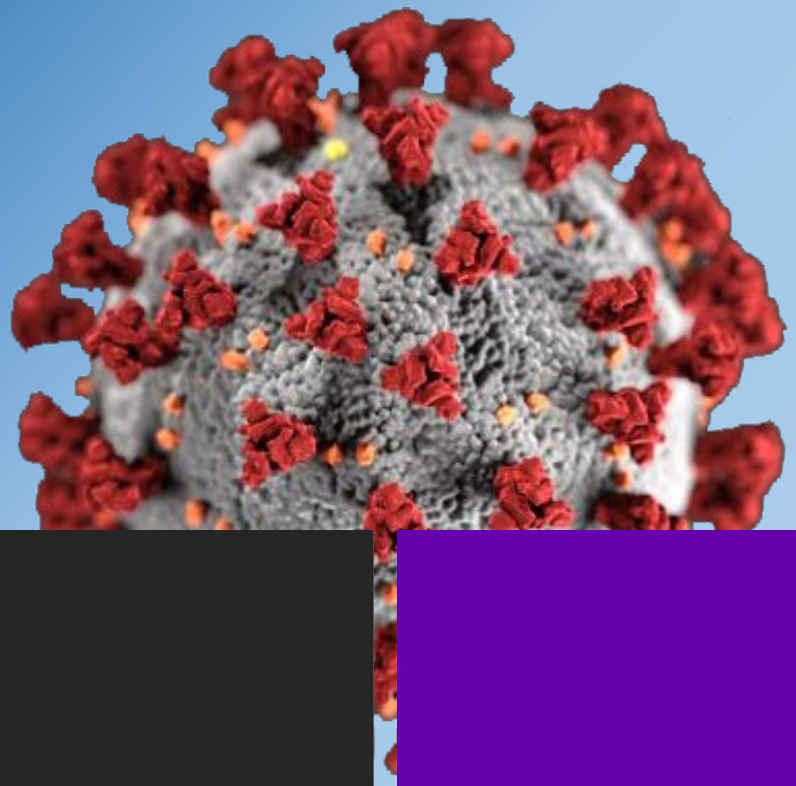
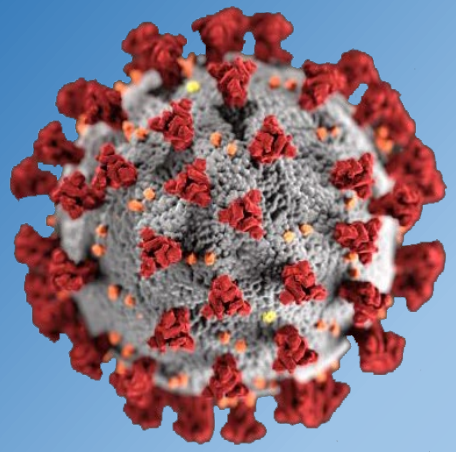


COVID-19 Pandemic
-- The Virus & Infection

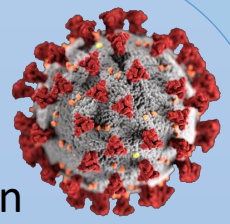


Kevin T. Kavanagh, MD, MS
Health Watch USA sm

USA
Health Watch

COVID-19: What Is A Coronavirus ?

Coronavirus Disease 2019 (COVID-19) is caused by the SARS-CoV-2 Virus



The Corona Virus is composed of a strand of RNA surrounded by a lipoprotein capsule. The capsule is surrounded by spike proteins which are key to cellular entry.

RNA viruses have a high mutation rate. Those mutations involving the spike protein are of importance.

There are two types of antibodies:
- Binding, which binds to the not critical parts of the virus.
- Neutralizing, binds to the spike proteins and inhibits cell entry.

There are four other coronavirus which cause about 20% of colds
https://www.cdc.gov/coronavirus/general-information.html

However, this one is different. It is related to the MERS and SARS corona virus which are very serious and rare viruses. Unlike the “cold” coronaviruses, SARS-CoV-2 attached to the ACE-2 receptor which is found though out the body. And a runny nose which is often caused by common coronaviruses, is a rare symptom with COVID-19.

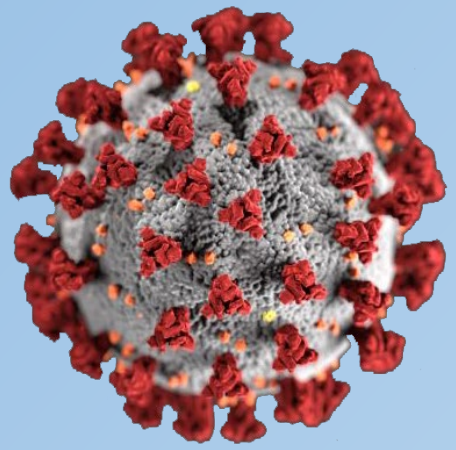
COVID-19: Immunity

EPIDEMIOLOGY & INFECTION

Epidemiol Infect. 1990 Oct; 105(2): 435–446. PMCID: PMC2271881
doi: 10.1017/s0950268800048019 PMID: 2170159

The time course of the immune response to experimental coronavirus infection of man.

K. A. Callow, H. F. Parry, M. Sergeant, and D. A. Tyrrell



The coronavirus studied in the paper provided immunity which last about 1 year.
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2271881/

Coronavirus protective immunity is short-lasting

Arthur WD Edridge, Joanna M Kaczorowska, Alexis CR Hoste, Margreet Bakker, Michelle Klein, Maarten F Jebbink, Amy Matser, Cormac Kinsella, Paloma Rueda, Maria Prins, Patricia Sastre, Martin Deijs, Lia van der Hoek

doi: https://doi.org/10.1101/2020.05.11.20086439

An alarmingly short duration of protective immunity to coronaviruses was found. Reinfections occurred frequently at 12 months post-infection and there was for each virus a substantial reduction in antibody levels as soon as 6 months post-infection.

https://www.medrxiv.org/content/10.1101/2020.05.11.20086439v2

COVID-19: Antibody Levels in Patients

Prolonged Natural Immunity Has Not Been Supported by Recent Studies, Especially In Those Who Are Asymptomatic or Have Mild Symptoms.

- A recent study in Nature found that at 39 days post infection 33% had a low neutralizing antibody level. https://www.nature.com/articles/s41586-020-2456-9
- Another study out of China found that 2 to 3 months after symptom onset "Forty percent of asymptomatic individuals became seronegative and 12.9% of the symptomatic group became negative for IgG in the early convalescent phase." https://www.nature.com/articles/s41591-020-0965-6

COVID-19: Mutates & Different Strains

The virus has already mutated and at least two strains exist, but the clinical importance is still being studied.

Spike mutation pipeline reveals the emergence of a more transmissible form of SARS-CoV-2

B Korber, WM Fischer, S Gnanakaran, H Yoon, J Theiler, W Abfalterer, B Foley, EE Giorgi, T Bhattacharya, MD Parker, DG Partridge, CM Evans, TM Freeman, TI de Silva,
on behalf of the Sheffield COVID-19 Genomics Group, CC LaBranche, DC Montefiori

doi: https://doi.org/10.1101/2020.04.29.069054

"The mutation Spike D614G is of urgent concern; it began spreading in Europe in early February, and when introduced to new regions it rapidly becomes the dominant form. …. These finding have important implications for SARS-CoV-2 transmission, pathogenesis and immune interventions."

Los Alamos National Laboratory & University of Sheffield, UK

https://www.biorxiv.org/content/10.1101/2020.04.29.069054v2

Daily Mail: "TWO strains of the killer coronavirus are spreading around the world – and 70% of infected patients have caught the more aggressive and contagious type, study claims" (China)
https://www.dailymail.co.uk/health/article-8073543/TWO-strains-killer-coronavirus-spreading-study-claims.html

Good news there may be some cross immunity provided by exposure to other coronaviruses https://medicalxpress.com/news/2020-07-scientists-uncover-sars-cov-specific-cell-immunity.html

COVID-19: Antibody Levels in Communities

Sweden: Swedish antibody study shows long road to immunity as COVID-19 toll mounts: "A Swedish study found that just **7.3 percent** of Stockholmers developed COVID-19 antibodies by late April." https://www.reuters.com/article/us-health-coronavirus-sweden-strategy/swedish-antibody-study-shows-long-road-to-immunity-as-covid-19-toll-mounts-idUSKBN22W2YC

Spain: "Antibody levels in Spain were also lower than expected. "Seroprevalence was **5·0%** (95% CI 4·7–5·4) by the point-of-care test and **4·6%** (4·3–5·0) by immunoassay"" https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31483-5/fulltext

USA: Los Angeles: "Only **2.1%** tested positive for antibodies… 1,014 adults were tested in the county between May 8 and 12. The results suggest that only about 165,000 L.A. County adults have antibodies to the coronavirus — an estimate nearly 50% lower than the first study's results." https://www.latimes.com/california/story/2020-06-05/how-many-people-in-l-a-actually-have-coronavirus-why-health-officials-still-dont-know-for-sure

USA: Los Angeles: "…the SARS-CoV-2 spike protein antibodies ranged from 1.0% in the San Francisco Bay area (collected April 23-27)" https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2768834

USA: New York: "…6.9% of persons in New York City (collected March 23-April 1)." https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2768834

COVID-19: Antibody Levels in Patients

South Korean Study:

The Korean Herald: "According to the Korea Centers for Disease Control and Prevention (KCDC), 111 people have tested positive for the new coronavirus again, after they were released from quarantine."

"They also said earlier the COVID-19 virus may remain latent in certain cells in the body and attack the respiratory organs again once reactivated"

http://www.koreaherald.com/view.php?ud=20200412000213&np=3&mp=1

https://www.reuters.com/article/us-health-coronavirus-southkorea/south-korea-reports-recovered-coronavirus-patients-testing-positive-again-idUSKCN21S15X

285 re-positive cases were investigated, 44% of these cases had symptoms, but none were infectious (no live viruses were isolated).

https://www.cdc.go.kr/board/board.es?mid=a30402000000&bid=0030

COVID-19: Infectivity – R0

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EMERGING INFECTIOUS DISEASES®
Volume 26, Number 7—July 2020

High Contagiousness and Rapid Spread of Severe Acute Respiratory Syndrome Coronavirus 2

Steven Sanche[1], Yen Ting Lin[1], Chonggang Xu, Ethan Romero-Severson, Nick Hengartner, and Ruian Ke
Author affiliations: Los Alamos National Laboratory, Los Alamos, New Mexico, USA

On This Page

Abstract

Severe acute respiratory syndrome coronavirus 2 is the causative agent of the ongoing coronavirus disease pandemic. Initial estimates of the early dynamics of the outbreak in Wuhan, China, suggested a doubling time of the number of infected persons of 6–7 days and a basic reproductive number (R_0) of 2.2–2.7. We collected extensive individual case reports across China and estimated key epidemiologic parameters, including the incubation period (4.2 days). We then designed 2 mathematical modeling approaches to infer the outbreak dynamics in Wuhan by using high-resolution domestic travel and infection data. Results show that the doubling time early in the epidemic in Wuhan was 2.3–3.3 days. Assuming a serial interval of 6–9 days, we calculated a median R_0 value of 5.7 (95% CI 3.8–8.9). We further show that active surveillance, contact tracing, quarantine, and early strong social distancing efforts are needed to stop transmission of the virus.

https://wwwnc.cdc.gov/eid/article/26/7/20-0282_article

R0 (pronounced “R naught”) is a measurement of the infectivity of a pathogen. A R0 of three means that on average one infected individual will spread it to three other people.

It is estimated that SARS-CoV-2 has an R0 of 5.7 placing it in the same category of Smallpox, Polio and Mumps. The season flu has an R0 of 1.3.

COVID-19: Herd Immunity

My patient caught Covid-19 twice. So long to herd immunity hopes?

Emerging cases of Covid-19 reinfection suggest herd immunity could be wishful thinking.

By D. Clay Ackerly | Jul 12, 2020, 9:40am EDT

https://www.vox.com/2020/7/12/21321653/getting-covid-19-twice-reinfection-antibody-herd-immunity

- With an R0 of 5.7 It would take over 80% of the population to become immune.
- Even if this happened with the observation of fading immunity in individuals and low rates of immunity in communities, it is unlikely Herd Immunity will naturally take place.

https://www.pbs.org/wgbh/nova/article/herd-immunity/

Our Best Strategy is either the use of Masks/Social Distancing/Hand Hygiene OR a Vaccine OR Both.

COVID-19: Tests

There Are Three Types of Tests

https://www.npr.org/sections/health-shots/2020/05/01/847368012/how-reliable-are-covid-19-tests-depends-which-one-you-mean

- **Molecular Tests: RT-PCR (Reverse Transcription-Polymerase Chain Reaction), Rapid Tests.** These tests identifies the RNA of the Virus.
  -- Very low false positive rates and acceptable false negative rates when performed in a laboratory setting. Usually takes less than 48 hrs. to get back results.
  -- The rapid tests may have a high false negative rate of between 10% to 15%. However, can give a result in as early as 15 to 45 mins. Thus, much better screening than temperature checks. Two examples are the Abbott and Cepheid Tests.
  -- https://www.cdc.gov/flu/professionals/diagnosis/molecular-assays.htm
- **Antibody Test** – This test is used to diagnosis if you had the infection and may be immune. However, there has been a problem with many of manufacturers producing tests which may have a very high false positive rate – They do not distinguish between other coronavirus. This has confounded some of the previous research on prevalence of immunity in communities.
  https://www.npr.org/sections/health-shots/2020/05/04/850195471/fda-cracks-down-on-antibody-tests-for-coronavirus
- **Antigen Test.** This tests for viral proteins, similar to the strep and flu test. Is very quick, but has had questionable reliability. If reliable this test could be a game changer.
  https://www.npr.org/2020/07/08/888846302/

Pool Testing: This involves collecting samples from a number of individuals (between 3 to 50) and testing all at once. If all are negative then all are cleared, if positive, then you need to test each one individually.
https://www.nbcnews.com/health/health-news/fda-authorizes-first-covid-19-test-people-without-symptoms-n1235119

COVID-19: Symptoms

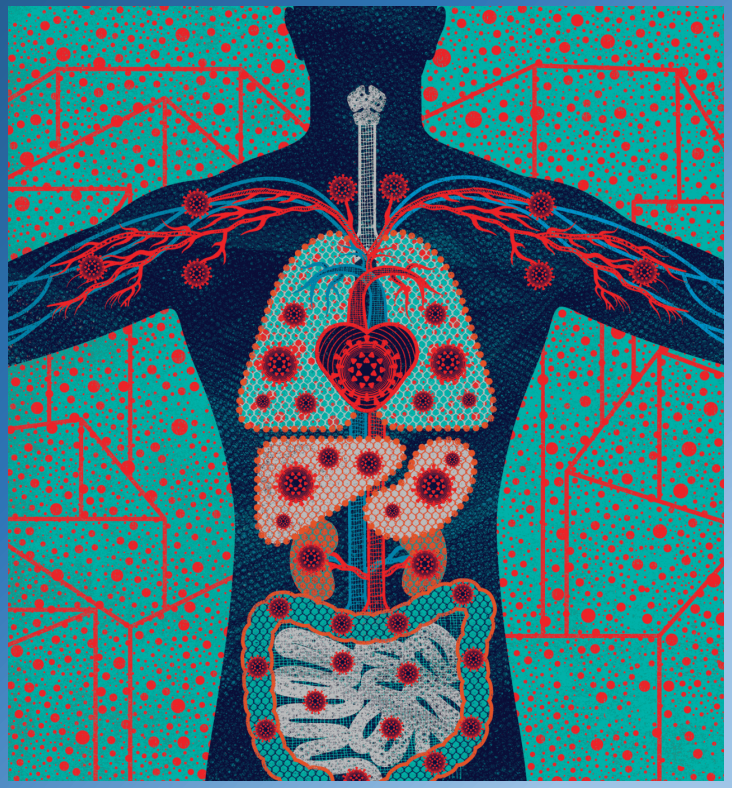


Illustration: Anna & Elena Balbusso

We Thought It Was Just a Respiratory Virus

We were wrong.

By Ariel Bleicher and Katherine Conrad • UCSF Magazine • Summer 2020

"However, infection with SARS-CoV-2 usually doesn't feel like a cold. Fewer than 20% of infected people who eventually show up at a hospital report having had a sore throat or runny nose. During the first few days of being infected, you're more likely to have a fever, dry cough or, peculiarly, lose your sense of smell or taste."

https://www.ucsf.edu/magazine/covid-body

COVID-19: Symptoms

Watch for symptoms

People with COVID-19 have had a wide range of symptoms reported – ranging from mild symptoms to severe illness. Symptoms may appear **2-14 days after exposure to the virus.** People with these symptoms may have COVID-19:

- Fever or chills
- Cough
- Shortness of breath or difficulty breathing
- Fatigue
- Muscle or body aches
- Headache
- New loss of taste or smell
- Sore throat
- Congestion or runny nose
- Nausea or vomiting
- Diarrhea

Very long Incubation Period
-- Symptoms appear 2 to 14 days after exposure
Death occurs 2 to 4 weeks after symptoms appear
-- Diagnosed cases also lag behind the onset of symptoms. Exceptions are in patients identified with case tracking & asymptomatic carriers.

This list does not include all possible symptoms. CDC will continue to update this list as we learn more about COVID-19.

https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/index.html

COVID-19: Symptoms

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 — COVID-NET, 14 States, March 1–30, 2020

Symptom[§§]	Age group (yrs), no./total no. (%)			
	Overall	18–49	50–64	≥65 years
Cough	155/180 (86.1)	43/47 (91.5)	54/60 (90.0)	58/73 (79.5)
Fever/Chills	153/180 (85.0)	38/47 (80.9)	53/60 (88.3)	62/73 (84.9)
Shortness of breath	144/180 (80.0)	40/47 (85.1)	50/60 (83.3)	54/73 (74.0)
Myalgia	62/180 (34.4)	20/47 (42.6)	23/60 (38.3)	19/73 (26.0)
Diarrhea	48/180 (26.7)	10/47 (21.3)	17/60 (28.3)	21/73 (28.8)
Nausea/Vomiting	44/180 (24.4)	12/47 (25.5)	17/60 (28.3)	15/73 (20.5)
Sore throat	32/180 (17.8)	8/47 (17.0)	13/60 (21.7)	11/73 (15.1)
Headache	29/180 (16.1)	10/47 (21.3)	12/60 (20.0)	7/73 (9.6)
Nasal congestion/Rhinorrhea	29/180 (16.1)	8/47 (17.0)	13/60 (21.7)	8/73 (11.0)
Chest pain	27/180 (15.0)	9/47 (19.1)	13/60 (21.7)	5/73 (6.8)
Abdominal pain	15/180 (8.3)	6/47 (12.8)	6/60 (10.0)	3/73 (4.1)
Wheezing	12/180 (6.7)	3/47 (6.4)	2/60 (3.3)	7/73 (9.6)
Altered mental status/Confusion	11/180 (6.1)	3/47 (6.4)	2/60 (3.3)	6/73 (8.2)

https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e3.htm

COVID-19: Asymptomatic Carriers

Review > Otolaryngol Head Neck Surg. 2020 Jul;163(1):3-11. doi: 10.1177/0194599820926473. Epub 2020 May 5.

The Prevalence of Olfactory and Gustatory Dysfunction in COVID-19 Patients: A Systematic Review and Meta-analysis

Jane Y Tong [1], Amanda Wong [2], Daniel Zhu [2], Judd H Fastenberg [2 3], Tristan Tham [2 3]

- Ten studies were analyzed for olfactory dysfunction (n = 1627), demonstrating 52.73% (95% CI, 29.64%-75.23%) prevalence among patients with COVID-19.
- Nine studies were analyzed for gustatory dysfunction (n = 1390), demonstrating 43.93% (95% CI, 20.46%-68.95%) prevalence.

https://pubmed.ncbi.nlm.nih.gov/32369429/

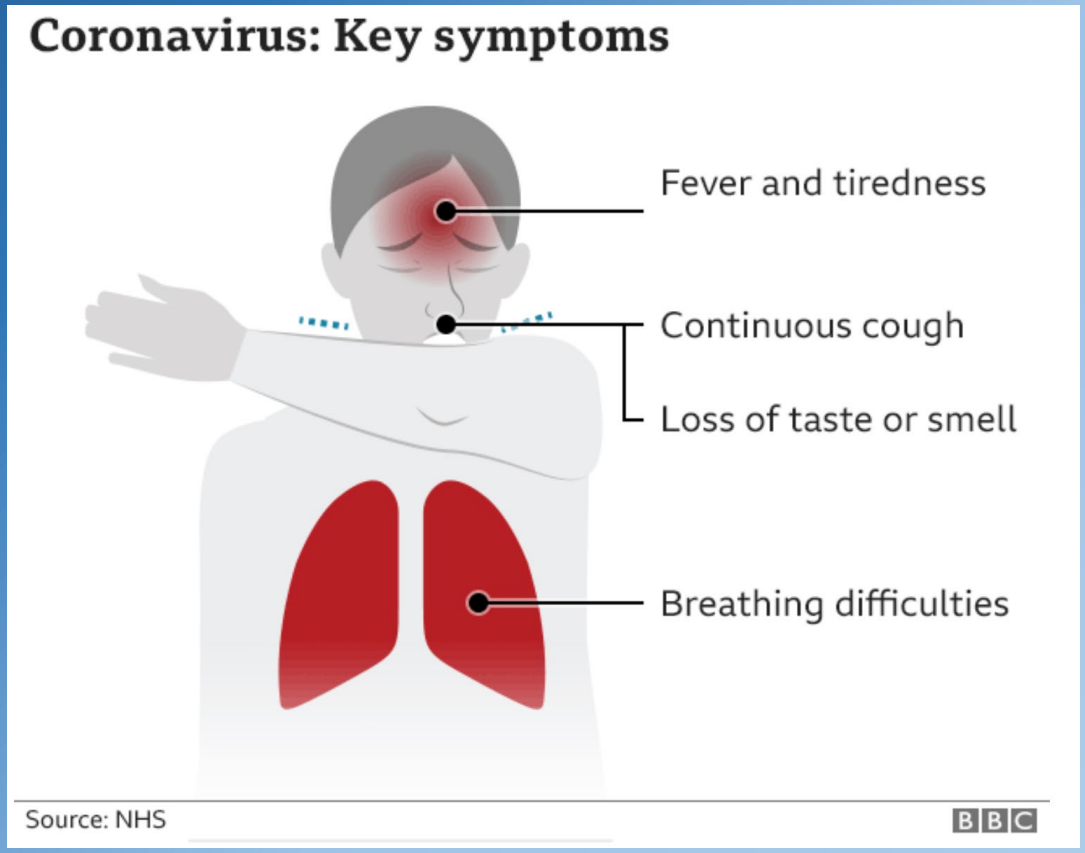
COVID-19: Symptoms

BBC July 3, 2020

Health

Coronavirus: Sense of smell and taste 'improve for most'

By Smitha Mundasad
Health reporter, BBC News



"Almost 90% of people who lost their sense of smell or taste while infected with Covid-19 improved or recovered within a month, a study has found."

https://www.bbc.com/news/health-53265280

COVID-19: Asymptomatic Spread

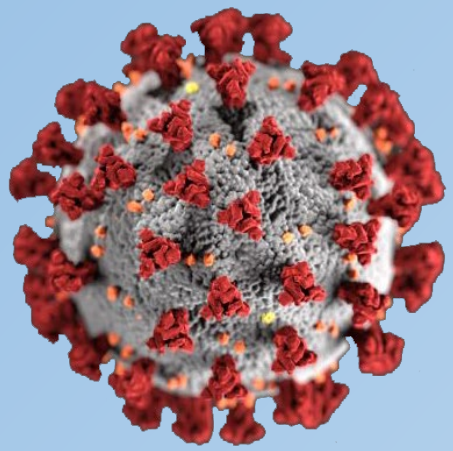
nature medicine

Brief Communication | Published: 15 April 2020

Temporal dynamics in viral shedding and transmissibility of COVID-19

Xi He, Eric H. Y. Lau ✉, Peng Wu, Xilong Deng, Jian Wang, Xinxin Hao, Yiu Chung Lau, Jessica Y. Wong, Yujuan Guan, Xinghua Tan, Xiaoneng Mo, Yanqing Chen, Baolin Liao, Weilie Chen, Fengyu Hu, Qing Zhang, Mingqiu Zhong, Yanrong Wu, Lingzhai Zhao, Fuchun Zhang, Benjamin J. Cowling, Fang Li & Gabriel M. Leung

Nature Medicine **26**, 672–675(2020) | Cite this article



"We estimated that 44% (95% confidence interval, 25–69%) of secondary cases were infected during the index cases' presymptomatic stage, in settings with substantial household clustering, active case finding and quarantine outside the home."

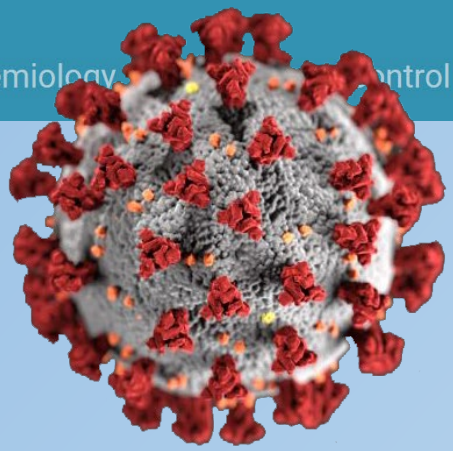
https://www.nature.com/articles/s41591-020-0869-5

COVID-19: Asymptomatic Spread

Eurosurveillance Europe's journal on infectious disease surveillance, epidemiology, control

Estimating the generation interval for coronavirus disease (COVID-19) based on symptom onset data, March 2020

Tapiwa Ganyani[1], Cécile Kremer[1], Dongxuan Chen[2,3], Andrea Torneri[1,4], Christel Faes[1], Jacco Wallinga[2,3], Niel Hens[1,4]



The proportion of pre-symptomatic transmission was:

- **48% (95% CrI: 32–67) for Singapore and**
- **62% (95% CrI: 50–76) for Tianjin.**

https://www.eurosurveillance.org/content/10.2807/1560-7917.ES.2020.25.17.2000257

Shots HEALTH NEWS FROM NPR

CDC Director On Models For The Months To Come: 'This Virus Is Going To Be With Us'

March 31, 2020 · 5:16 AM ET

Robert Redfield: "…. a significant number of individuals that are infected actually remain asymptomatic. That may be as many as 25%. That's important, because now you have individuals that may not have any symptoms that can contribute to transmission, and we have learned that in fact they do contribute to transmission."

https://www.npr.org/sections/health-shots/2020/03/31/824155179/cdc-director-on-models-for-the-months-to-come-this-virus-is-going-to-be-with-us

COVID-19: Asymptomatic Carriers

USA Health Watch

Annals of Internal Medicine®

Reviews | 3 Jun 2020

Prevalence of Asymptomatic SARS-CoV-2 Infection FREE

A Narrative Review

Daniel P. Oran, AM, Eric J. Topol, MD View fewer authors

The Authors Reviewed 16 Studies Which Reported Rates of Asymptomatic Infection in Different Groups of Patients.

- **The likelihood that approximately 40% to 45% of those infected with SARS-CoV-2 will remain asymptomatic suggests that the virus might have greater potential than previously estimated to spread silently and deeply through human populations.**

- **Asymptomatic persons can transmit SARS-CoV-2 to others for an extended period, perhaps longer than 14 days.**

COVID-19: Severe Outcome

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Morbidity and Mortality Weekly Report (*MMWR*)

Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020

Weekly / March 27, 2020 / 69(12);343-346 https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm

TABLE. Hospitalization, intensive care unit (ICU) admission, and case–fatality percentages for reported COVID–19 cases, by age group — United States, February 12–March 16, 2020

Age group (yrs) (no. of cases)	%*		
	Hospitalization	ICU admission	Case-fatality
0–19 (123)	1.6–2.5	0	0
20–44 (705)	14.3–20.8	2.0–4.2	0.1–0.2
45–54 (429)	21.2–28.3	5.4–10.4	0.5–0.8
55–64 (429)	20.5–30.1	4.7–11.2	1.4–2.6
65–74 (409)	28.6–43.5	8.1–18.8	2.7–4.9
75–84 (210)	30.5–58.7	10.5–31.0	4.3–10.5
≥85 (144)	31.3–70.3	6.3–29.0	10.4–27.3
Total (2,449)	**20.7–31.4**	**4.9–11.5**	**1.8–3.4**

* Lower bound of range = number of persons hospitalized, admitted to ICU, or who died among total in age group; upper bound of range = number of persons hospitalized, admitted to ICU, or who died among total in age group with known hospitalization status, ICU admission status, or death.

The cases described in this report include both COVID-19 cases confirmed by state or local public health laboratories, as well as those with a positive test at the state or local public health laboratories and confirmation at CDC.

CDC COVID-19 Response Team

COVID-19: Co-Morbidities

Underlying condition	Age group (yrs), no./total no. (%)			
	Overall	18–49	50–64	≥65 years
Any underlying condition	159/178 (89.3)	41/48 (85.4)	51/59 (86.4)	67/71 (94.4)
Hypertension	79/159 (49.7)	7/40 (17.5)	27/57 (47.4)	45/62 (72.6)
Obesity[§]	73/151 (48.3)	23/39 (59.0)	25/51 (49.0)	25/61 (41.0)
Chronic metabolic disease[¶]	60/166 (36.1)	10/46 (21.7)	21/56 (37.5)	29/64 (45.3)
Diabetes mellitus	47/166 (28.3)	9/46 (19.6)	18/56 (32.1)	20/64 (31.3)
Chronic lung disease	55/159 (34.6)	16/44 (36.4)	15/53 (28.3)	24/62 (38.7)
Asthma	27/159 (17.0)	12/44 (27.3)	7/53 (13.2)	8/62 (12.9)
Chronic obstructive pulmonary disease	17/159 (10.7)	0/44 (0.0)	3/53 (5.7)	14/62 (22.6)
Cardiovascular disease**	45/162 (27.8)	2/43 (4.7)	11/56 (19.6)	32/63 (50.8)
Coronary artery disease	23/162 (14.2)	0/43 (0.0)	7/56 (12.5)	16/63 (25.4)
Congestive heart failure	11/162 (6.8)	2/43 (4.7)	3/56 (5.4)	6/63 (9.5)
Neurologic disease	22/157 (14.0)	4/42 (9.5)	4/55 (7.3)	14/60 (23.3)
Renal disease	20/153 (13.1)	3/41 (7.3)	2/53 (3.8)	15/59 (25.4)
Immunosuppressive condition	15/156 (9.6)	5/43 (11.6)	4/54 (7.4)	6/59 (10.2)
Gastrointestinal/Liver disease	10/152 (6.6)	4/42 (9.5)	0/54 (0.0)	6/56 (10.7)
Blood disorder	9/156 (5.8)	1/43 (2.3)	1/55 (1.8)	7/58 (12.1)
Rheumatologic/Autoimmune disease	3/154 (1.9)	1/42 (2.4)	0/54 (0.0)	2/58 (3.4)
Pregnancy[††]	3/33 (9.1)	3/33 (9.1)	N/A	N/A

CDC Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 — COVID-NET, 14 States, March 1–30, 2020

https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e3.htm

As obesity's link to COVID-19 grows, one family that lost 24-year-old daughter diets together

Jayne O'Donnell USA TODAY
Published 12:40 p.m. ET May 23, 2020 | Updated 2:10 p.m. ET Jun. 3, 2020

https://www.usatoday.com/story/news/2020/05/23/obesity-makes-covid-19-risk-larger-hospitals-challenges-much-harder/5221600002/

COVID-19: Persistent Symptoms

Prolonged symptom duration and disability are common in adults hospitalized with severe coronavirus disease 2019 (COVID-19)
-- CDC COVID-19 Response Team

https://www.cdc.gov/mmwr/volumes/69/wr/mm6930e1.htm

COVID-19: Persistent Symptoms

JAMA Network™

Persistent Symptoms in Patients After Acute COVID-19

Angelo Carfì, MD[1]; Roberto Bernabei, MD[1]; Francesco Landi, MD, PhD[1]; et al

JAMA. Published online July 9, 2020. doi:10.1001/jama.2020.12603

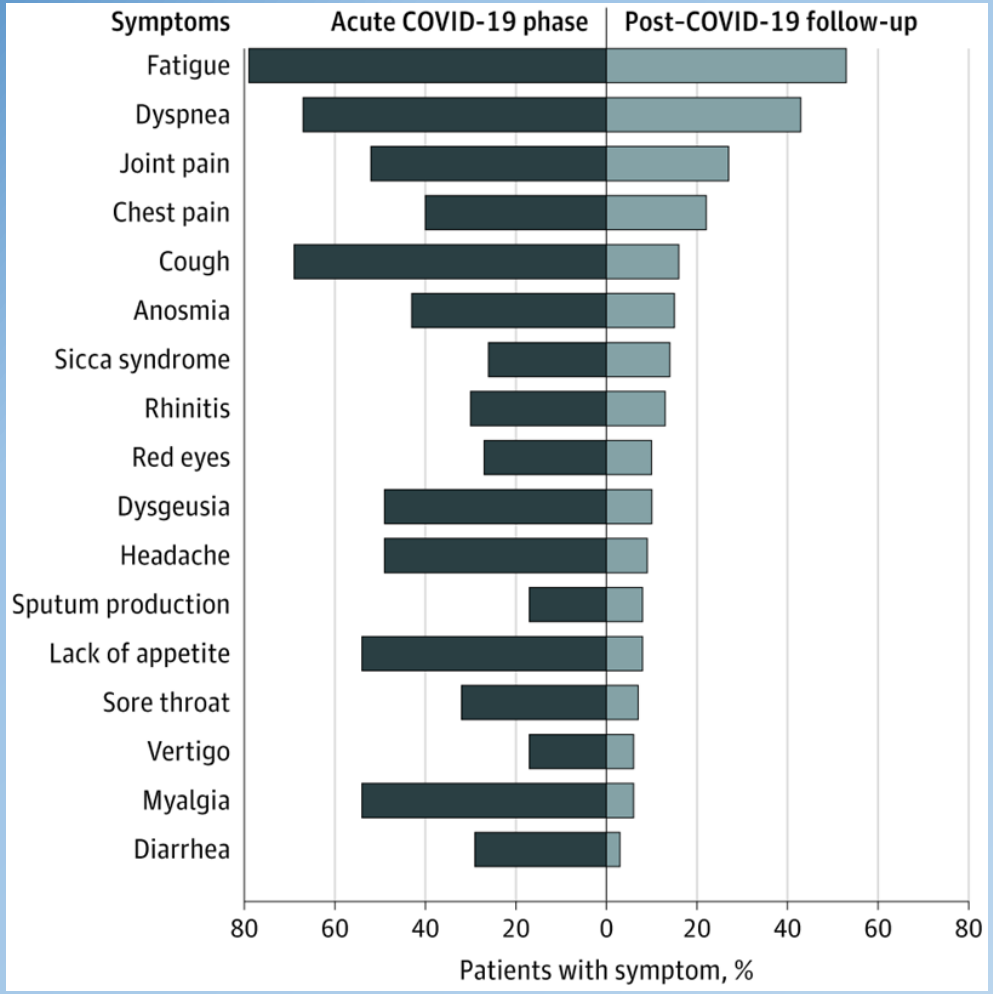
Rome, Italy: Discharged hospital patients: mean of 2 months post COVID-19 first symptoms:

-- 87.4% reported persistence of at least 1 symptom,

-- Shortness of Breath (dyspnea) (43%),

-- Tiredness (53%),

-- Worsened quality of life was observed among 44.1% of patients



https://jamanetwork.com/journals/jama/fullarticle/2768351

COVID-19: Persistent Symptoms

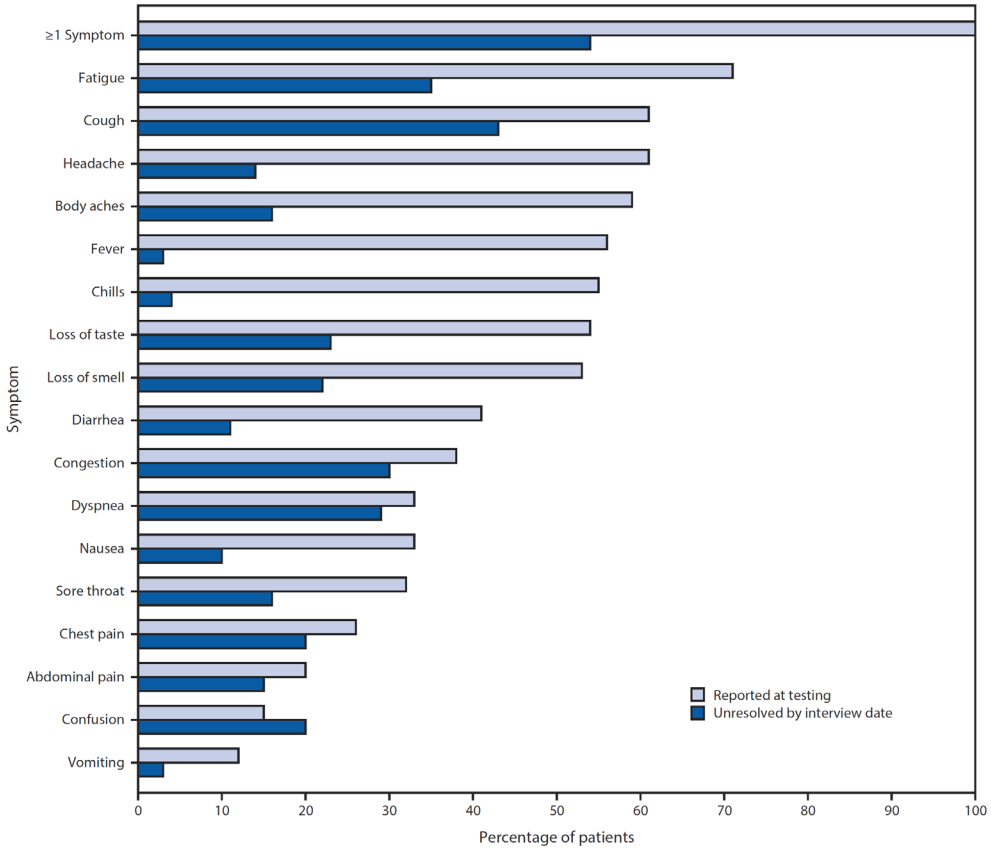
Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Morbidity and Mortality Weekly Report (*MMWR*)

Weekly / July 31, 2020 / 69(30);993-998

Symptom Duration and Risk Factors for Delayed Return to Usual Health Among Outpatients with COVID-19 in a Multistate Health Care Systems Network — United States, March–June 2020

FIGURE. Self-reported symptoms at the time of positive SARS-CoV-2 reverse transcription–polymerase chain reaction (RT-PCR) testing results and unresolved symptoms 14–21 days later among outpatients (N = 274)* — 14 academic health care systems,† United States, March–June 2020



* 294 patients responded to 14–21-day interview, did not report a previous positive SARS-CoV-2 test before the reference test, and answered questions about symptoms; 276 (94%) of these reported one or more symptoms at the time of SARS-CoV-2 RT-PCR testing; those who were interviewed at 7 days were excluded, with 274 included here.

Characterizing return to baseline health among outpatients with milder COVID-19 illness

35% had not returned to their usual state of health when interviewed 2–3 weeks after testing. Including:

- 26% among those aged 18–34 years,
- 32% among those aged 35–49 years;
- 47% among those aged ≥50 years

https://www.cdc.gov/mmwr/volumes/69/wr/mm6930e1.htm

COVID-19: Persistent Symptoms

Forbes Jun 13, 2020, 07:09am

Report Suggests Some 'Mildly Symptomatic' Covid-19 Patients Endure Serious Long-Term Effects

Joshua Cohen Contributor ⓘ

Healthcare

I write about prescription drug value, market access, healthcare systems, and ethics of distribution of healthcare resources

https://www.forbes.com/sites/joshuacohen/2020/06/13/report-suggests-some-mildly-symptomatic-covid-19-patients-endure-serious-long-term-effects/

Long Haulers

A study from the Lung Foundation in the Netherlands surveyed 1,622 patients who had reported long-term effects of COVID-19. 91% of the patients were not hospitalized.

- 88% reported intense fatigue
- 74% shortness of breath
- 45% reported chest pressure
- 40% headaches
- 35% muscle aches
- 29% dizziness

AND 90% stated they had problems with simple daily activities.

https://nos.nl/artikel/2337012-longfonds-ernstige-klachten-onder-coronapatienten-die-thuis-herstelden.html

COVID-19: Persistent Symptoms Tiredness & Brain Fog

The Atlantic

COVID-19 Can Last for Several Months

The disease's "long-haulers" have endured relentless waves of debilitating symptoms—and disbelief from doctors and friends.

Ashley Shew: "… as the pandemic progresses, the number of people with medium-to-long-term disabilities will increase. "Some science fiction—and more than a few tech bros—have led us to believe in a nondisabled future," "But whether through environmental catastrophe, or new viruses, we can expect more, exacerbated, and new disabilities." "

https://www.theatlantic.com/health/archive/2020/06/covid-19-coronavirus-longterm-symptoms-months/612679/

COVID-19: Persistent Symptoms Neurological Syndromes

USA Health Watch

BRAIN
A JOURNAL OF NEUROLOGY

The emerging spectrum of COVID-19 neurology: clinical, radiological and laboratory findings

Ross W Paterson, Rachel L Brown, Laura Benjamin, Ross Nortley, Sarah Wiethoff, Tehmina Bharucha, Dipa L Jayaseelan, Guru Kumar, Rhian E Raftopoulos, Laura Zambreanu ... Show more

Neurological Diagnoses in 43 SARS-CoV-2 patients.
5 major categories:

- Encephalopathies (*n* = 10) with delirium/psychosis
- Inflammatory CNS syndromes (*n* = 12) which included encephalitis (*n* = 2), acute disseminated encephalomyelitis (*n* = 9).
- Ischemic strokes (*n* = 8) associated with hypercoagulability of the blood (4 with pulmonary thromboembolism)
- Peripheral neurological disorders (*n* = 8): Guillain-Barré syndrome (*n* = 7), brachial plexopathy (*n* = 1).
- 5 patients with miscellaneous central nervous system disorders.

Longitudinal follow-up studies will be necessary to ascertain the long-term neurological and neuropsychological consequences of this pandemic.

https://academic.oup.com/brain/article/doi/10.1093/brain/awaa240/5868408

COVID-19: Persistent Symptoms Hypercoagulation – Stroke and MI

Hematological findings and complications of COVID-19

Terpos E, Ioannis Ntanasis-Stathopoulos I, Ismail Elalamy I, et. al
Am J Hematol. 2020 May 23 : 10.1002/ajh.25829. doi: 10.1002/ajh.25829

"COVID-19 infected patients, whether hospitalized or ambulatory, are at high risk for venous thromboembolism, and an early and prolonged pharmacological thromboprophylaxis with low molecular weight heparin is highly recommended."

"Furthermore, blood hypercoagulability is common among hospitalized COVID-19 patients. Elevated D-Dimer levels are consistently reported, whereas their gradual increase during disease course is particularly associated with disease worsening. Other coagulation abnormalities such as PT and a PTT prolongation, fibrin degradation products increase, with severe thrombocytopenia lead to life-threatening disseminated intravascular coagulation (DIC), which necessitates continuous vigilance and prompt intervention."

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7262337/

COVID-19: Persistent Symptoms Hypercoagulation – Stroke and MI

Pulmonary Embolism in Patients With COVID-19
-- Over a 20% incidence of Pulmonary Embolisms in ICU Patients
https://www.ahajournals.org/doi/10.1161/CIRCULATIONAHA.120.047430

Incidence of thrombotic complications in critically ill ICU patients with COVID-19
-- 31% incidence of thrombotic complications in ICU patients with COVID-19.
Klok FA, Kruip MKHA, van der Meer MJN, et al. "Our findings reinforce the recommendation to strictly apply pharmacological thrombosis prophylaxis in all COVID-19 patients admitted to the ICU, and are strongly suggestive of increasing the prophylaxis towards high-prophylactic doses, even in the absence of randomized evidence."
https://pubmed.ncbi.nlm.nih.gov/32291094/

COVID-19: Persistent Symptoms Heart

JAMA Network - China: "In this cohort study of 416 consecutive patients with confirmed COVID-19, cardiac injury occurred in 19.7% of patients during hospitalization, and it was one independent risk factor for in-hospital mortality." *51% of those with heart damage died compared to 4.5% without damage. -- March 25, 2020.*
https://jamanetwork.com/journals/jamacardiology/fullarticle/2763524

JAMA Network - Germany: *In the autopsies of 39 patients (78 to 89 years) who died of the virus, the virus was found in 24 (61.5%) patients, with high cardiac viral loads in 16 patients. July 27, 2020.*
https://jamanetwork.com/journals/jamacardiology/fullarticle/2768914

JAMA Network - Germany: "In this cohort study including 100 patients recently recovered from COVID-19 identified from a COVID-19 test center, cardiac magnetic resonance imaging revealed cardiac involvement in 78 patients (78%) and ongoing myocardial inflammation in 60 patients (60%)" *Hospitalized patients who recovered and were a minimum of 2 weeks from original diagnosis. – July, 27, 2020.*
https://jamanetwork.com/journals/jamacardiology/fullarticle/2768916

COVID-19: Persistent Symptoms Kidney

Kidney disease is associated with in-hospital death of patients with COVID-19

Of 701 patients admitted to Wuhan Hospital, at the time of admission 50% had proteinuria and 27% had hematuria. 5% developed acute kidney injury and this was associated with an increased risk of mortality.

https://pubmed.ncbi.nlm.nih.gov/32247631/

Kidney injury seen in more than a third of hospitalized COVID-19 patients

Over a third of 5,449 patients admitted to Northwell Health developed acute kidney injury (AKI) and 14% of AKI patients required dialysis. 90% of patients who required ventilator support developed acute kidney failure.

https://www.reuters.com/article/us-health-coronavirus-kidney/kidney-injury-seen-in-more-than-a-third-of-hospitalized-covid-19-patients-u-s-study-idUSKBN22Q0U7

COVID-19: Persistent Symptoms Lung

THE LANCET
Respiratory Medicine

Pulmonary fibrosis secondary to COVID-19: a call to arms?

Paolo Spagnolo • Elisabetta Balestro • Stefano Aliberti • Elisabetta Cocconcelli • Davide Biondini • Giovanni Della Casa • et al. Show all authors

https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(20)30222-8/fulltext

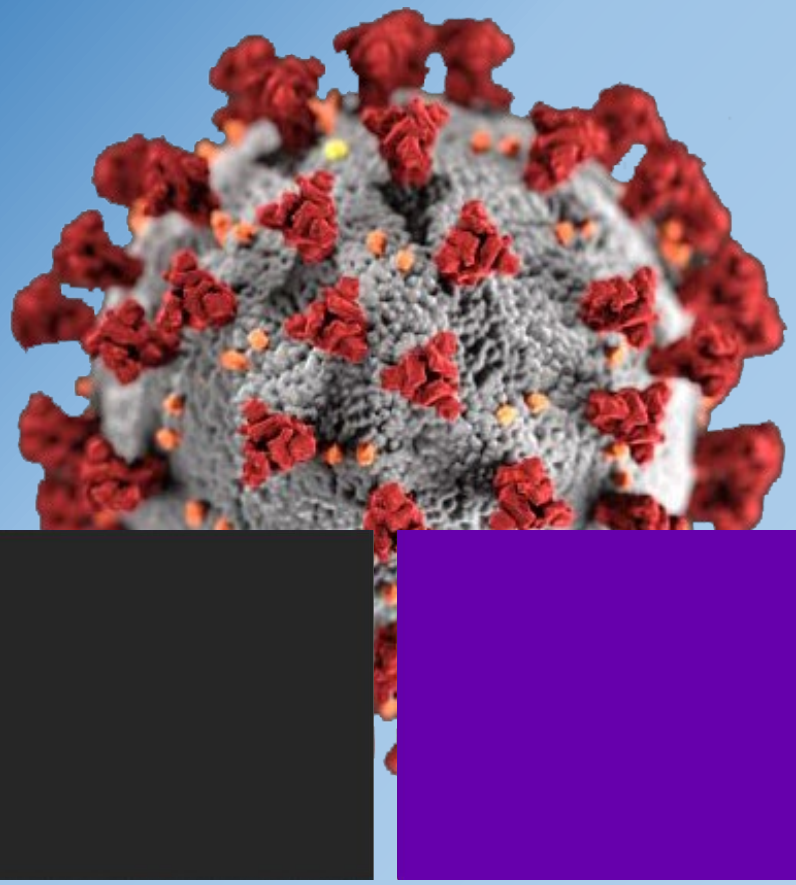
The sicker a patient is the more likely they will develop pulmonary fibrosis. Most patients who require ventilator support or ECMO with COVID-19 may develop pulmonary fibrosis. Many requiring oxygen administration are expected to have permanent lung injury but the extent of which requires further research.

There is even concern that lung damage can occur in about half of the asymptomatic patients:
https://www.msn.com/en-us/health/medical/scientists-see-lung-damage-in-asymptomatic-covid-19-patients/ar-BB16aukf
https://www.msn.com/en-us/health/medical/new-arizona-concern-study-shows-asymptomatic-covid-patients-could-have-long-term-lung-damage/ar-BB16bOgX

COVID-19: Persistent Disability

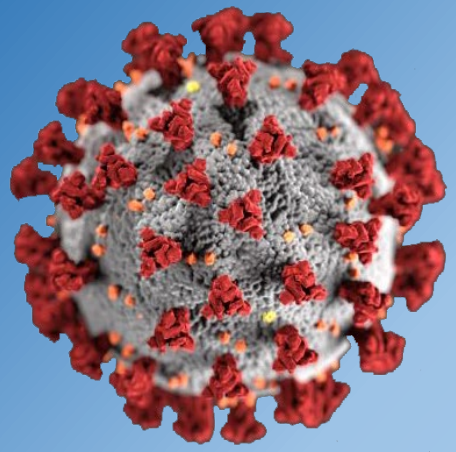
We need to start to view COVID-19 as a long-term disease in many individuals and treat the virus with the respect it deserves.

We should stop referring to patients as “recovered” when in fact all too many just “survived”. You recover when you return to normal health and activities.



COVID-19 Pandemic

-- Viral Spread & Prevention



Kevin T. Kavanagh, MD, MS
Health Watch USA sm

USA
Health Watch

COVID-19: Coronavirus Survival

The NEW ENGLAND JOURNAL of MEDICINE

April 16, 2020
N Engl J Med 2020; 382:1564-1567
DOI: 10.1056/NEJMc2004973

Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1

Viability of SARS-CoV-2 Virus

- Aerosols – Viable up to 3 hours,
- Plastic – Viable up to 72 hours,
- stainless steel – Viable up to 72 hours,
- copper – Less than 4 hours,
- cardboard – Viable up to 24 hours.

https://www.nejm.org/doi/full/10.1056/NEJMc2004973

COVID-19: Coronavirus Survival

Vox

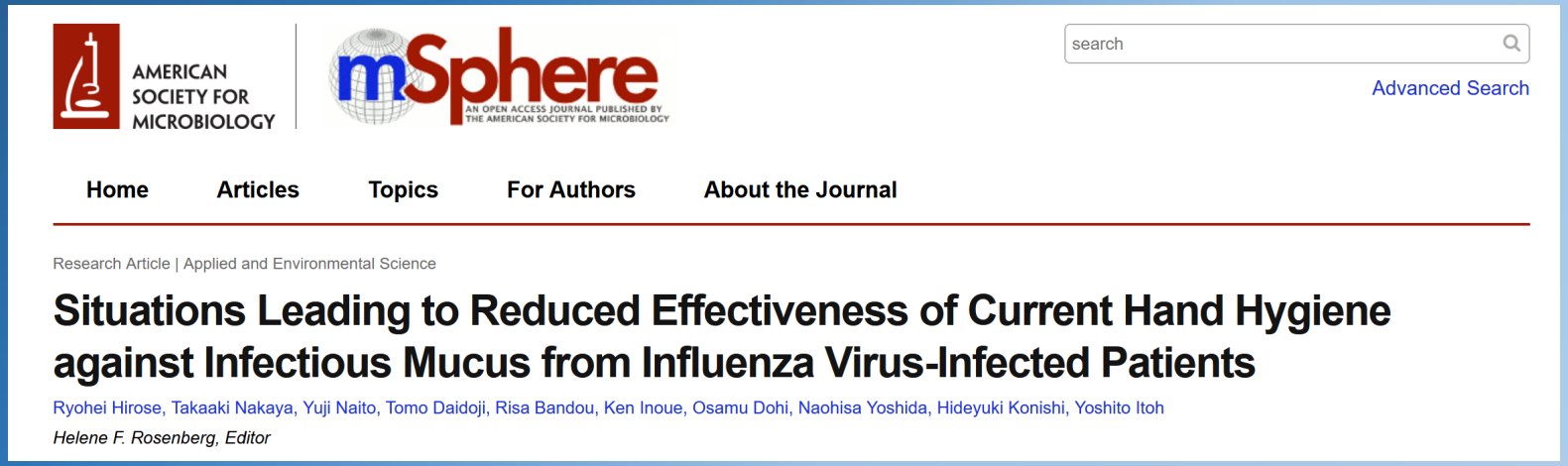
How soap absolutely annihilates the coronavirus

You're not just washing viruses down the drain. Soap destroys the coronavirus, a chemistry professor explains.

The virus has a lipoprotein capsule. Soap would be expected to destroy it. The CDC recommends using Soap and Water and if not available a hand sanitizer with at least 60% alcohol (ethyl alcohol or isopropyl alcohol).

https://www.vox.com/science-and-health/2020/3/11/21173187/coronavirus-covid-19-hand-washing-sanitizer-compared-soap-is-dope

COVID-19: Coronavirus Survival



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Situations Leading to Reduced Effectiveness of Current Hand Hygiene against Infectious Mucus from Influenza Virus-Infected Patients

Ryohei Hirose, Takaaki Nakaya, Yuji Naito, Tomo Daidoji, Risa Bandou, Ken Inoue, Osamu Dohi, Naohisa Yoshida, Hideyuki Konishi, Yoshito Itoh

Helene F. Rosenberg, Editor

"IAV (Influenza A Virus) in mucus remained active despite 120 s of AHR (Antiseptic Hand Rubs – 80% Alcohol); however, IAV in saline was completely inactivated within 30 s." https://msphere.asm.org/content/4/5/e00474-19

You need to use an alcohol base hand rub for 20 to 30 seconds.
https://youtu.be/ZnSjFr6J9HI

Recommended to 60% or greater alcohol (Ethanol or Isopropyl Alcohol) to deactivate the virus.

COVID-19: Toxic Hand Sanitizers

USA Health Watch

USA TODAY

MONEY

FDA further expands list of hand sanitizers to avoid due to methanol risk with more added to 'import alert'

Kelly Tyko USA TODAY

Published 5:51 p.m. ET Jul. 18, 2020 | **Updated 5:40 p.m. ET Jul. 27, 2020**

"The FDA's updated chart now includes 76 varieties of hand sanitizer that should be avoided, some which have already been recalled, and other products being recommended for recalls as they may contain the potentially fatal ingredient." https://www.fda.gov/drugs/drug-safety-and-availability/fda-updates-hand-sanitizers-consumers-should-not-use

https://www.usatoday.com/story/money/2020/07/18/hand-sanitizer-recall-avoid-these-brands-may-contain-methanol/5466054002/

COVID-19: Coronavirus Survival

The Washington Post
Democracy Dies in Darkness

White House promotes new lab results suggesting heat and sunlight slow coronavirus

Increased temperature, humidity, and sunlight are detrimental to SARS-CoV-2 in saliva droplets on surfaces and in the air

WH.GOV

CONDITION	*Temp*	*Humidity*	*Solar*	HALF LIFE
Surface	70-75°F	20%	None	18 hours
Surface	70-75°F	80%	None	6 hours
Surface	95°F	80%	None	1 hour
Surface	70-75°F	80%	Summer	2 minutes
Aerosol	70-75°F	20%	None	~60 minutes
Aerosol	70-75°F	20%	Summer	~1.5 minutes

This finding applied to the virus in contact with nonporous surfaces such as door handles. Adding in sunlight, the virus's half-life decreases from six hours to two minutes at temperatures from 70 to 75 degrees and humidity of 80 percent. "That's how much of an impact UV rays has on the virus," Bryan said. https://www.washingtonpost.com/weather/2020/04/23/lab-study-coronavirus-summer-weather/

COVID-19: Viral Spread

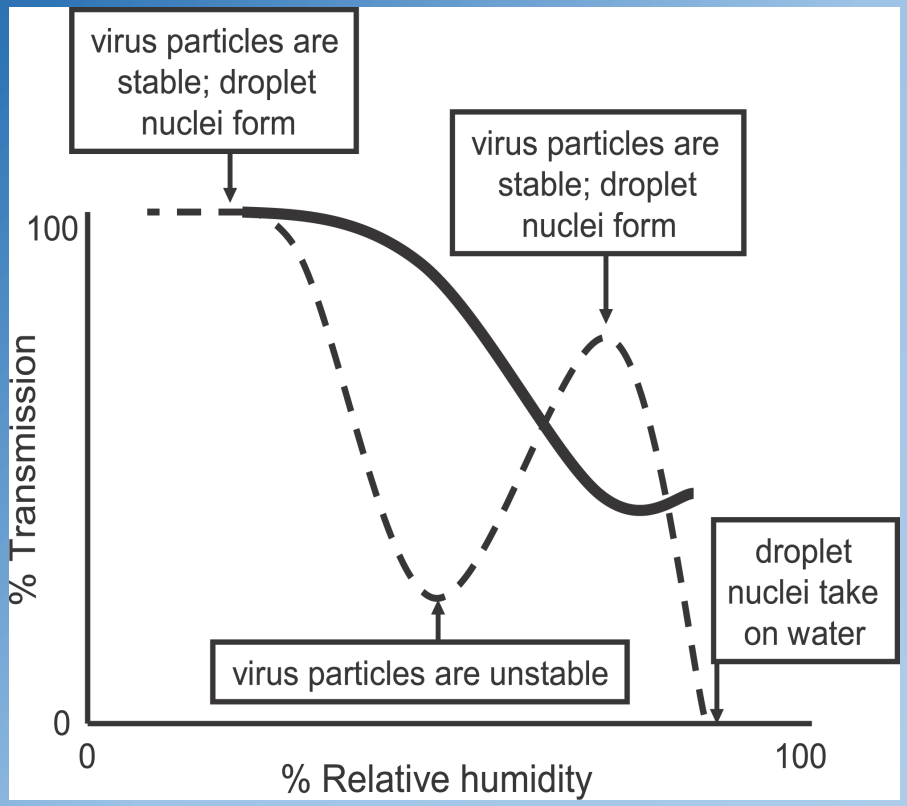
PLOS PATHOGENS

Influenza Virus Transmission Is Dependent on Relative Humidity and Temperature

Anice C Lowen, Samira Mubareka, John Steel, Peter Palese

Published: October 19, 2007 • https://doi.org/10.1371/journal.ppat.0030151

https://journals.plos.org/plospathogens/article?id=10.1371/journal.ppat.0030151



Aerosol Spread of Flu Virus

Solid Line: 5° C or 31° F

Dashed Line: 20° C or 68° F

COVID-19: Droplet Spread

Six feet or greater for normal breathing or talking.
But this may not be enough for Aerosols. Large droplets usually fall short of 6 feet.

https://www.bbc.com/news/science-environment-52522460
https://www.nytimes.com/2020/04/14/health/coronavirus-six-feet.html

A Cough Can Travel -- Up to 12 feet at 22 - 50 mph

https://www.miaminewtimes.com/news/how-far-can-a-cough-or-sneeze-travel-fau-says-up-to-12-feet-11626367

Being exposed to someone coughing is riskier. Being 2m away from a cough carries the same risk as someone talking to you for 30 minutes at the same distance.
https://www.bbc.com/news/science-environment-52522460

A Sneeze Can Travel – Up to 23 to 27 feet at 112 - 200 mph

https://jamanetwork.com/journals/jama/fullarticle/2763852

COVID-19: Aerosolization

"Aerosols are generally considered to be particles under 5 microns in diameter, about the size of a red blood cell, and can be spread in the environment by talking and breathing."

"Even without the launching power of a sneeze, air currents could carry a flow of aerosol sized virus particles exhaled by an infected person 20 feet or more away. https://www.nytimes.com/2020/04/14/health/coronavirus-six-feet.html"

1. **MASKs: An N-95 Mask Is Needed To Prevent Aerosolization and Spread of Particles < 5 µm (micron or micrometer)**
2. **Social Distancing: Since the virus lingers in the air and travels with air currents, the virus can travel greater than 6 feet.**

COVID-19: Aerosolization

Aerosolization Occurs When Small Viral Particles Linger in the Air.

These floating particles can travel further than 1 to 3 meters and can spread via air-conditioning. Particle sizes of 5 µm can travel up to 10 meters. https://academic.oup.com/cid/article/doi/10.1093/cid/ciaa939/5867798

Observations of Concern:

1. **High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice — Skagit County, Washington, March 2020**
   "Following a 2.5-hour choir practice attended by 61 persons, including a symptomatic index patient, 32 confirmed and 20 probable secondary COVID-19 cases occurred (attack rate = 53.3% to 86.7%); three patients were hospitalized, and two died. " https://www.cdc.gov/mmwr/volumes/69/wr/mm6919e6.htm
2. **COVID-19 Outbreak Associated with Air Conditioning in Restaurant, Guangzhou, China, 2020**
   "The airflow direction was consistent with droplet transmission.' https://wwwnc.cdc.gov/eid/article/26/7/20-0764_article
3. **Aerosol and Surface Distribution of Severe Acute Respiratory Syndrome Coronavirus 2 in Hospital Wards, Wuhan, China, 2020**
   "Virus was widely distributed on floors, computer mice, trash cans, and sickbed handrails and was detected in air ≈4 m from patients." https://wwwnc.cdc.gov/eid/article/26/7/20-0885_article
4. **Loud Talking Can Aerosolize Small Particles.**
   "… when the person said "stay healthy," numerous droplets ranging from 20 to 500 µm were generated." https://www.nejm.org/doi/full/10.1056/NEJMc2007800

An N-95 Mask Is Needed To Prevent Aerosolization and Spread of Particles < 5 µm

COVID-19: Aerosolization

Aerosolization Occurs When Small Viral Particles Linger in the Air.

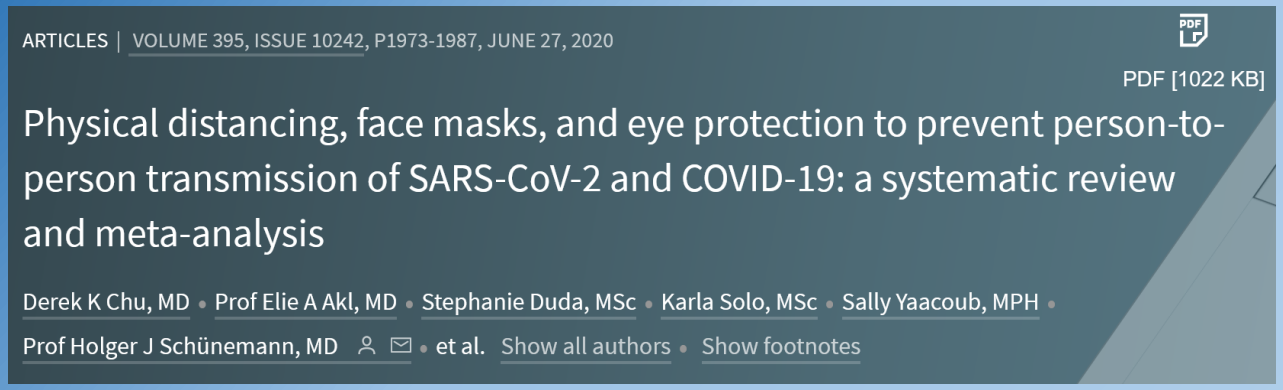
1. **The WHO has stated small particles (< 5 um) only occur with certain medical procedures.**
   "But in an open letter to the W.H.O., 239 scientists in 32 countries have outlined the evidence showing that smaller particles can infect people, and are calling for the agency to revise its recommendations."
   https://www.nytimes.com/2020/07/04/health/239-experts-with-one-big-claim-the-coronavirus-is-airborne.html

2. **This virus (R0 of 5.7) is not as infective as measles (R0 of 12 to 18) a truly aerosolized virus.**
   https://www.pbs.org/wgbh/nova/article/herd-immunity/

3. **Co-inhabitants at a home of a symptomatic patient have a 20% chance of catching the virus.**
   Spread by aerosolization is hard to prevent. "His team estimates that more than 19% of people in the same household as a COVID-19 patient, or nearly 1 in 5, can expect to develop the infection. An estimated 14% of close contacts who aren't in the same household but see the patient regularly will also develop the infection themselves, Yang says."
   https://www.webmd.com/lung/news/20200430/covid-19-household-spread-how-likely

COVID-19: Prevention

THE LANCET



- **Physical distancing:** The chance of transmission:
  At less than 1 meter (3.3 feet) was 12.8%,
  At more than 1 meter (3.3 feet) was 2.6% (1·3% to 5·3%).
- **Face masks:** The chance of transmission without a mask was 17.4%, which fell to 3.1% (1.5% to 6.7%) with a mask or N95 respirator.
- **Eye protection:** The chance of transmission without eye protection was 16%, which fell to 5.5% (3.6% to 8.5%) with eye protection (face shield or goggles).

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31142-9/fulltext

COVID-19: Prevention – Social Distancing

BBC NEWS

Coronavirus: Could social distancing of less than two metres work?

By David Shukman
Science editor

Social Distancing Rules Come From the 1930's. It is based on the Spread of Droplets

It is also not just about distance but also time. Thus, "Scientists advising the UK government say spending six seconds at a distance of 1m from someone is the same as spending one minute at a distance of 2m."

- England, Canada and Spain advise 2 meters.
- Germany, Italy Greece, Netherlands, Portugal advise 1.5 meters.
- South Korea advise 1.4 meters.
- China, France, Singapore, Hong Kong and Denmark advise 1 meter.

However, More Evidence Supports and Scientists Worry the Virus Can Float in the Air – Aerosolized.

https://www.bbc.com/news/science-environment-52522460

COVID-19: Prevention – Masks Types

- **Professional Respirators – N-95**
  These masks can stop aerosolized particles of less than 5 microns.
  A tight facial fit with no gaps is required.

- **Surgical or Procedural Masks**
  These masks can stop droplet particles.

- **Cloth or Do It Yourself (DIY) Masks**
  These masks can stop droplet particles.

COVID-19: Prevention – Protect Others

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

April 3, 2020

Your cloth face covering may protect them. Their cloth face covering may protect you.

https://www.nbcnews.com/news/us-news/u-s-expected-recommend-masks-americans-coronavirus-hotspots-n1175596

Without Eye Goggles and Protective Clothing and Knowledge on How To Safely Remove, A Mask Alone Will Probably Not Produce Adequate Protection.
But It Will Help.

COVID-19: Prevention – Viral Dose

The New York Times

Masks May Reduce Viral Dose, Some Experts Say

People wearing face coverings will take in fewer coronavirus particles, evidence suggests, making disease less severe.

https://www.nytimes.com/2020/07/27/health/coronavirus-mask-protection.html

Masks Do More than Protect Others during COVID-19: Reducing the Inoculum of SARS-CoV-2 Monica Gandhi, MD, MPH, Chris Beyrer MD, MPH, Eric Goosby, MD Journal of General Internal Medicine (August 2020)

https://ucsf.app.box.com/s/blvolkp5z0mydzd82rjks4wyleagt036

COVID-19: Prevention – Masks Types

JOURNAL OF
MEDICAL VIROLOGY

RESEARCH ARTICLE | Free Access

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

Qing-Xia Ma, Hu Shan, Hong-Liang Zhang, Gui-Mei Li, Rui-Mei Yang, Ji-Ming Chen

First published: 31 March 2020 | https://doi.org/10.1002/jmv.25805 | Citations: 25

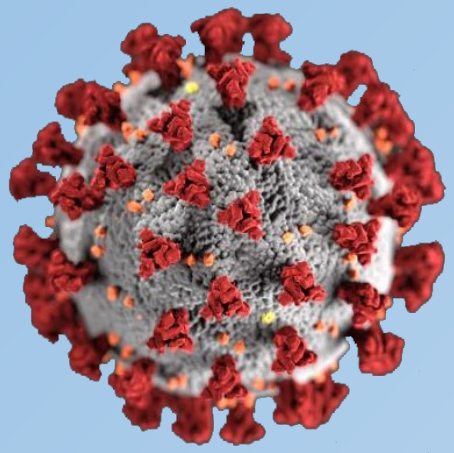


Table 2. Percentage of AIV blocked by masks as compared with one layer of cloth

	C_t increase ($\bar{X} \pm SD$)	Percentage blocked (95% CI)
N95 mask	12.49 ± 0.33	99.98% (99.98%-99.99%)
Medical mask	5.13 ± 0.98	97.14% (94.36%-98.55%)
Homemade mask (one-layer polyester cloth)	4.37 ± 0.90	95.15% (90.97%-97.39%)

Note: avian influenza virus (AIV)

https://onlinelibrary.wiley.com/doi/full/10.1002/jmv.25805

COVID-19: Prevention – Masks Cloth

- **"Filtration efficiencies of the hybrids (such as cotton–silk, cotton–chiffon, cotton–flannel) was >80% (for particles <300 nm) and >90% (for particles >300 nm)."** **(Note: 300 nm is equal to 0.3 microns)**
  Konda A, Prakash A, Moss GA, Schmoldt M, Grant GD, Guha S. Aerosol filtration efficiency of common fabrics used in respiratory cloth masks. ACS Nano 2020;14:6339–47.
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7185834/

COVID-19: Prevention – Masks Cloth

The Washington Post
Democracy Dies in Darkness

Business

The outbreak that didn't happen: Masks credited with preventing coronavirus spread inside Missouri hair salon

Springfield, Mo., health officials braced for an outbreak. Now they say face coverings prevented one.

Two Hair Stylists, 140 Clients and 200 to 300 other people inside a salon – No Infections. All wore masks.

https://www.washingtonpost.com/business/2020/06/17/masks-salons-missouri/

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

Weekly / July 17, 2020 / 69(28);930-932

On July 14, 2020, this report was posted online as an MMWR *Early Release.*

M. Joshua Hendrix, MD[1]; Charles Walde, MD[2]; Kendra Findley, MS[3]; Robin Trotman, DO[4] (View author affiliations)

https://www.cdc.gov/mmwr/volumes/69/wr/mm6928e2.htm?s_cid=mm6928e2_w

COVID-19: Prevention – Masks DYI

Instructional Links On How To Make Cloth Masks.

- **John Hopkins**
  https://www.hopkinsmedicine.org/coronavirus/_documents/INF2003076_VW_Hand-Sewn%20Mask%20instructions-1.pdf
- **Center for Disease Control snd Prevention**
  http://www.healthwatchusa.org/downloads/CDC-DIY-cloth-face-covering-instructions.pdf
- **World Health Organization**
  http://www.healthwatchusa.org/downloads/20200605-WHO-2019-nCov-IPC_Masks-2020.4-eng.pdf

COVID-19: Prevention – Masks N-95

USA Health Watch

Infectious diseases
Research

BMJ Open

A cluster randomised trial of cloth masks compared with medical masks in healthcare workers

C Raina MacIntyre[1], Holly Seale[1], Tham Chi Dung[2], Nguyen Tran Hien[2], Phan Thi Nga[2], Abrar Ahmad Chughtai[1], Bayzidur Rahman[1], Dominic E Dwyer[3], Quanyi Wang[4]

- "This study is the first RCT of cloth masks, and the results caution against the use of cloth masks. This is an important finding to inform occupational health and safety. Moisture retention, reuse of cloth masks and poor filtration may result in increased risk of infection."
- "The rates of all infection outcomes were highest in the cloth mask arm, with the rate of ILI (Influenza Like Illness) statistically significantly higher in the cloth mask arm"

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4420971/

COVID-19: Masks Can Stop Pandemic

COVID-19: Masks Can Stop Pandemic

One Study From the University of Cambridge Found this could stop a second wave of COVID-19, if 100% of the public wore masks combined with a lockdown. If 50% of the public wore masks then the curve could be flattened.
https://www.cnbc.com/2020/06/10/study-suggests-face-masks-could-prevent-or-lessen-second-covid-19-wave.html

Another Study From Berkeley's International Computer Science Institute (Dr. De Kai) ""For 80 or 90% of the population to be wearing masks." Anything less, he added, doesn't work as well. "If you get down to 30 or 40%, you get almost no [beneficial] effect at all.""

Duncan DE. If 80% of Americans Wore Masks, COVID-19 Infections Would Plummet, New Study Says. Vanity Fair. May 8, 2020.
https://www.vanityfair.com/news/2020/05/masks-covid-19-infections-would-plummet-new-study-says

View Mask Simulator & Effects on Pandemic: http://dek.ai/masksim/

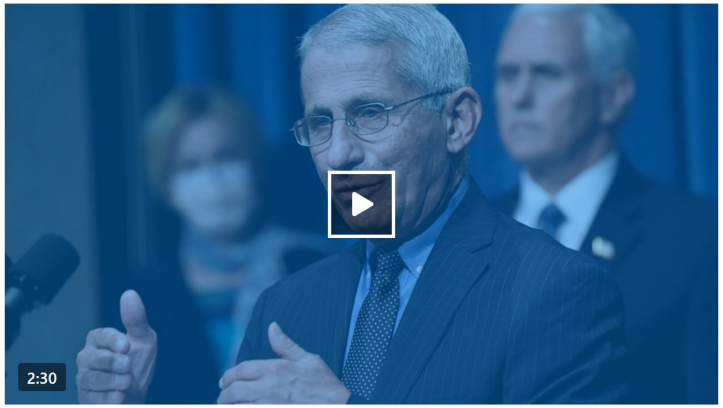
COVID-19: Goggles

ABC NEWS | CORONAVIRUS FAQS

Dr. Fauci: Wear goggles or eye shields to prevent spread of COVID-19; flu vaccine a must

The nation's top infectious disease expert spoke to ABC News live on Instagram.

By **Caterina Andreano**
July 29, 2020, 5:26 PM • 9 min read



What you need to know about Dr. Anthony Fauci

Dr. Jen Ashton shares some facts you might not know about the acclaimed immunologist.

Dr. Anthony Fauci suggested Wednesday that Americans should consider wearing goggles or a face shield in order to prevent spreading or catching COVID-19.

NEWS

Birx, Fauci recommend wearing goggles, face shields in addition to masks

by: Alexa Mae Asperin and Nexstar Media Wire
Posted: Jul 30, 2020 / 05:32 PM CDT / Updated: Jul 30, 2020 / 12:59 PM CDT

OKLAHOMA'S NEWS 4

SAN FRANCISCO (KRON) – Dr. Anthony Fauci is now suggesting that people wear goggles, or some other type of eye protection to better protect themselves from COVID-19.

- **Eye protection:** The chance of transmission without eye protection was 16%, which fell to 5.5% (3.6% to 8.5%) with eye protection (face shield or goggles).

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(20)31142-9/fulltext

COVID-19: High Risk Venues

The highest risk activities are:

- Indoors with poor ventilation.
  (being outside has a 20x lower risk)
- Individuals are crowded together.
- Loud talking, cheering or singing.

COVID-19: Bars

Outside Bar In Lexington Kentucky

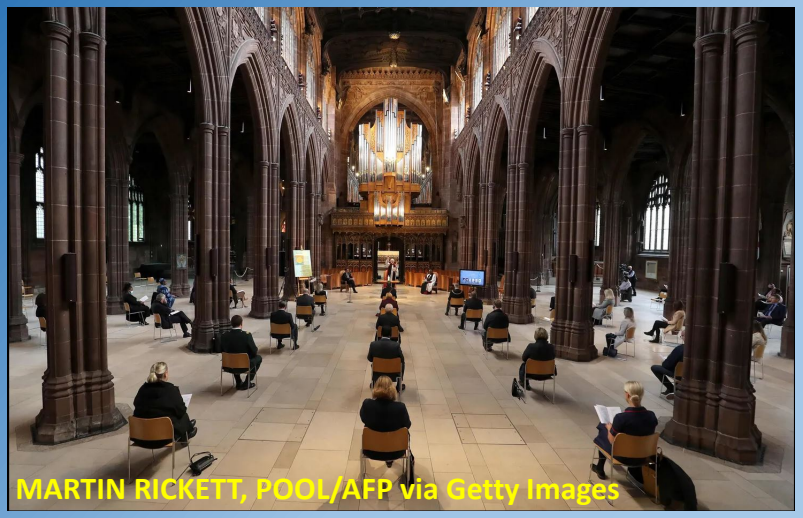
Risk Factors:

1. Close Together
2. Loud Talking Over Music
3. Indoors – Poor Ventilation
4. Exposure Time Greater Than 15 mins.
5. Not Wearing Masks

Mitigation Strategies:

1. Social Distancing & Wearing Masks.
2. Adequate Ventilation with Air Sterilization.
3. No Singing or Loud Talking.
4. Outdoor or Parking Lot Services.
5. Stay In Your Family “Bubble”.

COVID-19: Churches



Risk Factors:

1. Close Together
2. Singing
3. Indoors – Poor Ventilation
4. Exposure Time Greater Than 15 mins.

Mitigation Strategies:

1. Social Distancing & Wearing Masks.
2. Adequate Ventilation with Air Sterilization.
3. No Singing or Singing with Masks.
4. Outdoor or Parking Lot Services.
5. Stay In Your Family “Bubble”.
6. Online Services.

COVID-19: Churches

courier journal

Kentucky pastor spars with Beshear after 18 church members test positive for COVID-19

Billy Kobin Louisville Courier Journal

Published 11:28 a.m. ET Jun. 9, 2020 | **Updated 4:47 p.m. ET Jun. 9, 2020**

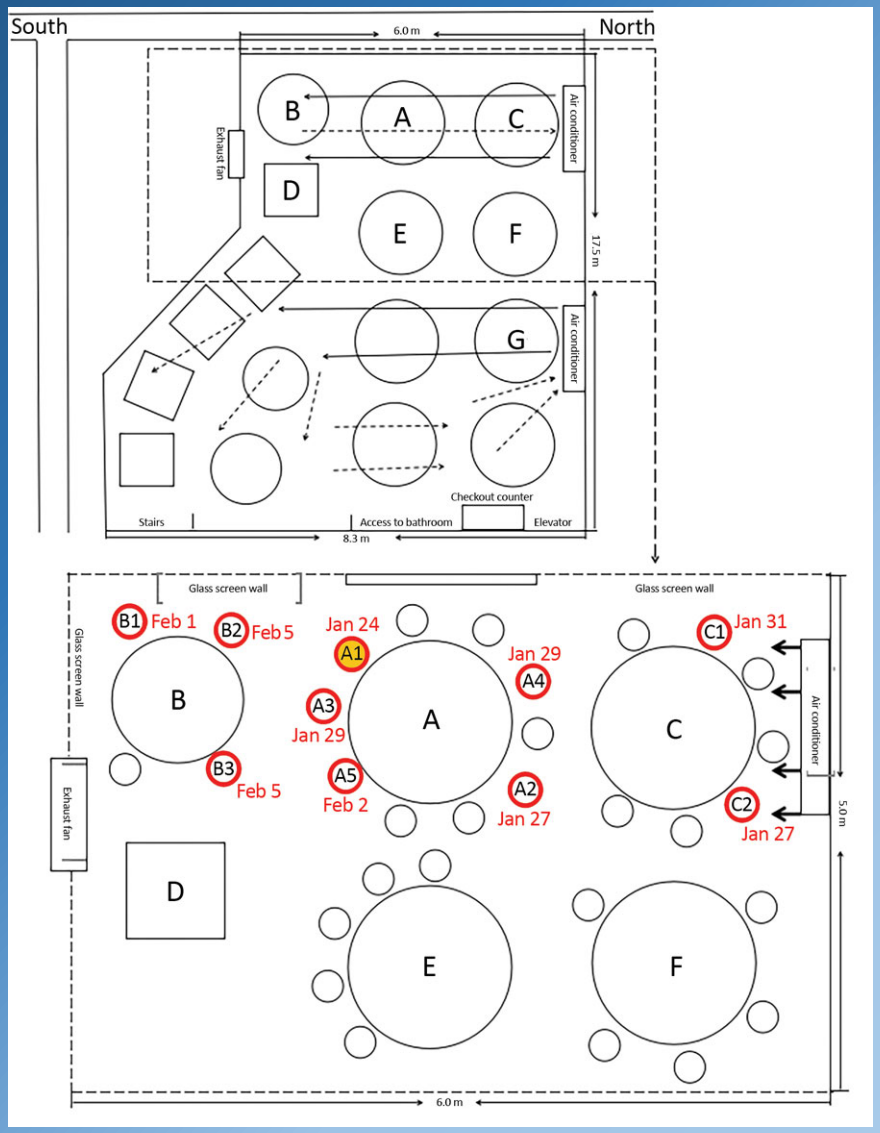
But pastor Jeff Fugate, who stood alongside Kentucky Attorney General Daniel Cameron in April and called for Gov. Andy Beshear to lift restrictions on in-person worship, stressed there is "no indication" anyone contracted the virus while at church.

"I decided it would just be best to go back to online services until we can figure out exactly what's going on and we can figure out what to do," Fugate told The Courier Journal on Saturday. "... The last thing I want is for my folks to get sick."

But Randy Gooch, executive director of the Jessamine County Health Department, said evidence suggests the cases are linked to attendance at the church.

https://www.courier-journal.com/story/news/local/2020/06/09/coronavirus-kentucky-17-clays-mill-baptist-church-members-infected/3164299001/

COVID-19: Restaurants



Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

COVID-19 Outbreak Associated with Air Conditioning in Restaurant, Guangzhou, China, 2020
Volume 26, Number 7—July 2020

"During January 26–February 10, 2020, an outbreak of 2019 novel coronavirus disease in an air-conditioned restaurant in Guangzhou, China, involved 3 family clusters. The airflow direction was consistent with droplet transmission. **To prevent the spread of the virus in restaurants, we recommend increasing the distance between tables and improving ventilation.**"

https://wwwnc.cdc.gov/eid/article/26/7/20-0764_article

Mitigation Strategies:

1. Social Distancing & Wearing Masks.
2. Outdoor tables.
3. Adequate Ventilation with Air Sterilization.
4. Delivery or Pick Up Services.

COVID-19: Other Businesses

Mitigation Strategies - Minimal

1. Online Ordering and Delivery.
2. Curbside Pickup.
3. Require Masks & Social Distancing for Patrons and Staff.
4. Employees With Barriers or Face shields.

COVID-19: Animals

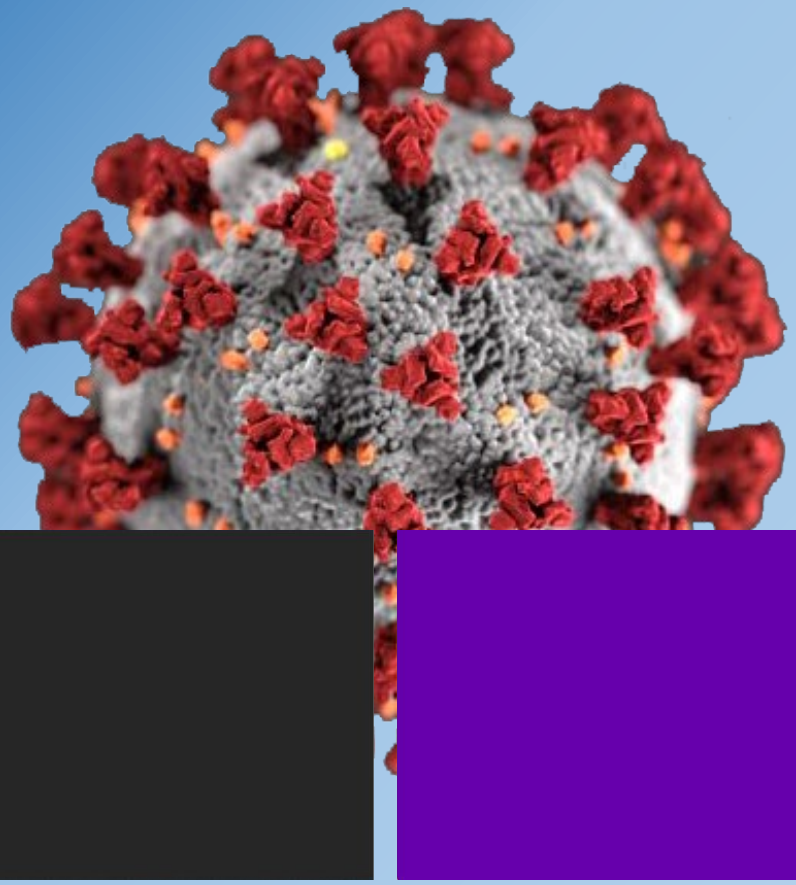
Health Watch USA @healthwatchusa · Now

The first dog to test positive for coronavirus in the U.S. has died via @natgeo

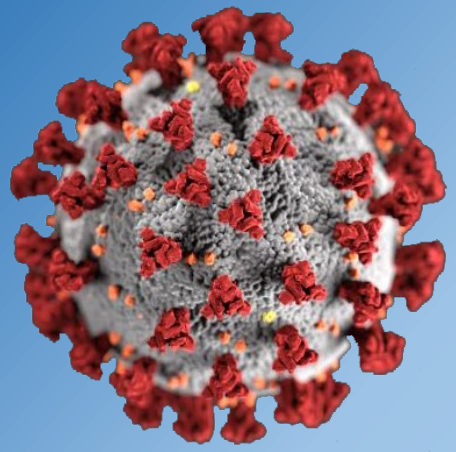
Exclusive: Buddy, first dog to test positive for COVID-19 in the U.S., has ...

Even though the German shepherd likely had cancer, his health records show how little we know about animals and the coronavirus.

nationalgeographic.com



COVID-19 Pandemic
-- Children & Schools

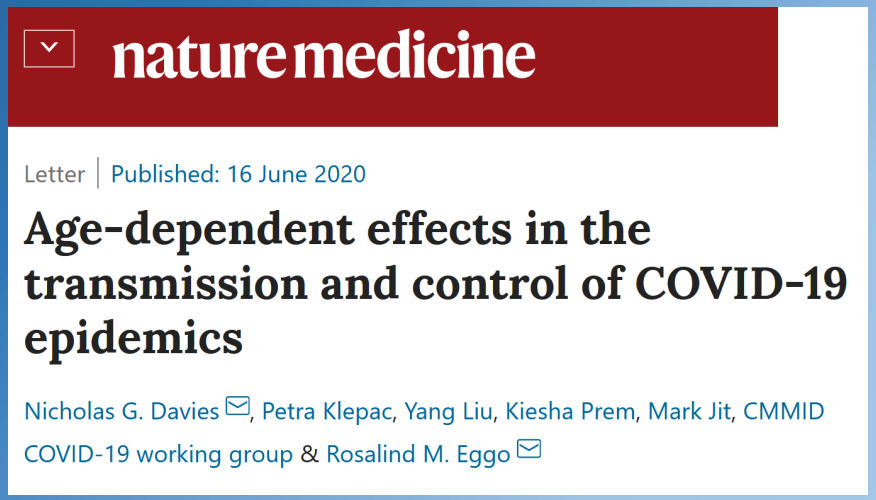


Kevin T. Kavanagh, MD, MS
Health Watch USA sm

USA
Health Watch

COVID-19: Schools – Opening

The Narrative: Children do not get sick, they do not get the virus, lets open schools !!



nature medicine

Letter | Published: 16 June 2020

Age-dependent effects in the transmission and control of COVID-19 epidemics

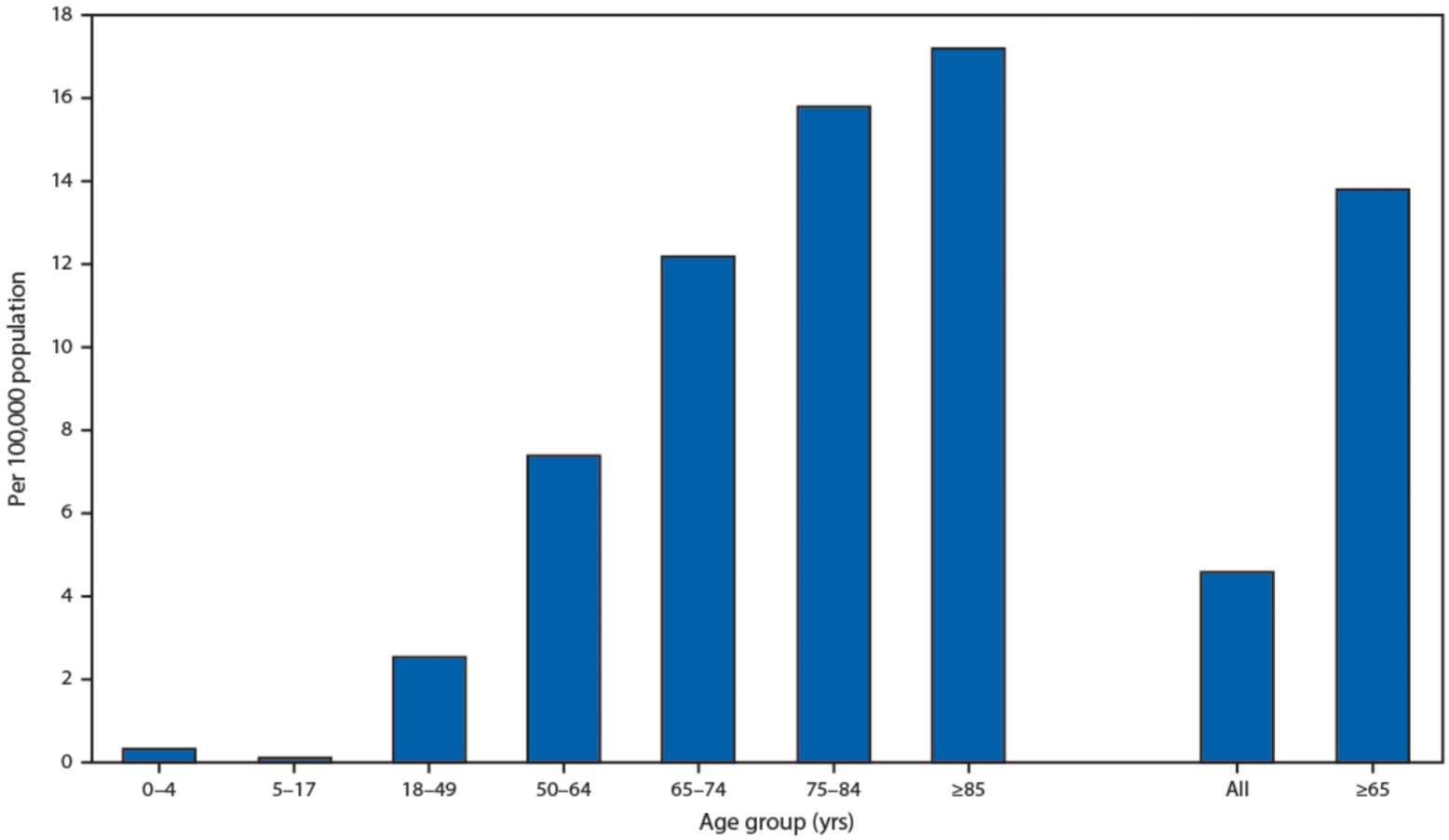
Nicholas G. Davies, Petra Klepac, Yang Liu, Kiesha Prem, Mark Jit, CMMID COVID-19 working group & Rosalind M. Eggo

"The COVID-19 pandemic has shown a markedly low proportion of cases among children[1,2,3,4]. Age disparities in observed cases could be **explained by children having lower susceptibility to infection, lower propensity to show clinical symptoms or both.** "

COVID-19: Schools – Children Symptoms & Death

USA Health Watch

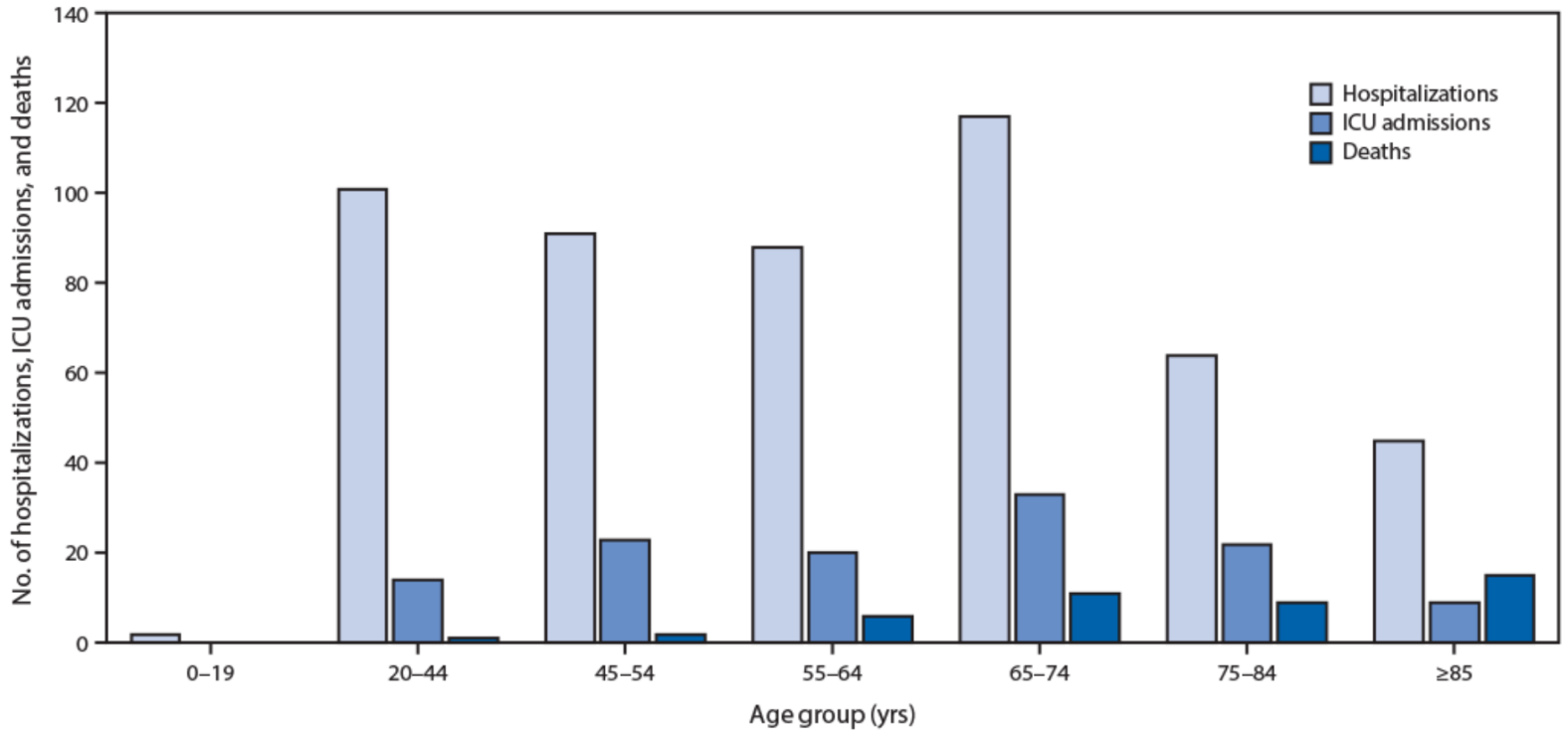
FIGURE 1. Laboratory-confirmed coronavirus disease 2019 (COVID-19)–associated hospitalization rates,* by age group — COVID-NET, 14 states,† March 1–28, 2020



Garg S; Kim L, Whitaker M, et al. https://www.cdc.gov/mmwr/volumes/69/wr/mm6915e3.htm

COVID-19: Schools – Children Symptoms & Death

FIGURE 2. Coronavirus disease 2019 (COVID-19) hospitalizations,* intensive care unit (ICU) admissions,† and deaths,§ by age group — United States, February 12– March 16, 2020



* Hospitalization status missing or unknown for 1,514 cases.

† ICU status missing or unknown for 2,253 cases.

§ Illness outcome or death missing or unknown for 2,001 cases.

CDC COVID-19 Response Team https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm

COVID-19: Schools – Children Symptoms & Death

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

Morbidity and Mortality Weekly Report (*MMWR*)

Severe Outcomes Among Patients with Coronavirus Disease 2019 (COVID-19) — United States, February 12–March 16, 2020

Weekly / March 27, 2020 / 69(12);343-346 https://www.cdc.gov/mmwr/volumes/69/wr/mm6912e2.htm

TABLE. Hospitalization, intensive care unit (ICU) admission, and case–fatality percentages for reported COVID–19 cases, by age group — United States, February 12–March 16, 2020

Age group (yrs) (no. of cases)	%*		
	Hospitalization	ICU admission	Case-fatality
0–19 (123)	1.6–2.5	0	0
20–44 (705)	14.3–20.8	2.0–4.2	0.1–0.2
45–54 (429)	21.2–28.3	5.4–10.4	0.5–0.8
55–64 (429)	20.5–30.1	4.7–11.2	1.4–2.6
65–74 (409)	28.6–43.5	8.1–18.8	2.7–4.9
75–84 (210)	30.5–58.7	10.5–31.0	4.3–10.5
≥85 (144)	31.3–70.3	6.3–29.0	10.4–27.3
Total (2,449)	**20.7–31.4**	**4.9–11.5**	**1.8–3.4**

* Lower bound of range = number of persons hospitalized, admitted to ICU, or who died among total in age group; upper bound of range = number of persons hospitalized, admitted to ICU, or who died among total in age group with known hospitalization status, ICU admission status, or death.

The cases described in this report include both COVID-19 cases confirmed by state or local public health laboratories as well as those with a positive test at the state or local public health laboratories and confirmation at CDC.

CDC COVID-19 Response Team

COVID-19: Schools – Children Symptoms & Death

LEXINGTON HERALD LEADER

Kentucky infant with COVID-19 dies. 265 new coronavirus cases and 8 new deaths.

BY ALEX ACQUISTO

JUNE 03, 2020 04:33 PM , UPDATED JUNE 03, 2020 06:21 PM

Gov. Andy Beshear announced 265 new cases of COVID-19 in Kentucky on Wednesday, bringing the state's total number of cases to at least 10,410. Eight more people with the coronavirus have died, including a nine-month-old girl.

MAYO CLINIC

How are babies affected by COVID-19?

Although rare, children under age 1 (infants) are at higher risk of severe illness with COVID-19. This is likely due to their immature immune systems and smaller airways, which make them more likely to develop breathing issues with respiratory virus infections.

https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/coronavirus-in-babies-and-children/art-20484405

COVID-19: Schools – Children Symptoms & Death

In Kentucky as of Aug. 1, 2020	
Age Yrs.	**Deaths**
0-9	1
10-29	0
30-39	6
40-49	16
50-59	46
60-69	122
70-79	180
80+	369
Total	740

The one death was in a 9 month old.

https://govstatus.egov.com/kycovid19

COVID-19: Multisystem Inflammatory Syndrome in Children (MIS-C)

Infectious Disease > COVID-19

Kids' Brains Affected by COVID-Linked Inflammatory Syndrome

— Central and peripheral nervous system symptoms also reported

by Crystal Phend, Senior Editor, MedPage Today July 1, 2020

https://www.medpagetoday.com/infectiousdisease/covid19/87378

Infectious Disease > COVID-19

MIS-C: Tip of the Iceberg for Kids' COVID Inflammation?

— Surveillance data affirm profile of the syndrome, but there may be more to it

by Crystal Phend, Senior Editor, MedPage Today June 30, 2020

https://www.medpagetoday.com/infectiousdisease/covid19/87341

Paediatric multisystem inflammatory syndrome temporally associated with COVID-19 (PIMS)

"A child presenting with persistent fever, inflammation (neutrophilia, elevated CRP and lymphopaenia) and evidence of single or multi-organ dysfunction (shock, cardiac, respiratory, renal, gastrointestinal or neurological disorder) with additional features (see listed in Appendix 1). This may include children fulfilling full or partial criteria for Kawasaki disease." https://www.rcpch.ac.uk/resources/guidance-paediatric-multisystem-inflammatory-syndrome-temporally-associated-covid-19-pims

COVID-19: Multisystem Inflammatory Syndrome in Children (MIS-C)

Delayed Presentation

- MIS-C develops 2 to 4 weeks after infection with SARS-CoV-2.
- The Syndrome is Rare. Affects less than 1% of SARS-CoV-2 infections which occur in patients less than 21 years of age (of cases reported by the NYSDOH).

https://www.nejm.org/doi/full/10.1056/NEJMe2023158

https://www.statnews.com/2020/06/29/nejm-inflammation-children-covid19-misc/

COVID-19: Multisystem Inflammatory Syndrome in Children (MIS-C)

The NEW ENGLAND JOURNAL of MEDICINE

July 23, 2020
N Engl J Med 2020; 383:334-346
DOI: 10.1056/NEJMoa2021680

Multisystem Inflammatory Syndrome in Children in New York State

"As of May 10, 2020, a total of 191 potential cases were reported to the NYSDOH."

- All presented with subjective fever or chills;
- 97% had tachycardia,
- 80% had gastrointestinal symptoms,
- 60% had rash,
- 56% had conjunctival injection,
- 27% had mucosal changes,
- 62% received vasopressor support,
- 53% had evidence of myocarditis,

"80% were admitted to an intensive care unit, and 2 died. The median length of hospital stay was 6 days."

https://www.nejm.org/doi/full/10.1056/NEJMoa2021756

COVID-19: Multisystem Inflammatory Syndrome in Children (MIS-C)

The NEW ENGLAND JOURNAL of MEDICINE

July 23, 2020
N Engl J Med 2020; 383:334-346
DOI: 10.1056/NEJMoa2021680

Multisystem Inflammatory Syndrome in U.S. Children and Adolescents

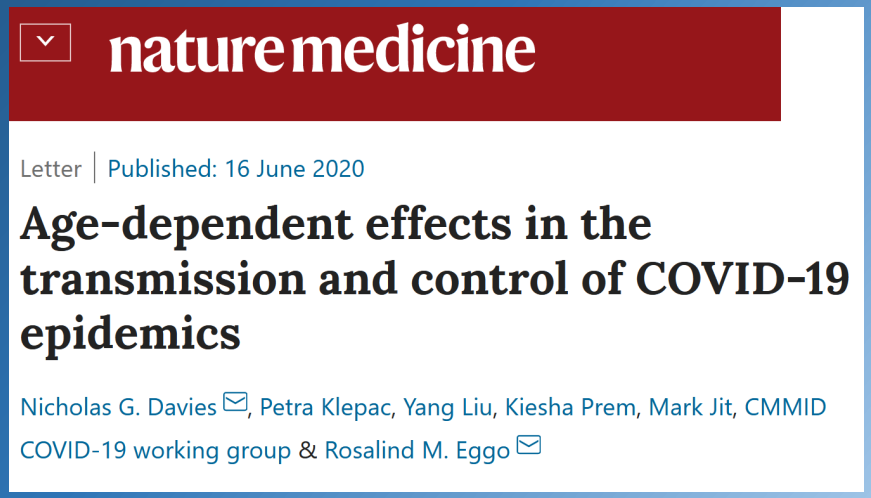
"We report on 186 patients with MIS-C in 26 states. 164 (88%) were hospitalized after April 16, 2020. Organ-system involvement included":

- Gastrointestinal system in 171 patients (92%),
- Cardiovascular in 149 (80%),
  Coronary-artery aneurysms were documented in 15 patients (8%),
- Hematologic in 142 (76%),
- Mucocutaneous in 137 (74%),
- Respiratory in 131 (70%),
- Kawasaki's disease–like features were documented in 74 (40%)."

"The median duration of hospitalization was 7 days (interquartile range, 4 to 10); 148 patients (80%) received intensive care, 37 (20%) received mechanical ventilation, 90 (48%) received vasoactive support, and 4 (2%) died.

https://www.nejm.org/doi/full/10.1056/NEJMoa2021680

COVID-19: Schools Most Children Are Asymptomatic



nature medicine

Letter | Published: 16 June 2020

Age-dependent effects in the transmission and control of COVID-19 epidemics

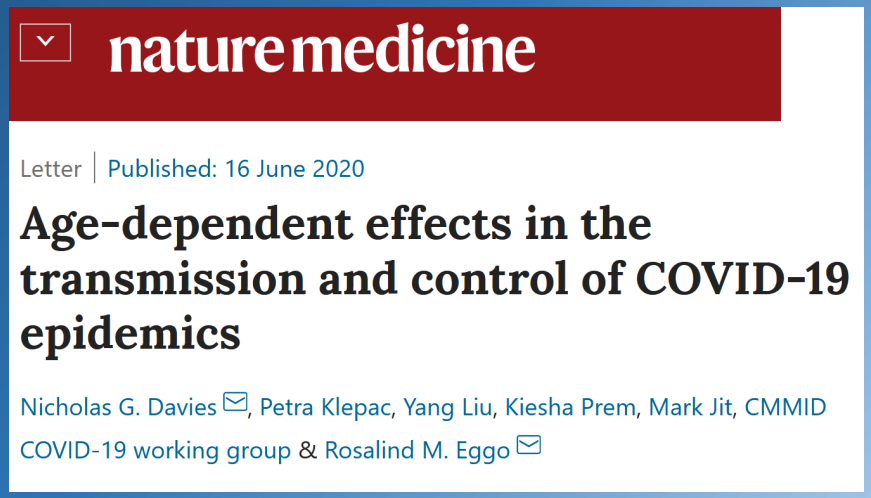
Nicholas G. Davies, Petra Klepac, Yang Liu, Kiesha Prem, Mark Jit, CMMID COVID-19 working group & Rosalind M. Eggo

Possibly Half as Likely to Be Infected; But 21% of those infected are symptomatic.

- First, age-varying susceptibility to infection by SARS-CoV-2, where children are less susceptible than adults to becoming infected on contact with an infectious person, would reduce cases among children.
- Second, children could experience mild or no symptoms with infections more frequently than adults.

https://www.nature.com/articles/s41591-020-0962-9

COVID-19: Schools
Most Children Are Asymptomatic



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Possibly Half as Likely to Be Infected; But 21% of those infected are symptomatic.

Nature Medicine: "We estimate that susceptibility to infection in individuals under 20 years of age is approximately half that of adults aged over 20 years"

And Clinical Symptoms Manifests In:

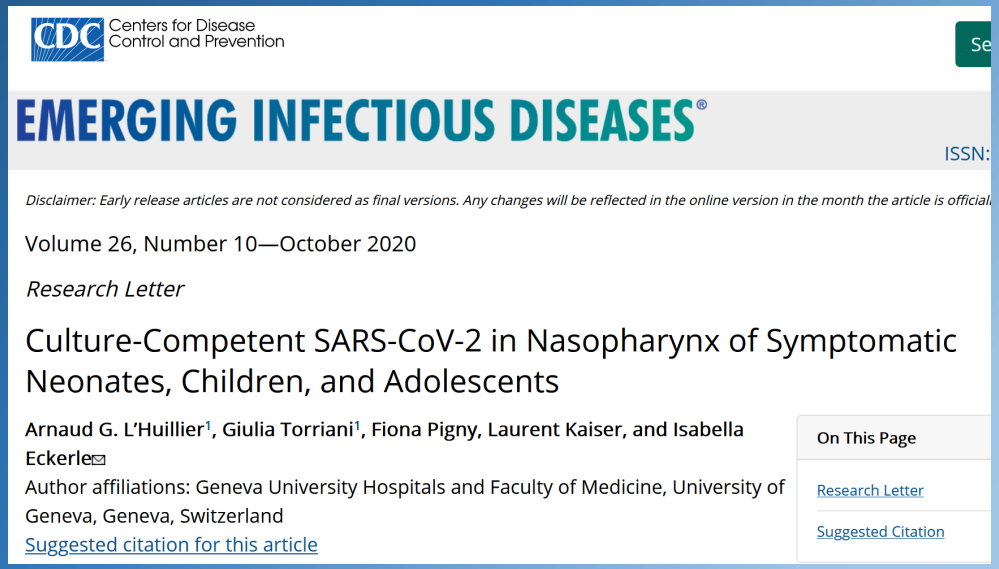
- 10- to 19-year-olds - 21% (95% CI: 12–31%) of infections.
- over 70 years - 69% (57–82%) of infections.

https://www.nature.com/articles/s41591-020-0962-9

COVID-19: Schools
Most Children Are Asymptomatic

However, what is the transmissibility of subclinical infection?

COVID-19: Schools – Children Transmission to Others



CDC Centers for Disease Control and Prevention

EMERGING INFECTIOUS DISEASES®

ISSN:

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Volume 26, Number 10—October 2020

Research Letter

Culture-Competent SARS-CoV-2 in Nasopharynx of Symptomatic Neonates, Children, and Adolescents

Arnaud G. L'Huillier[1], Giulia Torriani[1], Fiona Pigny, Laurent Kaiser, and Isabella Eckerle

Author affiliations: Geneva University Hospitals and Faculty of Medicine, University of Geneva, Geneva, Switzerland

Suggested citation for this article

On This Page

Research Letter

Suggested Citation

Infected Children Shed The Virus Similar to Adults.

"SARS-CoV-2 shedding patterns of culture competent virus in symptomatic children resemble those observed in adults. Therefore, transmission of SARS-CoV-2 from children is plausible." Median Age of Child Studied was 12 years, Range 7 days to 16 years.

https://wwwnc.cdc.gov/eid/article/26/10/20-2403_article

COVID-19: Schools – Children Transmission to Others

Comment on this paper

An analysis of SARS-CoV-2 viral load by patient age

Terry C Jones, Barbara Mühlemann, Talitha Veith, Guido Biele, Marta Zuchowski, Jörg Hoffmann, Angela Stein, Anke Edelmann, Victor Max Corman, Christian Drosten

doi: https://doi.org/10.1101/2020.06.08.20125484

- "… a threshold we previously established for the isolation of infectious virus in cell culture at more than 5% probability, were present across the study period in 29.0% of kindergarten-aged patients 0-6 years old (n=38), 37.3% of those aged 0-19 (n=150), and in 51.4% of those aged 20 and above (n=3153)."
- **"We conclude that a considerable percentage of infected people in all age groups, *including those who are pre- or mild-symptomatic*, carry viral loads likely to represent infectivity."**
- **"In particular, there is little evidence from the present study to support suggestions that children may not be as infectious as adults."**

Work at Charité virology is funded by European Commission via project ReCoVer, the German Ministry of Research and Education via Deutsches Zentrum für Infektionsforschung, and the German Ministry of Health via the Konsiliarlabor für Coronaviren. https://www.medrxiv.org/content/10.1101/2020.06.08.20125484v1

COVID-19: Schools – Children Transmission to Others

CDC Centers for Disease Control and Prevention

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ISSN: 1080-6059

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Volume 26, Number 10—October 2020

Dispatch

Contact Tracing during Coronavirus Disease Outbreak, South Korea, 2020

SARS-CoV-2 positive patients tracing number of positive cases in household contacts. (Table 2)

This Research included both symptomatic and asymptomatic patients. South Korea does extensive testing and case tracking but the authors stated "all asymptomatic patients might not have been identified"

https://wwwnc.cdc.gov/eid/article/26/10/20-1315_article

Age 1 to 9 spread the virus half as frequently as adults as those 10 to 19 spread it more than adults.

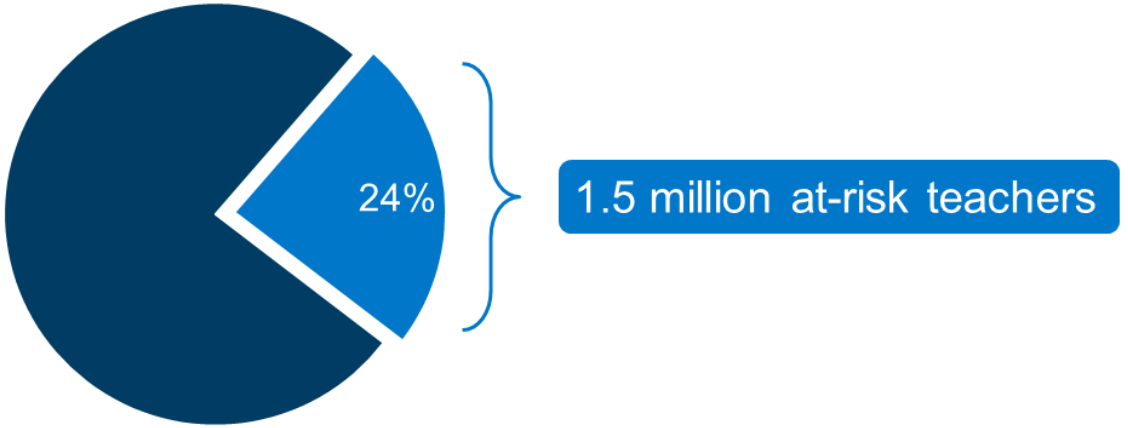
Index patient age, y	No. Household contacts positive/no. contacts traced	% Positive (95% CI)
0–9	3/57	5.3 (1.3–13.7)
10–19	43/231	18.6 (14.0–24.0)
20–29	240/3,417	7.0 (6.2–7.9)
30–39	143/1,229	11.6 (9.9–13.5)
40–49	206/1,749	11.8 (10.3–13.4)
50–59	300/2,045	14.7 (13.2–16.3)
60–69	177/1,039	17.0 (14.8–19.4)
70–79	86/477	18.0 (14.8–21.7)
≥80	50/348	14.4 (11.0–18.4)

COVID-19: Schools – Risk to Teachers

KFF

Nearly 1.5 Million Teachers (One in Four) are at Greater Risk of Serious Illness if Infected with Coronavirus

Share of teachers at greater risk of serious illness if infected with coronavirus



Source: KFF analysis of 2018 National Health Interview Survey.

KFF

https://www.kff.org/coronavirus-covid-19/issue-brief/how-many-teachers-are-at-risk-of-serious-illness-if-infected-with-coronavirus/

COVID-19: Schools – Experience In Other Countries

Over 191 countries closed schools. https://news.un.org/en/story/2020/04/1062232

EUROPE OPENED SCHOOLS AT AN INFECTION NADIR

MIT Technology Review: "But in many countries, schools are now cautiously reopening: in Germany, Denmark, Vietnam, New Zealand, and China, children are mostly back behind their desks. These countries all have two things in common: **low levels of infection and a reasonably firm ability to trace outbreaks**."

https://www.technologyreview.com/2020/06/30/1004625/is-it-safe-to-send-kids-back-to-school/

In Germany: ".. in most of Germany, students have been back in school since May, albeit on a part-time basis. And this is to allow for reduced class sizes and social distancing, meaning that students still study from home for some of the week."
https://www.npr.org/2020/07/10/889842725/lessons-on-reopening-schools-the-u-s-could-learn-from-germany-israel-and-thailan

But on July 20, 2020. German Schools in one district closed again: "All schools and day-care centers in the district were also closed and will remain so until mid-August."
https://www.cnbc.com/2020/06/23/germany-is-struggling-with-more-coronavirus-outbreaks.html

In Thailand: There has been no domestic infection for more than five weeks.
https://www.npr.org/2020/07/10/889842725/lessons-on-reopening-schools-the-u-s-could-learn-from-germany-israel-and-thailan

COVID-19: Schools – Experience In Other Countries

June 3, 2020, Israel: After reopening for two weeks Israel reclosed 130 schools.

THE CORONAVIRUS CRISIS

After Reopening Schools, Israel Orders Them To Shut If COVID-19 Cases Are Discovered

DANIEL ESTRIN

June 3, 2020 · 11:32 AM ET

https://www.npr.org/sections/coronavirus-live-updates/2020/06/03/868507524/israel-orders-schools-to-close-when-covid-19-cases-are-discovered

Lessons On Reopening Schools The U.S. Could Learn From Germany, Israel And Thailand

ESME NICHOLSON

July 10, 2020 · 3:45 PM ET

"But instead of just letting the younger kids go back to school, there were these last-minute negotiations. Ultra-Orthodox Jewish schools wanted the older kids to go back to religious studies, and so they did. And then 11th- and 12th-graders also went back to school. And so very, very quickly, everyone was back. And then very quickly after that, there was a heat wave, so the government said, well, kids don't need to wear masks anymore during this heat wave. And then we just saw big outbreaks in schools, and a lot of schools shut down for several weeks."

https://www.npr.org/2020/07/10/889842725/lessons-on-reopening-schools-the-u-s-could-learn-from-germany-israel-and-thailan

COVID-19: Schools – Experience In Other Countries

In France on May 18, 2020: Coronavirus flare-ups force France to re-close some schools. Reclosed 7 schools in Northern France due to a flare up. https://www.cbsnews.com/news/coronavirus-france-close-some-reopened-schools-covid-cases-flare-up-today-2020-05-18/

In South Korea on May 30, 2020: Hundreds (838) of schools closed after a spike infection rates. https://www.washingtonpost.com/education/2020/05/30/south-korea-closes-schools-again-amid-covid-19-spike-days-after-reopening/

All of these countries opened Schools when community spread of the virus was controlled and there was abundant case tracking.

COVID-19: Schools – Experience In Other Countries

In France on Aug 1, 2020: CNN reported that France is planning to use different strategies in opening schools in the fall, depending upon the level of spread of the virus in the community. Strategies range from: In school learning, blended programs and online only options.

COVID-19: Overnight Camp

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

https://www.cdc.gov/mmwr/volumes/69/wr/mm6931e1.htm

SARS-CoV-2 Transmission and Infection Among Attendees of an Overnight Camp — Georgia, June 2020 *Early Release* / July 31, 2020 / 69

- On June 23, a teenage staff member left camp A after developing chills the previous evening. The staff member was tested and reported a positive test result for SARS-CoV-2 the following day (June 24).
- Officials began sending campers home on June 24 and closed the camp on June 27.

TABLE. SARS-CoV-2 attack rates*,† among attendees of an overnight camp, by selected characteristics — Georgia, June 2020

Characteristic	No.§	No. positive	Attack rate, %
Total	**597**	**260**	**44**
Sex			
Male	267	123	46
Female	330	137	42
Age group, yrs			
6–10	100	51	51
11–17	409	180	44
18–21	81	27	33
22–59	7	2	29

136 cases had available symptom data,
- 36 (26%) patients reported no symptoms;
- 100 (74%) reported symptoms,
  subjective or documented fever (65%),
  headache (61%), and
  sore throat (46%).

COVID-19: When To Open - WHO

World Health Organization

Decision makers should consider the following when deciding on whether to open or close schools:

- **Current understanding about COVID-19 transmission and severity in children**
- **Local situation and epidemiology of COVID-19 where the school(s) are located**
- **School setting and ability to maintain COVID-19 prevention and control measures**

MIT Technology Review

These countries all have two things in common: low levels of infection and a reasonably firm ability to trace outbreaks.

COVID-19: When To Open - Criteria

Criteria for Opening Schools (University of Minnesota Center for Infectious Disease Research and Policy):

- Less than 5 cases per 100,000 per day (In Kentucky that would be about 200 cases per day).
- Rates falling for 2 weeks.
- 25% of hospital beds available.

Robert Redfield, Director of the CDC.

- Counties with test positivity rates greater than 5% should consider closing.

COVID-19: When To Open - Criteria

The New York Times

“To create safe schools is much more complex than just having students wear face masks and sit physically distanced from one another in class. We must ensure that all five of the core school-based activities — transportation, time in the classroom, mealtimes, gym and extracurricular activities — are safe.”

https://www.nytimes.com/2020/07/29/opinion/coronavirus-schools-reopen.html

COVID-19: When To Open - Criteria

Centers for Disease Control and Prevention
CDC 24/7: Saving Lives, Protecting People™

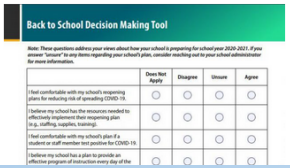
COMMUNITY, WORK & SCHOOL

School Decision-Making Tool for Parents, Caregivers, and Guardians

Decision-Making Tool for Parents and Guardians

Choosing whether or not to send your child back to school can be difficult. When weighing decisions about your child returning to school, it is important to consider your family's unique needs and situation and your comfort level with the steps your school is taking to reduce the spread of COVID-19. Some considerations may include the specific risks to members of your household if a child were to become infected in school, as well as access to school meal programs, social services, extended day childcare services and extra-curricular activities, social-emotional support from peers and educators, and school transportation.

Back to School Decision Making Tool



https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/decision-tool.html

COVID-19: When To Open – School Modifications Needed

Once Community Spread is Under control & There is Adequate Case Tracking:

- Social Distance of 6 feet between Desks.
- Wearing of Masks.
- Hand sanitizers.
- Smaller Class Size with Maintaining Activities Within The "Bubble" or Co-Hort. Some are using 10 or fewer so if a student tests positive the whole facility does not have to shut down.
- Pool Testing of Family.
- Outdoor Class.
- Infrastructure Investments
  1) Larger Class Room Sizes.
  2) Different Patient Flow and Protection in Halls, Restrooms & Cafeterias.
  3) Ventilation:
     - High Volume to Dilute The Virus.
     - Sterilization of Virus In A/C System – UV Light


IF WE DO NOT CHANGE OUR DIRECTION,
we are likely to end up where we are headed.
Ancient Chinese Proverb