

# Letters

## RESEARCH LETTER

### Trends in Outpatient Care Delivery and Telemedicine During the COVID-19 Pandemic in the US

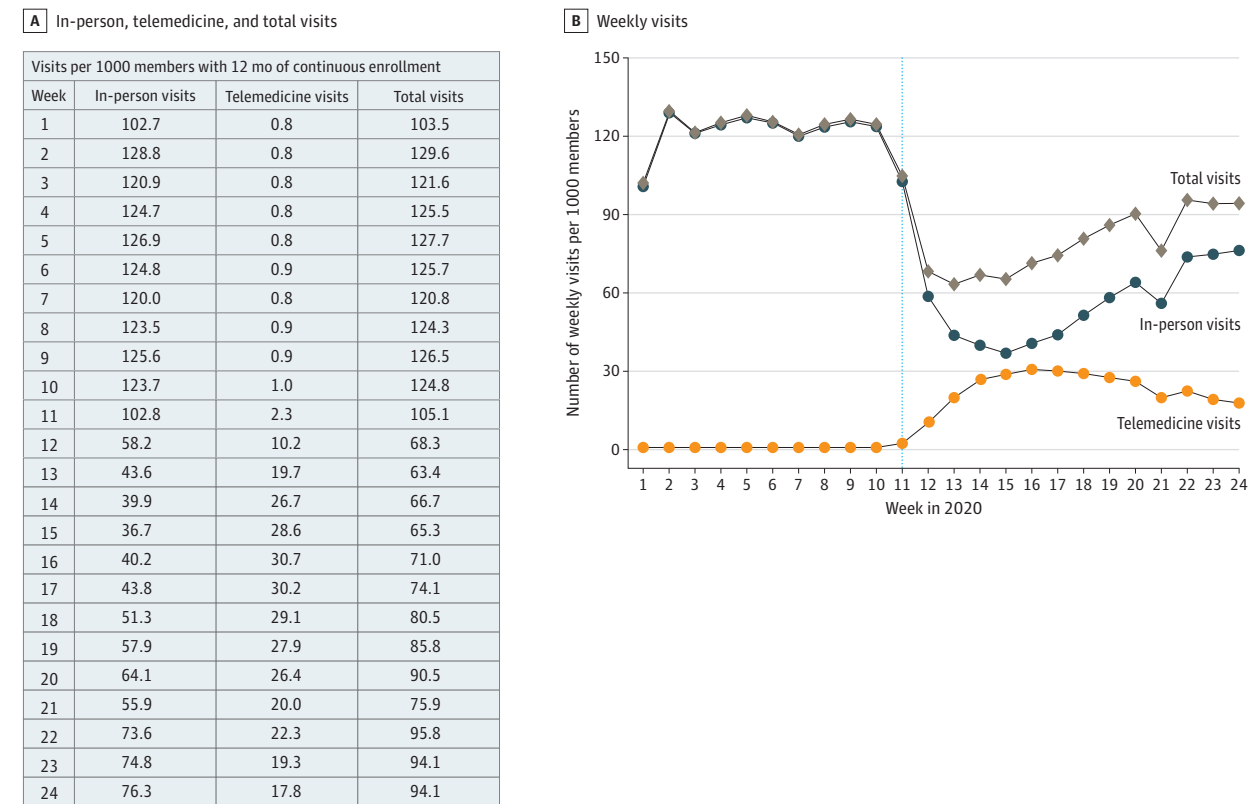
The coronavirus disease 2019 (COVID-19) pandemic has dramatically altered patterns of health care delivery in the US. In the context of declining in-person outpatient visits, many clinicians began using telemedicine for the first time, spurred in part by regulatory changes that expanded public and private insurer reimbursement for a wider range of telemedicine services.<sup>1,2</sup> To understand how telemedicine compensated for declining outpatient volume and geographic variation in changing patterns of outpatient care, we examined telemedicine and in-person outpatient visits in 2020 among a national sample of 16.7 million individuals with commercial or Medicare Advantage insurance.

**+**  
Supplemental content

**Methods** | We used insurance claims from the OptumLabs Data Warehouse<sup>3</sup> to capture all outpatient visits over a 24-week period from January 1, 2020, to June 16, 2020. We included enrollees with 12 months of continuous enrollment (July 2019-June 2020). We assessed data completeness using weekly childbirth rates (eAppendix in the Supplement). We defined outpatient visits as Medicare's list of Common Procedural Terminology (CPT) codes eligible for telemedicine<sup>4</sup> and telemedicine visits via modifier codes GT, GQ, or 95 or CPT codes 99441-99443.

We assessed changes in outpatient visit volume by capturing weekly rates per 1000 enrollees of telemedicine, in-person, and total visits over the study period. For each state, during the final 4 weeks of the study period (May 20 to June 16), we calculated the percent of total weekly visits delivered by telemedicine and the percent change in total weekly visits compared to the 4 week period preceding expansion of telehealth coverage by Medicare (February 12 to March 10).<sup>5</sup>

**Figure 1. Trends in In-person, Telemedicine, and Total (In-Person Plus Telemedicine) Visits per Week During the Pre-COVID-19 and COVID-19 periods, January 1, 2020, to June 16, 2020<sup>a</sup>**



The dotted vertical line in panel B indicates the week of March 17, 2020, (week 11), when Medicare expanded reimbursement for telemedicine visits due to the COVID-19 pandemic.<sup>4</sup>

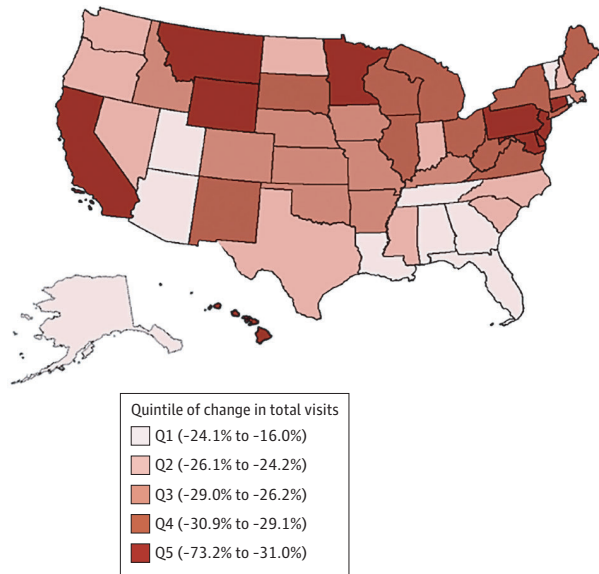
<sup>a</sup> Week 21 (May 20 to May 26, 2020) includes Memorial Day, a federal holiday in the US. The work week was likely 4 days for many practices resulting in a decrease in visit volume.

**Figure 2. US Geographic Variation in the Percent Change in Total Visits and Percent of Total Visits Delivered by Telemedicine From May 20 to June 16, 2020**

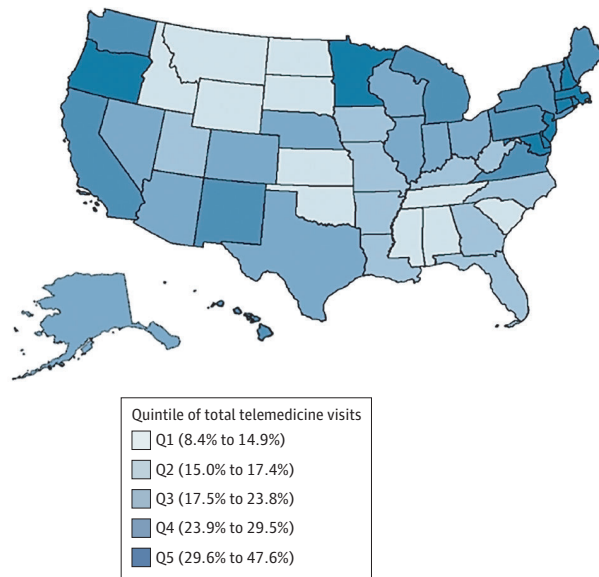
**A** Weekly visits per 1000 members with 12 mo continuous enrollment

| State                | Change in weekly total visits per 1000 members (wks 21-24 to 7-10), % | Weekly total visits per 1000 members delivered via telemedicine (wks 21-24), % |
|----------------------|---|--|
| Alabama              | -21.5   | 13.4   |
| Alaska               | -16.0   | 23.0   |
| Arizona              | -22.1   | 19.1   |
| Arkansas             | -26.8   | 15.4   |
| California           | -31.0   | 29.5   |
| Colorado             | -26.2   | 23.4   |
| Connecticut          | -34.3   | 31.5   |
| Delaware             | -32.9   | 33.8   |
| District of Columbia | -32.2   | 43.1   |
| Florida              | -24.0   | 17.4   |
| Georgia              | -22.7   | 15.6   |
| Hawaii               | -73.2   | 24.5   |
| Idaho                | -27.6   | 10.9   |
| Illinois             | -29.4   | 23.8   |
| Indiana              | -26.0   | 22.0   |
| Iowa                 | -29.0   | 15.1   |
| Kansas               | -27.4   | 13.0   |
| Kentucky             | -27.6   | 16.3   |
| Louisiana            | -22.6   | 15.9   |
| Maine                | -29.8   | 27.6   |
| Maryland             | -32.7   | 36.1   |
| Massachusetts        | -28.5   | 47.6   |
| Michigan             | -30.5   | 28.2   |
| Minnesota            | -32.2   | 34.5   |
| Mississippi          | -25.2   | 13.3   |
| Missouri             | -27.8   | 16.3   |
| Montana              | -31.2   | 11.3   |
| Nebraska             | -26.9   | 18.4   |
| Nevada               | -24.8   | 18.2   |
| New Hampshire        | -25.1   | 33.4   |
| New Jersey           | -36.3   | 30.3   |
| New Mexico           | -30.6   | 26.0   |
| New York             | -29.8   | 28.8   |
| North Carolina       | -24.5   | 16.7   |
| North Dakota         | -25.3   | 11.3   |
| Ohio                 | -29.1   | 21.1   |
| Oklahoma             | -26.7   | 14.9   |
| Oregon               | -25.6   | 30.3   |
| Pennsylvania         | -31.7   | 26.6   |
| Rhode Island         | -20.0   | 40.6   |
| South Carolina       | -24.2   | 11.4   |
| South Dakota         | -29.7   | 8.4  |
| Tennessee            | -23.6   | 10.4   |
| Texas                | -25.0   | 20.3   |
| Utah                 | -22.3   | 17.3   |
| Vermont              | -22.2   | 29.3   |
| Virginia             | -30.2   | 26.0   |
| Washington           | -24.6   | 24.4   |
| West Virginia        | -29.3   | 15.3   |
| Wisconsin            | -29.9   | 21.0   |
| Wyoming              | -33.1   | 12.2   |

**B** Change in total visits, %



**C** Total visits delivered by telemedicine, %



A, Data used to create panels B and C. B, Percent change in total weekly visits is defined as the difference between the total weekly visits from weeks 21 to 24 (May 20 to June 16) and baseline (weeks 7 to 10, February 12 to March 10) divided by the total weekly visits at baseline. Quintiles based on the distributions across all US states. C, Percent of total visits delivered by telemedicine is based on visits during weeks 21 to 24 (May 20 to June 16). Quintiles based on the distributions across all US states. Q1-Q5 indicates quintiles 1 to 5.

The Harvard Medical School institutional review board exempted this study from review and informed consent because all data were deidentified.

**Results** | Among 16 740 365 enrollees, the weekly rate of telemedicine visits increased during the pandemic period, peaking in the week of April 15, 2020, before declining by the week of June 10, 2020 (Figure 1). From the weeks of January 1 to June 10, the rates for telemedicine visits increased from 0.8 to 17.8 visits per 1000 enrollees (increase of 17.0 or 2013% change); in-person visits dropped from 102.7 to 76.3 (decrease of 26.4 or -30.0% change); total visits (telemedicine and in-person visits combined) decreased from 103.5 to 94.1 (-9.1% change).

By the last 4 weeks of the study period, May 20 through June 16, there was wide geographic variation in the percent of total visits delivered by telemedicine (ranging from 8.4% in South Dakota to 47.6% in Massachusetts) and the percent change from baseline in total visit rates (ranging from -73.2% in Hawaii to -16.0% in Alaska) (Figure 2). Some states, especially in the South, had a small decline in total visits and lower rates of telemedicine use (ie, Tennessee, -23.6% change in total visits with 10.4% of all visits as telemedicine; Alabama, -21.5% and 13.4%, respectively).

**Discussion** | In this national study of a commercially insured population, growth in telemedicine use offset roughly two-thirds of the decline in in-person visit volume during the COVID-19 pandemic. Although there was geographic variation in the magnitude of changes, every state experienced a drop in total visits, illustrating the broad scope of deferred care during the first months of COVID-19. Although some deferred care may have represented discretionary care that could be postponed without harm, these results also substantiate concerns that patients may fall behind in chronic illness management or face complications from deferred acute medical issues. This would be consistent with evidence from natural disasters resulting in decreased access to care associated with greater morbidity and mortality not directly related to the disaster itself.<sup>6</sup>

An important limitation is that results may not generalize to other populations (eg, traditional Medicare or Medicaid). Telemedicine use during the early COVID-19 pandemic only partially offset a drop in total outpatient care.

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**Author Contributions:** Dr Patel had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Concept and design:** Patel, Mehrotra, Barnett.

**Acquisition, analysis, or interpretation of data:** Patel, Huskamp, Uscher-Pines, Ganguli, Barnett.

**Drafting of the manuscript:** Patel.

**Critical revision of the manuscript for important intellectual content:** All authors.

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