
A cross-sectional and prospective cohort study of the role of schools in the SARS-CoV-2 second wave in Italy

Type Journal Article

Author Sara Gandini

Author Maurizio Rainisio

Author Maria Luisa Iannuzzo

Author Federica Bellerba

Author Francesco Cecconi

Author Luca Scorrano

Abstract Background: During COVID-19 pandemic, school closure has been mandated in analogy to its effect against influenza, but it is unclear whether schools are early COVID-19 amplifiers. Methods: We performed a cross-sectional and prospective cohort study in Italy during the second COVID-19 wave (from September 30, 2020 until at least February 28, 2021). We used databases from the Italian Ministry of Education, the Veneto region systems of SARS-CoV-2 cases notification and of schools' secondary cases tracing to compare SARS-CoV-2 incidence in students/school staff and general population and incidence across age groups. Number of tests, secondary infections by type of index case and ratio cases/ tests per school were estimated using an adjusted multivariable generalized linear regression model. Regional reproduction numbers R_t were estimated from Italian Civil Protection daily incidence data with a method of posterior distribution using a Markov Chain Monte Carlo algorithm. Findings: SARS-CoV-2 incidence among students was lower than in the general population. Secondary infections at school were $<1\%$, and clusters of ≥ 2 secondary cases occurred in 5-7% of the analysed schools. Incidence among teachers was comparable to the population of similar age ($P = 0.23$). Secondary infections among teachers were rare, occurring more frequently when the index case was a teacher than a student (37% vs. 10%, $P = 0.007$). Before and around the date of school opening in Veneto, SARS-CoV-2 incidence grew maximally in 20-29- and 45-49-years old individuals, not among students. The lag between school opening dates in Italian regions and the increase in the regional COVID-19 R_t was not uniform. Finally, school closures in two regions where they were implemented before other measures did not affect R_t decrease. Interpretation: This analysis does not support a role for school opening as a driver of the second COVID-19 wave in Italy, a large European country with high SARS-CoV-2 incidence. Funding: Fondazione MITE.

Date 2021-06

Language eng

Library Catalog PubMed

Extra PMID: 34104904 PMCID: PMC7995620

Volume 5

Pages 100092

Publication The Lancet Regional Health. Europe

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Journal Abbr Lancet Reg Health Eur

ISSN 2666-7762

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Tags:

Study

Attachments

- Full Text
- PubMed entry

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

Type Journal Article

Author M. Joshua Hendrix

Abstract On May 12, 2020 (day 0), a hair stylist at salon A in Springfield, Missouri (stylist A), developed respiratory symptoms and continued working with clients until day 8, when the stylist received a...

Date 2020

Language en-us

Library Catalog www.cdc.gov

URL <https://www.cdc.gov/mmwr/volumes/69/wr/mm6928e2.htm>

Accessed 9/2/2021, 10:11:20 AM

Volume 69

Publication MMWR. Morbidity and Mortality Weekly Report

DOI 10.15585/mmwr.mm6928e2

Journal Abbr MMWR Morb Mortal Wkly Rep

ISSN 0149-21951545-861X

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Tags:

Observation Study

Attachments

- Full Text
- Snapshot

Absence of in-flight transmission of SARS-CoV-2 likely due to use of face masks on board

Type Journal Article

Author Ran Nir-Paz

Author Itamar Grotto

Author Israel Strolov

Author Asher Salmon

Author Michal Mandelboim

Author Ella Mendelson

Author Gili Regev-Yochay

Abstract While there are many reports of patients who were either severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) or coronavirus disease 2019 (COVID-19) active patients flying in the last epidemic, there is no evidence to support viral transmission during flights. Recently, it was reported that in flights arriving from endemic areas to Greece and Brunei, asymptomatic rate was as high as 3–5%.^{1,2} Recently potential transmission during a flight in Africa was suggested.³ Thus, it would be important to anticipate the risk of such travel. On 20 February Israel repatriated 11 citizens from the Diamond Princess cruise ship in Japan back to Israel. Those 11 patients had at least 1 negative reverse transcription polymerase chain reaction (RT-PCR) for SARS-Cov-2 before flight boarding. A total of six were women and five men with age ranging from 42 to 76 (median of 70). All were transferred in a dedicated bus directly from the ship to the aircraft. The equipment was a charter Bombardier Galaxy 6000 commercial aircraft. Flight staff included three pilots and one steward, who were instructed to wear filtering facepiece (FFP2) masks. The crew had minimal interaction with passengers that was mainly in the distribution of the meals. This aircraft have two outflow valves that alternate between, and one air mixture unit (https://www.academia.edu/31466052/Global_Express_Integrated_Air_Management_System).

Date December 1, 2020

Library Catalog Silverchair

URL <https://doi.org/10.1093/jtm/taaa117>

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Volume 27

Publication Journal of Travel Medicine

DOI 10.1093/jtm/taaa117

Issue 8

Journal Abbr Journal of Travel Medicine

ISSN 1708-8305

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Tags:

Observation Study

Attachments

- Full Text PDF

Association between 2019-nCoV transmission and N95 respirator use

Type Journal Article

Author X. Wang

Author Z. Pan

Author Z. Cheng

Abstract Not available

Date 2020

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7134426/>

Accessed 9/2/2021, 9:58:02 AM

Extra PMID: 32142885 PMCID: PMC7134426

Volume 105

Pages 104-105

Publication The Journal of Hospital Infection

DOI 10.1016/j.jhin.2020.02.021

Issue 1

Journal Abbr J Hosp Infect

ISSN 0195-6701

Date Added 9/2/2021, 9:58:02 AM

Modified 9/2/2021, 2:49:01 PM

Tags:

Study

Attachments

- PubMed Central Full Text PDF
 - PubMed Central Link
-

Association between universal masking in a health care system and SARS-CoV-2 positivity among health care workers

Type Journal Article

Author Xiaowen Wang

Author Enrico G. Ferro

Author Guohai Zhou

Author Dean Hashimoto

Author Deepak L. Bhatt

Abstract The coronavirus disease 2019 (COVID-19) pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has severely affected health care workers (HCWs). As a result, hospital systems began testing HCWs and implementing infection control measures to mitigate workforce depletion and prevent disease spread. Mass General Brigham (MGB) is the largest health care system in Massachusetts, with 12 hospitals and more than 75 000 employees. In March 2020, MGB implemented a multipronged infection reduction strategy involving systematic testing of symptomatic HCWs and universal masking of all HCWs and patients with surgical masks. This study assessed the association of hospital masking policies with the SARS-CoV-2 infection rate among HCWs.

Date August 18, 2020

Library Catalog Silverchair

URL <https://doi.org/10.1001/jama.2020.12897>

Accessed 9/2/2021, 9:41:59 AM

Volume 324

Pages 703-704

Publication JAMA

DOI 10.1001/jama.2020.12897

Issue 7

Journal Abbr JAMA

ISSN 0098-7484

Date Added 9/2/2021, 9:41:59 AM

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Tags:

Study

Attachments

Association of state-issued mask mandates and allowing on-premises restaurant dining with county-level COVID-19 case and death growth rates - United States, March 1-December 31, 2020

Type Journal Article

Author Gery P, Jr Guy

Author Florence C Lee

Author Gregory Sunshine

Author Russell McCord

Author Mara Howard-Williams

Author Lyudmyla Kompaniyets

Author Christopher Dunphy

Author Maxim Gakh

Author Regen Weber

Author Erin Sauber-Schatz

Author John D Omura

Author Greta M Massetti

Author Mitigation Policy Analysis Unit CDC COVID-19 Response Team

Author CDC Public Health Law Program

Abstract CDC recommends a combination of evidence-based strategies to reduce transmission of SARS-CoV-2, the virus that causes COVID-19 (1). Because the virus is transmitted predominantly by inhaling respiratory droplets from infected persons, universal mask use can help reduce transmission (1). Starting in April, 39 states and the District of Columbia (DC) issued mask mandates in 2020. Reducing person-to-person interactions by avoiding nonessential shared spaces, such as restaurants, where interactions are typically unmasked and physical distancing (≥ 6 ft) is difficult to maintain, can also decrease transmission (2). In March and April 2020, 49 states and DC prohibited any on-premises dining at restaurants, but by mid-June, all states and DC had lifted these restrictions. To examine the association of state-issued mask mandates and allowing on-premises restaurant dining with COVID-19 cases and deaths during March 1-December 31, 2020, county-level data on mask mandates and restaurant reopenings were compared with county-level changes in COVID-19 case and death growth rates relative to the mandate implementation and reopening dates. Mask mandates were associated with decreases in daily COVID-19 case and death growth rates 1-20, 21-40, 41-60, 61-80, and 81-100 days after implementation. Allowing any on-premises dining at restaurants was associated with increases in daily COVID-19 case growth rates 41-60, 61-80, and 81-100 days after reopening, and increases in daily COVID-19 death growth rates 61-80 and 81-100 days after reopening. Implementing mask mandates was associated with reduced SARS-CoV-2 transmission, whereas reopening restaurants for on-premises dining was associated with increased transmission. Policies that require

universal mask use and restrict any on-premises restaurant dining are important components of a comprehensive strategy to reduce exposure to and transmission of SARS-CoV-2 (1). Such efforts are increasingly important given the emergence of highly transmissible SARS-CoV-2 variants in the United States (3,4).

Date March 12, 2021
Language eng
Archive PubMed
Loc. in Archive 33705364
URL <https://pubmed.ncbi.nlm.nih.gov/33705364>
Extra Publisher: Centers for Disease Control and Prevention
Volume 70
Pages 350-354
Publication MMWR. Morbidity and mortality weekly report
DOI 10.15585/mmwr.mm7010e3
Issue 10
Journal Abbr MMWR Morb Mortal Wkly Rep
ISSN 1545-861X
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Tags:

Humans, *Masks, COVID-19/*epidemiology/mortality/*prevention & control, Public Health/*legislation & jurisprudence, Restaurants/*legislation & jurisprudence, United States/epidemiology, Observational Study

Attachments

- Full Text (HTML)

Can face masks offer protection from airborne sneeze and cough droplets in close-up, face-to-face human interactions?—A quantitative study

Type Journal Article
Author Javed Akhtar
Author Abner Luna Garcia
Author Leonardo Saenz
Author Sarada Kuravi
Author Fangjun (東方军) Shu
Author Krishna Kota

Abstract Day-to-day observations reveal numerous medical and social situations where maintaining physical distancing is either not feasible or not practiced during the time of a viral pandemic, such as, the coronavirus disease 2019 (COVID-19). During these close-up, face-to-face interactions, a common belief is that a susceptible person wearing a face mask is safe, at least to a large extent, from foreign airborne sneeze and cough droplets. This study, for the first time, quantitatively verifies this notion. Droplet flow visualization experiments of a simulated face-to-face interaction with a mask in place were conducted using the particle image velocimetry setup. Five masks were tested in a snug-fit configuration (i.e., with no leakage around the edges): N-95, surgical, cloth PM 2.5, cloth, and wetted cloth PM 2.5. Except for the N-95 mask, the findings showed leakage of airborne droplets through all the face masks in both the configurations of (1) a susceptible person wearing a mask for protection and (2) a virus carrier wearing a mask to prevent the spreading of the virus. When the leakage percentages of these airborne droplets were expressed in terms of the number of virus particles, it was found that masks would not offer complete protection to a susceptible person from a viral infection in close (e.g., <6 ft) face-to-face or frontal human interactions. Therefore, consideration must be given to minimize or avoid such interactions, if possible. This study lends quantitative support to the social distancing and mask-wearing guidelines proposed by the medical research community.

Date December 1, 2020

Short Title Can face masks offer protection from airborne sneeze and cough droplets in close-up, face-to-face human interactions?

Library Catalog aip.scitation.org (Atypon)

URL <https://aip.scitation.org/doi/full/10.1063/5.0035072>

Accessed 9/1/2021, 5:20:11 PM

Extra Publisher: American Institute of Physics

Volume 32

Pages 127112

Publication Physics of Fluids

DOI 10.1063/5.0035072

Issue 12

ISSN 1070-6631

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Tags:

Study

Attachments

- Full Text PDF
-

Causal impact of masks, policies, behavior on early covid-19 pandemic in the U.S.

Type Journal Article

Author Victor Chernozhukov

Author Hiroyuki Kasahara

Author Paul Schrimpf

Abstract The paper evaluates the dynamic impact of various policies adopted by US states on the growth rates of confirmed Covid-19 cases and deaths as well as social distancing behavior measured by Google Mobility Reports, where we take into consideration people's voluntarily behavioral response to new information of transmission risks in a causal structural model framework. Our analysis finds that both policies and information on transmission risks are important determinants of Covid-19 cases and deaths and shows that a change in policies explains a large fraction of observed changes in social distancing behavior. Our main counterfactual experiments suggest that nationally mandating face masks for employees early in the pandemic could have reduced the weekly growth rate of cases and deaths by more than 10 percentage points in late April and could have led to as much as 19 to 47 percent less deaths nationally by the end of May, which roughly translates into 19 to 47 thousand saved lives. We also find that, without stay-at-home orders, cases would have been larger by 6 to 63 percent and without business closures, cases would have been larger by 17 to 78 percent. We find considerable uncertainty over the effects of school closures due to lack of cross-sectional variation; we could not robustly rule out either large or small effects. Overall, substantial declines in growth rates are attributable to private behavioral response, but policies played an important role as well. We also carry out sensitivity analyses to find neighborhoods of the models under which the results hold robustly: the results on mask policies appear to be much more robust than the results on business closures and stay-at-home orders. Finally, we stress that our study is observational and therefore should be interpreted with great caution. From a completely agnostic point of view, our findings uncover predictive effects (association) of observed policies and behavioral changes on future health outcomes, controlling for informational and other confounding variables.

Date January 1, 2021

URL <https://www.sciencedirect.com/science/article/pii/S0304407620303468>

Volume 220

Pages 23-62

Publication Pandemic Econometrics

DOI 10.1016/j.jeconom.2020.09.003

Issue 1

Journal Abbr Journal of Econometrics

ISSN 0304-4076

Date Added 9/2/2021, 11:46:40 AM

Modified 9/2/2021, 11:52:08 AM

Tags:

Characteristics of COVID-19 cases and outbreaks at child care facilities—District of Columbia, July–December 2020

Type Journal Article
Author Christine Kim
Abstract The occurrence of cases of COVID-19 reported by child care facilities among children, teachers, and staff members ...
Date 2021
Language en-us
Library Catalog www.cdc.gov
URL <https://www.cdc.gov/mmwr/volumes/70/wr/mm7020a3.htm>
Accessed 9/1/2021, 1:28:04 PM
Volume 70
Publication MMWR. Morbidity and Mortality Weekly Report
DOI 10.15585/mmwr.mm7020a3
Journal Abbr MMWR Morb Mortal Wkly Rep
ISSN 0149-21951545-861X
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Tags:

Observation Study

Attachments

- Full Text
- Snapshot

Clusters of SARS-CoV-2 infection among elementary school educators and students in one school district — Georgia, December 2020–January 2021

Type Journal Article
Author Jeremy A. W. Gold
Abstract Not available
Date 2021
Language en-us

Library Catalog www.cdc.gov
URL <https://www.cdc.gov/mmwr/volumes/70/wr/mm7008e4.htm>
Accessed 9/1/2021, 1:29:15 PM
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Publication MMWR. Morbidity and Mortality Weekly Report
DOI 10.15585/mmwr.mm7008e4
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Tags:

Observation Study

Attachments

- Full Text
- Snapshot

Community masks during the SARS-CoV-2 Pandemic: Filtration efficacy and air resistance polymers

Type Journal Article

Author Lukas Maurer

Author Davide Peris

Author Jens Kerl

Author Frank Guenther

Author Dieter Koehler

Author Dominic Dellweg

Abstract Background: Many countries have introduced a compulsory use of community masks for certain public areas during the SARS-CoV-2 pandemic. Different manufacturers offer reusable community masks in large quantities. The efficacy of these masks, however, is unknown. Method: We tested available community masks of major manufactures and determined the filtration efficacy using radioactive aerosol particles as well as air resistance with a vacuum measurement. Results: Filtration efficacy of the tested reusable community masks ranged from $34.9\% \pm 1.25\%$ to $88.7\% \pm 1.18\%$. Air resistance ranged from 4.3 ± 0.06 to 122.4 ± 0.12 Pa/cm². There was a good correlation between filtration efficacy and air resistance (Pearson correlation 0.938, $p < 0.0001$). Conclusions: Filtration efficacy and air resistance differ significantly between the different community masks, but the two measurements correlate well with each other within the entire test series. For optimal protection, one should select a rather airtight

mask. When selecting a mask, the highest level of tolerable air resistance can be used as a selection criterion.

Date February 1, 2021
Short Title Community Masks During the SARS-CoV-2 Pandemic
Library Catalog liebertpub.com (Atypon)
URL <https://www.liebertpub.com/doi/full/10.1089/jamp.2020.1635>
Accessed 9/2/2021, 10:04:22 AM
Extra Publisher: Mary Ann Liebert, Inc., publishers
Volume 34
Pages 11-19
Publication Journal of Aerosol Medicine and Pulmonary Drug Delivery
DOI 10.1089/jamp.2020.1635
Issue 1
ISSN 1941-2711
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Tags:

coronavirus, airflow resistance, community mask, Covid, filtration efficacy, Sars-CoV-2, Study

Attachments

- Full Text PDF

Community transmission of SARS-CoV-2 at three fitness facilities—Hawaii, June–July 2020

Type Journal Article
Author Laura M. Groves
Author Lauren Usagawa
Author Joe Elm
Author Eleanor Low
Author Augustina Manuzak
Author Joshua Quint
Author Katherine E. Center
Author Ann M. Buff
Author Sarah K. Kemble
Abstract Not available
Date 2021-3-05

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7948933/>

Accessed 9/2/2021, 10:10:15 AM

Extra PMID: 33661861 PMCID: PMC7948933

Volume 70

Pages 316-320

Publication Morbidity and Mortality Weekly Report

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ISSN 0149-2195

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Tags:

Observation Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Community use of face masks and COVID-19: Evidence from a natural experiment of state mandates in the US

Type Journal Article

Author Wei Lyu

Author George L. Wehby

Abstract State policies mandating public or community use of face masks or covers in mitigating the spread of coronavirus disease 2019 (COVID-19) are hotly contested. This study provides evidence from a natural experiment on the effects of state government mandates for face mask use in public issued by fifteen states plus Washington, D.C., between April 8 and May 15, 2020. 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.

Date August 1, 2020
URL <https://doi.org/10.1377/hlthaff.2020.00818>
Accessed 9/1/2021, 8:00:00 PM
Extra Publisher: Health Affairs
Volume 39
Pages 1419-1425
Publication Health Affairs
DOI 10.1377/hlthaff.2020.00818
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Tags:

Study

Notes:

doi: 10.1377/hlthaff.2020.00818

Comparison of performance of three different types of respiratory protection devices

Type Journal Article
Author Robert B. Lawrence
Author Matthew G. Duling
Author Catherine A. Calvert
Author Christopher C. Coffey
Abstract Respiratory protection is offered to American workers in a variety of ways to guard against potential inhalation hazards. Two of the most common ways are elastomeric N95 respirators and N95 filtering-facepiece respirators. Some in the health care industry feel that surgical masks provide an acceptable level of protection in certain situations against particular hazards. This study compared the performance of these types of respiratory protection during a simulated workplace test that measured both filter penetration and face-seal leakage. A panel of 25 test subjects with varying face sizes tested 15 models of elastomeric N95 respirators, 15 models of N95 filtering-facepiece respirators, and 6 models of surgical masks. Simulated workplace testing was conducted using a TSI PORTACOUNT Plus model 8020, and consisted of a series of seven exercises. Six simulated workplace tests were performed with redonning of the respirator/mask occurring between each test. The results of these tests produced a

simulated workplace protection factor (SWPF). The geometric mean (GM) and the 5th percentile values of the SWPFs were computed by category of respiratory protection using the six overall SWPF values. The level of protection provided by each of the three respiratory protection types was compared. The GM and 5th percentile SWPF values without fit testing were used for the comparison, as surgical masks were not intended to be fit tested. The GM values were 36 for elastomeric N95 respirators, 21 for N95 filtering-facepiece respirators, and 3 for surgical masks. An analysis of variance demonstrated a statistically significant difference between all three. Elastomeric N95 respirators had the highest 5th percentile SWPF of 7. N95 filtering-facepiece respirators and surgical masks had 5th percentile SWPFs of 3 and 1, respectively. A Fisher Exact Test revealed that the 5th percentile SWPFs for all three types of respiratory protection were statistically different. In addition, both qualitative (Bitrex and saccharin) and quantitative (N95-Companion) fit testing were performed on the N95 filtering- and elastomeric-facepiece respirators. It was found that passing a fit test generally improves the protection afforded the wearer. Passing the Bitrex fit test resulted in 5th percentile SWPFs of 11.1 and 7.9 for elastomeric and filtering-facepiece respirators, respectively. After passing the saccharin tests, the elastomeric respirators provided a 5th percentile of 11.7, and the filtering-facepiece respirators provided a 5th percentile of 11.0. The 5th percentiles after passing the N95-Companion were 13.0 for the elastomeric respirators and 20.5 for the filtering-facepiece respirators. The data supports fit testing as an essential element of a complete respiratory protection program.

Date 2006-09

Language eng

Library Catalog PubMed

Extra PMID: 16857645

Volume 3

Pages 465-474

Publication Journal of Occupational and Environmental Hygiene

DOI 10.1080/15459620600829211

Issue 9

Journal Abbr J Occup Environ Hyg

ISSN 1545-9624

Date Added 9/2/2021, 9:57:52 AM

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Tags:

Humans, Female, Male, Middle Aged, Adult, Equipment Failure Analysis, Inhalation Exposure, Materials Testing, Occupational Exposure, Respiratory Protective Devices, Study

Attachments

- PubMed entry

COVID-19 cases and transmission in 17 K–12 schools — Wood County, Wisconsin, August 31–November 29, 2020

Type Journal Article
Author Amy Falk
Author Alison Benda
Author Peter Falk
Author Sarah Steffen
Author Zachary Wallace
Author Tracy Beth Høeg
Abstract Not available
Date 2021
Language en-us
Library Catalog www.cdc.gov
URL <https://www.cdc.gov/mmwr/volumes/70/wr/mm7004e3.htm>
Accessed 9/2/2021, 2:18:31 PM
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Publication MMWR. Morbidity and Mortality Weekly Report
DOI 10.15585/mmwr.mm7004e3
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Attachments

- Full Text
- Snapshot

COVID-19: mask efficacy is dependent on both fabric and fit

Type Journal Article
Author Steven Darby
Author Krishnakumar Chulliyallipalil
Author Milosz Przyjalowski
Author Paddy McGowan
Author Simon Jeffers
Author Alan Giltinan
Author Liam Lewis

Author Niall Smith

Author Roy D Sleator

Abstract Aim: Face masks are an important addition to our arsenal in the fight against COVID-19. The aim of this study is to present a novel method of measuring mask performance which can simultaneously assess both fabric penetration and leakage due to poor fit. Materials & methods: A synthetic aerosol is introduced into the lung of a medical dummy. A conical laser sheet surrounds the face of the dummy where it illuminates the aerosol emitted during a simulated breath. The system is demonstrated with five mask types. Conclusions: The curved laser sheet highlights both penetration through the mask fabric and leakage around the edges of the mask. A large variation in both material penetration and leakage was observed. , Graphical abstract [Formula: see text] , Tweetable abstract Face masks are an effective means of stemming the spread of COVID-19. However, mask performance varies considerably depending on the fabric from which they are made, and how they fit on the face.

Date 01/2021

Language en

Short Title COVID-19

Library Catalog DOI.org (Crossref)

URL <https://www.futuremedicine.com/doi/10.2217/fmb-2020-0292>

Accessed 9/1/2021, 1:09:20 PM

Volume 16

Pages 5-11

Publication Future Microbiology

DOI 10.2217/fmb-2020-0292

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Tags:

Study

Attachments

- Darby et al. - 2021 - COVID-19 mask efficacy is dependent on both fabri.pdf

Declines in SARS-CoV-2 transmission, hospitalizations, and mortality after implementation of mitigation measures—Delaware, March–June 2020

Type Journal Article

Author Florence A. Kanu
Author Erica E. Smith
Author Tabatha Offutt-Powell
Author Rick Hong
Author Thu-Ha Dinh
Author Eric Pevzner

Abstract Not available

Date 2020-11-13

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7660664/>

Accessed 9/2/2021, 10:16:29 AM

Extra PMID: 33180757 PMCID: PMC7660664

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Pages 1691-1694

Publication Morbidity and Mortality Weekly Report

DOI 10.15585/mmwr.mm6945e1

Issue 45

Journal Abbr MMWR Morb Mortal Wkly Rep

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Tags:

Observation Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Double masking protection vs. comfort—A quantitative assessment

Type Journal Article

Author Venugopal Arumuru

Author Sidhartha Sankar Samantaray

Author Jangyadatta Pasa

Abstract COVID-19 has forced humankind to adopt face masks as an integral part of everyday life. This preventive measure is an effective source control technique to curb the spread of COVID-19 and other similar diseases. The virus responsible for causing

COVID-19 has undergone several mutations in the recent past, including B.1.1.7, B.1.351, P.1, and N501Y, B.1.617, with a higher infectious rate. These viruses' variants are mainly responsible for the recent spike in COVID-19 cases and associated steep rise in mortality rate worldwide. Under these circumstances, the Center for Disease Control (CDC) and health experts recommend double masking, which mainly includes a surgical mask and a cotton mask for the general public. This combination provides an additional layer of protection and masks fitment to minimize the leakage of droplets expelled during coughing, sneezing, talking, and breathing. This leakage may cause airborne transmission of the virus. In the present study, we report a systematic quantitative unsteady pressure measurement supplement with flow visualization to quantify the effectiveness of a single and double mask. We have also evaluated double masking consisting of a surgical mask and an N-95 mask used by medical professionals. A simple knot improves the surgical mask fitment significantly, and hence, the leakage of droplets is minimized. The leakage of the droplets was reduced to a large extent by using a double mask combination of a two-layer cotton mask over the surgical mask with a knot. The double mask combination of surgical and N-95 and two-layer cotton and N-95 masks showed the most promising results, and no leakage of the droplets is observed in the forward direction. A double mask combination of surgical and N-95 mask offers 8.6% and 5.6% lower mean and peak pressures compared to surgical, and cotton mask. The best results are observed with cotton and N-95 masks with 54.6% and 23% lower mean and peak pressures than surgical and cotton masks; hence, this combination will offer more comfort to the wearer.

Date 07/2021

Language en

Library Catalog DOI.org (Crossref)

URL <https://aip.scitation.org/doi/10.1063/5.0058571>

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Pages 077120

Publication Physics of Fluids

DOI 10.1063/5.0058571

Issue 7

Journal Abbr Physics of Fluids

ISSN 1070-6631, 1089-7666

Date Added 9/1/2021, 5:22:09 PM

Modified 9/2/2021, 10:51:24 AM

Tags:

Study, Mask Comparison

Attachments

- Arumuru et al. - 2021 - Double masking protection vs. comfort—A quantitati.pdf

Droplet fate, efficacy of face mask, and transmission of virus-laden droplets inside a conference room

Type Journal Article

Author Dnyanesh Mirikar

Author Silambarasan Palanivel

Author Venugopal Arumuru

Abstract The second and third waves of coronavirus disease-2019 (COVID-19) pandemic have hit the world. Even after more than a year, the economy is yet to return to a semblance of normality. The conference/meeting room is one of the critical sections of offices that might be difficult not to use. This study analyzes the distribution of the virus-laden droplets expelled by coughing inside a conference room, the effect of ventilation rates, and their positioning. The efficacy of masks is studied to get quantitative information regarding the residence time of the droplets. The effects of evaporation, turbulent dispersion, and external forces have been considered for calculating the droplets' trajectories. We have analyzed six cases, of which two are with masks. Change in the ventilation rate from four air changes per hour (ACH) to eight resulted in a 9% increment in the number of droplets entrained in the outlet vent, while their average residence time was reduced by 8 s. The shift in the vents' location has significantly altered droplets' distribution inside a conference room. It results in 1.5% of the injected droplets reaching persons sitting across the table, and a similar indoor environment is not recommended. Wearing a mask in the case of eight ACH has presented the best scenario out of the six cases, with a 6.5% improvement in the number of droplets entrained in the outlet vent and a 9 s decrease in their average residence time compared to the case without a mask. No droplets have reached persons sitting across the table when the infected person is wearing the mask, which follows that a social distancing of 6 ft with a mask is adequate in indoor environments.

Date 06/2021

Language en

Library Catalog DOI.org (Crossref)

URL <https://aip.scitation.org/doi/10.1063/5.0054110>

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Pages 065108

Publication Physics of Fluids

DOI 10.1063/5.0054110

Issue 6

Journal Abbr Physics of Fluids

ISSN 1070-6631, 1089-7666

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Modified 9/2/2021, 12:18:22 PM

Tags:

Study

Attachments

- Mirikar et al. - 2021 - Droplet fate, efficacy of face mask, and transmiss.pdf
-

Effectiveness of adding a mask recommendation to other public health measures to prevent SARS-cov-2 infection in Danish mask wearers

Type Journal Article

Author Henning Bundgaard

Author Johan Skov Bundgaard

Author Daniel Emil Tadeusz Raaschou-Pedersen

Author Christian von Buchwald

Author Tobias Todsén

Author Jakob Boesgaard Norsk

Author Mia M. Pries-Heje

Author Christoffer Rasmus Vissing

Author Pernille B. Nielsen

Author Ulrik C. Winslów

Author Kamille Fogh

Author Rasmus Hasselbalch

Author Jonas H. Kristensen

Author Anna Ringgaard

Author Mikkel Porsborg Andersen

Author Nicole Bakkegård Goecke

Author Ramona Trebbien

Author Kerstin Skovgaard

Author Thomas Benfield

Author Henrik Ullum

Author Christian Torp-Pedersen

Author Kasper Iversen

Abstract Background: Observational evidence suggests that mask wearing mitigates transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It is uncertain if this observed association arises through protection of uninfected wearers (protective effect), via reduced transmission from infected mask wearers (source control), or both. Objective: To assess whether recommending surgical mask use outside the home reduces wearers' risk for SARS-CoV-2 infection in a setting where masks were uncommon and not among recommended public health measures. Design:

Randomized controlled trial (DANMASK-19 [Danish Study to Assess Face Masks for the Protection Against COVID-19 Infection]). (ClinicalTrials.gov: NCT04337541) Setting: Denmark, April and May 2020. Participants: Adults spending more than 3 hours per day outside the home without occupational mask use. Intervention: Encouragement to follow social distancing measures for coronavirus disease 2019, plus either no mask recommendation or a recommendation to wear a mask when outside the home among other persons together with a supply of 50 surgical masks and instructions for proper use. Measurements: The primary outcome was SARS-CoV-2 infection in the mask wearer at 1 month by antibody testing, polymerase chain reaction (PCR), or hospital diagnosis. The secondary outcome was PCR positivity for other respiratory viruses. Results: A total of 3030 participants were randomly assigned to the recommendation to wear masks, and 2994 were assigned to control; 4862 completed the study. Infection with SARS-CoV-2 occurred in 42 participants recommended masks (1.8%) and 53 control participants (2.1%). The between-group difference was -0.3 percentage point (95% CI, -1.2 to 0.4 percentage point; P = 0.38) (odds ratio, 0.82 [CI, 0.54 to 1.23]; P = 0.33). Multiple imputation accounting for loss to follow-up yielded similar results. Although the difference observed was not statistically significant, the 95% CIs are compatible with a 46% reduction to a 23% increase in infection. Limitation: Inconclusive results, missing data, variable adherence, patient-reported findings on home tests, no blinding, and no assessment of whether masks could decrease disease transmission from mask wearers to others. Conclusion: The recommendation to wear surgical masks to supplement other public health measures did not reduce the SARS-CoV-2 infection rate among wearers by more than 50% in a community with modest infection rates, some degree of social distancing, and uncommon general mask use. The data were compatible with lesser degrees of self-protection. Primary Funding Source: The Salling Foundations.

Date March 16, 2021

Library Catalog acpjournals.org (Atypon)

URL <https://www.acpjournals.org/doi/full/10.7326/M20-6817>

Accessed 9/2/2021, 9:40:33 AM

Extra Publisher: American College of Physicians

Volume 174

Pages 335-343

Publication Annals of Internal Medicine

DOI 10.7326/M20-6817

Issue 3

Journal Abbr Ann Intern Med

ISSN 0003-4819

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Modified 9/2/2021, 2:45:13 PM

Tags:

Study

Attachments

- Full Text

Effectiveness of face masks in preventing airborne transmission of SARS-CoV-2

Type Journal Article

Author Hiroshi Ueki

Author Yuri Furusawa

Author Kiyoko Iwatsuki-Horimoto

Author Masaki Imai

Author Hiroki Kabata

Author Hidekazu Nishimura

Author Yoshihiro Kawaoka

Abstract Guidelines from the CDC and the WHO recommend the wearing of face masks to prevent the spread of coronavirus (CoV) disease 2019 (COVID-19); however, the protective efficiency of such masks against airborne transmission of infectious severe acute respiratory syndrome CoV-2 (SARS-CoV-2) droplets/aerosols is unknown. Here, we developed an airborne transmission simulator of infectious SARS-CoV-2-containing droplets/aerosols produced by human respiration and coughs and assessed the transmissibility of the infectious droplets/aerosols and the ability of various types of face masks to block the transmission. We found that cotton masks, surgical masks, and N95 masks all have a protective effect with respect to the transmission of infective droplets/aerosols of SARS-CoV-2 and that the protective efficiency was higher when masks were worn by a virus spreader. Importantly, medical masks (surgical masks and even N95 masks) were not able to completely block the transmission of virus droplets/aerosols even when completely sealed. Our data will help medical workers understand the proper use and performance of masks and determine whether they need additional equipment to protect themselves from infected patients.

Date 2020

Library Catalog journals.asm.org (Atypon)

URL <https://journals.asm.org/doi/full/10.1128/mSphere.00637-20>

Accessed 9/2/2021, 9:42:45 AM

Extra Publisher: American Society for Microbiology

Volume 5

Pages e00637-20

Publication mSphere

DOI 10.1128/mSphere.00637-20

Issue 5

Date Added 9/2/2021, 9:42:45 AM

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Tags:

Study

Attachments

- Full Text PDF

Effectiveness of surgical, KF94, and N95 respirator masks in blocking SARS-CoV-2: a controlled comparison in 7 patients

Type Journal Article

Author Min-Chul Kim

Author Seongman Bae

Author Ji Yeun Kim

Author Se Yoon Park

Author Joon Seo Lim

Author Minki Sung

Author Sung-Han Kim

Abstract Background Data on the filtration efficacies of various masks against severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) are limited. We thus evaluate the effectiveness of the surgical mask, the N95 respirator mask, and its equivalent (KF94 mask) in filtering SARS-CoV-2. Methods Patients hospitalised with SARS-CoV-2 infection were instructed to cough five times each while wearing (1) no mask, (2) surgical mask, (3) KF94 mask, and (4) N95 mask. The coughs were separated by 20-second intervals, and the patients were rested for at least 5 min between each setting. SARS-CoV-2 viral loads in patient samples (i.e. nasopharyngeal swabs and saliva), petri dishes placed in front of the patients during coughing, and swabs from the outer and inner surfaces of the masks were analysed with PCR. Results A total of 7 patients with SARS-CoV-2 infection participated in the mask test. SARS-CoV-2 was detected on the petri dishes after coughing in 3 out of 7 cases with the surgical mask or no mask. Viral particles were not found in the petri dishes after coughing while wearing the N95 mask or the KF94 mask. While viral particles were detected in both the inner and outer surfaces of the surgical masks, those were detected only in the inner surfaces of the N95 and K94 masks. Conclusion Surgical masks were less effective in filtering viral particles from coughing patients with SARS-CoV-2 infection. N95 masks and its equivalents efficiently blocked SARS-CoV-2 particles from coughing patients.

Date December 1, 2020

Short Title Effectiveness of surgical, KF94, and N95 respirator masks in blocking SARS-CoV-2

Library Catalog Taylor and Francis+NEJM

URL <https://doi.org/10.1080/23744235.2020.1810858>

Accessed 9/2/2021, 10:05:40 AM

Extra Publisher: Taylor & Francis _eprint: <https://doi.org/10.1080/23744235.2020.1810858>
PMID: 32845196

Volume 52

Pages 908-912

Publication Infectious Diseases

DOI 10.1080/23744235.2020.1810858

Issue 12

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Date Added 9/2/2021, 10:05:40 AM

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Tags:

Surgical mask, coronavirus disease 2019, N95 respirator, severe acute respiratory syndrome coronavirus 2, Study

Attachments

- Full Text PDF
- Snapshot

Effects of mask-wearing on the inhalability and deposition of airborne SARS-CoV-2 aerosols in human upper airway

Type Journal Article

Author Jinxiang (奚金祥) Xi

Author Xiuhua April (司秀华) Si

Author Ramaswamy Nagarajan

Abstract Even though face masks are well accepted as tools useful in reducing COVID-19 transmissions, their effectiveness in reducing viral loads in the respiratory tract is unclear. Wearing a mask will significantly alter the airflow and particle dynamics near the face, which can change the inhalability of ambient particles. The objective of this study is to investigate the effects of wearing a surgical mask on inspiratory airflow and dosimetry of airborne, virus-laden aerosols on the face and in the respiratory tract. A computational model was developed that comprised a pleated surgical mask, a face model, and an image-based upper airway geometry. The viral load in the nose was particularly examined with and without a mask. Results show that when breathing without a mask, air enters the mouth and nose through specific paths. When wearing a mask, however, air enters the mouth and nose through the entire surface of the mask at lower speeds, which favors the inhalation of ambient aerosols into the nose. With a 65% filtration efficiency (FE) typical for a three-layer surgical mask, wearing a mask reduces dosimetry for all micrometer particles except those of size 1 μm –3 μm , for

which equivalent dosimetry with and without a mask in the upper airway was predicted. Wearing a mask reduces particle penetration into the lungs, regardless of the FE of the mask. The results also show that mask-wearing protects the upper airway (particularly the nose and larynx) best from particles larger than 10 μm while protecting the lungs best from particles smaller than 10 μm .

Date December 1, 2020

Library Catalog aip.scitation.org (Atypon)

URL <https://aip.scitation.org/doi/full/10.1063/5.0034580>

Accessed 9/2/2021, 10:00:47 AM

Extra Publisher: American Institute of Physics

Volume 32

Pages 123312

Publication Physics of Fluids

DOI 10.1063/5.0034580

Issue 12

ISSN 1070-6631

Date Added 9/2/2021, 10:00:47 AM

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Tags:

Study

Attachments

- Full Text PDF

Effects of surgical and cloth facemasks during a submaximal exercise test in healthy adults

Type Journal Article

Author Gregory Reychler

Author Charlie vander Straeten

Author Adrien Schalkwijk

Author William Poncin

Abstract Background Surgical (SM) or cloth facemasks (CM) has become mandatory in many public spaces during the COVID-19 pandemic. They may interfere with the participation in physical activities. Objective To evaluate how these masks influence dyspnoea (primary outcome), exercise performance and cardiorespiratory response during a 1-min sit-to-stand test (1STST), and to assess masks discomfort sensations. Methods A randomized crossover trial was conducted in healthy adults. They performed 3 1STST (with either no mask (NM), a SM, or a CM) separated from each

other by 24–72 h. The number of 1STST repetitions and leg rate of perceived exertion (RPE) were measured. Dyspnoea (Borg scale), hearth rate, respiratory rate and SpO₂ were recorded before and at the end of 1STST, as well as after a short resting period. Several domains of subjective discomfort perceptions with masks were assessed. Results Twenty adults aged 22 ± 2y (11 males) were recruited. Wearing the CM generated significantly higher dyspnoea than NM at all time points, but it only became clinically relevant after the 1STST (median difference, 1 [95%CI 0 to 1]). The SM generated a small but significant higher leg RPE than NM (median difference, 1 [95%CI 0 to 1]). The masks had no impact on 1STST performance nor cardiorespiratory parameters. Both masks were rated similarly for discomfort perceptions except for breathing resistance where CM was rated higher. Conclusions In healthy adults, the CM and SM had minimal to no impact on dyspnoea, cardiorespiratory parameters, and exercise performance during a short submaximal exercise test.

Date September 1, 2021

Language en

Library Catalog ScienceDirect

URL <https://www.sciencedirect.com/science/article/pii/S0954611121002365>

Accessed 9/1/2021, 5:19:30 PM

Volume 186

Pages 106530

Publication Respiratory Medicine

DOI 10.1016/j.rmed.2021.106530

Journal Abbr Respiratory Medicine

ISSN 0954-6111

Date Added 9/1/2021, 5:19:30 PM

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Tags:

COVID-19, 1-Min sit-to-stand test, Cloth mask, Exercise capacity, Surgical mask, Study

Attachments

- ScienceDirect Snapshot

Efficacy of portable air cleaners and masking for reducing indoor exposure to simulated exhaled SARS-CoV-2 aerosols — United States, 2021

Type Journal Article

Author William G. Lindsley

Author Raymond C. Derk

Author Jayme P. Coyle
Author Stephen B. Martin
Author Kenneth R. Mead
Author Francoise M. Blachere
Author Donald H. Beezhold
Author John T. Brooks
Author Theresa Boots
Author John D. Noti

Abstract Not available

Date 2021-7-09

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8312755/>

Accessed 9/2/2021, 10:08:11 AM

Extra PMID: 34237047 PMCID: PMC8312755

Volume 70

Pages 972-976

Publication Morbidity and Mortality Weekly Report

DOI 10.15585/mmwr.mm7027e1

Issue 27

Journal Abbr MMWR Morb Mortal Wkly Rep

ISSN 0149-2195

Date Added 9/2/2021, 10:08:11 AM

Modified 9/2/2021, 2:47:31 PM

Tags:

Observation Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Factors affecting the transmission of SARS-CoV-2 in school settings

Type Journal Article
Author Connor Reynolds
Author Sydney Ng
Author Wan Yang

Abstract Background: Several studies have reported SARS-CoV-2 outbreaks in schools, with a wide range of secondary attack rate (SAR; range: 0-100%). We aimed to examine the key risk factors to better understand transmission in school settings. Methods: We collected records of SARS-CoV-2 school outbreaks globally published from January 2020 to January 2021 and compiled information on hypothesized risk factors. We utilized the directed acyclic graph (DAG) to conceptualize the risk mechanisms, used logistic regression to examine each risk-factor group, and further built multiple variable models based on the marginal analysis. Adjusted odds ratios (aOR) and 95% confidence intervals (CI) were calculated. Results: From 17 relevant articles, 26 school clusters were included for analysis. The best-fit model showed that the intensity of community transmission (aOR: 1.26; 95% CI: 1.22 - 1.30, for each increase of 10 cases per 100,000 persons per week), social distancing (aOR: 0.26; 95% CI: 0.18 - 0.37), mask-wearing (aOR: 0.52; 95% CI: 0.35 - 0.78) were associated the risk of SARS-CoV-2 infection in schools. Compared to students in pre-schools, the aOR was 0.12 (95% CI: 0.07 - 0.19) for students in primary schools and 1.31 (95% CI: 0.93 - 1.87) for students in high schools. Conclusions: Preventive measures in both schools (e.g. social distancing and mask-wearing) and communities (additionally, vaccination) should be taken to collectively reduce transmission and protect children in schools. Flexible reopening policies may be considered for different levels of schools given their risk differences. Key messages: We collected published records of COVID-19 school outbreaks globally to investigate the considerable heterogeneity in secondary attack rates (SAR) reported from school outbreaks and compiled information regarding potential risk factors. Higher community death and case rates are associated with higher SARs in children in school settings. Mask-wearing and social distancing are associated with lower SARs. When compared to pre-schools and early childhood education centers, primary schools have lower rates of transmission of SARS-CoV-2 however high schools have higher rates.

Date 2021-06-22

Language eng

Library Catalog PubMed

Extra PMID: 34189533 PMCID: PMC8240688

Pages 2021.06.18.21259156

Publication medRxiv: The Preprint Server for Health Sciences

DOI 10.1101/2021.06.18.21259156

Journal Abbr medRxiv

Date Added 9/2/2021, 9:23:25 AM

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Tags:

Study

Attachments

- PubMed entry
- Submitted Version

Factors associated with positive SARS-CoV-2 test results in outpatient health facilities and emergency departments among children and adolescents aged <18 years— Mississippi, September–November 2020

Type Journal Article

Author Charlotte V. Hobbs

Author Lora M. Martin

Author Sara S. Kim

Author Brian M. Kirmse

Author Lisa Haynie

Author Sarah McGraw

Author Paul Byers

Author Kathryn G. Taylor

Author Manish M. Patel

Author Brendan Flannery

Author Carmen S. Arriola

Author Eric P. Griggs

Author Ashley K. Simon

Author Meagan E. Stephenson

Abstract Not available

Date 2020-12-18

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7745952/>

Accessed 9/2/2021, 10:14:10 AM

Extra PMID: 33332298 PMCID: PMC7745952

Volume 69

Pages 1925-1929

Publication Morbidity and Mortality Weekly Report

DOI 10.15585/mmwr.mm6950e3

Issue 50

Journal Abbr MMWR Morb Mortal Wkly Rep

ISSN 0149-2195

Date Added 9/2/2021, 10:14:10 AM

Modified 9/2/2021, 2:46:38 PM

Tags:

Observation Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Filtration efficiencies of nanoscale aerosol by cloth mask materials used to slow the spread of SARS-CoV-2

Type Journal Article

Author Christopher D. Zangmeister

Author James G. Radney

Author Edward P. Vicenzi

Author Jamie L. Weaver

Abstract Filtration efficiency (FE), differential pressure (ΔP), quality factor (QF), and construction parameters were measured for 32 cloth materials (14 cotton, 1 wool, 9 synthetic, 4 synthetic blends, and 4 synthetic/cotton blends) used in cloth masks intended for protection from the SARS-CoV-2 virus (diameter 100 ± 10 nm). Seven polypropylene-based fiber filter materials were also measured including surgical masks and N95 respirators. Additional measurements were performed on both multilayered and mixed-material samples of natural, synthetic, or natural-synthetic blends to mimic cloth mask construction methods. Materials were microimaged and tested against size selected NaCl aerosol with particle mobility diameters between 50 and 825 nm. Three of the top five best performing samples were woven 100% cotton with high to moderate yarn counts, and the other two were woven synthetics of moderate yarn counts. In contrast to recently published studies, samples utilizing mixed materials did not exhibit a significant difference in the measured FE when compared to the product of the individual FE for the components. The FE and ΔP increased monotonically with the number of cloth layers for a lightweight flannel, suggesting that multilayered cloth masks may offer increased protection from nanometer-sized aerosol with a maximum FE dictated by breathability (i.e., ΔP).

Date 2020-07-28

Language en

Library Catalog DOI.org (Crossref)

URL <https://pubs.acs.org/doi/10.1021/acsnano.0c05025>

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Volume 14

Pages 9188-9200

Publication ACS Nano

DOI 10.1021/acsnano.0c05025

Issue 7

Journal Abbr ACS Nano

ISSN 1936-0851, 1936-086X

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Tags:

Study

Attachments

- Zangmeister et al. - 2020 - Filtration Efficiencies of Nanoscale Aerosol by Cl.pdf

From containment to harm reduction from SARS-CoV-2: A fabric mask for enhanced effectiveness, comfort, and compliance

Type Journal Article

Author Sungmee Park

Author Sundaresan Jayaraman

Abstract Although the COVID-19 pandemic shows no signs of abating, public health strategies have transitioned from containment to harm reduction. In light of this paradigm shift, it is critical that individuals take steps to prevent the spread of SARS-CoV-2, the virus that causes COVID-19. In the United States, the CDC recommends that individuals wear face coverings in public places, such as grocery stores. As lockdowns are being phased out around the world, authorities are requiring the use of such masks in public places while maintaining social distance. Individuals (including healthcare professionals outside of their clinical settings) and manufacturers are following the CDC's recommendation. But, many currently available masks are not form-fitting, are not customizable, and are uncomfortable with even short-term use, thereby undercutting their effectiveness. Moreover, because cotton absorbs and retains the moisture found in an exhaled breath masks made of cotton have the potential to increase the wearer's risk of infection. Thus, as we shift to harm reduction and social distancing measures relax, it is imperative that these shortcomings in fabric masks are addressed and that is the motivation for this research. The overall objective of the research is to design, develop, and test a fabric mask that is effective while being comfortable during continuous use over long periods of time. As the first step in the design process, we reviewed the modes of transmission of SARS-CoV-2 virus. We analyzed a medical mask and a fabric mask in the market and identified their shortcomings. We carried out an in-depth analysis of user needs and developed the performance requirements of the proposed mask. We defined the architecture of the mask comprising the following principal components: Barrier, Form-Fitting, Positioning, and Fastening. We tested and evaluated candidate materials for the

components and developed the design specifications and construction details for the mask. We produced the mask and carried out subjective testing on a user in a typical workplace setting; we demonstrated that the mask was form-fitting, customizable, washable, and could be worn continuously and routinely over extended periods of time by individuals and therefore could serve as an effective means to reduce the harm from SARS-CoV-2.

Date July 3, 2021

Short Title From containment to harm reduction from SARS-CoV-2

Library Catalog Taylor and Francis+NEJM

URL <https://doi.org/10.1080/00405000.2020.1805971>

Accessed 9/2/2021, 10:15:51 AM

Extra Publisher: Taylor & Francis _eprint: <https://doi.org/10.1080/00405000.2020.1805971>

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Pages 1144-1158

Publication The Journal of The Textile Institute

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Issue 7

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Tags:

COVID-19, SARS-CoV-2, mask, public health, aerosols, Correction, droplet, engineering design, N95 respirators, Study

Attachments

- Full Text PDF

Hand hygiene, mask-wearing behaviors and its associated factors during the COVID-19 epidemic: A cross-sectional study among primary school students in Wuhan, China

Type Journal Article

Author Xuyu Chen

Author Li Ran

Author Qing Liu

Author Qikai Hu

Author Xueying Du

Author Xiaodong Tan

Abstract Although the emphasis on behaviors of hand-washing and mask-wearing was repeated during the pandemic of Coronavirus Disease 2019 (COVID-19), not everyone paid enough attention to this. A descriptive statistic was used to make sense of the status of hand hygiene and mask-wearing among primary school students in Wuhan, China. A binary logistic regression analysis was conducted to identify the risk factors affecting the behaviors of hand-washing and mask-wearing. $p < 0.05$ (two-sides) was considered as significant at statistics. 42.05% of the primary school students showed a good behavior of hand-washing, while 51.60% had a good behavior of mask-wearing. Gender, grade, out-going history, father's occupation, mother's educational background, and the time filling out the survey were significantly associated with hand hygiene, whereas grade, mother's educational background, and residence were associated with mask-wearing. The behaviors of hand-washing and mask-wearing among primary school students were influenced by gender, grade, and other factors, therefore, parents should make efforts of behavior guidance whereas governments should enlarge medium publicity.

Date 2020/1

Language en

Short Title Hand Hygiene, Mask-Wearing Behaviors and Its Associated Factors during the COVID-19 Epidemic

Library Catalog www.mdpi.com

URL <https://www.mdpi.com/1660-4601/17/8/2893>

Accessed 9/1/2021, 5:13:16 PM

Rights <http://creativecommons.org/licenses/by/3.0/>

Extra Number: 8 Publisher: Multidisciplinary Digital Publishing Institute

Volume 17

Pages 2893

Publication International Journal of Environmental Research and Public Health

DOI 10.3390/ijerph17082893

Issue 8

Date Added 9/1/2021, 5:13:16 PM

Modified 9/2/2021, 10:58:51 AM

Tags:

COVID-19, hand hygiene, mask-wearing behavior, primary school student, risk factors, Study

Attachments

- Full Text PDF
- Snapshot

Type Journal Article
Author Erik Rosenstrom
Author Buse Eylul Oruc
Author Nathaniel Hupert
Author Julie Ivy
Author Pinar Keskinocak
Author Maria E. Mayorga
Author Julie L Swann

Abstract Objectives: To evaluate the effectiveness of widespread adoption of masks or face coverings to reduce community transmission of the SARS-CoV-2 virus that causes COVID-19. Methods: We created an agent-based stochastic network simulation using a variant of the standard SEIR dynamic infectious disease model. We considered a mask order that was initiated 3.5 months after the first confirmed COVID-19 case. We varied the likelihood of individuals wearing masks from 0-100% in steps of 20% (mask adherence) and considered 25% to 90% mask-related reduction in viral transmission (mask efficacy). Sensitivity analyses assessed early (by week 13) versus late (by week 42) adoption of masks and geographic differences in adherence (highest in urban and lowest in rural areas). Results: Introduction of mask use with 50% efficacy worn by 50% of individuals reduces the cumulative infection attack rate (IAR) by 27%, the peak prevalence by 49%, and populationwide mortality by 29%. If 90% of individuals wear 50% efficacious masks, this decreases IAR by 54%, peak prevalence by 75%, and population-wide mortality by 55%; similar improvements hold if 70% of individuals wear 75% efficacious masks. Late adoption reduces IAR and deaths by 18% or more compared to no adoption. Lower adoption in rural areas than urban would lead to rural areas having the highest IAR. Conclusions: Even after community transmission of SARS-CoV-2 has been established, adoption of mask-wearing by a majority of community-dwelling individuals can meaningfully reduce the number and outcome of COVID-19 infections over and above physical distancing interventions.

Date 2021, Jan 28

Language en

Library Catalog Zotero

Publication NIH Pre-Prints

Series <https://pubmed.ncbi.nlm.nih.gov/33532790/>

DOI 10.1101/2020.09.27.20199737

Date Added 9/1/2021, 3:45:15 PM

Modified 9/2/2021, 12:31:22 PM

Tags:

Study

Attachments

- Swann - High-Quality Masks Reduce COVID-19 Infections and .pdf

Incidence and secondary transmission of SARS-CoV-2 infections in schools

Type Journal Article

Author Kanecia O. Zimmerman

Author Ibukunoluwa C. Akinboyo

Author M. Alan Brookhart

Author Angelique E. Boutzoukas

Author Kathleen A. McGann

Author Michael J. Smith

Author Gabriela Maradiaga Panayotti

Author Sarah C. Armstrong

Author Helen Bristow

Author Donna Parker

Author Sabrina Zadrozny

Author David J. Weber

Author Daniel K. Benjamin

Author ABC SCIENCE COLLABORATIVE

Abstract BACKGROUND: In an effort to mitigate the spread of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), North Carolina closed prekindergarten through grade 12 public schools to in-person instruction on March 14, 2020. On July 15, 2020, North Carolina's governor announced schools could open via remote learning or a hybrid model that combined in-person and remote instruction. In August 2020, 56 of 115 North Carolina school districts joined The ABC Science Collaborative (ABCs) to implement public health measures to prevent SARS-CoV-2 transmission and share lessons learned. We describe secondary transmission of SARS-CoV-2 within participating school districts during the first 9 weeks of in-person instruction in the 2020-2021 academic year. METHODS: From August 15, 2020 to October 23, 2020, 11 of 56 school districts participating in ABCs were open for in-person instruction for all 9 weeks of the first quarter and agreed to track incidence and secondary transmission of SARS-CoV-2. Local health department staff adjudicated secondary transmission. Superintendents met weekly with ABCs faculty to share lessons learned and develop prevention methods. RESULTS: Over 9 weeks, 11 participating school districts had >90 000 students and staff attend school in person. Among these students and staff, 773 community-acquired SARS-CoV-2 infections were documented by molecular testing. Through contact tracing, health department staff determined an additional 32 infections were acquired within schools. No instances of child-to-adult transmission of SARS-CoV-2 were reported within schools. CONCLUSIONS: In the first 9 weeks of in-person instruction in North Carolina schools, we found extremely limited within-school secondary transmission of SARS-CoV-2, as determined by contact tracing.

Date 2021-04

Language eng

Library Catalog PubMed

Extra PMID: 33419869 PMCID: PMC8015158

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Publication Pediatrics

DOI 10.1542/peds.2020-048090

Issue 4

Journal Abbr Pediatrics

ISSN 1098-4275

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Tags:

Humans, Schools, North Carolina, Adolescent, COVID-19, Child, Child, Preschool, Cohort Studies, Education, Distance, Incidence, Study

Attachments

- Full Text
- PubMed entry

Jobs, housing, and mask wearing: Cross-sectional study of risk factors for COVID-19

Type Journal Article

Author Eline M. van den Broek-Altenburg

Author Adam J. Atherly

Author Sean A. Diehl

Author Kelsey M. Gleason

Author Victoria C. Hart

Author Charles D. MacLean

Author Daniel A. Barkhuff

Author Mark A. Levine

Author Jan K. Carney

Abstract Background: Many studies have focused on the characteristics of symptomatic patients with COVID-19 and clinical risk factors. This study reports the prevalence of COVID-19 in an asymptomatic population of a hospital service area (HSA) and identifies factors that affect exposure to the virus. Objective: The aim of this study is to measure the prevalence of COVID-19 in an HSA, identify factors that may increase or decrease the risk of infection, and analyze factors that increase the number of daily contacts. Methods: This study surveyed 1694 patients between April 30 and May 13, 2020, about their work and living situations, income, behavior, sociodemographic

characteristics, and prepandemic health characteristics. This data was linked to testing data for 454 of these patients, including polymerase chain reaction test results and two different serologic assays. Positivity rate was used to calculate approximate prevalence, hospitalization rate, and infection fatality rate (IFR). Survey data was used to analyze risk factors, including the number of contacts reported by study participants. The data was also used to identify factors increasing the number of daily contacts, such as mask wearing and living environment. Results: We found a positivity rate of 2.2%, a hospitalization rate of 1.2%, and an adjusted IFR of 0.55%. A higher number of daily contacts with adults and older adults increases the probability of becoming infected. Occupation, living in an apartment versus a house, and wearing a face mask outside work increased the number of daily contacts. Conclusions: Studying prevalence in an asymptomatic population revealed estimates of unreported COVID-19 cases. Occupational, living situation, and behavioral data about COVID-19–protective behaviors such as wearing a mask may aid in the identification of nonclinical factors affecting the number of daily contacts, which may increase SARS-CoV-2 exposure.

Date 2021-01-11

Language EN

Short Title Jobs, Housing, and Mask Wearing

Library Catalog publichealth.jmir.org

URL <https://publichealth.jmir.org/2021/1/e24320>

Accessed 9/1/2021, 1:06:16 PM

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Publication JMIR Public Health and Surveillance

DOI 10.2196/24320

Issue 1

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Modified 9/2/2021, 10:53:54 AM

Tags:

Study

Attachments

- Full Text
- Snapshot

Limited secondary transmission of SARS-CoV-2 in child care programs—Rhode Island, June 1–July 31, 2020

Type Journal Article

Author Ruth Link-Gelles

Abstract This report describes investigations of any reported COVID-19 case in a child or adult present at child care programs and mitigation efforts in Rhode Island during June 1–July 31, 2020.

Date 2020

Language en-us

Library Catalog www.cdc.gov

URL <https://www.cdc.gov/mmwr/volumes/69/wr/mm6934e2.htm>

Accessed 9/1/2021, 1:27:44 PM

Volume 69

Publication MMWR. Morbidity and Mortality Weekly Report

DOI 10.15585/mmwr.mm6934e2

Journal Abbr MMWR Morb Mortal Wkly Rep

ISSN 0149-21951545-861X

Date Added 9/1/2021, 3:45:15 PM

Modified 9/2/2021, 12:10:49 PM

Tags:

Observation Study

Attachments

- Full Text
- Snapshot

Low in-school COVID-19 transmission and asymptomatic infection despite high community prevalence

Type Journal Article

Author Sophie E. Katz

Author Rendie McHenry

Author Lauren G. Mauer

Author James D. Chappell

Author Laura S. Stewart

Author Jonathan E. Schmitz

Author Natasha Halasa

Author Kathryn M. Edwards

Author Ritu Banerjee

Abstract There is concern that in-person schooling during the coronavirus disease 2019 (COVID-19) pandemic will facilitate disease transmission. Through asymptomatic surveillance and contact tracing for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), we found low rates of asymptomatic SARS-CoV-2 infection and little in-school transmission of COVID-19 when physical distancing and masking strategies were enforced despite a high community prevalence of COVID-19.

Date 2021-6-16

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8271352/>

Accessed 9/2/2021, 10:15:01 AM

Extra PMID: 34144028 PMCID: PMC8271352

Publication The Journal of Pediatrics

DOI 10.1016/j.jpeds.2021.06.015

Journal Abbr J Pediatr

ISSN 0022-3476

Date Added 9/2/2021, 10:15:01 AM

Modified 9/2/2021, 12:06:00 PM

Tags:

Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Low SARS-CoV-2 transmission in elementary schools- Salt Lake County, Utah, December 3, 2020-January 31, 2021

Type Journal Article

Author Rebecca B. Hershow

Author Karen Wu

Author Nathaniel M. Lewis
Author Alison T. Milne
Author Dustin Currie
Author Amanda R. Smith
Author Spencer Lloyd
Author Brian Orleans
Author Erin L. Young
Author Brandi Freeman
Author Noah Schwartz
Author Bobbi Bryant
Author Catherine Espinosa
Author Yoshinori Nakazawa
Author Elizabeth Garza
Author Olivia Almendares
Author Winston E. Abara
Author Daniel C. Ehlman
Author Keith Waters
Author Mary Hill
Author Ilene Risk
Author Kelly Oakeson
Author Jacqueline E. Tate
Author Hannah L. Kirking
Author Angela Dunn
Author Snigdha Vallabhaneni
Author Adam L. Hersh
Author Victoria T. Chu

Abstract School closures affected more than 55 million students across the United States when implemented as a strategy to prevent the transmission of SARS-CoV-2, the virus that causes COVID-19 (1). Reopening schools requires balancing the risks for SARS-CoV-2 infection to students and staff members against the benefits of in-person learning (2). During December 3, 2020-January 31, 2021, CDC investigated SARS-CoV-2 transmission in 20 elementary schools (kindergarten through grade 6) that had reopened in Salt Lake County, Utah. The 7-day cumulative number of new COVID-19 cases in Salt Lake County during this time ranged from 290 to 670 cases per 100,000 persons.† Susceptible§ school contacts¶ (students and staff members exposed to SARS-CoV-2 in school) of 51 index patients** (40 students and 11 staff members) were offered SARS-CoV-2 reverse transcription-polymerase chain reaction (RT-PCR) testing. Among 1,041 susceptible school contacts, 735 (70.6%) were tested, and five of 12 cases identified were classified as school-associated; the secondary attack rate among tested susceptible school contacts was 0.7%. Mask use among students was high (86%), and the median distance between students' seats in classrooms was 3 ft. Despite high community incidence and an inability to maintain ≥6 ft of distance

between students at all times, SARS-CoV-2 transmission was low in these elementary schools. The results from this investigation add to the increasing evidence that in-person learning can be achieved with minimal SARS-CoV-2 transmission risk when multiple measures to prevent transmission are implemented (3,4).

Date 2021-03-26
Language eng
Library Catalog PubMed
Extra PMID: 33764967 PMCID: PMC7993560
Volume 70
Pages 442-448
Publication MMWR. Morbidity and mortality weekly report
DOI 10.15585/mmwr.mm7012e3
Issue 12
Journal Abbr MMWR Morb Mortal Wkly Rep
ISSN 1545-861X
Date Added 9/2/2021, 9:21:33 AM
Modified 9/2/2021, 11:59:36 AM

Tags:

Humans, Female, Male, Middle Aged, Schools, Adult, COVID-19, Masks, SARS-CoV-2, Child, Child, Preschool, Contact Tracing, COVID-19 Nucleic Acid Testing, Physical Distancing, Utah, Observation Study

Attachments

- Full Text
- PubMed entry

Mask adherence and rate of COVID-19 across the United States

Type Journal Article
Author Charlie B. Fischer
Author Nedghie Adrien
Author Jeremiah J. Silguero
Author Julianne J. Hopper
Author Abir I. Chowdhury
Author Martha M. Werler
Abstract Mask wearing has been advocated by public health officials as a way to reduce the spread of COVID-19. In the United States, policies on mask wearing have varied from

state to state over the course of the pandemic. Even as more and more states encourage or even mandate mask wearing, many citizens still resist the notion. Our research examines mask wearing policy and adherence in association with COVID-19 case rates. We used state-level data on mask wearing policy for the general public and on proportion of residents who stated they always wear masks in public. For all 50 states and the District of Columbia (DC), these data were abstracted by month for April – September 2020 to measure their impact on COVID-19 rates in the subsequent month (May – October 2020). Monthly COVID-19 case rates (number of cases per capita over two weeks) >200 per 100,000 residents were considered high. Fourteen of the 15 states with no mask wearing policy for the general public through September reported a high COVID-19 rate. Of the 8 states with at least 75% mask adherence, none reported a high COVID-19 rate. States with the lowest levels of mask adherence were most likely to have high COVID-19 rates in the subsequent month, independent of mask policy or demographic factors. Mean COVID-19 rates for states with at least 75% mask adherence in the preceding month was 109.26 per 100,000 compared to 249.99 per 100,000 for those with less adherence. Our analysis suggests high adherence to mask wearing could be a key factor in reducing the spread of COVID-19. This association between high mask adherence and reduced COVID-19 rates should influence policy makers and public health officials to focus on ways to improve mask adherence across the population in order to mitigate the spread of COVID-19.

Date Apr 14, 2021

Language en

Library Catalog PLoS Journals

URL <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0249891>

Accessed 9/1/2021, 1:06:04 PM

Extra Publisher: Public Library of Science

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Pages e0249891

Publication PLOS ONE

DOI 10.1371/journal.pone.0249891

Issue 4

Journal Abbr PLOS ONE

ISSN 1932-6203

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Tags:

United States, Conservation science, COVID 19, Health care policy, Hispanic people, Pandemics, Public and occupational health, Public policy, Study

Attachments

- Full Text PDF
- Snapshot

Mask use and ventilation improvements to reduce COVID-19 incidence in elementary schools - Georgia, November 16-December 11, 2020

Type Journal Article

Author Jenna Gettings

Author Michaila Czarnik

Author Elana Morris

Author Elizabeth Haller

Author Angela M Thompson-Paul

Author Catherine Rasberry

Author Tatiana M Lanzieri

Author Jennifer Smith-Grant

Author Tiffiany Michelle Aholou

Author Ebony Thomas

Author Cherie Drenzek

Author Duncan MacKellar

Abstract To meet the educational, physical, social, and emotional needs of children, many U.S. schools opened for in-person learning during fall 2020 by implementing strategies to prevent transmission of SARS-CoV-2, the virus that causes COVID-19 (1,2). To date, there have been no U.S. studies comparing COVID-19 incidence in schools that varied in implementing recommended prevention strategies, including mask requirements and ventilation improvements* (2). Using data from Georgia kindergarten through grade 5 (K-5) schools that opened for in-person learning during fall 2020, CDC and the Georgia Department of Public Health (GDPH) assessed the impact of school-level prevention strategies on incidence of COVID-19 among students and staff members before the availability of COVID-19 vaccines.(†) Among 169 K-5 schools that participated in a survey on prevention strategies and reported COVID-19 cases during November 16-December 11, 2020, COVID-19 incidence was 3.08 cases among students and staff members per 500 enrolled students.(§) Adjusting for county-level incidence, COVID-19 incidence was 37% lower in schools that required teachers and staff members to use masks, and 39% lower in schools that improved ventilation, compared with schools that did not use these prevention strategies. Ventilation strategies associated with lower school incidence included methods to dilute airborne particles alone by opening windows, opening doors, or using fans (35% lower incidence), or in combination with methods to filter airborne particles with high-efficiency particulate absorbing (HEPA) filtration with or without purification with ultraviolet germicidal irradiation (UVGI) (48% lower incidence). Multiple strategies should be implemented to prevent transmission of SARS-CoV-2 in schools (2); mask requirements for teachers and staff members and improved ventilation are important strategies that elementary schools

could implement as part of a multicomponent approach to provide safer, in-person learning environments. Universal and correct mask use is still recommended by CDC for adults and children in schools regardless of vaccination status (2).

Date May 28, 2021

Language eng

Archive PubMed

Loc. in Archive 34043610

URL <https://pubmed.ncbi.nlm.nih.gov/34043610>

Extra Publisher: Centers for Disease Control and Prevention

Volume 70

Pages 779-784

Publication MMWR. Morbidity and mortality weekly report

DOI 10.15585/mmwr.mm7021e1

Issue 21

Journal Abbr MMWR Morb Mortal Wkly Rep

ISSN 1545-861X

Date Added 9/2/2021, 11:57:17 AM

Modified 9/2/2021, 12:55:15 PM

Tags:

Humans, Child, Incidence, *Schools, COVID-19/epidemiology/*prevention & control, Georgia/epidemiology, Masks/*statistics & numerical data, Ventilation/*standards, Observational Study

Attachments

- Full Text (HTML)

Mask wearing in pre-symptomatic patients prevents SARS-CoV-2 transmission: An epidemiological analysis

Type Journal Article

Author Lu-Xiao Hong

Author Aifen Lin

Author Ze-Bao He

Author Hai-Hong Zhao

Author Jian-Gang Zhang

Author Chao Zhang

Author Ling-Jun Ying

Author Zheng-Ming Ge

Author Xia Zhang
Author Qiu-Yue Han
Author Qiong-Yuan Chen
Author Yao-Han Ye
Author Jian-Sheng Zhu
Author Hai-Xiao Chen
Author Wei-Hua Yan

Abstract Objectives Pandemic COVID-19 has become a seriously public health priority worldwide. Comprehensive strategies including travel restrictions and mask-wearing have been implemented to mitigate the virus circulation. However, detail information on community transmission is unavailable yet. Methods From January 23 to March 1, 2020, 127 patients (median age: 46 years; range: 11–80) with 71 male and 56 female, were confirmed to be infected with the SARS-CoV-2 in Taizhou, Zhejiang, China. Epidemiological trajectory and clinical features of these COVID-19 cases were retrospectively retrieved from electronic medical records and valid individual questionnaire. Results The disease onset was between January 9 to February 14, 2020. Among them, 64 patients are local residents, and 63 patients were back home from Wuhan from January 10 to 24, 2020 before travel restriction. 197 local residents had definite close-contact with 41 pre-symptomatic patients back from Wuhan. 123 and 74 of them contact with mask-wearing or with no mask-wearing pre-symptomatic patients back from Wuhan, respectively. Data showed that incidence of COVID-19 was significantly higher for local residents close-contact with no mask-wearing Wuhan returned pre-symptomatic patients (19.0% vs. 8.1%, $p < 0.001$). Among 57 close-contact individuals, 21 sequential local COVID-19 patients originated from a pre-symptomatic Wuhan returned couple, indicated dense gathering in congested spaces is a high risk for SARS-CoV-2 transmission. 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.

Date 2020

Short Title Mask wearing in pre-symptomatic patients prevents SARS-CoV-2 transmission

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7311905/>

Accessed 9/2/2021, 9:44:46 AM

Extra PMID: 32592903 PMCID: PMC7311905

Volume 36

Pages 101803

Publication Travel Medicine and Infectious Disease

DOI 10.1016/j.tmaid.2020.101803

Journal Abbr Travel Med Infect Dis

ISSN 1477-8939

Date Added 9/2/2021, 9:44:46 AM

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Tags:

Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Mask-wearing and control of SARS-CoV-2 transmission in the USA: A cross-sectional study

Type Journal Article

Author Benjamin Rader

Author Laura F White

Author Michael R Burns

Author Jack Chen

Author Joseph Brilliant

Author Jon Cohen

Author Jeffrey Shaman

Author Larry Brilliant

Author Moritz U G Kraemer

Author Jared B Hawkins

Author Samuel V Scarpino

Author Christina M Astley

Author John S Brownstein

Abstract Background Face masks have become commonplace across the USA because of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) epidemic. Although evidence suggests that masks help to curb the spread of the disease, there is little empirical research at the population level. We investigate the association between self-reported mask-wearing, physical distancing, and SARS-CoV-2 transmission in the USA, along with the effect of statewide mandates on mask uptake. Methods Serial cross-sectional surveys were administered via a web platform to randomly surveyed US individuals aged 13 years and older, to query self-reports of face mask-wearing. Survey responses were combined with instantaneous reproductive number (R_t) estimates from two publicly available sources, the outcome of interest. Measures of physical distancing, community demographics, and other potential sources of confounding (from publicly available sources) were also assessed. We fitted multivariate logistic regression models to estimate the association between mask-wearing and community transmission control ($R_t < 1$). Additionally, mask-wearing in 12 states was evaluated 2 weeks before and after statewide mandates. Findings 378 207 individuals responded to the survey between June 3 and July 27, 2020, of which

4186 were excluded for missing data. We observed an increasing trend in reported mask usage across the USA, although uptake varied by geography. A logistic model controlling for physical distancing, population demographics, and other variables found that a 10% increase in self-reported mask-wearing was associated with an increased odds of transmission control (odds ratio 3.53, 95% CI 2.03–6.43). We found that communities with high reported mask-wearing and physical distancing had the highest predicted probability of transmission control. Segmented regression analysis of reported mask-wearing showed no statistically significant change in the slope after mandates were introduced; however, the upward trend in reported mask-wearing was preserved. Interpretation The widespread reported use of face masks combined with physical distancing increases the odds of SARS-CoV-2 transmission control. Self-reported mask-wearing increased separately from government mask mandates, suggesting that supplemental public health interventions are needed to maximise adoption and help to curb the ongoing epidemic. Funding Flu Lab, Google.org (via the Tides Foundation), National Institutes for Health, National Science Foundation, Morris-Singer Foundation, MOOD, Branco Weiss Fellowship, Ending Pandemics, Centers for Disease Control and Prevention (USA).

Date March 1, 2021

Language en

Short Title Mask-wearing and control of SARS-CoV-2 transmission in the USA

Library Catalog ScienceDirect

URL <https://www.sciencedirect.com/science/article/pii/S2589750020302934>

Accessed 9/2/2021, 9:40:14 AM

Volume 3

Pages e148-e157

Publication The Lancet Digital Health

DOI 10.1016/S2589-7500(20)30293-4

Issue 3

Journal Abbr The Lancet Digital Health

ISSN 2589-7500

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Modified 9/2/2021, 12:21:37 PM

Tags:

Study

Attachments

○ Full Text

Minimal SARS-CoV-2 transmission after implementation of a comprehensive mitigation strategy at a school- New Jersey, August 20-November 27, 2020

Type Journal Article

Author Kevin G. Volpp

Author Bruce H. Kraut

Author Smita Ghosh

Author John Neatherlin

Abstract During fall 2020, many U.S. kindergarten through grade 12 (K-12) schools closed campuses and instituted remote learning to limit in-school transmission of SARS-CoV-2, the virus that causes COVID-19 (1,2). A New Jersey grade 9-12 boarding school with 520 full-time resident students, 255 commuter students, and 405 faculty and staff members implemented a comprehensive mitigation strategy that included universal masking, testing, upgraded air-handling equipment to improve ventilation, physical distancing of ≥ 6 ft, contact tracing, and quarantine and isolation protocols to prevent and control transmission of SARS-CoV-2 among students, faculty, and staff members. Mandatory twice-weekly screening using real-time reverse transcription-polymerase chain reaction (RT-PCR) testing of all students and staff members during August 20-November 27, 2020, resulted in the testing of 21,449 specimens. A total of 19 (5%) of 405 faculty and staff members and eight (1%) of 775 students received positive test results; only two identified cases were plausibly caused by secondary transmission on campus. Comprehensive mitigation approaches including frequent testing and universal masking can help prevent outbreaks in in-person high school settings even when community transmission is ongoing.

Date 2021-03-19

Language eng

Library Catalog PubMed

Extra PMID: 33735161 PMCID: PMC7976619

Volume 70

Pages 377-381

Publication MMWR. Morbidity and mortality weekly report

DOI 10.15585/mmwr.mm7011a2

Issue 11

Journal Abbr MMWR Morb Mortal Wkly Rep

ISSN 1545-861X

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Tags:

Humans, Schools, Adolescent, COVID-19, Masks, SARS-CoV-2, Contact Tracing, COVID-19 Nucleic Acid Testing, Physical Distancing, Quarantine, New Jersey, Observation Study

Attachments

- Full Text
- PubMed entry

Minimal transmission of SARS-CoV-2 from paediatric COVID-19 cases in primary schools, Norway, August to November 2020

Type Journal Article

Author Lin T. Brandal

Author Trine S. Ofitserova

Author Hinta Meijerink

Author Rikard Rykkvin

Author Hilde M. Lund

Author Olav Hungnes

Author Margrethe Greve-Isdahl

Author Karoline Bragstad

Author Karin Nygård

Author Brita A. Winje

Abstract An intense debate on school closures to control the COVID-19 pandemic is ongoing in Europe. We prospectively examined transmission of SARS-CoV-2 from confirmed paediatric cases in Norwegian primary schools between August and November 2020. All in-school contacts were systematically tested twice during their quarantine period. With preventive measures implemented in schools, we found minimal child-to-child (0.9%, 2/234) and child-to-adult (1.7%, 1/58) transmission, supporting that under 14 year olds are not the drivers of SARS-CoV-2 transmission.

Date 2021-01

Language eng

Library Catalog PubMed

Extra PMID: 33413743 PMCID: PMC7791599

Volume 26

Publication Euro Surveill: Bulletin European Sur Les Maladies Transmissibles = European Communicable Disease Bulletin

DOI 10.2807/1560-7917.ES.2020.26.1.2002011

Issue 1

Journal Abbr Euro Surveill

ISSN 1560-7917

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Modified 9/2/2021, 10:53:22 AM

Tags:

Humans, Female, Male, Schools, school, Adolescent, COVID-19, SARS-CoV-2, Child, Child, Preschool, transmission, Contact Tracing, Physical Distancing, COVID-19 Testing, Quarantine, children 5–13 years, Norway, Prospective Studies, school-related contacts, Observation Study

Attachments

- Full Text
- PubMed entry

Modeling the Transmission of COVID-19: Impact of mitigation strategies in Prekindergarten-Grade 12 public schools, United States, 2021

Type Journal Article

Author Gabrielle F. Miller

Author Bradford Greening

Author Ketra L. Rice

Author Aziza Arifkhanova

Author Martin I. Meltzer

Author Fátima Coronado

Abstract **BACKGROUND:** Schools are an integral part of the community; however, congregate settings facilitate transmission of SARS-CoV-2, presenting a challenge to school administrators to provide a safe, in-school environment for students and staff. **METHODS:** We adapted the Centers for Disease Control and Prevention's COVIDTracer Advanced tool to model the transmission of SARS-CoV-2 in a school of 596 individuals. We estimate possible reductions in cases and hospitalizations among this population using a scenario-based analysis that accounts for (a) the risk of importation of infection from the community; (b) adherence to key Centers for Disease Control and Prevention-recommended mitigation strategies: mask wearing, cleaning and disinfection, hand hygiene, and social distancing; and (c) the effectiveness of contact tracing interventions at limiting onward transmission. **RESULTS:** Low impact and effectiveness of mitigation strategies (net effectiveness: 27%) result in approximately 40% of exposed staff and students becoming COVID-19 cases. When the net effectiveness of mitigation strategies was 69% or greater, in-school transmission was mostly prevented, yet importation of cases from the surrounding community could result in nearly 20% of the school's population becoming infected within 180 days. The combined effects of mitigation strategies and contact tracing were able to prevent most onward transmission. Hospitalizations were low among children and adults (<0.5% of the school population) across all scenarios examined. **CONCLUSIONS:** Based on our model, layering mitigation strategies and contact tracing can limit the number of cases that may occur from transmission in schools. Schools in communities with substantial levels of community spread will need to be

more vigilant to ensure adherence of mitigation strategies to minimize transmission. Our results show that for school administrators, teachers, and parents to provide the safest environment, it is important to utilize multiple mitigation strategies and contact tracing that reduce SARS CoV-2 transmission by at least 69%. This will require training, reinforcement, and vigilance to ensure that the highest level of adherence is maintained over the entire school term.

Date 2021-04-30
Language eng
Short Title Modeling the Transmission of Covid-19
Library Catalog PubMed
Extra PMID: 33938487
Publication Journal of public health management and practice: JPHMP
DOI 10.1097/PHH.0000000000001373
Journal Abbr J Public Health Manag Pract
ISSN 1550-5022
Date Added 9/2/2021, 9:31:02 AM
Modified 9/2/2021, 12:18:15 PM

Tags:

Study

Attachments

- PubMed entry

Modelling the potential impact of mask use in schools and society on COVID-19 control in the UK

Type Journal Article
Author J. Panovska-Griffiths
Author C. C. Kerr
Author W. Waites
Author R. M. Stuart
Author D. Mistry
Author D. Foster
Author D. J. Klein
Author R. M. Viner
Author C. Bonell
Abstract As the UK reopened after the first wave of the COVID-19 epidemic, crucial questions emerged around the role for ongoing interventions, including test-trace-isolate (TTI)

strategies and mandatory masks. Here we assess the importance of masks in secondary schools by evaluating their impact over September 1–October 23, 2020. We show that, assuming TTI levels from August 2020 and no fundamental changes in the virus’s transmissibility, adoption of masks in secondary schools would have reduced the predicted size of a second wave, but preventing it would have required 68% or 46% of those with symptoms to seek testing (assuming masks’ effective coverage 15% or 30% respectively). With masks in community settings but not secondary schools, the required testing rates increase to 76% and 57%.

Date 2021-04-22
Language en
Library Catalog www.nature.com
URL <https://www.nature.com/articles/s41598-021-88075-0>
Accessed 9/1/2021, 1:06:27 PM
Rights 2021 The Author(s)
Extra Bandiera_abtest: a Cc_license_type: cc_by Cg_type: Nature Research Journals Number: 1 Primary_atype: Research Publisher: Nature Publishing Group Subject_term: Computational models;Computational science;Epidemiology;Health policy Subject_term_id: computational-models;computational-science;epidemiology;health-policy
Volume 11
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Publication Scientific Reports
DOI 10.1038/s41598-021-88075-0
Issue 1
Journal Abbr Sci Rep
ISSN 2045-2322
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Modified 9/2/2021, 12:18:51 PM

Tags:

Study

Attachments

- Full Text PDF
- Snapshot

Novel Coronavirus 2019 transmission risk in educational settings

Type Journal Article
Author Chee Fu Yung

Author Kai-Qian Kam
Author Karen Donceras Nadua
Author Chia Yin Chong
Author Natalie Woon Hui Tan
Author Jiahui Li
Author Khai Pin Lee
Author Yoke Hwee Chan
Author Koh Cheng Thoon
Author Kee Chong Ng

Abstract Transmission risk of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in schools is unknown. Our investigations, especially in preschools, could not detect SARS-CoV-2 transmission despite screening of symptomatic and asymptomatic children. The data suggest that children are not the primary drivers of SARS-CoV-2 transmission in schools and could help inform exit strategies for lifting of lockdowns.

Date 2021-03-15

Language eng

Library Catalog PubMed

Extra PMID: 32584975 PMCID: PMC7337629

Volume 72

Pages 1055-1058

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Humans, Schools, school, COVID-19, SARS-CoV-2, Child, Child, Preschool, transmission, Communicable Disease Control, Mass Screening, pediatric, Study

Attachments

- Full Text
 - PubMed entry
-

Pilot investigation of SARS-CoV-2 secondary transmission in Kindergarten through Grade 12 schools implementing mitigation strategies — St. Louis County and City of Springfield, Missouri, December 2020

Type Journal Article
Author Patrick Dawson
Author Mary Claire Worrell
Author Sara Malone
Author Sarah C. Tinker
Author Stephanie Fritz
Author Brett Maricque
Author Sadaf Junaidi
Author Gemille Purnell
Author Albert M. Lai
Author Julie A. Neidich
Author Justin S. Lee
Author Rachel C. Orscheln
Author Rachel Charney
Author Terri Rebmann
Author Jon Mooney
Author Nancy Yoon
Author Mabelle Petit
Author Spring Schmidt
Author Jean Grabeel
Author Lee Ann Neill
Author Lisa C. Barrios
Author Snigdha Vallabhaneni
Author Randall W. Williams
Author Clay Goddard
Author Jason G. Newland
Author John C. Neatherlin
Author Johanna S. Salzer
Author Suxiang Tong
Author Ying Tao
Author Brian Emery
Author Jing Zhang
Author Min-hsin Chen
Author Gimin Kim
Author Bettina Bankamp
Abstract Not available

Date 2021-3-26
Library Catalog PubMed Central
URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7993558/>
Accessed 9/2/2021, 10:16:17 AM
Extra PMID: 33764961 PMCID: PMC7993558
Volume 70
Pages 449-455
Publication Morbidity and Mortality Weekly Report
DOI 10.15585/mmwr.mm7012e4
Issue 12
Journal Abbr MMWR Morb Mortal Wkly Rep
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Tags:

Observation Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Placing a mask on COVID-19 patients during high-flow nasal cannula therapy reduces aerosol particle dispersion

Type Journal Article
Author Jie Li
Author James B. Fink
Author Ahmad A. Elshafei
Author Laurel M. Stewart
Author Hannah J. Barbian
Author Sara H. Mirza
Author Lena Al-Harathi
Author David Vines
Author Stephan Ehrmann
Abstract Wearing a surgical/procedure mask over high-flow nasal cannula (HFNC) reduces aerosol particle concentrations in the patients' vicinity. Wearing a mask over HFNC should be encouraged to reduce risks of aerosol transmission.

Date 01/2021
Language en
Library Catalog DOI.org (Crossref)
URL <http://openres.ersjournals.com/lookup/doi/10.1183/23120541.00519-2020>
Accessed 9/1/2021, 1:08:59 PM
Volume 7
Pages 00519-2020
Publication ERJ Open Research
DOI 10.1183/23120541.00519-2020
Issue 1
Journal Abbr ERJ Open Res
ISSN 2312-0541
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Modified 9/2/2021, 2:47:22 PM

Tags:

Study

Attachments

- Li et al. - 2021 - Placing a mask on COVID-19 patients during high-fl.pdf

Potential utilities of mask-wearing and instant hand hygiene for fighting SARS-CoV-2

Type Journal Article
Author Qing-Xia Ma
Author Hu Shan
Author Hong-Liang Zhang
Author Gui-Mei Li
Author Rui-Mei Yang
Author Ji-Ming Chen
Abstract The surge of patients in the pandemic of COVID-19 caused by the novel coronavirus SARS-CoV-2 may overwhelm the medical systems of many countries. Mask-wearing and handwashing can slow the spread of the virus, but currently, masks are in shortage in many countries, and timely handwashing is often impossible. In this study, the efficacy of three types of masks and instant hand wiping was evaluated using the avian influenza virus to mock the coronavirus. Virus quantification was performed using real-time reverse transcription-polymerase chain reaction. Previous studies on mask-wearing were reviewed. The results showed that instant hand wiping using a wet towel

soaked in water containing 1.00% soap powder, 0.05% active chlorine, or 0.25% active chlorine from sodium hypochlorite removed 98.36%, 96.62%, and 99.98% of the virus from hands, respectively. N95 masks, medical masks, and homemade masks made of four-layer kitchen paper and one-layer cloth could block 99.98%, 97.14%, and 95.15% of the virus in aerosols. Medical mask-wearing which was supported by many studies was opposed by other studies possibly due to erroneous judgment. With these data, we propose the approach of mask-wearing plus instant hand hygiene (MIH) to slow the exponential spread of the virus. This MIH approach has been supported by the experiences of seven countries in fighting against COVID-19. Collectively, a simple approach to slow the exponential spread of SARS-CoV-2 was proposed with the support of experiments, literature review, and control experiences.

Date 2020-4-08

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7228401/>

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Extra PMID: 32232986 PMCID: PMC7228401

Pages 10.1002/jmv.25805

Publication Journal of Medical Virology

DOI 10.1002/jmv.25805

Journal Abbr J Med Virol

ISSN 0146-6615

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Tags:

Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Preventing and mitigating SARS-COV-2 transmission—Four overnight camps, Maine, June-August 2020

Type Journal Article

Author Laura L. Blaisdell

Author Wendy Cohn

Author Jeff R. Pavell

Author Dana S. Rubin

Author Jeffrey E. Vergales

Abstract The World Health Organization declared coronavirus disease 2019 (COVID-19) a pandemic on March 11, 2020.* Shortly thereafter, closures of 124,000 U.S. public and private schools affected at least 55.1 million students through the end of the 2019-20 school year.† During the summer of 2020, approximately 82% of 8,947 U.S. overnight camps did not operate.§ In Maine, only approximately 20% of 100 overnight camps opened.¶ An overnight camp in Georgia recently reported SARS-CoV-2, the virus that causes COVID-19, transmission among campers and staff members when nonpharmaceutical interventions (NPIs) were not strictly followed (1); however, NPIs have been successfully used to mitigate SARS-CoV-2 transmission among military basic trainees (2). During June-August 2020, four overnight camps in Maine implemented several NPIs to prevent and mitigate the transmission of SARS-CoV-2, including prearrival quarantine, pre- and postarrival testing and symptom screening, cohorting, use of face coverings, physical distancing, enhanced hygiene measures, cleaning and disinfecting, and maximal outdoor programming. During the camp sessions, testing and symptom screening enabled early and rapid identification and isolation of attendees with COVID-19. Among the 1,022 attendees (staff members and campers) from 41 states, one territory, and six international locations, 1,010 were tested before arrival; 12 attendees who had completed a period of isolation after receiving a diagnosis of COVID-19 2 months before arrival were not tested. Four (0.4%) asymptomatic attendees received positive SARS-CoV-2 test results before arrival; these persons delayed their arrival, completed 10 days of isolation at home, remained asymptomatic, and did not receive any further testing before arrival or for the duration of camp attendance. Approximately 1 week after camp arrival, all 1,006 attendees without a previous diagnosis of COVID-19 were tested, and three asymptomatic cases were identified. Following isolation of these persons and quarantine of their contacts, no secondary transmission of SARS-CoV-2 occurred. These findings can inform similar multilayered public health strategies to prevent and mitigate the introduction and transmission of SARS-CoV-2 among children, adolescents, and adults in congregate settings, such as overnight camps, residential schools, and colleges.

Date 2020-09-04

Language eng

Library Catalog PubMed

Extra PMID: 32881850 PMCID: PMC7470465

Volume 69

Pages 1216-1220

Publication MMWR. Morbidity and mortality weekly report

DOI 10.15585/mmwr.mm6935e1

Issue 35

Journal Abbr MMWR Morb Mortal Wkly Rep

ISSN 1545-861X

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Humans, Aged, Female, Male, Middle Aged, Adolescent, Adult, COVID-19, Pandemics, Child, Coronavirus Infections, Pneumonia, Viral, COVID-19 Testing, Clinical Laboratory Techniques, Quarantine, Young Adult, Asymptomatic Diseases, Camping, Maine, Observation Study

Attachments

- Full Text
- PubMed entry

Professional and home-made face masks reduce exposure to respiratory infections among the general population

Type Journal Article

Author Marianne van der Sande

Author Peter Teunis

Author Rob Sabel

Abstract Background Governments are preparing for a potential influenza pandemic. Therefore they need data to assess the possible impact of interventions. Face-masks worn by the general population could be an accessible and affordable intervention, if effective when worn under routine circumstances. Methodology We assessed transmission reduction potential provided by personal respirators, surgical masks and home-made masks when worn during a variety of activities by healthy volunteers and a simulated patient. Principal Findings All types of masks reduced aerosol exposure, relatively stable over time, unaffected by duration of wear or type of activity, but with a high degree of individual variation. Personal respirators were more efficient than surgical masks, which were more efficient than home-made masks. Regardless of mask type, children were less well protected. Outward protection (mask wearing by a mechanical head) was less effective than inward protection (mask wearing by healthy volunteers). Conclusions/Significance Any type of general mask use is likely to decrease viral exposure and infection risk on a population level, in spite of imperfect fit and imperfect adherence, personal respirators providing most protection. Masks worn by patients may not offer as great a degree of protection against aerosol transmission.

Date Jul 9, 2008

Language en

Library Catalog PLoS Journals

URL <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0002618>

Accessed 9/2/2021, 1:30:44 PM

Extra Publisher: Public Library of Science

Volume 3

Pages e2618

Publication PLOS ONE

DOI 10.1371/journal.pone.0002618

Issue 7

Journal Abbr PLOS ONE

ISSN 1932-6203

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Tags:

Pandemics, Aerosols, Study, Respirators, Breathing, Face, Influenza, Respiratory infections, Surgical and invasive medical procedures

Attachments

- Full Text PDF
- Snapshot

Projected effects of nonpharmaceutical public health interventions to prevent resurgence of SARS-CoV-2 transmission in Canada

Type Journal Article

Author Victoria Ng

Author Aamir Fazil

Author Lisa A. Waddell

Author Christina Bancej

Author Patricia Turgeon

Author Ainsley Otten

Author Nicole Atchessi

Author Nicholas H. Ogden

Abstract BACKGROUND: Continual efforts to eliminate community transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) will be needed to prevent additional waves of infection. We explored the impact of nonpharmaceutical interventions on projected SARS-CoV-2 transmission in Canada. METHODS: We developed an age-structured agent-based model of the Canadian population simulating the impact of current and projected levels of public health interventions on SARS-CoV-2 transmission. Interventions included case detection and isolation, contact tracing and quarantine, physical distancing and community closures, evaluated alone and in combination. RESULTS: Without any interventions, 64.6% (95% credible interval [CrI] 63.9%-65.0%) of Canadians will be infected with SARS-CoV-2 (total attack rate) and 3.6% (95% CrI 2.4%-3.8%) of those infected and symptomatic will die. If case detection and contact tracing continued at baseline levels without

maintained physical distancing and reimplementing of restrictive measures, this combination brought the total attack rate to 56.1% (95% CrI 0.05%-57.1%), but it dropped to 0.4% (95% CrI 0.03%-23.5%) with enhanced case detection and contact tracing. Combining the latter scenario with maintained physical distancing reduced the total attack rate to 0.2% (95% CrI 0.03%-1.7%) and was the only scenario that consistently kept hospital and intensive care unit bed use under capacity, prevented nearly all deaths and eliminated the epidemic. Extending school closures had minimal effects but did reduce transmission in schools; however, extending closures of workplaces and mixed-age venues markedly reduced attack rates and usually or always eliminated the epidemic under any scenario. INTERPRETATION: Controlling SARS-CoV-2 transmission will depend on enhancing and maintaining interventions at both the community and individual levels. Without such interventions, a resurgent epidemic will occur, with the risk of overwhelming our health care systems.

Date 2020-09-14

Language eng

Library Catalog PubMed

Extra PMID: 32778573 PMCID: PMC7513947

Volume 192

Pages E1053-E1064

Publication CMAJ: Canadian Medical Association journal = journal de l'Association medicale canadienne

DOI 10.1503/cmaj.200990

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Journal Abbr CMAJ

ISSN 1488-2329

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Humans, Aged, Aged, 80 and over, Middle Aged, Adolescent, Adult, COVID-19, Pandemics, SARS-CoV-2, Child, Contact Tracing, Coronavirus Infections, Pneumonia, Viral, Communicable Disease Control, COVID-19 Testing, Asymptomatic Infections, Betacoronavirus, Canada, Clinical Laboratory Techniques, Computer Simulation, Patient Isolation, Public Health, Quarantine, Young Adult, Observation Study

Attachments

- Full Text
 - PubMed entry
-

Protecting healthcare staff from severe acute respiratory syndrome: filtration capacity of multiple surgical masks

Type Journal Article

Author J.L. Derrick

Author C.D. Gomersall

Abstract Guidelines issued by the Centers for Disease Control and Prevention and the World Health Organisation state that healthcare workers should wear N95 masks or higher-level protection during all contact with suspected severe acute respiratory syndrome (SARS). In areas where N95 masks are not available, multiple layers of surgical masks have been tried to prevent transmission of SARS. The in vivo filtration capacity of a single surgical mask is known to be poor. However, the filtration capacity of a combination of masks is unknown., This was a crossover trial of one, two, three and five surgical masks in six volunteers to determine the in vivo filtration efficiency of wearing more than one surgical mask. We used a Portacount to measure the difference in ambient particle counts inside and outside the masks. The best combination of five surgical masks scored a fit factor of 13.7, which is well below the minimum level of 100 required for a half face respirator., Multiple surgical masks filter ambient particles poorly. They should not be used as a substitute for N95 masks unless there is no alternative.

Date 2005-4

Short Title Protecting healthcare staff from severe acute respiratory syndrome

Library Catalog PubMed Central

URL <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7114845/>

Accessed 9/2/2021, 9:57:46 AM

Extra PMID: 15749326 PMCID: PMC7114845

Volume 59

Pages 365-368

Publication The Journal of Hospital Infection

DOI 10.1016/j.jhin.2004.10.013

Issue 4

Journal Abbr J Hosp Infect

ISSN 0195-6701

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Tags:

Study

Attachments

- PubMed Central Full Text PDF
- PubMed Central Link

Protective face mask filter capable of inactivating SARS-CoV-2, and methicillin-resistant staphylococcus aureus and staphylococcus epidermidis

Type Journal Article

Author Miguel Martí

Author Alberto Tuñón-Molina

Author Finn Lillelund Aachmann

Author Yukiko Muramoto

Author Takeshi Noda

Author Kazuo Takayama

Author Ángel Serrano-Aroca

Abstract Face masks have globally been accepted to be an effective protective tool to prevent bacterial and viral transmission, especially against indoor aerosol transmission. However, commercial face masks contain filters that are made of materials that are not capable of inactivating either SARS-CoV-2 or multidrug-resistant bacteria. Therefore, symptomatic and asymptomatic individuals can infect other people even if they wear them because some viable viral or bacterial loads can escape from the masks. Furthermore, viral or bacterial contact transmission can occur after touching the mask, which constitutes an increasing source of contaminated biological waste. Additionally, bacterial pathogens contribute to the SARS-CoV-2-mediated pneumonia disease complex, and their resistance to antibiotics in pneumonia treatment is increasing at an alarming rate. In this regard, herein, we report the development of a non-woven face mask filter fabricated with a biofunctional coating of benzalkonium chloride that is capable of inactivating more than 99% of SARS-CoV-2 particles in one minute of contact, and the life-threatening methicillin-resistant *Staphylococcus aureus* and *Staphylococcus epidermidis* (normalized antibacterial halos of 0.52 ± 0.04 and 0.72 ± 0.04 , respectively). Nonetheless, despite the results obtained, further studies are needed to ensure the safety and correct use of this technology for the mass production and commercialization of this broad-spectrum antimicrobial face mask filter. Our novel protective non-woven face mask filter would be useful for many healthcare workers and researchers working in this urgent and challenging field.

Date 2021/1

Language en

Library Catalog www.mdpi.com

URL <https://www.mdpi.com/2073-4360/13/2/207>

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Rights <http://creativecommons.org/licenses/by/3.0/>

Extra Number: 2 Publisher: Multidisciplinary Digital Publishing Institute

Volume 13
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Publication Polymers
DOI 10.3390/polym13020207
Issue 2
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Tags:

COVID-19, SARS-CoV-2, benzalkonium chloride, face mask filter, MRSA, MRSE, multidrug-resistant bacteria, Study

Attachments

- Full Text PDF
- Snapshot

Reduction of secondary transmission of SARS-CoV-2 in households by face mask use, disinfection and social distancing: a cohort study in Beijing, China

Type Journal Article
Author Yu Wang
Author Huaiyu Tian
Author Li Zhang
Author Man Zhang
Author Dandan Guo
Author Wenting Wu
Author Xingxing Zhang
Author Ge Lin Kan
Author Lei Jia
Author Da Huo
Author Baiwei Liu
Author Xiaoli Wang
Author Ying Sun
Author Quanyi Wang
Author Peng Yang
Author C. Raina MacIntyre

Abstract Introduction Transmission of COVID-19 within families and close contacts accounts for the majority of epidemic growth. Community mask wearing, hand washing and social distancing are thought to be effective but there is little evidence to inform or support community members on COVID-19 risk reduction within families. Methods A retrospective cohort study of 335 people in 124 families and with at least one laboratory confirmed COVID-19 case was conducted from 28 February to 27 March 2020, in Beijing, China. The outcome of interest was secondary transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) within the family. Characteristics and practices of primary cases, of well family contacts and household hygiene practices were analysed as predictors of secondary transmission. Results The secondary attack rate in families was 23.0% (77/335). Face mask use by the primary case and family contacts before the primary case developed symptoms was 79% effective in reducing transmission (OR=0.21, 95% CI 0.06 to 0.79). Daily use of chlorine or ethanol based disinfectant in households was 77% effective (OR=0.23, 95% CI 0.07 to 0.84). Wearing a mask after illness onset of the primary case was not significantly protective. The risk of household transmission was 18 times higher with frequent daily close contact with the primary case (OR=18.26, 95% CI 3.93 to 84.79), and four times higher if the primary case had diarrhoea (OR=4.10, 95% CI 1.08 to 15.60). Household crowding was not significant. Conclusion The study confirms the highest risk of transmission prior to symptom onset, and provides the first evidence of the effectiveness of mask use, disinfection and social distancing in preventing COVID-19. We also found evidence of faecal transmission. This can inform guidelines for community prevention in settings of intense COVID-19 epidemics.

Date 2020/05/01

Language en

Short Title Reduction of secondary transmission of SARS-CoV-2 in households by face mask use, disinfection and social distancing

Library Catalog gh.bmj.com

URL <https://gh.bmj.com/content/5/5/e002794>

Accessed 9/2/2021, 10:02:10 AM

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Extra Publisher: BMJ Specialist Journals Section: Original research PMID: 32467353

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Publication BMJ Global Health

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Issue 5

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Tags:

cohort study, infections, diseases, disorders, injuries, public health, Study

Attachments

- Full Text PDF
- PubMed entry
- Snapshot

Respiratory virus shedding in exhaled breath and efficacy of face masks

Type Journal Article

Author Nancy H. L. Leung

Author Daniel K. W. Chu

Author Eunice Y. C. Shiu

Author Kwok-Hung Chan

Author James J. McDevitt

Author Benien J. P. Hau

Author Hui-Ling Yen

Author Yuguo Li

Author Dennis K. M. Ip

Author J. S. Malik Peiris

Author Wing-Hong Seto

Author Gabriel M. Leung

Author Donald K. Milton

Author Benjamin J. Cowling

Abstract We identified seasonal human coronaviruses, influenza viruses and rhinoviruses in exhaled breath and coughs of children and adults with acute respiratory illness. Surgical face masks significantly reduced detection of influenza virus RNA in respiratory droplets and coronavirus RNA in aerosols, with a trend toward reduced detection of coronavirus RNA in respiratory droplets. Our results indicate that surgical face masks could prevent transmission of human coronaviruses and influenza viruses from symptomatic individuals.

Date 2020-05

Language en

Library Catalog www.nature.com

URL <https://www.nature.com/articles/s41591-020-0843-2>

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Extra Bandiera_abtest: a Cg_type: Nature Research Journals Number: 5 Primary_atype: Research Publisher: Nature Publishing Group Subject_term: Epidemiology;Infectious diseases Subject_term_id: epidemiology;infectious-diseases

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Publication Nature Medicine

DOI 10.1038/s41591-020-0843-2

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Journal Abbr Nat Med

ISSN 1546-170X

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Tags:

Study

Attachments

- Full Text PDF
- Snapshot

SARS-CoV-2 infection in schools in a northern French city: A retrospective serological cohort study in an area of high transmission, France, January to April 2020

Type Journal Article

Author Arnaud Fontanet

Author Laura Tondeur

Author Rebecca Grant

Author Sarah Temmam

Author Yoann Madec

Author Thomas Bigot

Author Ludivine Grzelak

Author Isabelle Cailleau

Author Camille Besombes

Author Marie-Noëlle Ungeheuer

Author Charlotte Renaudat
Author Blanca Liliana Perlaza
Author Laurence Arowas
Author Nathalie Jolly
Author Sandrine Fernandes Pellerin
Author Lucie Kuhmel
Author Isabelle Staropoli
Author Christèle Huon
Author Kuang-Yu Chen
Author Bernadette Crescenzo-Chaigne
Author Sandie Munier
Author Pierre Charneau
Author Caroline Demeret
Author Timothée Bruel
Author Marc Eloit
Author Olivier Schwartz
Author Bruno Hoen

Abstract Background Children's role in SARS-CoV-2 epidemiology remains unclear. We investigated an initially unnoticed SARS-CoV-2 outbreak linked to schools in northern France, beginning as early as mid-January 2020. Aims This retrospective observational study documents the extent of SARS-CoV-2 transmission, linked to an affected high school (n = 664 participants) and primary schools (n = 1,340 study participants), in the context of unsuspected SARS-CoV-2 circulation and limited control measures. Methods Between 30 March and 30 April 2020, all school staff, as well as pupils and their parents and relatives were invited for SARS-CoV-2 antibody testing and to complete a questionnaire covering symptom history since 13 January 2020. Results In the high school, infection attack rates were 38.1% (91/239), 43.4% (23/53), and 59.3% (16/27), in pupils, teachers, and non-teaching staff respectively vs 10.1% (23/228) and 12.0% (14/117) in the pupils' parents and relatives (p < 0.001). Among the six primary schools, three children attending separate schools at the outbreak start, while symptomatic, might have introduced SARS-CoV-2 there, but symptomatic secondary cases related to them could not be definitely identified. In the primary schools overall, antibody prevalence in pupils sharing classes with symptomatic cases was higher than in pupils from other classes: 15/65 (23.1%) vs 30/445 (6.7%) (p < 0.001). Among 46 SARS-CoV-2 seropositive pupils < 12 years old, 20 were asymptomatic. Whether past HKU1 and OC43 seasonal coronavirus infection protected against SARS-CoV-2 infection in 6-11 year olds could not be inferred. Conclusions Viral circulation can occur in high and primary schools so keeping them open requires consideration of appropriate control measures and enhanced surveillance.

Date 2021-04

Language eng

Short Title SARS-CoV-2 infection in schools in a northern French city

Library Catalog PubMed
Extra PMID: 33860747 PMCID: PMC8167414
Volume 26
Publication Euro Surveill: Bulletin Europeen Sur Les Maladies Transmissibles = European Communicable Disease Bulletin
DOI 10.2807/1560-7917.ES.2021.26.15.2001695
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Tags:

Humans, Schools, COVID-19, SARS-CoV-2, Child, Cohort Studies, Retrospective Studies, Coronavirus disease 2019 (COVID-19), Emerging infectious diseases, Epidemiology, France, Study

Attachments

- Full Text
- PubMed entry

SARS-CoV-2 infections in kindergartens and associated households at the start of the second wave in Berlin, Germany - a cross sectional study

Type Journal Article
Author Marlene Thielecke
Author Stefanie Theuring
Author Welmoed van Loon
Author Franziska Hommes
Author Marcus A. Mall
Author Alexander Rosen
Author Falko Böhringer
Author Christof von Kalle
Author Valerie Kirchberger
Author Tobias Kurth
Author Joachim Seybold
Author Frank P. Mockenhaupt
Author BECOSS study group

Abstract Actual surveys in kindergartens on SARS-CoV-2 infections are rare. At the beginning of the second pandemic wave, we screened twelve randomly selected kindergartens in Berlin, Germany. A total of 720 participants (pre-school children, staff, and connected household members) were briefly examined and interviewed, and SARS-CoV-2 infections and anti-SARS-Cov-2 IgG antibodies were assessed. About a quarter of the participants showed common cold-resembling symptoms. However, no SARS-CoV-2 infection was detected, and only one childcare worker showed IgG seroreactivity. Against a backdrop of increased pandemic activity in the community, this cross-sectional study does not suggest that kindergartens are silent transmission reservoirs.

Date 2021-05-06

Language eng

Library Catalog PubMed

Extra PMID: 33956945 PMCID: PMC8135989

Pages ckab079

Publication European Journal of Public Health

DOI 10.1093/eurpub/ckab079

Journal Abbr Eur J Public Health

ISSN 1464-360X

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Tags:

COVID-19, SARS-CoV-2, antibody, daycare, kindergarten, PCR, Study

Attachments

- Full Text
- PubMed entry

Size-dependent filtration efficiencies of face masks and respirators for removing SARS-CoV-2-laden aerosols

Type Journal Article

Author Yumeng Liu

Author Bin Zhao

Abstract Not available

Date 2021/07

Language en

Library Catalog Cambridge University Press

URL <https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/sizedependent-filtration-efficiencies-of-face-masks-and-respirators-for-removing-sarscov2laden-aerosols/B3BCAC4631256386E9A3CD888520ED31>

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Extra Publisher: Cambridge University Press

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Tags:

Study

Attachments

- Full Text PDF

Slight reduction in SARS-CoV-2 exposure viral load due to masking results in a significant reduction in transmission with widespread implementation

Type Journal Article

Author Ashish Goyal

Author Daniel B. Reeves

Author Niket Thakkar

Author Mike Famulare

Author E. Fabián Cardozo-Ojeda

Author Bryan T. Mayer

Author Joshua T. Schiffer

Abstract Masks are a vital tool for limiting SARS-CoV-2 spread in the population. Here we utilize a mathematical model to assess the impact of masking on transmission within individual transmission pairs and at the population level. Our model quantitatively links mask efficacy to reductions in viral load and subsequent transmission risk. Our results reinforce that the use of masks by both a potential transmitter and exposed person substantially reduces the probability of successful transmission, even if masks only lower exposure viral load by ~ 50%. Slight increases in mask adherence and/or efficacy above current levels would reduce the effective reproductive number (R_e) substantially below 1, particularly if implemented comprehensively in potential super-

spreader environments. Our model predicts that moderately efficacious masks will also lower exposure viral load tenfold among people who get infected despite masking, potentially limiting infection severity. Because peak viral load tends to occur pre-symptomatically, we also identify that antiviral therapy targeting symptomatic individuals is unlikely to impact transmission risk. Instead, antiviral therapy would only lower R_e if dosed as post-exposure prophylaxis and if given to ~ 50% of newly infected people within 3 days of an exposure. These results highlight the primacy of masking relative to other biomedical interventions under consideration for limiting the extent of the COVID-19 pandemic prior to widespread implementation of a vaccine. To confirm this prediction, we used a regression model of King County, Washington data and simulated the counterfactual scenario without mask wearing to estimate that in the absence of additional interventions, mask wearing decreased R_e from 1.3–1.5 to ~ 1.0 between June and September 2020.

Date 2021-06-04

Language en

Library Catalog www.nature.com

URL <https://www.nature.com/articles/s41598-021-91338-5>

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Tags:

Study

Attachments

- Full Text PDF
 - Snapshot
-

Strategies to minimize SARS-CoV-2 transmission in classroom settings: Combined impacts of ventilation and mask effective filtration efficiency

Type Journal Article

Author David A. Rothamer

Author Scott Sanders

Author Douglas Reindl

Author Timothy H. Bertram

Abstract The impact of the COVID-19 pandemic continues to be significant and global. As the global community learns more about the novel coronavirus SARS-CoV-2, there is strong evidence that a significant modality of transmission is via the long-range airborne route, referred to here as aerosol transmission. In this paper, we evaluate the efficacy of ventilation, mask effective filtration efficiency, and the combined effect of the two on the reduction of aerosol infection probability for COVID-19 in a classroom setting. The Wells-Riley equation is used to predict the conditional probability of infection for three distinct airborne exposure scenarios: (1) an infectious instructor exposing susceptible students; (2) an infectious student exposing other susceptible students; and (3) an infectious student exposing a susceptible instructor. Field measurements were performed in a classroom using a polydisperse neutralized salt (NaCl) aerosol, generated in a size range consistent with human-generated SARS-CoV-2 containing bioaerosols, as a safe surrogate. Measurements included time-resolved and size-resolved NaCl aerosol concentration distributions and size-resolved effective filtration efficiency of different masks with and without mask fitters. The measurements were used to validate assumptions and inputs for the Wells-Riley model. Aerosol dynamics and distribution measurements confirmed that the majority of the classroom space is uniform in aerosol concentration within a factor of 2 or better for distances > 2 m from the aerosol source. Mask effective filtration efficiency measurements show that most masks fit poorly with estimated leakage rates typically $> 50\%$, resulting in significantly reduced effective filtration efficiency. However, effective filtration efficiencies approaching the mask material filtration efficiency were achievable using simple mask fitters. Wells-Riley model results for the different scenarios suggest that ventilation of the classroom alone is not able to achieve infection probabilities less than 0.01 (1%) for air exchanges rates up to 10 h^{-1} and an event duration of one hour. The use of moderate to high effective filtration efficiency masks by all individuals present, on the other hand, was able to significantly reduce infection probability and could achieve reductions in infection probability by 5x, 10x, or even $>100\text{x}$ dependent on the mask used and use of a mask fitter. This enables conditional infection probabilities < 0.001 (0.1%) or even < 0.0001 (0.01%) to be reached with the use of masks and mask fitters alone. Finally, the results demonstrate that the reductions provided by ventilation and masks are synergistic and multiplicative. The results reinforce the use of properly donned masks to achieve reduced aerosol transmission of SARS-CoV-2 and other infectious diseases transmitted via respiratory aerosol indoors and provide new motivation to further improve the effective filtration efficiency of common face coverings through improved design, and/or the use of mask fitters.

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Language en
Short Title Strategies to minimize SARS-CoV-2 transmission in classroom settings
Library Catalog medRxiv
URL <https://www.medrxiv.org/content/10.1101/2020.12.31.20249101v1>
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Tags:

Study

Attachments

- Full Text PDF
- Snapshot

Surveillance of acute SARS-CoV-2 infections in school children and point-prevalence during a time of high community transmission in Switzerland

Type Journal Article
Author Susi Kriemler
Author Agne Ulyte
Author Priska Ammann
Author Gabriela P. Peralta
Author Christoph Berger
Author Milo A. Puhan
Author Thomas Radtke
Abstract Background: Switzerland had one of the highest incidence of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections in Europe during the second wave. Schools were open as in most of Europe with specific preventive measures in place. However, the frequency and transmission of acute unrecognized, asymptomatic or oligosymptomatic infections in schools during this time of high community

transmission is unknown. Thereof, our aim was to pilot a surveillance system that detects acute SARS-CoV-2 infections in schools and possible transmission within classes. Methods: Fourteen out of the randomly selected sample of the Ciao Corona cohort study participated between December 1 and 11, a time when incidence rate for SARS-CoV-2 infections was high for the canton of Zurich. We determined point-prevalence of acute SARS-CoV-2 infections of school children attending primary and secondary school. A buccal swab for polymerase chain reaction (PCR) and a rapid diagnostic test (RDT) to detect SARS-CoV-2 were taken twice 1 week apart (T1 and T2) in a cohort of children from randomly selected classes. A questionnaire assessed demographics and symptoms compatible with a SARS-CoV-2 infection during the past 5 days. Results: Out of 1,299 invited children, 641 (49%) 6- to 16-year-old children and 66 teachers from 14 schools and 67 classes participated in at least one of two testings. None of the teachers but one child had a positive PCR at T1, corresponding to a point-prevalence in children of 0.2% (95% CI 0.0-1.1%), and no positive PCR was detected at T2. The child with positive PCR at T1 was negative on the RDT at T1 and both tests were negative at T2. There were 7 (0.6%) false positive RDTs in children and 2 (1.7%) false positive RDTs in teachers at T1 or T2 among 5 schools (overall prevalence 0.7%). All 9 initially positive RDTs were negative in a new buccal sample taken 2 h to 2 days later, also confirmed by PCR. Thirty-five percent of children and 8% of teachers reported mild symptoms during the 5 days prior to testing. Conclusion: In a setting of high incidence of SARS-CoV-2 infections, unrecognized virus spread within schools was very low. Schools appear to be safe with the protective measures in place (e.g., clearly symptomatic children have to stay at home, prompt contact tracing with individual and class-level quarantine, and structured infection prevention measures in school). Specificity of the RDT was within the lower boundary of performance and needs further evaluation for its use in schools. Given the low point prevalence even in a setting of very high incidence, a targeted test, track, isolate and quarantine (TTIQ) strategy for symptomatic children and school personnel adapted to school settings is likely more suitable approach than surveillance on entire classes and schools. Clinical Trial Registration: <https://clinicaltrials.gov/ct2/show/NCT04448717>, ClinicalTrials.gov NCT04448717.

Date 2021

Language eng

Library Catalog PubMed

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school, COVID-19, SARS-CoV-2, children, acute infection, polymerase chain reaction, rapid diagnostic test, Study

Attachments

- Full Text
- PubMed entry

Testing of commercial masks and respirators and cotton mask insert materials using SARS-CoV-2 virion-sized particulates: Comparison of ideal aerosol filtration efficiency versus fitted filtration efficiency

Type Journal Article

Author W. Cary Hill

Author Matthew S. Hull

Author Robert I. MacCuspie

Abstract Shortages in the availability of personal protective face masks during the COVID-19 pandemic required many to fabricate masks and filter inserts from available materials. While the base filtration efficiency of a material is of primary importance when a perfect seal is possible, ideal fit is not likely to be achieved by the average person preparing to enter a public space or even a healthcare worker without fit-testing before each shift. Our findings suggest that parameters including permeability and pliability can play a strong role in the filtration efficiency of a mask fabricated with various filter media, and that the filtration efficiency of loosely fitting masks/respirators against ultrafine particulates can drop by more than 60% when worn compared to the ideal filtration efficiency of the base material. Further, a test method using SARS-CoV-2 virion-sized silica nanoaerosols is demonstrated to assess the filtration efficiency against nanoparticulates that follow air currents associated with mask leakage.

Date 2020-10-14

Short Title Testing of Commercial Masks and Respirators and Cotton Mask Insert Materials using SARS-CoV-2 Virion-Sized Particulates

Library Catalog ACS Publications

URL <https://doi.org/10.1021/acs.nanolett.0c03182>

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Extra Publisher: American Chemical Society

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Study

Attachments

- ACS Full Text Snapshot
- Full Text PDF

The experience of 2 independent schools with in-person learning during the COVID-19 pandemic

Type Journal Article

Author Darria L. Gillespie

Author Lauren A. Meyers

Author Michael Lachmann

Author Stephen C. Redd

Author Jonathan M. Zenilman

Abstract BACKGROUND: In 2020, US schools closed due to SARS-CoV-2 but their role in transmission was unknown. In fall 2020, national guidance for reopening omitted testing or screening recommendations. We report the experience of 2 large independent K-12 schools (School-A and School-B) that implemented an array of SARS-CoV-2 mitigation strategies that included periodic universal testing. METHODS: SARS-CoV-2 was identified through periodic universal PCR testing, self-reporting of tests conducted outside school, and contact tracing. Schools implemented behavioral and structural mitigation measures, including mandatory masks, classroom disinfecting, and social distancing. RESULTS: Over the fall semester, School-A identified 112 cases in 2320 students and staff; School-B identified 25 cases (2.0%) in 1400 students and staff. Most cases were asymptomatic and none required hospitalization. Of 69 traceable introductions, 63 (91%) were not associated with school-based transmission, 59 cases (54%) occurred in the 2 weeks post-thanksgiving. In 6/7 clusters, clear noncompliance with mitigation protocols was found. The largest outbreak had 28 identified cases and was traced to an off-campus party. There was no transmission from students to staff. CONCLUSIONS: Although school-age children can contract and transmit SARS-CoV-2, rates of COVID-19 infection related to in-person education were significantly lower than those in the surrounding community. However, social activities among students outside of school undermined those measures and should be discouraged, perhaps with behavioral contracts, to ensure the safety of school communities. In addition, introduction risks were highest following extended school

breaks. These risks may be mitigated with voluntary quarantines and surveillance testing prior to reopening.

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Library Catalog PubMed
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Humans, United States, Schools, Adolescent, COVID-19, SARS-CoV-2, Child, Guidelines as Topic, transmission, Centers for Disease Control and Prevention, U.S., Communicable Disease Control, COVID-19 Testing, Guideline Adherence, infection, laboratory screening, primary and secondary schools, Study

Attachments

- Full Text
- PubMed entry

The impact of community masking on COVID-19: A cluster-randomized trial in Bangladesh

Type Report
Author Jason Abaluck
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Author Ashley Styczynski
Author Ashraful Haque
Author Md. Alamgir Kabir
Author Ellen Bates-Jefferys
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Author Salim Benhachmi
Author Neeti Zaman
Author Peter J. Winch
Author Md. Maqsd Hossain
Author Hasan Mahmud Reza
Author Abdullah All Jaber
Author Shawkee Gulshan Momen
Author Faika Laz Bani
Author Aura Rahman
Author Tahrima Saiha Huq
Author Stephen P. Luby
Author Ahmed Mushfiq Mobarak

Abstract Background: Mask usage remains low across many parts of the world during the COVID19 pandemic, and strategies to increase mask-wearing remain untested. Our objectives were to identify strategies that can persistently increase mask-wearing and assess the impact of increasing mask-wearing on symptomatic SARS-CoV-2 infections. Methods: We conducted a cluster-randomized trial of community-level mask promotion in rural Bangladesh from November 2020 to April 2021 (N=600 villages, N=342,126 adults). We cross-randomized mask promotion strategies at the village and household level, including cloth vs. surgical masks. All intervention arms received free masks, information on the importance of masking, role modeling by community leaders, and in-person reminders for 8 weeks. The control group did not receive any interventions. Neither participants nor field staff were blinded to intervention assignment. Outcomes included symptomatic SARS-CoV-2 seroprevalence (primary) and prevalence of proper mask-wearing, physical distancing, and symptoms consistent with COVID-19 (secondary). Mask-wearing and physical distancing were assessed through direct observation at least weekly at mosques, markets, the main entrance roads to villages, and tea stalls. At 5 and 9 weeks follow-up, we surveyed all reachable participants about COVID-related symptoms. Blood samples collected at 10-12 weeks of follow-up for symptomatic individuals were analyzed for SARS-CoV-2 IgG antibodies. Results: There were 178,288 individuals in the intervention group and 163,838 individuals in the control group. The intervention increased proper mask-wearing from 13.3% in control villages (N=806,547 observations) to 42.3% in treatment villages (N=797,715 observations) (adjusted percentage point difference = 0.29 [0.27, 0.31]). This tripling of mask usage was sustained during the intervention period and two weeks after. Physical distancing increased from 24.1% in control villages to 29.2% in treatment villages (adjusted percentage point difference = 0.05 [0.04, 0.06]). After 5 months, the impact of the intervention faded, but mask-wearing remained 10 percentage points higher in the intervention group. The proportion of individuals with COVID-like symptoms was 7.62% (N=13,273) in the intervention arm and 8.62% (N=13,893) in the control arm. Blood samples were collected from N=10,952 consenting, symptomatic individuals. Adjusting for baseline covariates, the

2 intervention reduced symptomatic seroprevalence by 9.3% (adjusted prevalence ratio (aPR) = 0.91 [0.82, 1.00]; control prevalence 0.76%; treatment prevalence 0.68%). In villages randomized to surgical masks (n = 200), the relative reduction was 11.2% overall (aPR = 0.89 [0.78, 1.00]) and 34.7% among individuals 60+ (aPR = 0.65 [0.46, 0.85]). No adverse events were reported. Conclusions: Our intervention demonstrates a scalable and effective method to promote mask adoption and reduce symptomatic SARS-CoV-2 infections

Date 2021-04

URL <https://www.poverty-action.org/publication/normalizing-community-mask-wearing-evidence-randomized-evaluation-bangladesh>

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Extra Series: Working Paper Series DOI: 10.3386/w28734

Report Number NCT04630054

Report Type Working Paper

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Tags:

Study, experimental

The impact of COVID-19 management policies tailored to airborne SARS-CoV-2 transmission: policy analysis

Type Journal Article

Author Charles Roberto Telles

Author Archisman Roy

Author Mohammad Rehan Ajmal

Author Syed Khalid Mustafa

Author Mohammad Ayaz Ahmad

Author Juan Moises de la Serna

Author Elisandro Pires Frigo

Author Manuel Hernández Rosales

Abstract BACKGROUND: Daily new COVID-19 cases from January to April 2020 demonstrate varying patterns of SARS-CoV-2 transmission across different geographical regions. Constant infection rates were observed in some countries, whereas China and South Korea had a very low number of daily new cases. In fact, China and South Korea successfully and quickly flattened their COVID-19 curve. To understand why this was the case, this paper investigated possible aerosol-forming patterns in the atmosphere and their relationship to the policy measures adopted by select countries. OBJECTIVE: The main research objective was to compare the outcomes of policies adopted by countries between January and April 2020. Policies

included physical distancing measures that in some cases were associated with mask use and city disinfection. We investigated whether the type of social distancing framework adopted by some countries (ie, without mask use and city disinfection) led to the continual dissemination of SARS-CoV-2 (daily new cases) in the community during the study period. **METHODS:** We examined the policies used as a preventive framework for virus community transmission in some countries and compared them to the policies adopted by China and South Korea. Countries that used a policy of social distancing by 1-2 m were divided into two groups. The first group consisted of countries that implemented social distancing (1-2 m) only, and the second comprised China and South Korea, which implemented distancing with additional transmission/isolation measures using masks and city disinfection. Global daily case maps from Johns Hopkins University were used to provide time-series data for the analysis. **RESULTS:** The results showed that virus transmission was reduced due to policies affecting SARS-CoV-2 propagation over time. Remarkably, China and South Korea obtained substantially better results than other countries at the beginning of the epidemic due to their adoption of social distancing (1-2 m) with the additional use of masks and sanitization (city disinfection). These measures proved to be effective due to the atmosphere carrier potential of SARS-CoV-2 transmission. **CONCLUSIONS:** Our findings confirm that social distancing by 1-2 m with mask use and city disinfection yields positive outcomes. These strategies should be incorporated into prevention and control policies and be adopted both globally and by individuals as a method to fight the COVID-19 pandemic.

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Language eng

Short Title The Impact of COVID-19 Management Policies Tailored to Airborne SARS-CoV-2 Transmission

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Attachments

- Full Text
- PubMed entry

The impact of non-pharmaceutical interventions on SARS-CoV-2 transmission across 130 countries and territories

Type Journal Article

Author Yang Liu

Author Christian Morgenstern

Author James Kelly

Author Rachel Lowe

Author CMMID COVID-19 Working Group

Author Mark Jit

Abstract BACKGROUND: Non-pharmaceutical interventions (NPIs) are used to reduce transmission of SARS coronavirus 2 (SARS-CoV-2) that causes coronavirus disease 2019 (COVID-19). However, empirical evidence of the effectiveness of specific NPIs has been inconsistent. We assessed the effectiveness of NPIs around internal containment and closure, international travel restrictions, economic measures, and health system actions on SARS-CoV-2 transmission in 130 countries and territories. METHODS: We used panel (longitudinal) regression to estimate the effectiveness of 13 categories of NPIs in reducing SARS-CoV-2 transmission using data from January to June 2020. First, we examined the temporal association between NPIs using hierarchical cluster analyses. We then regressed the time-varying reproduction number (R_t) of COVID-19 against different NPIs. We examined different model specifications to account for the temporal lag between NPIs and changes in R_t , levels of NPI intensity, time-varying changes in NPI effect, and variable selection criteria. Results were interpreted taking into account both the range of model specifications and temporal clustering of NPIs. RESULTS: There was strong evidence for an association between two NPIs (school closure, internal movement restrictions) and reduced R_t . Another three NPIs (workplace closure, income support, and debt/contract relief) had strong evidence of effectiveness when ignoring their level of intensity, while two NPIs (public events cancellation, restriction on gatherings) had strong evidence of their effectiveness only when evaluating their implementation at maximum capacity (e.g. restrictions on 1000+ people gathering were not effective, restrictions on < 10 people gathering were). Evidence about the effectiveness of the remaining NPIs (stay-at-home requirements, public information campaigns, public transport closure, international travel controls, testing, contact tracing) was inconsistent and inconclusive. We found temporal clustering between many of the NPIs. Effect sizes varied depending on whether or not we included data after peak NPI intensity. CONCLUSION: Understanding the impact that specific NPIs have had on SARS-CoV-2 transmission is complicated by temporal clustering, time-dependent variation in effects, and differences in NPI intensity. However, the effectiveness of school closure and internal

movement restrictions appears robust across different model specifications, with some evidence that other NPIs may also be effective under particular conditions. This provides empirical evidence for the potential effectiveness of many, although not all, actions policy-makers are taking to respond to the COVID-19 pandemic.

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Humans, Schools, COVID-19, Pandemic, Pandemics, SARS-CoV-2, Contact Tracing, Physical Distancing, Quarantine, Time Factors, Health impact assessment, Longitudinal analysis, Non-pharmaceutical interventions, Policy evaluation, Public health intervention, Quantitative, Study

Attachments

- Full Text
- PubMed entry

The introduction of a mandatory mask policy was associated with significantly reduced COVID-19 cases in a major metropolitan city

Type Journal Article
Author Nick Scott
Author Allan Saul
Author Tim Spelman
Author Mark Stoove
Author Alisa Pedrana
Author Alexander Saeri
Author Emily Grundy

Author Liam Smith
Author Michael Toole
Author Chandini Raina McIntyre
Author Brendan S. Crabb
Author Margaret Hellard

Abstract Background Whilst evidence of use of face masks in reducing COVID-19 cases is increasing, the impact of mandatory use across a large population has been difficult to assess. Introduction of mandatory mask use on July 22, 2020 during a resurgence of COVID-19 in Melbourne, Australia created a situation that facilitated an assessment of the impact of the policy on the epidemic growth rate as its introduction occurred in the absence of other changes to restrictions. Methods and findings Exponential epidemic growth or decay rates in daily COVID-19 diagnoses were estimated using a non-weighted linear regression of the natural logarithm of the daily cases against time, using a linear spline model with one knot (lspline package in R v 3.6.3). The model's two linear segments pivot around the hinge day, on which the mask policy began to take effect, 8 days following the introduction of the policy. We used two forms of data to assess change in mask usage: images of people wearing masks in public places obtained from a major media outlet and population-based survey data. Potential confounding factors (including daily COVID-19 tests, number of COVID-19 cases among population subsets affected differentially by the mask policy—e.g., healthcare workers) were examined for their impact on the results. Daily cases fitted an exponential growth in the first log-linear segment ($k = +0.042$, s.e. = 0.007), and fitted an exponential decay in the second ($k = -0.023$, s.e. = 0.017) log-linear segment. Over a range of reported serial intervals for SARS-CoV-2 infection, these growth rates correspond to a 22–33% reduction in an effective reproduction ratio before and after mandatory mask use. Analysis of images of people in public spaces showed mask usage rose from approximately 43% to 97%. Analysis of survey data found that on the third day before policy introduction, 44% of participants reported “often” or “always” wearing a mask; on the fourth day after, 100% reported “always” doing so. No potentially confounding factors were associated with the observed change in growth rates. Conclusions The mandatory mask use policy substantially increased public use of masks and was associated with a significant decline in new COVID-19 cases after introduction of the policy. This study strongly supports the use of masks for controlling epidemics in the broader community.

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Tags:

Study

The role of community-wide wearing of face mask for control of coronavirus disease 2019 (COVID-19) epidemic due to SARS-CoV-2

Type Journal Article

Author Vincent Chi-Chung Cheng

Author Shuk-Ching Wong

Author Vivien Wai-Man Chuang

Author Simon Yung-Chun So

Author Jonathan Hon-Kwan Chen

Author Siddharth Sridhar

Author Kelvin Kai-Wang To

Author Jasper Fuk-Woo Chan

Author Ivan Fan-Ngai Hung

Author Pak-Leung Ho

Author Kwok-Yung Yuen

Abstract Background Face mask usage by the healthy population in the community to reduce risk of transmission of respiratory viruses remains controversial. We assessed the effect of community-wide mask usage to control coronavirus disease 2019 (COVID-19) in Hong Kong Special Administrative Region (HKSAR). Methods Patients presenting with respiratory symptoms at outpatient clinics or hospital wards were screened for COVID-19 per protocol. Epidemiological analysis was performed for confirmed cases, especially persons acquiring COVID-19 during mask-off and mask-on settings. The incidence of COVID-19 per million population in HKSAR with community-wide masking was compared to that of non-mask-wearing countries which are comparable with HKSAR in terms of population density, healthcare system, BCG vaccination and social distancing measures but not community-wide masking. Compliance of face mask usage in the HKSAR community was monitored. Findings Within first 100 days (31 December 2019 to 8 April 2020), 961 COVID-19 patients were diagnosed in HKSAR. The COVID-19 incidence in HKSAR (129.0 per million population) was significantly lower ($p < 0.001$) than that of Spain (2983.2), Italy (2250.8), Germany (1241.5), France (1151.6), U.S. (1102.8), U.K. (831.5), Singapore (259.8), and South Korea (200.5). The compliance of face mask usage by HKSAR general public was 96.6% (range: 95.7% to 97.2%). We observed 11 COVID-19 clusters in recreational 'mask-off' settings compared to only 3 in workplace 'mask-on' settings ($p = 0.036$ by Chi square test of goodness-of-fit). 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.

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Library Catalog ScienceDirect
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COVID-19, Face mask, Coronavirus, Community, Epidemic, SARS-COV-2, Study

Attachments

- Full Text
- ScienceDirect Snapshot

The spread of SARS-cov-2 infection among the medical oncology staff of ASST
spedali civili of brescia: Efficacy of preventive measures

Type Journal Article
Author Alberto Dalla Volta
Author Francesca Valcamonico
Author Rebecca Pedersini
Author Carla Fornaro
Author Valeria Tovazzi
Author Sara Monteverdi
Author Alice Baggi
Author Francesca Consoli
Author Vittorio Domenico Ferrari
Author Salvatore Grisanti
Author Elisabetta Conti
Author Vito Amoroso

Author Paolo Bossi

Author Alfredo Berruti

Abstract Patients with cancer are at a higher risk of developing serious disease-related complications in case of contracting SARS-CoV-2. Oncology units should implement all possible preventive measures to reduce the risk of viral transmission by healthcare professionals (HCPs) to patients. We conducted a surveillance for SARS-CoV-2 infection among the staff members of the Medical Oncology Unit of ASST Spedali Civili in Brescia, one of the Italian areas most affected by the SARS-CoV-2 pandemic. The aim of this study was to demonstrate whether the recommended preventive measures, promptly implemented by the unit, have been effective in reducing the spread of the virus among the HCPs. Between February 24 and May 19, 2020, SARS-CoV-2 infection was detected in 10 out of 76 healthy HCPs (13%). Six of them developed a symptomatic disease, leading to home quarantine, and four remained asymptomatic. The infection was revealed when a serology test was performed on all staff members of the unit. In seven HCPs, in which it was possible to trace the person-to-person infection, the contagion occurred as a result of unprotected contacts or partially protected with surgical masks. In particular, four asymptomatic HCPs did not stop working, but a widespread outbreak in the unit was avoided. Adherence to the recommended preventive strategies, in particular, wearing of surgical masks by both the HCPs and the patients, is effective in reducing and preventing the viral spread.

Date 2020

Short Title The Spread of SARS-CoV-2 Infection Among the Medical Oncology Staff of ASST Spedali Civili of Brescia

Library Catalog Frontiers

URL <https://www.frontiersin.org/article/10.3389/fonc.2020.01574>

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Attachments

- Full Text PDF
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The temporal association of introducing and lifting non-pharmaceutical interventions with the time-varying reproduction number (R) of SARS-CoV-2: a modelling study across 131 countries

Type Journal Article

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Abstract BACKGROUND: Non-pharmaceutical interventions (NPIs) were implemented by many countries to reduce the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causal agent of COVID-19. A resurgence in COVID-19 cases has been reported in some countries that lifted some of these NPIs. We aimed to understand the association of introducing and lifting NPIs with the level of transmission of SARS-CoV-2, as measured by the time-varying reproduction number (R), from a broad perspective across 131 countries. METHODS: In this modelling study, we linked data on daily country-level estimates of R from the London School of Hygiene & Tropical Medicine (London, UK) with data on country-specific policies on NPIs from the Oxford COVID-19 Government Response Tracker, available between Jan 1 and July 20, 2020. We defined a phase as a time period when all NPIs remained the same, and we divided the timeline of each country into individual phases based on the status of NPIs. We calculated the R ratio as the ratio between the daily R of each phase and the R from the last day of the previous phase (ie, before the NPI status changed) as a measure of the association between NPI status and transmission of SARS-CoV-2. We then modelled the R ratio using a log-linear regression with introduction and relaxation of each NPI as independent variables for each day of the first 28 days after the change in the corresponding NPI. In an ad-hoc analysis, we estimated the effect of reintroducing multiple NPIs with the greatest effects, and in the observed sequence, to tackle the possible resurgence of SARS-CoV-2. FINDINGS: 790 phases from 131 countries were included in the analysis. A decreasing trend over time in the R ratio was found following the introduction of school closure, workplace closure, public events ban, requirements to stay at home, and internal movement limits; the reduction in R ranged from 3% to 24% on day 28 following the introduction compared with the last day before introduction, although the reduction was significant only for public events ban (R ratio 0·76, 95% CI 0·58-1·00); for all other NPIs, the upper bound of the 95% CI was above 1. An increasing trend over time in the R ratio was found following the relaxation of school closure, bans on public events, bans on public gatherings of more than ten people, requirements to stay at home, and internal movement limits; the increase in R ranged from 11% to 25% on day 28 following the relaxation compared with the last day before relaxation, although the increase was significant only for school reopening (R ratio 1·24, 95% CI 1·00-1·52) and lifting bans

on public gatherings of more than ten people (1·25, 1·03-1·51); for all other NPIs, the lower bound of the 95% CI was below 1. It took a median of 8 days (IQR 6-9) following the introduction of an NPI to observe 60% of the maximum reduction in R and even longer (17 days [14-20]) following relaxation to observe 60% of the maximum increase in R. In response to a possible resurgence of COVID-19, a control strategy of banning public events and public gatherings of more than ten people was estimated to reduce R, with an R ratio of 0·71 (95% CI 0·55-0·93) on day 28, decreasing to 0·62 (0·47-0·82) on day 28 if measures to close workplaces were added, 0·58 (0·41-0·81) if measures to close workplaces and internal movement restrictions were added, and 0·48 (0·32-0·71) if measures to close workplaces, internal movement restrictions, and requirements to stay at home were added. INTERPRETATION: Individual NPIs, including school closure, workplace closure, public events ban, ban on gatherings of more than ten people, requirements to stay at home, and internal movement limits, are associated with reduced transmission of SARS-CoV-2, but the effect of introducing and lifting these NPIs is delayed by 1-3 weeks, with this delay being longer when lifting NPIs. These findings provide additional evidence that can inform policy-maker decisions on the timing of introducing and lifting different NPIs, although R should be interpreted in the context of its known limitations. FUNDING: Wellcome Trust Institutional Strategic Support Fund and Data-Driven Innovation initiative.

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Attachments

- Full Text
- PubMed entry

Universal masking is an effective strategy to flatten the severe acute respiratory coronavirus virus 2 (SARS-CoV-2) healthcare worker epidemiologic curve

Type Journal Article

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Abstract Not available

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URL <https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/universal-masking-is-an-effective-strategy-to-flatten-the-sars2cov-healthcare-worker-epidemiologic-curve/9301E77612122039190A29CB7223F9C4>

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Study

Attachments

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- Snapshot

Use of masks in public places in Poland during SARS-Cov-2 epidemic: a covert observational study

Type Journal Article

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Abstract Face masks have been employed in the COVID-19 pandemic plans as a public and personal health control measure against the spread of SARS-CoV-2. In Poland, obligatory wearing of masks in public spaces was introduced on April 10th, 2020; a relaxation of previous universal measures was announced on May 29th, 2020, limiting use to indoor public places.

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Attachments

Widespread use of face masks in public may slow the spread of SARS CoV-2: an ecological study

Type Report

Author Chris Kenyon

Abstract Background The reasons for the large differences between countries in the sizes of their SARS CoV-2 epidemics is unknown. Individual level studies have found that the use of face masks was protective for the acquisition and transmission of a range of respiratory viruses including SARS CoV-1. We hypothesized that population level usage of face masks may be negatively associated SARS CoV-2 spread. Methods At a country level, linear regression was used to assess the association between COVID-19 diagnoses per inhabitant and the national promotion of face masks in public (coded as a binary variable), controlling for the age of the COVID-19 epidemic and testing intensity. Results Eight of the 49 countries with available data advocated wearing face masks in public – China, Czechia, Hong Kong, Japan, Singapore, South Korea, Thailand and Malaysia. In multivariate analysis face mask use was negatively associated with number of COVID-19 cases/inhabitant (coef. -326 , 95% CI -601 - -51 , $P=0.021$). Testing intensity was positively associated with COVID-19 cases (coef. 0.07 , 95% CI 0.05 - 0.08 , $P<0.001$). Conclusion Whilst these results are susceptible to residual confounding, they do provide ecological level support to the individual level studies that found face mask usage to reduce the transmission and acquisition of respiratory viral infections.

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