Infectious Diseases Watch

August 17, 2022

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General Infectious Diseases

Antibiotic Resistant Infections among COVID-19 Inpatients in U.S. Hospitals Clin Infect Dis published online July 2, 2022

https://doi.org/10.1093/cid/ciac517

This is a retrospective study using adult and pediatric inpatient discharge data from US hospitals included in the Premier Healthcare Database Special COVID-19 Release. These records included diagnostic and procedure codes, demographic information, admission and discharge dates and facility characteristics.

They used the data to split inpatients into COVID-19 and ILI cohorts and identified patients with at least one microbiology specimen collected between 3 days before admission and 3 days after discharge. The study included 142,426 inpatients diagnosed with ILI from January to June 2019 and 206,465 diagnosed with COVID-19 from January 2020 to June 2021.

The researchers retrospectively calculated the proportions of inpatients with a positive bacterial or fungal culture among inpatients with ILI and COVID-19. To best determine antibiotic resistance rates, they limited specimens to MRSA, ESBLs, CRE, VRE, CRAB, and CRPA.

Overall, the study showed that inpatients with COVID-19 had longer lengths of stay than inpatients with ILI (8.3 vs. 6.1 days), as well as higher odds of spending at least 1 day in a critical care unit (48.3% vs. 46.4%) and having at least 1 day of invasive mechanical ventilation (13% vs. 10.2%). The proportion of inpatients with a bacterial or fungal culture obtained was similar for the COVID-19 and ILI cohorts — 56.2% and 60.4%, respectively — but the percent of discharges with a positive culture categorized as community onset was lower among inpatients with COVID-19 compared with inpatients with ILI 5: 7% vs. 10.4%). The percentage of

discharges with a positive culture categorized as hospital onset was higher among inpatients with COVID-19 (4.1% vs. 2.4%).

The most common organisms among inpatients in either group were similar. However, researchers found that community-onset infection rates of MRSA, ESBL, CRE, VRE, CRAB and CRPA were lower, whereas hospital-onset infection rates were higher among inpatients with COVID-19 compared with those with ILI across all pathogens.

	ILI[1] (N=142,426)		COVID-19[2] (N=206,456)		COVID-19 Compared with ILI		
	Frequency (N)	Rate per 10,000 discharges	Frequency (N)	Rate per 10,000 discharges	Odds Ratio[3]	99% Confidence Interval	P-value
Hospital-Onset							
MRSA	451	31.7	1,056	51.2	1.54	(1.23, 1.94)	<.0001
ESBL	186	13.1	633	30.7	2.34	(1.70, 3.23)	<.0001
CRE	18	1.3	88	4.3	2.99	(1.35, 6.62)	0.0005
VRE	151	10.6	265	12.8	1.24	(0.95, 1.62)	0.0391
CRPA	86	6.0	264	12.8	2.03	(1.23, 3.33)	0.0003
CRAB	24	1.7	41	2.0	1.02	(0.52, 2.00)	0.9455
Community-Onset							
MRSA	1,395	98.0	960	46.5	0.55	(0.48, 0.63)	<.0001
ESBL	829	58.2	1,059	51.3	0.99	(0.83, 1.19)	0.9385
CRE	41	2.9	31	1.5	0.57	(0.27, 1.18)	0.0681
VRE	204	14.3	204	9.9	0.77	(0.53, 1.12)	0.0666
CRPA	173	12.1	86	4.2	0.31	(0.20, 0.48)	<.0001
CRAB	40	2.8	27	1.3	0.45	(0.23, 0.86)	0.0013

[1]ILI discharges were defined as a hospitalization with a discharge during January–June 2019 and any of the following primary or

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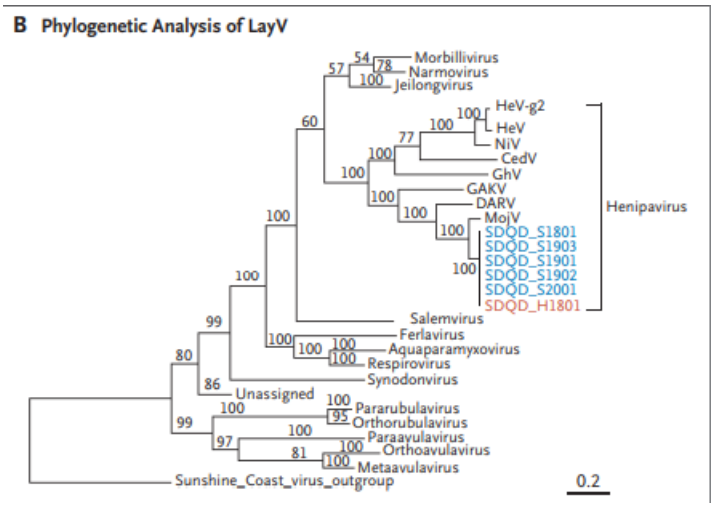
Comment: As other studies have demonstrated; empiric antibiotic therapy is rarely indicated to treat COVID-19 patients as the frequency of bacterial and fungal infections at admission for COVID-19 patients is low. These findings also show that COVID-19 inpatients have a higher risk of HO antibiotic resistant infections compared with inpatients diagnosed with ILI. Increases in HO-ESBL and other HO infections among COVID-19 inpatients may in part be due to longer hospital stays associated with COVID-19 and high rates of antibiotic exposure among inpatients with COVID-19. The authors used a large administrative dataset representing information from a diverse sample of hospital sizes, teaching status, urban/rural locations, and geographic divisions. Administrative data were collected primarily for billing purposes and adapted for research which could result in possible misclassification in clinical and facility information. The study did not include molecular diagnostics for identification of potential infections.

A Zoonotic Henipavirus in Febrile Patients in China N Engl J Med published online August 4, 2022

DOI: 10.1056/NEJMc2202705

Chinese researchers who were conducting routine surveillance in people with fevers who had recent contact with animals have identified Langya henipavirus (LayV), a distinct henipavirus and relative of Hendra and Nipah viruses, in a throat swab of one patient. Their investigation then turned up 35 suspected acute infections in Shandong and Henan provinces. The surveillance for potential zoonotic infections took place in three hospitals, two in Henan province and one in Shandong province, between April 2018 and August 2021. When the researchers investigated potential animal sources, they found serologic evidence of exposure in a few goats and dogs. Of 25 wildlife species they tested, LayV was mainly found in shrews (small, mouse-like animals), suggesting that the species might harbor the virus. They found no evidence of human-to-human spread or common exposures among patients, which they said suggests infections in humans may be sporadic. Contact tracing of 9 patients with 15 close contact family members revealed no close-contact LayV transmission, but their sample size was too small to determine the status of human-to-human transmission for LayV.



Comment: This newly identified henipavirus detected in southern China, warrants more investigation to better understand human infections and the reservoirs. Henipavirus is a genus of viruses in the Paramyxoviridae family that include both Hendra and Nipah viruses. Hendravirus and Nipah viruses are much more lethal. Let us hope this will not the next emerging infectious disease. I am encouraged that there have not been human to human transmission to date.

Polio Detected in New York City Wastewater August 12, 2022

New York City health authorities announced that they have found the virus in wastewater samples, suggesting polio was probably circulating in the city again. The announcement came three weeks after a man in Rockland County, NY., north of the city, was diagnosed with a case of polio that left him with paralysis. Officials now say polio has been circulating in the county's wastewater since May.

Comment: The US vaccination rate dipped amid the pandemic. [see last ID Watch] The spread of the virus poses a risk to unvaccinated people, but three doses of the current vaccine provide 99% protection against severe disease. In New York City, the overall rate of polio vaccination among children 5 and under is 86 percent.

Monkeypox

Monkeypox by the Numbers

1. Confirmed U.S. cases have surpassed 11,000, according to CDC data as of August 12th . Globally, there have been nearly 32,000 cases.

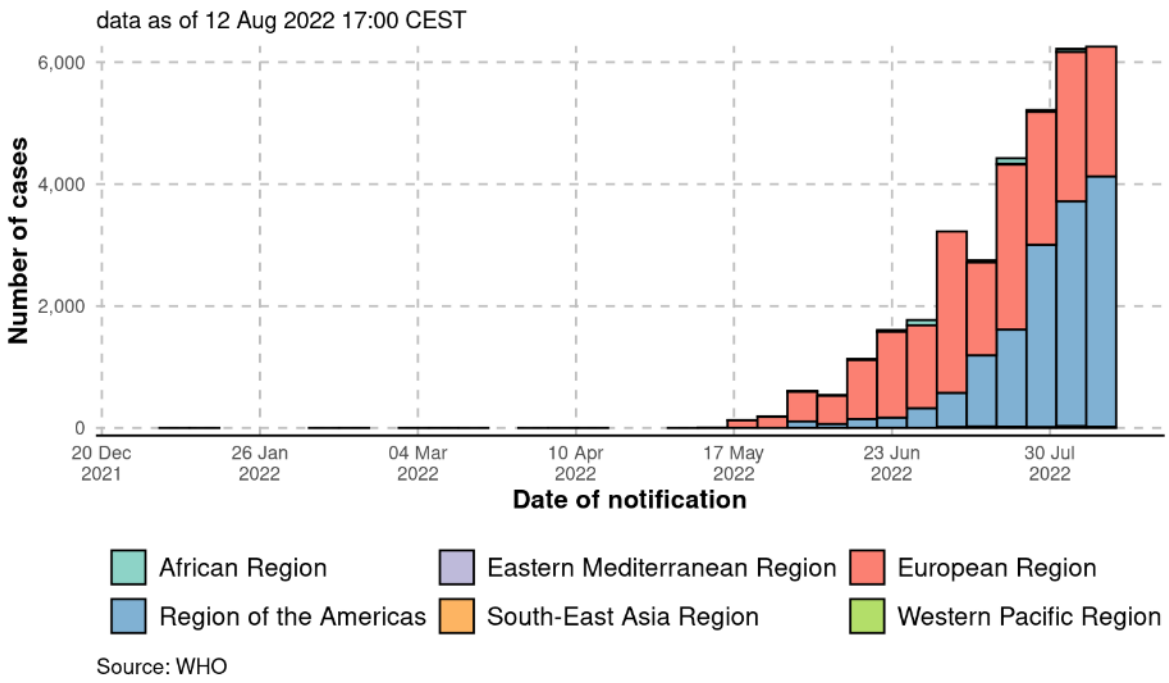
2. State health officials across the US are frustrated with the government's vaccine distribution process. Officials in at least 20 states and jurisdictions reported issues with the federal distribution process, such as late shipments of the Jynneos monkeypox vaccine, leading to unusable vaccines. Critics say part of what's driving the inefficiencies is monkeypox vaccines are being dispersed from the National Strategic Stockpile — which is overseen by an HHS agency — rather than the established ordering-based system run by the CDC.

3. A dog in France contracted monkeypox, evidence of the first case of human-to-animal transmission**,** researchers reported August 10th in Lancet.[see below]

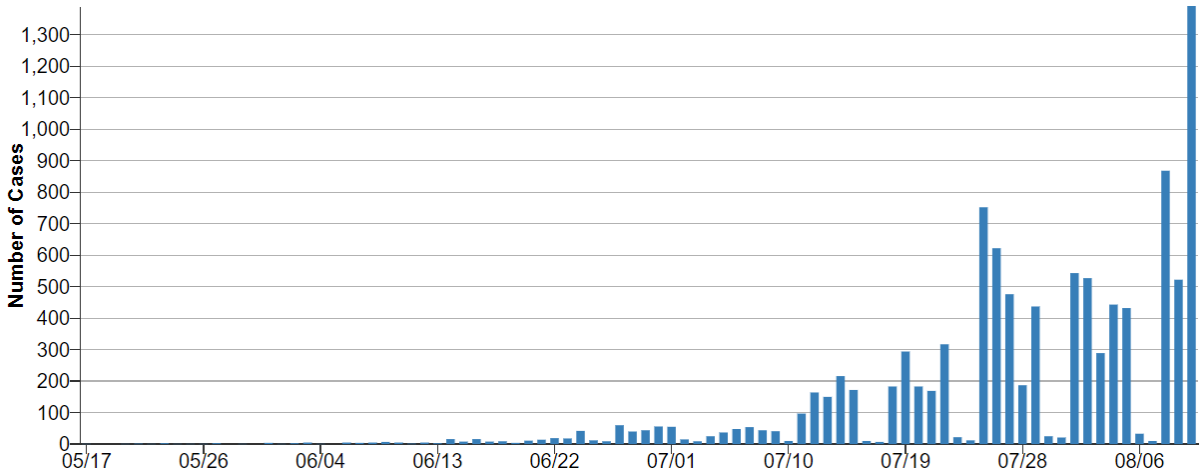
4. The WHO is accepting proposals to rename monkeypox in an effort to align with "current best practices" for naming diseases and avoid offense to any group.

5. The WHO in an August 12 statement also said it had renamed two variants of the virus using Roman numerals, doing away with referring to them by the geographic region where they were known to circulate. The clade formerly known as Congo Basin is now Clade I and the West African clade is now Clade II.

6. At least seven children in the U.S. have tested positive for monkeypox. The Jynneos monkeypox vaccine is available to children determined to be at high risk of contracting monkeypox under an emergency use authorization from the FDA.

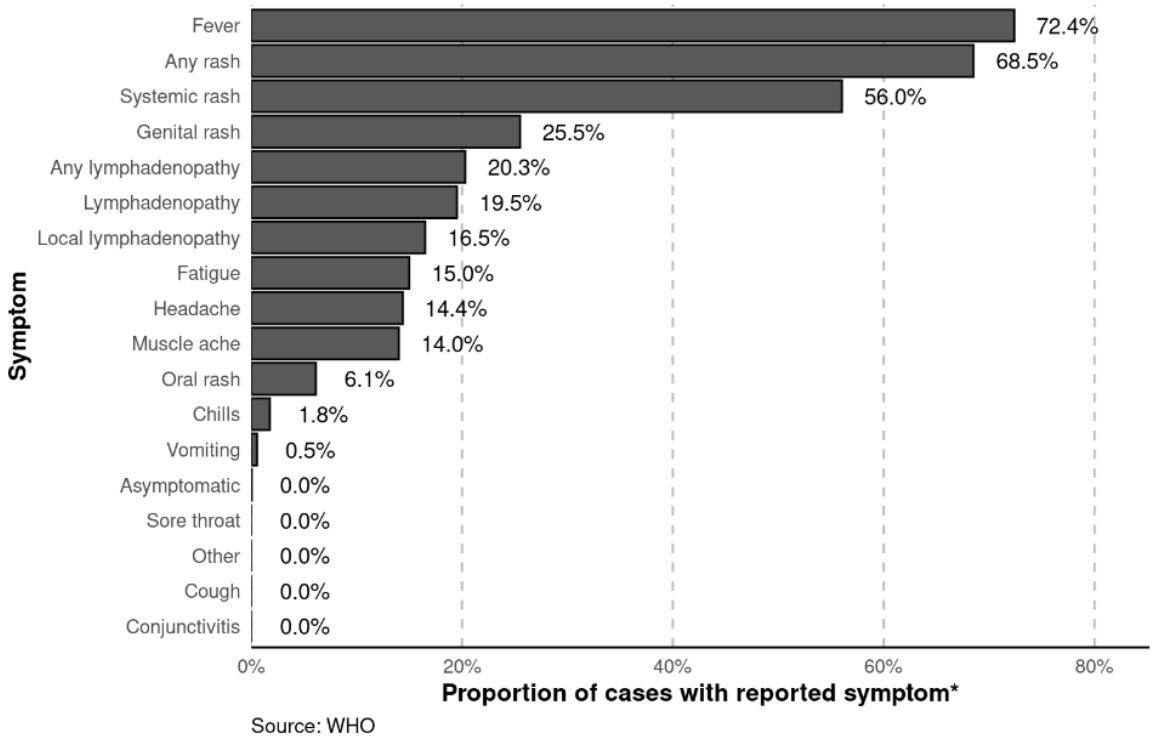


U.S. Monkeypox Case Trends Reported to CDC



	Reported values[1]		Unknown or Missing Value
	Yes	No	
Men who have sex with men	8382 (97.2%)	245 (2.8%)	19458
HIV-Positive	3537 (39.1%)	5519 (60.9%)	19029
Health worker	386 (9.8%)	3537 (90.2%)	24162
Travel History	936 (32.3%)	1962 (67.7%)	25187
Sexual Transmission	5582 (91.1%)	546 (8.9%)	21957
Hospitalised[2]	952 (7.9%)	11156 (92.1%)	15977
ICU	5 (0.1%)	4673 (99.9%)	23407
Died	2 (0.0%)	12468 (100.0%)	15615

[1] Note given true proportions of variables, yes reporting may be common than no reporting
[2] May be hospitalised for isolation or medical treatment



Comment: In the US, many sites still struggle in getting testing, access to vaccination and antivirals. See next report

FDA has granted EUA for the JYNNEOS vaccine to be administered intradermally August 9, 2022

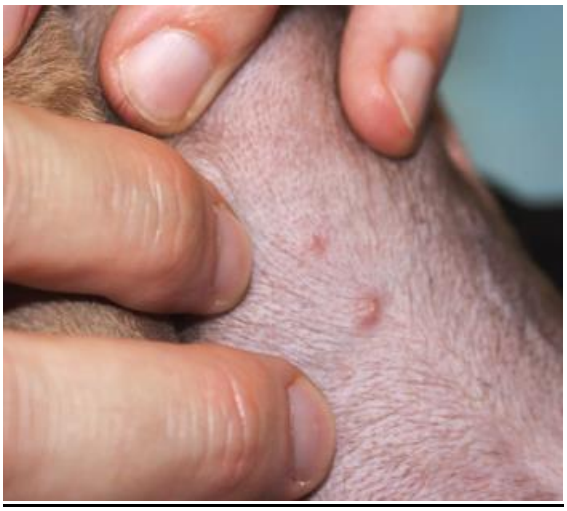
Data from a 2015 clinical study of the JYNNEOS vaccine prior to its approval, published in a peer-reviewed journal, demonstrated that a fifth of the dose, when given intradermally on the same two-dose schedule as currently administered, produced an immune response that was similar to subcutaneous dosing – meaning individuals in both groups responded to vaccination in a similar way, however, the ID route resulted in more erythema and/or induration. [Vaccine 2015; 22;30:5225-34] Additionally, data shows the intradermal administration of other vaccines such as influenza and hepatitis B, is safe and effective for immunocompromised individuals, such as people with HIV. JYNNEOS has been tested in individuals with immunocompromising conditions and has found to be safe and effective in the trials that were performed to support approval. Two doses of the vaccine given 28 days apart will still be needed. Individuals who received their first dose subcutaneously can receive their second dose intradermally or subcutaneously.

Comment: I understand the pressure in making this decision, but I do have some reservations due to the very limited safety data available. I also do not understand why the EUA is limited to vaccines and doesn't include therapeutics or testing.

Evidence of human-to-dog transmission of monkeypox virus Lancet published online August 10, 2022

doi.org/10.1016/ S0140-6736(22)01487-8

Two men who have sex with men were seen at a hospital in Paris, France, on June 10, 2022. One man (referred to as patient 1 going forward) is Latino, aged 44 years, and lives with HIV with undetectable viral loads on antiretrovirals; the second man (patient 2) is White, aged 27 years, and HIV-negative. The men are nonexclusive partners living in the same household. The men presented with anal ulceration 6 days after sex with other partners. In patient 1, anal ulceration was followed by a vesiculopustular rash on the face, ears, and legs; in patient 2, on the legs and back. In both cases, rash was associated with asthenia, headaches, and fever 4 days later. 12 days after symptom onset, their male Italian greyhound, aged 4 years and with no previous medical disorders, presented with mucocutaneous lesions, including abdomen pustules (see below) and a thin anal ulceration. The dog tested positive for monkeypox virus. Monkeypox virus DNA sequences from the dog and patient 1 were compared. Both samples contained virus of the hMPXV-1 clade, lineage B. Moreover, the virus that infected patient 1 and the virus that infected the dog showed 100% sequence homology on the 19·5 kilobase pairs sequenced.



Comment: To the best of my knowledge, based on the kinetics of symptom onset in both patients and, subsequently, in their dog suggest human-to-dog transmission of monkeypox virus. Should we isolate pets from monkeypox virus-positive individuals?

Retrospective detection of asymptomatic monkeypox virus infections among male sexual health clinic attendees in Belgium Nat Med published online August 12, 2022

doi.org/10.1038/ s41591-022-02004-w (2021)

The investigators retrospectively screened 224 samples collected for gonorrhea and chlamydia testing using a monkeypox virus (MPXV) PCR assay, and identified MPXV DNA-positive samples from four men. At the time of sampling, one man had a painful rash, and three men had reported no symptoms. All three men had condomless sexual intercourse with at least one male partner within a few days to one month before day 0. Upon clinical examination 21 to 37 days later, these three men were free of clinical signs, and they reported not having experienced any symptoms. Serology confirmed MPXV exposure in all three men, and MPXV was cultured from two cases.

Comment: This study adds that replication-competent particles were documented in asymptomatic individuals. This study suggests that some infections can go undiagnosed/asymptomatic and that testing, and quarantine may not be enough to contain the outbreak. See next article

Detection of Monkeypox Virus in Anorectal Swabs From Asymptomatic Men Who Have Sex With Men in a Sexually Transmitted Infection Screening Program in Paris, France Ann Intern Med published online August 16, 2022

doi:10.7326/M22-2183

Investigators retrospectively performed monkeypox testing on anorectal swabs collected for routine STI screening. Of 200 people who were asymptomatic for monkeypox, 13 samples were positive for the virus. Investigators followed up with those who were initially asymptomatic and found only two subsequently developed symptoms.

Comment: The findings raise the possibility that asymptomatic monkeypox spread is contributing to the global outbreak and that vaccination should not be limited to people with known exposure. The practice of ring post-exposure vaccination around symptomatic persons with probable or confirmed [monkeypox] infection may not be sufficient to contain spread. See article above from Belgium with same findings.

Monkeypox virus isolation from a semen sample collected in the early phase of infection in a patient with prolonged seminal viral shedding Lancet Infect Dis published online August 2, 2022

doi.org/10.1016/ S1473-3099(22)00513-8

Viral DNA detection in semen samples has been reported in three cases in Italy and subsequently in two patients with monkeypox in Germany. [Euro Surveill 2022; **27:** 2200421. Infection 2022; published online July 11, 2022] In addition, monkeypox DNA was detected in the seminal fluid of 29 (91%) of 32 people affected by monkeypox in a large case series on the 2022 global outbreak. [N Engl J Med 2022; published online July 21, 2022] However no evidence is available on the transmission of monkeypox virus in semen. Therefore, the authors investigated viral shedding in longitudinal semen samples collected 5–19 days after symptom onset from one confirmed monkeypox virus case.

Monkeypox virus infection was confirmed by real-time PCR on a skin lesion swab (quantification cycle [Cq] 18·9) and scab (Cq 21·4) collected on day 5 after symptom onset. The virus was successfully isolated in vitro from a swab of a skin lesion on the head. Plasma, urine, and semen samples were longitudinally collected to monitor the duration of viral shedding (table). Monkeypox virus DNA was detected in plasma collected on day 8 after symptom onset only. Urine samples were negative. Monkeypox virus DNA was detected in all semen samples tested during the period of observation (Cq range 27·8–40·6). Semen collected on day 6 after symptom onset was inoculated in Vero E6 cells. Clear cytopathic effect was observed 48 h after the inoculum and monkeypox virus replication was confirmed by real-time PCR on DNA purified from cell growth medium collected after 48 h, 72 h, and 96 h.

	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 13	Day 14	Day 15	Day 16	Day 17	Day 19
Plasma	NA	NA	NA	Positive (34·5)	NA	Negative	NA	Negative	NA	Negative	Negative	Negative	Negative
Urine	NA	NA	Negative	NA	Negative	NA	Negative	Negative	NA	Negative	NA	NA	Negative
Semen	Positive (28·0)	Positive (29·3)	Positive (27·8)	NA	NA	NA	NA	NA	Positive (34·3)	Positive (35·6)	NA	Positive (38·7)	Positive (40·6)
Rash or skin lesion	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Negative

Quantification cycle values are indicated in brackets after positive results. The cutoff cycle threshold is 45, thresholds of 42 or higher are retested for confirmation. Negative indicates no detection of monkeypox virus DNA or absence of rash or skin lesions. Positive indicates detection of monkeypox virus DNA or presence of rash or skin lesions. NA=not available.

Table: **Timeline of monkeypox virus DNA detection in plasma, urine, and semen samples with increasing days from symptom onset**

Comment: In the case discussed in this article, the isolation of live replication competent monkeypox virus from semen, and prolonged viral DNA shedding, even at low viral copies, suggest a possible genital reservoir. No monkeypox virus DNA was detected in urine and blood samples.

The authors added that at the time of writing, they detected monkeypox virus DNA in semen samples from 11 (79%) of 14 patients, and live and replication competent virus was isolated from the positive seminal fluid (Cq 22·7) of a second patient with HIV.

Given this and other reports, I think the evolving science may support that transmission of monkeypox virus during sexual activity might be a viable route for transmission.

COVID-19

New CDC COVID-19 Guidance (including schools) **(**see MMWR below)

1. The guidance underscores the importance of staying up to date with vaccination, "especially as new vaccines become available." Omicron-targeted vaccines are expected to be available in the fall.

    a. Guidance no longer draws a distinction between people who are up to date on their vaccinations and those who are not, streamlining a complicated set of rules that could be difficult for schools and businesses to navigate

    b. Almost all Americans are now eligible to be vaccinated, many are not up to date. Just 30 percent of 5- to 11-year-olds and 60 percent of 12- to 17-year-olds have received their primary vaccine series nationwide. Among adults 65 and older, who are at highest risk of severe illness, only 65 percent have received a booster. Uptake for 6 months-4 years has been very low.

2. CDC did away with quarantine recommendations, the new guidance says people exposed to COVID-19 should wear a high-quality mask for 10 days and get tested on day five.

3. Contact tracing and routine surveillance testing of people without symptoms are no longer recommended in most settings.

4. Masking — recommend that people wear them indoors in places where community Covid-19 levels are high — this has not changed. The CDC still recommends that everyone age 2 and older wear a well-fitting mask in public indoor spaces when the local Covid-19 community level is high. People who are at high risk for severe disease should also wear a mask when their communities are at the medium level.

5. The six-foot standard for social distancing is no longer an explicit recommendation. The guidelines place less emphasis overall on physical distancing as a key measure to avoid exposure, instead describing it as "just one component of how to protect yourself and others." The updated recommendations place more responsibility on individuals to assess the risks and take more precautions in particular settings, such as crowded indoor spaces. This precaution may be especially important for people who are at high risk for severe Covid- 19

6. The CDC no longer recommends routine screening of people without symptoms in most community settings, including schools.

    a. Under the new guidelines, children who have been in close contact with someone who has Covid-19 do not need to stay home, and schools do not need to administer frequent tests in order to keep these children in the classroom, an approach known as “test to stay.” See #7

7. The C.D.C. no longer recommends a practice known as cohorting, in which schools divide students into smaller groups and limit contact between them to reduce the risk of viral transmission.

    a. Schools that are experiencing outbreaks may want to temporarily adopt additional precautions, including surveillance testing, contact tracing, mask-wearing and open windows and doors to improve ventilation.

8. Isolation guidance for people with COVID-19 remains the same: Isolate for at least five days at home and wear a high quality-mask when around others. Isolation may be ended after five days if a person is fever-free for 24 hours without medication and symptoms are improving, though a mask should be worn through day 10. Immunocompromised people and those who had more severe illness should isolate through day 10.

9. For rebound infections that some people report after taking the antiviral treatment Paxlovid; if symptoms return, people should restart the clock on isolation.

10. The new guidance also puts more emphasis on improving ventilation

11. The FDA on Aug. 9 released a safety alert advising people to perform repeat testing to avoid false negative results when using at-home rapid antigen tests. If a symptomatic person tests negative, they should test again 48 hours later. People without symptoms who may have been exposed should take up to three tests after receiving their first negative result, each separated by a 48-hour period. See MedRxiv article

Comment: With high levels of population immunity due to vaccination and/or natural infection, and the new tools that we have available to protect and/or treat people at risk for severe illness and death, we are entering a new phase of the pandemic. The changes shift much of the responsibility for risk reduction from institutions/communities to individuals. Instead of focusing on slowing transmission of the virus, the recommendations prioritize preventing severe illness. They still emphasize the importance of vaccination and other prevention measures, including antiviral treatments and ventilation. Readers of ID Watch know this guidance is similar to what I have suggested months ago. CDC has been consistently behind — behind evolving scientific knowledge, behind the curve of Covid’s evolution, behind how most Americans have already

adapted. One note of caution, the pandemic has not ended, and more stringent measures may be needed in the event of new variants or future surges.

CDC COVID-19 Updates August 12, 2022

1. As of August 10th, the nation's seven-day case average was 103,614, a 13.8 percent decrease from the previous week's average.

2. As of August 11th, 39.6 percent of counties, districts or territories had high community levels of COVID-19, a 2.1 percentage point decrease from the week prior.

3. Another 40.7 percent had medium community levels, marking a 1.8 percentage point increase from the week prior.

4. The seven-day hospitalization average for August 3-9 was 6,003, a 2.6 percent decrease from the previous week's average.

5. The current seven-day death average is 400, down 6.7 percent from the previous week's average. Some historical deaths have been excluded from these counts.

6. As of August 10th , about 262 million people — 78.9 percent of the U.S. population — have received at least one dose of the COVID-19 vaccine, and more than 223.5 million people, or 67.3 percent of the population, have received both doses.

7. About 107.9 million additional or booster doses in fully vaccinated people have been reported. However, half of people eligible for a booster dose have not yet gotten one, the CDC said.

8. Based on projections for the week ending August 13th, the CDC estimates the omicron subvariant BA.5 accounts for 88.8 percent of US COVID-19 cases, while BA.4 accounts for 5.3 percent

9. Almost 87,000 child COVID-19 cases were reported for the week ending August 11th , down from more than 96,000 the previous week, according to the American Academy of Pediatrics.

Novavax applies for COVID booster

Following the FDA EUA approval of the Novavax COVID-19 vaccine last month for the primary vaccine series, the company announced Monday that it has applied for an EUA for the vaccine to also be used as a booster in adults ages 18 and older. This is based on a phase 3 study which found that the third dose produced robust antibody responses that met or exceeded levels seen in the primary series. The vaccine also prompted a significant antibody response when used as a heterologous booster.

Local and systemic responses lasted about 2 days and showed an increasing incidence across all three doses. Rare instances of myocarditis, pericarditis, and anaphylaxis have been reported

outside of clinical trials, and, earlier this month, the European Medicines Agency recommended that the vaccine maker carry a warning about myocarditis and pericarditis.

Comment: Vaccinations seem to have leveled off. An example, among adults 65 and older, who are at highest risk of severe illness, only 65 percent have received a booster. (See above)

UK approves 2-strain booster

The UK Medicines and Healthcare Products Regulatory Agency Monday approved Moderna's bivalent (two-strain) booster shot, which covers the original SARS-CoV-2 virus plus the Omicron BA.1 variant. The group said it based its findings on clinical trials that showed the booster prompted a strong immune response against BA.1 and the original virus and a good response against Omicron BA.4 and BA.5 subvariants.

Comment: The UK is the first to approve a bivalent booster vaccine. For the US market, Moderna is developing a separate vaccine that targets the BA.4 and BA.5 Omicron variants, after the FDA in late June recommended that vaccine makers pursue new booster shots aimed at those strains. The highly contagious BA.5 strain now accounts for nearly 90% of all infections in the US. (See above)

Journal Review

Summary of Guidance for Minimizing the Impact of COVID-19 on Individual Persons, Communities, and Health Care Systems — United States, August 2022
MMWR August 11, 2022

TABLE. Person- and community-level public health strategies to minimize the impact of COVID-19 on individual persons, communities, and health care systems — United States, August 2022

Recommended public health strategy	Person- and household-level prevention behaviors	Community-level prevention strategies*	Links to guidance and scientific evidence
COVID-19 vaccination	Stay up to date with COVID-19 vaccination	Distribute and administer vaccines to achieve high community vaccination coverage and ensure health equity Support community partnerships and leverage trusted sources of information to expand booster coverage	Vaccines for COVID-19: https://www.cdc.gov/coronavirus/2019-ncov/vaccines/index.html Stay up to date with COVID-19 vaccines: https://www.cdc.gov/coronavirus/2019-ncov/vaccines/stay-up-to-date.html Science brief: COVID-19 vaccines and vaccination: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/fully-vaccinated-people.html
Preexposure prophylaxis	Persons who are moderately or severely immunocompromised might benefit from COVID-19 preexposure prophylactic treatment (Evusheld) to prevent severe COVID-19 illness	Provide education and communication outreach to patients and clinical care organizations that serve patients with immunocompromising conditions to support equitable access to preexposure prophylaxis	COVID-19 preventive medication: https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/people-with-medical-conditions.html#preventive Prevention of SARS-CoV-2 infection: https://www.covid19treatmentguidelines.nih.gov/overview/prevention-of-sars-cov-2/
Medications for treatment of COVID-19	Persons at increased risk for severe illness should have a plan for rapid access to tests and treatment if they become infected	Enable rapid access to oral COVID-19 treatment within ≤5 days of diagnosis Support clinical-community linkages to ensure access to antiviral and monoclonal antibody treatment and reduce health disparities	COVID-19 treatments and medication: https://www.cdc.gov/coronavirus/2019-ncov/your-health/treatments-for-severe-illness.html Clinical management of COVID-19: https://www.covid19treatmentguidelines.nih.gov/management/clinical-management/
Improved ventilation	Increase ventilation and filtration	Take steps to increase ventilation and filtration in public places	Improving ventilation in your home: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/Improving-Ventilation-Home.html Ventilation in buildings: https://www.cdc.gov/coronavirus/2019-ncov/community/ventilation.html Ventilation in schools and childcare programs: https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/ventilation.html Science brief: SARS-CoV-2 transmission: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html
Masks and respirators	Persons at high risk for severe illness should wear a mask or respirator (N95/KN95) that provides more protection indoors in public at medium and high COVID-19 community levels All persons should wear well-fitting masks or respirators indoors in public at high COVID-19 Community Levels†	Recommend all persons wear well-fitting masks or respirators at high COVID-19 Community Levels and support use of masks through messaging and resources	Masks and respirators: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/types-of-masks.html Science brief: community use of masks to control and spread of SARS-CoV-2: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/masking-science-sars-cov2.html
Testing	Persons with a known or suspected exposure to someone with COVID-19 and those who experience symptoms should promptly seek testing through point-of-care and at-home tests	Increase equitable access to testing, including through point-of-care and at-home tests for all persons Recommend use of screening testing in certain high-risk settings (e.g., long-term care facilities or correctional facilities) to reduce risks of outbreaks Support Test to Treat and other initiatives to support rapid access to treatment among persons at high risk for severe illness	Overview of testing for SARS-CoV-2: https://www.cdc.gov/coronavirus/2019-ncov/hcp/testing-overview.html Technical page: guidance for healthcare workers about COVID-19 (SARS-CoV-2) testing: https://www.cdc.gov/coronavirus/2019-ncov/hcp/testing.html

communities, and health care systems — United States, August 2022

Recommended public health strategy	Person- and household-level prevention behaviors	Community-level prevention strategies*	Links to guidance and scientific evidence
Isolation	Symptomatic persons should isolate promptly and seek testing Infected persons should stay home for ≥5 days; for 10 days, infected persons should wear a mask around others at home and in public and avoid contact with persons at high risk for severe illness¶	Increase equitable access to testing, including through point-of-care and at-home tests for all persons Support case investigation and contact tracing in high-risk settings where recommended	Isolation: https://www.cdc.gov/coronavirus/2019-ncov/your-health/isolation.html Science brief: SARS-CoV-2 transmission: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html
Managing exposures to SARS-CoV-2	Persons with recent exposure should wear a mask indoors in public for 10 days and test ≥5 days after last exposure	Increase equitable access to testing, including through point-of-care and at-home tests for all persons Support case investigation and contact tracing in high-risk settings where recommended§	What to do if you are exposed: https://www.cdc.gov/coronavirus/2019-ncov/your-health/if-you-were-exposed.html Definition of close contacts: https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/appendix.html#contact Science brief: SARS-CoV-2 transmission: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html
Hand hygiene	Wash hands frequently	Ensure provision of adequate hand sanitation supplies	How to protect yourself and others: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html Science brief: SARS-CoV-2 transmission: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html
Increasing space and distance	Persons at high risk for severe illness can consider avoiding crowded areas and minimizing direct physical contact, especially in settings where there is high risk for exposure	Provide education to populations at high risk for severe illness to advise them to consider taking steps to protect themselves in settings where there is high risk for exposure	How to protect yourself and others: https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html Science brief: SARS-CoV-2 transmission: https://www.cdc.gov/coronavirus/2019-ncov/science/science-briefs/sars-cov-2-transmission.html

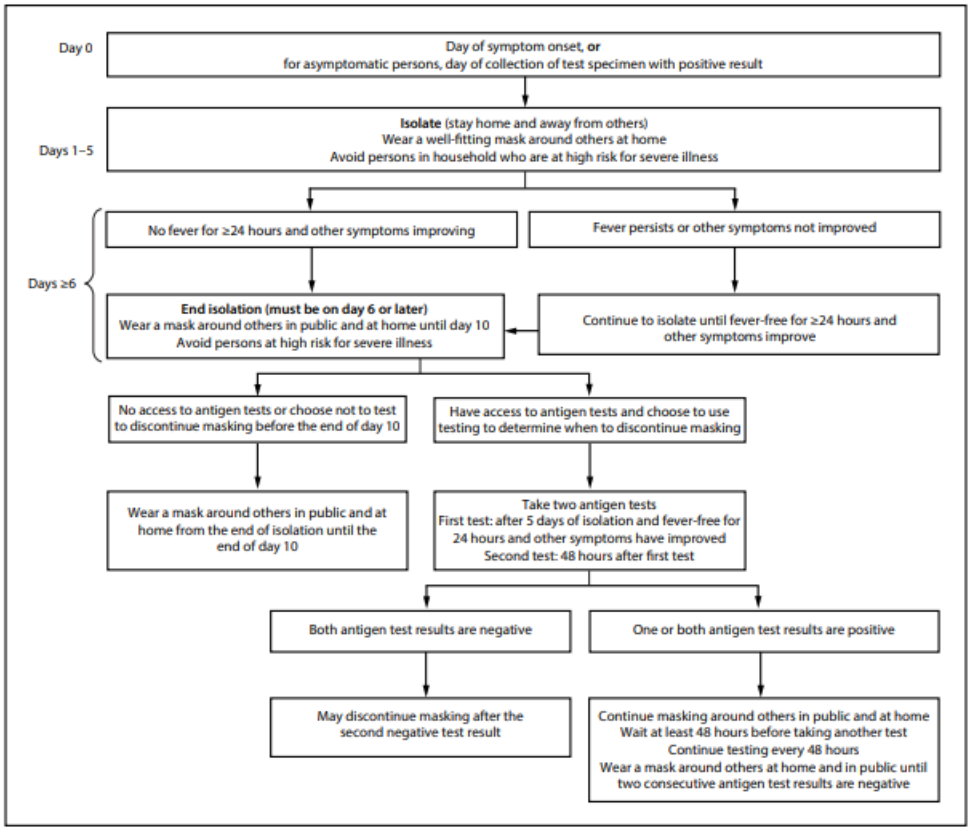
* Recommended strategies relate to general community settings; adapted setting-specific guidance and recommendations include schools and early childhood settings (https://www.cdc.gov/coronavirus/2019-ncov/community/schools-childcare/k-12-childcare-guidance.html), high-risk congregate settings such as correctional facilities and homeless shelters (https://www.cdc.gov/coronavirus/2019-ncov/community/high-risk-congregate-settings.html), health care settings (https://www.cdc.gov/coronavirus/2019-ncov/hcp/infection-control-recommendations.html), and travel (https://www.cdc.gov/coronavirus/2019-ncov/travelers/index.html).

† Although all masks and respirators provide some level of protection, properly fitting respirators provide the highest level of protection. Persons may consider the situation and other factors when choosing a mask or respirator that offers greater protection. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/types-of-masks.html#DifferentSituations

§ Universal case investigation and contact tracing are not recommended for COVID-19; health departments and jurisdictions should prioritize investigation of COVID-19 cases, clusters, and outbreaks involving high-risk congregate settings such as long-term care facilities and correctional facilities or unusual clusters of cases. https://www.cdc.gov/coronavirus/2019-ncov/php/contact-tracing/contact-tracing-plan/prioritization.html

¶ Infected persons should end isolation only when they are without a fever for ≥24 hours without use of medication and all other symptoms have improved. Persons who had moderate illness from COVID-19, including those who show evidence of lower respiratory disease such as shortness of breath or difficulty breathing should isolate for ≥10 days. Persons who had severe illness from COVID-19 (including those who were hospitalized or required intensive care) and persons who are immunocompromised should consult with a health care provider about how to determine end of isolation. https://www.covid19treatmentguidelines.nih.gov/overview/clinical-spectrum/

FIGURE. Recommendations for isolation,* masking,† and additional precautions for persons with COVID-19 illness§ or who receive a positive SARS-CoV-2 test result¶, — United States, August 2022**



* Symptomatic persons should isolate immediately and get tested. They should remain in isolation until they receive a test result. If the test result is positive, they should follow the full isolation recommendations. Asymptomatic persons should begin counting isolation from the first full day after a positive test result (day 0 is the date the test specimen was collected). If an infected person develops symptoms after a positive test result, the isolation count starts again with day 0 being the first day of symptoms.

† Persons at high risk for severe illness should wear a mask or respirator (N95/KN95) that provides more protection indoors in public at medium and high COVID-19 Community Levels. All persons should wear well-fitting masks or respirators indoors in public at high COVID-19 Community Levels. https://www.cdc.gov/coronavirus/2019-ncov/your-health/covid-by-county.html

§ Persons who had moderate illness from COVID-19, including those who show evidence of lower respiratory disease such as shortness of breath or difficulty breathing should isolate for ≥10 days. Persons who had severe illness from COVID-19, including those who were hospitalized and those who required intensive care or mechanical ventilation, and persons with immunocompromising conditions should isolate for ≥10 days and consult with a health care provider to determine end of isolation. https://www.covid19treatmentguidelines.nih.gov/overview/clinical-spectrum/

¶ Infected persons can contact their health care provider to discuss their test results and available treatment options. They should monitor fever and other symptoms. If they develop an emergency warning sign, they should seek emergency medical care immediately. Emergency warning signs include trouble breathing; persistent pain or pressure in chest; new confusion; inability to awaken or stay awake; and pale, gray, or blue-colored skin, lips, or nailbeds, depending on skin tone. https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

** If symptoms worsen from the end of isolation through day 10, infected persons should restart isolation; they should consider consulting with a health care provider to determine care.

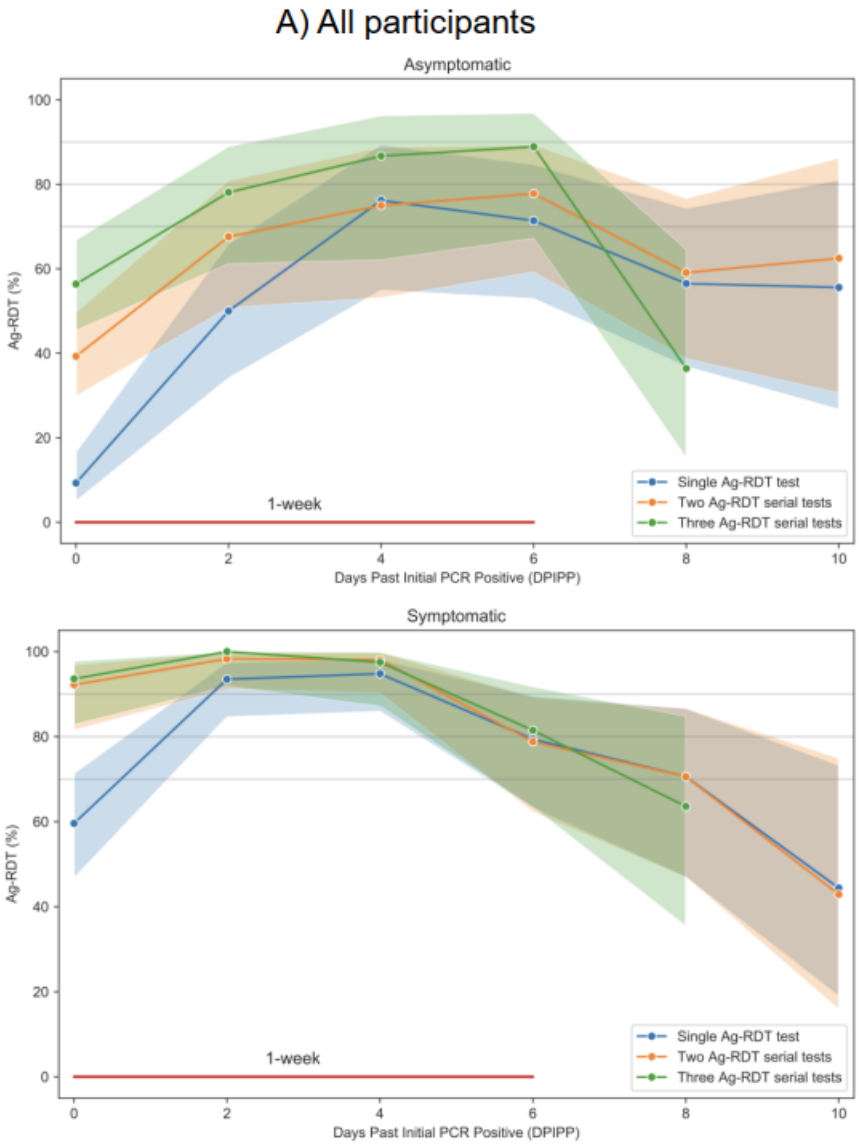
Comment: This document acknowledges we now have a high level of immunity and availability of effective COVID-19 prevention and management tools to reduce the risk for medically significant illness and death. To prevent medically significant COVID-19 illness and death, individuals should understand their risk, take steps to protect themselves and others with vaccines, therapeutics, and nonpharmaceutical interventions when needed, wear masks when exposed, receive testing if symptomatic, and isolate for ≥5 days if infected.

Performance of Screening for SARS-CoV-2 using Rapid Antigen Tests to Detect Incidence of Symptomatic and Asymptomatic SARS-CoV-2 Infection: findings from the Test Us at Home prospective cohort study medRxiv posted August 6, 2022

doi.org/10.1101/2022.08.05.22278466

This is a prospective cohort study conducted from October 2021 to February 2022 among participants > 2 years-old from across the US who enrolled using a smartphone app. During each testing encounter, participants self-collected one nasal swab and performed Ag-RDT at home; at-least fifteen minutes later, a second nasal swab was self- collected and shipped for SARS-CoV-2 RT-PCR at a central lab. Both nasal swabs were collected 7 times at 48-hour intervals (over approximately 14 days) followed by an extra nasal swab collection with home Ag-RDT test 48-hours after their last PCR sample. Each participant was assigned to one of the three emergency use authorized (EUA) RAT tests used in this study. This analysis was limited to participants who were asymptomatic and tested negative by antigen and molecular test on their first day of study participation. SARS-CoV-2 positivity was determined by testing a single home-collected anterior nasal sample with three FDA EUA molecular tests, where 2 out 3 positive test results were needed to determine a SARS-CoV-2 positive result. Onset of infection was defined as day on which the molecular PCR comparator result was positive for the first time. Sensitivity of RAT was measured based on testing once (same-day), twice (at 48-hours) and thrice (at 96 hours). Analysis was repeated for different Days Post Index PCR Positivity (DPIPP) and stratified based on symptom-status on a given DPIPP.

Among 154 eligible participants who tested positive for SARS-CoV-2 infection based on PCR, 97 were asymptomatic and 57 had symptoms at onset of infection (DPIPP 0). Serial testing with RAT twice over 48-hours resulted in an aggregated sensitivity of 93.4% (95% CI: 89.1-96.1%) among symptomatic participants on DPIPP 0-6. Among the 97 people who were asymptomatic at the onset of infection, 19 were singleton PCR positive, i.e., their positive test was preceded and followed by a negative PCR test within 48-hours. Excluding these singleton positives, aggregated sensitivity on DPIPP 0-6 for two-time serial-testing among asymptomatic participants was lower 62.7% (54.7-70.0%) but improved to 79.0% (71.0-85.3%) with serial testing three times at 48-hour interval.



Comment: To optimize detection of SARS-CoV-2 infection with home antigen tests, people suspected to be infected with SARS-CoV-2 virus should test twice at least 48-hours apart if they are symptomatic and three times at 48-hour intervals if they do not have symptoms (asymptomatic).

Based on this study, the FDA last Thursday issued new guidance. It follows a new study (reviewed above) that concludes using three home COVID tests with 48 hours between tests for those without symptoms delivers a higher degree of accuracy than two tests over three days.The recommendation for a third test is directed at those who fear they may have been exposed to the virus or want to leave no doubt about their negative status.

Health Care Utilization in the 6 Months Following SARS-CoV-2 Infection JAMA Netw Open 2022;5(8):e2225657.

doi:10.1001/jamanetworkopen.2022.25657

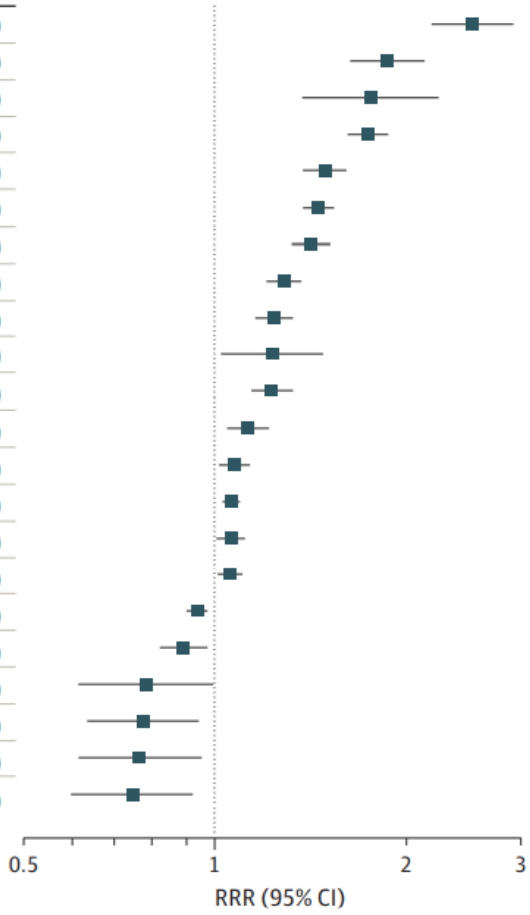
Kaiser Permanente researchers led the study, which involved 127,859 COVID-19 patients of all ages from eight large US healthcare systems who tested positive for COVID-19 from March 1 to November 1, 2020, and the same number of matched controls with negative test results.

Average age was 41.2 years, 53.7% were female, 51.8% were Hispanic, 26.9% were White, 7.1% were Asian, and 6.2% were Black. Common underlying medical conditions included high blood pressure (18.2%), overweight or obesity (18.0%), and diabetes (12.3%). These conditions were more common among controls than COVID-19 patients, except for diabetes, overweight or obesity, and neurologic conditions.

COVID-19 was tied to a 4% rise in healthcare use in the 6 months after infection (ratio of rate ratio [RRR], 1.04), mostly for virtual visits (RRR, 1.14) and emergency department visits (RRR, 1.08). Asian COVID-19 patients had the highest increase in use (RRR, 1.14). Healthcare use for 18 COVID-linked conditions stayed elevated for 6 months, with the largest increase for infectious disease–related conditions (RRR, 86.00), COVID-19 (RRR, 19.47), hair loss (RRR, 2.52), bronchitis (RRR, 1.85), pulmonary embolism or deep-vein thrombosis (RRR, 1.74), and shortness of breath (RRR, 1.73). An estimated 27,217 additional COVID-related medical visits took place over 6 months (212.9 visits per 1,000 patients). Children had lower healthcare use than adults (RRR, 0.88) but had significantly increased healthcare use for COVID-19 (RRR, 24.07), pulmonary embolism or deep vein thrombosis (RRR, 24.00), abnormal heart rhythms (RRR, 1.78), shortness of breath (RRR, 1.43), and ear, nose, and throat disorders (RRR, 1.25).

Figure 3. Health Care Utilization Associated With COVID-19 for Select Post–COVID-19 Conditions Compared With Patients with Negative SARS-CoV-2 Test Results

Post–COVID-19 condition	RRR (95% CI)	*P* value
Alopecia	2.52 (2.17-2.92)	<.001
Bronchitis	1.85 (1.62-2.12)	<.001
PE or DVT	1.74 (1.36-2.23)	<.001
Dyspnea	1.73 (1.61-1.86)	<.001
Hypoxemia	1.48 (1.37-1.60)	<.001
Cough	1.45 (1.37-1.53)	<.001
Constitutional fever, malaise, or fatigue	1.41 (1.31-1.51)	<.001
Pain in throat or chest	1.28 (1.20-1.36)	<.001
Ear, nose, and throat disorders	1.23 (1.15-1.32)	<.001
Delirium or encephalopathy	1.22 (1.02-1.47)	.03
Arrhythmias	1.22 (1.14-1.32)	<.001
Skin disorders	1.12 (1.04-1.21)	.003
Sleep disorders	1.07 (1.01-1.13)	.02
Diabetes	1.06 (1.02-1.09)	.001
Headache	1.06 (1.00-1.11)	.05
Anxiety	1.05 (1.01-1.10)	.03
Myalgia or arthralgia	0.94 (0.90-0.97)	.001
Nausea or vomiting	0.89 (0.82-0.97)	.006
Stroke	0.78 (0.61-0.99)	.04
Dementia	0.77 (0.63-0.94)	.01
Lymphadenopathy	0.76 (0.61-0.95)	.01
Psychosis	0.74 (0.59-0.92)	.008



Comment: These findings suggest that health care systems should consider long-term strategic resource allocation in response to the expected elevated health care utilization experienced by patients with SARS-CoV-2 infection for at least 6 months following the acute stage of infection. Follow-up time is limited to 6 months, which may underestimate the burden of PCCs (post Covid condition) with later onsets or long symptomatic periods. These findings may not represent the uninsured population. Furthermore, they may be underestimating the true burden of COVID-19 over 6 months owing to survival bias, since patients must have survived 6 months after acute infection to contribute data to the analysis. This may have explained the apparent protective association of COVID-19 for PCCs that are common in frail and multimorbid adult populations, such as dementia or stroke, in which they observed an inverse association after 6 months following acute illness. See above figure