COVID-19’s impact ripples across 18 conditions after initial illness

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COVID-19 leads to a rise in use of health care services for a variety of conditions long after the acute stage of infection. This is especially true with virtual and emergency care, a team of researchers has reported in *JAMA Network Open*.

Evaluating more than 250,000 patients from eight large health care organizations across the U.S., researchers found an association between the virus and a 4% boost in services six months post-infection. The study “highlights the potential for COVID-19 to exert an ongoing demand on health care organizations,” lead study author Sara Y. Tartof, PhD, MPH, an epidemiologist with the Kaiser Permanente Southern California Department of Research & Evaluation, said in a statement.

A 4% increase in patient encounters “represents a significant number of visits associated with substantial cost. The absolute number is big. In this case, it was over 27,000 extra encounters over six months among the eight health care organizations included in this study,” Tartof noted.

The Permanente Medical Group is part of the AMA Health System Program, which provides enterprise solutions to equip leadership, physicians and care teams with resources to help drive the future of medicine.

**Patient impact in 8 health systems**

The study included 127,859 patients who tested positive for SARS-CoV-2 and 127,859 who tested negative. The patients, representing all age groups, completed a COVID-19 diagnostic test between March 1 and November 1, 2020.

Kaiser used Vaccine Safety Datalink (VSD), a research collaboration led by the Centers for Disease Control and Prevention (CDC) to collect its data. Eight VSD sites provided data: Kaiser Permanente
Southern California; Denver Health; HealthPartners Institute; Kaiser Permanente Colorado; Kaiser Permanente Northern California; Kaiser Permanente Northwest; Kaiser Permanente Washington, and Marshfield Clinic Research Institute. (Marshfield Clinic Health System also is an AMA Health System Program member.)

Investigators matched SARS-CoV-2-positive and negative patients based on age, sex, race, ethnicity, site, and date of COVID-19 test and followed them for six months.

**More encounters for 18 conditions**

On average, extra health care use associated with COVID-19 infection resulted in 212.9 additional encounters per 1,000 patients with COVID-19. Virtual encounters comprised the highest share of use, followed by emergency department visits.

Health systems were looking for alternatives to cut transmission in clinical settings during the deadlier, pre-vaccine phase of the pandemic. Virtual and emergency care were likely the most accessible resources during the study period, Tartof said in an interview.

“Outpatient services had an overall decline in use from 2019 to 2020, with most encounters being replaced by virtual care such as telephone consultations,” she said.

COVID-19-associated health care encounters for 18 conditions remained elevated six months from the acute stage of illness. Encounters for lingering COVID-19, alopecia, bronchitis, pulmonary embolism or deep vein thrombosis, and difficulty breathing saw the highest increases in use. These are some of the most common conditions following SARS-CoV-2 infection, noted Tartof.

Children saw high utilization rates for pulmonary embolism or deep vein thrombosis, irregular heartbeat, difficulty breathing, and ear, nose and throat disorders.

**Guidance for the long term**

The findings represent one of the largest and most comprehensive studies of post-COVID conditions, said study co-author Debbie Malden, DPhil. She is an epidemiologist with the Kaiser Permanente Southern California Department of Research & Evaluation and an epidemic intelligence service officer with CDC.

“On a broader scale, this study will help health care organizations develop their long-term strategic plans to meet patients’ needs following COVID-19 infection,” said Tartof.
The study had some limitations. The follow-up time of six months could have underestimated the burden of post-COVID conditions with longer symptomatic periods, noted the investigators.