

BRIEF19

A daily review of covid-19 research and policy.

RESEARCH BRIEFING

Pfizer/BioNtech data from Israel. Four key takeaways including why the second dose matters.

The United States has administered the highest number of coronavirus vaccines. Israel had vaccinated the second highest percentage of its population, trailing only Seychelles, the nation located in the Somali Sea

[New data](#) in *The Lancet* out yesterday provides important updates and insights that go well beyond the usual expected results—i.e. that the Pfizer/BioNtech mRNA-based coronavirus vaccine works spectacularly well. Let’s look at four key points in this new study.

First, the data show that the “real world” data match the approximate findings of the data from the phase III clinical trials which first made headlines in November. The vaccine provides impressive protection against covid-19-related hospitalization and deaths across a wide spectrum of age groups. The news here is that the data remain impressive—with 97 percent reduction in hospitalizations—even in the face of SARS-CoV-2 variants. The B.1.1.7 variant (the so-called “UK Variant”) accounted for 94.5 percent of all infections. This is incredibly important news.

Second, the vaccine decreased both symptomatic infection (97 percent effective) and asymptomatic infection as well (91.5 percent effective). This means that the over 9 in 10 people who are vaccinated have *zero chance* of spreading the virus to others. Whether spread occurred from the few people who had “breakthrough infections” to other people remains unknown.

Third, the vaccine was effective across a wide array of ages. Some people mistakenly believe that covid-19 is harmless to adolescents and young adults. In Israel, 36 people aged 16-44 died of covid-19 during the 2.5 months that was studied. Every single one of those deaths occurred in unvaccinated individuals. Given that Israel’s population is approximately 36-times smaller than the United States, the equivalent number of deaths in the US would have recorded 1,300 deaths among persons age 16-44. This is a strong argument for vaccinating people in all approved age groups.

Lastly, the study provided granular data on the effectiveness of one dose. The researchers found that at day 21 (i.e. prior to a 2nd vaccination), the vaccine’s effectiveness was certainly notable but not nearly at its peak. At day 21, the effectiveness in protecting vaccine recipients from any-and-all infection was 57 percent; the effectiveness in protecting against asymptomatic infection was 49 percent. This implies that in that weeks leading up to the 2nd dose and after, an important fraction of people could still get the virus, some of whom were hospitalized and died. Again, it remains unknown whether these partially vaccinated individuals were able to spread the virus to others still. In addition, we do not know how long the first dose confers immunity. So while one dose is certainly a large improvement over zero doses, these data suggest that, at least for now, the second dose is important. That said, the researchers did not follow outcomes of the relatively few persons who never received a second dose, so we do not know whether the numbers would have improved to the levels seen two weeks after the second dose. What is known, is that the second dose of the Pfizer/BioNtech vaccine boosts antibody levels impressively, a finding which is thought to help protect against coronavirus variants slip out of the antibody-virus chokehold more easily. [6 May 2021](#).

—Jeremy Samuel Faust, MD MS

Neuropsychiatric symptoms prevalent among those with long covid-19.

For many who have suffered from covid-19, the initial infection is only the beginning. The lingering effects of covid-19 are referred to as “long covid” or post-covid-19 conditions. Long covid-19 symptoms described in the literature so far [include](#) fatigue, muscle weakness, joint pain, chronic chest pain, shortness of breath, and brain fog. Specific medical conditions such as potentially

dangerous blood clots, and kidney problems have also been described, though the rates of these problems among recovering covid-19 patients is not known. Increasingly, neuropsychiatric symptoms, such as headache, depression, anxiety, PTSD, *etc.* have been considered symptoms of long covid.

A new systematic review [published](#) in the preprint server *medRxiv* (and therefore not peer reviewed) describes the state of the medical literature to-date on persistent neuropsychiatric symptoms after SARS-CoV-2 infection.

A total of 51 studies accounting for approximately 18,917 patients were included in the systematic review. Sex, race/ethnicity, and covid-19 severity were not consistently reported in the included studies. The majority of included patients (> 50 percent) had at one point been hospitalized but eventually discharged to their homes.

The most frequent neuropsychiatric symptom? Sleep disturbance (27.4 percent) This was followed by fatigue (24.4 percent), cognitive impairment (20.2 percent), anxiety (19.1 percent), and post-traumatic stress disorder (15.7 percent). In a sub-group analysis of studies that reported on covid-19 severity and the type of hospital stay (i.e. general medical floors versus intensive care units, *etc.*), there was no difference in the prevalence of neuropsychiatric symptoms.

The literature on this topic should be considered incomplete. Some of gaps in these data included the inability to look at sex, race/ethnic, and socioeconomic disparities in patients with persistent post-covid-19 neuropsychiatric symptoms. Furthermore, almost half of the included studies did not look at covid-19 severity, and there was no consistency with regard to how long patients were followed after their initial illnesses.

Finally, and somewhat surprisingly, only 2 of 51 studies (4 percent) reported neuropsychiatric symptoms in a control group (i.e. a comparison group that did not have covid-19). This alone makes it very difficult to determine whether covid-19 independently increases risk for neuropsychiatric symptoms compared to baseline rates for all hospitalizations for countless other non-covid-19 reasons for hospitalization.

The reason for and the prevalence of neuropsychiatric symptoms after covid-19 remains unclear. But while this is sorted out, we can surmise that mental health services are likely to continue to be a pressing need, even after the acute phase of the pandemic comes to an end. [5 May 2021](#).

—Joshua Niforatos, MD, MTS

Emergency clinicians took an economic hit during the pandemic.

Frontline workers were in harm's way for much of the covid-19 pandemic. And while some, like the former president, at times claimed that these professionals were somehow making money off of the pandemic by way of billing for the care provided, the reality is economically speaking (in addition to physical and emotional stress) the covid-19 pandemic has not been good for emergency physicians and other emergency clinicians such as physician assistants and nurse practitioners.

A new paper [published](#) in *Annals of Emergency Medicine* provides new, more granular insight on emergency department (EDs) providers nationwide.

Using data from AcuteCare Solutions, a nationwide ED practice organization, the researchers sought to describe the economic impact of visit numbers and case complexity during the pandemic in 2020 as compared to similar metrics from 2019. The data were presented as a ratio of 2020 to 2019 for each outcome, meaning that a ratio equaling 1 corresponded to no change, a ratio greater than 1 corresponded to an “increase” in 2020 compared to 2019, and a ratio of less than 1 corresponded to a “decrease” in 2020 compared to 2019.

A total of 139 EDs across 18 states accounting for 6 million ED visits were included in this study. Here's a synopsis of the results:

- Early in the pandemic, adult ED and pediatric ED visits decreased to 0.6 and 0.3, respectively. Later in the year, visits increased but did not reach 2019 levels.

- Patient complexity (as measured by how much revenue each visit generated) for both adults and children increased to greater than 1.0 for the entirety of the pandemic, peaking at 1.1 and 1.2, respectively.
- ED-related revenue dropped significantly (to around 0.6) by mid-April of 2020, and recovered to 0.9 later in the year. Revenue never fully recovered in 2020 compared to 2019. Notably, however, the recovery in revenue was driven by both the recovering volume of patients visiting EDs, patient complexity, as well costs from *decreased* staffing (i.e. lower financial overhead because staff hours were cut).
- Physician hours decreased to 0.8 during 2020, rebounding to 0.9, though never fully recovering in 2020. Hours worked by physician assistants and nurse practitioners declined to 0.6 and rebounded to between 0.7 and 0.8; similarly, work hours among these care providers did not fully recover in 2020.
- Physician assistant and nurse practitioner hours fell significantly at small EDs and freestanding EDs at 0.5 and 0.3, respectively.
- On average in 2020, emergency physician hours decreased by 15 percent during the pandemic, while physician assistant and nurse practitioner hours decreased by 27 percent.
- The authors note that these changes would approximately “correspond to the loss of 174 emergency physician and 193 [physician assistant and nurse practitioner] full time equivalents.”

In other words, the covid-19 pandemic may have cost hundreds of emergency doctors and other emergency care providers their jobs in 2020 in this healthcare system alone.

These data are concerning and compelling. However, AcuteCare Solutions only accounts for about 2 percent of all EDs nationwide and may not be broadly representative. Additionally, costs were only considered for clinical expenses instead of all expenses needed to run an ED. The authors acknowledge that they were unable to account for financial help from CARES funding, which offset revenues by 30 percent.

Regardless, this well-done study provides the type of granularity needed to assess the economics of emergency care. While patient visits declined, patients were increasingly complex (i.e. more sick and requiring more care). To address declining volume and revenue, this particular corporation decreased physician, physician assistant, and nurse practitioner hours significantly.

The results of this study provide important data on how emergency departments adapted to the covid-19 pandemic—often by cutting the work hours of employees, and therefore their paychecks. [4 May 2021](#).
—Joshua Niforatos, MD, MTS

Joshua Niforatos, MD, MTS, Research Section Editor.

Kane Elfman PhD, Publishing and design.

Anna Fang, Week in Review.

Jeremy Samuel Faust MD MS, Editor-in-Chief.

<http://www.brief19.com/>

Twitter: [@brief_19](#)

submissions@brief19.com

Brief19 is a daily executive summary of covid-19-related medical research, news, and public policy. It was founded and created by frontline emergency medicine physicians with expertise in medical research critique, health policy, and public policy.