



# Telemedicine Reimbursement Changes and Health Care Contact Days for Older Adults

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## Abstract

**IMPORTANCE** Public health emergency waivers enacted during the COVID-19 pandemic dramatically expanded telemedicine use. Expiration of these waivers would limit access to this convenient care option for older adults, but it is unknown how expiration would affect patients' burden of care, quantified as health care contact days (days receiving in-person care).

**OBJECTIVE** To measure the extent to which telemedicine days experienced by older adults enrolled in traditional Medicare may supplement in-person health care contact days and to estimate how telemedicine waiver expiration could increase the number of health care contact days.

**DESIGN, SETTING, AND PARTICIPANTS** This is a cross-sectional study of the 2022 Medicare Current Beneficiary Survey examining a nationally representative sample of community-dwelling adults aged 65 years or older enrolled in traditional Medicare. Data analysis was performed from March 2025 to March 2026.

**MAIN OUTCOMES AND MEASURES** The primary outcomes were total telemedicine days (days with any telemedicine service) and additional health care contact days if telemedicine waivers expired (telemedicine days converted to in-person contact days, assuming 100% substitution). Multivariable logistic and Poisson regressions evaluated associations between patient characteristics and the probability and rate of additional health care contact days.

**RESULTS** Among 5151 community-dwelling older adults (weighted number, 27 321 585 individuals; mean [SD] age, 74.6 [7.0] years; 2496 female individuals [52.4%]), 1294 (weighted 22.7%) used telemedicine. Telemedicine use varied widely (median [IQR], 1 [1-3] telemedicine day; maximum, 91 days), with 10.5% of telemedicine users (135 respondents) accounting for 50% of all telemedicine days. If telemedicine waivers expired and all affected telemedicine services were substituted with in-person services, 74.1% of older adults (951 respondents) using telemedicine would experience at least 1 additional health care contact day, totaling 8 772 118 additional contact days. Having more chronic conditions (adjusted odds ratio for >10 conditions, 8.42; 95% CI, 5.44-13.00) and difficulty getting places (adjusted odds ratio, 1.29; 95% CI, 1.10-1.53) were associated with higher odds of additional contact days.

**CONCLUSIONS AND RELEVANCE** This cross-sectional study of older adults enrolled in traditional Medicare found that most older adults using telemedicine would experience additional health care contact days if telemedicine waivers expired and all affected telemedicine services were substituted with in-person services. The resulting burden would fall disproportionately on adults with multiple chronic conditions and difficulty getting places, potentially exacerbating access barriers for patients most in need of care.

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## Key Points

**Question** To what extent does telemedicine offset in-person health care contact days among older adults?

**Findings** In this nationally representative, cross-sectional study of 5151 traditional Medicare beneficiaries in 2022, most adults using telemedicine would experience additional health care contact days if telemedicine waivers expired and all affected telemedicine services were substituted with in-person services. Those with more chronic conditions and difficulty getting places had higher odds of additional contact days.

**Meaning** These findings suggest that most older adults using telemedicine could face additional health care contact days with telemedicine waiver expiration, contributing to burdens for patients who already experience access barriers and are most in need of care.

## + Supplemental content

Author affiliations and article information are listed at the end of this article.

## Introduction

The days that older adults spend receiving care outside of the home can represent substantial burdens for these adults and their care partners because of many factors, including mobility limitations, transportation costs, and missed work days.<sup>1-4</sup> Telemedicine is one potential strategy to reduce these burdens by shifting the location of care to the patient.<sup>5,6</sup> The feasibility of this approach was demonstrated during the COVID-19 pandemic, when a substantial portion of care for older adults was shifted to telemedicine settings and up to 50% of Medicare beneficiaries used telemedicine.<sup>7,8</sup> This shift was enabled by a patchwork of telemedicine waivers that expanded both the eligibility criteria for Medicare beneficiaries and the range of services available.<sup>9</sup>

Since the conclusion of the public health emergency in 2023, telemedicine has persisted as a care modality for traditional Medicare beneficiaries,<sup>8</sup> with many older adults expressing interest in its continued use even after in-person services resumed.<sup>10</sup> Telemedicine can complement or substitute for in-person care while mitigating travel and time burdens, which may be especially appealing for those with mobility or transportation challenges.<sup>6</sup> However, ongoing Medicare reimbursement for expanded telemedicine services now depends on a series of temporary waiver extensions, creating the recurring threat of a so-called telemedicine cliff that could abruptly end coverage for many services.<sup>11</sup> Although previous studies have described which older adults tend to use telemedicine,<sup>12-14</sup> less is known about how extensively they use it, and to our knowledge, no studies have assessed how waiver expiration would affect these patients' burden of care and access to needed services.<sup>15</sup>

To address these knowledge gaps, we used a nationally representative survey to (1) measure the number of telemedicine days experienced by traditional Medicare beneficiaries in 2022, (2) estimate the additional (in-person) health care contact days these beneficiaries would experience if telemedicine waivers were to expire and all affected telemedicine services were substituted with in-person services, and (3) identify patient characteristics associated with increased telemedicine days and increased health care contact days under telemedicine waiver expiration scenarios. We hypothesized that telemedicine services used by Medicare beneficiaries would frequently occur on days without in-person health care contact, and that substitution of all affected telemedicine services with in-person services under telemedicine waiver expiration could, therefore, increase the number of health care contact days experienced by beneficiaries. Our study aims to inform policy discussions around the continuation of telemedicine waivers and their potential impact on Medicare beneficiaries' access to care and burden of care.

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## Methods

This cross-sectional study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines. The Mass General Brigham institutional review board determined that this study was exempt from informed consent requirements.

### Data Source and Population

We conducted a cross-sectional study using the Medicare Current Beneficiary Survey (MCBS), a rotating panel survey drawn from a nationally representative sample of Medicare beneficiaries. We used 2022 MCBS data linked to traditional Medicare claims data, including the inpatient, outpatient, carrier, skilled nursing facility, and hospice files. Our cohort comprised MCBS participants who were community dwelling and aged 65 years or older as of January 1, 2022, who were alive for at least 1 complete month in the calendar year, and who were continuously enrolled in traditional Medicare through the end of calendar year 2022 or until death. In line with previous work,<sup>2</sup> we excluded individuals with end-stage kidney disease, for whom the prospective payment system precludes documentation of dates of service.

## Outcomes and Measures

The primary outcomes were total telemedicine days in 2022 and the total additional health care contact days in 2022 that would be contributed by telemedicine waiver expiration if all affected telemedicine services were substituted with in-person services. We defined total telemedicine days as the number of calendar days in 2022 in which an individual received at least 1 telemedicine service of any type. We identified telemedicine services in claims, as defined by 1 of the following: (1) telemedicine-specific Healthcare Common Procedure Coding System (HCPCS) code, or (2) Medicare telemedicine-eligible HCPCS code with a telemedicine modifier or telemedicine place of service (eMethods in [Supplement 1](#)). Telemedicine services were then classified into 1 of 4 categories: primary care, behavioral health care, other specialty care, and treatment (eg, physical therapy, occupational therapy, or speech and language pathology services) according to HCPCS codes using the Restructured BETOS Classification System taxonomy and the taxonomy code of the rendering practitioner.<sup>16,17</sup>

To define total additional health care contact days under telemedicine waiver expiration, we first used a previously described method to identify health care contact days—that is, days in which a beneficiary had any institutional care (ie, in a hospital, emergency department, or skilled nursing facility) or in-person ambulatory care (ie, a primary care or specialty care visit, test, imaging, procedure, or treatment).<sup>2</sup> We then defined additional health care contact days as the number of telemedicine days on which patients had no in-person health care contact that would become health care contact days if telemedicine waivers were not available. In the primary analysis, we assumed 100% substitution of affected telemedicine services with in-person services to estimate an upper-bound effect, informed by prior Medicare evidence suggesting that telemedicine is predominantly substitutive rather than additive.<sup>18-20</sup> We also evaluated alternative substitution assumptions in sensitivity analyses.

## Waiver Expiration Conditions

We simulated 4 conditions of telemedicine waiver expiration: (1) expiration of the geographic eligibility waiver, limiting telemedicine reimbursement to patients in rural or health professional shortage areas; (2) expiration of the audio-only services waiver, limiting reimbursement to real-time, 2-way, audio-visual telehealth services, which may not be feasible in areas with limited broadband; (3) expiration of the provisional services waiver, limiting reimbursement to services covered under standing policy, and ending reimbursement for expanded practitioner types and services provisionally granted coverage, including physical therapy, occupational therapy, and speech and language pathology; and (4) expiration of all 3 preceding waivers (eMethods and eBox in [Supplement 1](#)).<sup>11</sup> Behavioral health telemedicine services retained expanded coverage under separate policy provisions,<sup>21</sup> so we did not make them subject to substitution under the expiration of the geographic eligibility waiver or audio-only services waiver.

## Covariates

We used MCBS survey data and linked Medicare claims data to identify individuals' demographic (age, sex, self-reported race [Asian, Black, White, or other, which includes Native Hawaiian or Pacific Islander, American Indian or Alaska Native, or >1 race], self-reported ethnicity [Hispanic or non-Hispanic], educational attainment, income, and rurality), clinical (number of chronic conditions, presence of vision or hearing impairment, and presence of functional impairment in at least 1 activity of daily living), and social (difficulty getting health care, difficulty with getting places, and difficulty speaking English) characteristics (eTable 1 in [Supplement 1](#)). Data on race and ethnicity are included in this study because they are social factors associated with health care access among older adults, and their inclusion allowed assessment of potential differences in telemedicine use and health care contact days across patient groups.

## Statistical Analysis

Among traditional Medicare beneficiaries in our sample, we used descriptive statistics to characterize the distribution of telemedicine days and their share of all ambulatory health care days (the sum of in-person ambulatory health care contact days and telemedicine days without an in-person health care contact day). Then, for each of 4 telemedicine waiver expiration conditions, we described the number of additional health care contact days expected and the cumulative count of additional health care contact days across all traditional Medicare beneficiaries.

For each outcome, we used a 2-step model to examine its association with patient characteristics. First, we fit a multivariable logistic regression to assess the probability of experiencing the outcome (ie, any telemedicine days or any additional health care contact days under telemedicine waiver expiration). Among those who experienced the outcome, we then fit a multivariable Poisson regression model with an offset for days alive during the 2022 observation year and adjustment for overdispersion using a quasi-Poisson specification to assess the count of the outcome (ie, number of telemedicine days or number of additional health care contact days under telemedicine waiver expirations).

We performed sensitivity analyses examining alternate substitution assumptions of telemedicine to in-person conversion rates. First, we examined proportional substitution rates of 75% and 50%, representing conservative scenarios relative to prior Medicare evidence suggesting that telemedicine visits are largely substitutive rather than additive. One national analysis estimated that approximately 83% of telemedicine visits substitute for in-person care,<sup>22</sup> whereas other studies have found no or minimal increases in total visit volume despite greater telemedicine use, implying nearly complete substitution.<sup>18-20</sup> Second, we examined substitution of affected telemedicine services with in-person services only when telemedicine services were expected to take at least 20 minutes or be of at least moderate complexity (eMethods in Supplement 1). We also performed sensitivity analyses for both outcomes using an alternate modeling strategy of a zero-inflated Poisson model because of the skew in the distribution of telemedicine use, with many individuals having no telemedicine days.

For all analyses, we used MCBS individual-level survey weights, which accounted for stratified sampling design and survey nonresponse, to generate population estimates. For multivariable analyses, we conducted complete case analysis. All covariates had less than 5% missingness; complete case analysis reduced the analytic sample from 5151 to 4825. All statistical tests were 2 sided, and statistical significance was defined with a threshold of  $P < .05$ . All analyses were performed in R statistical software version 4.4.1 (R Project for Statistical Computing). Analyses were performed from March 2025 to March 2026.

## Results

We studied 5151 survey respondents (weighted number, 27 321 585 respondents), for whom the mean (SD) age was 74.6 (7.0) years, and 2496 (52.4%) were female. A total of 1294 of 5151 respondents (weighted 22.7%) used at least 1 telemedicine service (Table 1), representing a total of 6 210 516 older adults using telemedicine. The mean (SD) age among adults using telemedicine was 75.4 (6.8) years, and 736 (57.1%) were female. Within this population, 382 (28.5%) reported functional impairment, 115 (9.9%) reported difficulty getting health care, and 229 (17.8%) reported difficulty getting places.

Among patients using telemedicine, the median (IQR) number of telemedicine days used in 2022 was 1 (1-3) day (maximum, 91 days), accounting for a mean of 11.4% (95% CI, 10.6%-12.3%) of all ambulatory (in-person plus telemedicine only) care days (Table 2). Most telemedicine days (16 320 078 days [87.4%]) occurred in the absence of same-day in-person health care contact (eTables 2 and 3 in Supplement 1). Among adults using telemedicine, 741 (57.7%) used it for primary care visits, 110 (10.0%) for behavioral health visits, 677 (52.4%) for other specialty care visits, and less than 10 (<0.1%) for treatment (categories were not mutually exclusive). Users of telemedicine

Table 1. Characteristics of Older Adults in Survey and Those With Any Telemedicine Use, 2022

Characteristic	Participants, unweighted No. (weighted %) <sup>a</sup>	
	Total (N = 5151 [100.0%])	With any telemedicine use (n = 1294 [22.7%])
Age group, y		
65-69	949 (28.1)	206 (21.9)
70-74	1130 (28.9)	274 (29.2)
75-79	1042 (20.8)	289 (24.0)
80-84	1035 (11.9)	273 (13.1)
≥85	995 (10.4)	252 (11.7)
Sex		
Male	2355 (47.6)	558 (42.9)
Female	2796 (52.4)	736 (57.1)
Race		
Asian	87 (2.5)	27 (3.1)
Black	269 (5.9)	54 (4.7)
White	4550 (87.1)	1151 (87.8)
Other <sup>b</sup>	137 (2.6)	32 (2.2)
Ethnicity		
Hispanic	332 (5.6)	85 (5.6)
Non-Hispanic	4804 (94.1)	1205 (94.1)
Income level, % of federal poverty level		
>200	3899 (77.9)	1000 (78.7)
100-200	901 (16.0)	200 (14.8)
<100	351 (6.1)	94 (6.5)
Education		
Less than high school	412 (6.5)	85 (5.0)
High school or some college	2539 (49.3)	572 (46.1)
College or above	2186 (44.0)	631 (48.5)
Rurality		
Rural	1252 (19.7)	225 (14.9)
Urban	3895 (80.3)	1068 (85.0)
Chronic conditions		
0-1	727 (18.3)	82 (3.2)
2-5	1718 (36.1)	336 (29.7)
6-10	2124 (36.2)	655 (51.6)
>10	582 (9.4)	220 (15.5)
Functional impairment		
No	3757 (78.6)	855 (71.5)
Yes	1211 (21.4)	382 (28.5)
Vision impairment		
No	4629 (94.3)	1146 (94.7)
Yes	330 (5.5)	88 (5.2)
Hearing impairment		
No	3955 (82.9)	980 (83.4)
Yes	1005 (17.0)	253 (16.5)
Difficulty getting health care		
No	4636 (93.0)	1122 (90.1)
Yes	329 (6.9)	115 (9.9)
Difficulty getting places		
No	4339 (88.5)	1008 (82.2)
Yes	627 (11.5)	229 (17.8)
Difficulty with English speaking		
No	4962 (96.8)	1238 (96.9)
Yes	180 (3.1)	54 (3.0)

<sup>a</sup> Columns may not sum to 100% in cases in which covariate data are missing, where an indicator variable was used to account for missingness. All covariates had less than 5% missing data.

<sup>b</sup> Other race includes Native Hawaiian or Pacific Islander, American Indian or Alaska Native, or more than 1 race.

primary care services experienced a median (IQR) of 1 (1-2) primary care telemedicine day (maximum, 23 days), accounting for 36.0% (95% CI, 34.1%-37.9%) of their total primary care days. Users of telemedicine behavioral health services experienced a median (IQR) of 4 (1-12) behavioral health telemedicine days (maximum, 90 days), accounting for 81.3% (95% CI, 76.3%-86.2%) of their total behavioral health days. Users of other telemedicine specialty care services experienced a median (IQR) of 1 (1-2) other specialty telemedicine day (maximum, 33 days), accounting for 22.1% (95% CI, 20.6%-23.7%) of their total other specialty care days.

In total, 10.5% of telemedicine users (135 respondents) accounted for 50% of the total telemedicine days experienced by traditional Medicare beneficiaries (eFigure in Supplement 1). In multivariable models, female sex (adjusted odds ratio [AOR], 1.22; 95% CI, 1.05-1.40), higher educational attainment (AOR, 1.79; 95% CI, 1.18-2.73 for college or above vs less than high school), urban residence (AOR, 1.45; 95% CI, 1.18-1.79), more chronic conditions (AOR, 15.44; 95% CI, 10.28-23.19 for >10 vs 0-1 chronic conditions), difficulty getting health care (AOR, 1.47; 95% CI, 1.09-1.99), and difficulty getting places (AOR, 1.30; 95% CI, 1.04-1.62) were associated with higher odds of telemedicine use (Table 3). Among telemedicine users, female sex (adjusted rate ratio [ARR], 1.47; 95% CI, 1.03-2.08), higher educational attainment (ARR, 2.03; 95% CI, 1.16-3.54 for college or above vs less than high school), and more chronic conditions (ARR, 4.31; 95% CI, 2.29-8.12 for >10 vs 0-1 chronic conditions) were associated with greater number of telemedicine days.

When examining the potential contributions of telemedicine waiver expiration to health care contact days, we found that 951 patients (74.1%) using telemedicine would have experienced at least 1 additional health care contact day if all telemedicine services were replaced by in-person services. This would represent 8 772 118 additional health care contact days (Table 4), or approximately 321 additional contact days per 1000 beneficiaries. Among patients using telemedicine, 880 (69.4%) would be affected by expiration of geographic waivers (representing 8 335 726 additional contact days), 357 (26.1%) by expiration of audio-only waivers (representing 2 430 213 additional contact days), and 373 (27.4%) by expiration of provisional service waivers (representing 2 570 023 additional contact days).

In multivariable models, female sex (AOR, 1.15; 95% CI, 1.02-1.30), urban residence (AOR, 3.79; 95% CI, 2.91-4.94), more chronic conditions (AOR, 8.42; 95% CI, 5.44-13.00 for >10 vs 0-1 chronic conditions), and difficulty getting places (AOR, 1.29; 95% CI, 1.10-1.53) were associated with higher odds of experiencing additional health care contact days if all affected telemedicine services were replaced by in-person services (Table 5). Among those who would experience additional health care contact days, higher educational attainment (ARR, 1.49; 95% CI, 1.14-1.95 for college or above vs less

Table 2. Telemedicine Days Among Patients Using Telemedicine, 2022

Variable <sup>a</sup>	Days, median (IQR)			Share of total days with telemedicine, mean (95% CI), %
	Total (health care contact and telemedicine) <sup>b</sup>	Health care contact <sup>b</sup>	Telemedicine	
Among all patients using telemedicine (n = 1294 [100%])				
All ambulatory services	24 (14 to 39)	22 (12 to 36)	1 (1 to 3)	11.4 (10.6 to 12.3)
All visits	13 (8 to 19)	11 (6 to 17)	1 (1 to 3)	19.9 (18.7 to 21.2)
Primary care	4 (2 to 6)	3 (2 to 5)	1 (0 to 1)	21.7 (20.2 to 23.3)
Behavioral health	0	0	0	69.2 (62.5 to 75.8)
Other specialty care	8 (4 to 13)	7 (3 to 12)	1 (0 to 1)	12.0 (10.8 to 13.1)
All treatments	4 (2 to 14)	4 (2 to 14)	0	0
By telemedicine service use category				
Primary care (n = 741 [57.7%])	5 (3 to 7)	3 (2 to 6)	1 (1 to 2)	36.0 (34.1 to 37.9)
Behavioral health (n = 110 [10.0%])	5 (2 to 15)	0 (0 to 3)	4 (1 to 12)	81.3 (76.3 to 86.2)
Other specialty care (n = 677 [52.4%])	10 (6 to 16)	9 (5 to 13)	1 (1 to 2)	22.1 (20.6 to 23.7)
Physical therapy, occupational therapy, and speech and language pathology (n < 11 [ $<0.1\%$ ])	57 (25 to 57)	55 (25 to 55)	2 (2 to 2)	7.3 (-3.7 to 18.3)

<sup>a</sup> Numbers of participants are unweighted, and percentages are survey weighted.

<sup>b</sup> Health care contact days are defined as days in which a beneficiary received any in-person institutional care (ie, in a hospital, emergency department, or skilled nursing facility) or ambulatory care (ie, a primary care or specialty care visit, test, imaging, procedure, or treatment).

Table 3. Patient Characteristics Associated With Total Telemedicine Days

Variable	Overall population, AOR (95% CI) <sup>a</sup>	Population with any telemedicine days	
		ARR (95% CI) <sup>b</sup>	Total telemedicine days, mean (SD)
<b>Age group, y</b>			
65-69	1 [Reference]	1 [Reference]	4.02 (9.80)
70-74	0.88 (0.71-1.10)	0.65 (0.39-1.11)	3.00 (7.20)
75-79	0.90 (0.72-1.11)	0.50 (0.31-0.79)	2.43 (3.74)
80-84	0.74 (0.58-0.94)	0.54 (0.36-0.82)	2.69 (4.36)
≥85	0.69 (0.53-0.89)	0.46 (0.30-0.70)	2.62 (3.65)
<b>Sex</b>			
Male	1 [Reference]	1 [Reference]	2.49 (5.48)
Female	1.22 (1.05-1.40)	1.47 (1.03-2.08)	3.39 (7.35)
<b>Race</b>			
Asian	1.15 (0.67-1.97)	1.58 (0.56-4.48)	4.25 (7.97)
Black	0.84 (0.56-1.26)	0.95 (0.65-1.40)	2.56 (2.80)
White	1 [Reference]	1 [Reference]	3.01 (6.80)
Other <sup>c</sup>	0.78 (0.49-1.26)	0.60 (0.37-0.97)	1.90 (1.31)
<b>Ethnicity</b>			
Non-Hispanic	1 [Reference]	1 [Reference]	2.99 (6.70)
Hispanic	1.35 (0.84-2.17)	1.24 (0.87-1.78)	3.25 (4.99)
<b>Income level, % of federal poverty level</b>			
>200	1 [Reference]	1 [Reference]	2.88 (5.85)
100-200	0.89 (0.70-1.13)	1.28 (0.62-2.65)	3.67 (10.6)
<100	1.11 (0.75-1.65)	1.14 (0.71-1.82)	3.05 (2.60)
<b>Education</b>			
Less than high school	1 [Reference]	1 [Reference]	2.21 (2.50)
High school	1.37 (0.91-2.07)	1.35 (1.01-1.79)	2.71 (4.70)
College or above	1.79 (1.18-2.73)	2.03 (1.16-3.54)	3.35 (8.24)
<b>Rurality</b>			
Rural	1 [Reference]	1 [Reference]	3.20 (10.0)
Urban	1.45 (1.18-1.79)	0.86 (0.47-1.58)	2.96 (5.83)
<b>Chronic conditions</b>			
0-1	1 [Reference]	1 [Reference]	1.64 (1.10)
2-5	5.57 (3.74-8.29)	1.76 (0.89-3.46)	2.32 (7.20)
6-10	12.22 (8.50-17.55)	2.49 (1.38-4.49)	3.00 (6.54)
>10	15.44 (10.28-23.19)	4.31 (2.29-8.12)	4.61 (6.18)
<b>Functional impairment</b>			
No	1 [Reference]	1 [Reference]	2.73 (6.95)
Yes	1.11 (0.92-1.33)	1.09 (0.83-1.43)	3.69 (5.68)
<b>Vision impairment</b>			
No	1 [Reference]	1 [Reference]	2.96 (6.70)
Yes	0.92 (0.66-1.28)	0.96 (0.65-1.41)	3.66 (5.54)
<b>Hearing impairment</b>			
No	1 [Reference]	1 [Reference]	3.05 (7.03)
Yes	0.92 (0.75-1.14)	0.90 (0.61-1.31)	2.81 (4.47)
<b>Difficulty getting health care</b>			
No	1 [Reference]	1 [Reference]	2.96 (6.79)
Yes	1.47 (1.09-1.99)	0.98 (0.71-1.36)	3.44 (4.83)
<b>Difficulty getting places</b>			
No	1 [Reference]	1 [Reference]	2.76 (6.70)
Yes	1.30 (1.04-1.62)	1.14 (0.85-1.52)	4.15 (6.18)
<b>Difficulty with English speaking</b>			
No	1 [Reference]	1 [Reference]	3.00 (6.69)
Yes	0.84 (0.49-1.42)	0.82 (0.52-1.27)	2.93 (2.87)

Abbreviations: AOR, adjusted odds ratio; ARR, adjusted rate ratio.

<sup>a</sup> AORs represent the association between patient characteristics and the probability of having at least 1 telemedicine day (among all respondents), as estimated in the first-stage logistic regression of the 2-step model.

<sup>b</sup> ARRs represent the association between patient characteristics and the number of telemedicine days (conditional on having at least 1 telemedicine day), as estimated in the second-stage Poisson regression of the 2-step model.

<sup>c</sup> Other race includes Native Hawaiian or Pacific Islander, American Indian or Alaska Native, or more than 1 race.

than high school), urban residence (ARR 1.44; 95% CI, 1.22-1.70), more chronic conditions (ARR, 2.07; 95% CI, 1.56-2.74 for >10 vs 0-2 chronic conditions), and difficulty getting places (ARR 1.23; 95% CI, 1.02-1.47) were associated with greater additional health care contact days. Results were generally consistent when examining patient characteristics associated with each individual telemedicine waiver scenario, with a few exceptions (eTable 4 in Supplement 1). Notably, among those who would experience additional health care contact days under audio-only waivers, older age (ARR, 1.86; 95% CI, 1.27-2.72 for age ≥85 vs 65-69 years) was associated with greater additional health care contact days, whereas urban residence (ARR, 0.47; 95% CI, 0.35-0.64) and hearing impairment (ARR, 0.71; 95% CI, 0.51-0.98) were associated with fewer additional health care contact days.

In sensitivity analyses, projected additional health care contact days varied under alternate substitution assumptions. Assuming proportional substitution rates of 50% and 75% of telemedicine services with in-person services, we estimated approximately 4.4 million and 6.6 million additional contact days, or 165 and 248 additional contact days per 1000 beneficiaries, respectively (eTable 5 in Supplement 1). Under an alternate assumption that only telemedicine services of at least moderate complexity or duration of at least 20 minutes would convert to in-person services, the estimated number of additional contact days was modestly lower at 6.3 million, or 230 additional contact days per 1000 beneficiaries (eTable 6 in Supplement 1). The associations between patient characteristics and additional contact days were qualitatively similar under this alternate substitution rule (eTable 7 in Supplement 1). Results were also consistent when using a zero-inflated Poisson model rather than the primary 2-step modeling approach (eTables 8 and 9 in Supplement 1).

## Discussion

In this nationally representative cross-sectional study of older adult traditional Medicare beneficiaries, we found wide variation in telemedicine use, with telemedicine days per year ranging from 1 to 91 days among telemedicine users. Three-fourths (74.1%) of beneficiaries using

**Table 4. Simulated Additional Health Care Contact Days Under Telemedicine Waiver Expiration Scenarios, 2022**

Variable	Affected patients using telemedicine, No. (%) (N = 1294 [100.0%]) <sup>b</sup>	Additional health care contact days <sup>a</sup>	
		Total No.	Among affected patients, median (IQR)
Condition 1: all waiver expiration	951 (74.1)	8 772 118	1 (1-2)
Primary care days	555 (44.1)	4 250 906	1 (1-2)
Specialty care days	507 (39.7)	4 402 506	1 (1-2)
Behavioral health days	13 (1.1)	116 861	1 (1-2)
PT, OT, or SLP days	<11 (<0.1)	20 240	2 (2-2)
Condition 2: geographic waiver expiration	880 (69.4)	8 335 726	1 (1-2)
Primary care days	527 (42.2)	4 093 082	1 (1-2)
Specialty care days	472 (37.7)	4 240 798	1 (1-2)
Behavioral health days <sup>c</sup>	NA	NA	NA
PT, OT, or SLP days	<11 (<0.1)	20 240	2 (2-2)
Condition 3: audio-only waiver expiration	357 (26.1)	2 430 213	1 (1-2)
Primary care days	177 (13.4)	1 210 232	1 (1-2)
Specialty care days	202 (14.5)	1 219 981	1 (1-1)
Behavioral health days <sup>c</sup>	NA	NA	NA
PT, OT, or SLP days	0	0	0
Condition 4: provisional service waiver expiration	373 (27.4)	2 570 023	1 (1-2)
Primary care days	178 (13.5)	1 219 127	1 (1-2)
Specialty care days	203 (14.5)	1 223 100	1 (1-1)
Behavioral health days	13 (1.1)	116 861	1 (1-2)
PT, OT, or SLP days	<11 (<0.1)	20 240	2 (2-2)

Abbreviations: NA, not applicable; OT, occupational therapy; PT, physical therapy; SLP, speech and language pathology.

<sup>a</sup> Additional health care contact days were identified as days in which a beneficiary received a telemedicine service but no other in-person institutional care or ambulatory care. We assumed that 100% of telemedicine visits would have been replaced by in-person visits; thus, had telemedicine waivers not been in place, the beneficiary would have received in-person care instead. Under proportional substitution assumptions of 75% and 50%, condition 1 would correspond to 6 579 089 and 4 386 059 additional contact days, respectively.

<sup>b</sup> Numbers are unweighted, and percentages are survey weighted.

<sup>c</sup> Waivers for Medicare coverage of telemedicine behavioral health services regardless of patient location or audio-only mode were made permanent.

**Table 5. Patient Characteristics Associated With Additional Health Care Contact Days Under Telemedicine Waiver Expiration**

Variable	Overall population, AOR (95% CI) <sup>a</sup>	Population with any additional health care contact days	
		ARR (95% CI) <sup>b</sup>	Additional health care contact days, mean (SD)
<b>Age group, y</b>			
65-69	1 [Reference]	1 [Reference]	1.96 (1.73)
70-74	0.92 (0.77-1.12)	0.89 (0.74-1.08)	1.90 (1.68)
75-79	0.82 (0.67-1.00)	0.84 (0.69-1.03)	1.82 (1.58)
80-84	0.87 (0.70-1.08)	0.94 (0.75-1.19)	2.07 (2.10)
≥85	0.84 (0.67-1.05)	0.92 (0.75-1.12)	2.24 (1.93)
<b>Sex</b>			
Male	1 [Reference]	1 [Reference]	1.90 (1.71)
Female	1.15 (1.02-1.30)	1.01 (0.90-1.14)	2.01 (1.81)
<b>Race</b>			
Asian	1.15 (0.76-1.74)	1.22 (0.89-1.68)	2.83 (2.45)
Black	0.96 (0.69-1.33)	1.00 (0.69-1.44)	1.92 (1.83)
White	1 [Reference]	1 [Reference]	1.93 (1.74)
Other <sup>c</sup>	1.05 (0.72-1.51)	0.86 (0.67-1.10)	1.82 (1.29)
<b>Ethnicity</b>			
Hispanic	1.19 (0.85-1.68)	1.28 (0.93-1.77)	2.36 (2.25)
Non-Hispanic	1 [Reference]	1 [Reference]	1.94 (1.74)
<b>Income level, % of federal poverty level</b>			
>200	1 [Reference]	1 [Reference]	1.90 (1.65)
100-200	0.91 (0.74-1.13)	0.97 (0.80-1.18)	2.03 (2.17)
<100	0.96 (0.66-1.39)	1.25 (0.89-1.75)	2.73 (2.13)
<b>Education</b>			
Less than high school	1 [Reference]	1 [Reference]	1.70 (1.34)
High school	1.25 (0.90-1.73)	1.56 (1.20-2.03)	2.08 (1.94)
College or above	1.40 (1.00-1.98)	1.49 (1.14-1.95)	1.88 (1.62)
<b>Rurality</b>			
Rural	1 [Reference]	1 [Reference]	1.36 (0.69)
Urban	3.79 (2.91-4.94)	1.44 (1.22-1.70)	2.00 (1.81)
<b>Chronic conditions</b>			
0-1	1 [Reference]	1 [Reference]	1.45 (0.77)
2-5	4.34 (2.82-6.68)	1.09 (0.87-1.37)	1.53 (1.21)
6-10	7.12 (4.79-10.58)	1.37 (1.08-1.72)	1.94 (1.58)
>10	8.42 (5.44-13.04)	2.07 (1.56-2.74)	3.03 (2.75)
<b>Functional impairment</b>			
No	1 [Reference]	1 [Reference]	1.75 (1.49)
Yes	1.02 (0.87-1.20)	1.11 (0.98-1.27)	2.51 (2.26)
<b>Vision impairment</b>			
No	1 [Reference]	1 [Reference]	1.95 (1.77)
Yes	0.87 (0.69-1.10)	0.82 (0.66-1.01)	2.16 (1.73)
<b>Hearing impairment</b>			
No	1 [Reference]	1 [Reference]	1.98 (1.82)
Yes	0.94 (0.79-1.12)	0.81 (0.68-0.96)	1.89 (1.51)
<b>Difficulty getting health care</b>			
No	1 [Reference]	1 [Reference]	1.92 (1.71)
Yes	1.21 (0.95-1.55)	1.15 (0.94-1.41)	2.41 (2.24)
<b>Difficulty getting places</b>			
No	1 [Reference]	1 [Reference]	1.78 (1.51)
Yes	1.29 (1.10-1.53)	1.23 (1.02-1.47)	2.79 (2.49)
<b>Difficulty with English speaking</b>			
No	1 [Reference]	1 [Reference]	1.93 (1.72)
Yes	1.04 (0.68-1.60)	1.08 (0.74-1.58)	2.95 (2.74)

Abbreviations: AOR, adjusted odds ratio; ARR, adjusted rate ratio.

<sup>a</sup> AORs represent the association between patient characteristics and the probability of having at least 1 additional health care contact day under expiration of all telemedicine waivers (among all respondents), as estimated in the first-stage logistic regression of the 2-step model.

<sup>b</sup> ARRs represent the association between patient characteristics and the number of additional health care contact days under expiration of all telemedicine waivers (conditional on having at least 1 additional health care contact day), as estimated in the second-stage Poisson regression of the 2-step model.

<sup>c</sup> Other race includes Native Hawaiian or Pacific Islander, American Indian or Alaska Native, or more than 1 race.

telemedicine would experience additional health care contact days if telemedicine waivers expired and all affected telemedicine services were substituted with in-person services. Those with multiple chronic conditions used more telemedicine, whereas those with multiple chronic conditions and difficulty getting places were more likely to face additional health care contact days across every waiver expiration and telemedicine service substitution scenario. Taken together, these findings suggest that ending Medicare telemedicine waivers would disproportionately burden the very patients who may need the most care and experience existing challenges with in-person visits.

One proposed benefit of telemedicine is the reduction of logistical, financial, time, and other treatment burdens of in-person care.<sup>5,6</sup> Indeed, we found that difficulty with accessing health care and getting places were associated with increased probability of telemedicine use. Adding to prior work,<sup>13,14,23</sup> we also found that beneficiaries with multiple chronic conditions experienced not only a higher probability of telemedicine use, but also more days in which they interacted with health care only via telemedicine. The increased uptake of telemedicine among these individuals may reflect telemedicine allowing for reduced travel time, transportation costs, and coordination hassles among patients who already experience higher-than-average care needs.<sup>5,10,24</sup> Furthermore, travel and coordination burdens for in-person visits often extend to care partners, amplifying the effects of telemedicine in reducing burden.<sup>6</sup> These results suggest that telemedicine is being used by those who would benefit from reducing the burdens of in-person care.

Our results quantify the extent to which telemedicine may supplement in-person contact days among Medicare beneficiaries, and the potential consequences if Medicare were to fail to permanently extend telemedicine coverage for older adults. Specifically, we found that expiration of telemedicine waivers could contribute approximately 8.8 million additional health care contact days, imposing substantial burdens on patients and their care partners. Because the extent to which telemedicine substitutes for in-person care remains uncertain,<sup>9,18,20,22,25</sup> we examined a range of substitution assumptions to provide illustrative bounds on how additional health care contact days might vary under alternative scenarios. Even under conservative assumptions that only 50% to 75% of affected telemedicine services would be substituted with in-person care, we estimated telemedicine waiver expiration would contribute to 4.4 to 6.6 million additional health care contact days, or 165 to 248 additional contact days per 1000 beneficiaries, respectively. This would still represent a major increase in systemwide burden, skewed toward sicker beneficiaries who may already struggle to access care.

These findings have implications for Medicare reimbursement policy for telemedicine. Under standing policy, Medicare reimburses telemedicine services with several restrictions, including geographic eligibility criteria for patients and clinicians, and limits on eligible telemedicine modalities and services.<sup>21</sup> During the COVID-19 pandemic, these restrictions were relaxed through the use of telemedicine waivers, expanding access for millions of older adults previously unable to use telemedicine.<sup>26,27</sup> In response to the widespread adoption of telemedicine in behavioral health, Congress permanently expanded reimbursement for these services in 2021.<sup>21,28</sup> However, telemedicine waivers for most other services still require intermittent renewal, creating persistent uncertainty about future reimbursement that may discourage clinicians and health systems from investment in telemedicine infrastructure, including workforce training and patient outreach efforts needed to sustain meaningful telemedicine use. Our results also suggest that these waivers differ substantially in their potential impact. Expiration of the geographic waiver alone would account for most projected additional contact days, reflecting that many telemedicine users reside in urban areas that temporarily gained eligibility under pandemic-era policy changes. In contrast, expiration of audio-only waivers would affect a smaller share of telemedicine services, but may disproportionately affect key groups, including older adults and rural residents who may lack access to technology for video visits.<sup>29,30</sup> Likewise, although the 2026 Physician Fee Schedule Final Rule made some provisional telemedicine services permanent,<sup>31</sup> we estimated it would prevent only one-quarter of the additional health care contact days expected if all telemedicine waivers expired. Even though telemedicine waivers have now been extended through 2027,<sup>32</sup> a comprehensive legislative solution

that more permanently extends telemedicine coverage may ultimately be required to stabilize reimbursement policies, encourage health system investment, and reduce burdens for Medicare beneficiaries.

### Limitations

Our study has limitations. First, we simulated some but not all provisions of telemedicine waivers. For example, waivers currently enable reimbursement for telemedicine services in which the patient is located at home rather than in a facility (eBox in [Supplement 1](#)). However, claims data do not reliably indicate patients' location during telehealth visits, and we did not require this as a condition for a covered visit, likely resulting in an underestimate of telemedicine days affected by waiver expiration. Second, our estimates rely on assumptions about how affected telemedicine services were substituted with in-person services if waivers expired. To illustrate plausible ranges of impact, we evaluated several substitution scenarios, including proportional substitution assumptions of 50%, 75%, and 100%. These estimates should be interpreted as illustrative bounds rather than precise estimates, because we do not know which telemedicine encounters would have been consolidated with existing in-person visits or foregone entirely. We also conducted a sensitivity analysis assuming substitution only for telemedicine services of moderate duration and complexity, which yielded qualitatively similar results. Third, we focused on telemedicine usage that specifically replaced ambulatory health care contact days; innovative models of hospital at home could additionally reduce the burden of institutional health care contact days. Fourth, our study focuses on traditional Medicare beneficiaries, for whom claims-based contact day measurement has been well-defined, and results may not generalize to the growing population of older adults enrolled in Medicare Advantage.

### Conclusions

In this cross-sectional study of older adults enrolled in traditional Medicare, we found that most older traditional Medicare beneficiaries using telemedicine would be faced with additional health care contact days if all affected telemedicine services were substituted with in-person services under telemedicine waiver expiration. Across all Medicare beneficiaries, the increased burden of in-person contact would be concentrated among patients with multiple chronic conditions and difficulty getting places. These results suggest that expiration of telemedicine waivers has the potential to exacerbate burden for patients who are most in need of care and already experience difficulties with access.

### ARTICLE INFORMATION

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**SUPPLEMENT 1.**

eMethods.

eReferences

eBox. Standing Medicare reimbursement policy for telemedicine

eTable 1. Covariates included in analysis

eTable 2. Same-day overlap between telemedicine and health care contact

eTable 3. Characteristics of telemedicine users by presence vs absence of same-day health care contact

eFigure. Survey-weighted Lorenz curve for telemedicine days

eTable 4. Patient characteristics associated with additional health care contact days under individual telemedicine waiver expiration conditions

eTable 5. Simulated additional health care contact days under telemedicine waiver expiration scenarios, sensitivity analysis under alternative substitution assumptions for 50% and 75% substitution rates

eTable 6. Simulated additional health care contact days under telemedicine waiver expiration scenarios, sensitivity analysis under alternative substitution assumptions for moderate-duration or complexity services only

eTable 7. Patient characteristics associated with additional health care contact days under telemedicine waiver expiration, sensitivity analysis under alternative substitution assumptions for moderate-duration or complexity services only

eTable 8. Patient characteristics associated with total telemedicine days, sensitivity analysis with zero-inflated Poisson model

eTable 9. Patient characteristics associated with additional health care contact days under telemedicine waiver expiration, sensitivity analysis with zero-inflated Poisson model

**SUPPLEMENT 2.**

Data Sharing Statement