

COVID-19 Resource Desk

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New Research

*note, **PREPRINTS** have not undergone formal peer review

COVID-19 related publications by Providence caregivers – see [Digital Commons](#)

Clinical Syndrome

1. **SARS-CoV-2 and Stroke Characteristics: A Report from the Multinational COVID-19 Stroke Study Group.** Shahjouei S et al. *Stroke*. 2021 Apr 21:STROKEAHA120032927. doi: 10.1161/STROKEAHA.120.032927.

<https://www.ahajournals.org/doi/10.1161/STROKEAHA.120.032927>

We observed a considerably higher rate of large vessel occlusions, a much lower rate of small vessel occlusion and lacunar infarction, and a considerable number of young stroke when compared with the population studies before the pandemic. The rate of mechanical thrombectomy was significantly lower in countries with lower health expenditures.

Diagnostics & Screening

2. **Clinical Characteristics of False Negative SARS-CoV-2 Test Results amongst Hospitalized Patients.** MacKenzie EL, et al. *Infect Control Hosp Epidemiol*. 2021 Apr 19:1-26. doi: 10.1017/ice.2021.146. <https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/clinical-characteristics-of-false-negative-sarscov2-test-results-amongst-hospitalized-patients/ACEAC918B019EB8C9234A5E5BBEC5D93>

1,009 SARS-CoV-2 test results were included in this analysis, 4.0% were false negative results. Compared to true negative test results, false negative test results were associated with anosmia/ageusia, having a COVID-19 positive contact, and having an elevated lactate dehydrogenase level. Demographics, symptom duration, other laboratory values, and abnormal chest imaging were not significantly associated with false negative test results. Clinical features can help predict which patients are more likely to have false negative SARS-CoV-2 tests.

Epidemiology & Public Health

3. **Emergence and rapid transmission of SARS-CoV-2 B.1.1.7 in the United States.** Washington NL et al. *Cell*. 2021 Mar 30:S0092-8674(21)00383-4. doi: 10.1016/j.cell.2021.03.052.

<https://www.sciencedirect.com/science/article/pii/S0092867421003834>

The highly transmissible B.1.1.7 variant of SARS-CoV-2, first identified in the United Kingdom, has gained a foothold across the world. We investigated the prevalence and dynamics of this

variant in the United States, tracking it back to its early emergence. We found that, while the fraction of B.1.1.7 varied by state, the variant increased at a logistic rate with a roughly weekly doubling rate and an increased transmission of 40%-50%. We revealed several independent introductions of B.1.1.7 into the US as early as late November 2020, with community transmission spreading it to most states within months. We show that the US is on a similar trajectory as other countries where B.1.1.7 became dominant, requiring immediate and decisive action to minimize COVID-19 morbidity and mortality.

4. **Mortality Among US Patients Hospitalized with SARS-CoV-2 Infection in 2020.** Finelli L, et al. *JAMA Netw Open*. 2021 Apr 1;4(4):e216556. doi: 10.1001/jamanetworkopen.2021.6556. <https://jamanetwork.com/journals/jamanetworkopen/article-abstract/2778237>
This nationally representative study supported the findings of smaller, regional studies and found that in-hospital mortality declined across all age groups during the period evaluated. Reductions were unlikely because of a higher proportion of younger patients with lower in-hospital mortality in the later period.
5. **Airport Traveler Testing Program for SARS-CoV-2 - Alaska, June-November 2020.** Ohlsen EC, et al. *MMWR Morb Mortal Wkly Rep*. 2021 Apr 23;70(16):583-588. doi: 10.15585/mmwr.mm7016a2. <https://www.cdc.gov/mmwr/volumes/70/wr/mm7016a2.htm>
Post-travel self-quarantine and testing programs might reduce travel-associated SARS-CoV-2 transmission and importation, even without enforcement. Traveler education and community and industry partnerships might help ensure success. Airport testing program administrators reported that clear communication, preparation, and organization were vital for operational success; challenges included managing travelers' expectations and ensuring that sufficient personnel and physical space were available to conduct testing. Expected mitigation measures such as vaccination, physical distancing, mask wearing, and avoidance of gatherings after arrival might also help limit postarrival transmission.
6. **COVID-19 associated mortality and cardiovascular disease outcomes among US women veterans.** Tsai S, et al. *Sci Rep*. 2021 Apr 19;11(1):8497. doi: 10.1038/s41598-021-88111-z. <https://www.nature.com/articles/s41598-021-88111-z>
Women veterans who tested positive for SARS-CoV-2 had 4 times higher mortality risk than women veterans who tested negative but had lower risk of cardiovascular events and developing new heart disease conditions within 60 days. Older age, obesity, and prior CVD and COPD conditions were positively associated with increased mortality in 60 days. Despite a higher infection rate among minority women veterans, there was no significant race difference in mortality, cardiovascular events, or onset of heart disease. SARS-CoV-2 infection increased short-term mortality risk among women veterans similarly across race groups. However, there was no evidence of increased cardiovascular disease incidence in 60 days.
7. **Severe Acute Respiratory Syndrome Coronavirus 2 P.2 Lineage Associated with Reinfection Case, Brazil, June-October 2020.** Resende PC et al. *Emerg Infect Dis*. 2021 Apr 22;27(7). doi: 10.3201/eid2707.210401. https://wwwnc.cdc.gov/eid/article/27/7/21-0401_article

A 37-year-old healthcare worker from the northeastern region of Brazil experienced 2 clinical episodes of coronavirus disease. Infection with severe acute respiratory syndrome coronavirus 2 was confirmed by reverse transcription PCR in samples collected 116 days apart. Whole-genome sequencing revealed that the 2 infections were caused by the most prevalent lineage in Brazil, B.1.1.33, and the emerging lineage P.2. The first infection occurred in June 2020; Reinfection was at some point during September 14-October 11, 2020, a few days before the second episode of coronavirus disease. Of note, P.2 corresponds to an emergent viral lineage in Brazil that contains the mutation E484K in the spike protein. The P.2 lineage was initially detected in the state of Rio de Janeiro, and since then it has been found throughout the country. Our findings suggest not only a reinfection case but also geographic dissemination of the emerging Brazil clade P.2.

Healthcare Delivery & Healthcare Workers

8. **Respiratory Viral Shedding in Healthcare Workers Reinfected with SARS-CoV-2, Brazil, 2020.** Amorim MR et al. *Emerg Infect Dis.* 2021 Apr 19;27(6). doi: 10.3201/eid2706.210558. https://wwwnc.cdc.gov/eid/article/27/6/21-0558_article
We documented 4 cases of severe acute respiratory syndrome coronavirus 2 reinfection by non-variant of concern strains among healthcare workers in Campinas, Brazil. We isolated infectious particles from nasopharyngeal secretions during both infection episodes. Improved and continued protection measures are necessary to mitigate the risk for reinfection among healthcare workers.
9. **Extracorporeal membrane oxygenation network organisation and clinical outcomes during the COVID-19 pandemic in Greater Paris, France: a multicentre cohort study.** Lebreton G et al. *Lancet Respir Med.* 2021 Apr 19:S2213-2600(21)00096-5. doi: 10.1016/S2213-2600(21)00096-5. [https://www.thelancet.com/journals/lanres/article/PIIS2213-2600\(21\)00096-5/fulltext](https://www.thelancet.com/journals/lanres/article/PIIS2213-2600(21)00096-5/fulltext)
Beyond associations with similar factors to those reported on ECMO for non-COVID-19 ARDS, 90-day survival among ECMO-assisted patients with COVID-19 was strongly associated with a centre's experience in venovenous ECMO during the previous year. Early ECMO management in centres with a high venovenous ECMO case volume should be advocated, by applying centralisation and regulation of ECMO indications, which should also help to prevent a shortage of resources.

Prognosis

10. **The impact of frailty on survival in elderly intensive care patients with COVID-19: the COVIP study.** Jung C et al. *Crit Care.* 2021 Apr 19;25(1):149. doi: 10.1186/s13054-021-03551-3. <https://ccforum.biomedcentral.com/articles/10.1186/s13054-021-03551-3>
In frail patients, there was no difference found in 30-day survival between different age categories. Frailty was linked to an increased use of treatment limitations and less use of mechanical ventilation. In a model controlling for age, disease severity, sex, treatment limitations and comorbidities, frailty was independently associated with lower survival. Frailty

provides relevant prognostic information in elderly COVID-19 patients in addition to age and comorbidities.

Survivorship & Rehabilitation

11. **Risk stratification of cardiac sequelae detected using cardiac magnetic resonance in late convalescence at the six-month follow-up of recovered COVID-19 patients.** Fu H, et al. *J Infect.* 2021 Apr 19;S0163-4453(21)00202-4. doi: 10.1016/j.jinf.2021.04.016.
[https://www.journalofinfection.com/article/S0163-4453\(21\)00202-4/fulltext](https://www.journalofinfection.com/article/S0163-4453(21)00202-4/fulltext)
Cardiac sequela is uncommon in recovered COVID-19 patients at six months follow-up. Cardiac magnetic resonance is useful to evaluate cardiac involvement of COVID-19 survivors in the late convalescence, such a right ventricular dysfunction, myocardial edema, focal fibrosis and dysfunction of myocardial deformation. Elevated LDH, the presence of echocardiographic abnormalities, the presence of cardiac abnormalities at admission, and the severity of COVID-19 were risk factors for cardiac sequelae in the late convalescent stage.
12. **Acute Ischemic Stroke during the Convalescent Phase of Asymptomatic COVID-2019 Infection in Men.** Tu TM, et al. *JAMA Netw Open.* 2021 Apr 1;4(4):e217498. doi: 10.1001/jamanetworkopen.2021.7498.
<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2779040>
This case series suggests that the risk for AIS is higher in adults 50 years or younger during the convalescent period of a COVID-19 infection without respiratory symptoms. Acute ischemic stroke could be part of the next wave of complications of COVID-19, and stroke units should be on alert and use serological testing, especially in younger patients or in the absence of traditional risk factors.
13. **High-dimensional characterization of post-acute sequelae of COVID-19.** Al-Aly Z, Xie Y, Bowe B. *Nature.* 2021 Apr 22. doi: 10.1038/s41586-021-03553-9.
<https://www.nature.com/articles/s41586-021-03553-9>
Our approach identifies incident sequelae in the respiratory system and several others including nervous system and neurocognitive disorders, mental health disorders, metabolic disorders, cardiovascular disorders, gastrointestinal disorders, malaise, fatigue, musculoskeletal pain, and anemia. We show increased incident use of several therapeutics including pain medications, antidepressants, anxiolytics, antihypertensives, and oral hypoglycemics and evidence of laboratory abnormalities in multiple organ systems. Analysis of an array of pre-specified outcomes reveals a risk gradient that increased across severity of the acute COVID-19 infection. The findings show that beyond the acute illness, substantial burden of health loss - spanning pulmonary and several extrapulmonary organ systems - is experienced by COVID-19 survivors.
14. **Health Care Utilization and Clinical Characteristics of Nonhospitalized Adults in an Integrated Health Care System 28–180 Days after COVID-19 Diagnosis — Georgia, May 2020–March 2021.** Hernandez-Romieu AC, et al. *MMWR Morb Mortal Wkly Rep.* ePub: 23 April 2021. DOI: <http://dx.doi.org/10.15585/mmwr.mm7017e3>

The presence of diagnoses of COVID-19 and related symptoms in the 28–180 days following acute illness suggests that some nonhospitalized adults, including those with asymptomatic or mild acute illness, likely have continued health care needs months after diagnosis. Clinicians and health systems should be aware of post-COVID conditions among patients who are not initially hospitalized for acute COVID-19 disease.

15. Symptoms, Pulmonary Function and Functional Capacity Four Months after COVID-19.

Abdallah SJ, et al. *Ann Am Thorac Soc*. 2021 Apr 19. doi: 10.1513/AnnalsATS.202012-1489RL. <https://www.atsjournals.org/doi/pdf/10.1513/AnnalsATS.202012-1489RL>

Consistent with previous studies, we found that hospitalized and non-hospitalized survivors of COVID-19 report persistent fatigue and exertional breathlessness and exhibit impaired lung function and diminished functional capacity three to four months after SARS-CoV-2 infection. While cardiopulmonary abnormalities were observed in both groups, they were more prevalent and severe in hospitalized patients.

Therapeutics

16. Intermediate vs Standard-dose Prophylactic Anticoagulation in Patients with COVID-19 Admitted to ICU: Ninety-day Results from the INSPIRATION Trial. Bikdeli B et al. *Thromb Haemost*. 2021 Apr 17. doi: 10.1055/a-1485-2372. <https://www.thieme-connect.com/products/ejournals/pdf/10.1055/a-1485-2372.pdf>

Intermediate-dose compared with standard-dose prophylactic anticoagulation did not reduce a composite of death, treatment with ECMO, or venous or arterial thrombosis at 90-day follow-up.

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17. Anticoagulation Therapy in Patients with Coronavirus Disease 2019: Results from a Multicenter International Prospective Registry (Health Outcome Predictive Evaluation for Corona Virus Disease 2019 [HOPE-COVID19]). Santoro F et al. *Crit Care Med*. 2021 Apr 2. doi: 10.1097/CCM.0000000000005010.

https://journals.lww.com/ccmjournals/Abstract/9000/Anticoagulation_Therapy_in_Patients_With.95287.aspx

Anticoagulation therapy in general population with coronavirus disease 2019 was not associated with better survival rates but with higher bleeding risk. Better results were observed in patients admitted with respiratory failure and requiring invasive ventilation.

18. Mortality outcomes with hydroxychloroquine and chloroquine in COVID-19 from an international collaborative meta-analysis of randomized trials. Axfors C et al. *Nat Commun*. 2021 Apr 15;12(1):2349. doi: 10.1038/s41467-021-22446-z. <https://www.nature.com/articles/s41467-021-22446-z>

<https://www.nature.com/articles/s41467-021-22446-z>

We found that treatment with hydroxychloroquine is associated with increased mortality in COVID-19 patients, and there is no benefit of chloroquine. Findings have unclear generalizability to outpatients, children, pregnant women, and people with comorbidities.

19. **Severe Acute Respiratory Syndrome Coronavirus 2 Convalescent Plasma Versus Standard Plasma in Coronavirus Disease 2019 Infected Hospitalized Patients in New York: A Double-Blind Randomized Trial.** Stony Brook Medicine COVID Plasma Trial Group. *Crit Care Med.* 2021 Apr 16. doi: 10.1097/CCM.0000000000005066.
<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovft&AN=00003246-900000000-95264&PDF=y>
Administration of convalescent plasma to hospitalized patients with coronavirus disease 2019 infection increased antibodies to severe acute respiratory syndrome coronavirus disease 2 but was not associated with improved outcome.
20. **Prone position in intubated, mechanically ventilated patients with COVID-19: a multi-centric study of more than 1000 patients.** Langer T et al. *Crit Care.* 2021 Apr 6;25(1):128. doi: 10.1186/s13054-021-03552-2. <https://ccforum.biomedcentral.com/articles/10.1186/s13054-021-03552-2>
During the COVID-19 pandemic, prone position has been widely adopted to treat mechanically ventilated patients with respiratory failure. The majority of patients improved their oxygenation during prone position, most likely due to a better ventilation perfusion matching.
21. **Effect of Early Treatment with Hydroxychloroquine or Lopinavir and Ritonavir on Risk of Hospitalization Among Patients With COVID-19: The TOGETHER Randomized Clinical Trial.** Reis G et al. *JAMA Netw Open.* 2021 Apr 1;4(4):e216468. doi: 10.1001/jamanetworkopen.2021.6468.
<https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2779044>
In this randomized clinical trial, neither hydroxychloroquine nor lopinavir-ritonavir showed any significant benefit for decreasing COVID-19-associated hospitalization or other secondary clinical outcomes. This trial suggests that expedient clinical trials can be implemented in low-income settings even during the COVID-19 pandemic.

Transmission / Infection Control

22. **Indoor Air Changes and Potential Implications for SARS-CoV-2 Transmission.** Allen JG, Ibrahim AM. *JAMA.* 2021 Apr 16. doi: 10.1001/jama.2021.5053.
<https://jamanetwork.com/journals/jama/fullarticle/2779062>
Increasing air changes per hour and air filtration is a simplified but important concept that could be deployed to help reduce risk from within-room, far-field airborne transmission of SARS-CoV-2 and other respiratory infectious diseases. Healthy building controls like higher ventilation and enhanced filtration are a fundamental, but often overlooked, part of risk reduction strategies that could have benefit beyond the current pandemic.
23. **Fitted Filtration Efficiency of Double Masking During the COVID-19 Pandemic.** Sickbert-Bennett EE, et al. *JAMA Intern Med.* 2021 Apr 16. doi: 10.1001/jamainternmed.2021.2033.
<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2778913>
Wearing a medical procedure mask underneath a cloth mask provided the best improvement to FFE of all the combinations evaluated. The improvement in the FFE of procedure masks when

doubled or when worn underneath reusable cloth face coverings is consistent with minimizing leaks between the mask and facial skin, including the bridge of the nose.

24. **Laboratory Modeling of SARS-CoV-2 Exposure Reduction through Physically Distanced Seating in Aircraft Cabins Using Bacteriophage Aerosol - November 2020.** Dietrich WL, et al. *MMWR Morb Mortal Wkly Rep.* 2021 Apr 23;70(16):595-599. doi: 10.15585/mmwr.mm7016e1.

<https://www.cdc.gov/mmwr/volumes/70/wr/mm7016e1.htm>

Based on a laboratory model, a vacant middle seat reduces risk for exposure to SARS-CoV-2 from nearby passengers. These data suggest that increasing physical distance between passengers and lowering passenger density could help reduce potential COVID-19 exposures during air travel. Physical distancing of airplane passengers, including through policies such as middle seat vacancy, could provide additional reductions in SARS-CoV-2 exposure risk.

25. **SARS-CoV-2 Transmission Risk Among National Basketball Association Players, Staff, and Vendors Exposed to Individuals with Positive Test Results After COVID-19 Recovery During the 2020 Regular and Postseason.** Mack CD, et al. *JAMA Intern Med.* 2021 Apr 22. doi: 10.1001/jamainternmed.2021.2114.

<https://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2779287>

In this retrospective cohort study of the 2020 NBA closed campus occupational health program, recovered individuals who continued to test positive for SARS-CoV-2 following discontinuation of isolation were not infectious to others. These findings support time-based US Centers of Disease Control and Prevention recommendations for ending isolation.

26. **Serological investigation of asymptomatic cases of SARS-CoV-2 infection reveals weak and declining antibody responses.** Yang Y, et al. *Emerg Microbes Infect.* 2021 Apr 19:1-28. doi: 10.1080/22221751.2021.1919032.

<https://www.tandfonline.com/doi/full/10.1080/22221751.2021.1919032>

We conducted a serosurvey of asymptomatic infections among food workers. Our results show that asymptomatic subjects are likely to be vulnerable to SARS-CoV-2 reinfection, and neither the proportion of population immunity nor the breadth of immune responses is sufficient for herd immunity.

Vaccines / Immunology

27. **Perioperative risk evaluation in patients scheduled for elective surgery in close relation to their SARS-CoV-2 vaccination.** Limper U, et al. *Br J Anaesth.* 2021 Mar 20:S0007-0912(21)00168-9. doi: 10.1016/j.bja.2021.03.007. [https://bjanaesthesia.org/article/S0007-0912\(21\)00168-9/fulltext](https://bjanaesthesia.org/article/S0007-0912(21)00168-9/fulltext)

Findings: (1) the best timing of vaccination for optimal immune response to protect the patient from COVID-19 after surgery is unknown; (2) immunomodulatory effects caused by anaesthesia and surgical trauma may diminish immunisation; (3) side-effects of the vaccine, of live vaccines in particular, may be aggravated through perioperative immunomodulation; and (4) adverse events of the vaccine may be misinterpreted as postoperative complications.

28. **SARS-CoV-2 incidence and vaccine escape.** Thompson RN, et al. *Lancet Infect Dis.* 2021 Apr 13:S1473-3099(21)00202-4. doi: 10.1016/S1473-3099(21)00202-4.
[https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(21\)00202-4/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00202-4/fulltext)
In summary, high SARS-CoV-2 incidence rates act to increase the vaccine escape risk (variants that render vaccines less effective). Maintaining low case numbers using NPIs and vaccines is crucial at this time.
29. **Pathologic Antibodies to Platelet Factor 4 after ChAdOx1 nCoV-19 Vaccination.** Scully M, et al. *N Engl J Med.* 2021 Apr 16. doi: 10.1056/NEJMoa2105385.
<https://www.nejm.org/doi/full/10.1056/NEJMoa2105385>
A pathogenic PF4-dependent syndrome, unrelated to the use of heparin therapy, can occur after the administration of the ChAdOx1 nCoV-19 vaccine. Rapid identification of this rare syndrome is important because of the therapeutic implications.
30. **Corticosteroids in COVID-19 and non-COVID-19 ARDS: a systematic review and meta-analysis.** Chaudhuri D et al. *Intensive Care Med.* 2021 Apr 19:1-17. doi: 10.1007/s00134-021-06394-2.
<https://link.springer.com/article/10.1007/s00134-021-06394-2>
The use of corticosteroids probably reduces mortality in patients with ARDS. This effect was consistent between patients with COVID-19 and non-COVID-19 ARDS, corticosteroid types, and dosage.
31. **COVID-19 dynamics after a national immunization program in Israel.** Rossman H, et al. *Nat Med.* 2021 Apr 19. doi: 10.1038/s41591-021-01337-2.
<https://www.nature.com/articles/s41591-021-01337-2>
A larger and earlier decrease in COVID-19 cases and hospitalization was observed in individuals older than 60 years, followed by younger age groups, by the order of vaccination prioritization. This pattern was not observed in the previous lockdown and was more pronounced in early-vaccinated cities. Our analysis demonstrates the real-life effect of a national vaccination campaign on the pandemic dynamics.
32. **The safety and immunogenicity of an inactivated SARS-CoV-2 vaccine in Chinese adults aged 18-59 years: A phase I randomized, double-blinded, controlled trial.** Pu J et al. *Vaccine.* 2021 Apr 9:S0264-410X(21)00431-X. doi: 10.1016/j.vaccine.2021.04.006.
[https://www.thelancet.com/article/S1473-3099\(20\)30843-4/fulltext](https://www.thelancet.com/article/S1473-3099(20)30843-4/fulltext)
Vaccination was completed in 191 subjects. Forty-four adverse reactions occurred within 28 days, most commonly mild pain and redness at the injection site or slight fatigue. In a population aged 18-59 years in this trial, this inactivated SARS-CoV-2 vaccine was safe and immunogenic.
33. **Vaccine Breakthrough Infections with SARS-CoV-2 Variants.** Hacısuleyman E et al. *N Engl J Med.* 2021 Apr 21. doi: 10.1056/NEJMoa2105000.
<https://www.nejm.org/doi/full/10.1056/NEJMoa2105000>
In a cohort of 417 persons who had received the second dose of BNT162b2 (Pfizer–BioNTech) or mRNA-1273 (Moderna) vaccine at least 2 weeks previously, we identified 2 women with

vaccine breakthrough infection. Despite evidence of vaccine efficacy in both women, symptoms of coronavirus disease 2019 developed, and they tested positive for SARS-CoV-2 by polymerase-chain-reaction testing. Viral sequencing revealed variants of likely clinical importance, including E484K in 1 woman and three mutations (T95I, del142–144, and D614G) in both. These observations indicate a potential risk of illness after successful vaccination and subsequent infection with variant virus, and they provide support for continued efforts to prevent and diagnose infection and to characterize variants in vaccinated persons.

****See also:** [COVID-19 Outbreak Associated with a SARS-CoV-2 R.1 Lineage Variant in a Skilled Nursing Facility After Vaccination Program — Kentucky, March 2021](#). Cavanaugh AM, et al. *MMWR Morb Mortal Wkly Rep*. ePub: 21 April 2021. DOI: <http://dx.doi.org/10.15585/mmwr.mm7017e2>;
[Postvaccination SARS-CoV-2 Infections Among Skilled Nursing Facility Residents and Staff Members — Chicago, Illinois, December 2020–March 2021](#). Teran RA, et al. *MMWR Morb Mortal Wkly Rep*. ePub: 21 April 2021. DOI: <http://dx.doi.org/10.15585/mmwr.mm7017e1>

- 34. Safety and immunogenicity of SARS-CoV-2 recombinant protein vaccine formulations in healthy adults: interim results of a randomised, placebo-controlled, phase 1-2, dose-ranging study.** Goepfert PA et al. *Lancet Infect Dis*. 2021 Apr 19:S1473-3099(21)00147-X. doi: 10.1016/S1473-3099(21)00147-X. [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(21\)00147-X/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00147-X/fulltext)

Lower than expected immune responses, especially in the older age groups, and the high reactogenicity after dose two were probably due to higher than anticipated host-cell protein content and lower than planned antigen doses in the formulations tested, which was discovered during characterisation studies on the final bulk drug substance. Further development of the AS03-adjuvanted candidate vaccine will focus on identifying the optimal antigen formulation and dose.

- 35. Safety and immunogenicity of an MF59-adjuvanted spike glycoprotein-clamp vaccine for SARS-CoV-2: a randomised, double-blind, placebo-controlled, phase 1 trial.** Chappell KJ et al. *Lancet Infect Dis*. 2021 Apr 19:S1473-3099(21)00200-0. doi: 10.1016/S1473-3099(21)00200-0. [https://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(21\)00200-0/fulltext](https://www.thelancet.com/journals/laninf/article/PIIS1473-3099(21)00200-0/fulltext)

This first-in-human trial shows that a subunit vaccine comprising mammalian cell culture-derived, MF59-adjuvanted, molecular clamp-stabilised recombinant spike protein elicits strong immune responses with a promising safety profile. However, the glycoprotein 41 peptide present in the clamp created HIV diagnostic assay interference, a possible barrier to widespread use highlighting the criticality of potential non-spike directed immunogenicity during vaccine development. Studies are ongoing with alternative molecular clamp trimerisation domains to ameliorate this response.

Whole Person Care

36. **Suicide trends in the early months of the COVID-19 pandemic: an interrupted time-series analysis of preliminary data from 21 countries.** Pirkis J et al. *Lancet Psychiatry*. 2021 Apr 13:S2215-0366(21)00091-2. doi: 10.1016/S2215-0366(21)00091-2.

[https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366\(21\)00091-2/fulltext](https://www.thelancet.com/journals/lanpsy/article/PIIS2215-0366(21)00091-2/fulltext)

This is the first study to examine suicides occurring in the context of the COVID-19 pandemic in multiple countries. In high-income and upper-middle-income countries, suicide numbers have remained largely unchanged or declined in the early months of the pandemic compared with the expected levels based on the pre-pandemic period. We need to remain vigilant and be poised to respond if the situation changes as the longer-term mental health and economic effects of the pandemic unfold.

Women & Children

37. **Preliminary Findings of mRNA Covid-19 Vaccine Safety in Pregnant Persons.** Shimabukuro TT et al. *N Engl J Med*. 2021 Apr 21. doi: 10.1056/NEJMoa2104983.

<https://www.nejm.org/doi/full/10.1056/NEJMoa2104983>

Preliminary findings did not show obvious safety signals among pregnant persons who received mRNA Covid-19 vaccines. However, more longitudinal follow-up, including follow-up of large numbers of women vaccinated earlier in pregnancy, is necessary to inform maternal, pregnancy, and infant outcomes.

38. **Multisystem Inflammatory Syndrome in Children (MIS-C) and the Prothrombotic State: Coagulation Profiles and Rotational Thromboelastometry in a MIS-C Cohort.** Al-Ghafry M et al. *J Thromb Haemost*. 2021 Apr 19. doi: 10.1111/jth.15340.

<https://onlinelibrary.wiley.com/doi/abs/10.1111/jth.15340>

Despite an observed prothrombotic state, none of the MIS-C patients (on aspirin alone or in combination with enoxaparin) developed symptomatic thrombosis. ROTEM, in addition to coagulation profiles, may be helpful to tailor thromboprophylaxis in critically ill MIS-C patients.

39. **Multisystem Inflammatory Syndrome in Infants <12 months of Age, United States, May 2020-January 2021.** Godfred-Cato S et al. *Pediatr Infect Dis J*. 2021 Apr 16. doi: 10.1097/INF.0000000000003149.

<https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=ovft&AN=00006454-900000000-95842&PDF=y>

Infants appear to have a milder course of MIS-C than older children with resolution of their illness after hospital discharge. The full clinical picture of MIS-C across the pediatric age spectrum is evolving.

40. **Maternal and Neonatal Morbidity and Mortality among Pregnant Women with and Without COVID-19 Infection: The INTERCOVID Multinational Cohort Study.** Villar J et al. *JAMA Pediatr*. 2021 Apr 22. doi: 10.1001/jamapediatrics.2021.1050.

<https://jamanetwork.com/journals/jamapediatrics/fullarticle/2779182>

In this multinational cohort study, COVID-19 in pregnancy was associated with consistent and substantial increases in severe maternal morbidity and mortality and neonatal complications when pregnant women with and without COVID-19 diagnosis were compared. The findings should alert pregnant individuals and clinicians to implement strictly all the recommended COVID-19 preventive measures.

41. **Compassionate Use of Remdesivir in Children with Severe COVID-19.** Goldman DL et al. *Pediatrics*. 2021 Apr 21:e2020047803. doi: 10.1542/peds.2020-047803.
<https://pediatrics.aappublications.org/content/early/2021/04/19/peds.2020-047803/tab-article-info>

Among 77 children treated with remdesivir for severe COVID-19, 80% recovered and the rate of serious adverse events was low (16%). Most adverse events were related to COVID-19 or comorbid conditions.

FDA / CDC / NIH / WHO Updates

FDA - [Coronavirus \(COVID-19\) Update: FDA Revokes Emergency Use Authorization for Monoclonal Antibody Bamlanivimab](#)

NIH – COVID-19 Treatment Guidelines New - [Outpatient Management of Acute COVID-19](#)

Commentary & News

[ACIP opts to lift pause on Johnson & Johnson vaccine](#) April 23, 2021

[Ten scientific reasons in support of airborne transmission of SARS-CoV-2.](#) *Lancet*. 2021 Apr 15:S0140-6736(21)00869-2. doi: 10.1016/S0140-6736(21)00869-2.

[SARS-CoV-2 Vaccine-Induced Immune Thrombotic Thrombocytopenia.](#) *N Engl J Med*. 2021 Apr 16. doi: 10.1056/NEJMe2106315.

[India's massive COVID surge puzzles scientists.](#) *Nature*. 2021 Apr 21. doi: 10.1038/d41586-021-01059-y.

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