Health Affairs Scholar, 2025, **3**(4), qxaf064
https://doi.org/10.1093/haschl/qxaf064
Advance access publication: March 26, 2025
Research Article

Health Affairs Scholar
EMERGING & GLOBAL HEALTH POLICY
OXFORD

Utilization and quality among Medicare Advantage beneficiaries with high vs low access to telehealth

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Abstract

Access to telehealth care has increased markedly in recent years, especially for patients in the Medicare Advantage (MA) program. Given the unique features of MA, such as capitated payment and provider networks, understanding the impact of telehealth availability on quality, costs, and utilization is important for informing coverage and payment decisions. We compared quality and utilization outcomes among MA beneficiaries with varying access to telehealth, using MA encounter data from a 20% national random sample of enrollees from 2019 to 2021. We found that high-telehealth access was associated with a 13.4% decrease in in-person evaluation and management (E&M) visits, relative to the period prior to the pandemic onset. Given that this decrease was offset by increases in telehealth E&M visits, there was no change in total E&M visits. High-telehealth access was also associated with a 4.8% decrease in total emergency department (ED) visits, but no differences in preventable ED visits, total hospital admissions, or ambulatory care-sensitive admissions. Increases in telehealth-delivered E&M visits among MA beneficiaries with high-telehealth access offset decreases in in-person-delivered E&M visits. These findings may help clinicians and policymakers contextualize the relationship between broader access to telehealth for MA enrollees and various types of health care utilization.

Lay summary

Access to telehealth has grown significantly in recent years, especially for patients enrolled in the Medicare Advantage (MA) program, but it is not clear whether greater availability of telehealth improves the quality of care that patients receive or how much medical care they use. This study examined data between 2019 and 2021 and asked whether MA patients at practices that delivered more of their care by telehealth ended up seeing the doctor more or having to go to the emergency department or hospital more often. Results from this study showed that patients with high-telehealth access had more telehealth visits and fewer in-person visits, but about the same number of overall office visits. They also had 4.8% fewer emergency department visits compared to before the pandemic. These findings could help clinicians and policymakers better understand the role that telehealth plays in the care of older adults in the MA program.

Key words: telehealth; Medicare Advantage.

Introduction

Unlike traditional Medicare, which covered few telehealth services prior to the COVID-19 Public Health Emergency (PHE), many Medicare Advantage (MA) plans have covered telehealth services as a supplemental benefit since 2013 and use among MA beneficiaries increased during the pandemic.[1-3] Given the unique features of the MA program, including capitated payment, provider networks, and utilization management practices such as prior authorization, it is important to understand the potentially distinct impact of telehealth on quality, costs, and utilization for MA beneficiaries who represent a growing share of the overall Medicare population.[4]

Prior research examining telehealth use in MA after the onset of the COVID-19 pandemic has found that beneficiaries who were frail, disabled, and lower income were significantly more likely to use telehealth for primary care compared to other patients and that there was more telehealth use within MA contracts participating in risk-sharing arrangements with providers compared to traditional Medicare contracts.[5] Within the MA program, several physician characteristics have also been found to influence the extent of telehealth use, with higher levels of telehealth being delivered by female physicians, physicians working in urban areas, and physicians in specialties such as endocrinology, psychiatry, and gastroenterology.[6,7] However, most previous work on telehealth among MA patients has focused on care within a single state or health care organization,[8-12] with some studies finding that patients of practices delivering more telehealth have higher rates of emergency department (ED) visits and hospitalizations.[10,12] A 2017 study of a commercial plan in California found that most telehealth use largely resulted in additional utilization—meaning that telehealth visits added to, as opposed to substituted for, in-person office visits—and led to an increase in total health care spending.[13]

Received: January 16, 2025; Revised: March 10, 2025; Accepted: March 24, 2025

Given these findings, some policymakers have expressed concerns that broader coverage of telehealth may lead to increased utilization among patients who would not have otherwise sought care or unnecessary follow-up care, resulting in higher spending with uncertain effects on quality.[13-17] These concerns may also be relevant in traditional Medicare, a program for which there are ongoing discussions about whether and how to cover telehealth services.[18] In this study, we used a difference-in-differences (DD) framework to compare changes in quality and utilization among MA beneficiaries receiving care from primary care practices that delivered a high vs low proportion of care via telehealth. The study is, to our knowledge, the first to leverage a quasi-experimental research design to examine the effects of telehealth delivery in the MA program nationally since pandemic-era expansions.

Methods

Data

We used encounter data for a 20% national random sample of MA enrollees from 2019 to 2021 that included inpatient, outpatient, and professional services received, as well as beneficiary demographic information. To identify unique physicians and practices, we used the Medicare Data on Provider Practice and Specialty file, which contains information on physician specialty, geographic location, and tax identification number (TIN) for 1.2 million clinicians.

Study population

We included MA patients aged 65 or older and attributed patients using physician encounter records to the practice (defined as a TIN) that delivered a plurality of their primary care services, following logic from the Medicare Shared Savings Program attribution methodology version 6.0.[19] Primary care services were defined as office-based evaluation and management (E&M) services (CPT codes 99201-99205 and 99211-99215) delivered by physicians in general practice, family practice, internal medicine, osteopathic manipulative medicine, geriatric medicine, and preventative medicine. Following previous work, primary care practices were categorized as TINs with at least 80% of their physicians specializing in primary care.[20,21] Individuals were attributed to practices in each year; for instance, claims data from 2019 were used to attribute patients to practices in 2019. We also conducted a sensitivity analysis in which only individuals who remained attributed to the same practice across all study years were included.

During each study year, we excluded patients who were not continuously enrolled in 1 or more MA plans (Figure S1). Patients who switched between traditional Medicare and MA at any time during the study period were excluded.

Outcomes

We examined changes in in-person E&M services, telehealth E&M services, ED visits (not resulting in a hospital admission), and hospital admissions. Evaluation and management services were considered telehealth if they had a telehealth-specific modifier code (95, G0, GT, GQ) or place of service code (02). For ED visits, we examined total ED visits and potentially preventable ED visits, using the New York University preventable ED algorithm.[22] For hospital admissions, we examined total admissions and ambulatory care-sensitive admissions (ACSAs), using the Agency for Healthcare Research and Quality's Prevention Quality Indicator algorithm.[23]

Covariates

Patient covariates included age (65-74, 75-84, and 85+), sex, dual eligibility for Medicare and Medicaid, race/ethnicity (Asian, Black, Hispanic, White, and others), the rural–urban commuting area codes associated with patients' zip codes,[24] and the Centers for Medicare & Medicaid Services (CMS) Hierarchical Condition Category (HCC) score, calculated from the CMS HCC risk adjustment model.[25] Practice-level covariates included the mean CMS HCC score of patients in the practice, the percentage of dually eligible patients, the percentage of patients in the 4 largest racial/ethnic groups in the sample (Hispanic, non-Hispanic, Asian, non-Hispanic Black, and non-Hispanic White), and the number of patients seen by the practice. Dual-eligible patients were defined as those with at least 6 months of Medicaid eligibility in a year.

Telehealth

Telehealth exposure was defined as the percentage of all outpatient E&M services delivered via telehealth by a practice between July 2020 and December 2021 (ie, after the initial phase of the COVID-19 pandemic). We excluded data from the second quarter of 2020 because this period coincided with the onset of the pandemic and stay-at-home orders. Patients attributed to primary care practices in the highest quartile of telehealth delivery of primary care services ("high-telehealth practices") were considered the treatment group. Patients attributed to practices that did not deliver any telehealth services were considered the comparison group ("no-telehealth practices"). Because more than a quarter of practices in the sample did not provide any telehealth during the study period, the number of comparison group practices was initially larger than the number of treatment group practices (although not after applying the matching process described below).

Statistical analysis

Because of observable differences between high- and no-telehealth practices (Table S1), we employed a propensity-score matching approach. Specifically, we used a logit model to estimate the propensity that a practice would be categorized as a high-telehealth practice. After matching, the treatment and control group practices in the pre-period were relatively similar (Table S2); however, some differences remained: practices in the control group had fewer attributed patients (259.3 vs 367.0; $P < 0.001$) and were more likely to be located in small towns or rural areas (3.6% vs 2.8%; $P < 0.001$). Further details on matching are included in Table S2.

To estimate the association of high-telehealth practices with patient outcomes, we used a DD framework. In a pooled DD analysis, we assessed changes in outcomes from before the start of the COVID-19 pandemic (pre-period: January 1, 2019 to February 2020) compared to the period following the initial onset of the pandemic (July 1, 2020 to December 2021). The period March 2020 to June 2020 was treated as a washout period and excluded from the study. Similar to several recent studies,[26,27] this approach yields estimates of the mean treatment effect of being attributed to a high-telehealth practice by comparing changes in the post-period relative to the pre-period for patients at high- vs no-telehealth practices. Patient covariates, practice fixed effects, and time-varying practice covariates were included. All outcomes in the pooled analyses were standardized to a 14-month period (the length of the pre-period). In sensitivity analyses, we included state-time fixed effects to control for disparate regional COVID-19 effects and state telehealth policies during the study period, such as the types of covered services and how services were reimbursed.[28] Standard errors were clustered at the practice level.

Next, we used a DD approach within an event-study framework to estimate the quarterly effects of being attributed to a high- vs no-telehealth practice over time. This allowed us to assess if there were significant differential trends in the pre-treatment period, in order to support the assumption of parallel trends in the pre-period, which is needed to make valid DD inferences. The same covariates were used as in the pooled DD model, but practice and quarter-year fixed effects were also included. Standard errors were adjusted for clustering at the practice level, and all outcomes in the quarterly analyses were constructed at the patient-quarter level.

Finally, we conducted 4 subgroup DD analyses to examine the potentially differing effects of attribution to a high- vs no-telehealth practice for (1) dual-eligible patients, (2) non-dual-eligible patients, (3) patients with high baseline medical complexity (HCC scores above the median) who were attributed to a practice in both the pre- and post-periods, and (4) patients with lower baseline medical complexity (HCC scores below the median) who were attributed to a practice in both the pre- and post-periods.

Results

Sample characteristics

Among practices in the matched sample (Table S1), there were 5362 practices in the no-telehealth group and 8804 practices in the high-telehealth group. During the post-period, practices in the no-telehealth group did not deliver any E&M visits via telehealth (patients attributed to no-telehealth practices could still have received some telehealth visits from other practices that they may have visited during the study period.). Practices in the high-telehealth group delivered 35.8% of their E&M visits via telehealth.

Patients attributed to high-telehealth practices during the pre-period ($n = 219\,457$) had similar characteristics compared to patients attributed no-telehealth practices ($n = 61\,150$) except that they were less likely to live in a small town or rural area (2.8% vs 6.7%, $P < 0.001$) (Table 1).

Summary of unadjusted outcomes

In the pre-period, patients attributed to no-telehealth practices had slightly fewer E&M visits (10.81 vs 11.55; $P < 0.001$); other outcomes were similar among patients attributed to high- vs no-telehealth practices (Table 2). During the post-period, patients attributed to no-telehealth practices had an average of 0.29 (SD: 1.04) telehealth E&M visits, while patients attributed to high-telehealth practices had an average of 1.71 (SD: 2.62) telehealth E&M visits. Patients at high-telehealth practices had 10.87 total E&M visits (SD: 9.04) and 9.15 in-person E&M visits (SD: 8.01), while patients at no-telehealth practices had 10.07 total E&M visits (SD: 8.52) and 9.78 in-person E&M visits (SD: 8.25).

Patients at high-telehealth practices had similar numbers of total ED, preventable ED visits, hospital admissions, and ACSAs to patients at no-telehealth practices within the pre-periods. In the post-period, patients at no-telehealth practices had an average of 0.75 total ED visits and 0.24 preventable ED visits, compared to patients in high-telehealth TINs, who had an average of 0.70 total ED visits and 0.21 preventable ED visits.

Adjusted changes in utilization and quality by telehealth exposure

Table 3 presents pooled DD regression results adjusted for patient covariates. Compared to the pre-period, patients at high- vs no-telehealth practices had 1.42 additional telehealth E&M visits (95% CI, 1.35-1.48; $P < 0.001$), 1.52 fewer in-person

Table 1. Summary of sample characteristics.

Characteristics	No-telehealth TINs Pre-period	High-telehealth TINs Pre-period	Difference between high and low TINs during pre-period *P*-value	No-telehealth TINs Post-period	High-telehealth TINs Post-period
HCC score, mean (SD)	1.77 (1.50)	1.77 (1.50)	0.99	1.69 (1.39)	1.71 (1.43)
Age, mean (SD), y	75.31 (7.16)	75.15 (7.09)	<0.001	75.62 (7.17)	75.54 (7.08)
Sex					
Female, No. (%)	35 387 (57.87)	129 665 (59.08)	<0.001	32 421 (57.83)	132 281 (59.43)
Male, No. (%)	25 763 (42.13)	89 792 (40.92)		23 640 (42.17)	90 287 (40.57)
Dual eligibility					
Dual, no. (%)	12 296 (20.11)	48 414 (22.06)	<0.001	11 721 (20.91)	49 958 (22.45)
Not dually eligible, no. (%)	48 854 (79.89)	171 043 (77.94)		44 340 (79.09)	172 610 (77.55)
Race					
Asian/Pacific islander, no. (%)	4027 (6.59)	14 567 (6.64)	<0.001	4297 (7.66)	16 824 (7.56)
Black or African-American, no. (%)	7668 (12.54)	25 200 (11.48)		7199 (12.84)	25 626 (11.51)
Hispanic, no. (%)	11 811 (19.31)	43 333 (19.75)		11 177 (19.94)	43 528 (19.56)
Non-Hispanic White, no. (%)	36 894 (60.33)	133 640 (60.90)		32 735 (58.39)	133 835 (60.13)
Other, no. (%)	750 (1.23)	2717 (1.24)		653 (1.16)	2755 (1.24)
Rurality					
Small town or rural, no. (%)	4105 (6.71)	6149 (2.80)	<0.001	3839 (6.85)	6428 (2.89)
Not small town or rural, no. (%)	57 045 (93.29)	213 308 (97.20)		52 222 (93.15)	216 140 (97.11)
N	61 150	219 457		56 061	222 568

Patients attributed to primary care practices in the highest quartile of telehealth delivery of primary care services among all TINs are in the high-telehealth TIN group. Practices in the lowest quartile of telehealth provision are in no-telehealth TINs. Patient assignment to a high- or no-telehealth TIN was based on the attributed TIN that provided care for the longest period of time in the pre- and the post-period. Individuals are defined as dual if they are dually eligible for at least half of the pre- or post-period. Pre-period differences between were compared using *t*-tests for continuous variables and χ^2 tests for categorical variables. Abbreviation: TINs, tax identification numbers.

Table 2. Summary of outcome measures.

Outcomes	No-telehealth TINs		High-telehealth TINs		Difference between high and low telehealth during pre-period	No-telehealth TINs		High-Telehealth TINs	
	Pre-period	SD	Pre-period	SD		Post-period	SD	Post-period	SD
Telehealth E&M	0.00	0.08	0.00	0.13	<0.001	0.29	1.04	1.71	2.62
In-person E&M	10.81	9.01	11.52	9.54	<0.001	9.78	8.25	9.15	8.01
All E&M	10.81	9.01	11.55	9.54	<0.001	10.07	8.52	10.87	9.04
All Admissions	0.23	0.67	0.24	0.69	0.12	0.20	0.56	0.21	0.58
ACSA Admissions	0.04	0.27	0.04	0.27	0.72	0.03	0.22	0.03	0.21
All ED visits	0.84	2.51	0.83	2.69	0.14	0.75	2.38	0.70	2.07
Preventable ED Visits	0.31	1.19	0.30	1.19	0.004	0.24	1.00	0.21	0.89
N	61 150		219 457			56 061		222 568	

Means for each patient in the pre- and post-periods are shown above. Outcomes are normalized to a 14-month period for both the pre- and post-periods. Patients attributed to primary care practices in the highest quartile of telehealth delivery of primary care services among all TINs are in the high-telehealth TIN group. Practices in the lowest quartile of telehealth provision are in no-telehealth TINs. Patient assignment to a high- or no-telehealth TIN was based on the attributed TIN that provided care for the longest period of time in the pre and the post period. Pre-period differences between were compared using t-tests. ACSA, ambulatory care-sensitive admission; ED, emergency department; E&M, evaluation and management; TINs, tax identification numbers.

Table 3. Adjusted pooled DD regression results.

Outcomes	Coefficient	95% CI	*P*-value
Telehealth E&M visits	1.42	1.35 to 1.48	<0.001
In-person E&M Vvsits	−1.52	−1.68 to −1.36	<0.001
All E&M visits	−0.10	−0.25 to 0.05	0.17
All admissions	−0.003	−0.01 to 0.01	0.47
ACSAs	−0.002	−0.01 to 0.001	0.24
All ED visits	−0.04	−0.07 to −0.005	0.02
Preventable ED visits	−0.01	−0.02 to 0.01	0.33
N		559 236	

The DD regression model adjusts for patient characteristics (age, whether the patient is female, race (non-Hispanic Asian, non-Hispanic Black, Hispanic, non-Hispanic White, Other, rural-urban commuting area code, months of dual eligibility, HCC score) and TIN characteristics (average HCC score, percent of patients that are dually eligible, percent of patients that are non-Hispanic Black, percent of patients that are Hispanic, percent of patients that are non-Hispanic White, number of unique beneficiaries), and TIN fixed effects. Patients 65 or over in each pre- and post-period were included. Patient assignment to a high- or no-telehealth TIN was based on the attributed TIN that provided care for the longest period of time in the pre and the post period.
ACSA, ambulatory care-sensitive admission; ED, emergency department; E&M, evaluation and management; HCC, Hierarchical Condition Category; TINs, tax identification numbers (TINs).

E&M visits (95% CI, −1.68 to −1.36; $P < 0.001$), and no difference in total E&M visits (−0.10, 95% CI, −0.25 to 0.05; $P = 0.17$) during the post-period. This represented a 13.4% decrease in in-person E&M visits, relative to the baseline number of E&M visits during the pre-period for all patients in the sample (11.38 in-person E&M visits).

Patients at high-telehealth practices experienced a relative decline in total ED visits from the pre- to post-period compared to patients at no-telehealth practices (−0.04; 95% CI, −0.07 to −0.005; $P = 0.02$) (Table 3). This change represented a 4.8% decrease relative to the baseline mean number of ED visits for all patients during the pre-period (0.83 ED visits). There were no statistically significant differences in preventable ED visits, total hospital admissions, or ACSAs.

Quarterly results

Figure 1 shows adjusted differences in telehealth, in-person, and all E&M visits for patients attributed to high- vs no-telehealth practices, relative to the last quarter of 2019, the reference quarter (coefficient estimates and 95% CIs are reported in Table S3). The coefficients in the pre-pandemic period did not differ significantly for patient-quarters at high- vs no-telehealth practices in the matched sample, indicating that the parallel trends assumption was met.

Aligning with the pooled regression results, the number of telehealth E&M visits per patient-quarter in high- vs no-telehealth practices was higher in all quarters after June 2020, relative to the reference quarter (Figure 1; Table S3), while in-person E&M visits per patient-quarter were lower in all subsequent quarters. Relative to baseline, there were no statistically significant differences in any post-period quarter in total admissions, ACSAs, or preventable ED visits (Figure 2; Tables S4 and S5 and Figure S2); total ED visits were lower among patients at high-telehealth practices in the third quarter of 2021.

Patient subgroups

Results of subgroup analyses generally aligned with the primary findings. However, the magnitude of changes in telehealth and in-person E&M visits among patients who were dual eligible and who had high medical complexity was larger than for the overall sample (Tables S6 and S7). Among dual-eligible and medically complex patient subgroups, telehealth E&M visits increased by 1.92 (95% CI, 1.80-2.04; $P < 0.001$) and 1.91 (95% CI, 1.81-2.00; $P < 0.001$), respectively, and in-person E&M visits decreased by 2.26 (95% CI, −2.62 to −1.91; $P < 0.001$) and 2.01 (95% CI, −2.26 to −1.77; $P < 0.001$), respectively (Tables S6 and S7). This corresponded to a 16.9% decrease in the number of in-person E&M visits from the pre-period for dually eligible patients (13.41 visits in the pre-period) and a 13.2% increase for medically complex patients (15.27 visits), respectively.

Similar to the overall sample, there were no differences in total hospital admissions for all subgroups (Tables S6 and S7), but for patients with high baseline medical complexity, attribution to a high-telehealth practice was associated with a statistically significant decrease in ACSAs (−0.007, 95% CI, −0.01 to −0.001; $P = 0.03$). This represents a 11.7% decrease in ACSAs, compared to pre-period means (0.06 ACSAs). Total

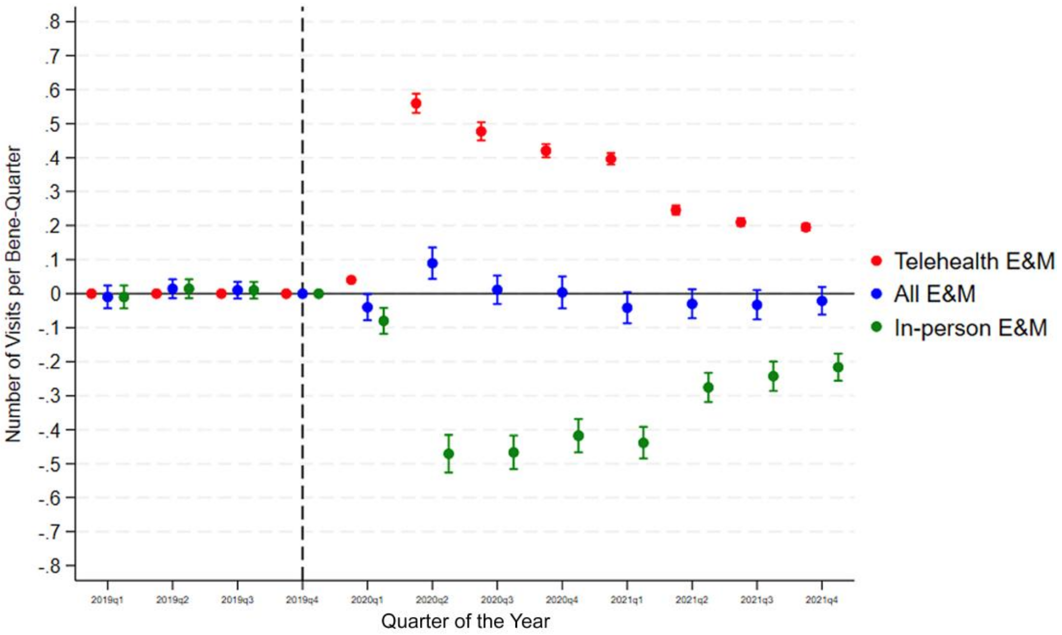

Figure 1. Adjusted differential changes in E&M visits for high- and no-telehealth TINs in pre- and post-pandemic onset quarters. The coefficients above represent adjusted differences in telehealth, in-person, and all E&M visits for patients attributed to high- vs no-telehealth TINs after the pandemic onset, relative to the reference quarter (2019q4). The model is adjusted for patient characteristics (age, whether the patient is female, race [non-Hispanic Asian, non-Hispanic Black, Hispanic, non-Hispanic White, and others], rural–urban commuting area code, dual eligibility, and HCC score), and TIN characteristics (average HCC score, percent of patients that are dually eligible, percent of patients that are non-Hispanic Black, percent of patients who are Hispanic, percent of patients that are non-Hispanic White, and number of unique beneficiaries), and TIN fixed effects. Dual-eligible patients were defined as those with at least 6 months of Medicaid eligibility in a year. Abbreviations: E&M, evaluation and management; HCC, Hierarchical Condition Category; TINs, tax identification numbers.

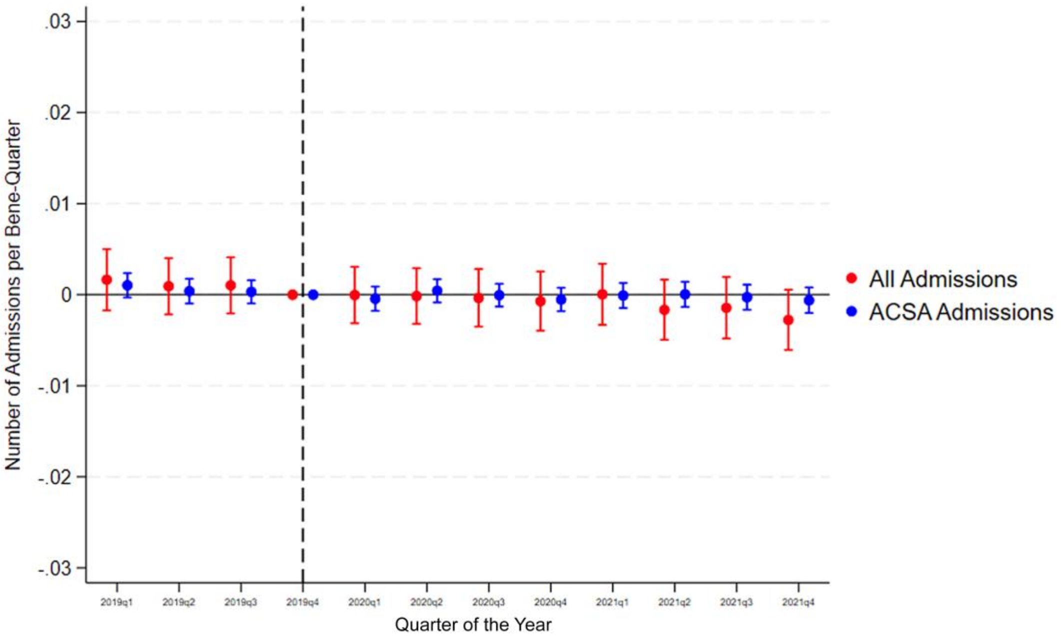

Figure 2. Adjusted differential changes in hospital admissions for high- and no-telehealth TINs in pre- and post-pandemic onset quarters. The coefficients above represent adjusted differences in ambulatory care sensitive admissions and total admissions for patients attributed to high- vs no-telehealth TINs after the pandemic onset, relative to the reference quarter (2019q4). The model is adjusted for patient characteristics (age, whether the patient is female, race (non-Hispanic Asian, non-Hispanic Black, Hispanic, non-Hispanic White, Other, rural-urban commuting area code, dual eligibility, HCC score), and TIN characteristics (average HCC score, percent of patients that are dually eligible, percent of patients that are non-Hispanic Black, percent of patients that are Hispanic, percent of patients that are non-Hispanic White, number of unique beneficiaries), and TIN fixed effects. Dual-eligible patients were defined as those with at least 6 months of Medicaid eligibility in a year. Abbreviations: ACSAs, ambulatory care-sensitive admissions; HCC, Hierarchical Condition Category; TINs, tax identification numbers.

ED visits were lower for most patient subgroups (non-dually eligible: −0.04, 95% CI, −0.07 to −0.01; $P = 0.02$; more medically complex: −0.07, 95% CI, −0.13 to −0.01; $P = 0.02$; less medically complex: −0.05, 95% CI, −0.08 to −0.03; $P < 0.001$). This corresponded to a 5.7%, 6.1%, and 14.3% decrease in ED visits from pre-period means for non-dually eligible patients (0.70 ED visits), more medically complex patients (1.14 ED visits), and less medically complex patients (0.35 ED visits), respectively. Preventable ED visits were lower only for less medically complex patients (−0.01, 95% CI, −0.03 to −0.002; $P = 0.03$), representing a 7.7% decrease from pre-period means (0.13 preventable ED visits).

Sensitivity analysis

Continuous patient attribution

Among patients who remained attributed to the same practice from 2019 to 2021, being attributed to a high-telehealth practice was associated with an increase in telehealth E&M visits (1.59, 95% CI, 1.51-1.67; $P < 0.001$), a decrease in in-person E&M visits (−1.60, 95% CI, −1.78 to −1.43; $P < 0.001$), corresponding to a 13.9% decrease from baseline means (11.53 E&M visits), and no change in total E&M visits (−0.01, 95% CI, −0.17 to 0.14; $P = 0.87$) (Table S8). High-telehealth exposure was also associated with fewer ACSAs (−0.004, 95% CI −0.01 to −0.0001; $P = 0.05$) and total ED visits (−0.04, 95% CI, −0.07 to −0.003; $P = 0.03$), corresponding to a 10.0% and a 5.3% decrease from baseline means, respectively (0.04 ASCAs, 0.75 ED visits).

State-time fixed effects

In sensitivity analyses that include state-by-time fixed effects, where time denotes pre- or post-study period (pre-period: January 2019 to February 2020; post-period: July 2020 to December 2021), attribution to a high-telehealth practice was associated with an increase in telehealth E&M visits (1.35, 95% CI, 1.28-1.42; $P < 0.001$), a decrease in in-person E&M visits (1.39, 95% CI, −1.54 to −1.24; $P < 0.001$), corresponding to a 12.2% decrease from baseline means (11.38 E&M visits), and no changes in any of the other outcomes (Table S9).

Discussion

In this national study of telehealth use in the MA population, we found that patients attributed to primary care practices that delivered a high proportion of their care via telehealth experienced a relative decrease in in-person E&M visits (13.4% of baseline) without a change in total E&M visits; they also experienced fewer total ED visits (4.8% of baseline). There were no differential changes in hospital admissions, ambulatory care-sensitive admissions, or potentially preventable ED visits for patients attributed to high- vs no-telehealth practices.

The finding that increases in telehealth E&M visits offset decreases in in-person E&M visits was robust across all sensitivity analyses. In the continuous patient attribution sample, these results were larger in magnitude. High-telehealth exposure was also associated with a reduction in total ED visits, as in the primary sample, in addition to fewer ACSAs. These findings suggest that among patients with longer-term patient-provider relationships, telehealth exposure may be associated with greater telehealth use and better patient outcomes. Moreover, in subgroup analyses, we found that the magnitudes of the changes in E&M visits were larger among patients who were dual-eligible patients and patients with high medical complexity. Telehealth may be disproportionately important for the care of sicker and more socially vulnerable patients, who tend to have greater health needs and more contact with the health care system.[29] These findings align with other work, which has found that MA beneficiaries who are frail, disabled, or lower income are more likely to use telehealth.[5]

In a sensitivity analysis that includes state-by-time fixed effects, however, we did not find an association between attribution to a high-telehealth practice and changes in ED visits or hospital admissions. It is possible that the severity of regional COVID-19 waves, state telehealth environments, and other confounders that varied across states and time periods accounted for some of the observed effects in the primary analysis. We also observed a relative decline in total ED visits in only the third quarter of 2021 in quarterly DD analysis. Nevertheless, this may suggest that high-telehealth practices may have been better positioned to manage outpatient care during this period, which coincided with a highly contagious new COVID-19 variant.[30]

This study contributes to the growing literature on the implications of broader access to telehealth for the Medicare population by using a national sample of MA enrollees, which has not been done in previous studies.[12,13] Prior work using national samples of traditional Medicare patients has found that greater telehealth use may be associated with an increase in overall office visits and ACSAs.[27] Another study, using data through 2022, found that telehealth use, was associated with an increase in outpatient (telehealth and in-person) health care encounters (2.2% relative increase) but a decline in ED visits (2.7% relative decline); our findings were consistent with these changes but had somewhat larger magnitudes.[31] It is likely that practice-level factors such as health information technology infrastructure, staffing levels, and administrative support also contribute to telehealth use, and future research should examine the impact of these factors on telehealth use and patient outcomes.

Some policymakers have expressed concern that greater telehealth availability may result in higher health care utilization and spending.[32] Our study suggests that much of the increase in telehealth use among MA patients may be offset by a decrease in in-person care and that there may be small reductions in ED visits resulting from greater access to telehealth. Further research should examine the persistence of these findings as patients and practices grow more familiar with telehealth and as health care delivery in the United States enters a steady state after the COVID-19 pandemic.

Limitations

This study has limitations. First, we classified practices as high- vs no-telehealth based on MA encounter records, rather than an all-payer claims dataset, which does not exist at the national level. The extent to which physicians offered telehealth to other patient populations is not reflected in this study; however, given the large differences in telehealth delivery in the treatment vs control group (eg, the control group practices did not provide any telehealth E&M visits), it is unlikely that there was crossover. Furthermore, we analyzed care at the practice level and did not distinguish outcomes for patients cared for by high- vs no-telehealth physicians within practices.

Second, the study period overlapped with the COVID-19 pandemic, which may limit generalizability to post-pandemic health care delivery. For example, there was a declining national trend in ED visits during the PHE, compared to 2019 levels,[27,33] and we could not determine the associations of telehealth access with utilization and quality outcomes independent of the PHE.

Third, by necessity, we defined the exposure (high- vs no-telehealth) during the same period that the outcomes were measured, as telehealth was rarely identified in claims prior to 2020. Although we leveraged an established methodology for defining variation in practice-level telehealth,[27,31,34] it may be difficult to disentangle whether telehealth access influenced the outcomes of interest, or vice versa (though we believe it more likely that telehealth use affected outcomes such as avoidable ED visits, rather than the opposite). Furthermore, our event study plots do not show evidence of changes in outcomes of interest prior to the change in the exposure (attribution to a high- vs no-telehealth practice in the post period).

Fourth, according to national commercial data sources, telehealth use has declined somewhat since 2021.[35] The effect sizes we observed in our study may not generalize to other time periods. Fifth, even after matching on observable practice-level characteristics, high-telehealth practices were significantly larger than no-telehealth practices and less likely to be in small town or rural areas, suggesting that they may have had better access to resources and infrastructure that allowed them to increase telehealth provision more easily. These larger and less rural practices may have also been better equipped to provide higher-quality primary care during the initial 2 years of the pandemic. Therefore, we were not able to fully account for potential bias arising from differences in practice size and resource availability. Additionally, the patients in the no-telehealth matched sample may represent a slightly healthier subset of the overall population of patients attributed to no-telehealth practices. Our finding that patients at high-telehealth practices experienced a reduction in ED visits relative the control group may therefore represent a lower bound of the true effect.

Finally, our study used MA encounter data. While earlier years of these data (eg, prior to 2018) have had relatively high levels of missingness,[36] recent assessments have found that the share of contracts reporting encounters has improved, increasing to 96% of contracts in 2020.[17] Furthermore, the MA encounter files for physician, outpatient, and inpatient services are more complete than the files for skilled nursing facility services and durable medical equipment, which are not used in this study.[32] Assuming that telehealth-delivered encounters are not missing at a different rate than in-person encounters, the classification of treatment vs comparison practices is not likely to have been affected.

Conclusions

In this national study of MA beneficiaries, individuals who received care from a practice that delivered a high level of telehealth had more telehealth visits, fewer in person visits, and a similar number of overall visits. They also had small relative decrease in total ED visits, but otherwise experienced similar levels of acute care utilization. These findings may be of interest to clinicians, policymakers, and health insurance executives determining the availability and delivery of telehealth in primary care settings.

Acknowledgments

J.Y. and M.Z. had full access to all of the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis.

Contribution statement

Concept and design: J.Y., L.P.C., D.K., H.-Y.J. Acquisition, analysis, or interpretation of data: D.K. and J.Y. Drafting of the manuscript: J.Y. Critical revision of the manuscript for important intellectual content: all authors. Statistical analysis: J.Y. and D.L. Obtained funding: L.P.C. and D.K. Administrative, technical, or material support: all authors. Supervision: D.K.

Supplementary material

Supplementary material is available at *Health Affairs Scholar* online.

Funding

This work was supported by the Physicians Foundation. The funder had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

Conflicts of interest

J.Y. reported receiving grants from the National Institutes of Health (NIH), Agency for Healthcare Research and Quality (AHRQ), and Patient-Centered Outcomes Research Institute, outside the submitted work. L.P.C. reported being a paid member of the Medicare Payment Advisory Commission outside the submitted work. H.-Y.J. reported receiving grants from the NIH and honoraria from Brown University and Chung-Ang University outside the submitted work. D.K. reported receiving grants from Arnold Ventures and AHRQ, outside the submitted work. No other disclosures were reported. Please see ICMJE form(s) for author conflicts of interest. These have been provided as supplementary materials.

Notes

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