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GW Covid-19 Intelligence Reports: December 28, 2020

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The national picture for COVID-19 continues to worsen, widespread community spread including in previously controlled areas, record-setting hospitalizations, and stark warnings of worse to come:

- Record-setting counts of [new cases, deaths, and hospitalizations](#) were observed nationwide, peaking after Thanksgiving. Inconsistent testing and reporting [over the holidays](#) may obscure short-term trends, but overall patterns suggest cases will continue to rise after Christmas.
- [Regional variation](#) in recent weeks includes signs of improvement in the Midwest, while indicators in the South and West regions have worsened dramatically. California reported over 300,000 cases in the past week and the south of the state is reporting [critical shortage of ICU beds](#).
- In DC, [substantial community spread is ongoing](#) with cases peaking in late Nov. but [deaths and hospitalizations rising](#); DC hospitals are [~80% full](#), of which ~12% are COVID-19 patients.
- [Outbreaks](#) have been documented in local childcare settings, schools, restaurants, and congregate residential buildings. DC DOH reports it is [able to trace](#) >90% of new cases within one day.
- The District remains in Phase II with [additional restrictions on indoor dining](#) and group gatherings. Non-essential workers who are able to telework are required to do so. The DC Public Health Emergency has been [extended](#) through 31MAR2021.
- Nursing students in the DMV are [entering practice early](#) to help alleviate staffing shortages.
- Nationally and regionally, medical and public health leaders are [alarmed](#) about the possibility of a [“surge upon a surge”](#) after the holidays and its impact on an already-strained health care system.

In spite of the ongoing surge, there is a ray of hope for ending the pandemic as two vaccines have received emergency approval from the FDA and mass vaccination of priority groups has begun:

- The FDA has granted EUA status to the [Pfizer-BioNTech](#) and [Moderna-NIH](#) mRNA vaccines, and mass distribution of available vaccine supplies has begun across all states, allocated by DHHS.
- The CDC [Advisory Committee on Immunization Practices](#) recommends that health care personnel and residents of long-term care facilities be offered immunization first (Phase 1a), followed by persons aged 75+ and non-HCW frontline essential personnel (Phase 1b), followed then by persons aged 65-74 and those under 64 with high-risk conditions (Phase 1c).
- [Rare allergic reactions](#) have been reported among recipients of the Pfizer-BioNTech vaccine.
- The Moderna-NIH vaccine showed promising [safety and immunogenicity in older adults](#) aged 56+.
- ACOG has issued interim recommendations for [vaccination of pregnant and lactating individuals](#).
- [Willingness to get vaccinated against COVID-19](#) differs significantly among different population groups in the USA, with changes in attitudes observed over time. Those initially hesitant may [reconsider](#).
- Ensuring equitable distribution of the vaccines is going to be a problem in the USA. Vaccination programs must intentionally address [access](#), [historical injustice](#) and [trust barriers](#) for people of color.
- Health systems must [be aware of structural bias and ensure transparency](#) in vaccine distribution.
- There is a debate concerning the possibility of using [single-dose vaccination](#) to provide at least partial protection to more people until production can be ramped up, but data are inconclusive.

Research on epidemiology, pathophysiology, and immunology of COVID-19 continues to advance:

- [Epidemiologic studies](#) report 79.5% of age-adjusted excess deaths in the USA from March through August of 2020 to be COVID-19-related, including 38% of excess deaths among young people (aged 25-44).
- A [novel variant of SARS-CoV-2](#) with a unique spike protein mutation has emerged in southeast England and was rapidly identified in other parts of Europe and the world. It is reportedly 50-74% more

transmissible but does not appear to be associated with more severe disease or with loss of immunity. The [higher \$R_0\$](#) of this variant has raised public health concerns and led to [increased travel restrictions](#).

- The [CDC is monitoring genomic variations of SARS-CoV-2](#) in the USA, however our molecular epidemiology efforts remain limited compared to those of other countries.
- It is unclear if [viral persistence in immunocompromised persons](#) contributes to evolution of new variants.
- In [a South Korean study](#), neutralizing antibodies against SARS-CoV-2 were detected 8 months after infection in 31 of 58 participants, with variation by participant gender and type of antibody. This raises hope that humoral immunity may last longer than previously reported (3-4 months).
- [Potent B-cell response](#) to SARS-CoV-2 mRNA vaccines is reported, as well as a [more lasting antibody response](#), further supporting the hope of lasting immunity after vaccination.
- The role of “cytokine storming” in severe COVID-19 [may be less than initially proposed](#), with more extensive changes in the inflammatory and immune system response compared to influenza.
- The rate of PCR positivity in COVID-19 infection peaks within the first few days, while seroconversion peaks within 4-5 weeks. [Low IgM titers](#) are an independent risk factor for persistent viral positivity.
- A [machine-learning approach](#) using antibody response dynamics holds promise for more accurate serologic diagnosis of COVID-19.
- A [review in *Frontiers in Pediatrics*](#) summarizes the current understanding of the pathophysiology of MIS-C and compares it to other hyper-inflammatory syndromes in children.
- A systematic review of [surface contamination and stability](#) of SARS-CoV-2 on fomites has found that we still do not know how much of a transmission risk surfaces pose.
- While SARS-CoV-2 can be detected by PCR from [blood of some infected patients](#), the samples themselves do not seem to pose a significant disease transmission risk.
- In a study from Italy, only [1 of 62 newborns](#) roomed with and breastfed by infected mothers became diagnosed with COVID-19.
- The CDC has finally released a scientific brief [supporting the use of cloth masks](#) to prevent community transmission of SARS-CoV-2. The [WHO](#) has an updated guidance on masks as well.

Research on patient outcomes and risk factors continues to grow as well.

- [Male sex](#) is consistently associated with higher risk of ICU admission and mortality in a global study.
- Further evidence links [blood types O and Rh-](#) to slightly lower risk of infection and of severe COVID-19, though the mechanism of this association remains elusive.
- In an epidemiologic linkage study, [people with HIV in NYC](#) did not have a higher risk of COVID-19 infection compared to the general population, but those with CD4 <500 had worse outcomes.
- [Renin-angiotensin system blockers](#) are associated with lower risk of COVID-19 infection in a meta-analysis, and should be continued in patients already taking them.
- Among [VA patients hospitalized with COVID-19](#) in March through July 2020, 19.5% died during hospitalization; of those who survived to discharge, 20% were readmitted and 10% died within 60 days of discharge. This is comparable to a [similar recent study](#) of non-VA patients.
- While peak influenza seasons are associated with increased cardiovascular hospitalization rates, the COVID-19 pandemic has unexpectedly seen [lower-than-usual rates](#) of cardiac event admissions.

Persistent symptoms after infection, or “Long COVID,” are emerging as a significant cause of morbidity and health care needs as the pandemic continues.

- The NIH has [updated its definition of the clinical spectrum of COVID-19](#) to include persistent post-infection symptoms and organ damage, and [conducted a workshop on these long-term impacts](#), highlighting the need for further research and interventions. Areas of interest include cardiac,

pulmonary, neurologic, immunologic/rheumatologic, and psychiatric/functional changes.

- Patients who survived [severe COVID-19](#) and [mechanical ventilation](#) unsurprisingly have high prevalence of pulmonary sequelae at 3 months.
- [Patient advocacy and testimonies](#) play a prominent role in bringing attention to Long COVID.
- A [patient-led research consortium](#) has released a report of symptoms persisting over 90 days among over 3,500 COVID-19 survivors in 56 countries. The most commonly reported symptoms were fatigue (78%), post-exertional malaise (72%), and cognitive dysfunction (55%), leading to inability to return to work (22%) or reducing work schedules (45%). Only 8% had been hospitalized. [This is a pre-print].
- The American Academy of Family Physicians has published a [primer on Long COVID](#).
- A [UK rapid guideline](#) is available on the management of Long COVID in adults and children.
- [New ICD-10 codes](#) have been issued for the documentation of persistent symptoms after COVID-19.

Ongoing progress is being made with diagnostic methods, while advances in therapeutics remain limited:

- The FDA has granted EUA to the Quest Diagnostics [at-home sample self-collection kit](#) for mail-in use with an RT-PCR test that differentiates SARS-CoV-2 vs. influenza A and B viruses. The FDA has also granted EUA to the BinaxNOW COVID-19 [Antigen Card at-home test](#). Both kits are available by prescription and users are meant to consult a physician in interpreting the results.
- A [pooled surveillance strategy](#) was successfully implemented for detection of campus transmission of COVID-19 at Duke University, allowing for efficient use of testing resources.
- The sensitivity of [testing pooled saliva samples by RT-PCR](#) is lower compared to nasopharyngeal swabs but can be useful for detecting individuals with higher viral loads and extending resources.
- The WHO has published [interim results from the SOLIDARITY trial](#), showing no significant benefit from remdesivir, hydroxychloroquine, lopinavir, or interferon treatment in patients hospitalized with COVID-19. The trial was limited by different availabilities of drugs across sites, multiple concurrent interventions, and difficulty in ascertaining duration/stage of infection.
- [Convalescent plasma did not improve outcomes](#) in a large RCT of patients with COVID-19 requiring oxygen support or having organ failure.
- [Tocilizumab did not improve outcomes](#) in moderately ill hospitalized patients with COVID-19.
- High-dose thromboprophylaxis in [critically ill COVID-19 patients](#) is associated with lower incidence of thromboembolic events and lower mortality.
- Post-exposure prophylaxis with [hydroxychloroquine did not reduce risk](#) of developing COVID-19 among 2,314 healthy contacts of 672 PCR-confirmed patients in Spain.
- The NIH guidelines have been updated on [17DEC2020](#) including new recommendations on antithrombotic therapy in pregnant patients.
- The NIH finds there to be [insufficient data](#) to recommend either for or against the use of baricitinib for treatment of COVID-19 in cases where corticosteroids can be used instead, and recommends against the use of baricitinib without remdesivir.
- Although monoclonal antibody infusions for the treatment of early COVID-19 showed promise in clinical trials and the FDA has granted [EUA status](#) to two treatments (bamlanivimab, and casirivimab/imdevimab, both authorized for use in ambulatory patients), the [NIH finds the data to be insufficient](#), and in practice their [utilization remains limited](#) by logistic and cost concerns.
- [Bamlanivimab did not improve outcomes](#) over standard of care (including remdesivir and steroids when indicated) in hospitalized patients with COVID-19 in the ACTIV3/TICO trial.

The practical and psychological impacts of the COVID-19 pandemic are a massive and protracted challenge, and the morale and resilience of health care workers need to be addressed:

- [Concerning trends in suicides](#), differing by race, have been observed since the start of the pandemic.

- [Increased deaths due to synthetic opioid overdoses](#) are observed, representing the largest increase in opioid deaths in the US over a 12-month period ever recorded.
- A [rapid intervention developed by the US Army](#) can improve psychological resilience among HCWs.
- Another [intervention based on Psychological First Aid](#) principles was successful among UK HCWs.
- DHHS publishes data on the impact of COVID-19 on [healthcare facilities and capacity](#).

Mobile options to improve contact tracing are available to DMV residents:

- Android and iPhone users in [D.C.](#), [Maryland](#), [Virginia](#), and [other states](#), can opt into [an alert system](#) which notifies them if they have been in close proximity with another user who tests positive for COVID-19. This automated system is voluntary and is meant to complement other public health efforts. For frontline medical workers who take care of COVID-19 patients this system would not be able to distinguish workplace contacts (in PPE and with other precautions) from other exposures.

Finally, under “other issues that should have been self-evident,” patients undergoing MRI during the time of COVID-19 should be provided with [a metal-free mask](#).

This edition of the COVID-19 Intelligence Report was produced by Dr. Hana Akselrod with support from the Himmelfarb Librarian team and the entire GW Intelligence Unit led by Dr. Lawrence “Bopper” Deyton.

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