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A Smaller Count, the Same Distance: Rural and Urban Telehealth Use and Its Digital Preconditions from 2021 to 2025

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ABSTRACT

Telehealth is usually judged by visit volumes and by how many people it reaches. This article asks whether post-pandemic telehealth in the United States closed or widened the gap between rural and urban adults, and how the digital conditions that telehealth requires shape that gap. I analysed the 2021 to 2025 National Health Interview Survey (143,499 adults) with survey-weighted logistic models and compared it with Medicare claims-based telehealth trends. The share of adults with a video or phone visit in the past 12 months fell from 37.0% in 2021 to 26.2% in 2025. In nonmetropolitan counties it fell from 29.4% to 18.0%, a drop of 39% against 25% in large central metro counties. After adjustment, nonmetropolitan adults remained about 10 to 11 percentage points less likely to use telehealth in every year, but their adjusted use fell from 74% to 63% of the large central metro level. Internet access differed only modestly by place, yet online contact with a doctor's office was 32.5% in nonmetropolitan and 48.4% in large central metro counties, and the rural gap was largest among connected adults. Medicare claims show the absolute rural gap narrowing from 10.6 to 6.3 points, a picture of convergence that the relative survey measures do not support. Telehealth after the pandemic added to in-person care rather than replacing it, and it reached rural adults through the same portal-centred channels that they used less. The survey cannot show visit quality or separate video from phone visits.

Keywords: telehealth, rural health, digital divide, health information technology, National Health Interview Survey, measurement

1. Introduction

Telehealth expanded abruptly in the United States in 2020. In the first months of the COVID-19 pandemic, about 30% of outpatient visits among 16.7 million commercially insured and Medicare Advantage enrollees were delivered by telemedicine (Patel et al., 2021). Rural residents were often named as the group with most to gain, because distance, clinic closures and specialist shortages make in-person care costly for them (Hirko et al., 2020). Before the pandemic, Medicare paid for telemedicine mainly in rural areas, and use was still very low (Mehrotra et al., 2016).

Five years later, the debate about telehealth policy rests on two kinds of numbers. Payers and agencies count claims and report the share of beneficiaries who used a telehealth service. Researchers count which groups appear in those claims or in surveys. Both counts treat a telehealth visit as one unit, whether it was a video call through a patient portal or a phone call to a clinic. Both also report gaps mostly as differences in percentage points. This article argues that these choices of measurement shape what the evidence appears to say about rural equity.

The technology matters here because telehealth is not a single device. A video visit needs a working internet connection, a camera-equipped device, an account in a provider's portal, and the skills to join a call at a set time. A phone visit needs only a telephone, but it carries less clinical information. Studies from single health systems found that older, Black, Hispanic, Medicaid-insured and low-broadband patients were less likely to use video than phone (Eberly et al., 2020; Chen et al., 2022). If the system routes care through portals and video links, then the people who reach it are those who already have that digital equipment and routine.

Most national evidence on telehealth equity comes from the first year of the pandemic, from single health systems, or from claims for one insured population. Fewer studies follow the general adult population after the emergency rules ended, and fewer still examine the digital steps that link a patient to a virtual visit. This article contributes on both points. It follows the rural gap for five years after 2020 in a national survey, and it uses the survey's internet items to locate where in the chain of access the gap arises.

I use five years of the National Health Interview Survey (NHIS), from 2021 to 2025, to study who used telehealth after the emergency phase of the pandemic, and whether the gap between rural and urban adults closed. I add Medicare claims-based telehealth trends to compare the population picture with the volume metric that payers publish. Three research questions guide the analysis.

RQ1. How did telehealth use change across the urban-rural continuum from 2021 to 2025, and did the gap between nonmetropolitan and large central metro adults narrow or widen in absolute and in relative terms?

RQ2. Does the rural gap remain after adjusting for age, socioeconomic position, insurance and health, and how is it related to internet access and to online contact with a doctor's office?

RQ3. How does the survey picture compare with the claims-based telehealth trends that Medicare publishes for rural and urban beneficiaries?

The answer, in brief, is that telehealth reached fewer people each year and that nonmetropolitan adults stayed about 10 percentage points behind. Because overall use fell, a stable absolute gap became a larger relative one. The Medicare series, read in percentage points, suggests convergence. The rural gap was smallest among adults with no internet and largest among connected adults, which points to how the system links patients to care rather than to physical connection alone.

2. Related work and theoretical framing

2.1 Telehealth use and its disparities

Early pandemic studies agreed that telehealth did not reach all groups equally. In employer-based plans, the rise in telemedicine was greatest among patients in metropolitan and low-poverty counties (Cantor et al., 2021). In a family medicine practice in Missouri, rural residence lowered the odds of any telehealth visit in the first month of the emergency (Pierce & Stevermer, 2023). Among older Medicare beneficiaries in the National Health and Aging Trends Study, rural residents were less likely than urban residents to use video calls or portal messages with their usual provider (Johannes et al., 2023).

Modality is the second axis of difference. In an integrated health system, practices and clinicians explained more of the variation in video use than patients did, and patients from low-broadband areas were less likely to use video (Rodriguez et al., 2021). At an academic medical centre in Michigan, 45.4% of telehealth patients received care only by phone, and living in a low-broadband zip code reduced the probability of video by 7.2 percentage points (Chen et al., 2022). Similar patterns appeared in Oregon and North Carolina, where older, Black and publicly insured patients relied more on phone than on video (Sachs et al., 2021; Drake et al., 2022).

Phone visits did not disappear after the emergency. Among traditional Medicare beneficiaries, telehealth fell from 16.1% to 7.8% of evaluation and management visits between 2020 and 2022, and audio-only visits were still 25.4% of telehealth visits in 2022 (Yu et al., 2024). Among Medicare beneficiaries offered telehealth in 2020, about 35% were offered only audio, and most of them had a smartphone or tablet and home internet (Benjenk et al., 2021). The second finding matters for this article: phone-only care was not explained by the patient's equipment alone.

2.2 Digital divides as successive stages

Digital divide theory gives a vocabulary for these patterns. Van Dijk (2006) describes access as a sequence of stages: motivation, physical and material access, skills, and use. Later work found that once basic internet access becomes common, differences in skills and in types of use carry the inequality forward (van Deursen & van Dijk, 2014). Material access also keeps mattering, because the type of device, the data plan and the cost of upkeep shape what people can do online (van Deursen & van Dijk, 2019). Robinson et al. (2015) argue that digital inequality should sit beside income, education and race as a form of inequality in its own right, including in health care.

Health research has applied this view directly to telehealth. In 2018, 26.3% of community-dwelling Medicare beneficiaries had neither a computer with high-speed internet nor a smartphone with a data plan, and 50.1% of those below the poverty line lacked both (Roberts & Mehrotra, 2020). An estimated 38% of adults over 65 were not ready for video visits in 2018, mainly because of inexperience with technology (Lam et al., 2020). Nonmetropolitan households were more likely than metropolitan households to have no digital access in the 2019 American Community Survey (Curtis et al., 2022). Benda et al. (2020) call broadband a social determinant of health for this reason.

The link between infrastructure and use is not simple. Before the pandemic, broadband availability was associated with more telemedicine only in fully rural counties, where low availability meant 34% fewer visits per capita (Wilcock et al., 2019). Veinot et al. (2018) describe how health informatics interventions can produce new inequality when they are easier to reach, use or benefit from for advantaged groups. Telehealth fits that description if its main channel is a portal-based video visit.

2.3 Telehealth as infrastructure and as a counted unit

Two ideas from science and technology studies frame the sociotechnical argument. First, Star and Ruhleder (1996) show that infrastructure is relational: a system works as infrastructure only for those whose practices, tools and skills are already aligned with it. A telehealth visit sits on several layers, including a connection, a device, a portal account and a scheduling routine, and a patient can fail at any layer. Greenhalgh et al. (2017) make a similar point for video consultations, where adoption depends on the fit between the technology, the patient, the clinic and the wider system.

Second, measurement systems sort and merge. Bowker and Star (1999) show that classifications decide which differences become visible. Espeland and Stevens (1998) call the act of comparing different things on one metric commensuration. The NHIS item and the Medicare telehealth flag both commensurate a video consultation and a phone call into one count of telehealth. A gap reported in percentage points is a further choice, because a constant absolute gap means a widening relative gap when overall use falls. These choices are not neutral for rural adults, and the findings below show why.

3. Data and methods

3.1 National Health Interview Survey

The NHIS is an annual, cross-sectional household survey of the civilian noninstitutionalized population, run by the National Center for Health Statistics (NCHS). I downloaded the public-use Sample Adult files for 2021, 2022, 2023, 2024 and 2025 as CSV files from the NCHS website (National Center for Health Statistics, 2026). Each file has one randomly selected adult per household. The pooled file holds 143,499 adults, of whom 142,175 answered the telehealth question.

The outcome is the item coded VIRAPP12M_A. It asks whether, during the past 12 months, the respondent had an appointment with a doctor, nurse or other health professional by video or by phone. The item does not separate the two modes. In 2021 only, adults who said yes were asked whether any of these appointments were because of the COVID-19 pandemic

(VIRAPPCVD_A). This follow-up item is absent from 2022 onwards.

Urbanicity comes from the NCHS urban-rural classification of the respondent's county, which has four public categories: large central metro, large fringe metro, medium and small metro, and nonmetropolitan. The 2021 to 2023 files carry the 2013 scheme (URBRRL), and the 2024 and 2025 files carry the 2023 scheme (URBRRL23). The four categories have the same names, but some counties changed class, so changes between 2023 and 2024 partly reflect the new scheme. The unweighted number of nonmetropolitan respondents also rose from 4,522 in 2023 to 7,304 in 2024, and the survey weights adjust for this.

The technology measures come from the internet and health information technology section. ACCSSINT_A asks whether the adult has access to the internet, and ACCSSHOM_A asks whether that access is available at home. Adults with access were asked whether, in the past 12 months, they used the internet to look up health information, to look up test results, or to communicate with a doctor or doctor's office (HITCOMM_A). I code adults without internet access as not having done these activities. These items are absent in 2021, were fielded only in quarters 3 and 4 of 2022, and were fielded all year from 2023 to 2025. The internet analyses therefore pool 2023 to 2025.

For 2023 to 2025, the question on the last visit to a doctor tells respondents not to include appointments by video or phone. This wording lets me classify adults into four care patterns: both in-person and virtual care, in-person care only, virtual care only, or neither. The earlier years lack this instruction, so the care-pattern analysis also uses 2023 to 2025 only.

Controls are age group, sex, race and Hispanic origin, education, family income as a ratio of the federal poverty level, insurance type, self-rated health, disability status (DISAB3_A) and census region. Income uses the poverty ratio on the Sample Adult file, which has no missing values. Insurance is private, public or other coverage, or uninsured, built from the NCHS insurance hierarchy for adults under and over 65. Item missingness on these controls was below 1.1% in every year.

3.2 Medicare Telehealth Trends

To compare the survey with a payer's volume metric, I downloaded the Medicare Telehealth Trends file published by the Centers for Medicare & Medicaid Services (CMS), which covers January 2020 to March 2026 (Centers for Medicare & Medicaid Services, 2026). For each quarter and year, it reports the share of eligible fee-for-service beneficiaries with at least one telehealth service, by rural or urban residence based on rural-urban commuting area codes. The public file has no breakdown by video or audio. I used the national rows with all other characteristics set to all.

3.3 Analysis

All NHIS estimates use the final annual sample adult weight (WTFA_A) and the design variables PSTRAT and PPSU, analysed with the survey package in R. When years are pooled, I divide the weights by the number of years and make strata and primary sampling units unique within each year. This treats each annual sample as independent, which is a conservative choice for variance. Confidence intervals for proportions are design-based 95% intervals.

For RQ1, I estimate weighted telehealth use by urbanicity for each year, and the unadjusted difference between nonmetropolitan and large central metro adults. For RQ2, I fit survey-weighted logistic models of telehealth use. Model 1 pools 2021 to 2025, includes urbanicity, year, their interaction and all controls, and is fitted to the 140,735 adults with complete data. I test the interaction with a design-based Wald test. Because odds ratios are hard to compare across groups with different baseline use, I report average marginal effects (AMEs). An AME here is the average change in the predicted probability of telehealth use when the urbanicity category is changed for every adult while all other characteristics stay as observed. I also compute adjusted predicted probabilities for each year and their ratio between nonmetropolitan and large central metro adults, with delta-method confidence intervals from the marginaleffects package.

For the technology analysis, I fit three models on the 84,639 adults with complete data in 2023 to 2025. Model A has the controls only. Model B adds internet access. Model C adds online contact with a doctor's office. Comparing the nonmetropolitan AME across these models shows how much of the gap is statistically accounted for by each digital measure. It is not a causal mediation analysis, because online contact may follow from telehealth use as well as precede it. I then fit models with an interaction between a binary metropolitan indicator and each of six characteristics, and report the nonmetropolitan AME within each subgroup.

For RQ3, I compare annual and quarterly rural and urban shares from the CMS file with NHIS estimates for adults aged 65 and over, the age group closest to the Medicare population. The two sources differ in population, rurality definition, period and measurement, so I compare their direction and their absolute and relative gaps rather than their levels.

4. Findings

4.1 Who lives where

Nonmetropolitan and metropolitan adults differ in ways that matter for telehealth (Table 1). Nonmetropolitan adults were older, with 27.7% aged 65 or over against 21.8% in metropolitan counties. They were more often non-Hispanic White (80.9% against 58.5%) and less often held a bachelor's degree (19.4% against 36.1%). They were more likely to have family income below twice the poverty line, to report fair or poor health, and to report a disability. Uninsurance was similar, at 9.6% and 9.2%. A slightly higher share of nonmetropolitan adults had a usual place of care.

Table 1. Characteristics of adults by metropolitan status, NHIS 2021-2025 pooled (weighted percentages)

Characteristic	Metropolitan	Nonmetropolitan
Age 18-34	29.6	24.8
Age 35-49	24.9	21.7
Age 50-64	23.7	25.8
Age 65-74	12.8	16.1
Age 75 and over	9.0	11.6
Female	51.4	51.0
Non-Hispanic White	58.5	80.9

Hispanic	19.4	6.4
Non-Hispanic Black	12.5	7.7
Non-Hispanic Asian	7.1	0.9
Non-Hispanic other or multiple races	2.5	4.0
Bachelor's degree or higher	36.1	19.4
Some college or associate degree	28.2	30.7
High school or GED	25.8	37.1
Less than high school	9.8	12.8
Family income 400% FPL or more	44.9	29.0
Family income 200-399% FPL	29.1	34.7
Family income 100-199% FPL	16.8	23.0
Family income below 100% FPL	9.2	13.4
Private insurance	62.1	55.8
Public or other coverage only	28.7	34.6
Uninsured	9.2	9.6
Fair or poor self-rated health	13.8	19.3
Disability	8.7	13.9
Usual place of care	89.4	92.1
South	37.8	42.0
Midwest	18.7	32.2
Video or phone visit, past 12 months, 2021	38.2	29.4
Video or phone visit, past 12 months, 2025	27.5	18.0
Unweighted number of adults, 2021-2025	119,503	23,996

4.2 Telehealth use fell everywhere and fell most in nonmetropolitan counties (RQ1)

Telehealth use declined after 2021 in all four types of county (Figure 1). Across all adults, the weighted share with a video or phone visit in the past 12 months was 37.0% in 2021, 30.1% in 2022, 26.7% in 2023, 25.0% in 2024 and 26.2% in 2025. The level in 2025 was not lower than in 2024, which suggests that use had settled at about a quarter of adults.

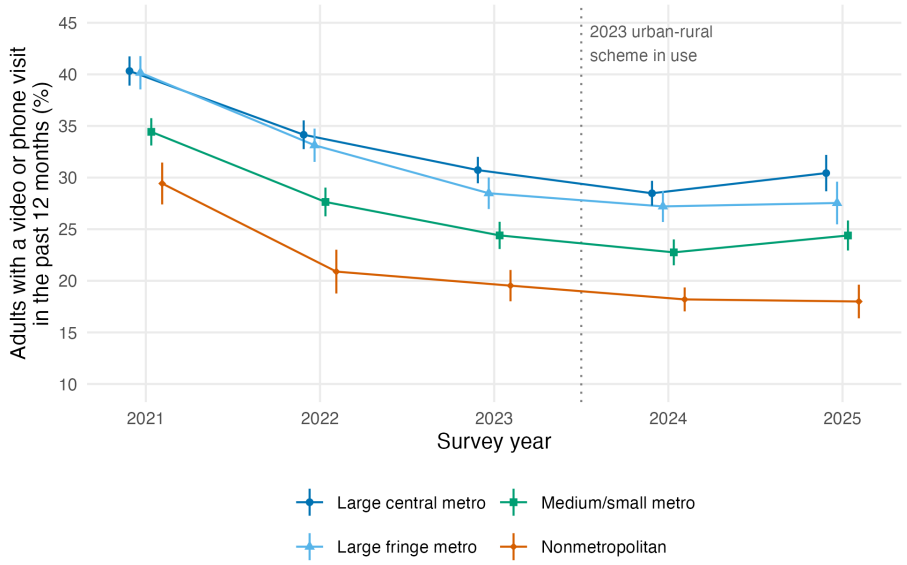

Figure 1. Weighted share of adults with a video or phone appointment in the past 12 months, by county urbanicity and year, NHIS 2021-2025. Bars show 95% confidence intervals. The dotted line marks the switch from the 2013 to the 2023 NCHS urban-rural scheme.

The ordering by urbanicity held in every year. In large central metro counties, use fell from 40.3% in 2021 to 30.4% in 2025. In nonmetropolitan counties, it fell from 29.4% to 18.0%. The absolute declines were similar, at 9.9 and 11.4 percentage points. The relative declines were not: nonmetropolitan use fell by 38.8% of its 2021 level, against 24.5% in large central metro counties. Medium and small metro counties sat between the two, at 34.4% in 2021 and 24.4% in 2025.

The unadjusted difference between nonmetropolitan and large central metro adults was 10.9 percentage points in 2021 (95% CI 8.4 to 13.4) and 12.4 points in 2025 (95% CI 10.0 to 14.8). In ratio terms, nonmetropolitan use was 73% of large central metro use in 2021 and 59% in 2025. Pandemic motives also differed by place in 2021. Among telehealth users that year, 77.3% of nonmetropolitan users and 82.0% of large central metro users said at least one virtual appointment was because of the pandemic.

4.3 The adjusted gap was stable in points and wider in ratio (RQ2)

Adjustment for composition did not remove the gap. In the pooled model without the interaction, nonmetropolitan adults were 10.7 percentage points less likely than comparable large central metro adults to report telehealth use (95% CI 9.7 to 11.7), with an odds ratio of 0.56 (95% CI 0.52 to 0.59). Medium and small metro adults were 5.9 points less likely (95% CI 5.0 to 6.8), and large fringe metro adults 1.3 points less likely. The gradient therefore follows distance from large urban cores rather than a

simple rural and urban split.

Large fringe metro counties, which are mostly suburban, were close to large central metro counties throughout. Their adjusted gap was within 2.3 points of zero in every year, and its confidence interval included zero in all five years. The telehealth deficit is thus a feature of smaller metro areas and of nonmetropolitan counties, the places farthest from the large health systems that expanded virtual care fastest in 2020.

Other characteristics showed the expected patterns. Holding urbanicity constant, adults with less than a high school education were 14.9 points less likely to use telehealth than adults with a bachelor's degree, and uninsured adults were 14.7 points less likely than privately insured adults. Need raised use: adults in fair or poor health were 17.2 points more likely than those in excellent or very good health, and adults with a disability 9.2 points more likely. Adults aged 75 and over were 6.0 points less likely than adults aged 18 to 34.

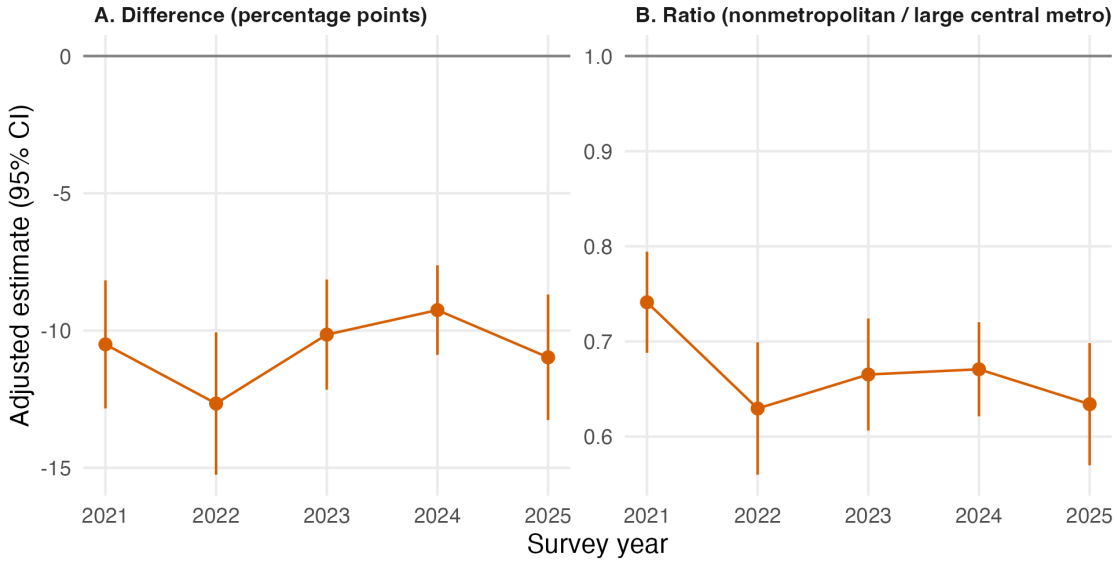

Figure 2 shows the year-specific adjusted gaps from Model 1. The nonmetropolitan AME was 10.5 points in 2021 (95% CI 8.2 to 12.8), 12.7 points in 2022, 10.1 points in 2023, 9.3 points in 2024 and 11.0 points in 2025 (95% CI 8.7 to 13.3). The change between 2021 and 2025 was 0.5 points (95% CI minus 2.8 to 3.7, p = 0.77). The interaction between urbanicity and year was not significant on the log-odds scale (F = 0.55 on 12 and 2,902 df, p = 0.88).

The same model gives a different reading on the ratio scale. Adjusted nonmetropolitan use was 74% of large central metro use in 2021 (95% CI 69% to 79%) and 63% in 2025 (95% CI 57% to 70%). A gap of 10 to 11 points is a constant share of a large number in 2021 and a growing share of a smaller number in 2025. The answer to RQ1 thus depends on the metric. In percentage points, the rural gap neither closed nor widened. As a ratio, rural adults lost ground, because overall use fell while the absolute gap held.

4.4 Internet access was common; online contact with care was not (RQ2)

Physical internet access differed only modestly by place in 2023 to 2025 (Figure 3). Internet access was reported by 91.6% of nonmetropolitan adults and 95.1% of large central metro adults, and home access by 88.7% and 93.5%. The gap was wider among adults aged 65 and over, at 81.9% against 86.7%. In the half-year sample of 2022, the corresponding shares were 89.5% and 93.5%.

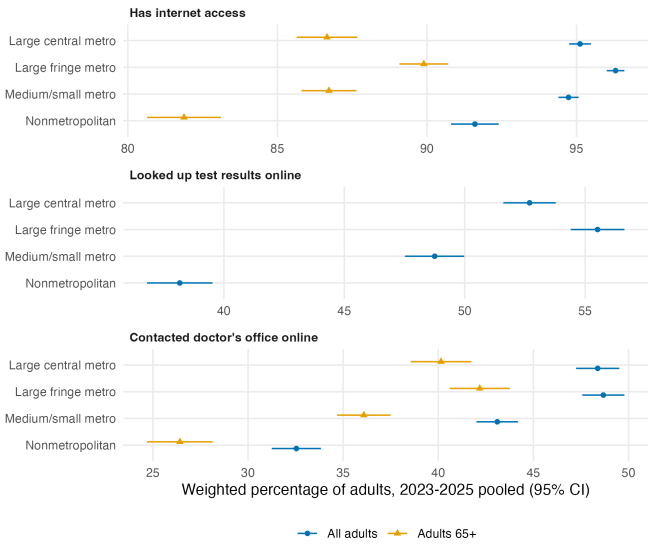

Figure 3. Internet access and online health activities by county urbanicity, NHIS 2023-2025 pooled. Online activities refer to the past 12 months; adults without internet access are counted as not doing them. Estimates for adults aged 65 and over are shown for internet access and online contact with a doctor's office only. Bars show 95% confidence intervals.

The gaps grew at each later stage of use. Looking up test results online was reported by 38.2% of nonmetropolitan adults and 52.7% of large central metro adults. Contacting a doctor's office

online was reported by 32.5% and 48.4%, a gap of 15.9 points. Among adults aged 65 and over, only 26.4% of nonmetropolitan adults had contacted a doctor's office online, against 40.1% in large central metro counties. The pattern matches the staged model of digital inequality: the divide is narrowest at basic access and widest at the activities that connect a person to a clinic's digital system.

These activities were closely tied to telehealth use. Among adults without internet access, 13.0% reported a video or phone visit, against 26.7% of adults with access. Among adults who had contacted a doctor's office online, 46.0% had a telehealth visit, against 9.8% of those who had not. Because phone visits need no internet, the 13.0% among unconnected adults shows that telephone care still reached part of this group.

Table 2 shows how the adjusted nonmetropolitan gap changes when the digital measures enter the model. With controls only (Model A), nonmetropolitan adults were 9.9 points less likely than large central metro adults to use telehealth in 2023 to 2025. Adding internet access (Model B) left the gap almost unchanged at 9.8 points, although internet access itself was associated with 10.7 points higher use. Adding online contact with a doctor's office (Model C) reduced the gap to 6.0 points (95% CI 4.9 to 7.1). Online contact was associated with 33.8 points higher use, and the remaining internet effect turned slightly negative once online contact was held constant.

Table 2. Adjusted differences in the probability of telehealth use (average marginal effects, percentage points, 95% CI)

Model or subgroup	Contrast	AME (95% CI)
Pooled 2021-2025 (Model 1, no interaction)	Nonmetropolitan vs large central metro	-10.7 (-11.7 to -9.7)
	Medium/small metro vs large central metro	-5.9 (-6.8 to -5.0)
	Large fringe metro vs large central metro	-1.3 (-2.2 to -0.3)
2023-2025, Model A: controls	Nonmetropolitan vs large central metro	-9.9 (-11.1 to -8.7)
2023-2025, Model B: + internet access	Nonmetropolitan vs large central metro	-9.8 (-11.0 to -8.6)
	Internet access, yes vs no	10.7 (9.3 to 12.1)
2023-2025, Model C: + online contact	Nonmetropolitan vs large central metro	-6.0 (-7.1 to -4.9)
	Online contact with doctor's office, yes vs no	33.8 (33.0 to 34.6)
	Internet access, yes vs no	-2.9 (-4.8 to -1.1)
Nonmetropolitan vs metropolitan gap within subgroups, 2023-2025	No internet access	-2.3 (-4.5 to -0.1)
	Internet access	-7.4 (-8.4 to -6.3)
	No online contact with doctor's office	-2.1 (-2.8 to -1.3)
	Online contact with doctor's office	-6.7 (-8.6 to -4.9)
	Age 18-34	-5.9 (-8.0 to -3.9)
	Age 50-64	-9.2 (-11.1 to -7.4)
	Age 75 and over	-5.0 (-7.2 to -2.7)
	Bachelor's degree or higher	-9.3 (-11.2 to -7.5)
	High school or GED	-5.1 (-6.6 to -3.6)
	Family income 400% FPL or more	-9.4 (-11.1 to -7.7)
	Family income below 100% FPL	-7.6 (-9.9 to -5.2)

The subgroup models sharpen this point. Among adults without internet access, the adjusted nonmetropolitan gap was 2.3 points. Among adults with access, it was 7.4 points. Among adults who had not contacted a doctor's office online, the gap was 2.1 points, against 6.7 points among those who had. Both interactions were significant ($p < 0.001$). The gap did not differ clearly by age group, education, income or self-rated health. It was, if anything, larger among adults with a bachelor's degree (9.3 points) and with high incomes (9.4 points) than among adults with a high school education (5.1 points).

The rural gap is therefore not mainly a gap among the unconnected. It is largest among adults who are online and who already use digital channels with their providers. Among connected adults, 19.3% of nonmetropolitan and 30.7% of large central metro adults reported a telehealth visit. Among adults with online contact, the shares were 40.1% and 50.4%. Whatever separates rural from urban telehealth use operates after the stage of basic access.

4.5 Telehealth was added to in-person care, not substituted for it

The care-pattern measure for 2023 to 2025 shows how telehealth fitted into care. Virtual care alone was rare everywhere: only 0.7% of nonmetropolitan adults and 1.6% of large central metro adults had a virtual visit and no in-person visit in the past year. Among telehealth users, 96.0% of nonmetropolitan users and 94.6% of large central metro users had also seen a clinician in person. The difference between places lay in the combination of both. In large central metro counties, 28.3% of adults had both kinds of visit; in nonmetropolitan counties, 17.9% did. In-person care only was the pattern for 67.5% of nonmetropolitan adults, against 55.2% of large central metro adults.

The share with no visit of either kind was similar, at 13.9% and 14.8%. Nonmetropolitan adults were thus not less connected to clinicians overall. They were less often connected by the virtual channel in addition to the in-person one. For a system often justified by the cost of rural travel, this pattern means telehealth rarely replaced a trip for rural adults.

4.6 The claims metric suggests convergence (RQ3)

The CMS series tells a different story when read as reported (Figure 4). In 2020, 39.8% of eligible rural and 50.4% of eligible urban fee-for-service beneficiaries had at least one telehealth service. By 2025, the shares were 18.4% and 24.7%. The absolute gap fell from 10.6 to 6.3 percentage points. The rural to urban ratio moved from 0.79 in 2020 to 0.72 in 2022 to 2024, and to 0.75 in 2025. In the first quarter of 2026, 9.9% of rural and 13.5% of urban beneficiaries used telehealth, a ratio of 0.74.

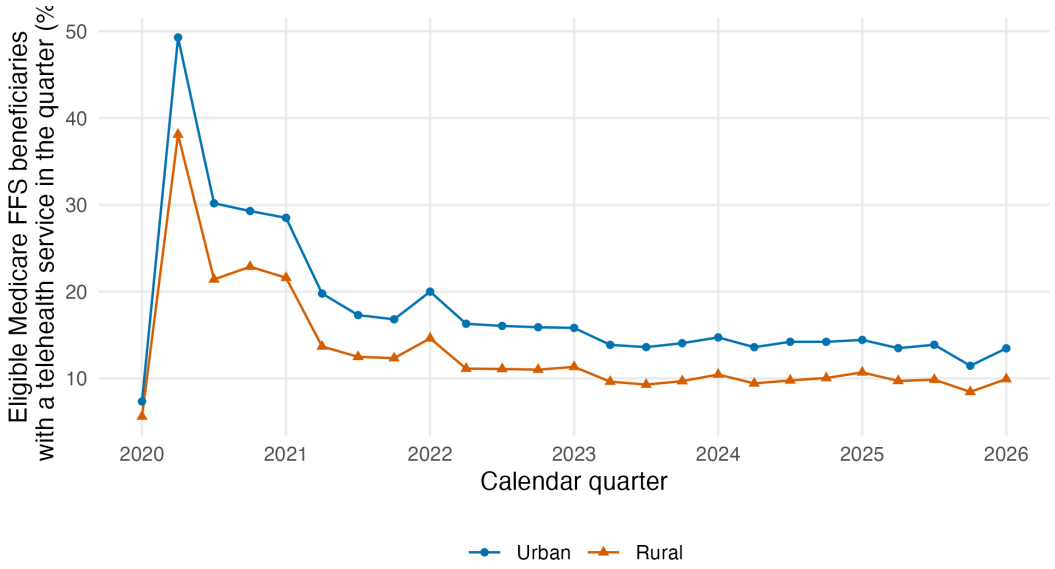

Figure 4. Share of eligible Medicare fee-for-service beneficiaries with at least one telehealth service in each quarter, by rural or urban residence, January 2020 to March 2026. Source: CMS Medicare Telehealth Trends file (data released September 2026).

The NHIS shows a similar pattern for adults aged 65 and over. Metropolitan and nonmetropolitan use was 45.4% and 32.2% in 2021, and 26.1% and 19.2% in 2025. The absolute gap fell from 13.2 to 6.9 points, while the ratio was 0.71 in 2021 and 0.71 to 0.74 in 2023 to 2025, with a dip to 0.64 in 2022. Among all adults, by contrast, the absolute gap between metropolitan and nonmetropolitan counties was 8.8 points in 2021 and 9.5 points in 2025, and the ratio fell from 0.77 to 0.65.

Read in percentage points, the Medicare series would support a claim that rural beneficiaries are catching up. Read as a ratio, rural beneficiaries were about a quarter less likely than urban beneficiaries to use telehealth in every year after 2021. Among all adults in the survey, the relative position of nonmetropolitan adults worsened. The published metric also merges video and phone services, which the Medicare literature shows to be used by different patients (Yu et al., 2024).

5. Discussion

5.1 A smaller system with the same distance

The main finding is that post-pandemic telehealth neither closed nor narrowed the rural gap among US adults. Use fell from 37.0% to about a quarter of adults, and nonmetropolitan adults stayed about 10 to 11 percentage points behind comparable large central metro adults in every year. As a result, rural adults' share of telehealth fell more than urban adults' share, and their adjusted use dropped from 74% to 63% of the urban level. Earlier studies found lower rural use in the first pandemic months (Cantor et al., 2021; Pierce & Stevermer, 2023). This study shows that the gap outlasted the emergency and became larger in relative terms as the system contracted.

This is the gap between how telehealth is evaluated and how it is experienced that the journal theme describes. A payer reading claims in percentage points sees a rural deficit shrinking from 10.6 to 6.3 points. A rural resident is in a population where fewer than one adult in five used telehealth in 2025, against almost one in three in large cities. Both readings use the same kind of count. They differ only in the scale that is reported, and the choice of scale decides whether the system appears to be equalizing. Espeland and Stevens (1998) describe commensuration as a form of power; here it takes the plain form of reporting a difference rather than a ratio.

The two data sources also differ in who they cover, and this matters for the metric. In both the Medicare file and the NHIS sample aged 65 and over, the rural to urban ratio stayed between 0.71 and 0.75 in 2023 to 2025. Among all adults, the ratio fell from 0.77 in 2021 to 0.65 in 2025. Because the ratio for older adults was stable, the relative decline among all adults points to adults under 65. These are the people whom the most visible public telehealth metric, the Medicare series, does not cover. A payer dashboard can therefore be accurate for its own population and still miss where the rural gap widened.

5.2 Where the divide sits in the system

The digital divide model helps locate the gap. Internet access differed by only 3.5 points between nonmetropolitan and large central metro adults, and adding it to the model hardly changed the rural gap. The gap in online contact with a doctor's office was 15.9 points, and adding it reduced the rural gap by about 40%. This fits the argument that inequality moves from physical access to differences in use once access is common (van Deursen & van Dijk, 2014). It also fits the evidence that the type and cost of material access shape what people do online (van Deursen &

van Dijk, 2019). The survey does not measure device type or connection speed, so some of the online contact gap may reflect these material differences.

Online contact with a doctor's office is a trait of the clinic as well as the patient. It measures whether the patient's clinic offers a portal, answers messages and schedules virtual visits through it. The finding that the rural gap was largest among connected adults suggests that supply and system design matter. Rodriguez et al. (2021) found that practices and clinicians explained more variation in video use than patients did, and Benjenk et al. (2021) found that most beneficiaries offered only audio had the equipment for video. A rural adult with internet access may still face clinics with fewer virtual options, longer-standing in-person routines or weaker portal use. NHIS cannot separate these explanations, but it rules out the simplest one, that rural adults are missing telehealth only because they are offline.

The NHIS access item is also coarse. It asks whether an adult has internet access at all, not whether that access comes through a computer with a fast connection or only through a phone with a limited data plan. Studies using the American Community Survey, which records device and connection type, find larger rural deficits in digital access than the NHIS item shows (Curtis et al., 2022). Among older adults, readiness for video visits also depends on hearing, cognition and experience with technology (Lam et al., 2020). The small access gap reported here is therefore a lower bound on rural material disadvantage, and part of the online contact gap may reflect the quality of the connection rather than the clinic.

In Star and Ruhleder's (1996) terms, telehealth works as infrastructure for patients whose clinics and practices are already linked to the portal layer. For the 67.5% of nonmetropolitan adults whose care was in person only, telehealth was a channel that existed in principle but was not part of their care. Veinot et al. (2018) warn that informatics interventions produce inequality when they are easier for advantaged groups to reach and use. The rural data fit that warning in a specific way: the advantage lies in being part of a digitally active care relationship, not in owning a connection.

5.3 Phone visits and what the count hides

The NHIS item counts video and phone appointments together. This is a measurement choice with consequences. Studies of modality show that phone visits serve older, poorer and less connected patients (Chen et al., 2022; Eberly et al., 2020). Among adults without internet access, 13.0% reported a virtual visit, and most of these were probably phone visits. If rural users relied more on phone than urban users, as some evidence suggests for Medicare (Yu et al., 2024), then the merged count overstates rural access to video care. The rural deficit in video care would then be larger than the deficit reported here. Because telephone coverage under Medicare has been debated, the policy choice about audio-only visits matters more for rural and offline adults than an aggregate count can show.

The finding that telehealth was nearly always an addition to in-person care also qualifies the rural access argument. Hirko et al. (2020) expected telehealth to ease the burden of distance for rural patients. In 2023 to 2025, fewer than 1% of nonmetropolitan adults relied on virtual care alone. The data cannot say whether telehealth replaced some trips for adults who had both kinds of visit. They show, however, that telehealth reached rural adults mainly as a complement for those already in regular in-person care.

5.4 Implications

Three implications follow for the evaluation of telehealth. First, agencies and payers should report rural and urban telehealth use as ratios as well as differences, especially while overall use is changing. Second, survey and claims measures should separate video from phone, because the two modes require different equipment and reach different people. A short follow-up question on mode in the NHIS would allow this. Third, rural telehealth policy that focuses on broadband availability alone addresses the stage where the gap is smallest. Support for clinic portals, patient onboarding and virtual scheduling in rural practices addresses the stage where this study finds the gap is largest.

6. Limitations

The study has clear limits. The NHIS measures only whether an adult had at least one video or phone appointment in a year. It cannot show the number of visits, their purpose, their clinical quality, or whether the patient's problem was resolved. A rural adult who had one unsatisfactory phone call and an urban adult with regular video follow-up are both counted as users. The survey also cannot separate video from phone visits. The statements in this article about phone care among unconnected adults rest on the logic of the question, not on a direct measure of mode.

All measures are self-reported and subject to recall error over a 12-month window. The design is cross-sectional, so the associations with internet access and online contact are not causal. Online contact with a doctor's office may be a result of telehealth use, since many virtual visits are booked and joined through a portal. The reduction in the rural gap in Model C should be read as statistical accounting, not as an estimate of what better portal use would achieve.

Urbanicity is measured at the county level, and the classification changed from the 2013 to the 2023 scheme in 2024. Some counties moved between categories, and the nonmetropolitan sample grew in 2024. The stability of the adjusted gap across the change suggests that this did not drive the results, but year-to-year comparisons across 2023 and 2024 carry this caveat. The internet items were absent in 2021 and were asked for half of 2022, so the digital analyses cover 2023 to 2025 only. The instruction to exclude virtual appointments from the last-visit question also applies only from 2023.

The pooled variance estimates treat each year as an independent sample, which is conservative. Analyses use complete cases, but missingness on the controls was low. The Medicare file covers fee-for-service beneficiaries only, defines rurality by commuting areas rather than counties, and counts any telehealth service including some non-visit services. Its levels are therefore not comparable with the NHIS, and the comparison rests on

direction and relative size.

7. Conclusion

After the pandemic, telehealth in the United States became smaller but did not become more equal between rural and urban adults. From 2021 to 2025, nonmetropolitan adults stayed about 10 percentage points behind comparable adults in large central metro counties, and their adjusted use fell from 74% to 63% of the urban level. Physical internet access explained little of this gap. Online contact with a doctor's office, which links a patient to the clinic's digital system, differed by 16 points and accounted for much more. The rural gap was largest among adults who were already online.

The way telehealth is counted shapes how this gap appears. A claims metric in percentage points shows rural Medicare beneficiaries catching up, while the ratio shows no improvement, and the survey shows rural adults losing ground. A single count that merges video and phone hides the mode that may matter most for rural and offline patients. Evaluating telehealth by its reach and its volume is not enough. Its evaluation should also ask which patients the system's design connects, and on which scale the result is reported.

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Ethics statement

This study is a secondary analysis of publicly available, de-identified data from the National Health Interview Survey and of aggregate data published by the Centers for Medicare & Medicaid Services. No human participants were contacted, and no ethics approval was required.

Data availability statement

The National Health Interview Survey Sample Adult public-use files for 2021 to 2025 are available from the National Center for Health Statistics at https://www.cdc.gov/nchs/nhis/documentation/ and https://ftp.cdc.gov/pub/Health_Statistics/NCHS/Datasets/NHIS/ (accessed October 2026). The Medicare Telehealth Trends file is available from the Centers for Medicare & Medicaid Services at https://data.cms.gov/summary-statistics-on-use-and-payments/medicare-service-type-reports/medicare-telehealth-trends (accessed October 2026). The analysis code will be deposited in a public repository on acceptance; it is withheld during review only to keep the review anonymous.

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