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Covid-19 Clinical Update 9/24/2020

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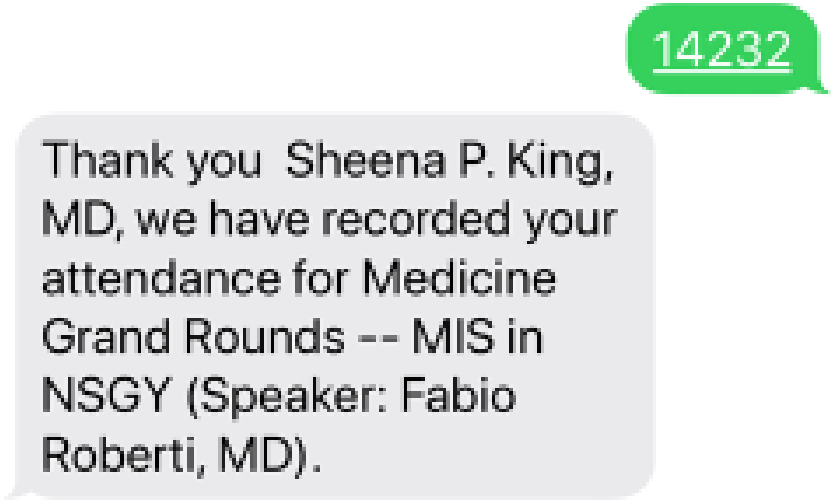


COVID-19 UPDATE

HANA AKSELROD, MD, MPH

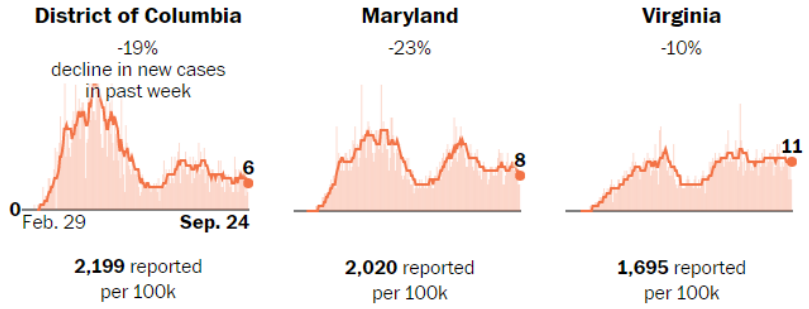
GW DIVISION OF INFECTIOUS DISEASES

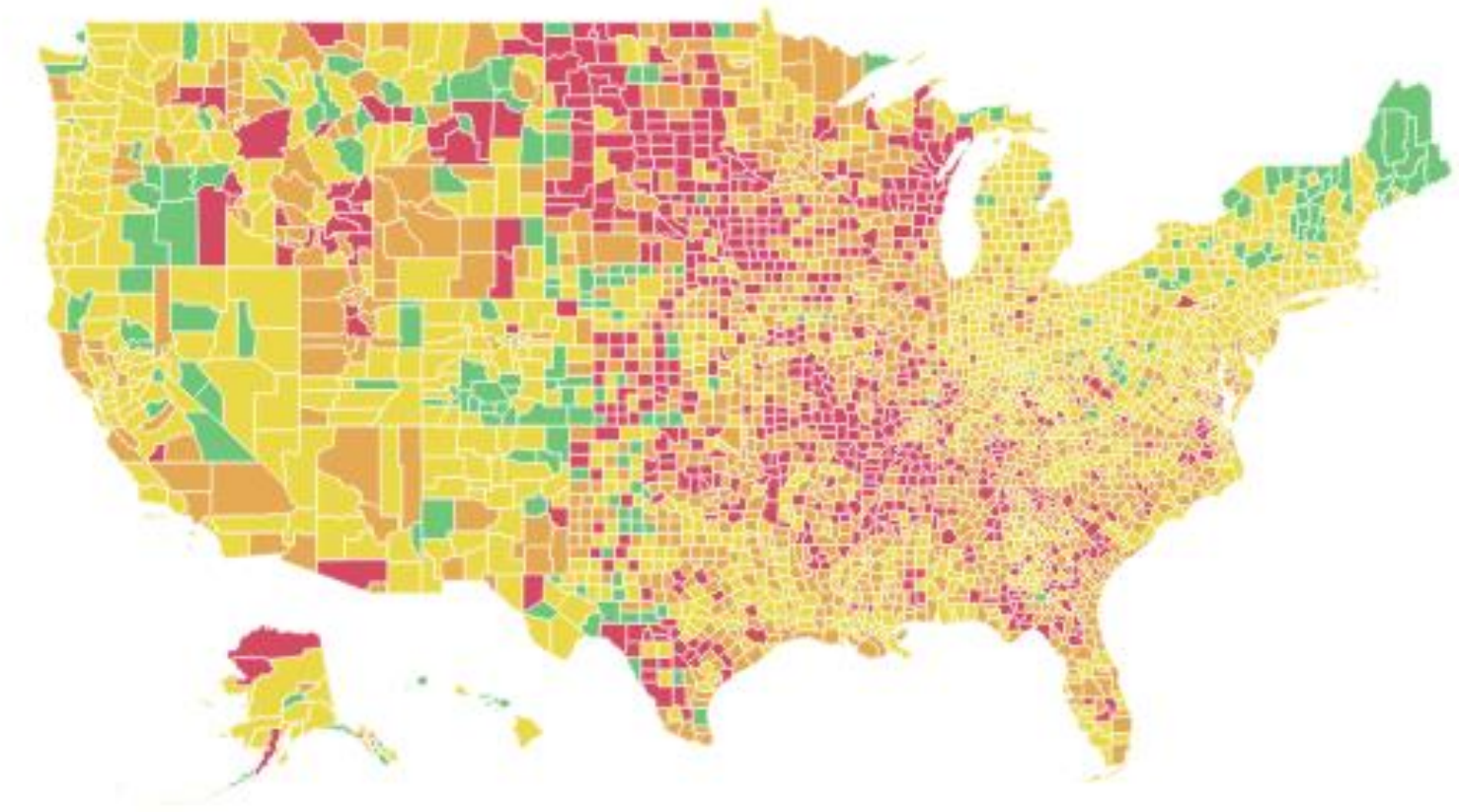
9/24/2020

1. EPIDEMIOLOGY
2. TRANSMISSION
3. PATHOPHYSIOLOGY
4. GW UPDATES

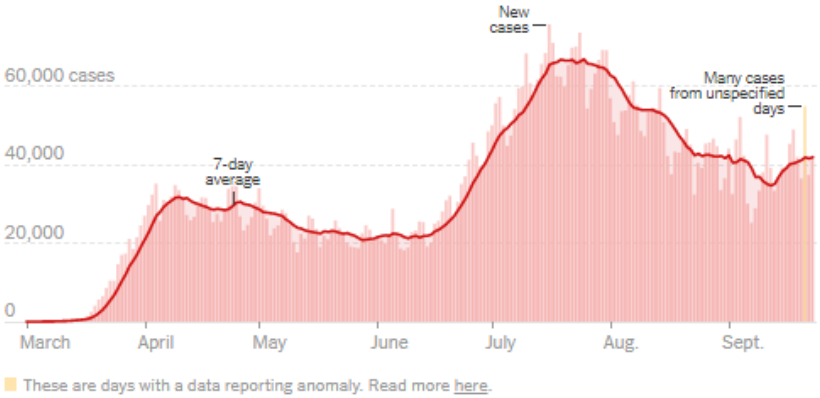
DISCLOSURES: NO FINANCIAL COI. INVESTIGATOR ON ABBVIE AND MODERNA STUDIES. PRE-PRINT FINDINGS AND INVESTIGATIONAL USE MAY BE DISCUSSED.

7-DAY AVERAGE OF DAILY NEW REPORTED CASES PER 100K





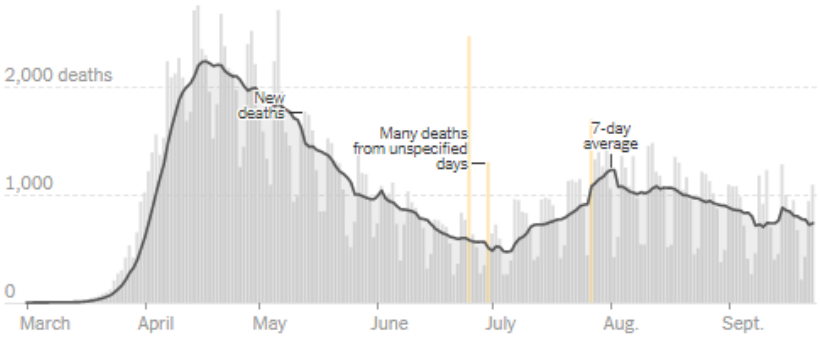
New reported cases by day in the United States



These are days with a data reporting anomaly. Read more here.

Note: The seven-day average is the average of a day and the previous six days of data.

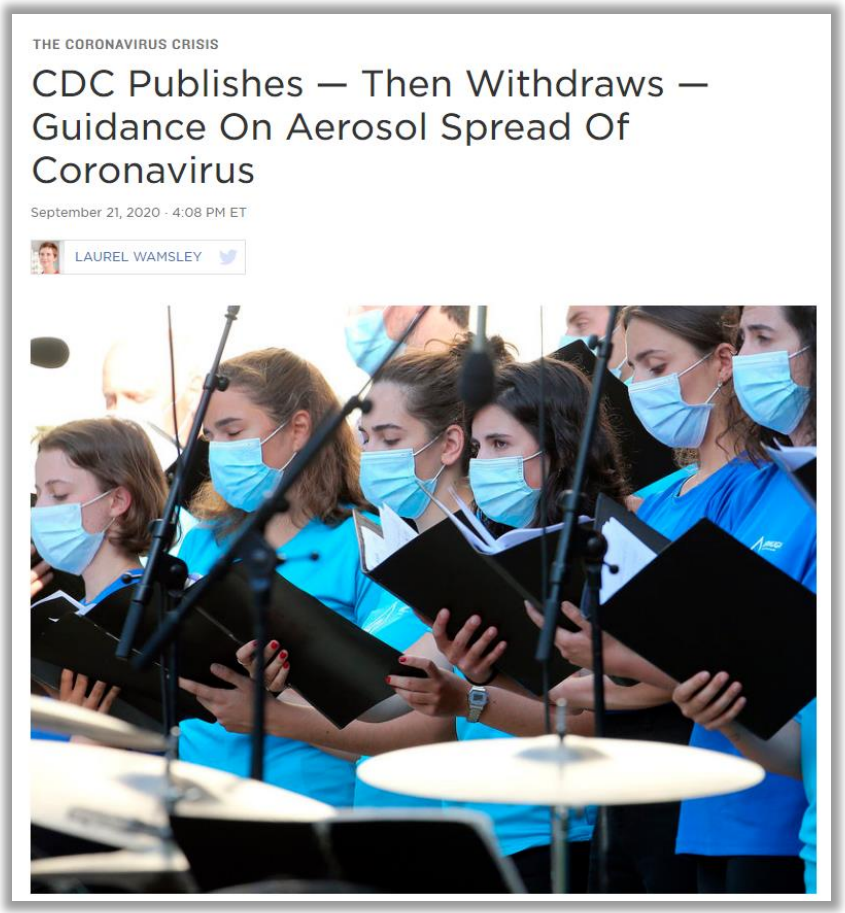
New reported deaths by day in the United States



These are days with a data reporting anomaly. Read more here.

https://www.washingtonpost.com/graphics/local/dc-maryland-virginia-coronavirus-cases/
https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html
https://globalepidemics.org/key-metrics-for-covid-suppression/

Airborne Transmission



THE CORONAVIRUS CRISIS

CDC Publishes — Then Withdraws — Guidance On Aerosol Spread Of Coronavirus

September 21, 2020 · 4:08 PM ET

LAUREL WAMSLEY

HOME > NEWS

A Maine wedding is linked to 147 coronavirus cases and 3 deaths. Infections spilled over into a jail and 2 nursing homes.

Aria Bendix
Sep 5, 2020, 3:31 PM

National Institute of Allergy and Infectious Diseases; Samantha Lee/Insider

https://www.npr.org/sections/coronavirus-live-updates/2020/09/21/915351325/cdc-publishes-then-withdraws-guidance-on-aerosol-spread-of-coronavirus

Airborne Transmission

Morbidity and Mortality Weekly Report (*MMWR*)

High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice — Skagit County, Washington, March 2020

ACCEPTED MANUSCRIPT

Outbreak of COVID-19 in a nursing home associated with aerosol transmission as a result of inadequate ventilation FREE

Peter de Man ✉, Sunita Paltansing, David S Y Ong, Norbert Vaessen, Gerard van Nielen, Johannes G M Koeleman

Clinical Infectious Diseases, ciaa1270, https://doi.org/10.1093/cid/ciaa1270

Published: 28 August 2020 **Article history** ▾

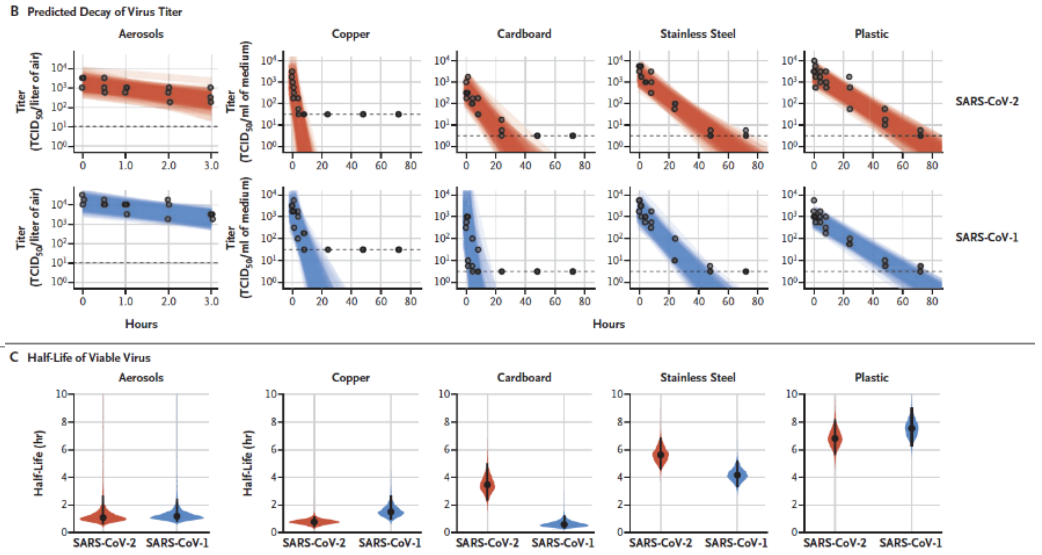
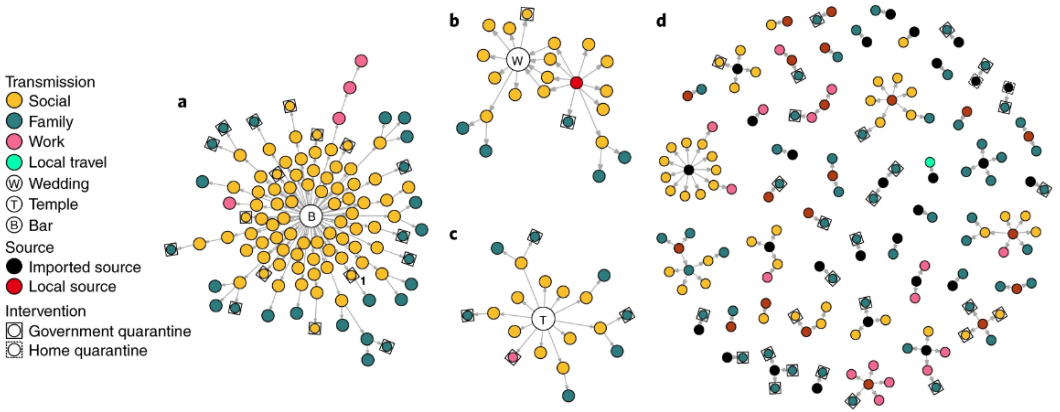


Fig. 2: Chains of SARS-CoV-2 transmission in Hong Kong initiated by local or imported cases.

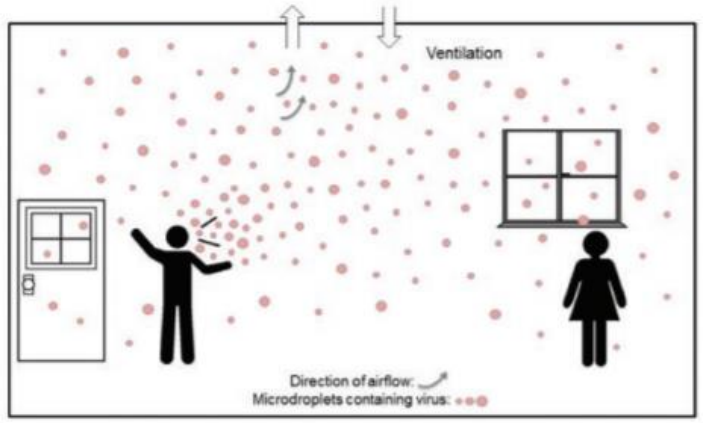
From: Clustering and superspreading potential of SARS-CoV-2 infections in Hong Kong

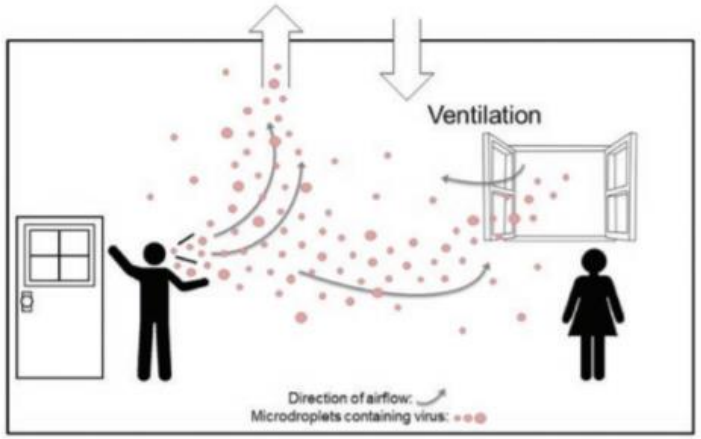


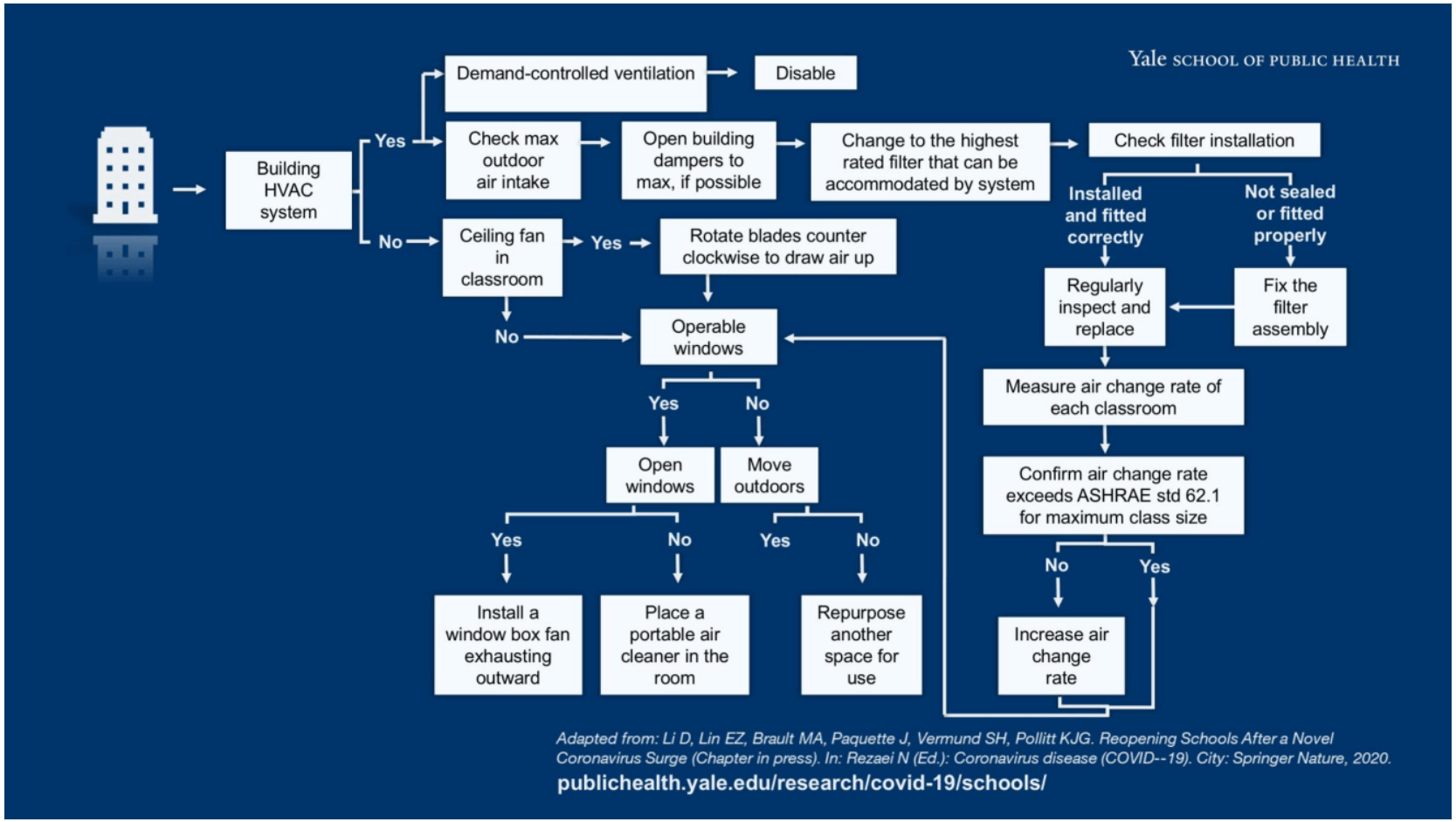
a, Transmission network of the 'bar and band' cluster of undetermined source ($n = 106$). **b**, Transmission network associated with a wedding without clear infector–infectee pairs but linked back to a preceding social gathering and local source ($n = 22$). **c**, Transmission network associated with a temple cluster of undetermined source ($n = 19$). **d**, All other clusters of SARS-CoV-2 infections where the source and transmission chain could be determined.

Van Doremalen, Bushmaker, & Doris. NEJM. March 2020
Adam et al. Nature Medicine. Sept 2020

Transmission of SARS-CoV-2







Morawska & Milton. Clin Infect Dis. 2020

https://publichealth.yale.edu/research/covid-19/schools/ventilation/

Risk Factors for Infection

MARYLAND

- Clipman et al., **"Rapid real-time tracking of non-pharmaceutical interventions and their association SARS-CoV-2 positivity: The COVID-19 Pandemic Pulse Study."** *Clin Infect Dis* 2020. PMID: 32766598.
- 1,030 individuals in Maryland in 06/2020 surveyed on non-pharmacologic intervention (NPI) adoption, access to SARS-CoV-2 testing, and self-reported SARS-CoV-2 positivity
- SARS-CoV-2 infection was negatively associated with **strict social distancing** (aOR: 0.10; 95% CI: 0.03-0.33)
- After adjusting for strict social distancing and demographics, only **public transport use** (aOR for ≥7 times vs. never: 4.29) and **visiting a place of worship** (aOR for ≥3 times vs. never: 16.0) remained significantly associated with SARS-CoV-2 infection

MASSACHUSETTS

- Figueroa et al., **"Community-Level Factors Associated With Racial And Ethnic Disparities In COVID-19 Rates In Massachusetts."** *Health Affairs* 2020. PMID: 32853056.
- Cross-sectional study of 351 municipalities in 01—05/2020
- Independent predictors of higher COVID-19 rates in the Latino/a population included the proportion of foreign-born non-citizens living in a community, mean household size, and share of food service workers.
- The association between the Black population and COVID-19 rates may be explained by other systemic inequities
- Efforts that **improve care for foreign born non-citizens**, **address crowded housing**, and **protect food-service workers** may help mitigate the spread of COVID-19 among minority communities

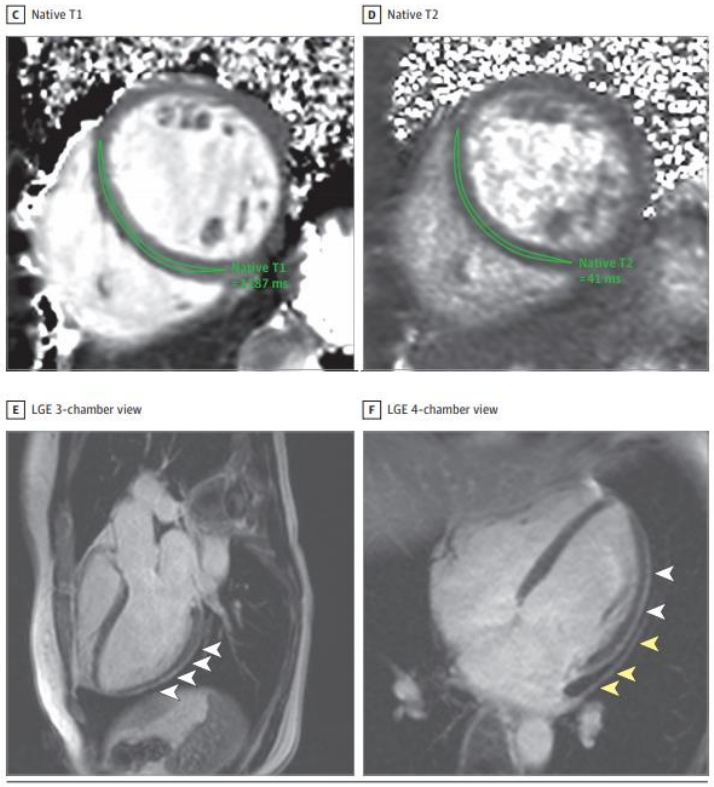
Myocarditis in COVID-19

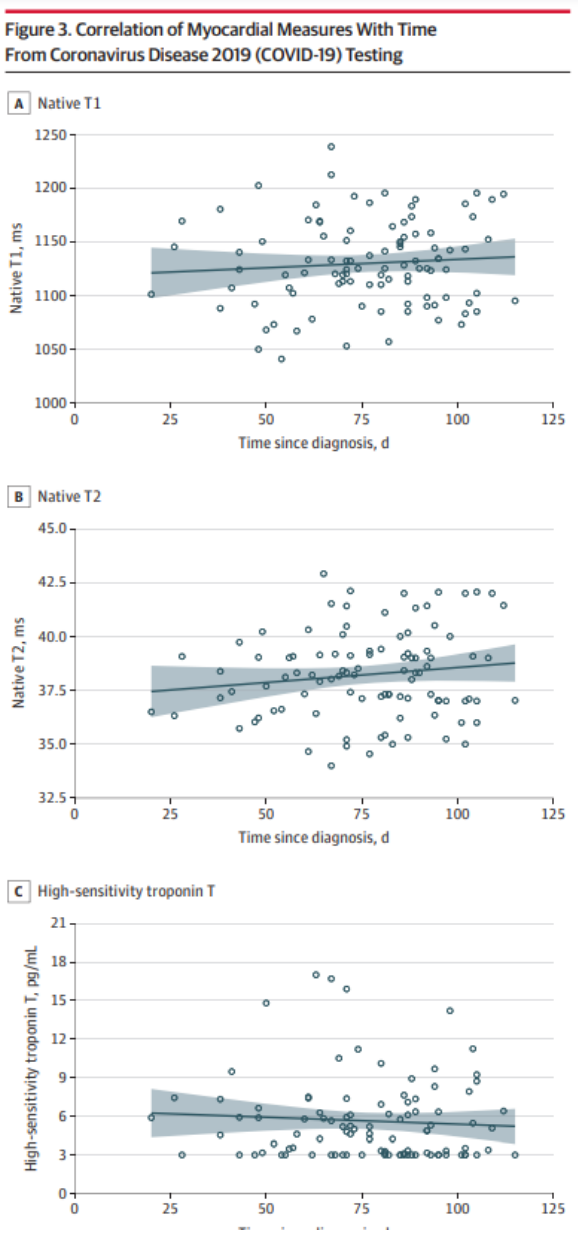
JAMA Cardiology | Original Investigation

Outcomes of Cardiovascular Magnetic Resonance Imaging in Patients Recently Recovered From Coronavirus Disease 2019 (COVID-19)

Valentina O. Puntmann, MD, PhD; M. Ludovica Carerj, MD; Imke Wieters, MD; Masia Fahim; Christophe Arendt, MD; Jedrzej Hoffmann, MD; Anastasia Shchendrygina, MD, PhD; Felicitas Escher, MD; Mariuca Vasa-Nicotera, MD; Andreas M. Zeiher, MD; Maria Vehreschild, MD; Eike Nagel, MD

- Frankfurt, Germany, Spring 2020
- 100 patients recently recovered from COVID-19
- Mean age 49 ± 14 y, 53% M, 33% hospitalized
- CMR revealed cardiac involvement in 78 patients (78%) and ongoing myocardial inflammation in 60 patients (60%), **independent of preexisting conditions, severity and overall course of the acute illness, and time from the original diagnosis.** Only 7% w/ fulminant myocarditis.





Myocarditis in COVID-19

Research Letter ONLINE FIRST FREE

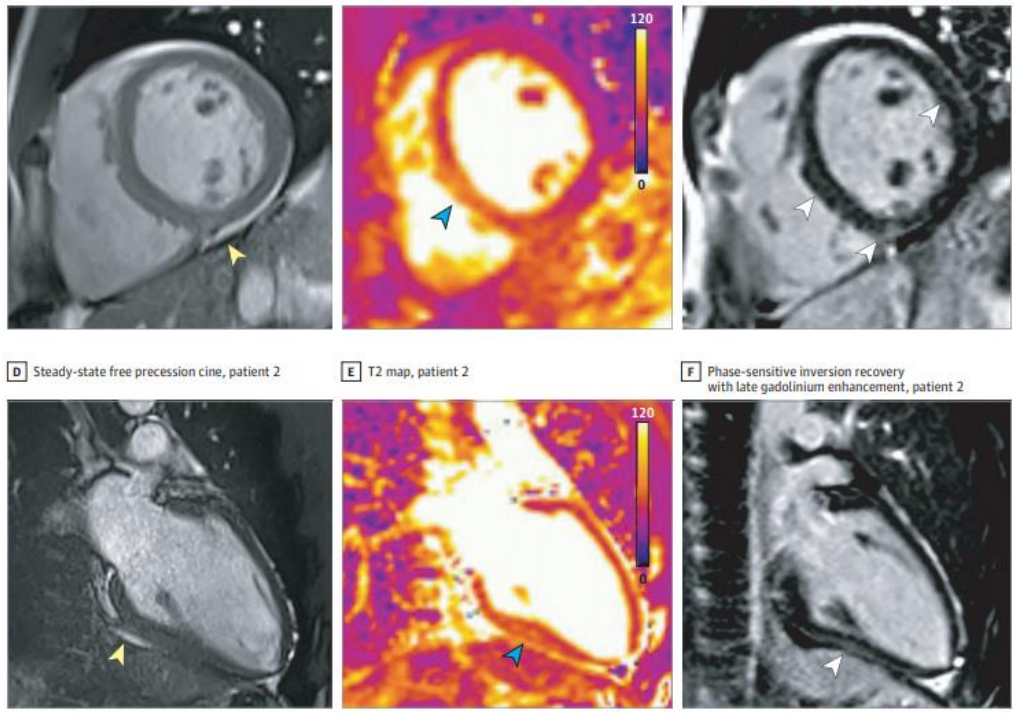
September 11, 2020

Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From COVID-19 Infection

Saurabh Rajpal, MBBS, MD[1]; Matthew S. Tong, DO[1]; James Borchers, MD, MPH[1]; et al

- Ohio State University, June-August 2020
- Sports medicine clinic, no hospitalizations
- N = 26, mean age 19.5 ± 1.5 y, 58% M
- No diagnostic ST/T changes on ECG, no trop-I elevations
- Ventricular volumes, function WNL in all by TTE and cMRI
- 4 athletes (15%, all M) had cMRI findings c/w myocarditis, including 2 with pericardial effusion. 2 were asymptomatic

Figure. Cardiovascular Magnetic Resonance Findings in Competitive Athletes Recovering From Coronavirus Disease 2019 Infection



A, Cine mid short-axis images showing pericardial effusion indicated by yellow arrowhead. B, T2 map with color overlay mid short-axis showing myocardial edema (elevated T2, 61 milliseconds) indicated by blue arrowhead. C, Short-axis view showing late gadolinium enhancement in the mid inferoseptum, right ventricular insertion point, and mid anterolateral wall indicated by white arrowheads. D, Cine 2-chamber long-axis view showing pericardial effusion indicated by yellow arrowhead. E, T2 map with color overlay myocardial edema (elevated T2, 58 milliseconds) indicated by blue arrowhead. F, Right 2-chamber long-axis view showing epicardial late gadolinium enhancement in the inferior wall indicated by white arrowhead.

Myocardial Damage

SARS-CoV-2 infection of human iPSC-derived cardiac cells predicts novel cytopathic features in hearts of COVID-19 patients

Juan A. Pérez-Bermejo, Serah Kang, Sarah J. Rockwood, Camille R. Simoneau, David A. Joy, Gokul N. Ramadoss, Ana C. Silva, Will R. Flanigan, Huihui Li, Ken Nakamura, Jeffrey D.Whitman, Melanie Ott, Bruce R. Conklin, Todd C. McDevitt

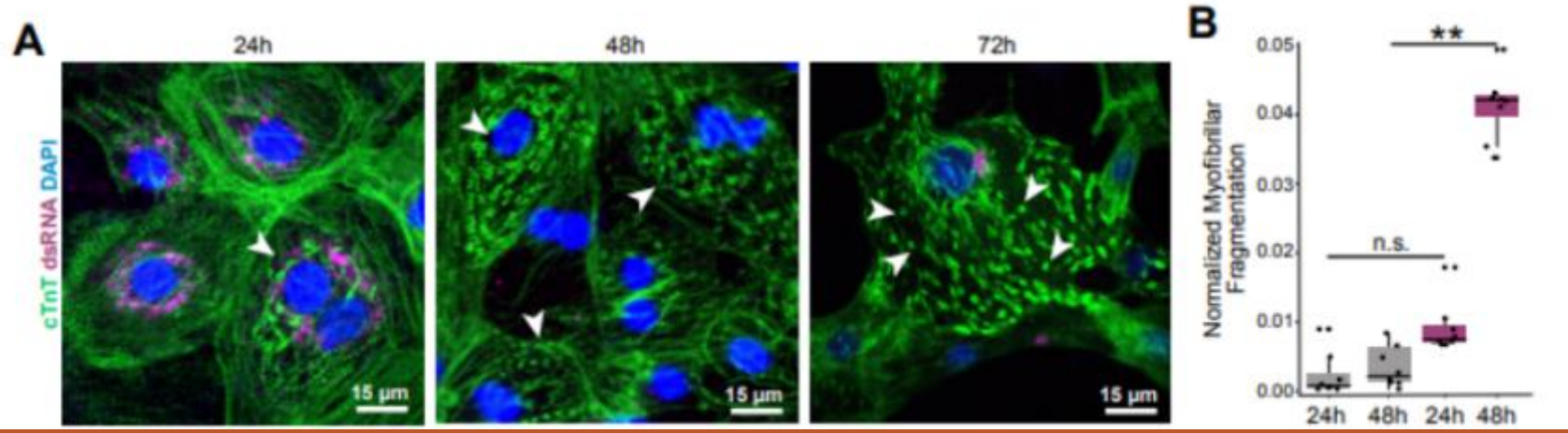
doi: https://doi.org/10.1101/2020.08.25.265561

This article is a preprint and has not been certified by peer review [what does this mean?].

- COVID-19 causes cardiac dysfunction in up to 25% of patients
- Exposure of human iPSC-derived heart cells to SARS-CoV-2 revealed productive infection and robust transcriptomic and morphological signatures of damage, particularly in cardiomyocytes
- Transcriptome signatures revealed disruption of structural proteins with myofibrillar fragmentation
- Human autopsy specimens from COVID19 patients displayed similar disruption

(A) Cardiomyocytes after exposure to SARS-CoV-2

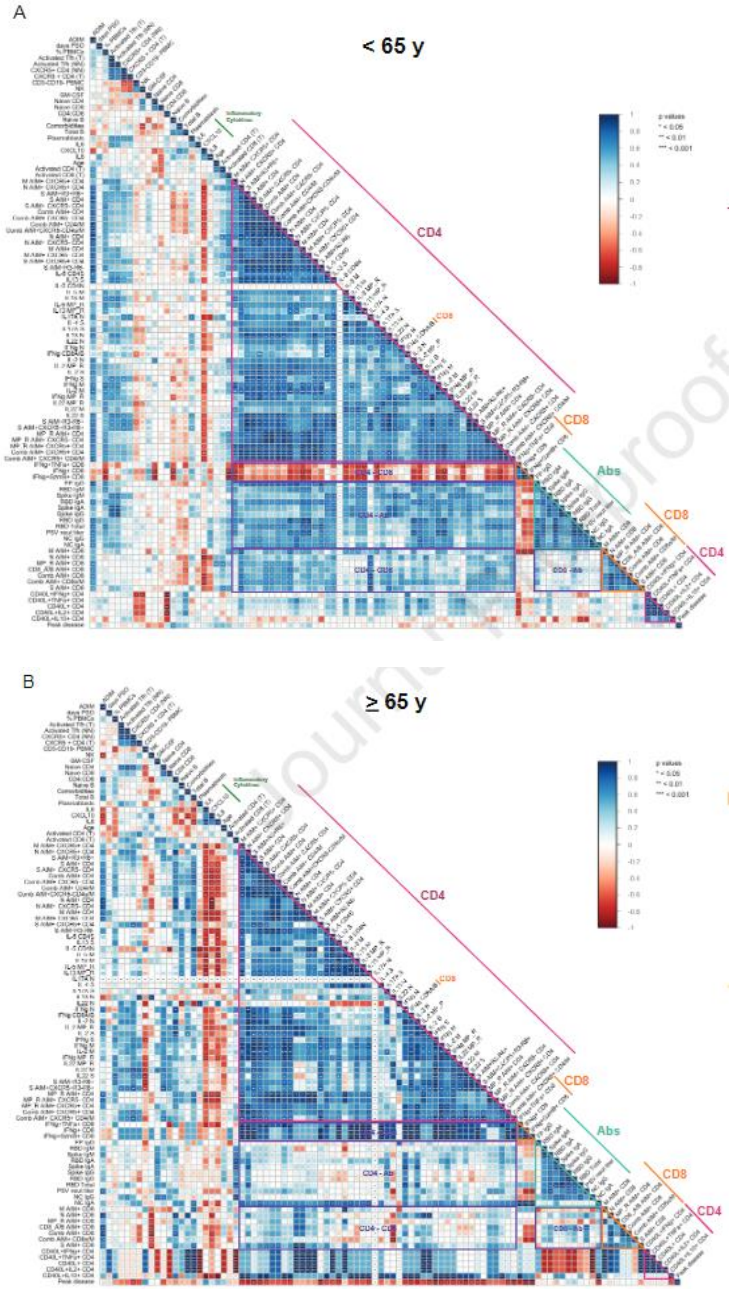
(B) Concentration of myofibril fragments



bioRxiv
THE PREPRINT SERVER FOR BIOLOGY

Adaptive Immune Response to SARS-CoV-2 and Age

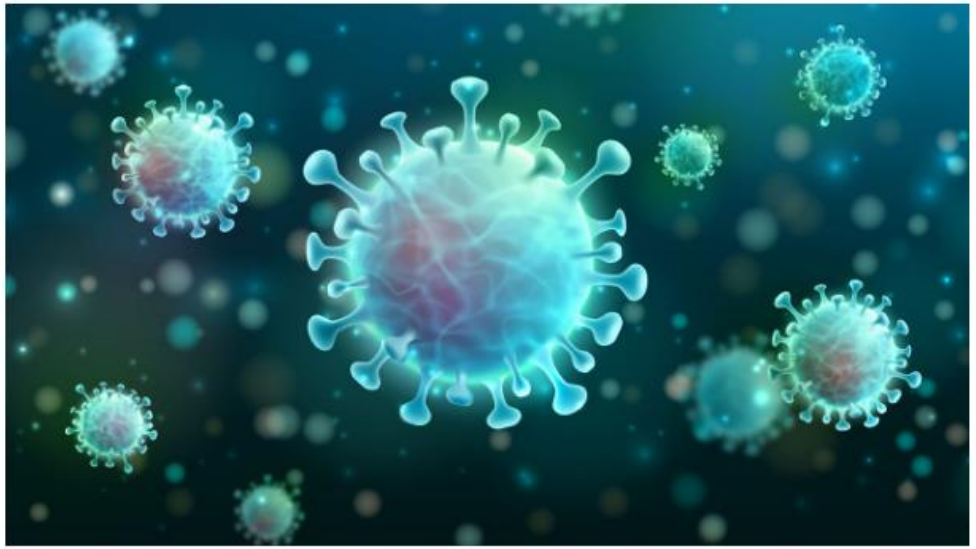
- La Jolla Institute of Immunology, CA
- Adaptive immune response in 24 people whose COVID-19 symptoms ranged from mild to fatal
- Coordinated SARS-CoV-2-specific adaptive immune responses were associated with milder disease, suggesting roles for both CD4+ and CD8+ T cells in protective immunity in COVID-19
- Notably, coordination of SARS-CoV-2 antigen-specific responses was disrupted in individuals >65 years old
- Scarcity of naive T cells was also associated with ageing and poor disease outcomes
- "A parsimonious explanation is that coordinated CD4+ T cell, CD8+ T cell, and antibody responses are protective, but **uncoordinated responses frequently fail to control disease, with a connection between ageing and impaired adaptive immune responses to SARS-CoV-2**"



Moderbacher et al. *Cell*, Sept 2020

Monoclonal Antibody

- LY-CoV555: mAb based on nAb from convalescent plasma
- Ambulatory patients with mild or moderate symptoms, tested positive for SARS-CoV-2 within previous 3 days
- 5/302 (1.7%) patients in intervention arm were hospitalized – vs. 9/150 (6%) in placebo arm
- Relative risk reduction (RRR): 72%
  Absolute risk reduction (ARR): 4.3%
  NNT: 23
- No serious side effects reported
- Formal data analysis forthcoming



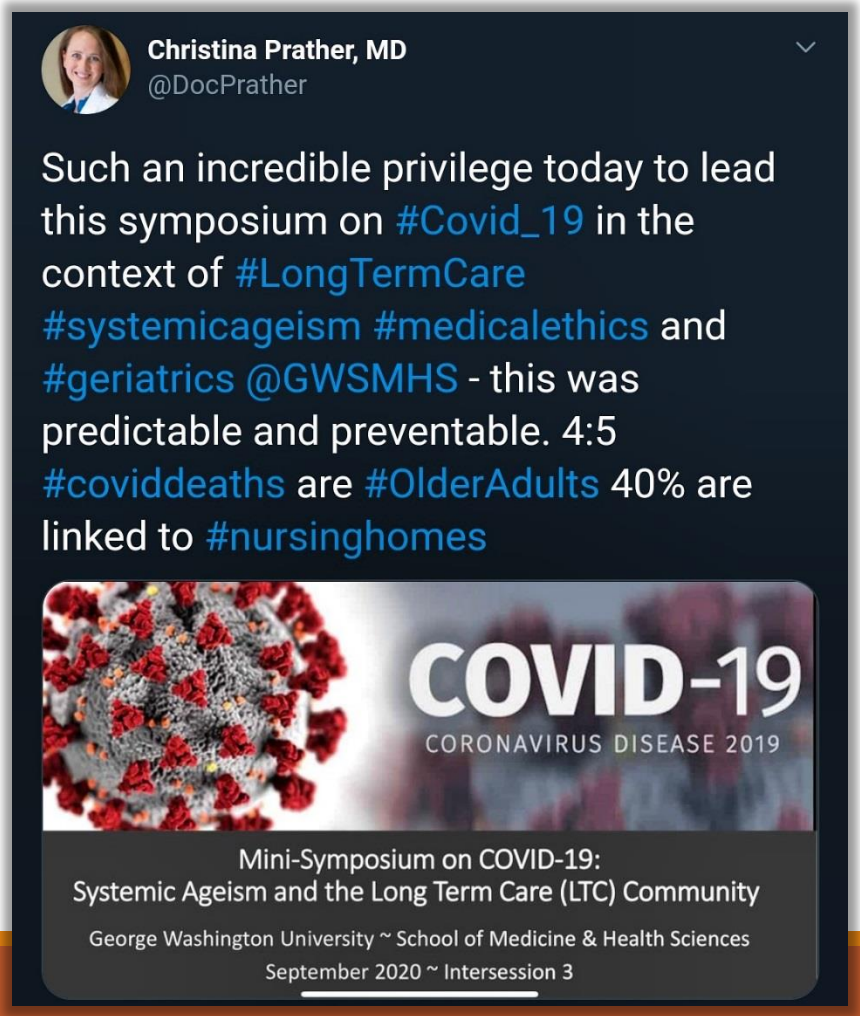
Researchers have high hopes for monoclonal antibodies' power in fighting the novel coronavirus.
FOTOMAY/ISTOCKPHOTO

Eli Lilly reports promising first results for an antibody against COVID-19

By Meredith Wadman | Sep. 16, 2020 , 11:15 AM

https://www.sciencemag.org/news/2020/09/eli-lilly-reports-first-promising-results-antibody-against-covid-19;
https://globalrph.com/medcalcs/number-needed-to-treat-nnt-calculator/

GW Updates


Christina Prather, MD
@DocPrather
Such an incredible privilege today to lead this symposium on #Covid_19 in the context of #LongTermCare #systemicageism #medicalethics and #geriatrics @GWSMHS - this was predictable and preventable. 4:5 #coviddeaths are #OlderAdults 40% are linked to #nursinghomes
COVID-19
CORONAVIRUS DISEASE 2019
Mini-Symposium on COVID-19:
Systemic Ageism and the Long Term Care (LTC) Community
George Washington University ~ School of Medicine & Health Sciences
September 2020 ~ Intersession 3

Arthritis Rheumatol. 2020 Aug 2;10.1002/art.41469. doi: 10.1002/art.41469. Online ahead of print.
Antirheumatic Disease Therapies for the Treatment of COVID-19: A Systematic Review and Meta-analysis
Michael Putman [1], Yu Pei Eugenia Chock [2], Herman Tam [3], Alfred H J Kim [4], Sebastian E Sattui [5], Francis Berenbaum [6], Maria I Danila [7], Peter Korsten [8], Catalina Sanchez-Alvarez [9], Jeffrey A Sparks [10], Laura C Coates [11], Candace Palmerlee [12], Andrea Peirce [13], Arundathi Jayatilleke [14], Sindhu R Johnson [15], Adam Kilian [16], Jean Liew [17], Larry J Prokop [18], M Hassan Murad [19], Rebecca Grainger [20], Zachary S Wallace [21], Alí Duarte-García [22], COVID-19 Global Rheumatology Alliance
Affiliations + expand
PMID: 32741139 PMCID: PMC7435536 DOI: 10.1002/art.41469
Free PMC article
FULL TEXT LINKS
WILEY Full Text Article
PMC FREE Full text
ACTIONS
Cite
Favorites
SHARE