry K, Kuang Y, et al. To mask or not to mask: Modeling the potential for face mask use by the general public to curtail the COVID-19 pandemic. Infect Dis Model. 2020;5:293–308.
    Our results suggest use of face masks by the general public is potentially of high value in curtailing community transmission and the burden of the pandemic. The community-wide benefits are likely to be greatest when face masks are used in conjunction with other non-pharmaceutical practices (such as social-distancing), and when adoption is nearly universal (nation-wide) and compliance is high.
13. Fisman DN, Greer AL, Tuite AR. Bidirectional impact of imperfect mask use on reproduction number of COVID-19: A next generation matrix approach. Infect Dis Model. 2020;5:405–8.
    1. Masks, even with suboptimal efficacy in both prevention of acquisition and transmission of infection, could substantially decrease the reproduction number for COVID-19 if widely used.
    2. Widespread masking may be sufficient to suppress epidemics where R has been brought close to 1 via other measures (e.g., distancing).
    3. "Assortment" within populations (the tendency for interactions between masked individuals to be more likely than interactions between masked and unmasked individuals) would rapidly erode the impact of masks. As such, mask uptake needs to be fairly universal to have an effect.
    This simple model suggests that widespread uptake of masking could be determinative in suppressing COVID-19 epidemics in regions with R(t) at or near 1.
14. Ngonghala CN, Iboi E, Eikenberry S, Scotch M, MacIntyre CR, Bonds MH, et al. Mathematical assessment of the impact of non-pharmaceutical interventions on curtailing the 2019 novel Coronavirus. Math Biosci. 2020 Apr 30;108364.

Using face-masks in public (including the low efficacy cloth masks) is very useful in minimizing community transmission and burden of COVID-19, provided their coverage level is high. The masks coverage needed to eliminate COVID-19 decreases if the masks-based intervention is combined with the strict social-distancing strategy.

15. Worby CJ, Chang H-H. Face mask use in the general population and optimal resource allocation during the COVID-19 pandemic. medRxiv. 2020 Apr 7;
    In summary, face mask use, particularly for a pathogen with relatively common asymptomatic carriage, can effectively provide some mitigation of transmission, while balancing provision between vulnerable healthy persons and symptomatic persons can optimize mitigation efforts when resources are limited.
16. Li T, Liu Y, Li M, Qian X, Dai SY. Mask or no mask for COVID-19: A public health and market study. PLoS One. 2020;15(8):e0237691.
    Our study indicates that wearing a face mask can be effectively combined with social distancing to flatten the epidemic curve. Wearing a mask presents a rational way to implement as an NPI to combat COVID-19. We recognize our study provides a projection based only on currently available data and estimates potential probabilities. As such, our model warrants further validation studies.
17. Iversen BG. Should individuals in the community without respiratory symptoms wear facemasks to reduce the spread of COVID-19? :45.
    In the current epidemiological situation in Norway, wearing facemasks to reduce the spread of COVID-19 is not recommended for individuals in the community without respiratory symptoms who are not in near contact with people who are known to be infected. If the epidemiological situation worsens substantially in a geographical area, the use of facemasks as a precautionary measure should be reconsidered. Measures to reduce risks during necessary public transport and during mass events, including wearing facemasks, should be explored further. If use of facemasks by individuals without respiratory symptoms in the community is recommended in specific circumstances, such as public transport or mass events, medical masks or quality controlled non-medical masks with a documented filtration effect should be used.
18. Leffler CT, Ing EB, Lykins JD, Hogan MC, McKeown CA, Grzybowski A. Association of country-wide coronavirus mortality with demographics, testing, lockdowns, and public wearing of masks. Update August 4, 2020. medRxiv. 2020 Aug 5;2020.05.22.20109231.
    Conclusions. Societal norms and government policies supporting the wearing of masks by the public, as well as international travel controls, are independently associated with lower per-capita mortality from COVID-19.
19. Cheng VC-C, Wong S-C, Chuang VW-M, So SY-C, Chen JH-K, Sridhar S, et al. The role of community-wide wearing of face mask for control of coronavirus disease 2019 (COVID-19) epidemic due to SARS-CoV-2. J Infect. 2020;81(1):107–14.
    Conclusion
    Community-wide mask wearing may contribute to the control of COVID-19 by reducing the amount of emission of infected saliva and respiratory droplets from individuals with subclinical or mild COVID-19.
20. Chiang C-H, Chiang C-H, Chiang C-H, Chen Y-C. The Practice of Wearing Surgical Masks during the COVID-19 Pandemic. Emerg Infect Dis. 2020 Apr 23;26(8):1962.

Letter: Although evidence is limited for their effectiveness in preventing transmission of severe acute respiratory syndrome coronavirus 2, either for source control or to reduce exposure, the wearing of masks by healthy persons may prevent potential asymptomatic or presymptomatic transmission (3). This marginal reduction in transmission may produce substantial results, particularly when it is implemented early.

21. Hendrix MJ, Walde C, Findley K, Trotman R. Absence of Apparent Transmission of SARS-CoV-2 from Two Stylists After Exposure at a Hair Salon with a Universal Face Covering Policy - Springfield, Missouri, May 2020. MMWR Morb Mortal Wkly Rep. 2020 Jul 17;69(28):930–2.

    Among 139 clients exposed to two symptomatic hair stylists with confirmed COVID-19 while both the stylists and the clients wore face masks, no symptomatic secondary cases were reported; among 67 clients tested for SARS-CoV-2, all test results were negative. Adherence to the community's and company's face-covering policy likely mitigated spread of SARS-CoV-2.

22. Hong L-X, Lin A, He Z-B, Zhao H-H, Zhang J-G, Zhang C, et al. Mask wearing in pre-symptomatic patients prevents SARS-CoV-2 transmission: An epidemiological analysis. Travel Med Infect Dis. 2020 Jun 24;101803.

    Conclusions

    Our findings provided valuable details of pre-symptomatic patient mask-wearing and restriction of mass gathering in congested spaces particularly, are important interventions to mitigate the SARS-CoV-2 transmission.

23. Liu X, Zhang S. COVID-19 : Face Masks and Human-to-human Transmission. Influenza Other Respir Viruses. 2020 Mar 29;

    Letter: In the study of attitudes of influenza-vaccinated healthcare workers toward masks, 65.7% of the participants agreed with infection control recommendation "wearing a mask" to prevent influenza transmission. Due to the lack of research on face masks, further research should focus on assessing the efficacy of face masks against COVID-19, investigating reuse of face masks and assessing compliance.

24. Lyu W, Wehby GL. Community Use Of Face Masks And COVID-19: Evidence From A Natural Experiment Of State Mandates In The US. Health Aff (Millwood). 2020;101377hlthaff202000818.

    The research design is an event study examining changes in the daily county-level COVID-19 growth rates between March 31 and May 22, 2020. Mandating face mask use in public is associated with a decline in the daily COVID-19 growth rate by 0.9, 1.1, 1.4, 1.7, and 2.0 percentage points in 1–5, 6–10, 11–15, 16–20, and 21 or more days after state face mask orders were signed, respectively. Estimates suggest that as a result of the implementation of these mandates, more than 200,000 COVID-19 cases were averted by May 22, 2020. The findings suggest that requiring face mask use in public could help in mitigating the spread of COVID-19.

25. MacIntyre CR, Chughtai AA, Seale H, Dwyer DE, Quanyi W. HUMAN CORONAVIRUS DATA FROM FOUR CLINICAL TRIALS OF MASKS AND RESPIRATORS. Int J Infect Dis. 2020 Jun 1;96:631–3.

There was a higher risk of coronavirus infection in HCWs who wore a mask compared to a respirator, but the difference was not statistically significant. These are the only available clinical trial data on coronavirus infections associated with mask or respirator use. More clinical trials are needed to assess the efficacy of respiratory protection against coronavirus infections.

26. Xu J, Hussain S, Lu G, Zheng K, Wei S, Bao W, et al. Associations of Stay-at-Home Order and Face-Masking Recommendation with Trends in Daily New Cases and Deaths of Laboratory-Confirmed COVID-19 in the United States. Explor Res Hypothesis Med. 2020 Jul 8;1–10.
    Trends in COVID-19 daily cases and Rt reduced after March 23 (P<0.001) and further reduced on April 3 (P<0.001), which was associated with implementation of SAHO [Stay-at-home-order] by 10 states on March 23, and face-masking recommendation on April 3, respectively. The estimates of Rt eventually fell below/around 1.0 on April 13. Similar turning points were identified in the trends of daily deaths with a lag time. Early implementation and early-removal of SAHO would be associated with significantly reduced and increased daily new cases and deaths, respectively.
27. Loupa G, Karali D, Rapsomanikis S. Aerosol filtering efficiency of respiratory face masks used during the COVID-19 pandemic [Internet]. Epidemiology; 2020 Jul [cited 2020 Aug 26]. Available from: http://medrxiv.org/lookup/doi/10.1101/2020.07.16.20155119
    The spread of the COVID-19 pandemic, effected the imposition of personal protection measures in a large number of countries. The use of commercially available personal face masks was widely accepted as such a protective measure. Since the quality of the face masks scanned the spectrum from surgical to the home made fabric ones, it was considered appropriate to experimentally establish their effectiveness for stopping aerosol in entering the respiratory system of the bearer. Presently, the masks were tested with polydisperse indoor air. Their effectiveness was examined for aerosol of aerodynamic diameters of 0.006 μm to 10 μm. Of these masks, only two were effective for the whole range of aerosol. Cloth masks were found to be ineffective for the whole spectrum of aerosol particle sizes and especially in SARS-CoV-2 virus most abundant size range.
28. Lima MM de S, Cavalcante FML, Macêdo TS, Galindo Neto NM, Caetano JÁ, Barros LM. Cloth face masks to prevent Covid-19 and other respiratory infections. Rev Lat Am Enfermagem. 2020;28:e3353.
    Results: low coverage cloth face masks made of 100% cotton, scarf, pillowcase, antimicrobial pillowcase, silk, linen, tea towel, or vacuum bag, present marginal/reasonable protection against particles while high coverage cloth masks provide high protection. Conclusion: cloth face masks are a preventive measure with moderate efficacy in preventing the dissemination of respiratory infections caused by particles with the same size or smaller than those of SARS-CoV-2. The type of fabric used, number of layers and frequency of washings influence the efficacy of the barrier against droplets.
29. Konda A, Prakash A, Moss GA, Schmoldt M, Grant GD, Guha S. Aerosol Filtration Efficiency of Common Fabrics Used in Respiratory Cloth Masks. ACS Nano. 2020 May 26;14(5):6339–47.
    Overall, we find that combinations of various commonly available fabrics used in cloth masks can potentially provide significant protection against the transmission of aerosol particles.
30. Mantzari E, Rubin GJ, Marteau TM. Is risk compensation threatening public health in the covid-19 pandemic? BMJ. 2020 Jul 26;m2913.

Unfounded concerns about risk compensation threaten public health when they delay the introduction of protective measures such as wearing of face coverings

31. Chen Y-J, Qin G, Chen J, Xu J-L, Feng D-Y, Wu X-Y, et al. Comparison of Face-Touching Behaviors Before and During the Coronavirus Disease 2019 Pandemic. JAMA Netw Open. 2020 Jul 29;3(7):e2016924.
    Findings In this cross-sectional study, including 4699 individuals before the coronavirus disease 2019 (COVID-19) pandemic and 2887 individuals during the COVID-19 pandemic, mandatory mask-wearing policies were associated with increased mask wearing among the general population during the COVID-19 pandemic. Wearing masks, either medical or fabric, was associated with reduced face-touching behavior, especially touching of the eyes, nose, and mouth.
32. Van der Vliet m. fl. [Gedragswetenschappelijke literatuur over mondkapjes | RIVM] [Internet]. 2020 [cited 2020 Aug 25]. Available from: https://www.rivm.nl/documenten/gedragswetenschappelijke-literatuur-over-mondkapjes
    En nederländsk rapport om "Risk compensation"
33. [Gedragswetenschappelijke literatuur over mondkapjes] | RIVM. Update 5 Aug 2020. [Internet]. [cited 2020 Aug 31]. Available from: https://www.rivm.nl/documenten/gedragswetenschappelijke-literatuur-over-mondkapjes
    Same as 32
34. Shiraly R, Shayan Z, McLaws M-L. Face touching in the time of COVID-19 in Shiraz, Iran. Am J Infect Control. 2020 Aug 13;
    Conclusion:
    Non-mask wearers were 1.5 more likely to touch their mucosal zone compared with mask wearers.
35. Betsch C, Korn L, Sprengholz P, Felgendreff L, Eitze S, Schmid P, et al. Social and behavioral consequences of mask policies during the COVID-19 pandemic. Proc Natl Acad Sci U S A. 2020 Aug 20;
    In conclusion, should countries or communities want people to wear masks (e.g., to curb local outbreaks or to reduce transmission in future waves of the pandemic), introducing a mandatory policy along with explicit communication of the benefits of mask wearing (risk reduction, mutual protection, positive social signaling) and the benefits of the mandatory policy (fairness, less stigmatization, higher effectiveness) appears advisable.
36. Seale H, Dyer CEF, Abdi I, Rahman KM, Sun Y, Qureshi MO, et al. Improving the impact of non-pharmaceutical interventions during COVID-19: examining the factors that influence engagement and the impact on individuals. BMC Infect Dis. 2020 Aug 17;20(1):607.
    The results revealed that there are a range of demographic, social and psychological factors underpinning engagement with quarantine, school closures, and personal protective behaviours. Aside from the factors impacting on acceptance and compliance, there are several key community concerns about their use that need to be addressed including the potential for economic consequences.
37. Tao Z-Y, Dong J, Culleton R. The use of facemasks may not lead to an increase in hand-face contact. Transbound Emerg Dis. 2020 Jun 28;

We assessed the facial touching behaviour of bus passengers in China before and after the outbreak of COVID-19 and found that wearing a face mask does not increase the number of hand-face contacts and is likely, therefore, to have a positive beneficial effect on suppressing the spread of COVID-19 within populations when used in conjunction with social distancing measures.

Uppdaterat: 2020-08-31