Infectious Diseases Watch

January 24, 2022

Ed Septimus, MD

General Infectious Diseases

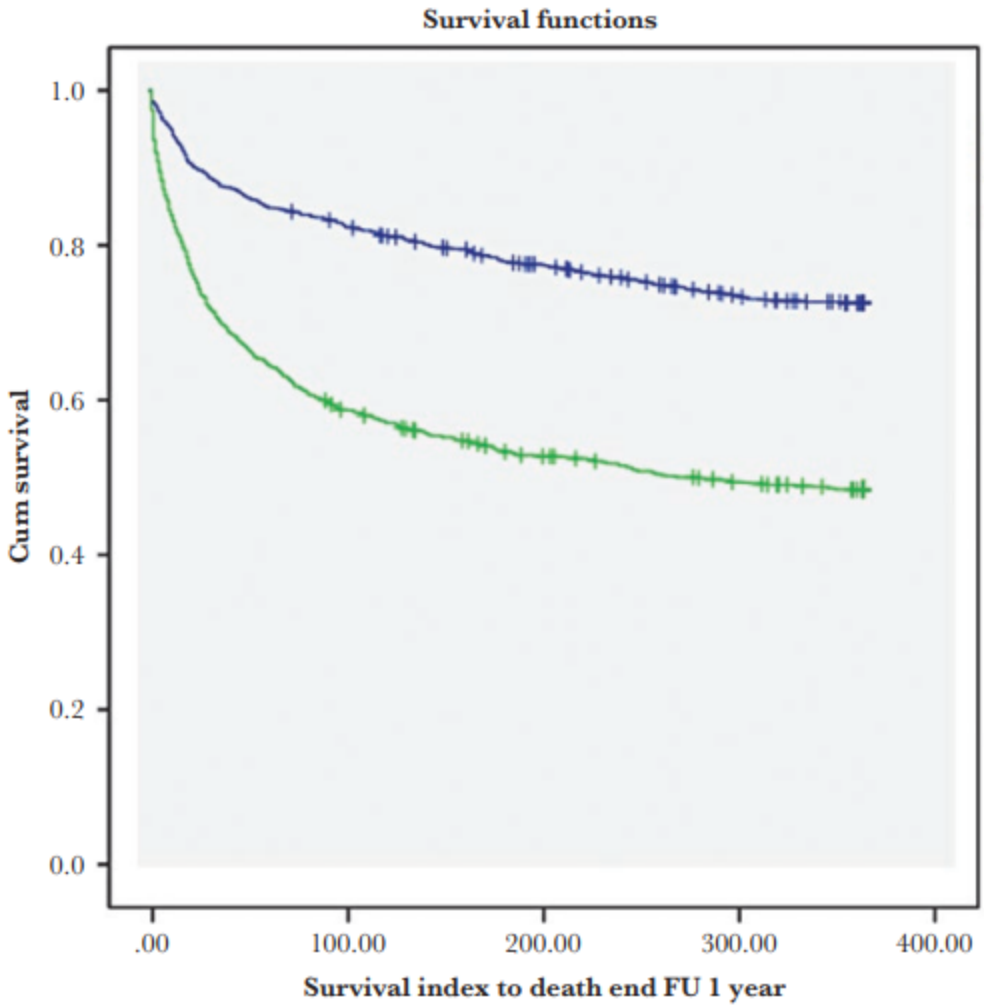
The Impact of Nosocomial Bloodstream Infections on Mortality: A Retrospective Propensity-Matched Cohort Study

OFID 2021; 8: ofab552

doi.org/10.1093/ofid/ofab552

This is a retrospective propensity-matched cohort study conducted in 1 hospital in Israel between January 2010–December 2020. Adults >18 years old with HA-BSI were matched to controls using nearest neighbor matching of the propensity score for HA-BSI. They assessed all-cause mortality at 30 days, 90 days, and survival up to 1 year starting on the BSI day or matched hospital-day among controls; and the functional and cognitive change between admission and discharge using the Norton score among patients discharged alive. Residual differences between matched groups were addressed through Cox regression for 1-year survival.

In all, 1188 patients with bacterial HA-BSIs were matched with 1188 hospital patients without BSI (control). HA- BSI occurred at a median of 11 days in hospital (IQR, 6–21 days). Of the 1361 BSIs, 341 (25.1%) were due to gram-positive bacteria, 970 (71.3%) were due to gram-negative bacteria, and 50 (3.7%) were due to anaerobes. MDR bacteria were isolated in 223 (16.4%): 84/197 (42.6%) MRSA of all *S aureus*, 12/125 (9.6%) VRE of *Enterococcus* spp, 36/633 (5.7%) CRE of all Enterobacterales, 61/85 (71.8%) CRAB of all *Acinetobacter baumannii*, and 30/171 (17.5%) CRPA of all *P aeruginosa* BSIs. Inappropriate antibiotic therapy in the first 24 hours was prescribed to 761/1361 (55.9%) of patients with HA-BSI MDR bacteria. Survival curves were divergent between groups beginning on the index day. Thereafter, 30-day mortality was 28.3% (HA-BSI) versus 11.4% (control; propensity score–matched odds ratio, 3.1) and 90-day mortality was 40.3% versus 16.8% (OR, 3.4). Patients with HA-BSI also showed a greater decline in functionality from admission to discharge. Within the HA-BSI group, mortality was higher in patients with infection caused by multidrug resistant organisms and in those who did not receive an appropriate antibiotic during the first 24 hours following the initial positive blood culture.



Comment: Between 2010 and 2020, HA-BSI led to a 3.4-fold increase in 90-day mortality at a hospital in Israel. The results are not surprising and are consistent with prior studies. Until the pandemic, the US had made significant progress in the reduction of CLABSIs. During the pandemic, CLABSIs and all cause HA-BSI have increased. Given that not all HA-BSI are due to central lines, perhaps it is time to not just report CLABSI, but all HA-BSI. [see next article] To my knowledge I am not aware of previous studies assessing functional and cognitive outcomes, highly relevant for surviving patients similar to sepsis. The investigators did not have reliable data on the source of the BSI, since this was not collected as a discrete variable until recently. This was a missed opportunity to assessed source which may impact prevention strategies.

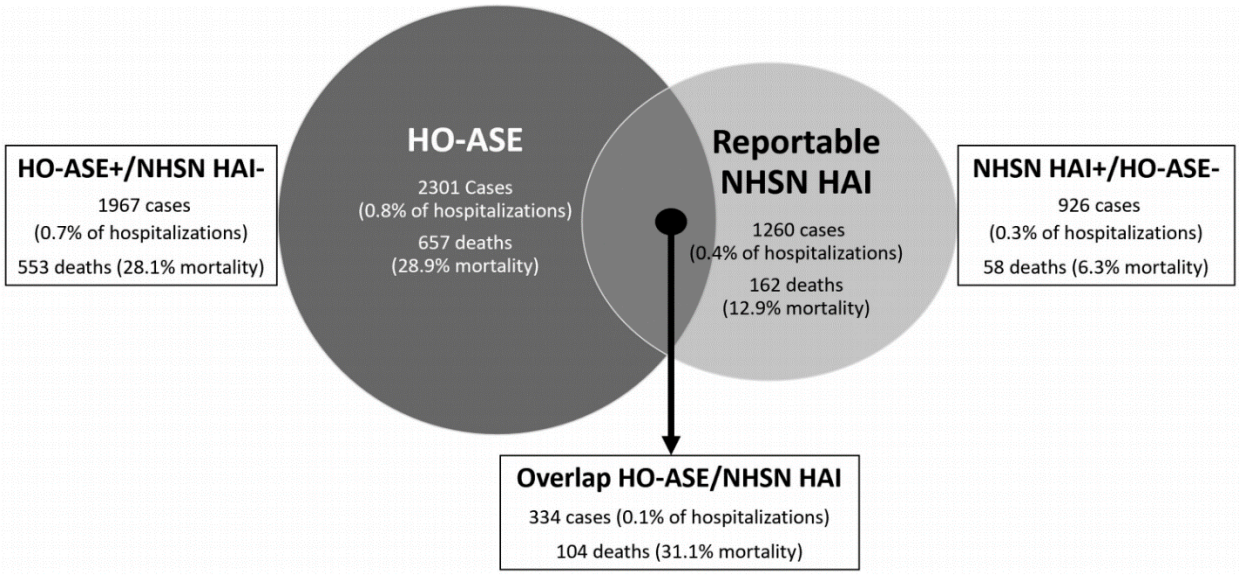
Surveillance for Healthcare-Associated Infections: Hospital-Onset Adult Sepsis Events Versus Current Reportable Conditions Clin Infest Dis 2021;73(6):1013–9

DOI: 10.1093/cid/ciab217

US hospitals are required by the CMS to publicly report CLABSIs, CAUTIs, *C diffficile*, MRSA bacteremia, and selected surgical site infections for benchmarking and pay-for-performance programs. The authors wonder to what extent these conditions capture the full breadth of serious HAIs.

The authors used the CDC's hospital-onset Adult Sepsis Event (HO-ASE) definition to determine if it would facilitate more comprehensive and efficient surveillance for serious HAIs. They retrospectively assessed the overlap between HO-ASEs and reportable HAIs among adults hospitalized between June 2015–June 2018 in 3 hospitals. Medical record reviews were conducted for 110 randomly selected HO-ASE cases to determine clinical correlates.

Among 282,441 hospitalized patients, 2301 (0.8%) met HO-ASE criteria and 1260 (0.4%) had reportable HAIs. In-hospital mortality rates were higher with HO-ASEs than reportable HAIs (28.6% vs 12.9%). Mortality rates for HO-ASE missed by reportable HAIs were substantially higher than mortality rates for reportable HAIs missed by HO-ASE (28.1% vs 6.3%). Reportable HAIs were only present in 334/2301 (14.5%) HO-ASEs, most commonly CLABSIs (6.0% of HO-ASEs), *C. difficile* (5.0%), and CAUTIs (3.0%). On medical record review, most HO-ASEs were caused by pneumonia (39.1%, of which only 34.9% were ventilator associated), bloodstream infections (17.4%, of which only 10.5% were central line–associated), non–*C. difficile* intra-abdominal infections (14.5%), urinary infections (7.3%, of which 87.5% were catheter-associated), and skin/soft tissue infections (6.4%).



Comment: CDC's HO-ASE definition detects many serious nosocomial infections missed by currently reportable HAIs. The ability to conduct automated HO-ASE surveillance using EHR data is particularly appealing when compared with the manual reviews required for some of the reportable NHSN HAIs (such as CLABSI, SSI, and CAUTI). Manual NHSN HAI surveillance is complicated, time-consuming, and subjective. Prior studies were able to estimate the positive predictive value of HO-ASE for CMS SEP-1 and Sepsis-3 criteria, but the authors were unable to estimate sensitivity given the limited sampling strategy for medical record reviews. In addition,

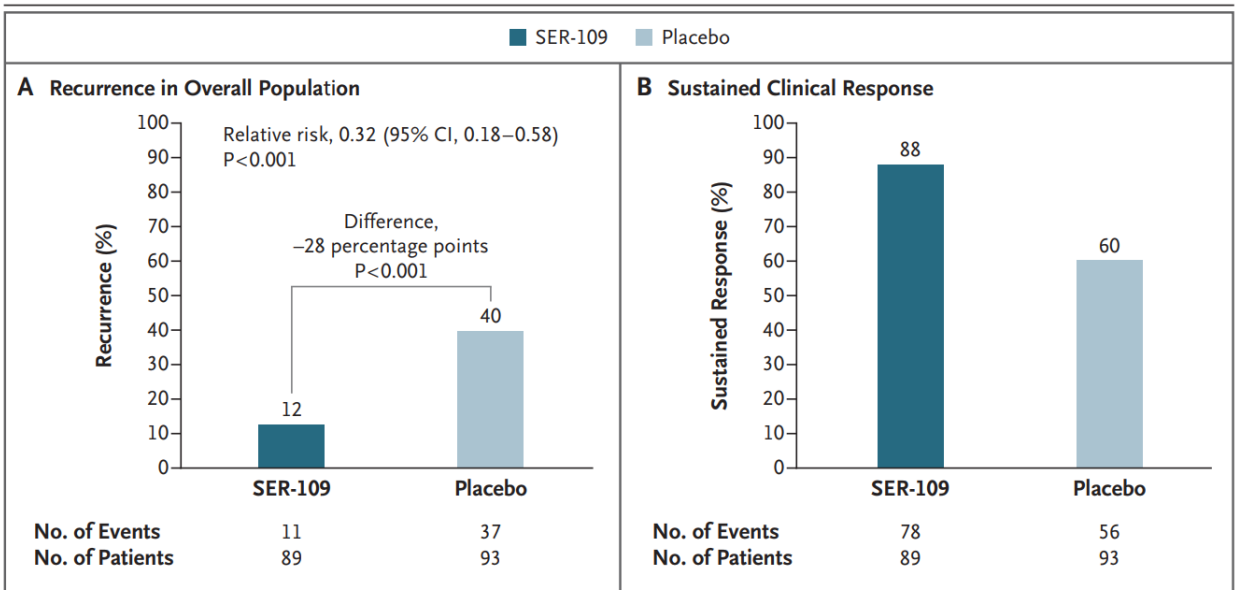
prior studies have demonstrated that ASE is more sensitive than sepsis diagnosis codes relative to Sepsis-3 criteria. [JAMA 2017; 318:1241–9]. Although
they found that HO-ASEs were associated with high mortality rates, this study does not provide insight into the preventability of these events. HO-ASE surveillance could increase the efficiency and clinical significance of surveillance while identifying new targets for prevention.

SER-109, an Oral Microbiome Therapy for Recurrent Clostridioides difficile Infection N Engl J Med 2022;386:220-9.

DOI: 10.1056/NEJMoa2106516

The development of *C. difficile* disease (CDD) is driven by gut microbiome alterations that allow germination and vegetative growth of *C. difficile* spores, with subsequent toxin production. Fecal microbiota transplantation can be highly effective in treating CDD, despite variable clinical responses and concerns about inadvertent exposure to unrecognized pathogens within the transplant. This is an industry-supported trial, to determine the beneficial effects of fecal microbiota transplantation could be achieved using an oral microbiome product, SER-109, composed of live Firmicutes bacterial spores derived from healthy human donor fecal material extensively processed to remove all other bacteria, fungi, parasites, and viruses. Patients were stratified according to age (<65 or ≥65 years) and antibiotic received for *C. difficile* infection (vancomycin or fidaxomicin) before randomization. They randomized adult patients with a history of recurrent CDD episodes within 12 months to receive 4 capsules of either SER-109 or placebo daily for 3 days. The primary outcome was the number of subjects who developed recurrent CDD.

Among 182 participants, significantly fewer SER-109 recipients than placebo recipients developed recurrent CDD within 8 weeks of treatment (11 of 89 [SER-109] vs. 37 of 93 [placebo]), with comparable findings when stratified by age or CDD antibiotic treatment. SER-109 treatment was associated with fecal engraftment with SER-109 dose species as well as an increase in secondary bile acids. No adverse events were observed with treatment. Most adverse events were mild to moderate and were gastrointestinal in nature, with similar numbers in the two groups. SER-109 dose species were detected as early as week 1 and were associated with bile-acid profiles that are known to inhibit *C. difficile* spore germination.



Comment: In patients with recurrent *C. difficile* infection, achievement of a sustained clinical response can be made more likely with a two-pronged treatment paradigm of antibiotics followed by a microbiome therapeutic. SER-109 was superior to placebo in reducing the risk of recurrence, with an observed safety profile similar to that of placebo. This study also demonstrated that SER-109 restored production of bile acids that can inhibit C difficile spore germination. One concern was that samples were only obtained from 4 donors. It will be important to know they can maintain efficacy if production is scaled up to increase capacity.

COVID-19

COVID-19 News

Israeli study shows 4th shot of COVID-19 vaccine less effective on Omicron

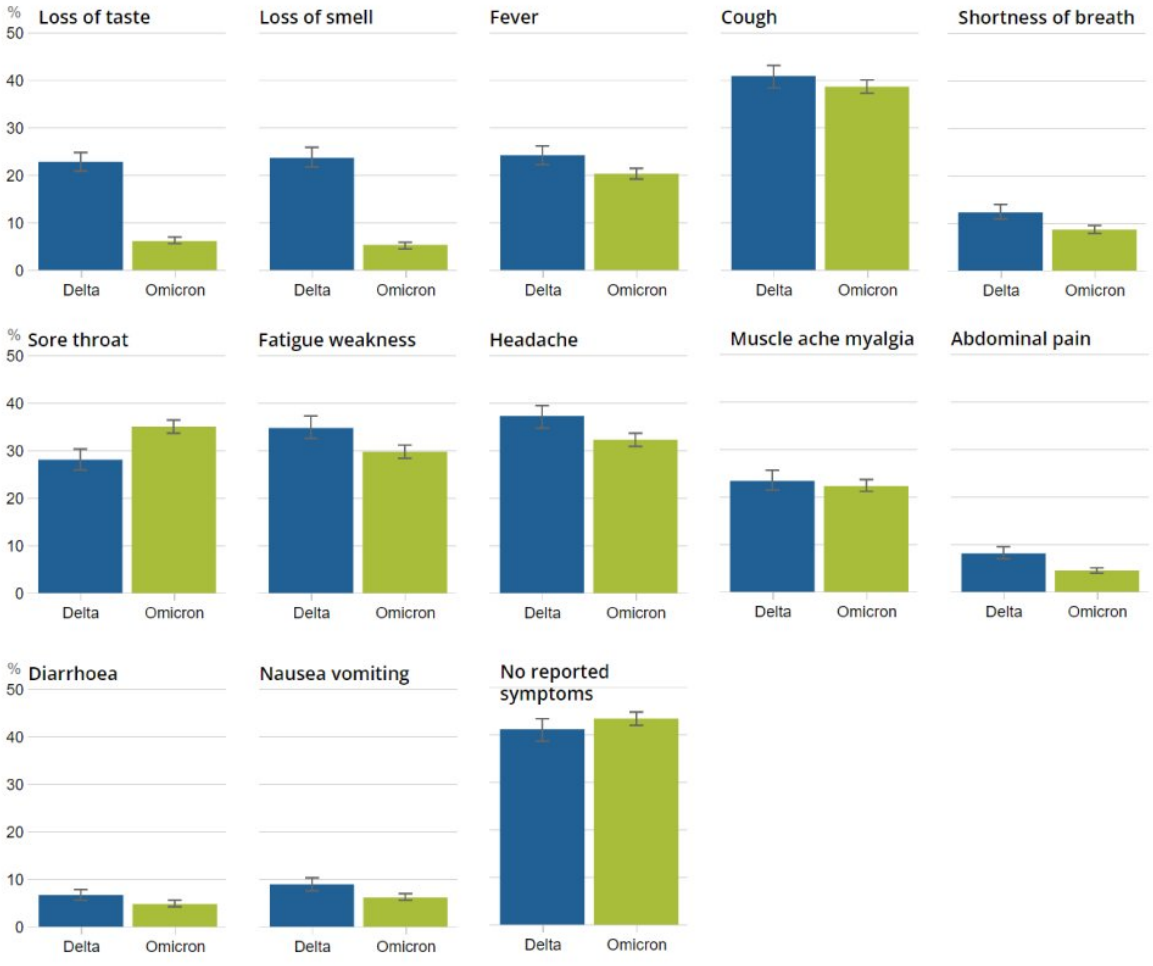
A fourth shot of COVID-19 vaccine boosts antibodies to even higher levels than the third shot but it is not enough to prevent Omicron infections, according to a preliminary study in Israel.

Israel's Sheba Medical Center has given second booster shots in a trial among its staff and is studying the effect of the Pfizer booster in 154 people after two weeks and the Moderna booster in 120 people after one week. These were compared to a control group that did not receive the fourth shot. Those in the Moderna group had previously received three shots of Pfizer's vaccine.

Comment: Israel is still recommending a fourth shot to older adults and those who face higher risks for severe COVID-19. As of Sunday, more than 500,000 people in Israel had received fourth doses since the country began offering them last month to medical workers, immunocompromised patients, and people ages 60 years and older.

People with Omicron compatible infections are less likely to report most symptoms, and substantially less likely to report loss of taste or loss of smell, compared with people with Delta compatible infections

Unweighted percentage of people with symptoms, including only those who have strong positive tests (Ct less than 30) by Delta and Omicron compatible COVID-19 variants, UK, 9 to 31 December 2021



Source: Coronavirus (COVID-19) Infection Survey, characteristics of people testing positive for COVID-19, UK: 19 January 2022

Office for National Statistics

Comment: As the graph shows, loss of taste and smell was reported far less with Omicron.

Center for Strategic and International Studies (CSIS): CSIS Commission on Strengthening America's Health Security Pandemic Report January 2022

A new report from CSIS comments on the "ineffectual and fragmented" US COVID-19 pandemic responses thus far and recommends eight steps to manage the ongoing crisis amid variant fatigue, inflation, and supply chain disruptions.

- Launch a 5-year US international pandemic preparedness project with concrete targets, a prioritization of partner countries and institutions, a clear action plan, and a permanent leadership structure, with a budget of $18 to $20 billion a year.

- Appoint a presidential global health security envoy to be based at the Department of State to lead development of the US initiative, work with Congress, coordinate interagency action in partnership with the White House, and expand diplomatic engagement with key allies, international institutions, and regional bodies.

- Make COVID-19 vaccines the cornerstone of the US and international response to ensure an affordable, timely supply to COVAX and regional and key partners states, shore up delivery capacity, debunk misinformation, confront vaccine hesitancy, and foster new regional production partnerships with vaccine makers.

- Prioritize COVID-19 tests and therapies with a "test and treat" approach, support development and deployment of therapies to prevent and treat infections and designate an agency to lead distribution and proper use of treatments in developing countries with the support of multiyear budgets.

- Develop strategies for development of future tests, treatments, and vaccines, with US and international monitoring and surveillance modernization. This includes fostering US-European Union (EU) cooperation, especially between the Biomedical Advanced Research and Development Authority (BARDA) and the new EU Health Emergency preparedness and Response Authority (HERA) and supporting the Coalition for Epidemic Preparedness Innovations (CEPI).

- Establish and resource a pandemic fund and high-level leaders' council, with political and financial backing from other G20 nations and funding from Congress.

- Integrate the US Department of Defense's roles and funding authorities into the US international initiative using dedicated resources.

- Encourage the Biden administration to nurture a better relationship with China that would lead to discrete health security improvements for reasons such as travel, public health infrastructure, information sharing, and supply chains.

Comment: Progress is not likely to be consolidated and advanced under current circumstances unless a far more strategic and disciplined international approach is taken that is integrated with the domestic approach, wins support in Congress, and addresses both the immediate acute global needs and the long-term requirements for global readiness against future threats. We must never forget the lessons learned.

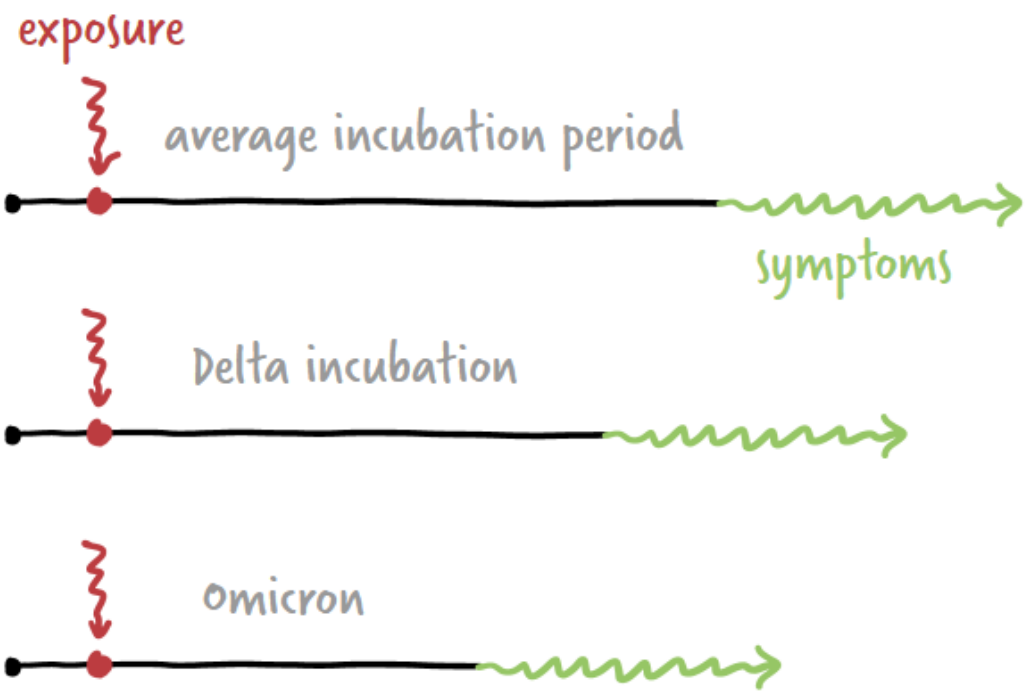
Distribution of N95 Masks

This past Wednesday, the administration announced a plan to distribute 400 million N95 masks for adults from the strategic national stockpile starting next week. Masks will be distributed in pharmacies and health centers. Adults will be able to 3 masks each. CDC recently updated their mask policy [see ID Watch last week] away from cloth masks to a higher level of protection to include N95 and KN95 masks.

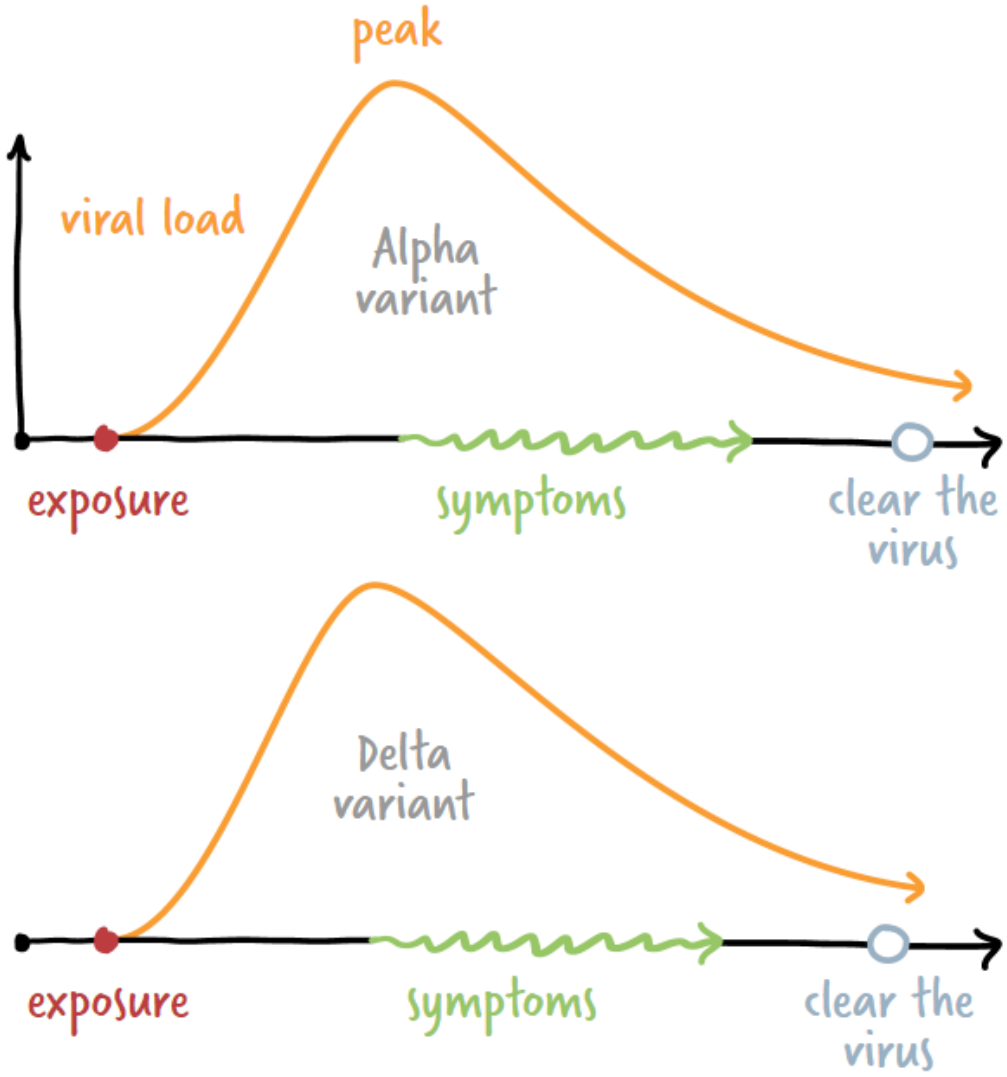
Comment: CDC urged Americans to "wear the most protective mask you can that fits well and that you will wear consistently." While the higher-quality masks provide better protection, they can be uncomfortable to wear and expensive. The former is true, but the government will now provide N95 masks to adults free of charge. Appropriate fit is important and not everyone can comfortably wear an N95 mask. Lastly, although I believe this is the right direction, this is another example of Washington being reactive rather than proactive similar to testing. Children are currently not part of this program.

Charting an Omicron Infection NY Times January 22, 2022

Incubation

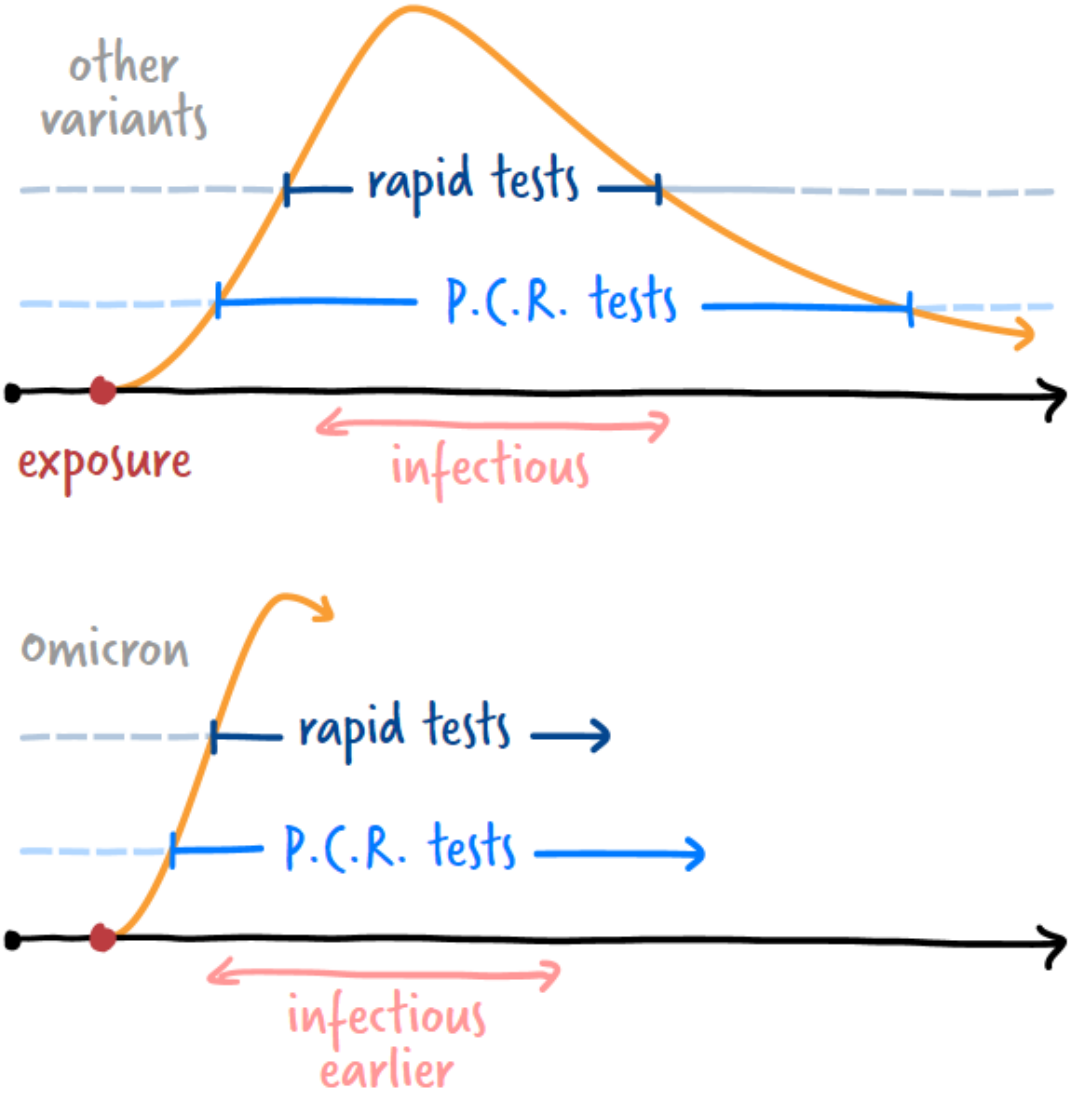

exposure
average incubation period
symptoms
Delta incubation
Omicron

Viral Load

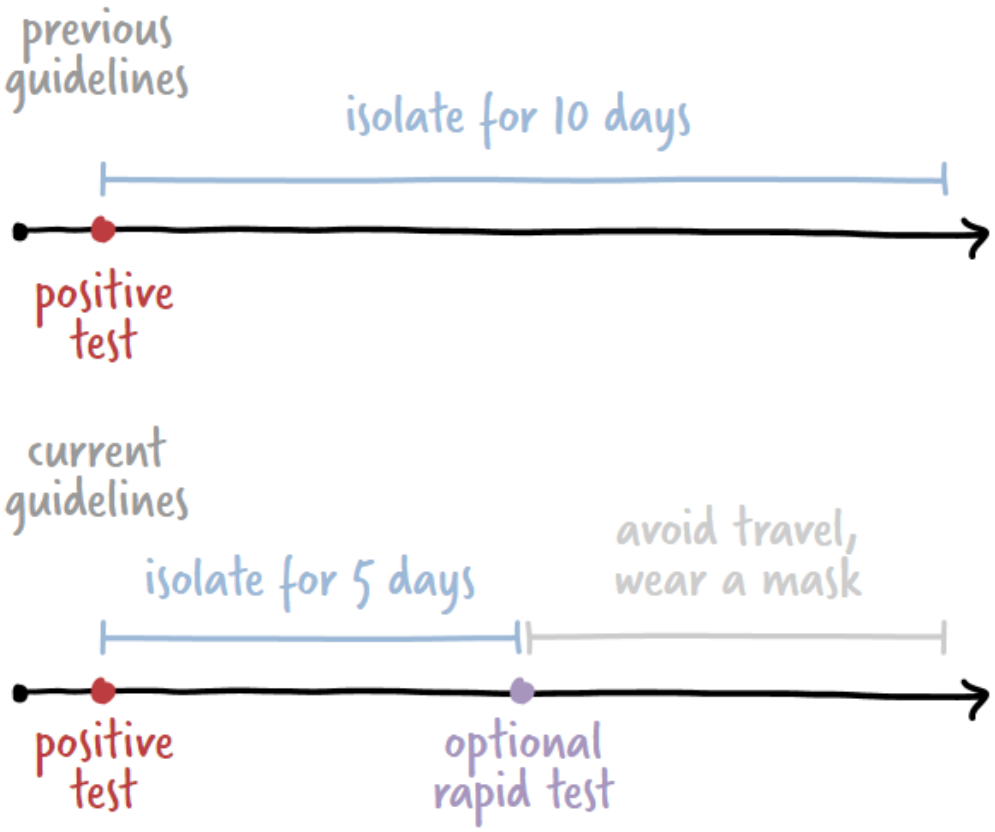


Unclear whether Omicron follows the same pattern remains to be seen. In one preliminary study["Viral dynamics and duration of PCR positivity of the SARS-CoV-2 Omicron variant." Pre-print., https://nrs.harvard.edu/URN-3:HUL.INSTREPOS:37370587] researchers found that Omicron infections were about a day shorter than Delta infections and resulted in slightly lower peak viral loads, on average. But the difference might be due to higher rates of pre-existing immunity.

Testing

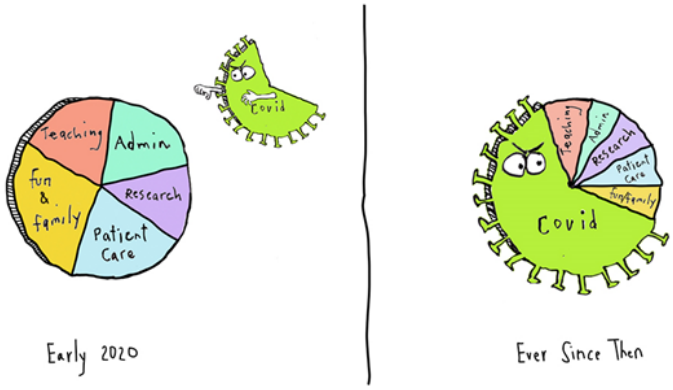


New Isolation Guidance



Comment: I included these figures from the article. Graphically they explain these subjects well for a lay audience which I thought you might find helpful.

The Pandemic Life of an ID Doctor — in Graphic Form New England Journal Watch January 12, 2022

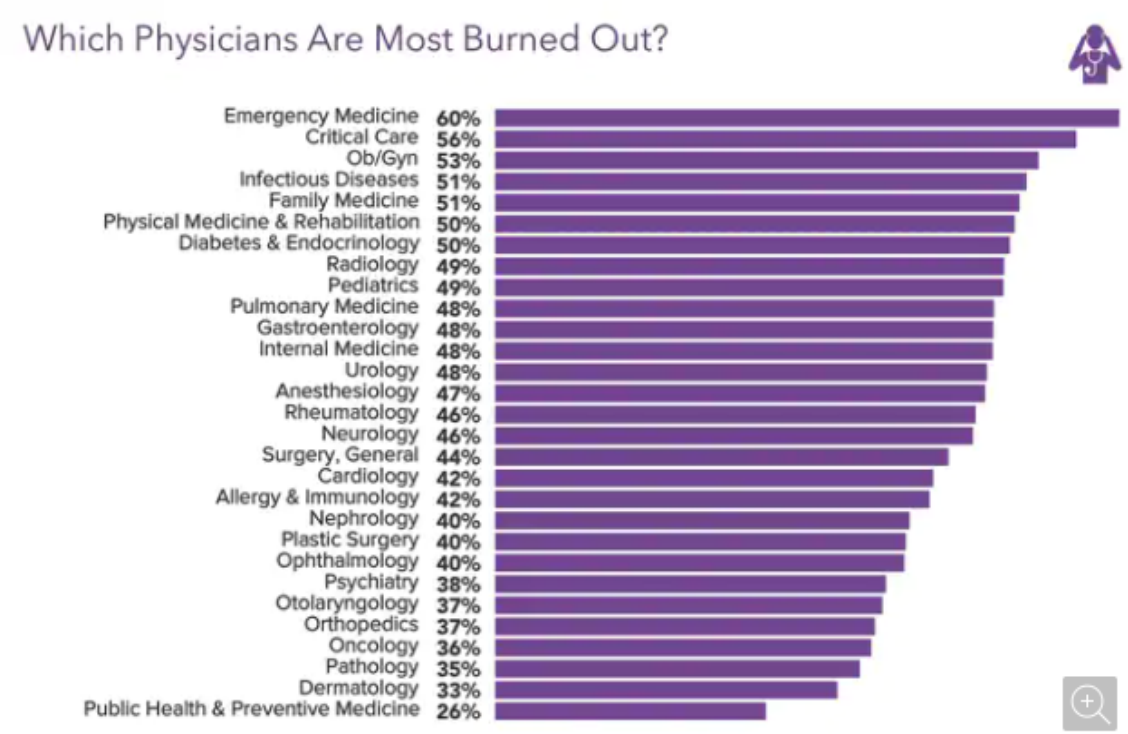


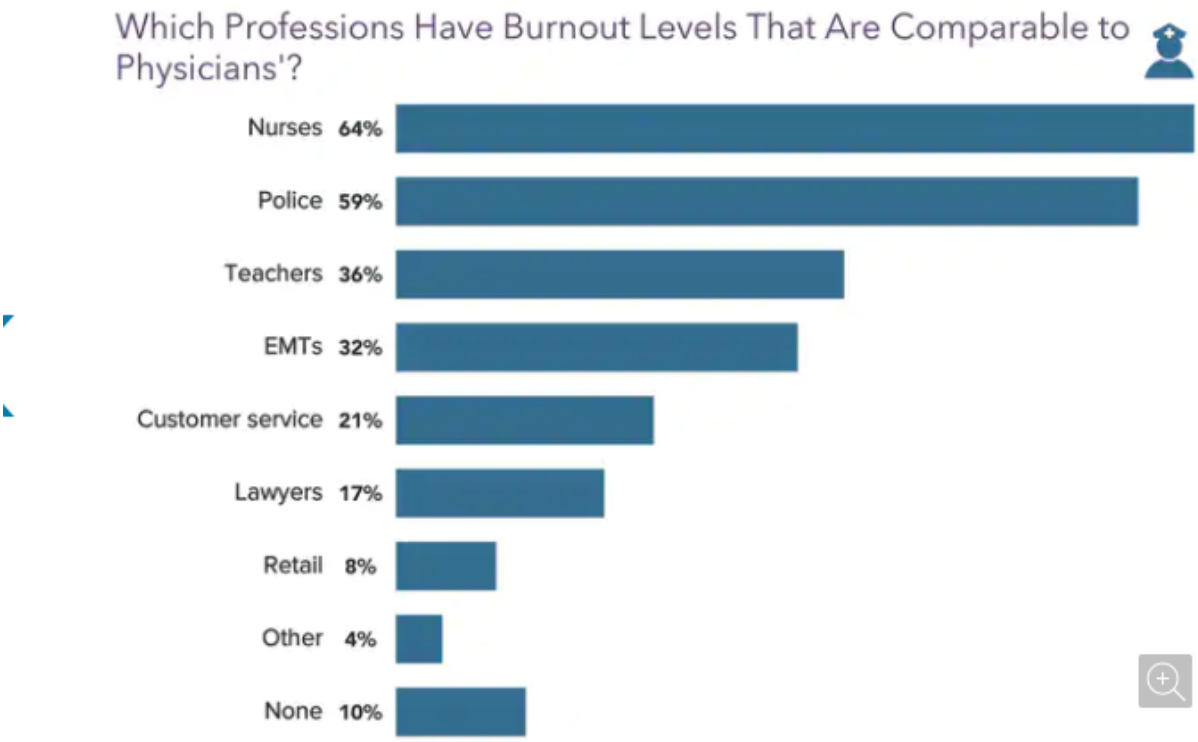
Comment: I think many of us can identify with this graph -see survey below

Medscape's National Burnout and Depression Report 2022

Medscape asked more than 13,000 physicians from 29 specialties to share details about their lives and struggles with burnout and depression this past year.

In last year's report, 42% of physicians said they were burned out. This year, that number increased to 47%. Perhaps not surprisingly, burnout among emergency physicians took the biggest leap, increasing from 43% last year to 60% this year. Critical care (56%), ob/gyn (53%), and infectious disease and family medicine (both at 51%) rounded out the top five specialties with doctors experiencing burnout in 2021. Burnout has typically been a greater problem for women than men physicians, indeed, 56% of women and 41% of men reported burnout in this year's survey. The causes, however, were not all pandemic related — or at least not directly. As in previous surveys, the major contributing factor to burnout was too much paperwork (60%), such as charting and other bureaucratic tasks. Treating COVID-19 patients was cited as the major source of stress by only 10% of respondents. [the word major maybe the clue. I think Covid contributed in many other ways] Thirty-four percent said too many hours at work was the biggest contributing factor to burnout.


Which Physicians Are Most Burned Out?
Emergency Medicine 60%
Critical Care 56%
Ob/Gyn 53%
Infectious Diseases 51%
Family Medicine 51%
Physical Medicine & Rehabilitation 50%
Diabetes & Endocrinology 50%
Radiology 49%
Pediatrics 49%
Pulmonary Medicine 48%
Gastroenterology 48%
Internal Medicine 48%
Urology 48%
Anesthesiology 47%
Rheumatology 46%
Neurology 46%
Surgery, General 44%
Cardiology 42%
Allergy & Immunology 42%
Nephrology 40%
Plastic Surgery 40%
Ophthalmology 40%
Psychiatry 38%
Otolaryngology 37%
Orthopedics 37%
Oncology 36%
Pathology 35%
Dermatology 33%
Public Health & Preventive Medicine 26%

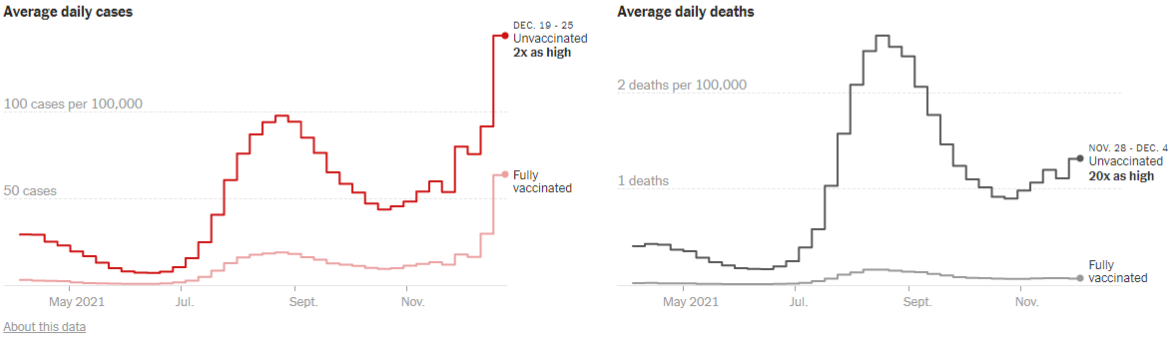

Which Professions Have Burnout Levels That Are Comparable to Physicians'?
Nurses 64%
Police 59%
Teachers 36%
EMTs 32%
Customer service 21%
Lawyers 17%
Retail 8%
Other 4%
None 10%

Comment: Very interesting survey. I wanted to highlight it is not just physicians who have been impacted. As you can see above, our nurses have been impacted in the last 2 years as my perspective discussed last week.

COVID-19 by the Numbers January 23, 2022

Rates for vaccinated and unvaccinated

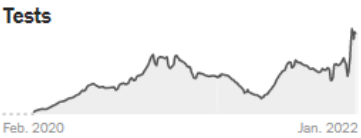
Data from the Centers for Disease Control and Prevention shows that people who are unvaccinated are at a much greater risk than those who are fully vaccinated to die from Covid-19. These charts compare age-adjusted average daily case and death rates for vaccinated and unvaccinated people in the 26 states and two cities that provide this data.

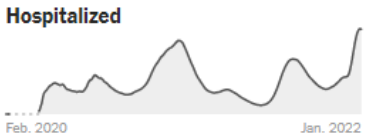


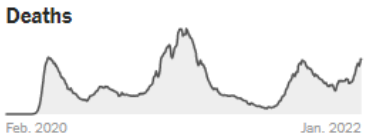
About this data

New reported cases

All time | Last 90 days







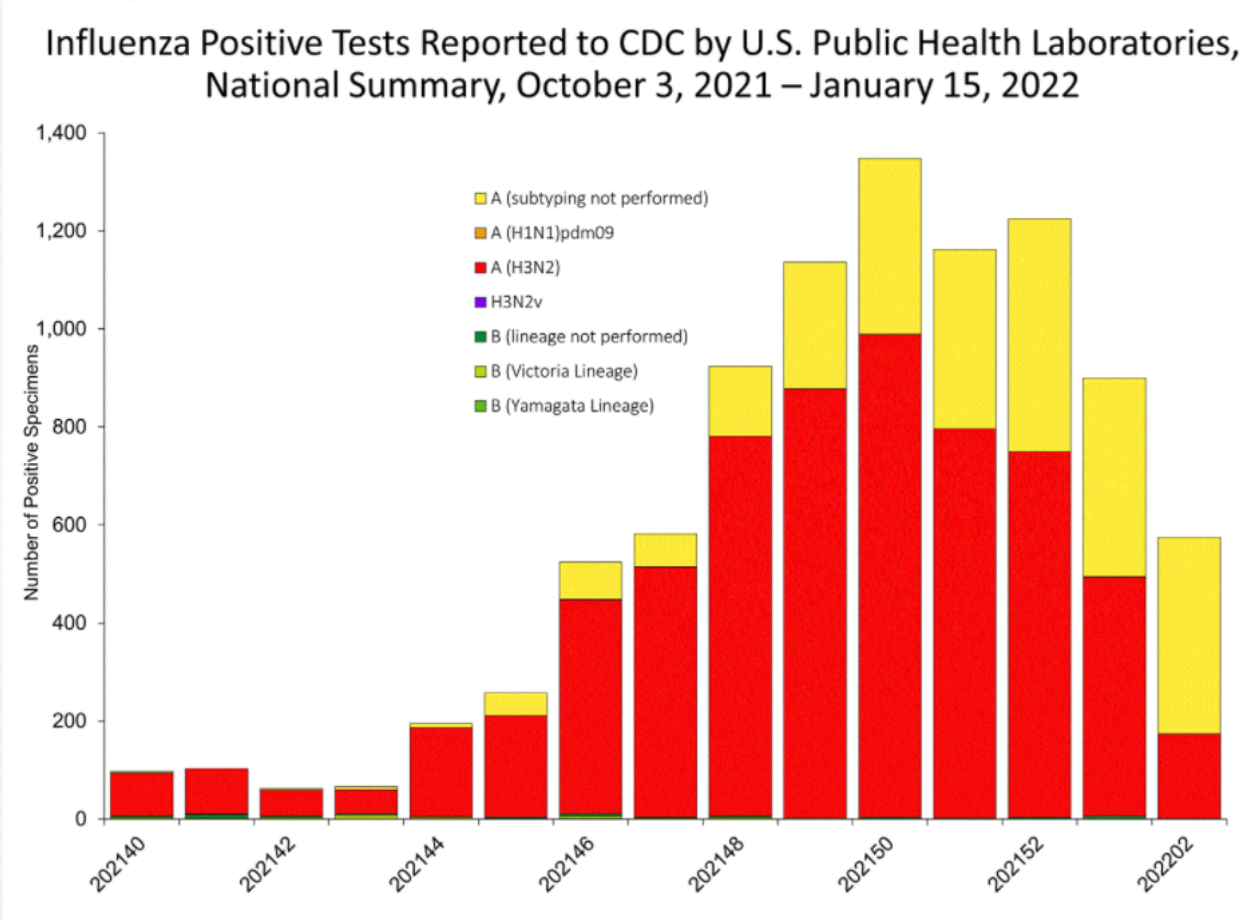
	DAILY AVG. ON JAN. 22	14-DAY CHANGE	TOTAL REPORTED
Cases	705,878	+8%	70,468,038
Tests	2,596,425	+100%	—
Hospitalized	158,825	+24%	—
Deaths	2,152	+41%	865,116

About this data

Comment: New cases have started to fall nationally, signaling that the Omicron wave has finally begun to recede. More and more states have passed a peak in new cases in recent days, as hope of progress have spread to much of the country. Despite these hopeful signs, the threat has not passed. Some parts of the US continue to identify far more infections a day than in any prior surge, and some states in the West, South and Great Plains are still seeing sharp increases.

CDC Influenza January 15, 2022

- Influenza activity remains elevated but declined slightly again this week. While influenza activity is difficult to predict, it is expected to continue for several more weeks.
- The majority of influenza viruses detected are A(H3N2). Most of the H3N2 viruses identified so far this season are genetically closely related to the vaccine virus, but there are some antigenic differences that have developed as H3N2 viruses have continued to evolve.
- The number of hospital admissions reported to HHS Protect declined slightly again this week.
- The cumulative hospitalization rate in the FluSurv-NET system is higher than the rate for the entire 2020-2021 season, but much lower than the rate seen at this time during the four seasons preceding the COVID-19 pandemic.
- Initial data show that flu vaccination coverage so far is lower this season compared to last.



Comment: Influenza activity is still far below pre-pandemic, but higher than last year. The question: We are moving to be on the back side of the Omicron wave, will influenza and other respiratory viruses emerge in February/March?

COVID-19

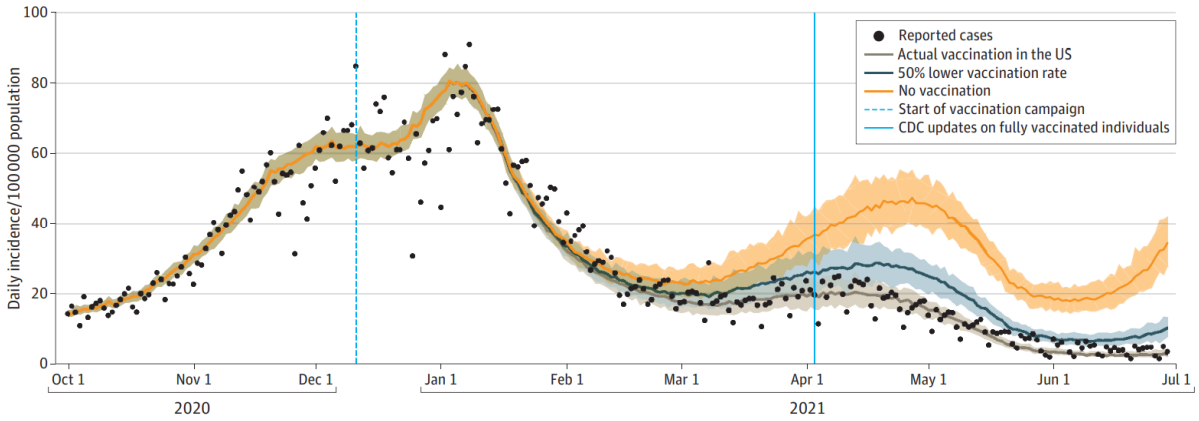
COVID-19 News

Journal Review

Estimating COVID-19 Infections, Hospitalizations, and Deaths Following the US Vaccination Campaigns During the Pandemic JAMA Netw Open 2022;5(1):e2142725

The authors simulated pandemic trajectory under 2 counterfactuals: a no vaccination scenario and a program that achieved only half the daily vaccination rate of actual rollout. For each scenario, cumulative infections, hospitalizations, and deaths were compared with the simulated trends under the US vaccination program.

Compared with the no vaccination scenario, the actual vaccination campaign saved an estimated 240,797 (95% CrI, 200 665-281 230) lives and prevented an estimated 1,133,617 (95% CrI, 967 487- 1 301 881) hospitalizations from December 12, 2020, to June 30, 2021. The number of cases averted during the same period was projected to exceed 14 million. Vaccination prevented a wave of COVID-19 cases driven by the Alpha variant that would have occurred in April 2021 without vaccination, with a projected peak of 4409 (95% CrI, 2865-6312) deaths and 17 979 (95% CrI, 13 191-23 219) hospitalizations. Under the second counterfactual with daily vaccination rates at half the reported pace, we projected that the US would have still endured an additional 77,283 (95% CrI, 48 499-104 519) deaths and 336,000 (95% CrI, 225 330- 440 109) hospitalizations.



Comment: Limitations of their model included the use of reported cases for fitting, which may not reflect the true incidence. They did not consider waning immunity after vaccination or recovery within the study time frame. This simulation did not include Delta and certainly not Omicron. Nonetheless multiple studies which includes both Delta and Omicron have confirmed that vaccines provide significant protection from severe disease and deaths due to Covid-19.

No infectious SARS-CoV-2 in breast milk from a cohort of 110 lactating women

Pediatric Res published online January 19, 2022

Breast milk from 110 lactating women was analyzed by reverse transcription-polymerase chain reaction (285 samples) and viral culture (160 samples). Those containing SARS-CoV-2 viral RNA (vRNA) were examined for the presence of subgenomic RNA (sgRNA), a putative marker of infectivity.

Sixty-five women had a positive SARS-CoV-2 diagnostic test, 9 had symptoms but negative diagnostic tests, and 36 symptomatic women were not tested. SARS-CoV-2 vRNA was detected in the milk of 7 (6%) women with either a confirmed infection or symptomatic illness, including 6 of 65 (9%) women with a positive SARS-CoV-2 diagnostic test. Infectious virus was not detected in any culture, and none had detectable sgRNA.

Comment: SARS-CoV-2 RNA can be found infrequently in the breastmilk after recent infection, but investigators found no evidence that breastmilk contains an infectious virus or that breastfeeding represents a risk factor for transmission of infection to infants. Breast milk is an invaluable source of nutrition to infants and contains numerous antimicrobial factors, including neutralizing antibodies to viruses. Of note, antibodies to SARS-CoV-2 have been detected in the breast milk of recently infected lactating women. [N. Microbes N. Infect. 37, 100752 (2020)] The collection of breast milk samples was not directly observed, and the investigators relied on the maternal report of SARS-CoV-2 test results, symptoms, and treatments received. This study represents the largest number of breast milk samples analyzed to date from women with recent SARS-CoV-2 infection. Nonetheless, even this size may have been too small to permit the identification of factors that would predict the presence of SARS-CoV-2 RNA in breast milk.

However, this study provides substantial additional evidence that breastfeeding from women proven or suspected to have had SARS-CoV-2 infection does not represent a significant hazard for infants.

Effectiveness of a Third Dose of mRNA Vaccines Against COVID-19–Associated Emergency Department and Urgent Care Encounters and Hospitalizations Among Adults During Periods of Delta and Omicron Variant Predominance — VISION Network, 10 States, August 2021–January 2022 MMWR published online January 21, 2022

Data are limited on the real-world effectiveness of third doses of COVID-19 mRNA vaccine in the US, especially since the Omicron variant became predominant in mid-December 2021. The VISION Network [Baylor Scott & White Health (Texas), Columbia University Irving Medical Center (New York), HealthPartners (Minnesota and Wisconsin), Intermountain Healthcare (Utah), Kaiser Permanente Northern California (California), Kaiser Permanente Northwest (Oregon and Washington), Regenstrief Institute (Indiana), and University of Colorado (Colorado)] examined VE by analyzing 222,772 encounters from 383 emergency departments (EDs) and urgent care (UC) clinics and 87,904 hospitalizations from 259 hospitals among adults aged ≥18 years across 10 states from August 26, 2021 to January 5, 2022. Analyses were stratified by the period before and after the Omicron variant became the predominant strain (>50% of sequenced viruses) at each study site.

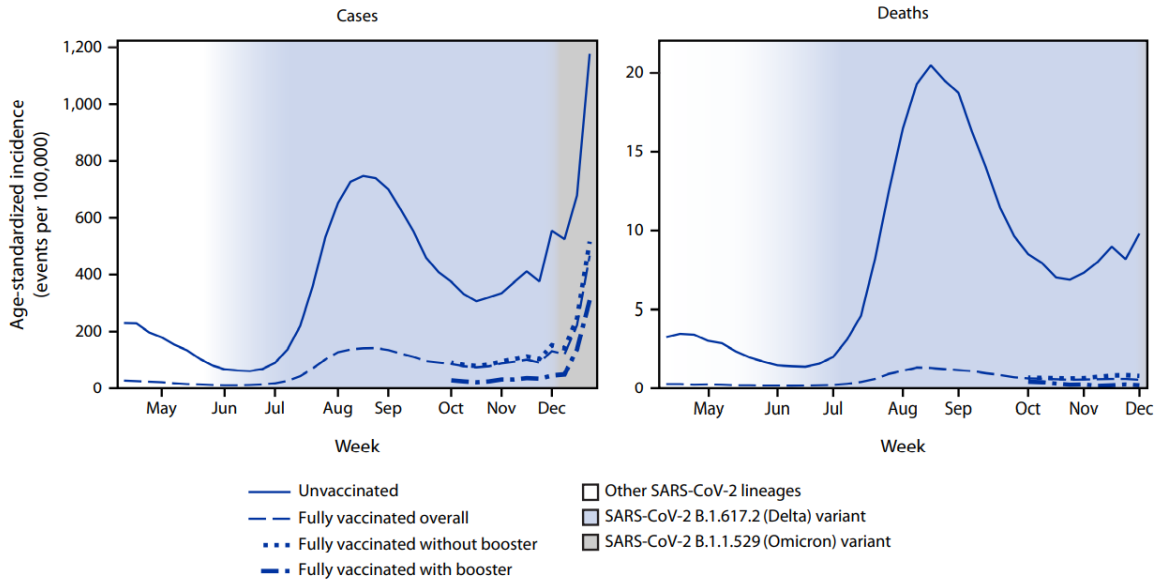
During the period of Delta predominance across study sites in the United States (August–mid-December 2021), VE against laboratory-confirmed COVID-19–associated ED and UC encounters was 86% 14–179 days after dose 2, 76% ≥180 days after dose 2, and 94% ≥14 days after dose 3. Estimates of VE for the same intervals after vaccination during Omicron variant predominance were 52%, 38%, and 82%, respectively. During the period of Delta variant predominance, VE against laboratory-confirmed COVID-19–associated hospitalizations was 90% 14–179 days after dose 2, 81% ≥180 days after dose 2, and 94% ≥14 days after dose 3. During Omicron variant predominance, VE estimates for the same intervals after vaccination were 81%, 57%, and 90%, respectively.

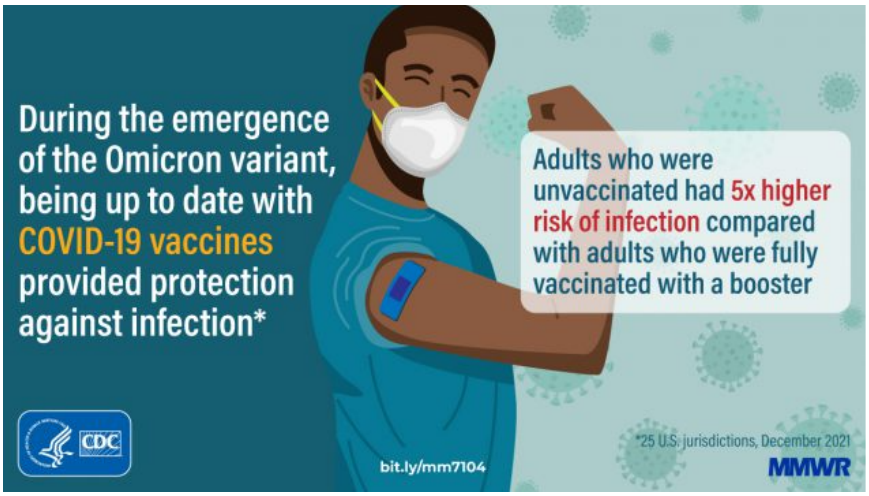
Comment: The highest estimates of VE against COVID-19–associated ED and UC encounters or hospitalizations during both Delta- and Omicron waves were among adults who received a third dose of mRNA vaccine. Estimates of VE for 2 doses of an mRNA vaccine were higher against COVID-19–associated hospitalizations than against COVID-19–associated ED or UC encounters, especially during the Omicron period. This study also found that immunocompromised adults had lower third dose VE against COVID-19–associated ED and UC encounters and hospitalization, which is consistent with trends observed for VE following a second dose and is consistent with recommendations for a booster dose for this group 5 months after the additional primary dose (3 doses).[CDC now recommends that all immunocompromised persons receive a booster dose of either Pfizer-BioNTech or Moderna COVID-19 vaccines 5 months after completing their 3-dose primary series] VE estimates from this study do not include COVID-19-associated outpatient visits or non-medically attended COVID-19. Second, the median interval from receipt of dose 3 to medical encounters was 41–44 days; thus, the observed performance of dose 3 is limited to a relatively short period after vaccination. Bottom line, this study supports that all adults who have received mRNA vaccines during their primary COVID-19 vaccination series should receive a third dose when eligible.

COVID-19 Incidence and Death Rates Among Unvaccinated and Fully Vaccinated Adults with and Without Booster Doses During Periods of Delta and Omicron Variant Emergence — 25 U.S. Jurisdictions, April 4–December 25, 2021 MMWR published online January 21, 2022

This report looked at nearly 10 million Covid cases and more than 117,000 associated deaths recorded at 25 state and local health departments between April 4 and Dec. 25, 2021.

Cases and deaths were lower among people who had received a booster dose, compared with those who were fully vaccinated but did not receive a booster, and much lower than the rates seen among unvaccinated people. Booster doses provided much larger gains in protection among people ages 65 and older, followed by those ages 50 to 64. Unvaccinated Americans 50 years and older were about 45 times more likely to be hospitalized than those who were vaccinated and got a third shot.





Comment: COVID-19 vaccination protected against SARS-CoV-2 infection, even as the Omicron variant became predominant. This study supports that all eligible persons should stay "up to date" with COVID-19 vaccination. This study did not offer data on the benefits of the shots in younger people (< age 50). Booster doses could not be distinguished from additional primary doses administered to immunocompromised persons, which could result in reduced IRRs because of lower VE in this population. Second, this ecological study lacked multivariable adjustments, and causality could not be determined. Lastly, national variant prevalence estimates were used, but prevalence differed by jurisdiction over time. Less than 40 percent of fully vaccinated Americans who are eligible for a booster shot have received one.

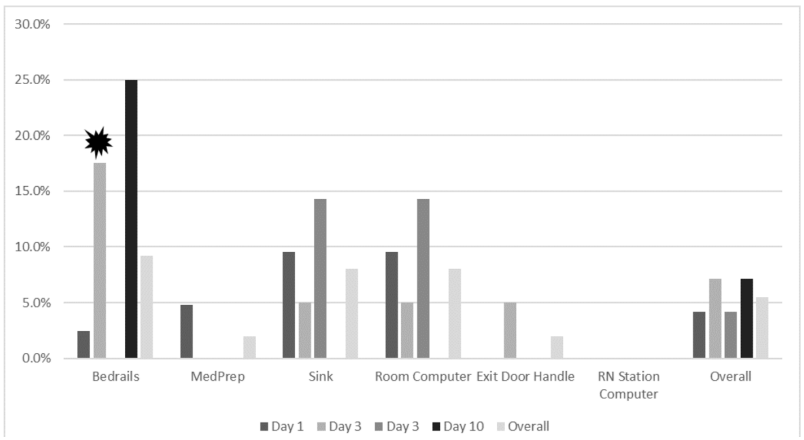
SARS-CoV-2 Environmental contamination in hospital rooms is uncommon using viral culture techniques Clin Infect Dis published online January 12, 2022

doi.org/10.1093/cid/ciac023

Investigators working under the CDC Prevention Epicenters Program, tested a variety of surfaces in the hospital rooms of 20 COVID patients at Duke University Hospital over several days of hospitalization, including on days 1, 3, 6, 10 and 14.

Samples were collected from the patients' bedrail, sink, medical prep area, room computer and exit door handle. A final sample was collected at the nursing station computer outside the patient room.

PCR testing found that 19 of 347 samples gathered were positive for the virus, including nine from bedrails, four from sinks, four from room computers, one from the medical prep area and one from the exit door handle. All nursing station computer samples were negative. Of the 19 positive samples, most (16) were from the first or third day of hospitalization. All 19 positive samples were screened for infectious virus via cell culture with only one sample, obtained on day three from the bedrails of a symptomatic patient with diarrhea and a fever, demonstrating the potential to be infectious.



Proportion of SARS-CoV-2 Positive Environmental Samples by Sample Location and Day
Asterisk Indicates positive cell culture sample

Comment: These findings reinforce the understanding that SARS-CoV-2 primarily spreads through person-to-person encounters via respiratory droplets in the air and environment plays a very minor role. As has been reported by others, a +PCR exaggerates SARS-CoV-2 contamination and does not correlate with live virus. Our effort should focus on known effective strategies such as masking, improved ventilation, and socially distancing. One possible limitation, patients were potentially later in their disease since timing of hospital presentation and admission does not necessarily reflect timing of infection.

Early Evidence of the SARS-CoV-2 B.1.1.529 (Omicron) Variant in Community Wastewater — United States, November–December 2021 MMWR January 21, 2022

Early warning systems, such as sewage (wastewater) surveillance, can help track the spread of SARS-CoV-2 variants across communities. The National Wastewater Surveillance System (NWSS) comprises 43 health departments funded by CDC to provide data on presence of and trends in SARS-CoV-2 infections that are independent of clinical testing. Health departments in four states (California, Colorado, New York, and Texas) were the first wastewater surveillance programs to detect evidence of Omicron in community wastewater. Houston has the most robust program. The California Department of Public Health and academic partners use mutation-specific RT-PCR and sequencing to track variants in wastewater collected daily from 10 sewersheds. The Colorado Department of Public Health and Environment conducts biweekly SARS-CoV-2 wastewater testing at 21 sewersheds, using sequencing to track variants. The New York City Department of Environmental Protection tracks variants in wastewater by sequencing weekly samples collected from 14 sewersheds. The Houston Health Department conducts weekly wastewater testing at 39 sewersheds in the city and uses sequencing to track variants.

Comments: The wastewater surveillance programs in these four states were the first to detect evidence of Omicron in community wastewater. Limitations of variant tracking in wastewater include detections inconsistent with the current epidemiology, low quality sequence data, sporadic detections, detection of a single variant-associated mutation, and conflicting trends in concentration or abundance data for mutations associated with the same variant. The detection of Omicron-associated mutations in community wastewater provides strong early evidence that

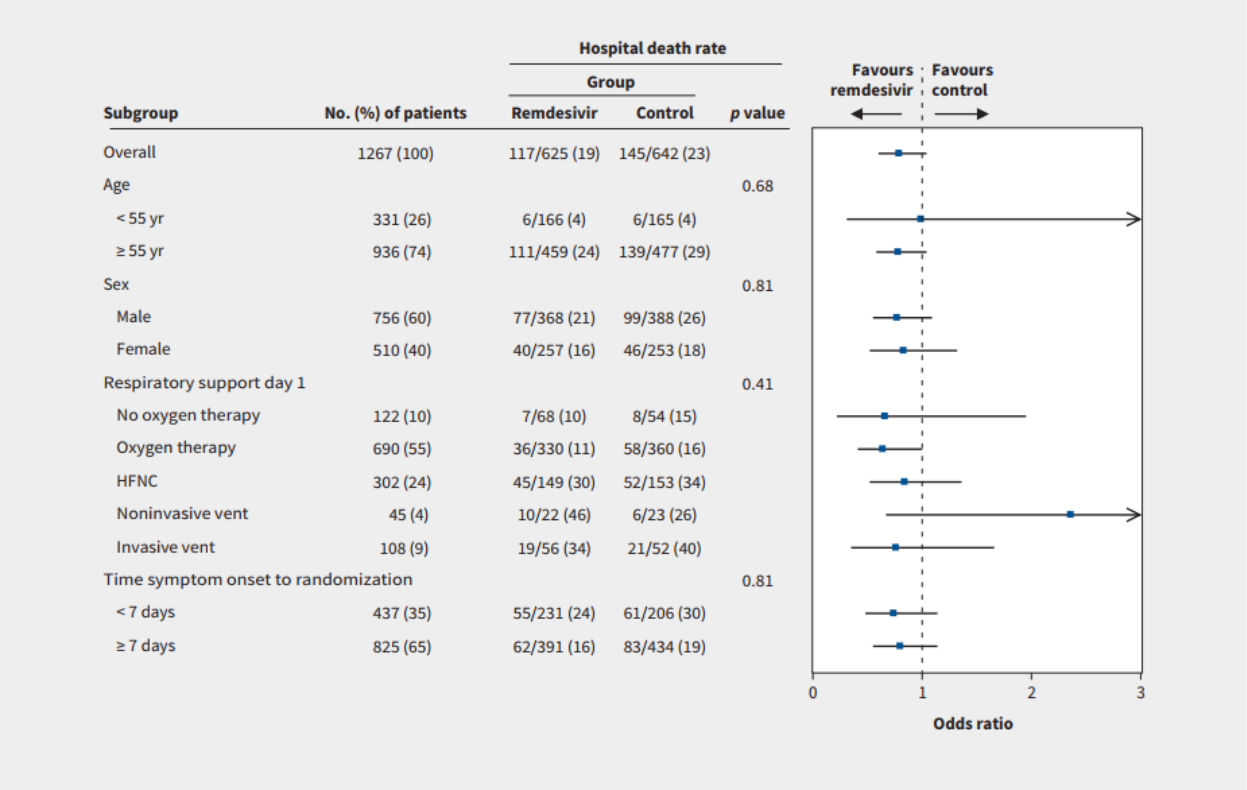
the Omicron variant was likely present or more widely distributed in these communities than originally indicated by clinical testing alone; Omicron-associated mutations were documented during November 2021, at least a week before the first U.S. case identified via clinical testing on December 1. Variant tracking data from wastewater can be used as a complement to clinical testing for early detection of emerging variants, which can help guide decisions about allocation of clinical and public health resources, testing strategies, and public health messaging. In addition, a drop in counts locally usually precede a drop in clinical cases by 1-2 weeks. Wastewater surveillance can also be used to track antimicrobial resistance in a community. We are just scratching the surface of using this tool.

Remdesivir for the treatment of patients in hospital with COVID-19 in Canada: a randomized controlled trial CMAJ published online January 19, 2022

doi: 10.1503/cmaj.211698;

The investigators performed an open-label, pragmatic RCT in 52 Canadian hospitals, in conjunction with the Solidarity trial. We randomized patients to 10 days of RDV (200 mg intravenously [IV] on day 0, followed by 100 mg IV daily), plus standard care, or standard care (SOC) alone. The primary outcome was in-hospital mortality. Secondary outcomes included severity, oxygen and ventilator-free day, incidence of new oxygen or MV use, LOS, and adverse event rates. Eligible patients include adults admitted to participating hospitals with laboratory-confirmed SARS-CoV-2 infection. Exclusion criteria were allergy to study drug, anticipated transfer to a nonstudy site, expected to not survive beyond 24 hours, or already receiving remdesivir at time of enrollment.

They randomized 1282 patients, 634 RDV and 648 SOC. In RDV group, in hospital mortality was 18.7% compared to 22.6% in SOC (RR 0.93 [CI 0.67-1.03]) and 60-day mortality was 24.8% and 28.2% respectively (CI 0.72-1.07). For patients not mechanically ventilated at baseline, the need for MV was 8.0% in those assigned RDV and 15.0% in those assigned to SOC (RR 0.53, 95% CI 0.38 to 0.75). Mean oxygen-free and ventilator-free days at day 28 were 15.9 (± SD 10.5) and 21.4 (± SD 11.3) in those receiving RDV and 14.2 (± SD 11) and 19.5 (± SD 12.3) in those receiving SOC (p = 0.006 and 0.007, respectively). LOS was not different between the 2 groups (median 10 [IQR 6–18] in the RDV group v. 9 [IQR 6–17] in the control group, and they observed no difference in LOS for survivors. Examining in-hospital mortality among prespecified subgroups, the treatment effect did not vary according to age, sex, severity of disease or duration of symptoms.



Subgroup	No. (%) of patients	Hospital death rate: Group: Remdesivir	Hospital death rate: Group: Control	p value
Overall	1267 (100)	117/625 (19)	145/642 (23)	
Age				0.68
< 55 yr	331 (26)	6/166 (4)	6/165 (4)	
≥ 55 yr	936 (74)	111/459 (24)	139/477 (29)	
Sex				0.81
Male	756 (60)	77/368 (21)	99/388 (26)	
Female	510 (40)	40/257 (16)	46/253 (18)	
Respiratory support day 1				0.41
No oxygen therapy	122 (10)	7/68 (10)	8/54 (15)	
Oxygen therapy	690 (55)	36/330 (11)	58/360 (16)	
HFNC	302 (24)	45/149 (30)	52/153 (34)	
Noninvasive vent	45 (4)	10/22 (46)	6/23 (26)	
Invasive vent	108 (9)	19/56 (34)	21/52 (40)	
Time symptom onset to randomization				0.81
< 7 days	437 (35)	55/231 (24)	61/206 (30)	
≥ 7 days	825 (65)	62/391 (16)	83/434 (19)	

Comment: The findings of this trial are complementary to Solidarity as they help to address questions of generalizability of a large simple protocol carried out across a wide range of hospitals and health care systems from low-, middle- and high-income countries. Canada has a well-developed and relatively well resourced, nationally regulated and provincially administered system of acute and critical care. This report contains a smaller number of patients than that reported in the main Solidarity trial and, as such, has limited power to independently show statistical significance on the primary mortality outcome. The Canadian trial represents outcomes from an intervention delivered in a highly resourced health system. Their findings help to understand the expected effects in similar and highly resourced health systems; their data are most consistent with the original ACTT-1 data. Recently RDV has been shown to significantly prevent progression when given early in the outpatient setting to high-risk patients. [NEJM December 22, 2021 DOI: 10.1056/NEJMoa2116846]