LEADING MEDICINE: A TOWN HALL CONVERSATION WITH DR. MARC BOOM

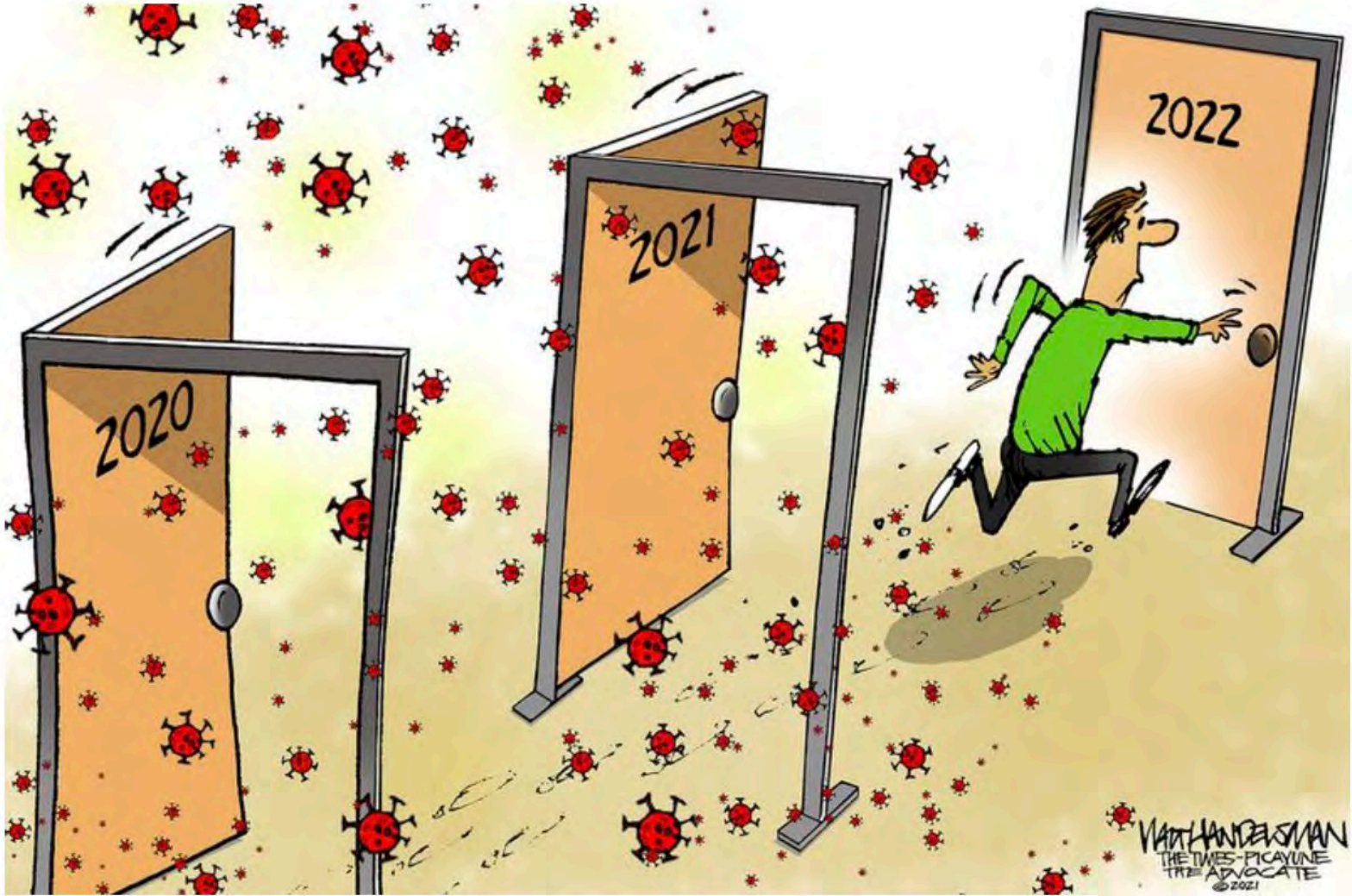
Town Hall Conversation XXI

We will begin at 10 a.m.

Houston Methodist Update

Marc L. Boom, MD
January 27, 2022

HOUSTON Methodist
LEADING MEDICINE


2020
2021
2022
MATT HANDELSMAN
THE TIMES-PICAYUNE
THE ADVOCATE
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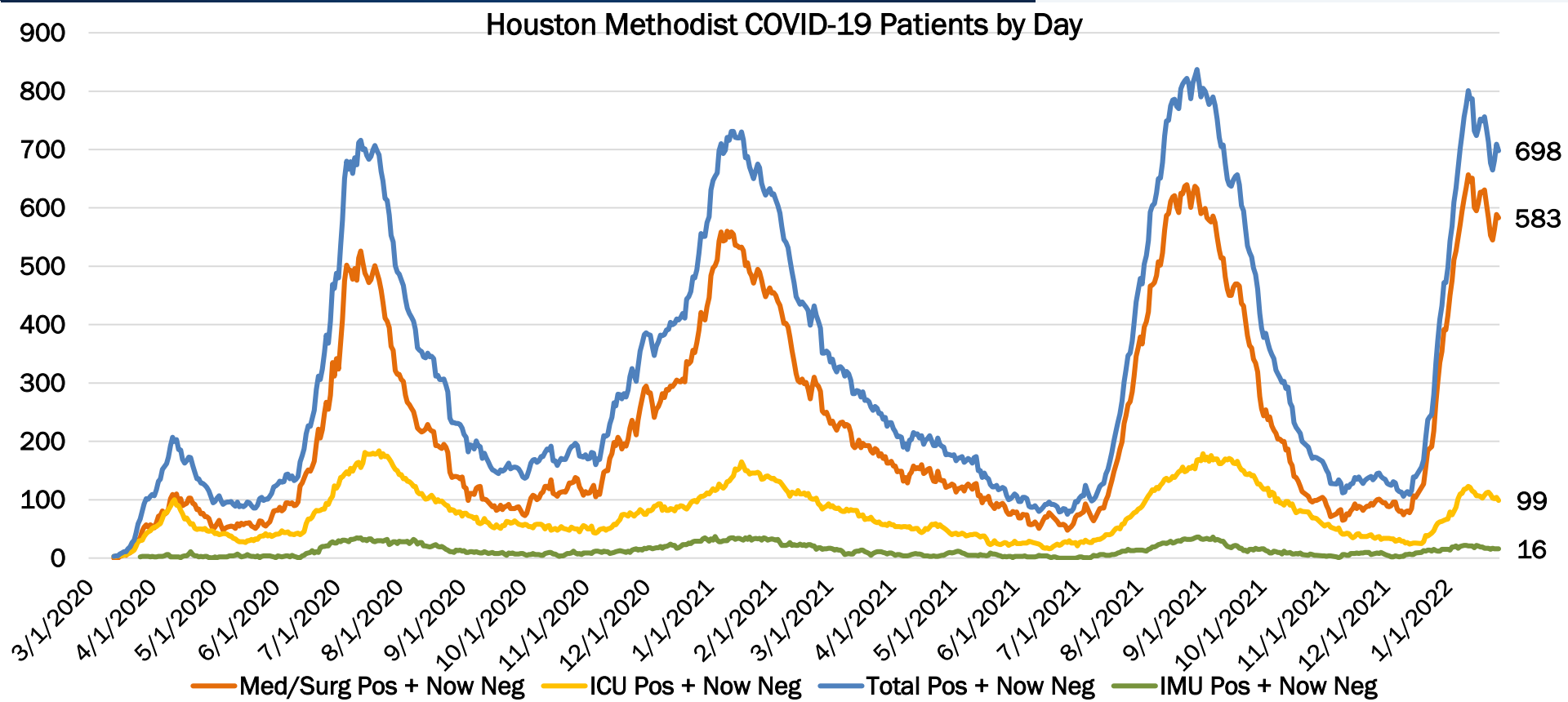
Houston Methodist COVID-19 Cases By Day



Data as of January 26, 2022

COVID-19 Viral Load Detected in City of Houston Wastewater

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HOUSTON

January 17, 2022

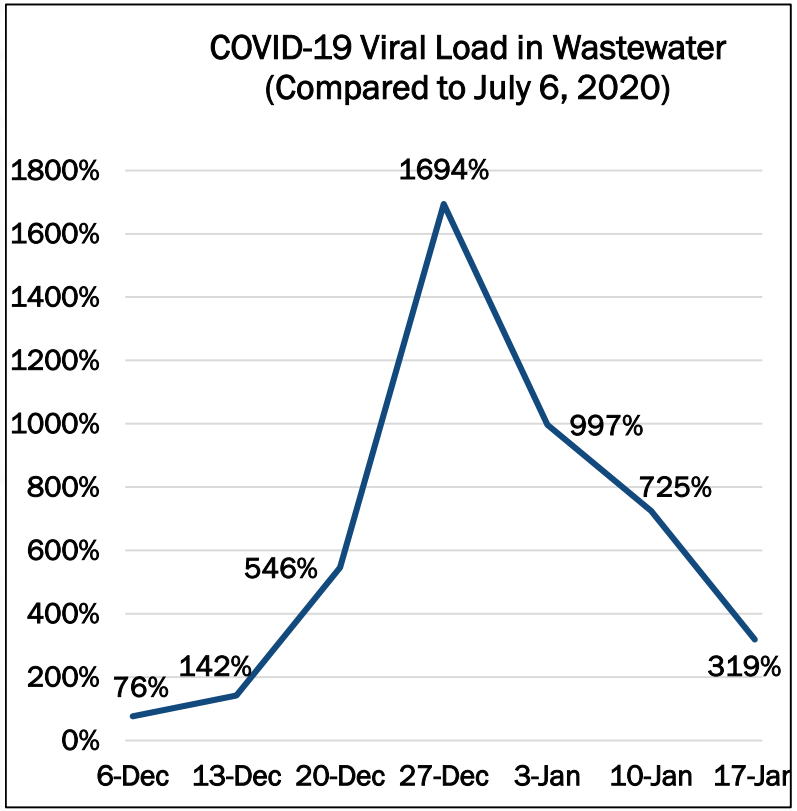
Viral Load:

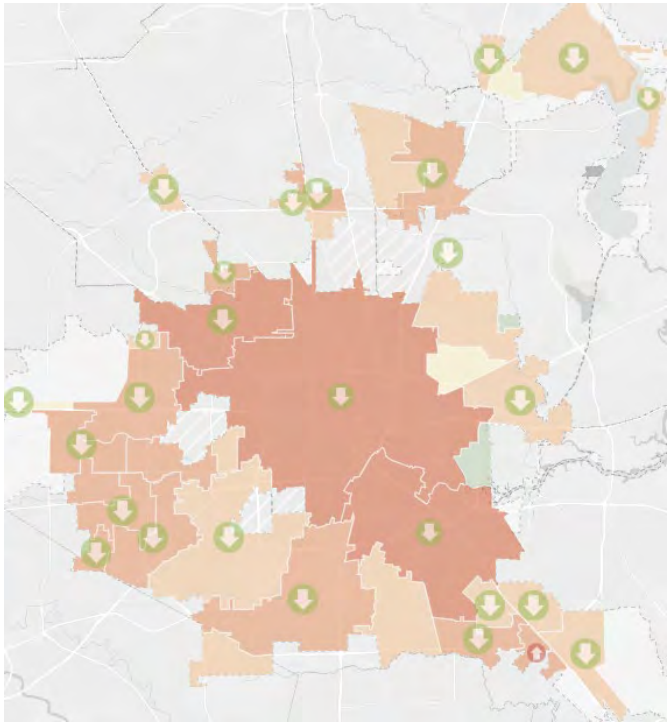
319%

In comparison to July 6, 2020

Positivity Rate:

28%





https://covidwwtp.spatialstudieslab.org/

Comparison of Omicron Surge with Delta Surge

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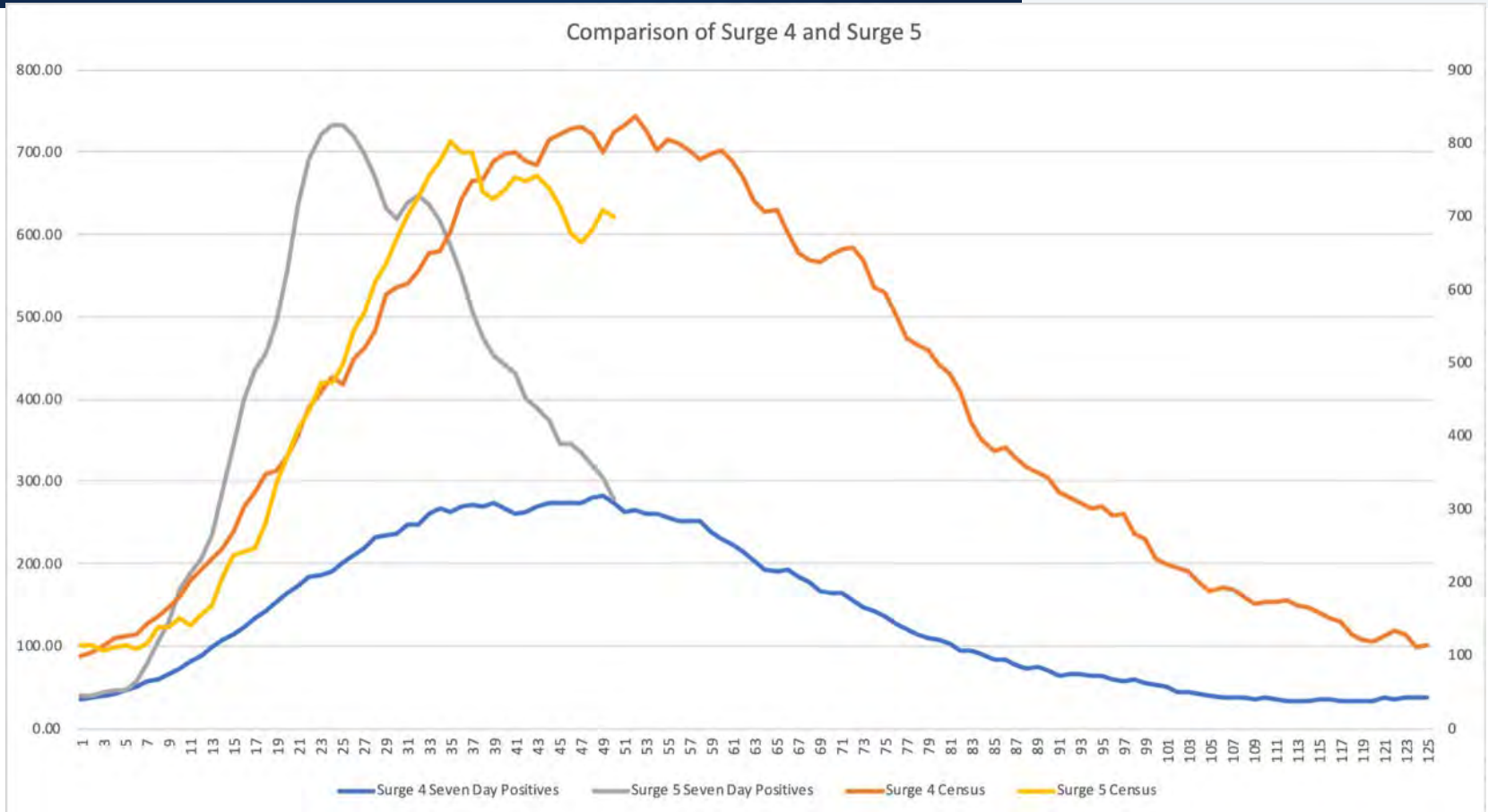
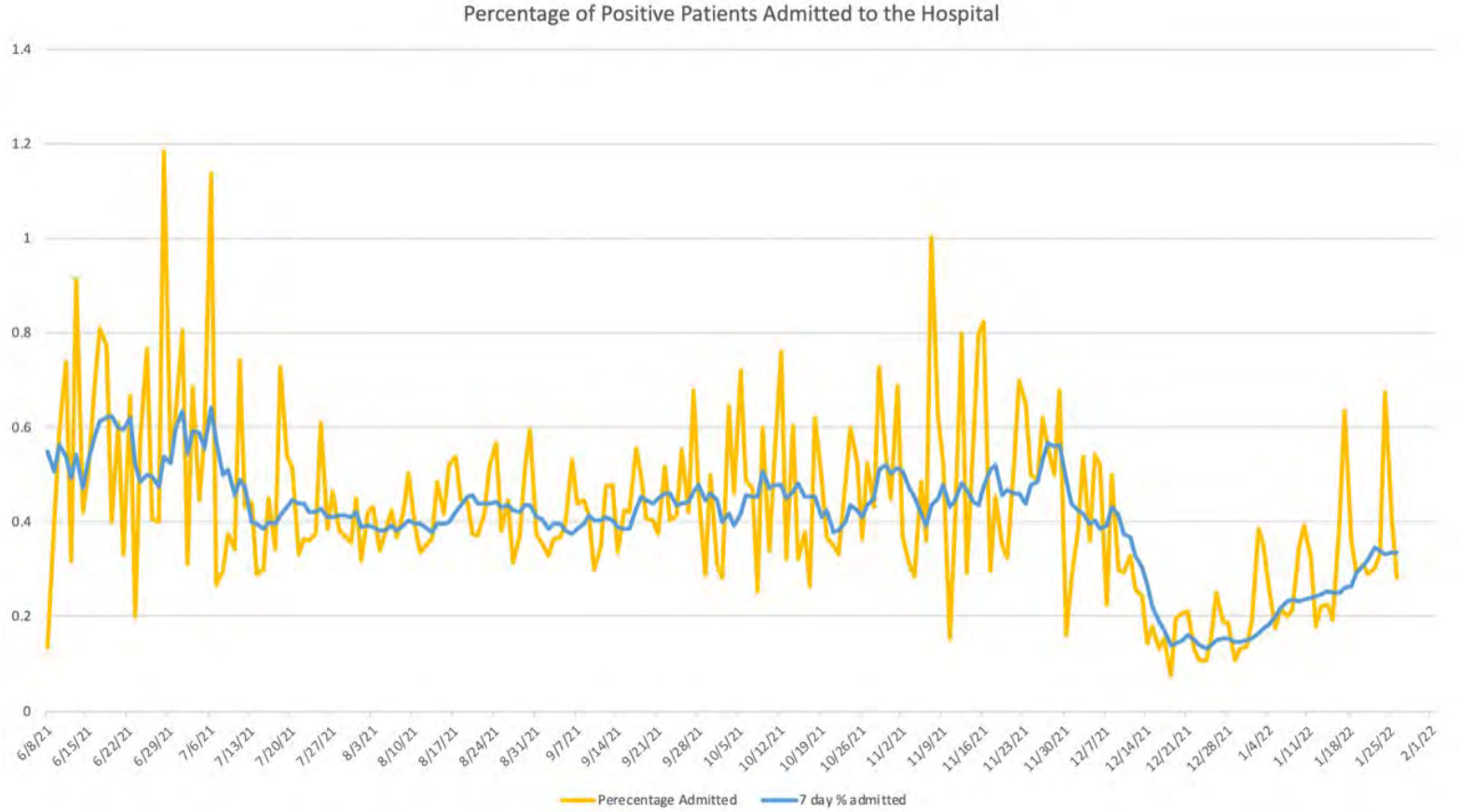


COVID-19 Key Statistics: Percent of Positive Patients Admitted to the Hospital



Incidental COVID-19 Admissions

The Washington Post

Health

In the nation's hospitals, this covid wave is different

Sabrina Stewart, an intensive care unit nurse, prepares to enter a covid-19 patient's room Jan. 4 at Western Reserve Hospital in Cuyahoga Falls, Ohio. (Shannon Stapleton/Reuters)

By Dan Diamond, Fenit Nirappil and Dan Keating

January 6, 2022 at 5:36 p.m. EST

The number of Americans hospitalized with covid-19 reached more than 126,000 this week — the highest level in a year. But this wave of the

Houston Methodist internal data suggest that 32% to 40% of the COVID-19 hospitalizations in the Omicron Surge (Surge 5) are incidental (patient admitted for something else and discover diagnosis upon pre-admission testing).

Incidental Admissions from COVID-19 Higher with Omicron

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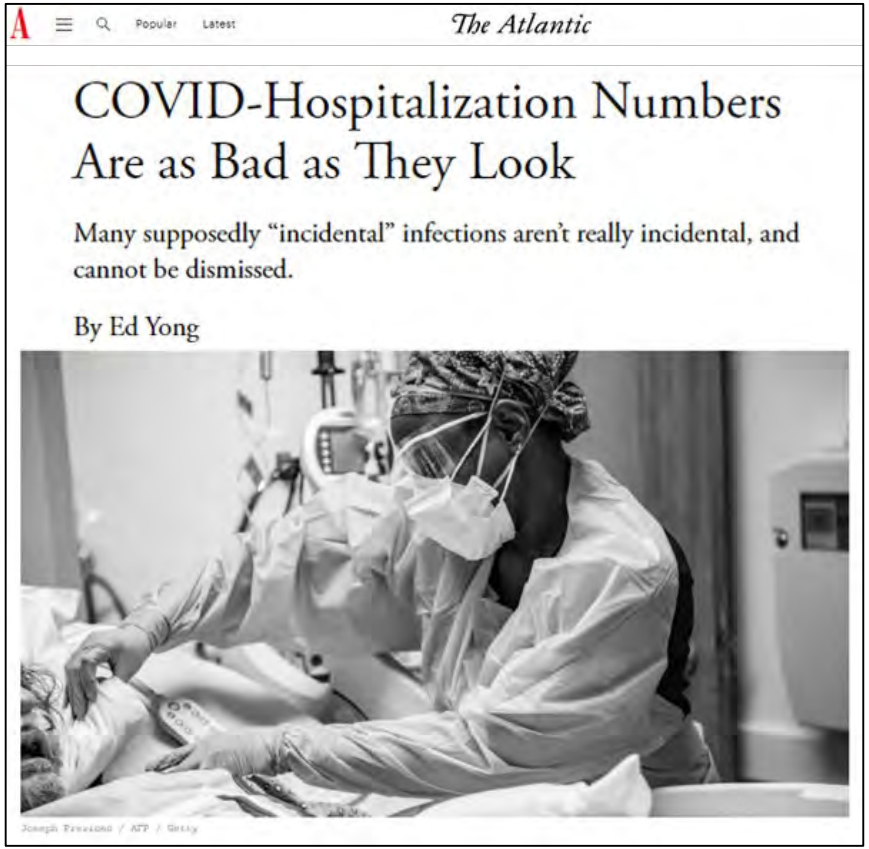

Popular Latest

The Atlantic

COVID-Hospitalization Numbers Are as Bad as They Look

Many supposedly "incidental" infections aren't really incidental, and cannot be dismissed.

By Ed Yong

- More Americans are now hospitalized with COVID-19 than at any previous point in the pandemic.
- Proportion of COVID-19 admissions that are "Incidental":
  - 33% at UC San Francisco
  - 50% of Jackson Health System in Florida

"These 'incidental' infections are not so incidental for people with chronic conditions. Colds and other viral infections can also land people in the hospital by pushing their chronic diseases over the edge."

https://www.theatlantic.com/health/archive/2022/01/for-covid-with-covid-hospitals-are-mess-either-way/621229/

Severity Assessment is Difficult

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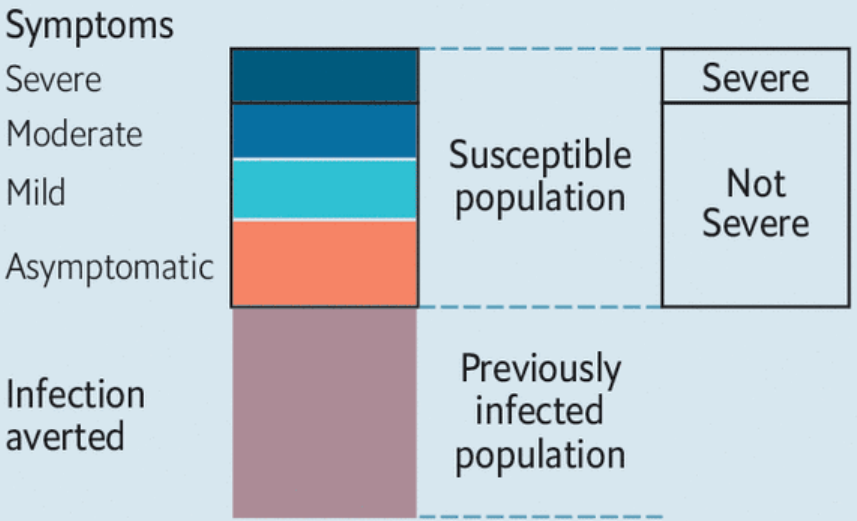
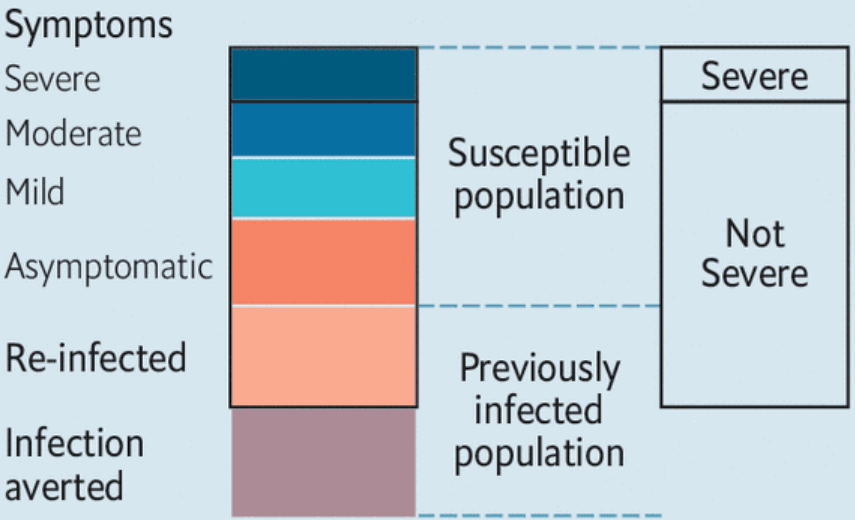
Selection effects

Covid-19 infections by severity and re-infection capacity, illustrative example

Variant with little capacity for re-infection



Variant with high capacity for re-infection



"Omicron's success at reinfecting people may give the impression a smaller fraction gets severely ill just by inflating the denominator. It could thus seem more benign even if, among those contracting covid for the first time, it were just as dangerous as Delta."

https://www.economist.com/weeklyedition/2021-12-18

Omicron Severity: Early Results

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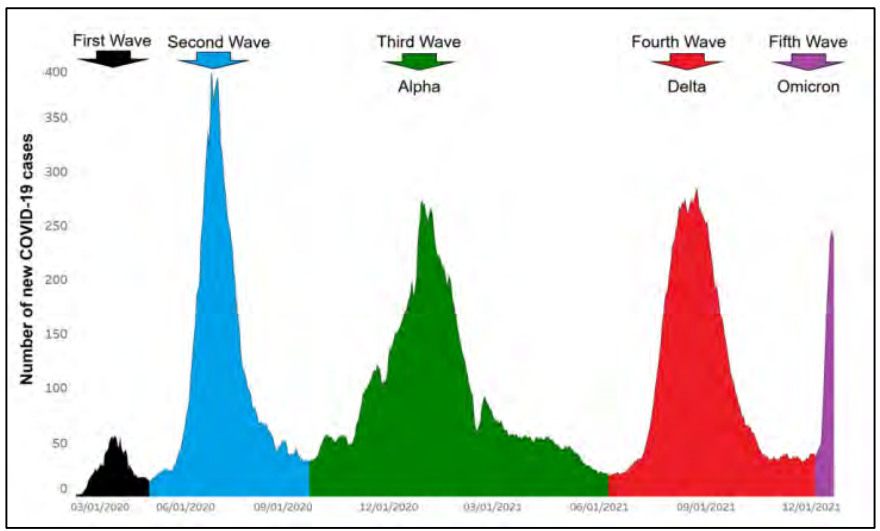
Early signals of significantly increased vaccine breakthrough, decreased hospitalization rates, and less severe disease in patients with COVID-19 caused by the Omicron variant of SARS-CoV-2 in Houston, Texas

Paul A. Christensen, Randall J. Olsen, S. Wesley Long, Richard Snehal, James J. Davis, Matthew Ojeda Saavedra, Kristina Reppond, Madison N. Shyer, Jessica Cambric, Ryan Gadd, Rashi M. Thakur, Akanksha Batajoo, Regan Mangham, Sindy Pena, Trina Trinh, Jacob C. Kinskey, Guy Williams, Robert Olson, Jimmy Gollihar, James M. Musser

doi: https://doi.org/10.1101/2021.12.30.21268560



- Omicron very rapidly increased in only three weeks to cause 90% of all new Covid-19 cases.
- Compared to patients infected with either Alpha or Delta variants at HM, Omicron patients were:
  - Significantly younger;
  - Significantly increased vaccine breakthrough rates;
  - Significantly less likely to be hospitalized;
  - Required less intense respiratory support; and
  - Had a shorter length of hospital stay, consistent with decreased disease severity

https://www.medrxiv.org/content/10.1101/2021.12.30.21268560v2.full.pdf+html

Omicron Severity: Early Results

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	Omicron Variant	Delta Variant	Total	Statistical Analysis
No. (%) with data	4,468 (58.7%)	3,149 (41.3%)	7,617	
Median Age	44.3	50.0	47.2	P<0.0001 Mann-Whitney
Admitted	884 (19.8%)	1,719 (54.6%)	2,603 (34.2%)	P<0.0001 Fisher's exact test OR: 0.205 (95%CI: 0.185-0.227)
Median LOS (Days)	3.2	5.1	4.7	P<0.0001 Mann-Whitney
Max Respiratory Support				
ECMO	1 (0.1%)	7 (0.4%)	8 (0.3%)	P<0.0001 Chi-square
Mechanical Ventilation	49 (5.5%)	144 (8.4%)	193 (7.4%)	
Non-Invasive Ventilation	63 (7.1%)	163 (9.5%)	226 (8.7%)	
High Flow Oxygen	72 (8.1%)	364 (21.2%)	436 (16.7%)	
Low Flow Oxygen	314 (35.5%)	722 (42.0%)	1,036 (39.8%)	
Mortality	38 (0.9%)	170 (5.4%)	208 (2.7%)	P<0.0001 Fisher's exact test OR: 0.150 (95%CI: 0.105-0.214)
Vaccine Status – No Vaccine	1,971 (44.1%)	3,048 (96.8%)	5,019 (65.9%)	P<0.0001 Fisher's exact test OR: 0.150 (95%CI: 31.008-47.017)

https://www.medrxiv.org/content/10.1101/2021.12.30.21268560v2.full.pdf+html

Clinical Outcomes Among Patients Infected with Omicron in S. California

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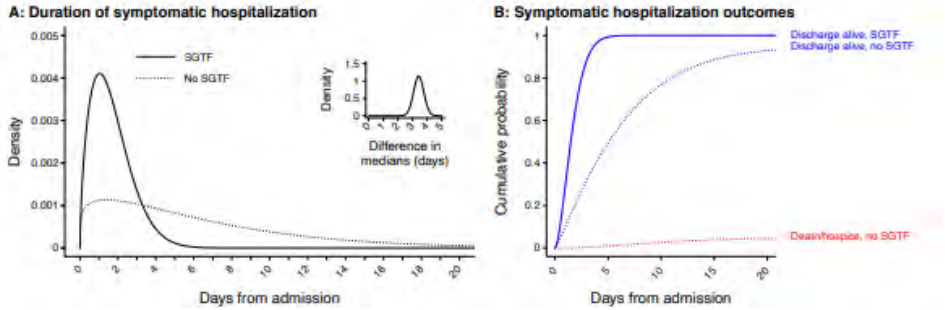

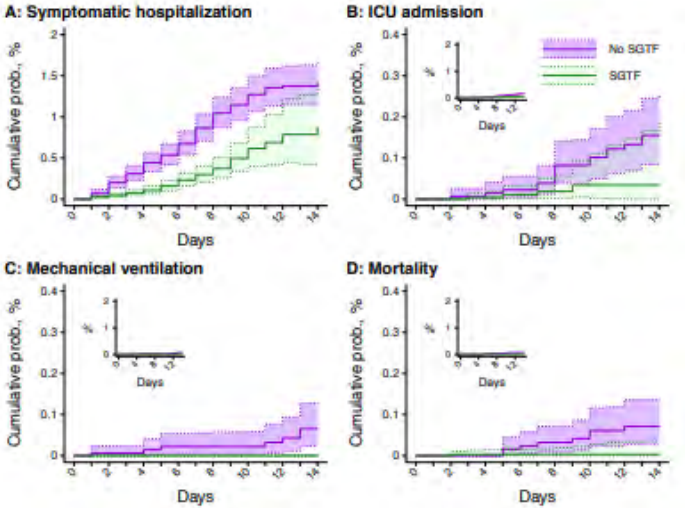

Outcome	Case population[1]	Hazard ratio (95% CI)	
		Unadjusted	Adjusted
Any hospital admission			
	Cases tested in outpatient settings	0.32 (0.25, 0.42)	0.48 (0.36, 0.64)
	All cases	0.57 (0.47, 0.69)	0.72 (0.58, 0.88)
Symptomatic hospital admission			
	Cases tested in outpatient settings	0.31 (0.24, 0.41)	0.47 (0.35, 0.62)
	All cases	0.47 (0.38, 0.58)	0.62 (0.49, 0.77)
ICU admission[2]			
	Cases tested in outpatient settings	0.26 (0.10, 0.73)	--
	All cases	0.34 (0.14, 0.84)	--
Mechanical ventilation[3]			
	Cases tested in outpatient settings	--	--
	All cases	--	--
Death[2]			
	Cases tested in outpatient settings	0.09 (0.01, 0.75)	--
	All cases	0.09 (0.01, 0.75)	--

https://www.medrxiv.org/content/10.1101/2022.01.11.22269045v1.full.pdf

Trends in Disease Severity and Health Care Utilization During the Early Omicron Variant Period Compared with Previous SARS-CoV-2 High Transmission Periods

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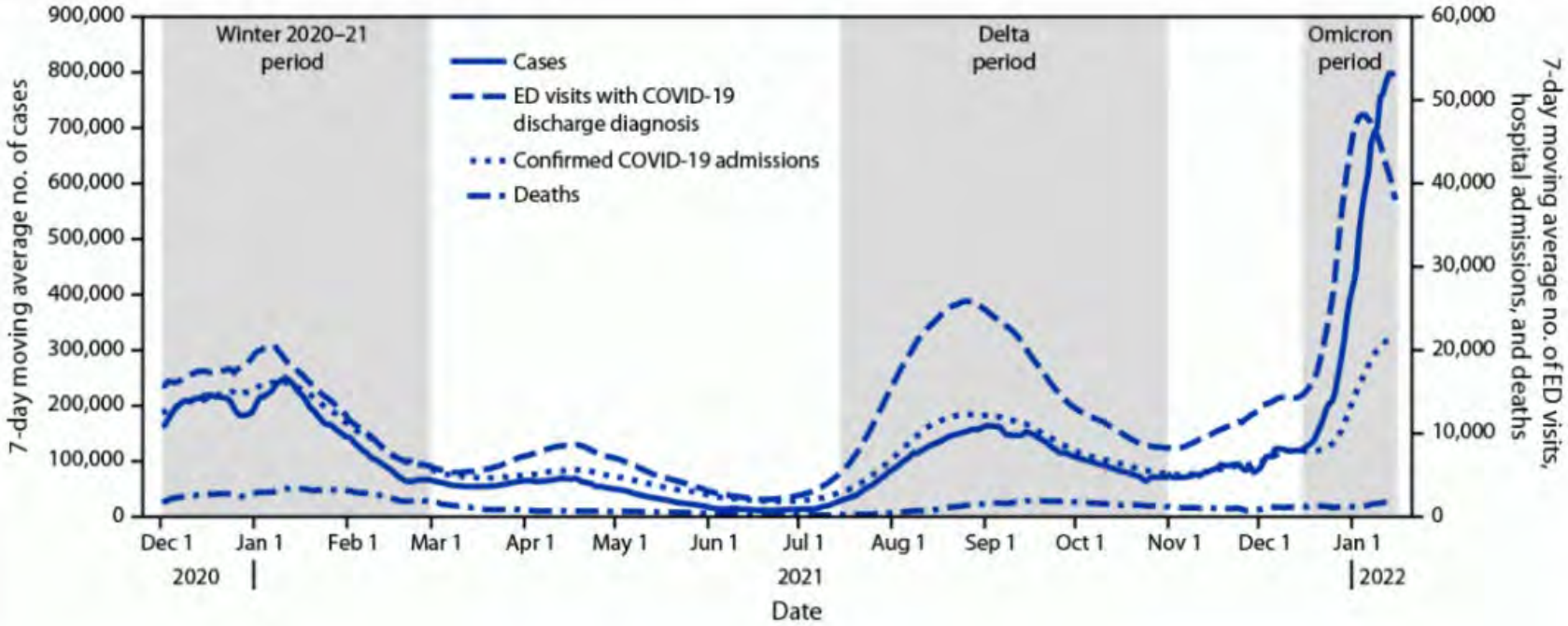
FIGURE. Seven-day moving average number of COVID-19 cases, emergency department visits, hospital admissions, and deaths — United States,* December 1, 2020–January 15, 2022



https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e4.htm

Trends in Disease Severity and Health Care Utilization During the Early Omicron Variant Period Compared with Previous SARS-CoV-2 High Transmission Periods

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	Winter 2020-21 Peak 7 Day Average	Delta Period Peak 7 Day Average	Omicron Period Peak 7 Day Average	Omicron vs. Winter 2020-21 Period Peak 7 Day Average	Omicron vs. Winter Delta Period Peak 7 Day Average
Cases	250,335	164,249	798,976	+219.2%	+386.4%
Admissions	16,497	12,285	21,586	+30.8%	+75.7%
Deaths	3,422	1,924	1,854	-45.8%	-3.6%
Hospitalized as % of Total Hospitalizations	12.0%	9.4%	12.9%	+8.2%	+37.5%
ICU Admission	18.2%	17.5%	13.0%	-28.8%	-25.9%
In-Hospital Death Rate	12.9%	12.3%	7.1%	-44.9%	-42.3%
Mean LOS	8.0	7.6	5.5	-31%	-26.8%

https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e4.htm

Omicron May Be Milder, But It Is Still Straining Hospitals

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Kaiser's analysis found that for every 10,000 cases of Covid-19 detected outside of a hospital, 110 of those with the Delta variant had symptoms and ended up in the hospital. For those with the Omicron variant, only 16 were hospitalized.

https://www.wsj.com/articles/why-omicrons-milder-infections-are-straining-u-s-hospitals-11642761012

Omicron May Be Milder, But It Is Still Straining Hospitals

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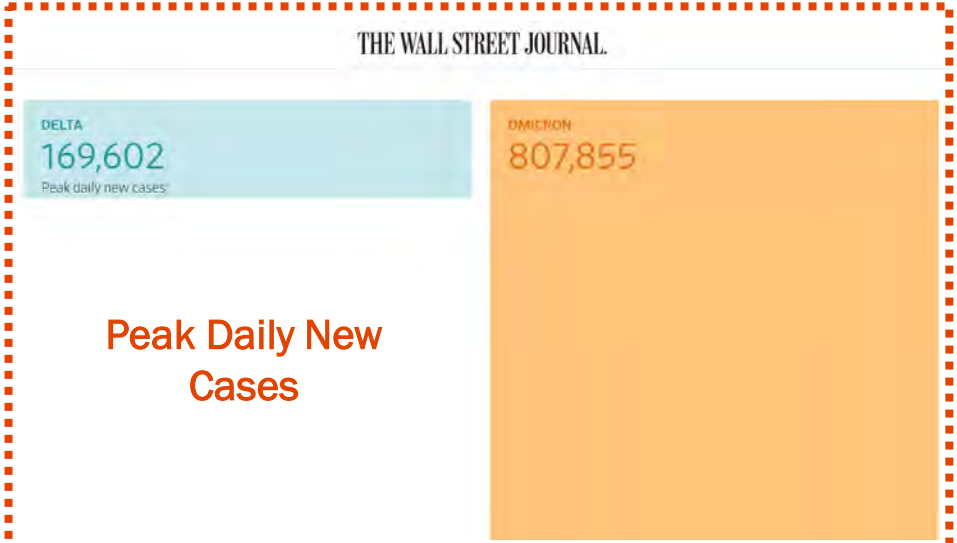
Symptomatic Hospitalizations per 10,000 Cases

Kaiser's analysis found that for every 10,000 cases of Covid-19 detected outside of a hospital, 110 of those with the Delta variant had symptoms and ended up in the hospital. For those with the Omicron variant, only 16 were hospitalized.



Peak Daily New Cases

But Omicron is estimated to be about three to five times more contagious than Delta. Consequently, the number of people infected is many times greater than during the Delta peak in late summer of 2021.

https://www.wsj.com/articles/why-omicrons-milder-infections-are-straining-u-s-hospitals-11642761012

Omicron May Be Milder, But It Is Still Straining Hospitals

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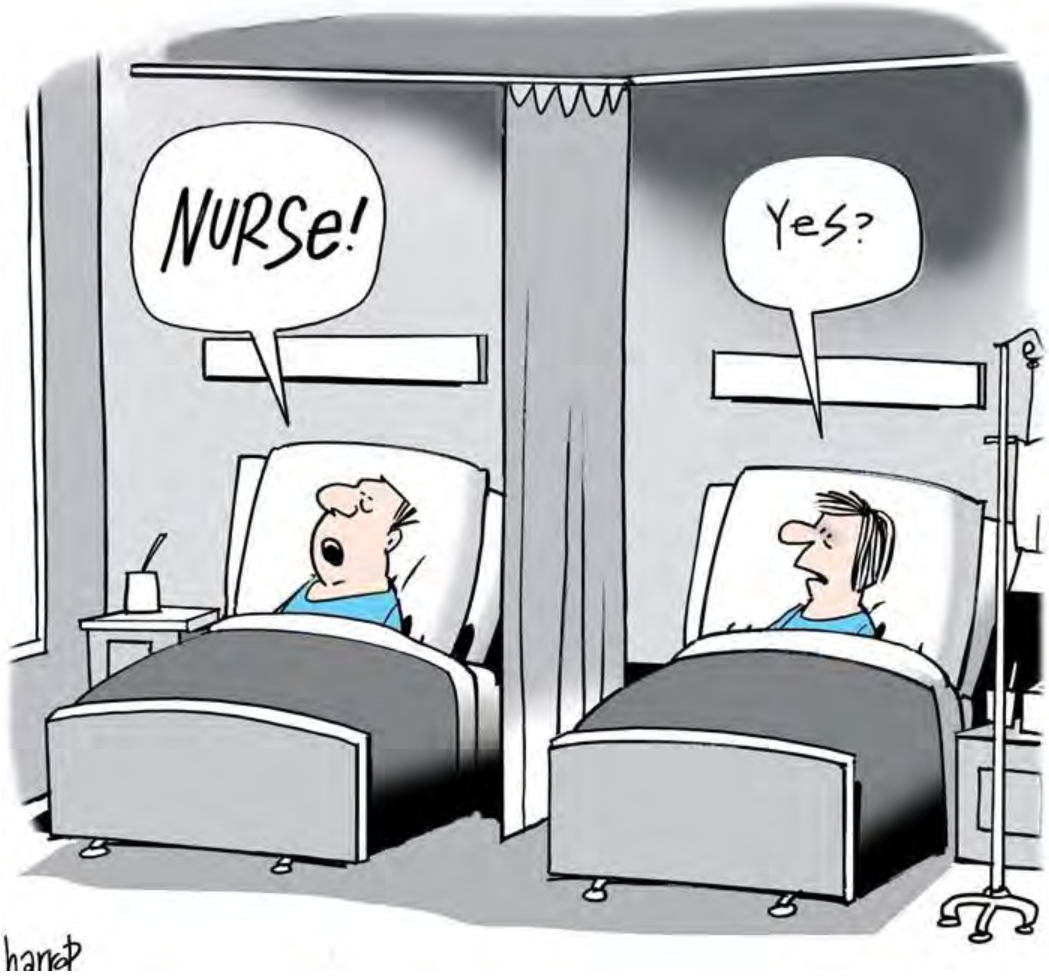
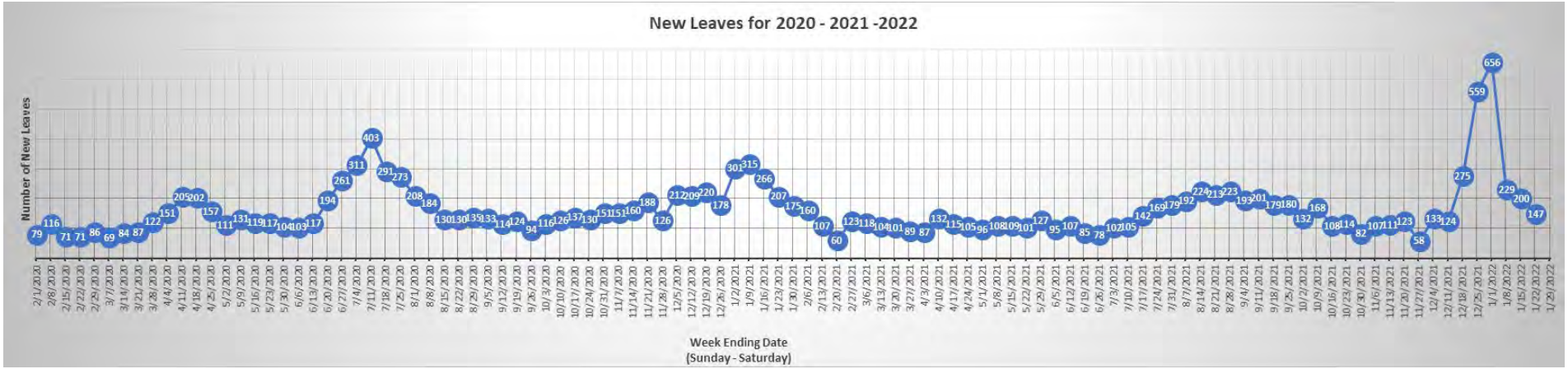
So even though Omicron is less likely to result in severe disease, the sheer scale of infections means the raw number of hospitalizations now exceeds the peak number when Delta was dominant.

https://www.wsj.com/articles/why-omicrons-milder-infections-are-straining-u-s-hospitals-11642761012


NURSE!
Yes?
harrop

New Employee Leaves



SHENEMAN THE STAR-LEDGER

You must never confuse faith that you will prevail in the end—which you can never afford to lose—with the discipline to confront the most brutal facts of your current reality, whatever they might be.

– Admiral Jim Stockdale
the highest-ranking U.S. officer
held prisoner during the Vietnam War

COVID-19 Key Statistics: Deaths vs. Admissions Trend

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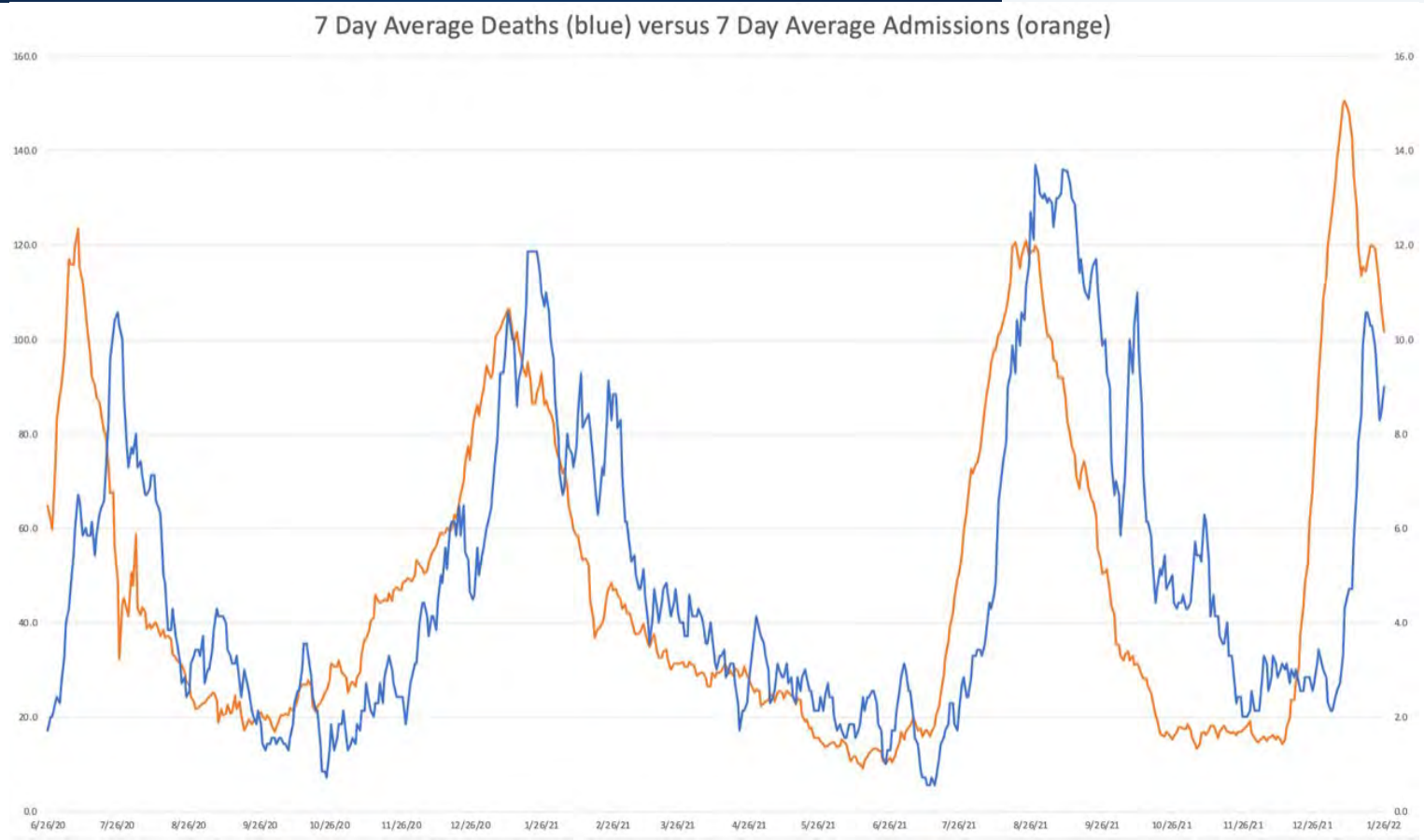

Cumulative Confirmed COVID-19 Deaths per Million People by Country

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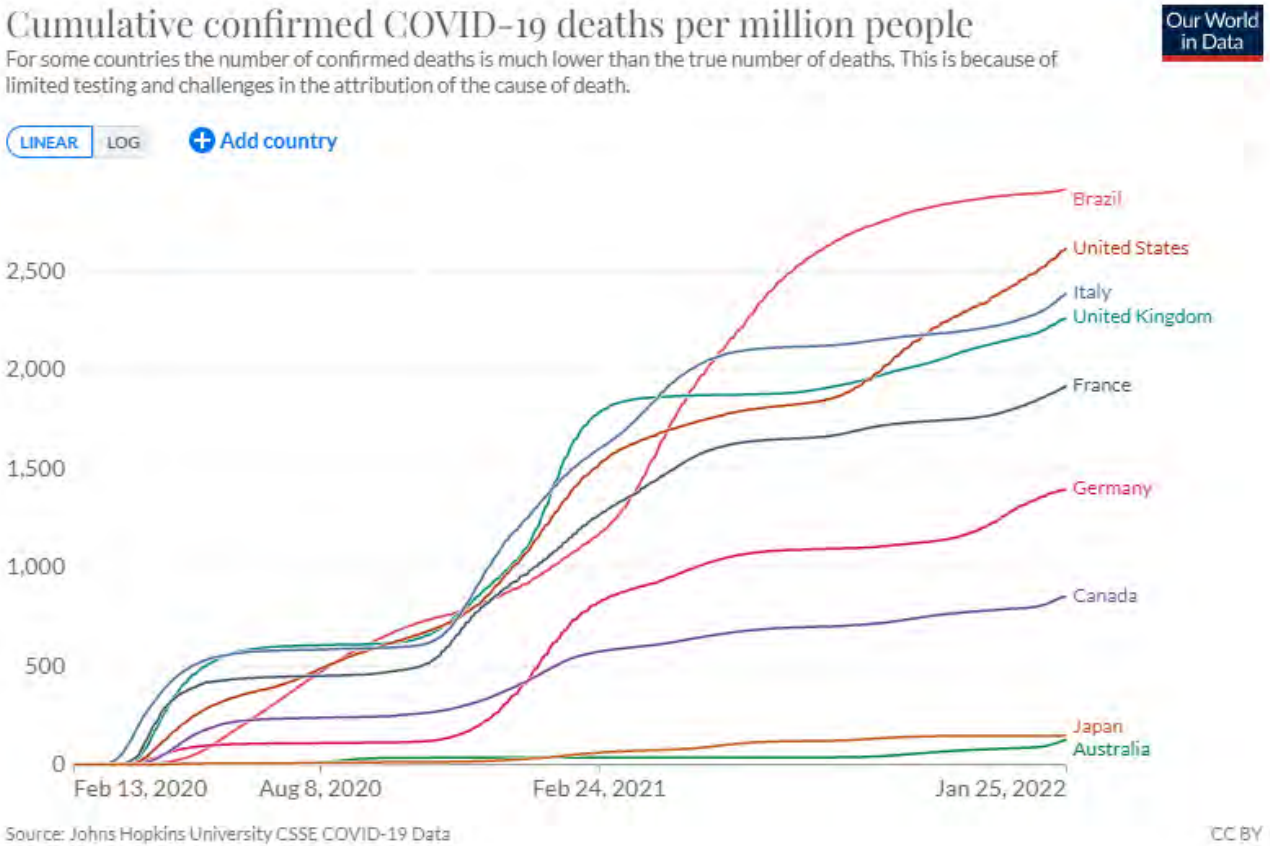
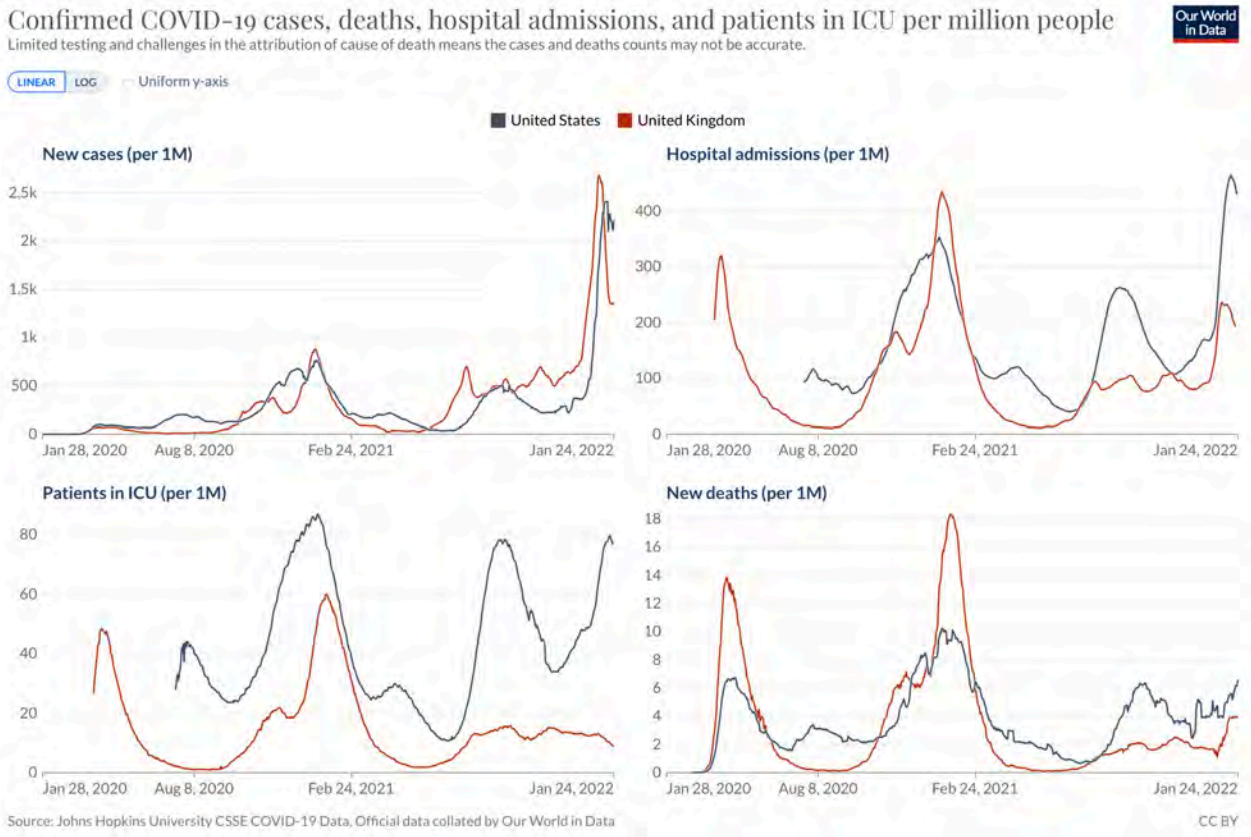


https://ourworldindata.org/covid-deaths

Very Different Experience in the UK versus the US



https://ourworldindata.org/covid-cases

WHY?????

A Partial List of Possible Explanations

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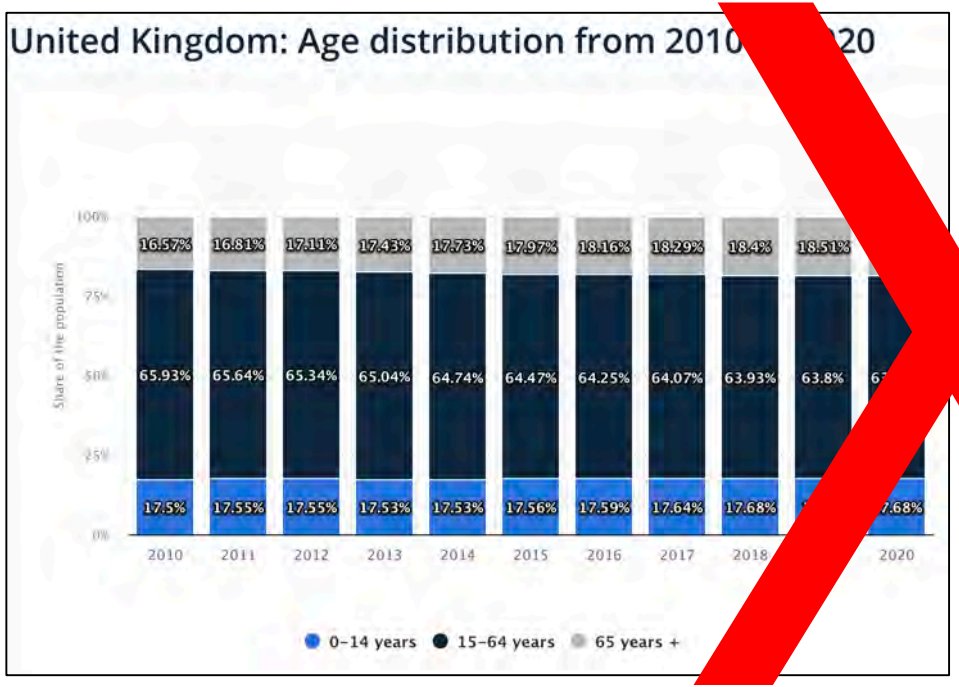
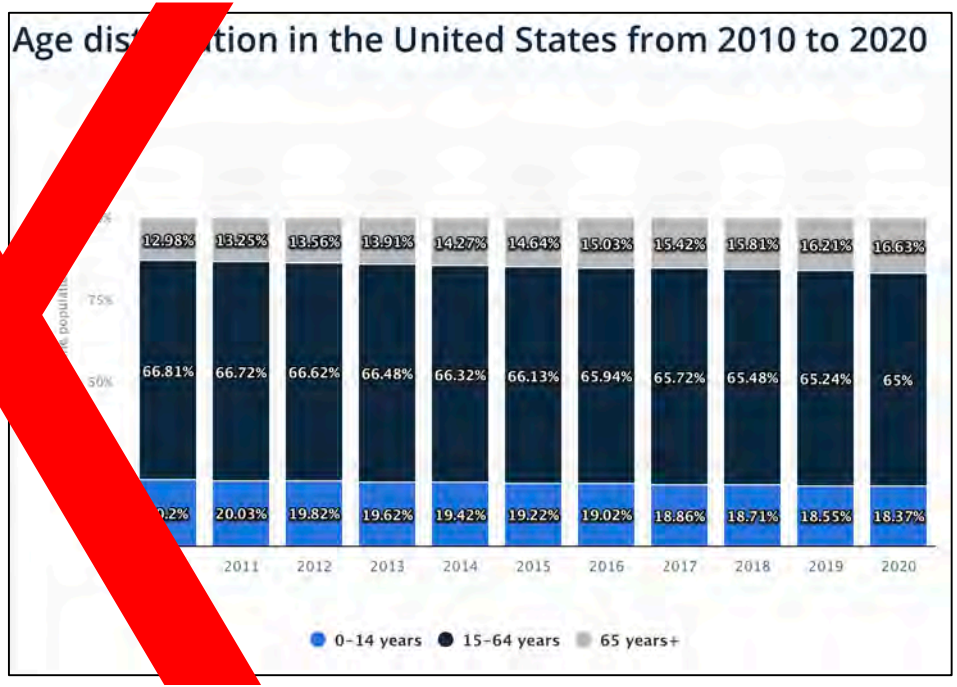
1) Is there an age distribution difference between the UK and the US?
2) Are there underlying differences in the health status of the populations?
3) Is there a difference in the quality of the health systems, medical practice and/or sophistication?
4) Are there differences in social support and access to health care?
5) Is there an underlying difference in the virus itself, the mix of variants, etc.?
6) Is there a difference in social behaviors?
7) Have we used testing and/or contact tracing differently?
8) How have vaccines been used in each country?

Age Distribution of UK and US





https://www.statista.com/statistics/270370/age-distribution-in-the-united-kingdom/
https://www.statista.com/statistics/270000/age-distribution-in-the-united-states/

Health of Adults in UK and US

U.S. Adults Have the Highest Chronic Disease Burden

Download data

Notes: Chronic disease burden defined as adults age 18 years or older who have ever been told by a doctor that they have two or more of the following chronic conditions: joint pain or arthritis; asthma or chronic lung disease; diabetes; heart disease, including heart attack; or hypertension/high blood pressure. Average reflects 11 countries shown in the exhibit that take part in the Commonwealth Fund's International Health Policy Survey.

Data: Commonwealth Fund International Health Policy Survey, 2016.

Source: Roosa Tikkanen and Melinda K. Abrams, *U.S. Health Care from a Global Perspective, 2019: Higher Spending, Worse Outcomes?* (Commonwealth Fund, Jan. 2020). https://doi.org/10.26099/tzvy-tc30

The U.S. Has the Highest Rate of Avoidable Deaths

Download data

Notes: Data for 2000 (except UK, 2001) and latest available (2016 for NETH, NOR, SWE, US; 2015 for AUS, CAN, FRA, GER, SWIZ, UK; 2014 for NZ). Mortality data from World Health Organization (WHO) detailed mortality files (released Dec. 2018). Population data from WHO detailed mortality files, except CAN (UN population database) and US (Human Mortality Database). Amenable causes as per list by Nolte and McKee (2004). Calculations by the European Observatory on Health Systems and Policies (2019). Age-specific rates standardized to European Standard Population, 2013.

Data: Marina Karanikolos, European Observatory on Health Systems and Policies, 2019.

Source: Roosa Tikkanen and Melinda K. Abrams, *U.S. Health Care from a Global Perspective, 2019: Higher Spending, Worse Outcomes?* (Commonwealth Fund, Jan. 2020). https://doi.org/10.26099/tzvy-tc30

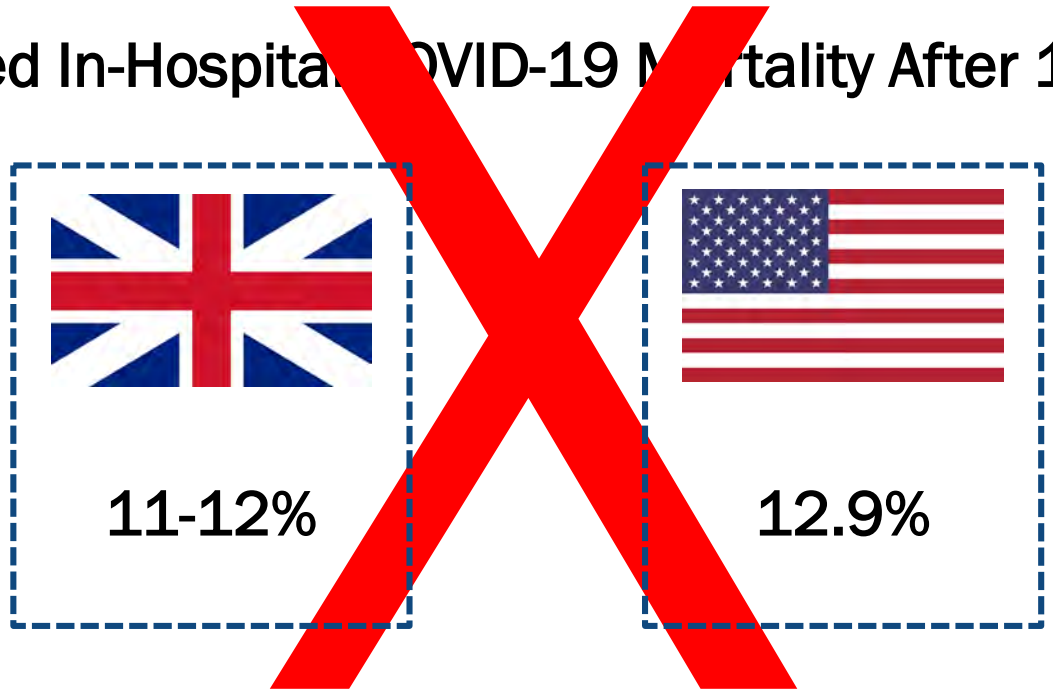
https://www.commonwealthfund.org/publications/issue-briefs/2020/jan/us-health-care-global-perspective-2019

Health of Adults in UK and US

https://www.commonwealthfund.org/publications/issue-briefs/2020/jan/us-health-care-global-perspective-2019

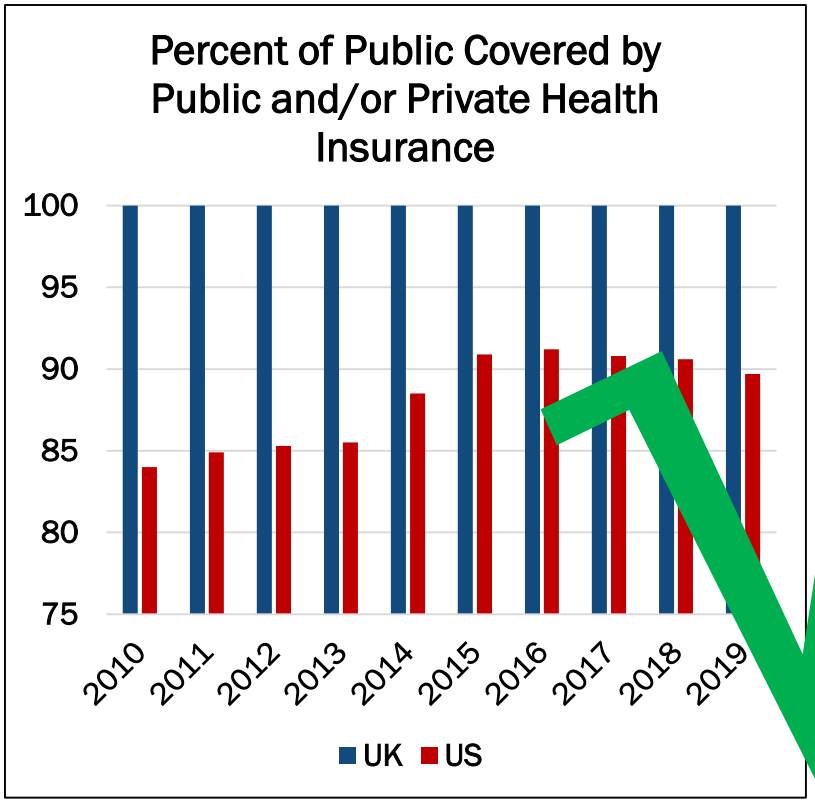
Health System Quality for UK and US

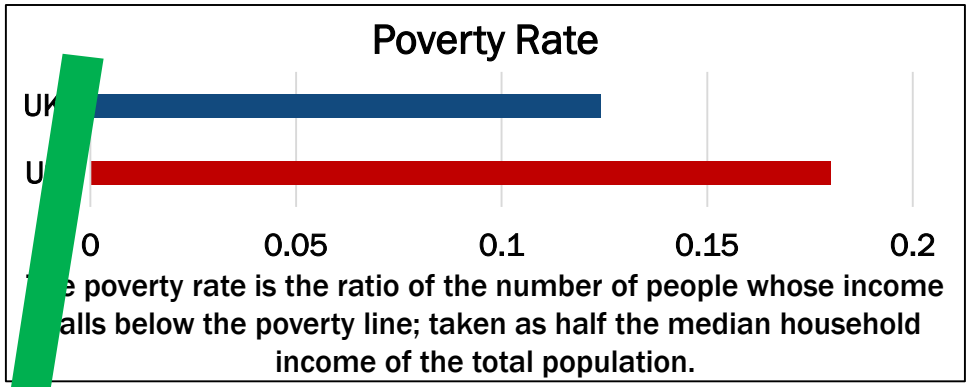
Reported In-Hospital COVID-19 Mortality After 1st Wave

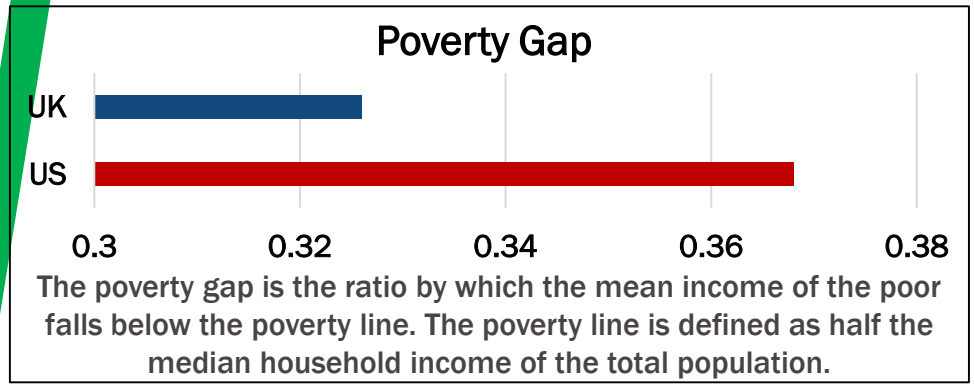


https://www.thelancet.com/journals/lanepe/article/PIIS2666-7762(21)00081-8/fulltext#seccesectitle0021
https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e4.htm

Social Support and Access to Health Care

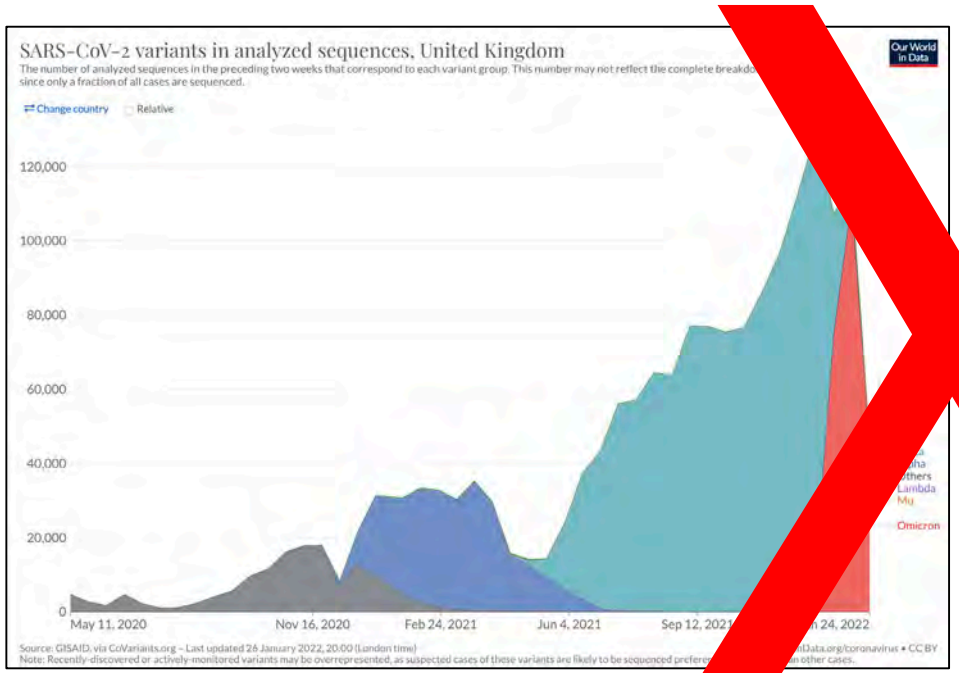


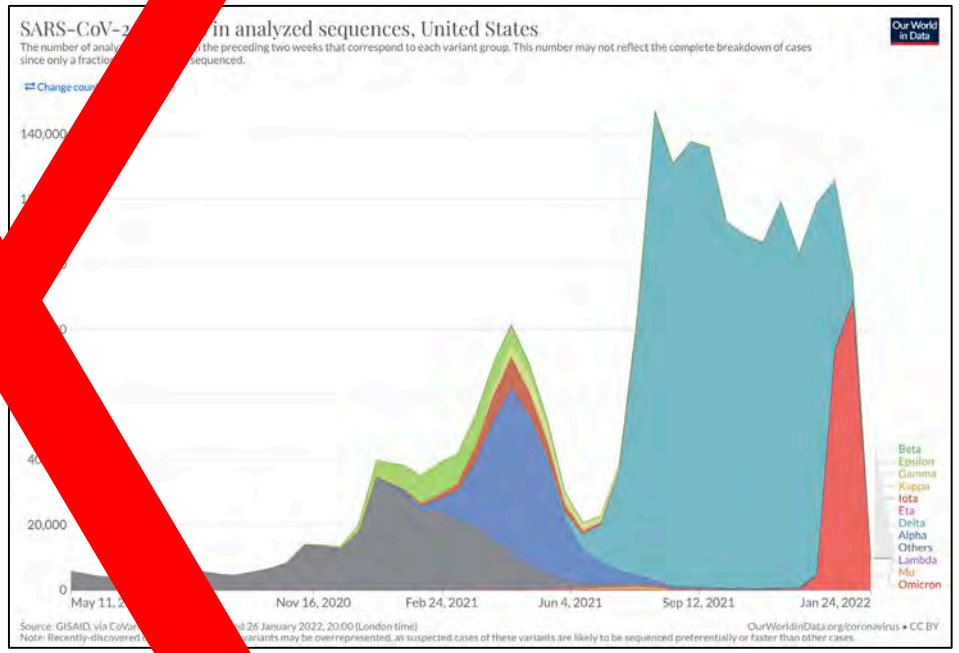




https://data.oecd.org/inequality/poverty-gap.htm#indicator-chart
https://data.oecd.org/inequality/poverty-rate.htm
https://stats.oecd.org/viewhtml.aspx?datasetcode=HEALTH_PROT&lang=en

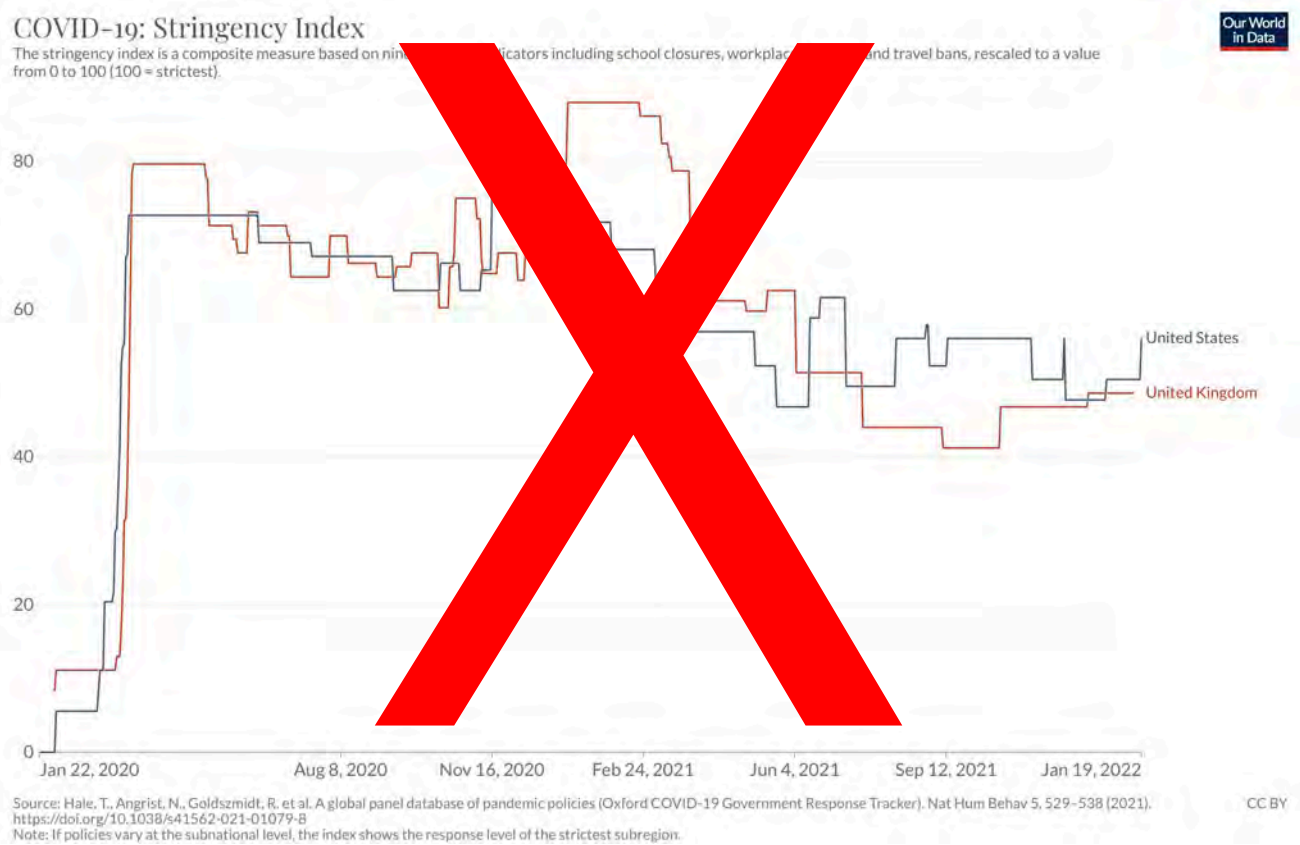
Variant Distribution Trend by Country





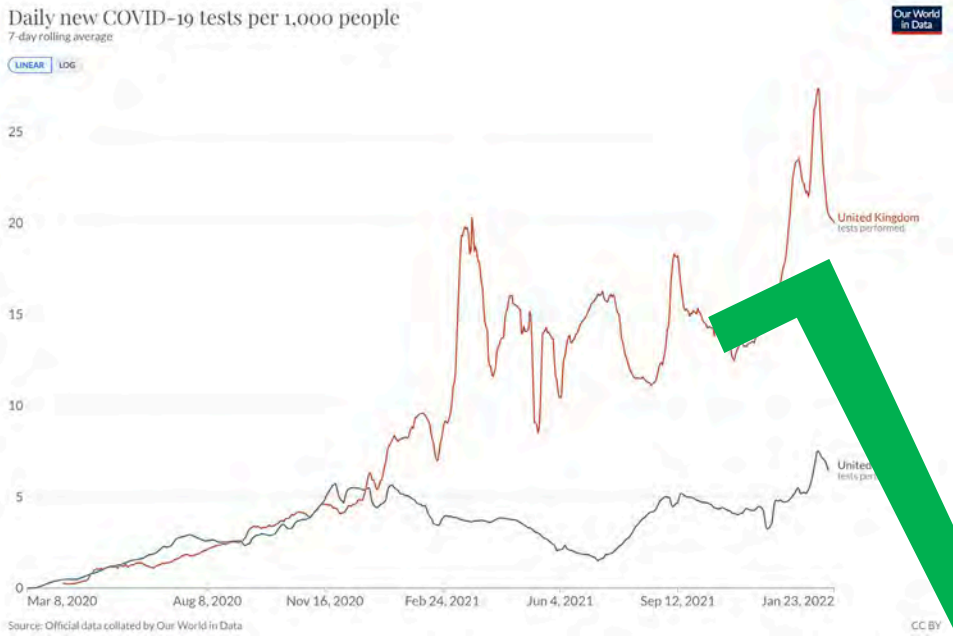
https://ourworldindata.org/covid-vaccinations

Social Behaviors in UK and US

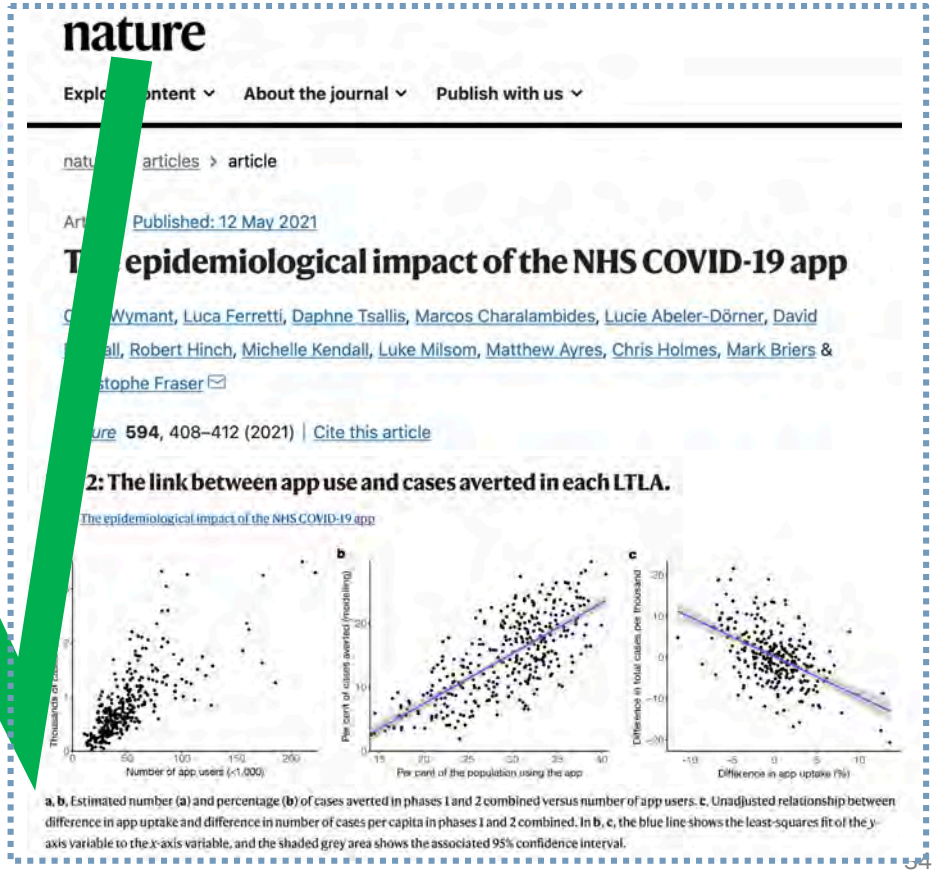


https://ourworldindata.org/grapher/covid-stringency-index?tab=chart&country=USA~GBR

Testing and Contact Tracing in the UK and US



https://ourworldindata.org/grapher/daily-tests-per-thousand-people-smoothed-7-day?tab=chart&country=GBR



https://www.nature.com/articles/s41586-021-03606-z#:~:text=Our%20analyses%20suggest%20that%20a,19%20over%20the%20same%20period.~USA

BTeen San Diego Union-Tribune ©
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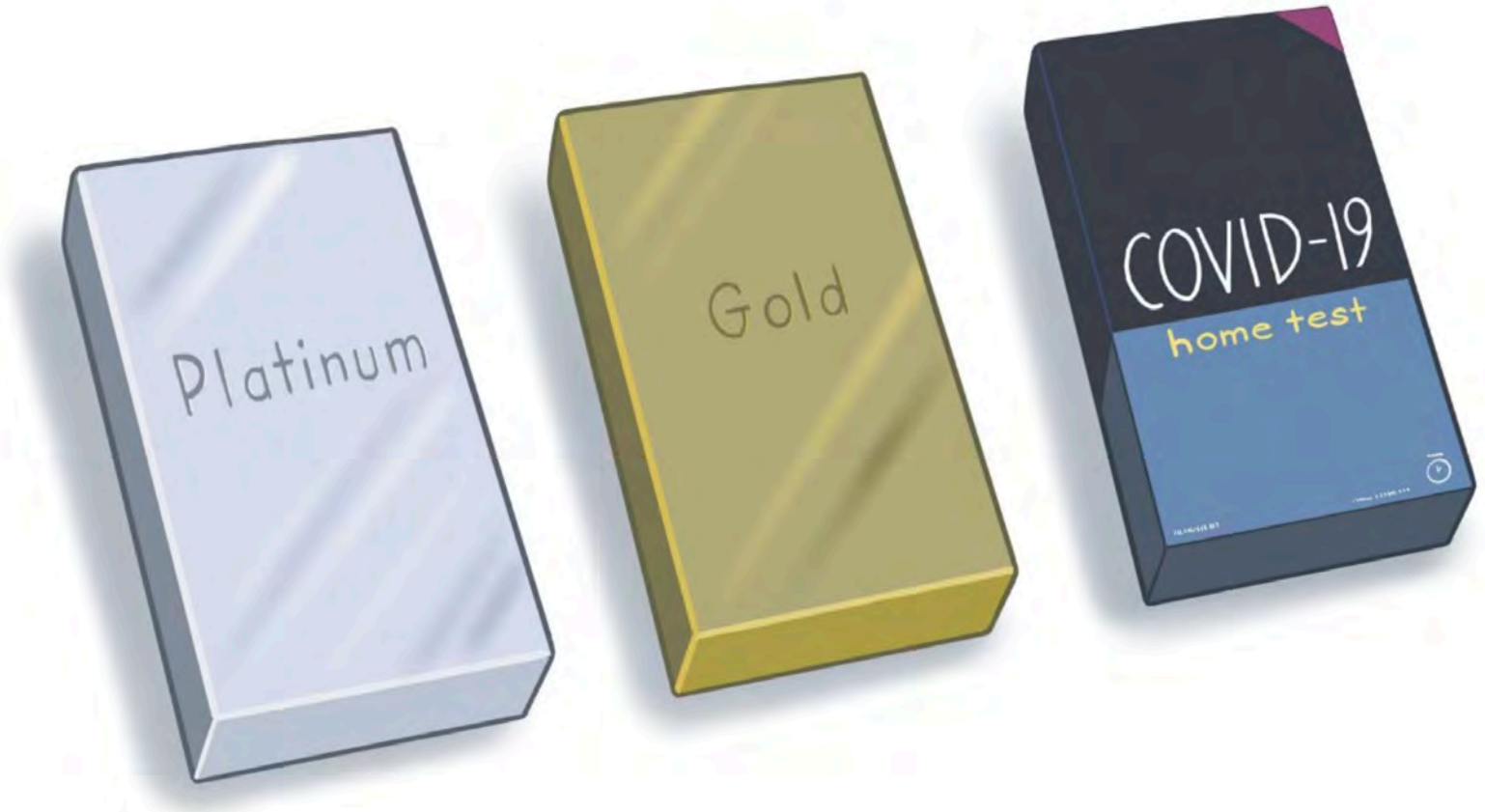
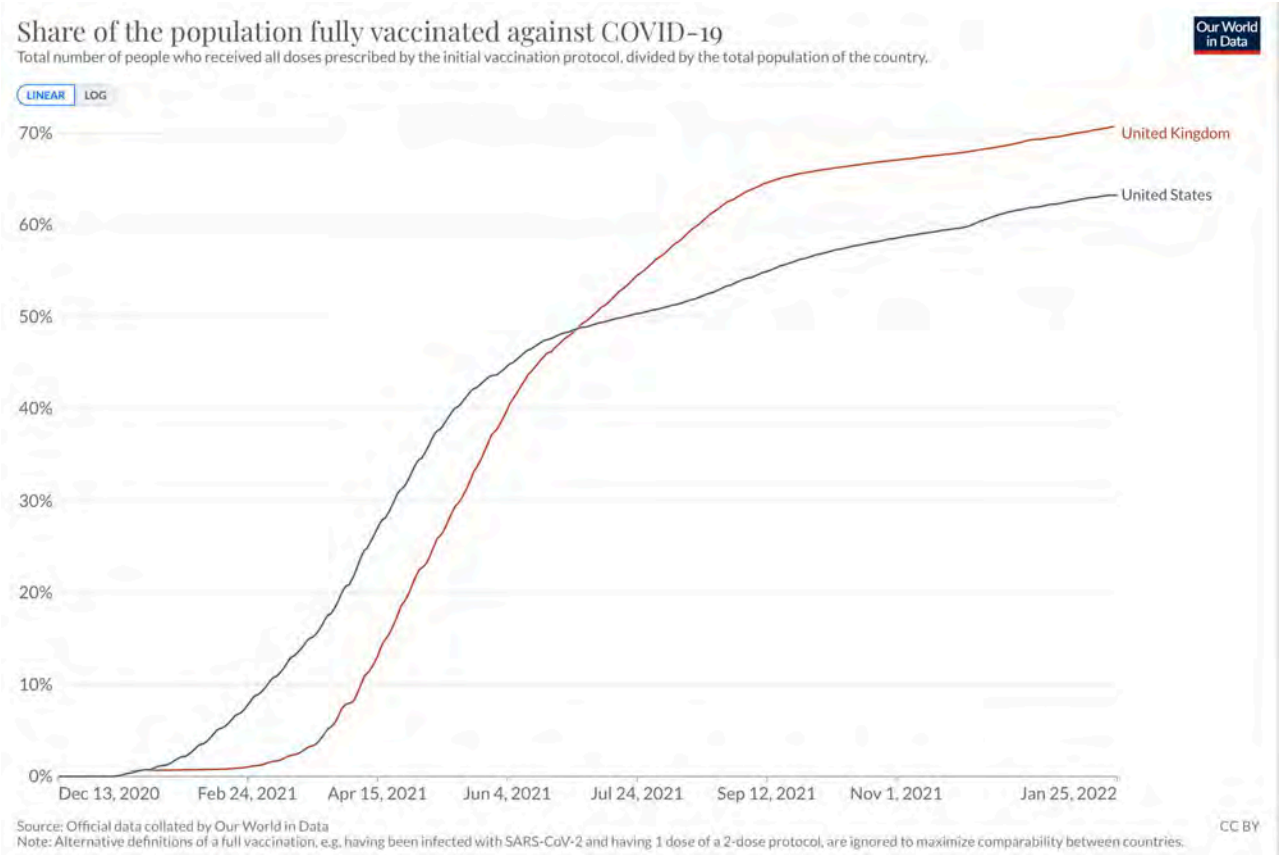
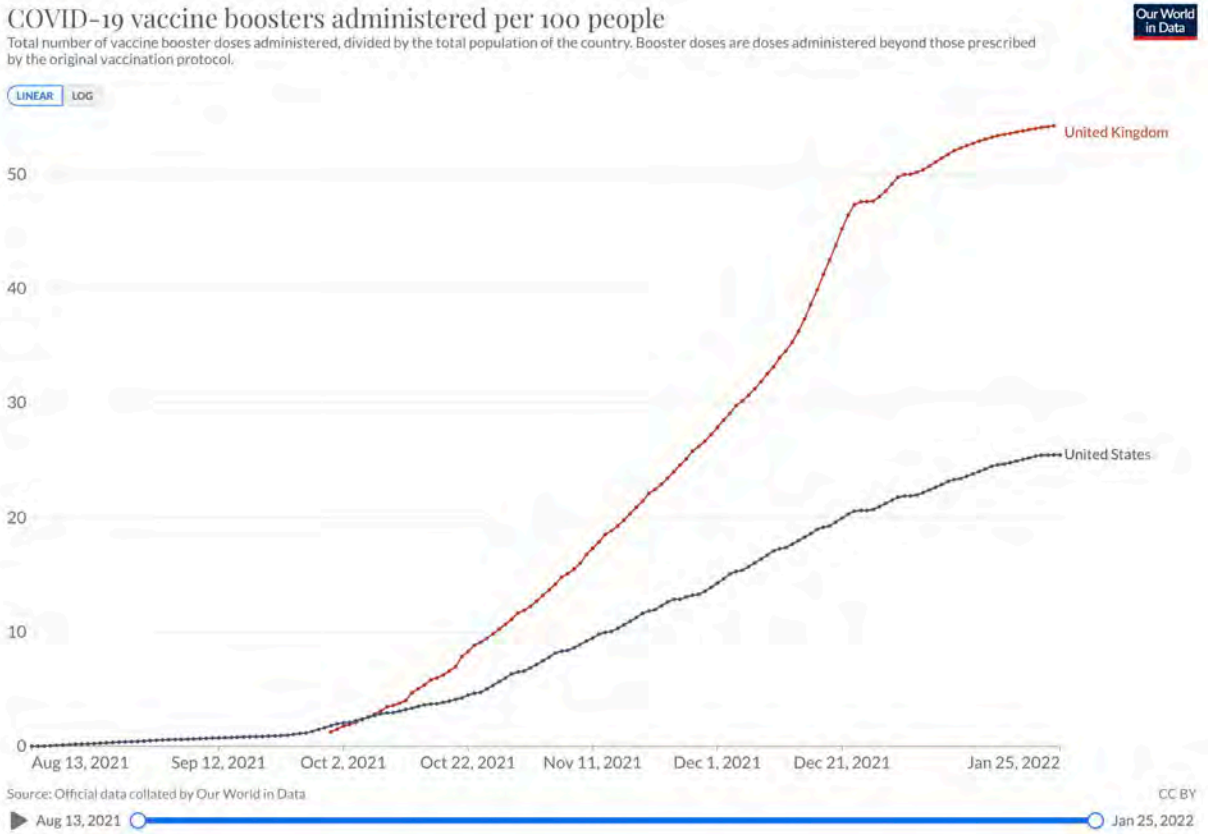


Vaccination Rates by Country



https://ourworldindata.org/covid-vaccinations

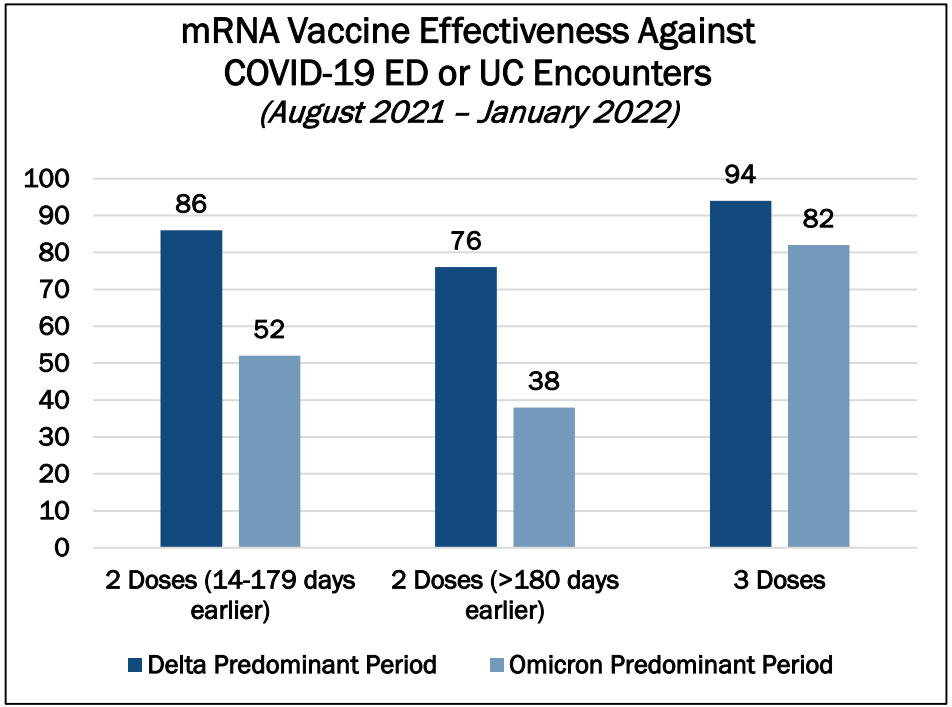
Vaccination Rates by Country

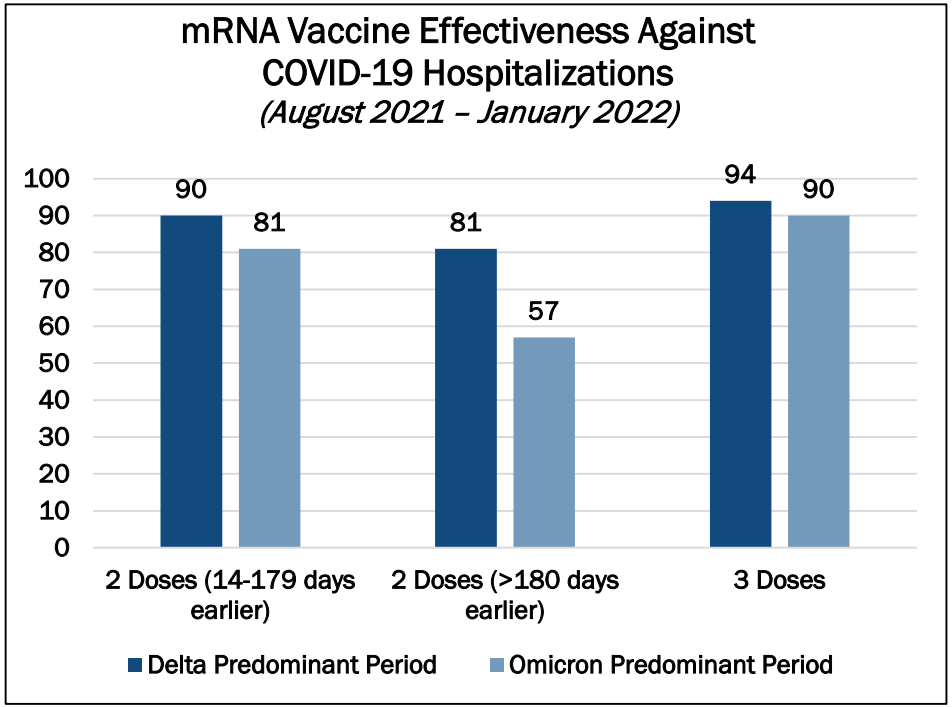


https://ourworldindata.org/covid-vaccinations

CDC Study

Multi-state analysis of 222,772 ED and UC encounters and 87,904 hospitalizations among adults with COVID-19–like illness during August 26, 2021–January 5, 2022.

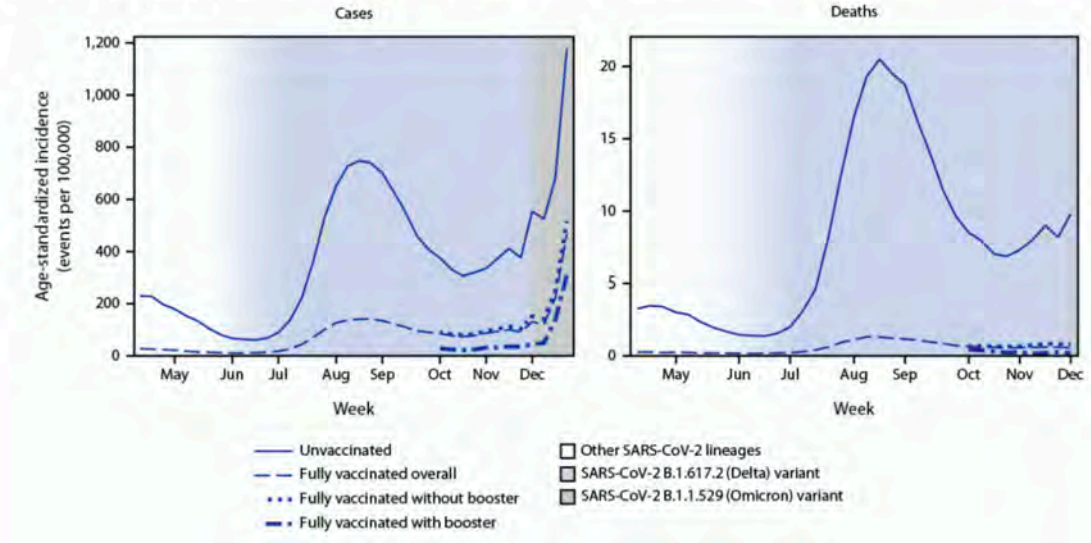




https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e3.htm?s_cid=mm7104e3_x#T1_down

2nd CDC Study

FIGURE. Weekly trends in age-standardized incidence of COVID-19 cases (April 4–December 25, 2021) and deaths (April 4–December 4, 2021) for unvaccinated compared with fully vaccinated persons,* overall and by receipt of booster doses† and national weighted estimates of variant proportions§ — 25 U.S. jurisdictions¶



- VE was higher among persons who were fully vaccinated and had received a booster dose than among fully vaccinated persons who had not received a booster dose for cases and deaths during the period of Delta predominance and for cases during the period of Omicron emergence in December.
- Because of reporting lags, the influence of the Omicron variant on COVID-19–associated deaths by vaccination status in December could not be evaluated.
- The added benefits of booster doses were especially prominent among persons aged 50–64 and ≥65 years.

https://www.cdc.gov/mmwr/volumes/71/wr/mm7104e2.htm?s_cid=mm7104e2_w#F1_down

COVID-19 Weekly Death Rate by Vaccination Status in Switzerland

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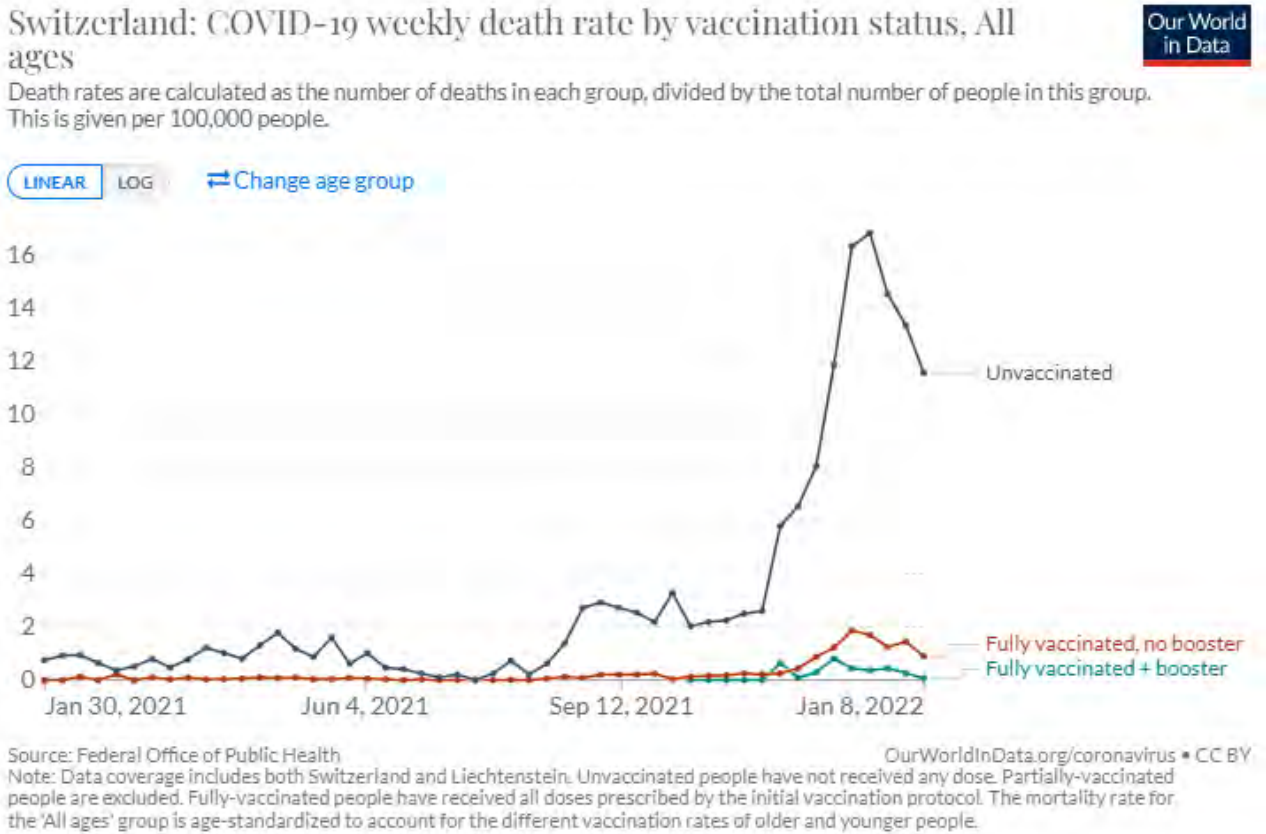
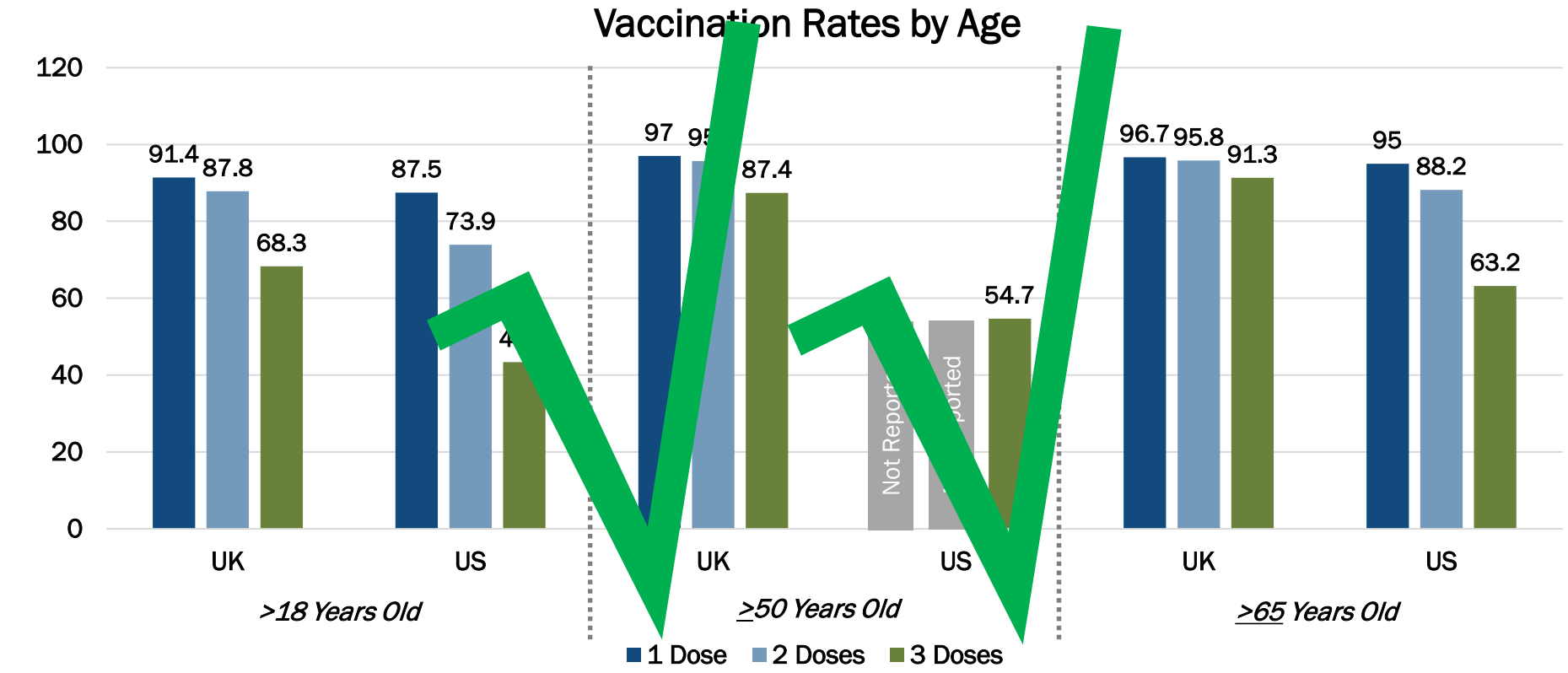
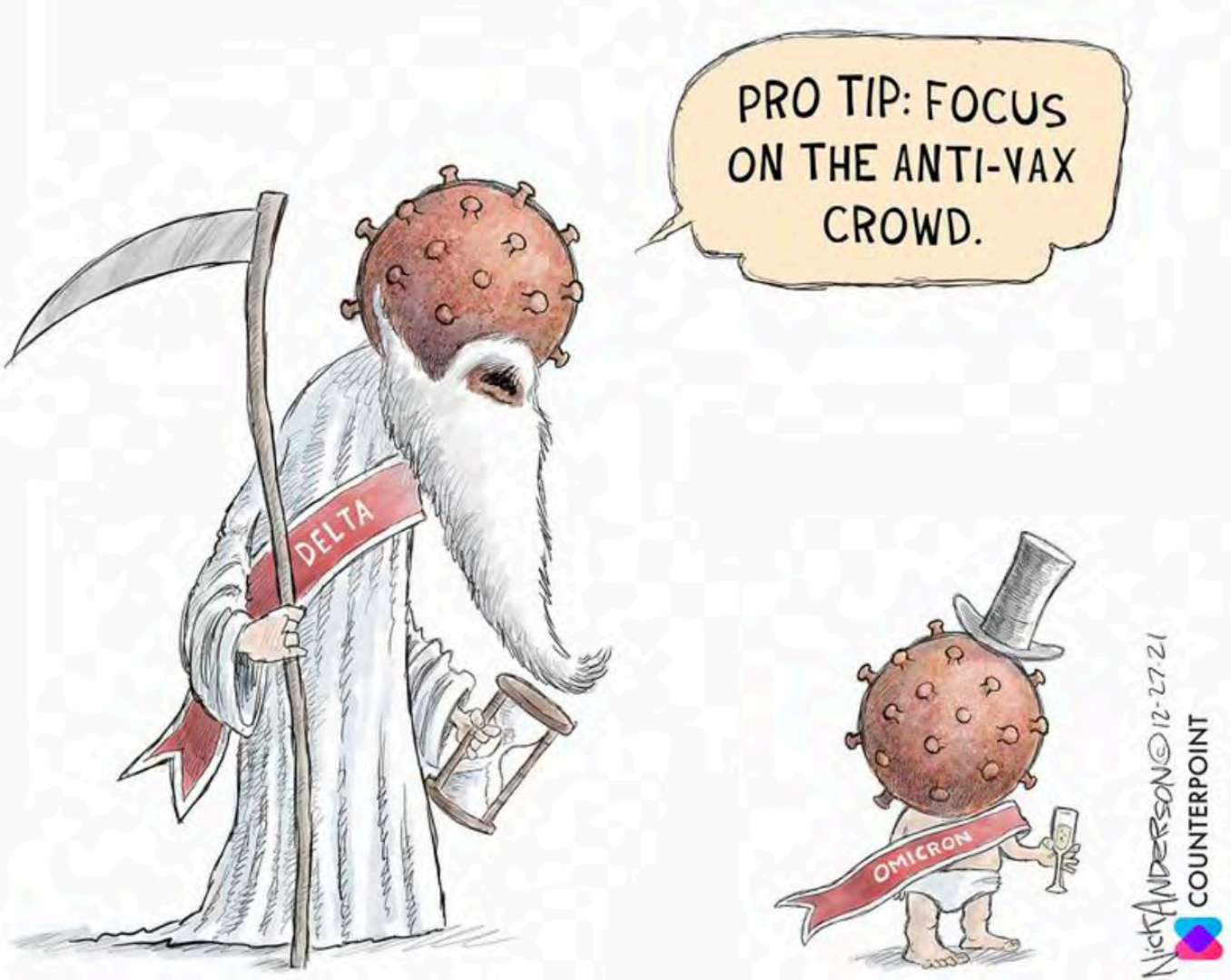


https://ourworldindata.org/covid-deaths-by-vaccination

Vaccinations in the UK and US



https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total
https://www.england.nhs.uk/statistics/wp-content/uploads/sites/2/2022/01/COVID-19-weekly-announced-vaccinations-20-January-2022.pdf


PRO TIP: FOCUS ON THE ANTI-VAX CROWD.
DELTA
OMICRON
NICK ANDERSON@12-27-21
COUNTERPOINT

A Partial List of Possible Explanations

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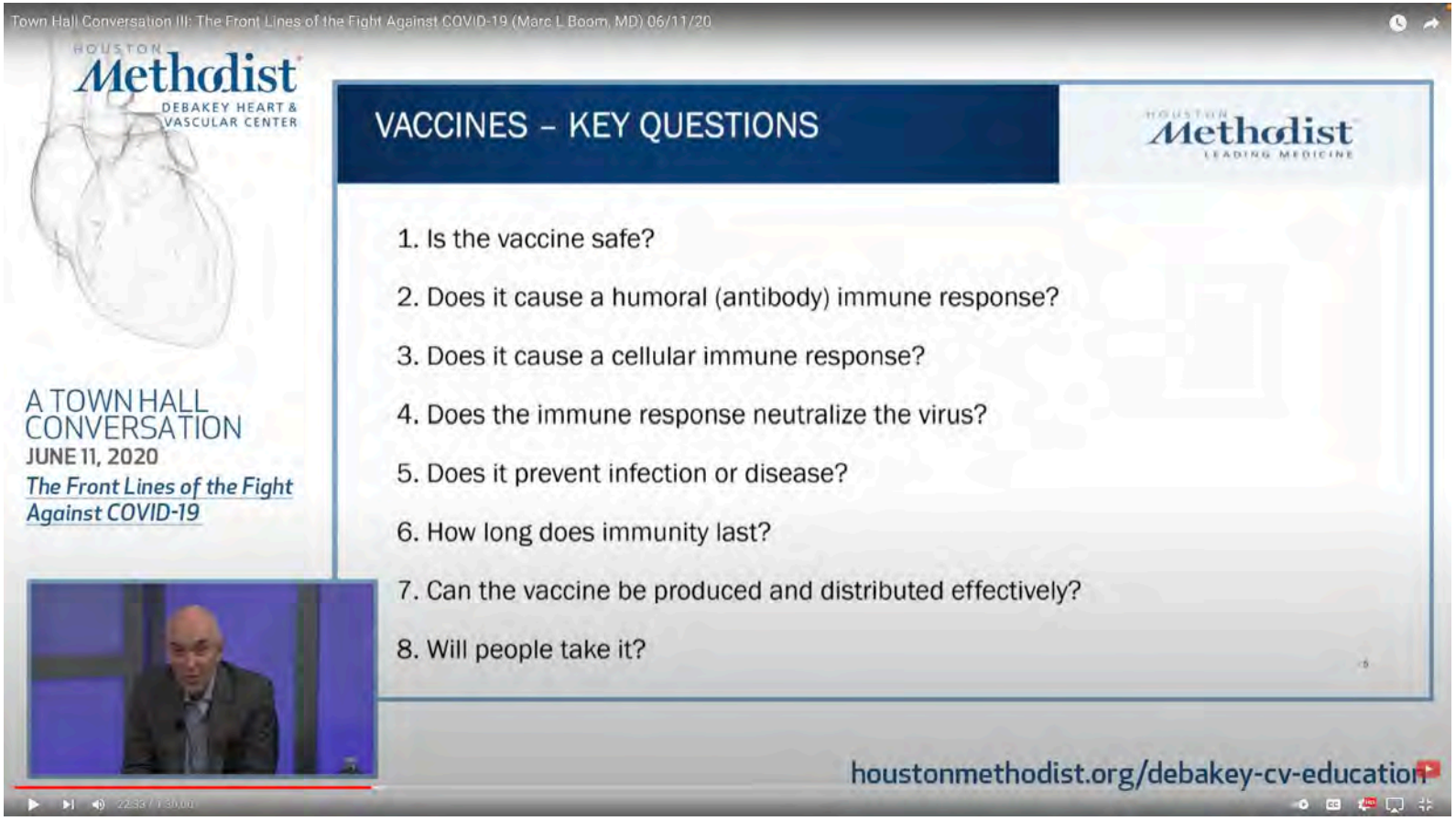
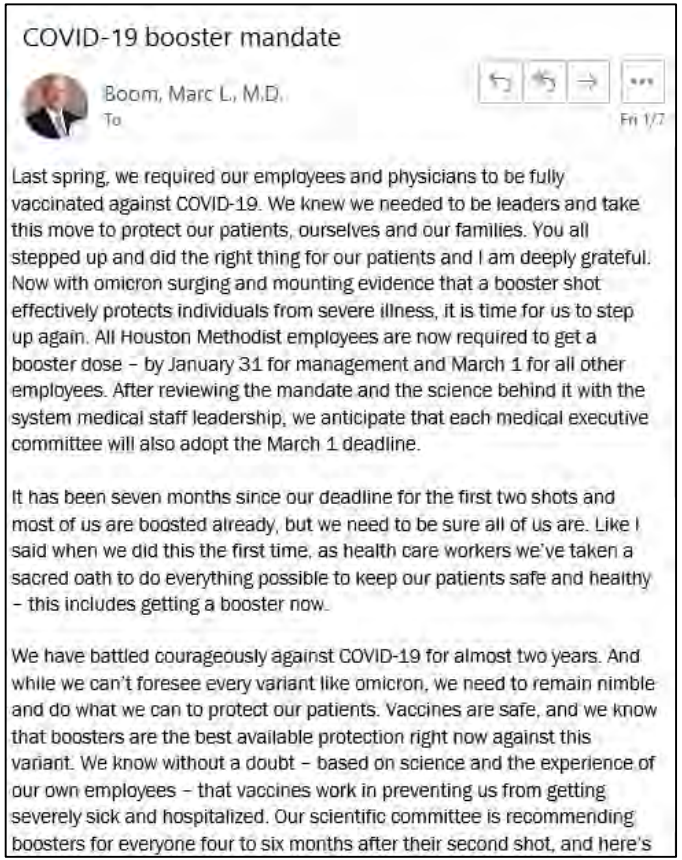
X 1) Is there an age distribution difference between the UK and the US?
√ 2) Are there underlying differences in the health status of the populations?
X 3) Is there a difference in the quality of the health systems, medical practice and/or sophistication?
√ 4) Are there differences in social support and access to health care?
X 5) Is there an underlying difference in the virus itself, the mix of variants, etc.?
X 6) Is there a difference in social behaviors?
√ 7) Have we used testing and/or contact tracing differently?
√√ 8) How have vaccines been used in each country?

Conclusion: A complex interplay among the underlying health of the population, access to health care, testing, contact tracing, and especially vaccine uptake.

Consistent evidence-based decision making and communication



Booster Mandate Announcement



COVID-19 booster mandate

Boom, Marc L, M.D.
To

Fri 1/7

Last spring, we required our employees and physicians to be fully vaccinated against COVID-19. We knew we needed to be leaders and take this move to protect our patients, ourselves and our families. You all stepped up and did the right thing for our patients and I am deeply grateful. Now with omicron surging and mounting evidence that a booster shot effectively protects individuals from severe illness, it is time for us to step up again. All Houston Methodist employees are now required to get a booster dose – by January 31 for management and March 1 for all other employees. After reviewing the mandate and the science behind it with the system medical staff leadership, we anticipate that each medical executive committee will also adopt the March 1 deadline.

It has been seven months since our deadline for the first two shots and most of us are boosted already, but we need to be sure all of us are. Like I said when we did this the first time, as health care workers we've taken a sacred oath to do everything possible to keep our patients safe and healthy – this includes getting a booster now.

We have battled courageously against COVID-19 for almost two years. And while we can't foresee every variant like omicron, we need to remain nimble and do what we can to protect our patients. Vaccines are safe, and we know that boosters are the best available protection right now against this variant. We know without a doubt – based on science and the experience of our own employees – that vaccines work in preventing us from getting severely sick and hospitalized. Our scientific committee is recommending boosters for everyone four to six months after their second shot, and here's

"All Houston Methodist employees are now required to get a booster dose – by January 31 for management and March 1 for all other employees.

It has been seven months since our deadline for the first two shots and most of us are boosted already, but we need to be sure all of us are. Like I said when we did this the first time, as health care workers we've taken a sacred oath to do everything possible to keep our patients safe and healthy – this includes getting a booster now."

GET YOUR FREE COVID-19 BOOSTER TODAY

NOW ACCEPTING WALK-INS

Visit any of our 7 vaccination locations:
Monday – Thursday: 8 a.m. – 5 p.m.
Friday: 8 a.m. – Noon

PREFER AN APPOINTMENT?

Visit houstonmethodist.org/vaccine to schedule online.

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COVID-19: Pandemic to Endemic

Town Hall, January 27, 2022

H. Dirk Sostman, MD FACR, Ernest Cockrell, Jr. Presidential Distinguished Chair, EVP & Chief Academic Officer

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Vaccine Updates

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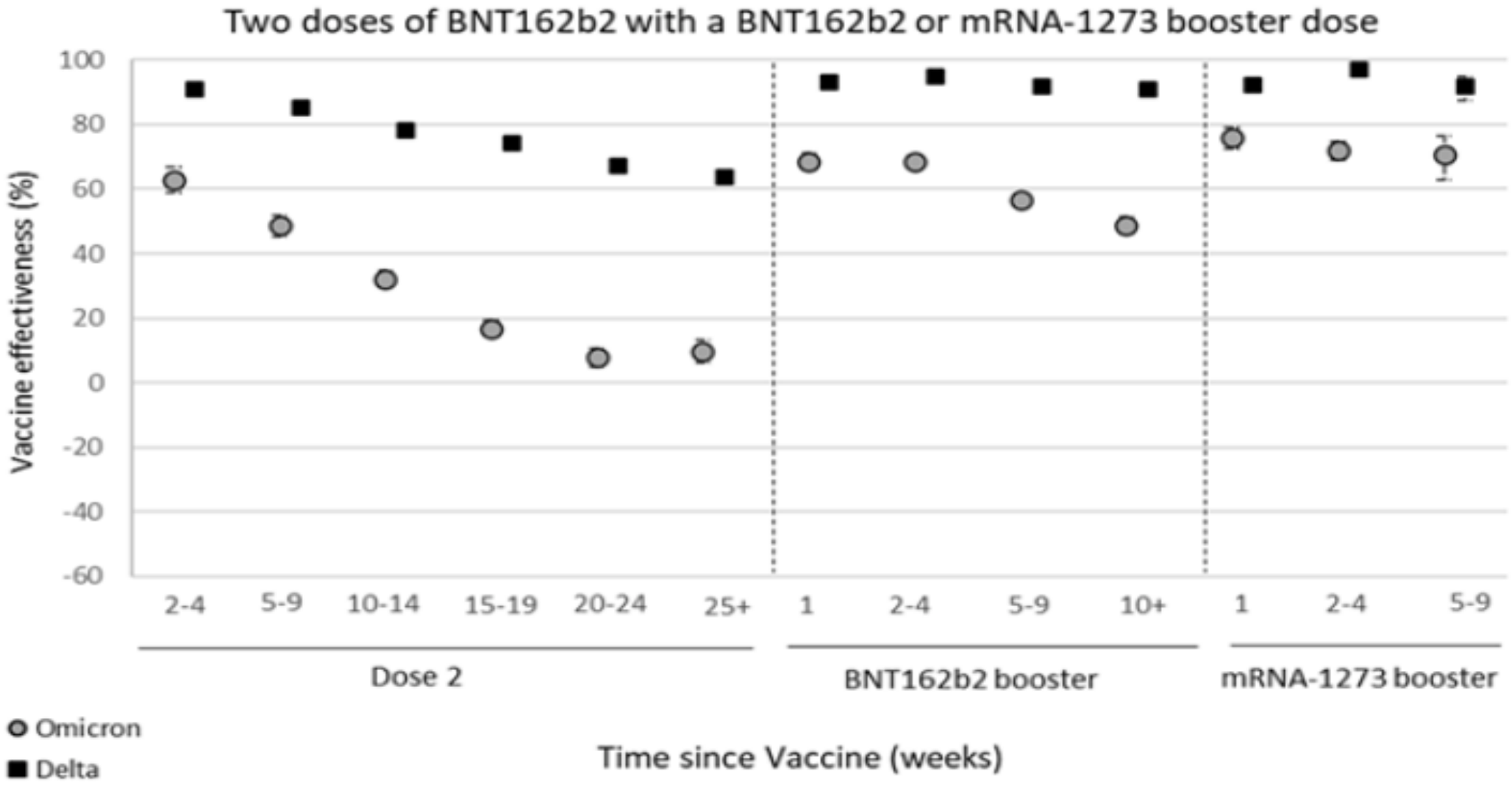
Summary of Vaccine Efficacy: Pre-Omicron

- Vaccines effective against COVID-19 infection for ~4-6 months
  - Lower viral load, reduced transmission – even with delta
- As time passes, vaccines offer less protection against infection
  - Related to lower levels of circulating antibodies
  - Antibody levels correlate with protection, but we do not know a “cut-off” value for an individual person
- Protection against hospitalization and death is longer lasting
  - Likely related to cellular immunity
  - How much longer lasting? Time will tell
- Boosters restore antibody levels and 85–90% protection from infection
  - About the same as two doses + prior infection
  - Will this last longer than first two doses? Time will tell
- Prior infection alone
  - About 80% effective (lower quality data than for vaccines)
  - Less effective in older people or if infection was mild
  - However, appears to be synergistic with vaccination

Boosters for Delta vs Omicron

UK HSA Technical Briefing December 31, 2021



Omicron: Immunity Wanes, Restored by Booster

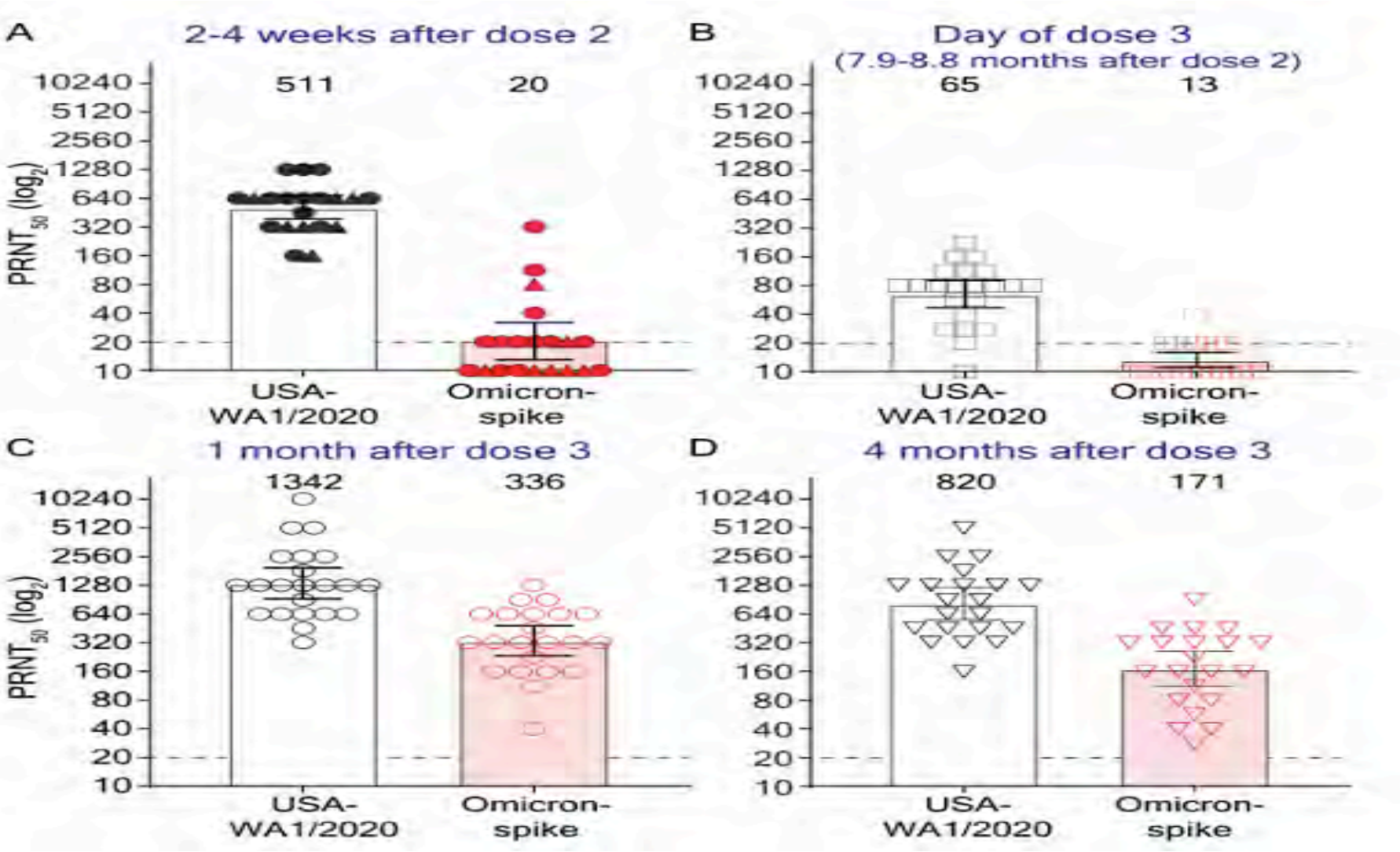
MMWR January 21, 2022

Variant Predominance	Hazard Ratio for Infection Two Doses vs Unvaccinated	Hazard Ratio for Infection Two Doses vs Two Doses + Booster	Hazard Ratio for Death Two Doses vs Unvaccinated
Pre-delta	13.9		21.9
Delta	5.1		16.3
Omicron	3.1	13.9	19.4

- Omicron has more mutations than delta
- These mutations interfere with antibodies (which protect from infection) more than with cellular immunity (which protects from severe disease and death)
- Booster helps overcome antibody resistance

Omicron: Booster Restores Neutralizing Abs for 4 Months

https://www.biorxiv.org/content/10.1101/2022.01.21.476344v1



Omicron: Vaccination Saves Lives, Booster Saves Even More

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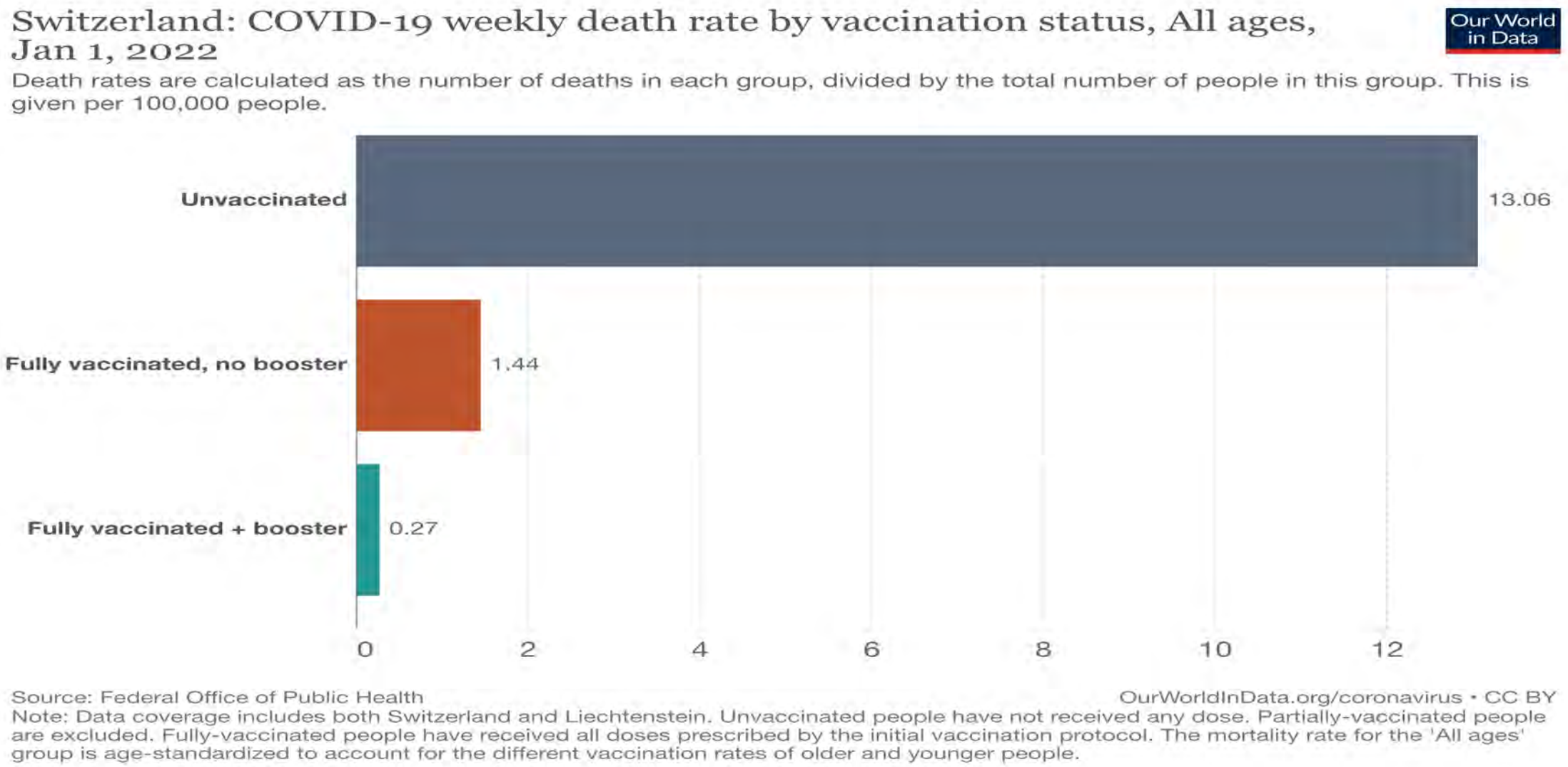

Changing Effect of Prior Infection on Infections

MMWR January 19, 2022

Hazard Ratio for UNVACCINATED and *NO* PRIOR INFECTION *Versus ---------->*	Vaccinated *No* Prior Infection	Unvaccinated + Prior Infection	Vaccinated + Prior Infection
May 30 – June 5	20.9 (18.9–22.9)	8.2 (6.6–9.9)	10.6 (8.1–13.2)
Nov 14 – Nov 20	7.3 (7.0–7.5)	25.4 (21.4–29.3)	32.5 (25.5–39.5)

- Antibody breadth against viral variants is less after infection than vaccination, but improves over several months
- Viral variant infection elicits variant-specific antibodies, while vaccination imprints serological responses toward Wuhan-Hu-1
- https://www.sciencedirect.com/science/article/pii/S0092867422000769?via%3Dihub

Current Vaccine Strategies for COVID-19

- Immune-compromised people
  - –Should have a three-shot primary vaccine series plus a booster shot six months later
- For people at “ordinary” risk – repeated doses of original vaccine all we have to offer
  - –Third / booster shot at 4–6 months is supported by data
  - –Fourth / booster shot has persuasive rationale but not much data
    - Israel recommends for all people over 18, five months after booster
      - –Increases antibody levels
      - –In over-60s, 2x protection against infection, 3x protection from severe disease
    - No evidence for theoretical “immune exhaustion”
    - With current vaccines, four shots (or three shots + infection) may have diminishing returns
    - Some have used fourth shot (4–6 months after third shot) to cover a specific episode of increased risk – no data to support this

Future Vaccine Strategies for SARS Coronaviruses

- Tailored boosters against SARS-CoV-2 variants
  - —At some point this will be necessary – not clear when, but likely will be soon
  - —Pfizer starting clinical trial of omicron-specific vaccine
  - —Still amounts to playing catch-up
- Novel vaccines – at least a year away
  - —Nasal vaccines
    - Theoretically ideal but not a simple task in practice
    - Altimmune AdCOVID vaccine well tolerated but failed to generate immune response (June 2021 press release)
    - Intranasal AstraZeneca vaccine produced serum IgG and nasal IgA (van Doremalen et al Sci Trans Med August 2021)
    - Intranasal attenuated RSV bearing spike protein protected nonhuman primates, reduced viral load (Tioni et al, bioRxiv August 6, 2021)
  - —Pan-coronavirus vaccines – multivalent antigens vs novel delivery systems
    - Ferritin nanoparticles (Joyce et al Sci Trans Med Dec 2021) protected nonhuman primates against major VOCs and SARS-CoV-1
    - Pan-sarbecovirus neutralizing antibodies in SARS survivors vaccinated with Pfizer vaccine (Tan et al, NEJM August 2021; Schmidt et al, Nature September 20, 2021)

Outpatient Treatments Authorized by FDA

Early treatment of high-risk outpatients is a critical part of the pandemic defense

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Monoclonal Antibodies

- Precise nature of mAbs makes them very sensitive to immune evasion by variants
  - Regen-Cov (Regeneron) and bamlanivimab + etesevimab (Lilly) – **Not effective against omicron**
  - Evushield (AstraZeneca) – for pre-exposure prophylaxis (not for treatment) – **Neutralizes omicron**
- Sotrovimab
  - Pan-sarbecovirus mAb (originally isolated from SARS patient)
  - Neutralizes alpha, beta, gamma and delta SARS-CoV-2 variants
  - Clinical trial (NEJM October 2021)
    - Treatment within 5 days of symptoms, high risk
    - 85% RR for hospitalization or death
  - Reduced effectiveness but neutralizes omicron (press release, 12/7/21)

“COVID Pills” – Effective Against Omicron

- Two FDA-authorized oral treatments that reduce hospitalization in high-risk people
  - –Paxlovid – 89% reduction
  - –Molnupiravir – 30% reduction
- One FDA-approved intravenous treatment (3x daily infusion)
  - –Remdesivir – 87% reduction in hospitalization
- Possibilities of combined therapy
  - –Protease inhibitor (paxlovid)
  - –Polymerase inhibitor (molnupiravir, remdesivir)
  - –mAb

Testing

At-home testing can rapidly identify those who have high viral loads

Potentially major effect on transmission of infection & early treatment

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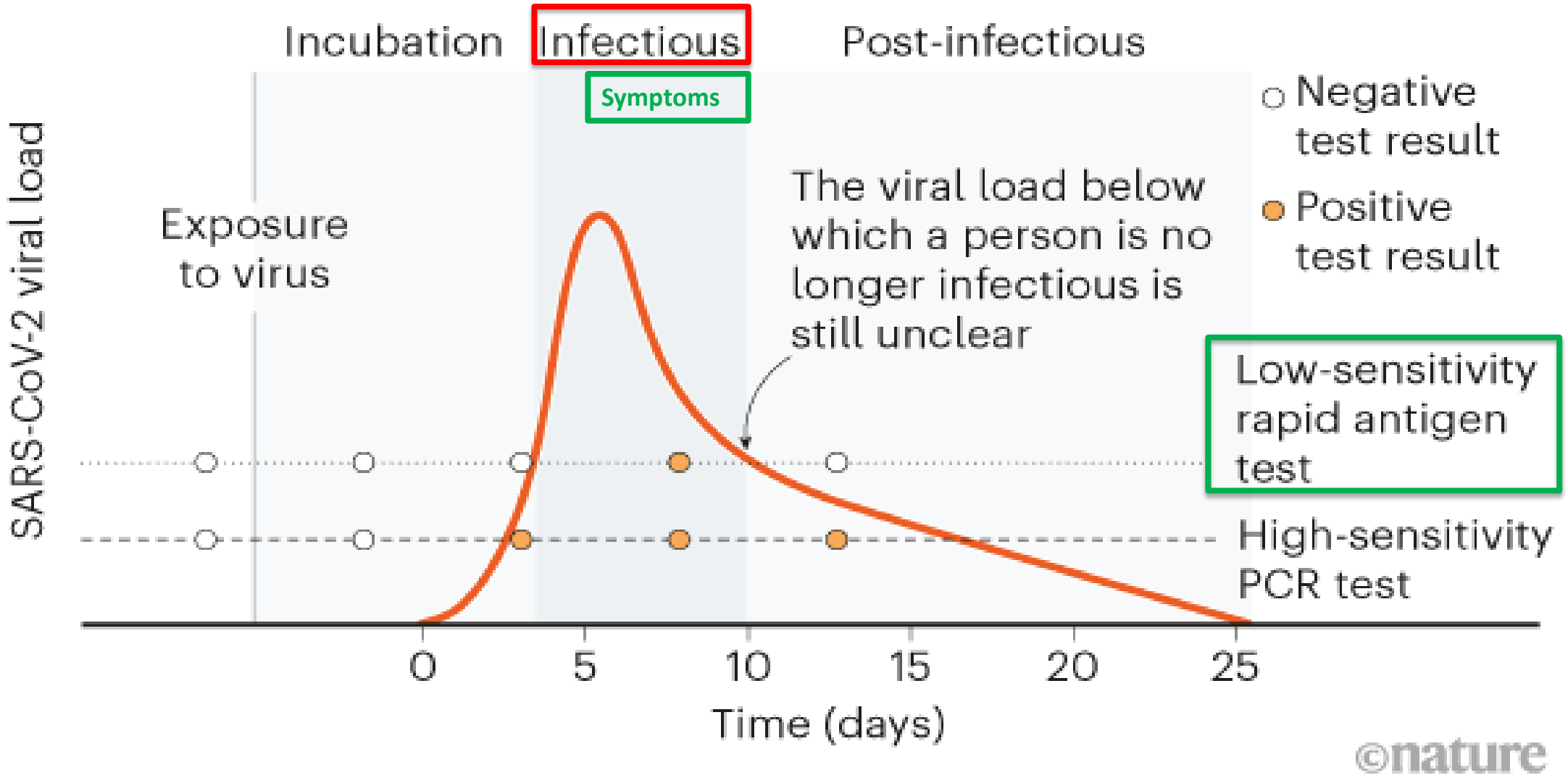
Why Are Lower Sensitivity Tests Still Useful?



Rapid COVID-19 Testing – Antigen Tests

Schrom et al doi: https://doi.org/10.1101/2022.01.08.22268954

- Walk-up testing site
  - –Among people with a positive PCR with *no* symptoms, the sensitivity of antigen tests was 89.8%
  - –Among people with a positive PCR who were *symptomatic*, the sensitivity of antigen tests was 97.6%
- Higher the viral load → more accurate the antigen test
- Tests were equally accurate for all ages
- Tests performed similarly regardless of vaccination status
- Likelihood of a false positive was very small (0.4%)

Antigen Tests and Quarantine

Hay et al, https://dash.harvard.edu/handle/1/37370587

- Hay et al, https://dash.harvard.edu/handle/1/37370587
  - 204 vaccinated people – who were tested daily
    - Omicron infection lasted, on average, 10 days
    - Delta infections lasted, on average, 11 days
  - Some cleared the virus faster and others cleared the virus more slowly
  - Roughly 50% still had high viral levels at Day 5 (they were likely infectious)
- UK Health Security Agency
  - After 7-day isolation (not using an antigen test), 1 in 6 chance to be still infectious
  - Negative antigen test on Day 7 of isolation, less than 1 in 10 chance to be still infectious

Houston Methodist Recommended Antigen Tests

Thank you, Dr. David Bernard!

- Home Antigen Tests
  - BinaxNow – available online at pharmacies including Walgreens and Walmart but not Amazon
  - Access CareStart – online pharmacies and wholesalers, not Amazon
  - Quidel QuickVue – Amazon, others
  - iHealth – Amazon, others
  - Free antigen tests from US government ordered at https://www.covidtests.gov/. Unclear what test will be given but likely either iHealth or BinaxNow
  - US distribution of free antigen tests through pharmacies is unclear at this time. It is anticipated to begin soon in limited areas and in limited supply at the beginning.
- Home Virus nucleic acid tests
  - Lucira – Amazon
  - Cue Health – online at Cue Health

Transitioning from Pandemic to Endemic

What might be next?

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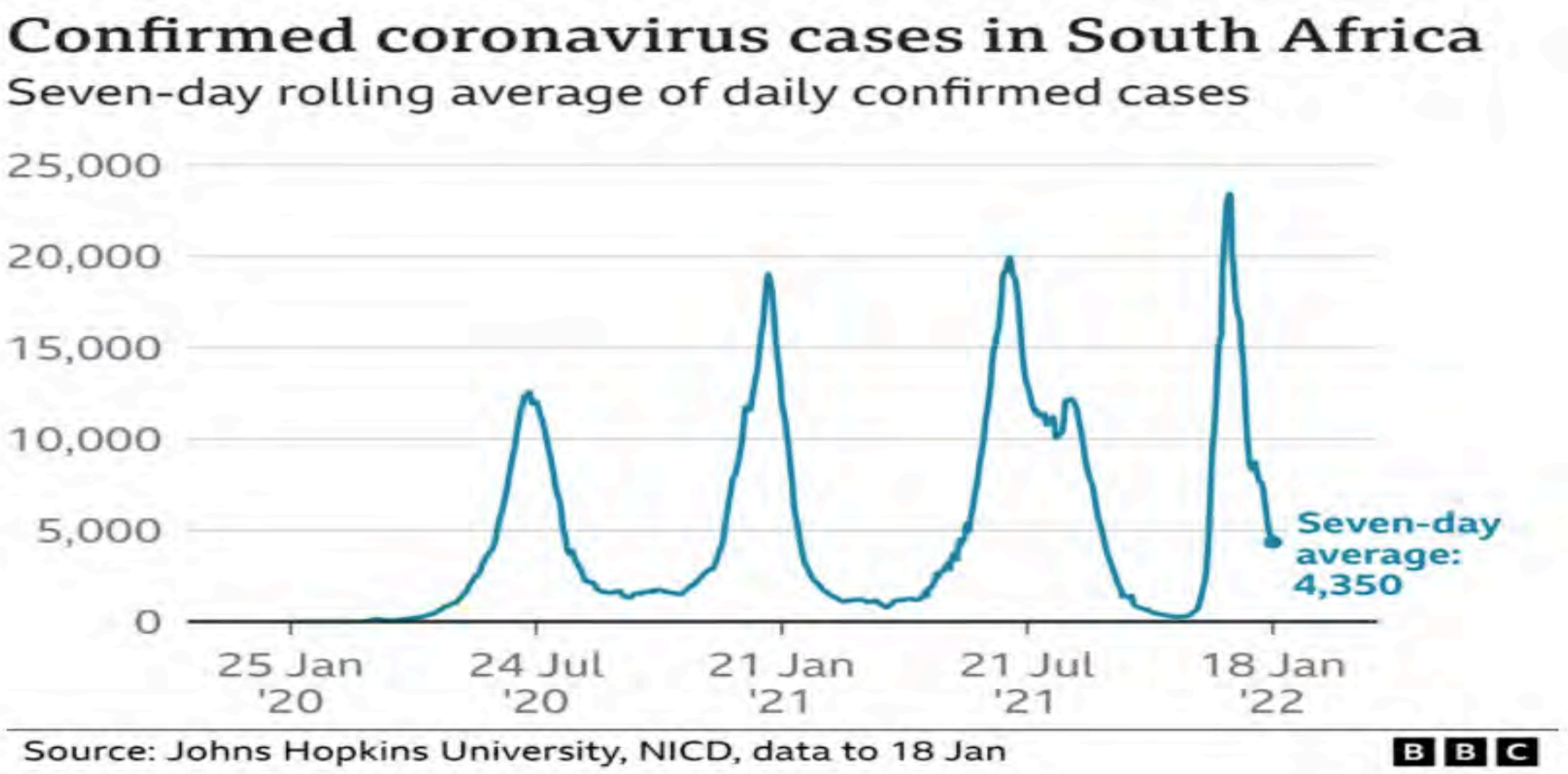
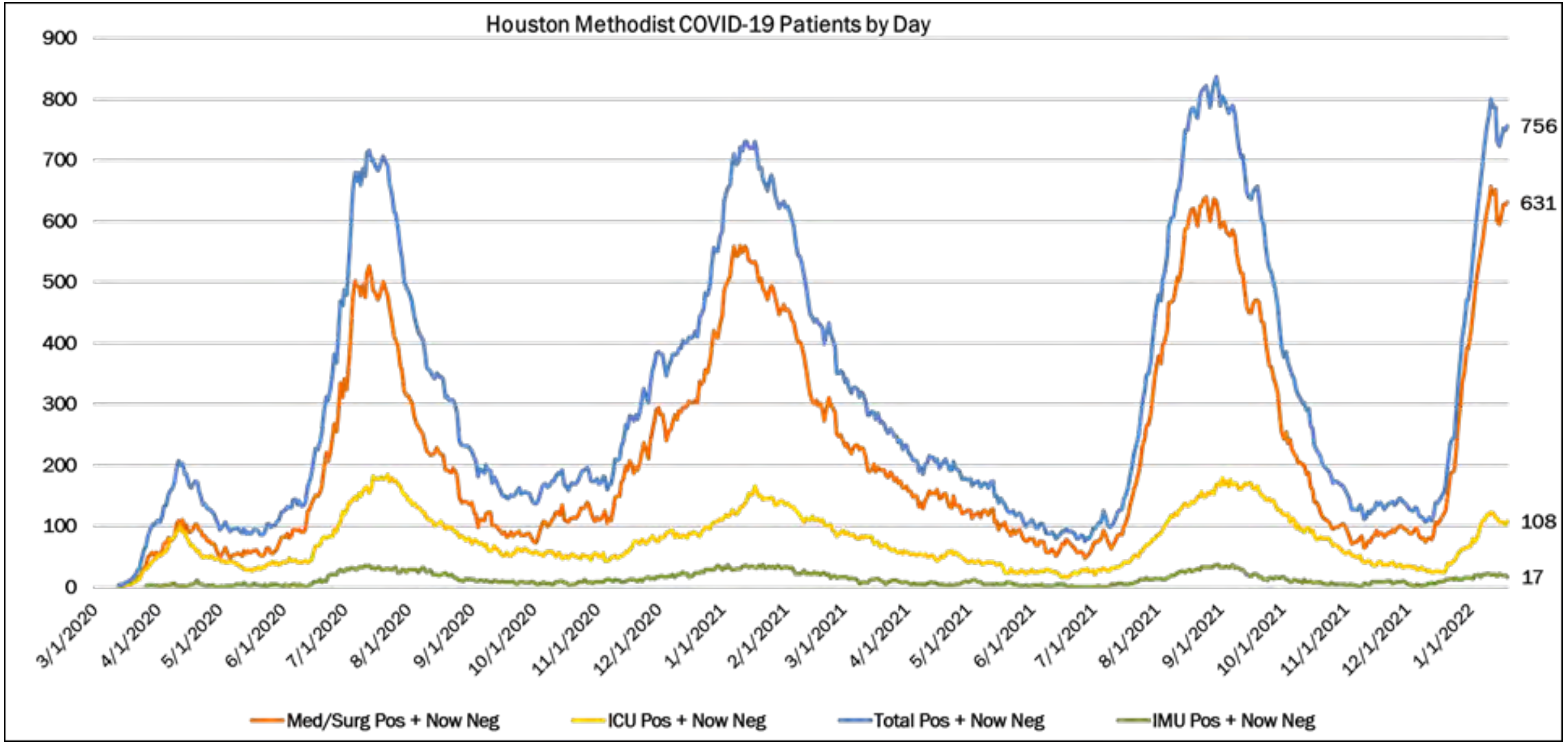
What Do You Mean, Endemic???

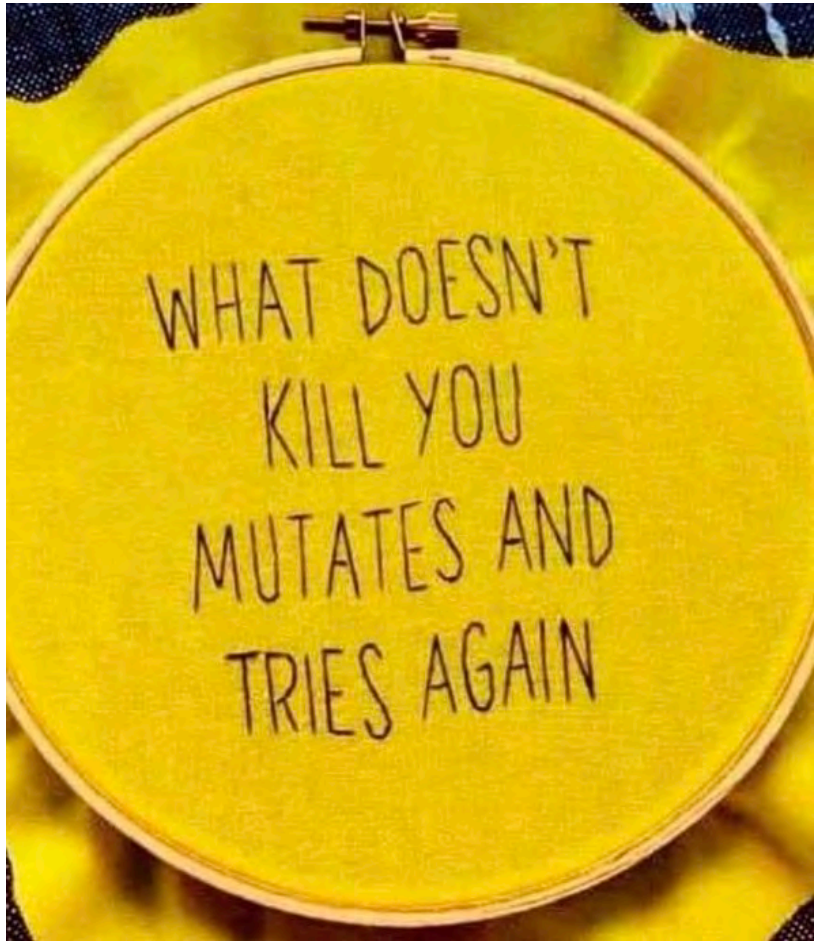


What Do You Mean, Endemic???



What Could Happen Next? Viral Factors

- All pandemics end, but diseases rarely disappear
- Likely entering a transition phase between pandemic (global outbreak) and endemic (local outbreaks)
  - Endemic doesn't mean inconsequential (malaria, TB…)
- We can expect variants to continue to appear
  - Evolution in response to selective pressures
  - Chronic infection in immune-compromised hosts
  - Viral recombination
  - Human → animal → human transmission
- Influenza – infects ~10% of US population each year, with 20k–50k deaths
- How might endemic COVID compare?



Transitioning from Pandemic to Endemic: Theory

Trevor Bedford, Hutchinson Cancer Center, twitter @trvrb

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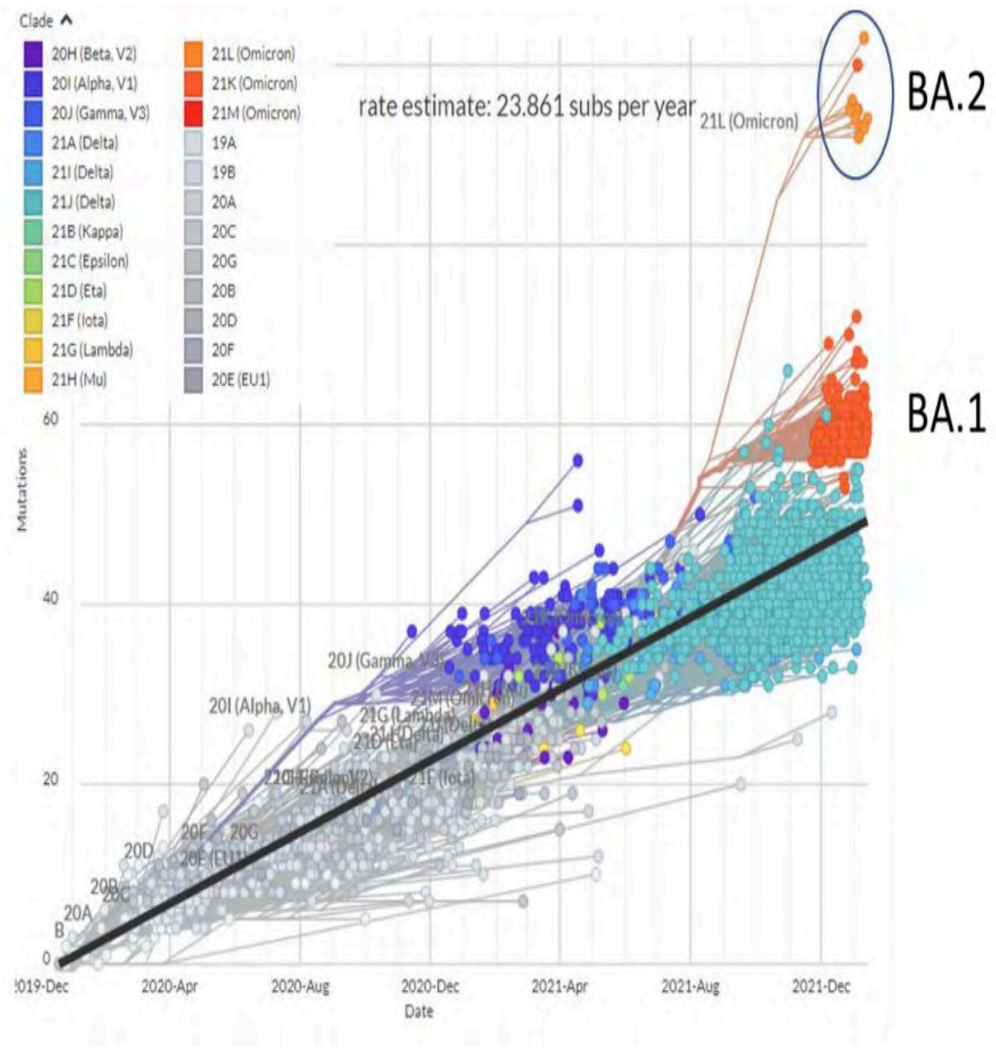
- Key factors:
  1. R_0 (flu = 2, omicron = 12)
  2. Periodically waning immunity
  3. Antigenic drift in virus
  4. Infection to fatality rate (IFR) – (flu = 0.06%, original COVID = 0.6%)
- High R_0, waning immunity and antigenic drift together suggest substantial circulation with a *guess* of 20% or 30% of the population infected per year ("attack rate", flu = 10%)
- Most infections likely to be relatively mild (like flu), but with enough infections, a small fraction of severe outcomes adds up
  - 40k deaths / year would be 20% attack rate with 0.06% IFR
  - 100k deaths / year would be 30% attack rate with 0.1% IFR

Transitioning from Pandemic to Endemic

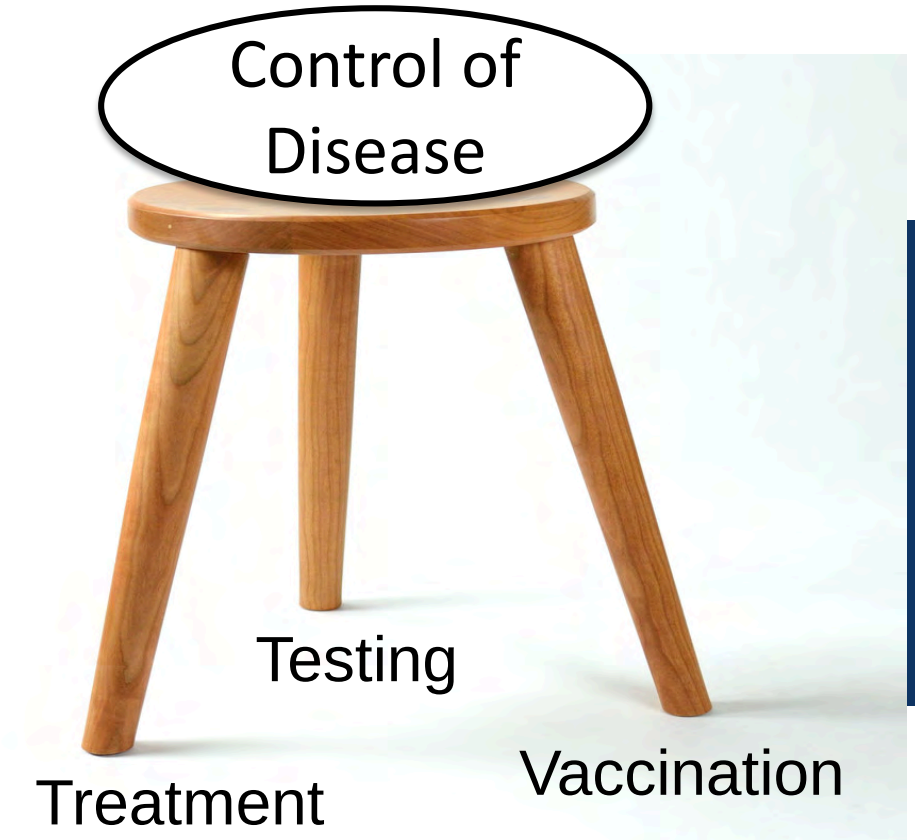
Sostman commentary on Trevor Bedford Model

- Attack rate and IFR likely to be worse during the transition period than in the endemic phase
- As a respiratory virus, probably will be seasonal
- Like seasonal flu, should expect significant season–to–season variability
- Viral evolution unpredictable, but some guesses:
  - further immune evasion
  - little further change in R_0
  - could become more or less severe
- Better preventive measures and testing → reduce the attack rate
- Better therapeutics and vaccines → reduce the infection fatality rate
- Remember the difference between theory and practice!



What Could Happen Next? Social Factors

- Societal responses remain “wild cards.” Thus far, not encouraging.
  - –Dysfunctional social behavior
  - –Social media disinformation
  - –Self-serving politicians
  - –Government inefficiency
  - –Poor communication from leaders & scientists
  - –Poor international coordination



Masks, Air Filters, Hand Hygiene & Other Precautions

Tools to control the pandemic exist – and they will continue to improve.

They are most effective if used correctly and consistently.

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Alternatively, we can let nature take its course.

Nature is ultimately very effective, but can be brutal.

What if your family was collateral damage?

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POST ACUTE COVID (LONG COVID) FOLLOW UP

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- https://journals.plos.org/plosmedicine/article?id=10.1371/journal.pmed.1003871
- 1 year follow up
- 480% increase in all cause mortality

- jama_heesakkers_2022_oi_220002_1642801976.73468.pdf
- 1 year follow up after ICU for COVID
- 74.3% had physical symptoms, 26.2% mental symptoms, 16.2% cognitive symptoms

- https://www.nature.com/articles/s41586-021-03553-9
- Mild COVID (not hospitalized) 30 days after infection
- 159% increased risk of death

- https://www.medrxiv.org/content/10.1101/2022.01.05.22268800v2
- Vaccinated people 54% - 68% less likely to have long COVID

- **By the way.....**
- https://www.cdc.gov/mmwr/volumes/70/wr/mm7043e2.htm#T1_down
- Risk of all cause mortality after vaccination is 0.31 (Moderna), 0.34 (Pfizer) and 0.54 (J&J) compared with unvaccinated

THANK YOU FOR ATTENDING OUR TOWN HALL CONVERSATION

If you'd like more information about the topics discussed today, or would like to join The Society for Leading Medicine, please contact us at **foundation@houstonmethodist.org**

Take care and be well