The Health Implications of Masks

Dr Mari Arce & Jacob Diaz, U.V

In our systematic review, we identified 10 RCTs that reported estimates of the effectiveness of face masks in reducing laboratory-confirmed influenza virus infections in the community from literature published during 1946–July 27, 2018. In pooled analysis, we found no significant reduction in influenza transmission with the use of face masks (RR 0.78, 95% CI 0.51–1.20; I^2 = 30%, p = 0.25) (Figure 2). One study evaluated the use of masks among pilgrims from Australia during the Hajj pilgrimage and reported no major difference in the risk for laboratory-confirmed influenza virus infection in the control or mask group (*33*). Two studies in university settings assessed the effectiveness of face masks for primary protection by monitoring the incidence of laboratory-confirmed influenza among student hall residents for 5 months (*9*,*10*). The overall

reduction in ILI or laboratory-confirmed influenza cases in the face mask group was not significant in either studies (*9*,*10*). Study designs in the 7 household studies were slightly different: 1 study provided face masks and P2 respirators for household contacts only (*34*), another study evaluated face mask use as a source control for infected persons only (*35*), and the remaining studies provided masks for the infected persons as well as their close contacts (*11*–*13*,*15*,*17*). None of the household studies reported a significant reduction in secondary laboratory-confirmed influenza virus infections in the face mask group (*11*–*13*,*15*,*17*,*34*,*35*). Most studies were underpowered because of limited sample size, and some studies also reported suboptimal adherence in the face mask group.

Disposable medical masks (also known as surgical masks) are loose-fitting devices that were designed to be worn by medical personnel to protect accidental contamination of patient wounds, and to protect the wearer against splashes or sprays of bodily fluids (*36*). There is limited evidence for their effectiveness in preventing influenza virus transmission either when worn by the infected person for source control or when worn by uninfected persons to reduce exposure. Our systematic review found no significant effect of face masks on transmission of laboratory-confirmed influenza.

We did not consider the use of respirators in the community. Respirators are tight-fitting masks

Healthy People Should Not Wear Face Masks

The Pandemic of Bad Science and Public Health Misinformation on Community Wearing of Masks

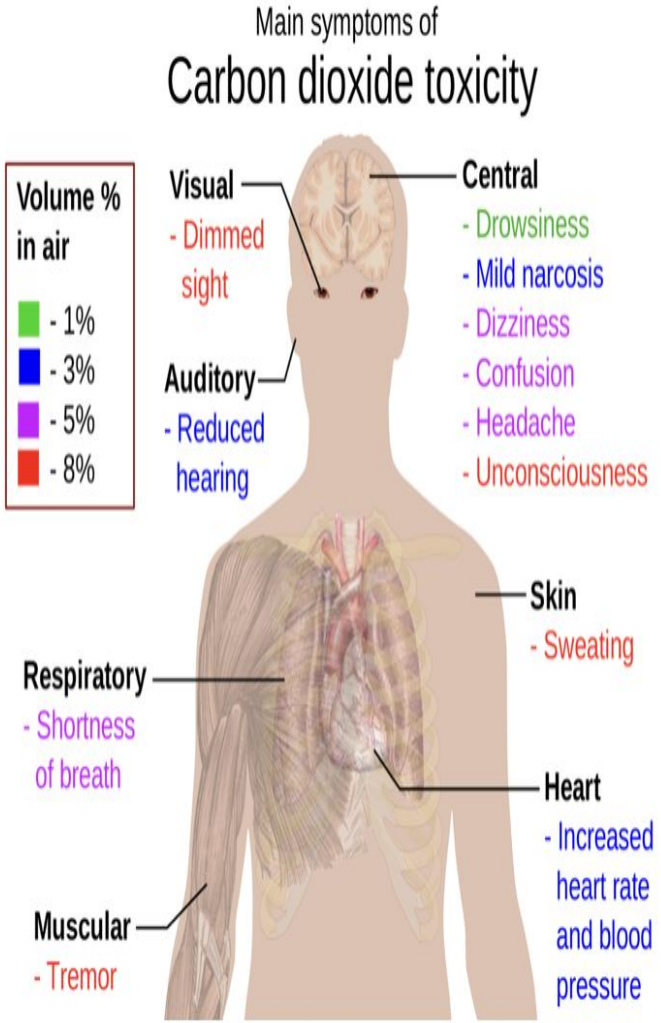
By Jim Meehan, MD

Introduction

During the COVID-19 pandemic, public health experts began telling us to follow a number of disease mitigation strategies that sounded reasonably scientific, but actually had little or no support in the scientific literature.

Renowned neurosurgeon, Russell Blaylock, MD had this to say about the science of masks:

"As for the scientific support for the use of face mask, a recent careful examination of the literature, in which 17 of the best studies were analyzed, concluded that, "None of the studies established a conclusive relationship between mask/respirator use and protection against influenza infection."[1] Keep in mind, no studies have been done to demonstrate that either a cloth mask or the N95 mask has any effect on transmission of the COVID-19 virus. Any recommendations, therefore, have to be based on studies of influenza virus transmission. The fact is, there is no conclusive evidence of their efficiency in controlling flu virus transmission." - Russell Blaylock, MD [R]



Effects of surgical and FFP2/N95 face masks on cardiopulmonary exercise capacity

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Abstract

Background Due to the SARS-CoV2 pandemic, medical face masks are widely recommended for a large number of individuals and long durations. The effect of wearing a surgical and a FFP2/N95 face mask on cardiopulmonary exercise capacity has not been systematically reported.

Methods This prospective cross-over study quantitated the effects of wearing no mask (nm), a surgical mask (sm) and a FFP2/N95 mask (ffpm) in 12 healthy males (age 38.1 ± 6.2 years, BMI 24.5 ± 2.0 kg/m^2). The 36 tests were performed in randomized order. The cardiopulmonary and metabolic responses were monitored by ergo-spirometry and impedance cardiography. Ten domains of comfort/discomfort of wearing a mask were assessed by questionnaire.

Results The pulmonary function parameters were significantly lower with mask (forced expiratory volume: 5.6 ± 1.0 vs 5.3 ± 0.8 vs 6.1 ± 1.0 l/s with sm, ffpm and nm, respectively; $p = 0.001$; peak expiratory flow: 8.7 ± 1.4 vs 7.5 ± 1.1 vs 9.7 ± 1.6 l/s; $p < 0.001$). The maximum power was 269 ± 45, 263 ± 42 and 277 ± 46 W with sm, ffpm and nm, respectively; $p = 0.002$; the ventilation was significantly reduced with both face masks (131 ± 28 vs 114 ± 23 vs 99 ± 19 l/m; $p < 0.001$). Peak blood lactate response was reduced with mask. Cardiac output was similar with and without mask. Participants reported consistent and marked discomfort wearing the masks, especially ffpm.

Conclusion Ventilation, cardiopulmonary exercise capacity and comfort are reduced by surgical masks and highly impaired by FFP2/N95 face masks in healthy individuals. These data are important for recommendations on wearing face masks at work or during physical exercise.

Keywords Cardiopulmonary · Exercise capacity · Ventilation · Surgical masks · FFP2/N95

Conclusion

Medical face masks have a marked negative impact on cardiopulmonary capacity that significantly impairs strenuous physical and occupational activities. In addition, medical masks significantly impair the quality of life of their wearer.

8.

9.

Trial measures effectiveness of adding a mask recommendation to other public health measures

18 November 2020

previous known diagnosis of SARS-CoV-2 infection. Participants were randomized into the mask group or the control group and those in the mask group were given a supply of surgical masks. All participants completed weekly surveys and antibody tests with PCR testing if COVID-19 symptoms developed, and at 1 month. At the conclusion of the trial, infection rates were similar between the two groups.

Of note, Danish authorities did not recommend

Association between School Mask Mandates and SARS-CoV-2 Student Infections: Evidence from a Natural Experiment of Neighboring K-12 Districts in North Dakota

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Abstract

There is still considerable debate about whether mask mandates in the K-12 schools limit transmission of SARS-CoV-2 in children attending school. Randomized data about the effectiveness of mask mandates in children is still entirely lacking. Our study took advantage of a unique natural experiment of two adjacent K-12 school districts in Fargo, North Dakota, one which had a mask mandate and one which did not in the fall of the 2021-2022 academic year. In the winter, both districts adopted a masks-optional policy allowing for a partial crossover study design. We observed no significant difference between student case rates while the districts had differing masking policies (IRR 0.99; 95% CI: 0.92 to 1.07) nor while they had the same mask policies (IRR 1.04; 95% CI: 0.92 to 1.16). The IRRs across the two periods were also not significantly different (p = 0.40). Our findings contribute to a growing body of literature which suggests school-based mask mandates have limited to no impact on the case rates of COVID-19 among K-12 students.

Introduction

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Comparison of Filtration Efficiency and Pressure Drop in Anti-Yellow Sand Masks, Quarantine Masks, Medical Masks, General Masks, and Handkerchiefs

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CONCLUSION

We tested all 44 different brands of mask, including anti-yellow sand masks for adults and children, quarantine masks, medical masks, general masks, and handkerchiefs using the KFDA (similar to the EU protocol) and the NIOSH protocols. All tested quarantine masks satisfied the maximum penetration criterion of 6% (KF 94). Six of nine anti-yellow sand masks (67%) and four of seven anti-yellow sand masks for children (57%) satisfied the KF 80 criteria.

The penetration values of most medical masks were over 20%. Medical masks show no significant differences in penetration and pressure drop between inward tests (which mimic inhalation) and outward tests (which mimic exhalation). General masks and handkerchiefs have no protection function in terms of the aerosol filtration efficiency. No significant difference in penetration was noted between the KFDA and NIOSH protocols ($p = 0.1223$), but the pressure drop using the KFDA protocol was significantly lower than that using the NIOSH protocol ($p < 0.001$). The government needs to prepare exact guidelines for mask use by citizens to avoid the inhalation of external harmful substances

Do mask mandates work?

May 1 to Dec 15

We looked at all 50 states for mask mandates.

With & Without

We calculated how many cases per day by population with and without mask mandates

No mask mandate: 17

The number of cases per day per 100K people for states with NO mask mandates in place.

With mask mandate: 27

The number of cases per day per 100K people for states with mask mandates in place.

41,959 cases / day no mandate

62,450 cases / day with mandate

RationalGround.com

Control and Prevention

NIOSH Science Blog

The Physiological Burden of Prolonged PPE Healthcare Workers during Long Shifts

Posted on June 10, 2020 by Jon Williams, PhD; Jaclyn Krah Cichowicz, MA; Adam Hornbeck, MSN, APRN, FNP-I CPE; and Jeffrey Snyder, MSN, CRNP

Healthcare workers (HCW) and first responders often work long, physically and mentally exhausting patients, especially during a public health emergency. These long hours can result in fewer adequat nutrition, and hydration. During these extended work shifts, many HCWs are also required to wear p (PPE), which may include N95 filtering facepiece respirators (FFRs) elastomeric half-mask respirator respirators (PAPRs). Particular features of PPE can impose a physiological (how the body normally f which can be exacerbated by long work hours without adequate breaks for eating, hydration and se

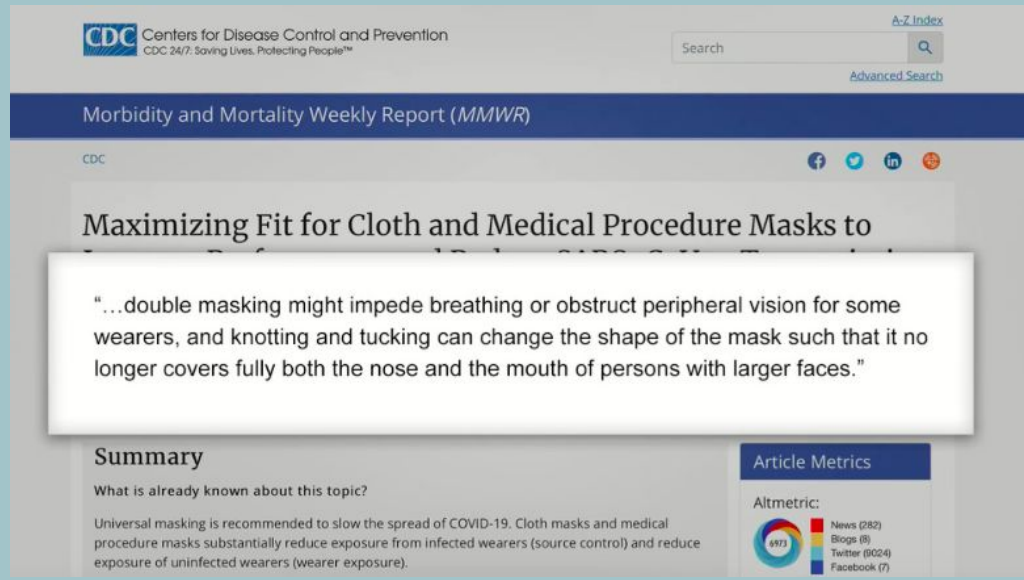
While every HCW should be medically cleared before wearing respiratory protection, there are still n exacerbate the PPE burden, including obesity, underlying respiratory conditions (asthma, allergies, HCWs should be provided regular opportunities to take breaks and a supportive environment to rep PPE use. For example, using an FFR for an extended period may cause dizziness (as well as other s compromise the worker, workplace, and patient safety. Dizziness is an important warning sign, as it hyperventilation (gasping for breath), elevated carbon dioxide [CO_2] levels in the blood, low blood su things.

Respirator wearers should be aware of the potential physiological impact of using each type

Filtering Facepiece Respirators

An N95 FFR user is always going to experience some level of difficulty breathing, or breathing resist devices are designed to minimize breathing resistance as much as possible. Enough breathing resis reduction in the frequency and depth of breathing, known as hypoventilation (the opposite of hyper

Hypoventilation is a primary cause of significant discomfort while wearing an N95 FFR (Williams 20 Roberge et al. (2010) indicated that this hypoventilation did not pose a significant risk to healthcare than one hour of continuous N95 use. When HCWs are working longer hours without a break while FFR, blood CO_2 levels may increase past the 1-hour mark, which could have a significant physiolog



Journal Neurocirugia, PMID 18500410: "Our study revealed a decrease in oxygen saturation of arterial pulsations".

New England Journal of Medicine, PMID 32237672: "We know that wearing a mask outside health care facilities offers little, if any, protection from infection.

American journal of infection control, PMID 19216002: "Face mask use in healthcare workers has not been demonstrated to provide benefit in terms of cold symptoms or getting colds".

Annals of internal medicine: "..both surgical and cloth masks seem to be ineffective in preventing the dissemination of Sars-Cov 2 from the coughs of patients with Covid-19 to the environmental and external mask surface".

British medical journal, PMID 25903751: ".. laboratory confirmed respiratory virus were significantly higher in the cloth masks group... penetration of cloth masks by particles was almost 97%. This study is the first RCT of cloth masks, and the results caution against the use of cloth masks...Moisture retention, reuse of cloth masks and poor filtration may result in increased risk of infection".

Medical news today on Respiratory acidosis: "Respiratory acidosis develops when air inhaled into and exhaled from the lungs does not get adequately exchanged between the carbon dioxide from the body and oxygen from the air".

Journal headache, PMID 32232837: "Most healthcare workers develop de novo PPE such as N95 face masks associated headaches or exacerbation of their pre-existing headache disorders".

Journal of influenza and other respiratory virus, PMID 22188875: "None of the studies established a conclusive relationship between mask/respirator use and protection against Influenza infection".

Journal of Life and Environmental sciences, PMID 31289698: "This study showed that the filtering efficiency of cloth face masks were relatively lower, and washing and drying practices deteriorated the efficiency."

Journal of epidemiology and infection, PMID 20092668: "There is little evidence to support the effectiveness of face masks to reduce the risk of infection".

Journal of American medical association: "Face masks should not be worn by healthy individuals to protect themselves from acquiring respiratory infection because there is no evidence to suggest that face masks worn by healthy individuals are effective in preventing people from becoming ill".

University of Edinburgh: "...surgical, hand made masks and face shields, generate significant leakage jets that have the potential to disperse virus-laden fluid particles by several meters...makes the direction of these jets difficult to be predicted...they all showed an intense backward jet for heavy breathing and coughing conditions...be aware of this jet, to avoid a false sense of security that may arise when standing to the side of, or behind a person wearing a surgical, handmade mask or shield".

University of New South Wales In 2015, conducted a study of cloth masks,titled: Cloth masks, dangerous to your health? Concluding: "The widespread use of cloth masks by healthcare workers might actually put them at an increased risk of respiratory illness and viral Infection, their global use should be discouraged. UNSW study provides. "

Nonpharmaceutical measures for Pandemic influenza in Nonhealthcare settings- "...we found no significant reduction in influenza transmission with the use of face masks".

Medical Care minister, Tamara van Ark, stated: "..there is no evidence of medical effect of wearing face masks..".

PMID 15340662: "70% of the patients showed a reduction in partial pressure of oxygen and 19% developed various degrees o hypoxemia".

PMID 23514282: ..."phonic respiration and low work rates significantly higher levels of Co2 rebreathing.."

PMID 4202234: High bacterial contamination on the outside are of the used masks was demonstrated, and it showed a significa correlation with microbial air quality of working wards. https://pubmed.ncbi.nlm.nih.gov/25337311/

PMID 7087880: "..n95 and surgical facemasks can induce significantly different temperatures and humidity in the microclimates of face masks, which have profound influences o heart rate and thermal stress..."

PMID 30035033: "Surgical masks as source of Bacterial contamination during operative procedures....surgeons should change the mask after each operation, especially those beyond two hours"

PMID 6409147: "Infection rate was 4.7% with masks and 3.5% without the masks and there was no increase in surgical site infections when masks were not worn".

Published Study, Annals of Internal Medicine, November 18, 2020: "...a recommendation to wear a surgical mask when outside the home among others did not reduce, at conventional levels of statistical significance, incident SARS-CoV-2 infection compared with no mask recommendation." (https://www.acpjournals.org/doi/10.7326/M20-6817)

PMID: 33303303- "...The data suggest that both medical and non-medical facemasks are ineffective to block human-to-human transmission of viral and infectious disease…..Wearing facemasks has been demonstrated to have substantial adverse physiological and psychological effects. These include hypoxia, hypercapnia, shortness of breath, increased acidity and toxicity, activation of fear and stress response, rise in stress hormones, immunosuppression, fatigue, headaches, decline in cognitive performance, predisposition for viral and infectious illnesses, chronic stress, anxiety and depression….health deterioration, developing and progression of chronic diseases and premature death."

Meta Analysis of 65 Mask Studies show Masks cause great harm)
https://www.mdpi.com/1660-4601/18/8/4344/htm
"...We objectified evaluation evidenced changes in respiratory physiology of mask wearers with significant correlation of O2 drop and fatigue ($p < 0.05$), a clustered co-occurrence of respiratory impairment and O2 drop (67%), N95 mask and CO2 rise (82%), N95 mask and O2 drop (72%), N95 mask and headache (60%), respiratory impairment and temperature rise (88%), but also temperature rise and moisture (100%) under the masks. Extended mask-wearing by the general population could lead to relevant effects and consequences in many medical fields”

Surgical mask / cloth face mask studies
Community and Close Contact Exposures Associated with COVID-19 Among Symptomatic Adults ≥18 Years in 11 Outpatient Health Care Facilities — United States, July 2020

The US Centre for Disease Control performed a study which showed that 85 percent of those who contracted Covid-19 during July 2020 were mask wearers. Just 3.9 percent of the study participants never wore a mask.

Physical interventions to interrupt or reduce the spread of respiratory viruses
“There is moderate certainty evidence that wearing a mask probably makes little or no difference to the outcome of laboratory-confirmed influenza compared to not wearing a mask”

Study article: https://pubmed.ncbi.nlm.nih.gov/33215698/

Disposable surgical face masks: a systematic review
Two randomized controlled trials were included involving a total of 1453 patients. In a small trial there was a trend towards masks being associated with fewer infections, whereas in a large trial there was no difference in infection rates between the masked and unmasked group.

Study article: https://pubmed.ncbi.nlm.nih.gov/16295987/

Evaluating the efficacy of cloth facemasks in reducing particulate matter exposure
“Our results suggest that cloth masks are only marginally beneficial in protecting individuals from particles<2.5 μm”

Effectiveness of N95 respirators versus surgical masks against influenza: A systematic review and meta- analysis
“The use of N95 respirators compared with surgical masks is not associated with a lower risk of laboratory- confirmed influenza. It suggests that N95 respirators should not be recommended for the general public or non high-risk medical staff who are not in close contact with influenza patients or suspected patients”

Respiratory performance offered by N95 respirators and surgical masks: human subject evaluation with NaCl aerosol representing bacterial and viral particle size range
“The study indicates that N95 filtering facepiece respirators may not achieve the expected protection level against bacteria and viruses”

cluster randomised trial of cloth masks compared with medical masks in healthcare workers
Penetration of cloth masks by influenza particles was almost 97 percent and medical masks 44 percent. so cloth masks are essentially useless, and “medical grade” masks don’t provide adequate protection.

Study article: https://pubmed.ncbi.nlm.nih.gov/25903751/

34. Simple respiratory protection–evaluation of the filtration performance of cloth masks and common fabric materials against 20-1000 nm size particles
Cloth masks and other fabric materials tested in the study had 40-90 percent instantaneous penetration levels against polydisperse NaCl aerosols.

20. “Exercise with facemask; Are we handling a devil’s sword?” – A physiological hypothesisNo evidence to suggest that wearing a mask during exercise offers any benefit from the droplet transfer from the virus.

“Exercising with facemasks may reduce available Oxygen and increase air trapping preventing substantial carbon dioxide exchange. The hypercapnic hypoxia may potentially increase acidic environment,cardiac overload, anaerobic metabolism and renal overload, which may substantially aggravate the underlying pathology of established chronic diseases”

Hypercapnia status has been shown to predict mild cognitive impairment" (https://www.nature.com/articles/s41598-018-35797-3?fbclid=IwAR00iB6FN7ZB1oJAUroWnBfDZPG5vfb3qsxoESd7B1upF6h61Ac-VHu_iz0)

"Chronic hypoxia-Hypercapnia has been seen as a cause of cognitive impairment" https://www.sciencedirect.com/science/article/abs/pii/S0306987708000455/?fbclid=IwAR1BlOuacuJ3FEcpFEG0K

Dr. Rashid Butler stated: "When a person is wearing a facemask, they are breathing their own carbon dioxide, becoming hypoxic, they are reducing oxygen, stressing your body out because you have to suck oxygen in...when you do that you are causing the body to go into a 'stress' state....which spikes cortisol, and cortisol, suppresses immune system...which makes you now susceptible to any pathogen, bacteria, virus etc". (https://www.instagram.com/tv/CFKw0P8B3D9/?igshid=a578zubmjvha)
TG Tunevall- ""“It has never been shown that wearing surgical face masks decreases postoperative wound infections. On the contrary, a 50% decrease has been reported after omitting facemasks" (https://pubmed.ncbi.nlm.nih.gov/1853618/)
USDOL, OSHA: “Cloth masks: Will not protect the wearer against airborne transmissible infectious agents due to loose fit and lack of seal or inadequate filtration. Surgical Masks: Will not protect the wearer against airborne transmissible infectious agents due to loose fit and lack of seal or inadequate filtration.” (https://www.osha.gov/SLTC/covid-19/covid-19-faq.html)
CDC: Those who come in close contact with people showing COVID-19 symptoms or someone who has tested positive for the virus can spread the infection whether or not they are wearing masks. (https://www.cdc.gov/coronavirus/2019-ncov/php/public-health-recommendations.html)

CDC Study showed: Of Those who got Sick from Covid-19, 70.6%, always wore a mask. Whereas, 3.9% of those who got sick, never wore masks. Constitutional Lawyer, Rocco Galatti, expounded on the point: "...there is a greater risk of contamination from improper mask wearing...than the contaminate without the mask".
(https://t.co/f79gZ6JDzG?amp=1)

Can Wearing an N95 Mask Cause Cardiopulmonary Overload?

Sue Hughes

June 15, 2023

In a new study, Chinese researchers conclude that wearing an N95 mask for a prolonged period could affect physiologic and biochemical parameters.

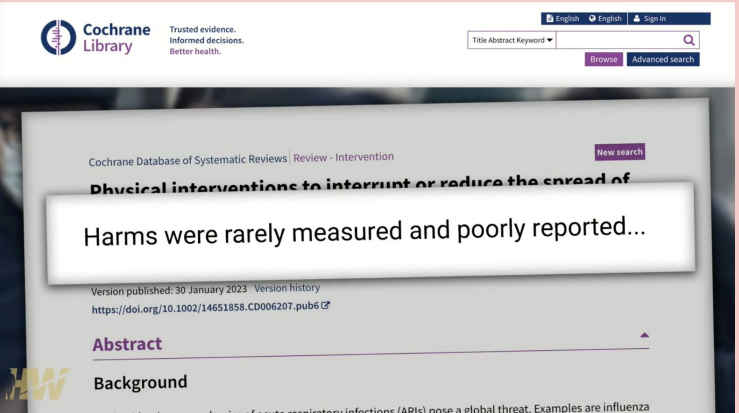
The authors report that the effect was primarily initiated by increased respiratory resistance and subsequent decreased blood oxygen and pH, which contributed to sympathoadrenal system activation and epinephrine as well as norepinephrine secretion elevation, and a compensatory increase in heart rate and blood pressure.

"Although healthy individuals can compensate for this cardiopulmonary overload, other populations, such as elderly individuals, children, and those with cardiopulmonary diseases, may experience compromised compensation," they write.

The study is reported in a Research Letter to *JAMA Network Open* published online June 9.

The authors, led by Riqiang Bao, MD, Shanghai Jiaotong University School of Medicine, note that in China, mask use remains a highly adopted practice in everyday life, and the N95 mask offers the highest level of protection against viruses. They say that studies to date on the adverse effects of wearing masks have yielded inconsistent conclusions because of the short duration of intervention.

https://www.frontiersin.org/articles/10.3389/fpubh.2023.1125150/full
(This study was conveniently retracted after receiving tremendous backlash from the “Scientific Community”.



"Medical or surgical masks
Ten studies took place in the community, and two studies in healthcare workers. Compared with wearing no mask in the community studies only, wearing a mask may make little to no difference in how many people caught a flu-like illness/COVID-like illness (9 studies; 276,917 people); and probably makes little or no difference in how many people have flu/COVID confirmed by a laboratory test (6 studies; 13,919 people). Unwanted effects were rarely reported; discomfort was mentioned.
N95/P2 respirators
Four studies were in healthcare workers, and one small study was in the community. Compared with wearing medical or surgical masks, wearing N95/P2 respirators probably makes little to no difference in how many people have confirmed flu (5 studies; 8407 people); and may make little to no difference in how many people catch a flu-like illness (5 studies; 8407 people), or respiratory illness (3 studies; 7799 people). Unwanted effects were not well-reported; discomfort was mentioned."
https://www.cochrane.org/CD006207/ARI_do-physical-measures-such-hand-washing-or-wearing-masks-stop-or-slow-down-spread-respiratory-viruses