

By Juan J. Andino, Ziwei Zhu, Mihir Surapaneni, Rodney L. Dunn, and Chad Ellimoottil

DOI: 10.1377/hlthaff.2021.01825
HEALTH AFFAIRS 41,
NO. 6 (2022): 838–845
©2022 Project HOPE—
The People-to-People Health
Foundation, Inc.

Interstate Telehealth Use By Medicare Beneficiaries Before And After COVID-19 Licensure Waivers, 2017–20

Juan J. Andino, University of Michigan, Ann Arbor, Michigan.

Ziwei Zhu, University of Michigan.

Mihir Surapaneni, University of Michigan.

Rodney L. Dunn, University of Michigan.

Chad Ellimoottil (cellimoo@med.umich.edu), University of Michigan.

ABSTRACT During the COVID-19 pandemic, all fifty states and Washington, D.C., passed licensure waivers that allowed patients to participate in telehealth visits with out-of-state clinicians (that is, interstate telehealth). Because many of these temporary flexibilities have expired or are set to expire, we analyzed trends in interstate telehealth use by Medicare beneficiaries during 2017–20, which covers the period both directly before and during the first year of the pandemic. Although the volume of interstate telehealth use increased in 2020, out-of-state telehealth made up a small share of all outpatient visits (0.8 percent) and of all telehealth visits (5 percent) overall. For individual states, out-of-state telehealth made up between 0.2 percent and 9.3 percent of all outpatient visits. We found that most out-of-state telehealth use was for established patient care and that a higher percentage of out-of-state telehealth users lived in rural areas compared with beneficiaries who did not receive care outside of their state (28 percent versus 23 percent). Our collective findings suggest that the elimination of pandemic licensure flexibilities will affect different states to varying degrees and will also affect the delivery of care for both established patients and rural patients.

Before the federal COVID-19 public health emergency, first issued January 31, 2020, by then–health and human services secretary Alex M. Azar II, the concept of interstate health care did not receive much attention. Interstate health care occurs when patients receive medical care from a clinician located in a different state. Medicare beneficiaries may be inclined to participate in interstate health care if they live close to their state border, live in a state with health care professional shortages, or seek unique expertise from a specialized clinician. As rates of telehealth use grew during the COVID-19 public health emergency,¹ new policy discussions emerged on the rules governing interstate telehealth use.² Before the public health emergency, state medical licensure regulations

restricted clinicians from practicing telehealth with patients who were physically located outside of the state in which the clinician was licensed at the time of the visit.

During the COVID-19 public health emergency, insurers and state governments implemented a number of temporary measures to make it easier for patients to seek care from out-of-state clinicians.³ For example, in March 2020 the Centers for Medicare and Medicaid Services (CMS) allowed individual states to waive within-state licensure requirements for Medicare beneficiaries receiving telehealth services. During the same time frame all fifty states and Washington, D.C., issued emergency orders that allowed out-of-state clinicians to perform telehealth across state lines.⁴ These temporary measures were intended to ensure continued access to medical

Interstate telehealth legislation and policy changes are best prioritized at the individual state level.

care during the public health emergency.

Although the Consolidated Appropriations Act, 2022, will allow the Medicare program to extend many telehealth flexibilities for a 151-day period after the end of the national public health emergency, many states are already changing their stance on allowing interstate telehealth. As of April 18, 2022, thirty-seven states and Washington, D.C., had ended their emergency declarations, and as a result, many temporary licensure waivers have expired.³ Fifteen states still had licensure flexibilities in place as of April 18, 2022, and several states had enacted legislation allowing out-of-state clinicians to practice interstate telehealth.^{3,4} For example, in Arizona a recently passed law, House Bill 2454, permanently allows out-of-state clinicians to perform telehealth with patients living in or visiting Arizona.⁵ Similarly, in Michigan, House Bill 4355 was introduced in February 2021 to allow out-of-state clinicians to provide telehealth services to Michigan residents.⁶

Proponents of permanently relaxing interstate telehealth licensure restrictions contend that the flexibilities are essential for patients who live near state borders and patients who live in areas with health care shortages. Furthermore, the licensure flexibilities expand patients' clinician choices. Opponents of interstate telehealth argue that allowing out-of-state clinicians to practice in states where they are not licensed creates complexity if physician disciplinary action is needed.² It may also be argued that large, national practices or health systems could use telehealth to cherry-pick patients away from their local clinicians. In addition, out-of-state clinicians may lack local resources (for example, local hospital admission privileges) to handle issues such as surgical complications and exacerbations of chronic disease.

Despite the interest of policy makers in addressing the use of telehealth across state lines, there is a lack of data around how Medicare beneficiaries use interstate telehealth. The COVID-19 public health emergency creates a unique op-

portunity to study how interstate telehealth functioned in an environment of widespread licensure relaxation. To inform policy making on interstate telehealth, we used a national 20 percent sample of Medicare beneficiaries to describe trends in telehealth use within and across states from January 2017 to December 2020. Specifically, we analyzed how quarterly rates of out-of-state telehealth changed from 2017 through 2020, the content of out-of-state telehealth visits, the characteristics of Medicare beneficiaries who used out-of-state telehealth, and state-level variation in out-of-state telehealth use.

Study Data And Methods

DATA SOURCES We used data from the 20 percent sample of Medicare fee-for-service beneficiaries to perform this study. The 20 percent sample is a random sample of Medicare beneficiaries that is created by the CMS Chronic Conditions Data Warehouse for research purposes. Using the 2017–20 Medicare Master Beneficiary Summary Files, we excluded beneficiaries who were not continuously enrolled in Medicare Part B or had Medicare Advantage coverage. Using the Medicare Carrier file, we identified all outpatient evaluation and management visits received by these beneficiaries from January 1, 2017, through December 31, 2020. We defined outpatient evaluation and management visits using Berenson-Eggers Type of Service codes (M1A, M1B, M5B, M5C, and M5D).

For this study we defined four visit types: out-of-state (or interstate) telehealth visits, out-of-state in-person visits, in-state telehealth visits, and in-state in-person visits. To identify out-of-state visits, we first determined the patient's home state, using the Master Beneficiary Summary File. The clinician's practice location was determined using the state code listed in the claim line for the health care service. Although we did not know where the patient and clinician were physically located at the time of the visit, we assumed that out-of-state visits occurred when the patient's and clinician's states differed.

To identify telehealth services, we first identified outpatient evaluation and management services that included the appropriate modifier codes (GT, GQ, 95) or place-of-service code (02). Second, we ensured that the Healthcare Common Procedure Coding System (HCPCS) codes associated with the identified claims were included in Medicare's list of eligible telehealth services for the corresponding year or were listed by Medicare as virtual care services (for example, virtual check-ins, interprofessional consultations, online digital evaluations, and remote monitoring).

ANALYSIS For our first analysis we assessed longitudinal trends in the four visit types. To do so, we calculated the quarterly number and percentage of each visit type that occurred from January 1, 2017, through December 31, 2020. This analysis allowed us to compare the magnitude of and changes in out-of-state telehealth care that occurred before and during the pandemic relative to the other three visit types.

For our second analysis we evaluated the content of out-of-state telehealth visits and compared them with in-state telehealth visits. To do so, we first assessed the top ten HCPCS codes and top five primary diagnosis codes associated with in-state in-person and telehealth visits and compared them with those for out-of-state visits. This allowed us to understand the nature of the visits (for example, established patient visits, new patient visits, or psychotherapy). We also evaluated whether there was a change in the volume of new patient visits as telehealth flexibilities were introduced during the pandemic. A change in new patient visit volume would indicate that patients were using out-of-state telehealth to seek additional care (for example, second opinions or new experts outside of their state). For this step, we extracted all out-of-state new patient visits using HCPCS codes 99201–5 and calculated quarterly counts of all out-of-state new patient visits and the percentage of these visits that were performed through telehealth.

For our third analysis we evaluated the characteristics of beneficiaries who used out-of-state health care. For this analysis we categorized beneficiaries into one of three groups based on all evaluation and management services they received during the study period: received at least one out-of-state in-person service but no out-of-state telehealth service; received at least one out-of-state telehealth service; or received no out-of-state services. We then compared these three groups on the basis of age, race and ethnicity, rurality, and Medicaid dual eligibility status. Race and ethnicity were defined using the Research Triangle Institute race code in the Master Beneficiary Summary File. Rurality was defined using ZIP codes from the Federal Office of Rural Health Policy data files. Dual-eligible beneficiaries were defined as those who had one or more months of Medicaid eligibility in 2019 or 2020.

Our fourth analysis was a state-level analysis. First, we calculated the percentage of all out-of-state in-person and telehealth visits for each of the fifty US states and Washington, D.C. (hereafter referred to as “states”). Because current licensing requirements are based on where the patient is located, we attributed out-of-state health care encounters to the home state of the patient. Second, we also evaluated whether

The widespread use of telehealth is often viewed as the silver lining for the COVID-19 pandemic.

out-of-state health care occurred between a bordering (adjacent) or nonbordering state. Finally, we assessed the correlation between several state-level variables and out-of-state telehealth use. These variables were obtained from the American Community Survey and Medicare claims. They included percentage of out-of-state in-person care, percentage of population considered rural, median household income, percentage of households with broadband internet, land mass in square miles, and percentage of patients who were dually eligible for Medicaid and Medicare. Because the volume of telehealth services was low in 2017–19, we only used 2020 data for this fourth analysis. We used SAS, version 9.4, for this study. The University of Michigan Institutional Review Board determined that the study was exempt from review.

LIMITATIONS Our study had several limitations. First, our data set limited our ability to ascertain the physical location of the patient or physician at the time of the visit. As a proxy, we used the mailing addresses for the patient and clinician, which may have led us to under- or overcount out-of-state health care claims. For instance, a patient’s mailing address may be in Illinois, but they may reside in Michigan. In this case, their health care appointments in Michigan would be misclassified as out-of-state appointments. Similarly, a patient or clinician may both have a Michigan address, but the patient may be in Florida during the telehealth encounter. In this case, an out-of-state health care visit would be misclassified as in-state. Second, we could not classify some telehealth visits (for example, telephone visits) as new or established patient visits. Therefore, the number of new patient visits may be undercounted. Finally, although our analysis provides the first evaluation of out-of-state Medicare services, it should be acknowledged that some of the observed trends might not be directly related to relaxed licensure regulations and may be affected by confounding factors related to the ongoing COVID-19 pandemic.

Study Results

In exhibit 1 we present quarterly trends in the four visit types that we examined: out-of-state (or interstate) telehealth visits, out-of-state in-person visits, in-state telehealth visits, and in-state in-person visits. From 2017 to 2019 the median quarterly number of out-of-state telehealth services was 1,611 (interquartile range: 1,257–1,739). The number of out-of-state telehealth services increased from the first quarter to the second quarter of 2020, from 17,286 to 171,754, and then declined to 101,325 in the third quarter and 98,987 in the fourth quarter, although the number remained at a higher level than at the beginning of 2020. From 2017 to 2019 out-of-state telehealth visits accounted for 0.1 percent of all evaluation and management visits and 8 percent of all telehealth visits. In 2020 out-of-state telehealth visits accounted for 0.8 percent of all evaluation and management visits and 5 percent of all telehealth visits.

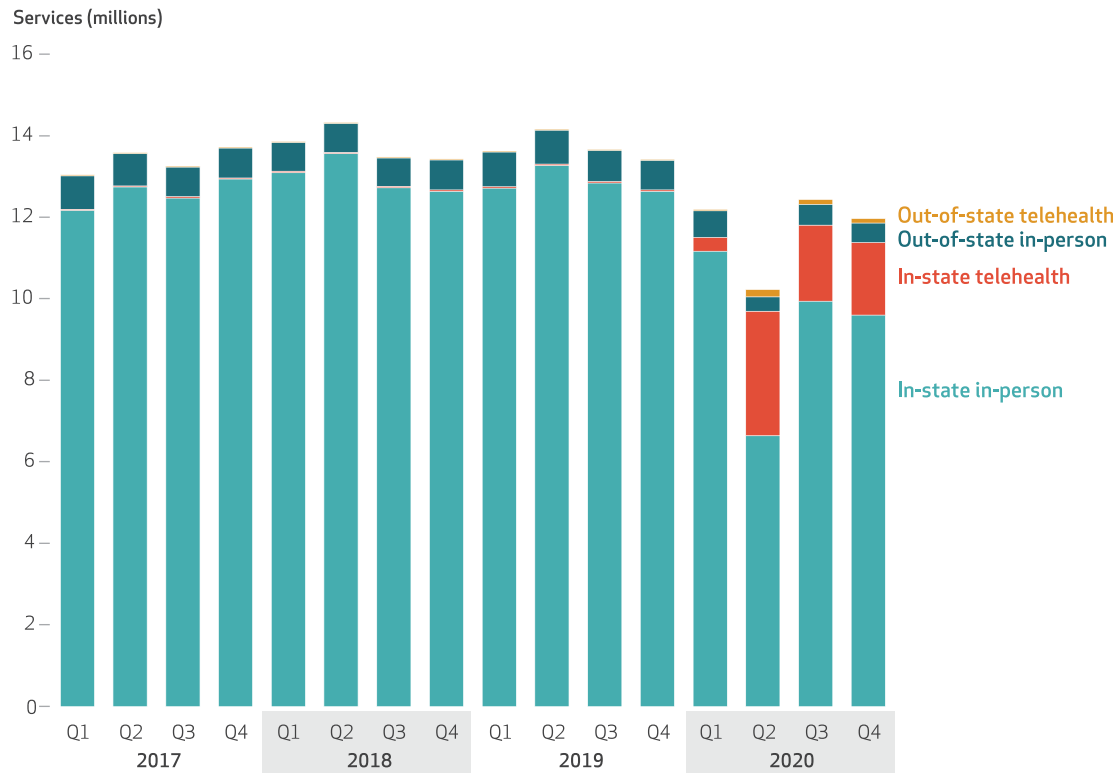
Exhibit 2 shows the same trends but is focused on the results for telehealth to provide more granularity. Although the count of out-of-state

telehealth services grew in 2020, which reflects the overall growth of telehealth services in that year, the percentage of telehealth that occurred across state lines did not change substantially.

In online appendix exhibits 1 and 2 we report the top ten HCPCS codes and top five primary diagnosis codes associated with in-state in-person and telehealth visits.⁷ The top ten HCPCS codes made up 87.5 percent and 87.8 percent of in-state in-person and telehealth visits, respectively. The same codes made up 86.4 percent and 85.9 percent of out-of-state in-person and telehealth visits, respectively. Only minor differences were seen in the distribution of out-of-state and in-state HCPCS codes. Of note, similar to in-state telehealth visits, the vast majority of out-of-state telehealth visits were performed for established patients. The top three HCPCS codes for both out-of-state and in-state telehealth visits were 99214 (established patient office visit, level 4), 99213 (established patient office visit, level 3), and 99442 (audio-only evaluation and management visit). These three codes made up 58 percent of in-state telehealth visits and 56 per-

EXHIBIT 1

Quarterly number of outpatient evaluation and management services for Medicare beneficiaries, by visit type, 2017–20

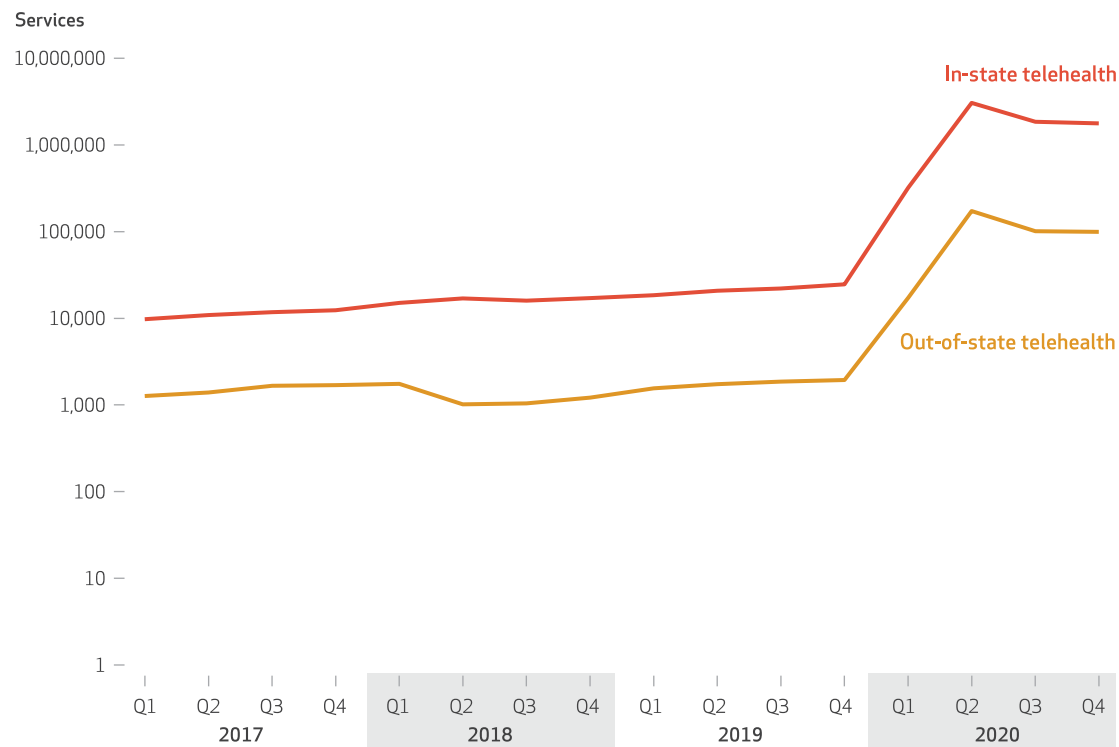


SOURCE Authors' analysis of a 20 percent national sample of Medicare beneficiaries from January 1, 2017, through December 31, 2020.

NOTES Telehealth includes outpatient evaluation and management services such as office visits, telephone visits, virtual check-in, online digital evaluation, remote monitoring, and interprofessional consult. Beneficiaries who were not continuously enrolled in Part B or had Medicare Advantage coverage were excluded.

EXHIBIT 2

Quarterly number of outpatient evaluation and management services delivered via telehealth for Medicare beneficiaries, 2017–20



SOURCE Authors' analysis of a 20 percent national sample of Medicare beneficiaries from January 1, 2017, through December 31, 2020.

NOTES Telehealth includes outpatient evaluation and management services such as office visits, telephone visits, virtual check-in, online digital evaluation, remote monitoring, and interprofessional consult. Beneficiaries who were not continuously enrolled in Part B or had Medicare Advantage coverage were excluded.

cent of out-of-state telehealth visits. When we compared in-state and out-of-state primary diagnosis codes, we also only found minor differences in the distribution of out-of-state and in-state diagnosis codes. The top three diagnosis codes for both in-state and out-of-state telehealth were essential hypertension, major depressive disorder, and generalized anxiety disorder.

In exhibit 3 we demonstrate the time trend in the number of out-of-state new patient visits by quarter from 2017 through 2020. The median quarterly number of out-of-state new patient visits from 2017 to 2019 was 114,427 (IQR: 107,058–127,470). The median in 2020 was lower, at 80,391. Before 2020, telehealth made up less than 1 percent of out-of-state new patient visits. In 2020, 6 percent of out-of-state new patient visits occurred through telehealth (1 percent, 14 percent, 7 percent, and 7 percent of visits for 2020 quarters 1–4, respectively).

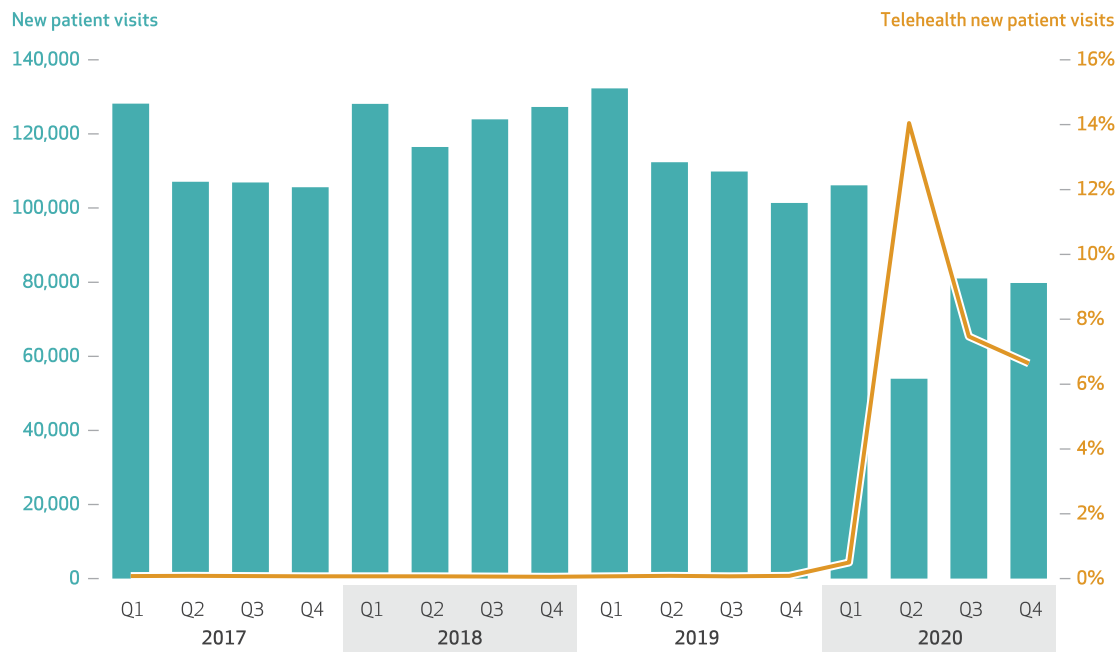
Exhibit 4 presents the characteristics of beneficiaries who received out-of-state health care during 2019–20. Among beneficiaries who used out-of-state telehealth services, a higher percent-

age were rural (28 percent versus 23 percent) and a lower percentage were dual eligible (13 percent versus 20 percent) compared with beneficiaries who used no out-of-state services. Only minor differences regarding age, sex, and race and ethnicity existed between beneficiaries who used no out-of-state services, those who used only in-person out-of-state services, and those who used out-of-state telehealth.

In appendix exhibits 3–5 we compare differences in out-of-state telehealth use at the state level.⁵ We found that the median percentage of out-of-state evaluation and management visits in 2020 was 6.3 percent (IQR: 4.7–8.9), and out-of-state telehealth made up 0.9 percent (IQR: 0.7–1.4).⁵ States with the highest percentage of evaluation and management visits performed by out-of-state clinicians were Washington, D.C. (45.5 percent), Vermont (19.6 percent), and West Virginia (19.0 percent). States with the highest percentage of out-of-state telehealth evaluation and management visits were Washington, D.C. (9.3 percent), Vermont (4.1 percent), and New Hampshire (4.1 percent).

EXHIBIT 3

Quarterly number of out-of-state new patient outpatient evaluation and management visits among Medicare beneficiaries and percent delivered by telehealth, 2017–20



SOURCE Authors' analysis of a 20 percent national sample of Medicare beneficiaries from January 1, 2017, through December 31, 2020.
NOTES Telehealth includes outpatient evaluation and management services such as office visits, telephone visits, virtual check-in, online digital evaluation, remote monitoring, and interprofessional consult. Beneficiaries who were not continuously enrolled in Part B or had Medicare Advantage coverage were excluded.

For twenty-six states, fewer than 1 percent of evaluation and management visits were performed by out-of-state clinicians. Sixty-four percent of out-of-state telehealth visits occurred between a patient and clinician located in a bordering (adjacent) state (data not shown). As expected, we found a strong correlation between a state's percentage of out-of-state telehealth and out-of-state in-person care ($r = 0.94$). However, the correlation between a state's percentage of out-of-state telehealth and other variables was unremarkable (percentage of population considered rural [$r = 0.03$], median household income [$r = 0.34$], percentage of households with broadband [$r = 0.10$], land mass in square miles [$r = 0.15$], and percentage of patients who were dual eligible [$r = 0.44$]).

Discussion

Our analysis of trends in out-of-state telehealth use by Medicare beneficiaries yielded several findings that should inform policy discussion on interstate telehealth. First, our findings suggest that interstate telehealth legislation and policy changes are best prioritized at the individual state level. We observed that from 2017 through

2020 out-of-state telehealth made up a small proportion of total outpatient care nationwide. Moreover, although the number of out-of-state telehealth visits grew substantially in 2020, there was little meaningful change in the proportion of these visits throughout the entire study period. Although the overall proportion was small, the percentage of outpatient care made up of out-of-state telehealth did vary by state and was strongly correlated with the percentage of in-person out-of-state care received by beneficiaries in the state. For the majority of states, fewer than 1 percent of outpatient visits were out-of-state telehealth in 2020. However, for some states (for example, Vermont, New Hampshire, and Washington, D.C.) the magnitude of out-of-state telehealth was considerable. State governments can determine the priority they should place on out-of-state telehealth by examining how much total care (in-person and telehealth) occurred across state lines (appendix exhibit 4).⁵ For instance, for West Virginia, 19 percent of outpatient care occurred across state lines, although only 2.6 percent was through telehealth. As Medicare beneficiaries become more comfortable with telehealth, it is likely that more out-of-state care will occur through telehealth. In Utah

EXHIBIT 4

Characteristics of Medicare beneficiaries who received out-of-state health services, by visit type, 2019–20

Characteristics	No out-of-state services (n = 4,668,878)		Out-of-state in-person only (n = 628,187)		Out-of-state telehealth (n = 175,585)	
	Number	Percent	Number	Percent	Number	Percent
Age, years						
<65	594,955	13	56,993	9	23,713	14
66–70	999,384	21	140,186	22	37,709	21
71–75	1,103,189	24	165,563	26	44,999	26
76–80	798,982	17	121,526	19	33,003	19
>80	1,172,368	25	143,619	23	36,161	21
Sex						
Male	2,057,305	44	279,944	45	76,690	44
Female	2,611,572	56	347,943	55	98,895	56
Race and ethnicity ^a						
Non-Hispanic White	3,742,456	80	543,010	86	148,605	85
Black or African American	380,141	8	36,191	6	12,838	7
Asian or Pacific islander	137,332	3	10,297	2	2,892	2
Hispanic	258,776	6	17,153	3	4,917	3
American Indian or Alaska Native	26,648	<1	3,591	<1	1,111	<1
Other or unknown	123,525	3	17,645	3	5,222	3
ZIP code						
Rural ^b	1,085,170	23	196,839	31	48,686	28
Nonrural	3,583,708	77	431,048	69	126,899	72
Dual eligibility ^c						
Yes	927,120	20	67,177	11	23,404	13
No	3,741,758	80	560,710	89	152,181	87

SOURCE Authors' analysis of a 20 percent national sample of Medicare beneficiaries from January 1, 2019, through December 31, 2020.

NOTES Beneficiaries who were not continuously enrolled in Part B or had Medicare Advantage coverage were excluded. Percentages might not equal 100 because of rounding. ^aDefined using the Research Triangle Institute race code in the Master Beneficiary Summary File. ^bDefined using Federal Office of Rural Health Policy data files. ^cDual-eligible beneficiaries were those who had one or more month of Medicaid eligibility in 2019 or 2020.

only 2.3 percent of outpatient visits (in-person and telehealth) occurred across state lines. Therefore, residents of Utah may consider interstate telehealth a lower priority than other pressing health care matters.

Second, our findings reveal that out-of-state telehealth is primarily used for continuity of care, rather than the acquisition of new patients. For instance, the billing and primary diagnosis codes for in-state and out-of-state telehealth visits did not differ substantially, and most out-of-state care was for established patients and routine diagnoses. In addition, we did not observe an increase in the volume of new patient visits from 2017 to 2020 as telehealth use grew. These findings should mitigate possible concerns that extending licensure flexibilities will result in out-of-state clinicians luring away patients from their existing clinicians.

Third, a higher percentage of rural patients used both out-of-state in-person and telehealth services compared with their nonrural counterparts. This finding is consistent with the abundance of literature on health care provider shortages and extended distances that rural patients

have to travel for care.^{8–10} Policy changes that favor continued interstate telehealth flexibilities will certainly benefit rural communities. Given that approximately two-thirds of out-of-state telehealth encounters occurred with a clinician in a bordering state, states with rural counties located along their borders may consider policies such as licensure reciprocity² to enable continued telehealth access in rural communities.

Although the findings in this study shed light on interstate telehealth trends, several questions remain unanswered. First, it is unclear how this trend will change over time. As patients become comfortable with telehealth, they may obtain a greater proportion of their care with out-of-state clinicians. For this reason, individual states should continue to monitor trends in interstate telehealth (particularly how rural patients are using interstate telehealth) to better understand how to prioritize this issue in the future. Second, we do not know whether the decision to obtain care by out-of-state clinicians is driven by patient choice or clinician supply. Although we observed a higher frequency of out-of-state telehealth use among rural patients, we could not determine

the underlying factors driving this trend. Finally, it is unclear whether interstate telehealth is associated with an increase or decrease in quality of care. On the one hand, as interstate telehealth grows in popularity, patients will be empowered to select clinicians that better fit their clinical and emotional needs. On the other hand, patients who rely on out-of-state clinicians may find it difficult to obtain in-person care when they need it.

Conclusion

The widespread use of telehealth is often viewed as the silver lining for the COVID-19 pandemic. As telehealth flexibilities expire, it will be important for policy makers to enact permanent telehealth policies in an evidence-based manner. We hope that the findings in this study can directly contribute to policy discussions on interstate telehealth. ■

The authors acknowledge grant support from the Agency for Healthcare Research and Quality (Grant No. 1K08 HS027632-01). The authors thank Sophia Ng for her review of the article.

NOTES

- 1 Verma S. Early impact of CMS expansion of Medicare telehealth during COVID-19. *Health Affairs Blog* [blog on the Internet]. 2020 Jul 15 [cited 2022 Apr 11]. Available from: <https://www.healthaffairs.org/doi/10.1377/forefront.20200715.454789/full/>
- 2 Mehrotra A, Nimgaonkar A, Richman B. Telemedicine and medical licensure—potential paths for reform. *N Engl J Med*. 2021;384(8):687–90.
- 3 Alliance for Connected Care. State telehealth and licensure expansion COVID-19 dashboard [Internet]. Washington (DC): The Alliance; 2022 Mar 8 [cited 2022 Apr 11]. Available from: <https://connectwithcare.org/state-telehealth-and-licensure-expansion-covid-19-chart>
- 4 Center for Connected Health Policy. Cross-state licensing [Internet]. West Sacramento (CA): CCHP; [cited 2022 Apr 11]. Available from: <https://www.cchpca.org/topic/cross-state-licensing-covid-19/>
- 5 Office of the Governor [Internet]. Phoenix (AZ): The Office. Press release, Governor Ducey signs legislation to dramatically expand telehealth; 2021 May 5 [cited 2022 Apr 26]. Available from: <https://azgovernor.gov/governor/news/2021/05/governor-ducey-signs-legislation-dramatically-expand-telehealth>
- 6 Michigan Legislature. House Bill 4355 (2021) [Internet]. Lansing (MI): The Legislature; [cited 2022 Apr 26]. Available from: <http://legislature.mi.gov/doc.aspx?2021-HB-4355>
- 7 To access the appendix, click on the Details tab of the article online.
- 8 Rural Health Information Hub. Rural health disparities [Internet]. Grand Forks (ND): RHInfo; [cited 2022 Apr 11]. Available from: <https://www.ruralhealthinfo.org/topics/rural-health-disparities>
- 9 Rural Health Information Hub. Health professional shortage areas: primary care, by county, 2019 [Internet]. Grand Forks (ND): RHInfo; [cited 2022 Apr 11]. Available from: <https://www.ruralhealthinfo.org/charts/5>
- 10 Lin CC, Bruinooge SS, Kirkwood MK, Olsen C, Jemal A, Bajorin D, et al. Association between geographic access to cancer care, insurance, and receipt of chemotherapy: geographic distribution of oncologists and travel distance. *J Clin Oncol*. 2015;33(28):3177–85.