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# Medicare telehealth utilization by Rural Health Clinics and Federally Qualified Health Centers prior to and during the COVID-19 pandemic

Yvonne Jonk PhD | Heidi O'Connor MS | John Gale MS | Deborah Thayer MBA

Muskie School of Public Service, University of Southern Maine, Portland, Maine, USA

**Correspondence**
Yvonne Jonk, Maine Rural Health Research Center, Muskie School of Public Service, University of Southern Maine, 34 Bedford St, Portland, ME 04101, USA.
Email: yvonne.jonk@maine.edu

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## Abstract

**Purpose:** To address the extent to which Federally Qualified Health Centers (FQHCs) and independent and provider-based Rural Health Clinics (RHCs) were using telehealth prior to and during the COVID-19 pandemic.

**Methods:** A nationally representative 5% sample of Medicare Fee-for-Service beneficiaries who used outpatient services at FQHCs and RHCs were identified within the 2019–2021 5% Medicare Limited Data Set Outpatient and Carrier files. Rural-Urban Continuum Codes were used to identify rural–urban clinic locations. Logistic regression included three-way interaction terms for time, rurality, and clinic type.

**Findings:** Telehealth use curbed the decline in outpatient visits for all clinic types during the pandemic. Telehealth use declined as the pandemic continued in 2021 yet remained higher than pre-pandemic levels. FQHCs had higher telehealth use (18%–31%) than RHCs (8%–14%) in 2020–2021. Across all years, tele-behavioral health was the primary venue for originating and distant site providers. Overall, 19%–34% of originating site providers were psychiatrists and 10%–31% were primary care providers. Likely due to patients sheltering-in-place (at home), 2020–2021 distant site providers were largely primary care providers. Urban FQHCs experienced the largest increase in telehealth use during the pandemic (24.6% increase in urban, 14.4%–15.8% in rural) followed by rural ID_RHCs (10.2%–11.7%). RHCs were less likely to provide telehealth services than FQHCs during the pandemic.

**Conclusions:** Telehealth played a key role in facilitating access to health services during the height of the pandemic (2020–2021). Telehealth flexibilities were associated with greater telehealth use among FQHCs and RHCs but did not make up for the overall decline in health service use.

KEYWORDS
COVID-19, Federally Qualified Health Centers, public health emergency, Rural Health Clinics, telehealth

## BACKGROUND

The COVID-19 Public Health Emergency (PHE) has been a driving force in the expanded use of telehealth as health care providers deferred elective and preventive visits to decrease the risk of transmitting the virus to patients and health care workers. At the same time, many patients avoided necessary health care services to minimize their risk of exposure.[1–3] According to a Commonwealth Fund report, ambulatory care visits declined by almost 60% early in the pandemic.[4] During the early stages of the PHE, many providers shifted quickly to telehealth as a strategy to provide access to essential health care services.[4]

Section 3704 of the 2020 Coronavirus Aid, Relief, and Economic Security Act (CARES Act) authorized Rural Health Clinics (RHCs) and Federally Qualified Health Centers (FQHCs) to provide distant site telehealth services to Medicare beneficiaries during the COVID-19 PHE.[5] Prior to the CARES Act (signed into law March 27, 2020), FQHCs and RHCs located in rural areas could serve as telehealth originating sites. As originating sites, FQHCs and RHCs facilitate access to the services of distant site providers. An originating site, as defined by the Centers for Medicare & Medicaid (CMS), is where the patient is located during the telehealth encounter. The distant site is where the provider or specialist seeing the patient via telehealth is located.[6] As an originating site, FQHCs and RHCs could facilitate access to specialty care services provided by distant site providers. For facilitating telehealth services, FQHCs and RHCs, along with other defined originating sites, can bill Medicare for an originating site fee, which is paid under the Medicare Physician Fee Schedule.[6]

The CARES Act (2020) authorized FQHCs and RHCs to provide distant site services to Medicare beneficiaries during the PHE using interactive audio and video telecommunication systems that allow real-time communication between patients and providers.[5,7] Any health care provider working for an FQHC or RHC can provide distant site services (within the scope of their licenses) from any location, including their homes.[7] Medicare reimburses FQHCs and RHCs for distant site services at a rate equivalent to the national average payment rates for comparable telehealth services under the Physician Fee Schedule.[8] In addition, the 2021 Consolidated Appropriations Act (CAA) codified FQHCs and RHCs serving as distant site providers for the treatment of mental health disorders (in addition to substance use disorders) and added the patient's home as a permissible originating site.[9] Although the PHE ended on May 11, 2023, the 2023 CAA extended many of the telehealth flexibilities through December 31, 2024.[10]

In this paper, we assess the extent to which FQHCs and RHCs expanded their use of telehealth during the COVID-19 PHE (2020–2021).

### Research questions

Stratifying our analyses by FQHCs, independent RHCs (ID_RHCs), and provider-based RHCs (PB_RHCs), our research questions included:

1. What were the trends in telehealth use by FQHCs and RHCs prior to and during the pandemic?
2. What types of services were FQHCs and RHCs providing through telehealth, and how did they vary prior to and during the pandemic?
3. Distinguishing between originating and distant site providers:
   a. What types of services were being provided through telehealth?
   b. What were the most common diagnoses for telehealth services provided to Medicare beneficiaries, and how do their health risk profiles compare to non-telehealth users?
   c. What types of providers were facilitating access to services through telehealth?
4. What factors were predictive of the use of telehealth services?

## METHODS

### Data sources

We used the following 2019–2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files (SAFs): the Medicare Beneficiary Summary Files, Outpatient, and Carrier Files. Each year of SAF data comprises Fee-for-Service (FFS) claims and beneficiary information for a 5% sample of the national Medicare FFS population. All beneficiaries receiving care through FQHCs and RHCs at any time during 2019–2021 were included in the analyses.

Using Medicare FQHC and RHC FFS claims data, this study had a national geographic focus, and the results are generalizable across all FQHCs and RHCs. We analyzed the data by provider type (ID_RHCs and PB_RHCs) and by degree of rurality using a three-tiered designation of the 2013 Rural Urban Continuum Codes (i.e., urban, large rural [LR], and a combined category for small rural and isolated small rural [I/SR] counties).

### Identification of FQHCs and RHCs

To identify FQHCs, ID_RHCs, and PB_RHCs in the outpatient files, we used the facility's Medicare provider number, that is, the CMS certification number (CCN), in which the last four digits indicate the type of provider. We also used bill types 73 and 77 to identify FQHCs and bill type 71 to identify RHCs in the outpatient files. As the carrier files do not contain provider numbers (i.e., CCNs), we used the place of service code 50 to identify FQHCs and 72 to identify RHCs and matched the billing National Provider Identifier (NPI) to the entity type (1 = ID_RHC, 2 = PB_RHC) from the National Plan & Provider Enumeration System NPI file to identify FQHCs and RHCs. We further categorized PB_RHCs as affiliated with Critical Access Hospitals (CAHs) or prospective payment system (PPS) hospitals using CMS' Provider of Service file[11] to obtain the parent provider number, where the first two digits of the last four digits indicate the type of hospital (e.g., 13 = CAH, not 13 = PPS).

Based on the Medicare FFS claims data, the number of outpatient visits per clinic (i.e., clinic visit volume) was used as a proxy for clinic size. The number of outpatient visits per clinic were grouped into four categories using the underlying distribution of quartiles (1: number of visits <16, 2: 16–40 visits, 3: 41–100 visits, 4: number of visits >100).

## Matching outpatient and carrier files

When patients use telehealth, it is possible that we would find an originating site claim in the outpatient file and the distant site provider's claim for the same event in the carrier file. Thus, to avoid double counting the use of telehealth services captured in the outpatient and carrier files, we matched an RHC/FQHC outpatient visit to either an RHC/FQHC or a non-RHC/FQHC carrier file claim using the unique person identifier and date of service. Using this approach, less than 1% of visits identified in the carrier file were not matched to an outpatient visit. The primary venues captured in the carrier files (for telehealth visits found in the outpatient files) were lab tests conducted during the patient's visit to the clinic facilitating access to a telehealth visit.

## Identification of telehealth services

To identify telehealth services, we flagged outpatient claims that contained the telehealth modifier 95, Current Procedural Terminology (CPT) modifiers for interactive videoconferencing (GT) and asynchronous telecommunications (GQ); the telehealth place of service code 02; a series of telehealth-specific CPT and Healthcare Common Procedure Coding System (HCPCS) codes for emergency department, inpatient, skilled nursing facility, crisis care, and interprofessional consultations; and codes for online and telephone assessment and management, remote patient monitoring, and remote evaluation of imaging (store and forward services). The telehealth codes and modifiers used in this definition designated interactive videoconferencing visits deemed billable by Medicare prior to the PHE, as well as services newly allowed by Medicare during the PHE (i.e., audio-only visits, virtual check-ins, and codes that could be used by FQHCs and RHCs to bill as distant telehealth providers [G2025]) (see Table A1 for the list of telehealth codes).[12–14]

## Identification of types of services

Within Medicare claims data, we used HCPCS code Q3014 to identify originating site services and HCPC GT or 95 modifiers to identify distant site services. We used a combination of the Restructured Berenson–Eggers Type of Service (BETOS) Classification System (RBCS)[15] and the Healthcare Cost and Utilization Project (HCUP) Clinical Classifications Software (CCS)[16] category descriptions to group the outpatient service codes into clinically meaningful categories: acute care, mental health/substance use, chronic care management, and wellness preventive and office visits.

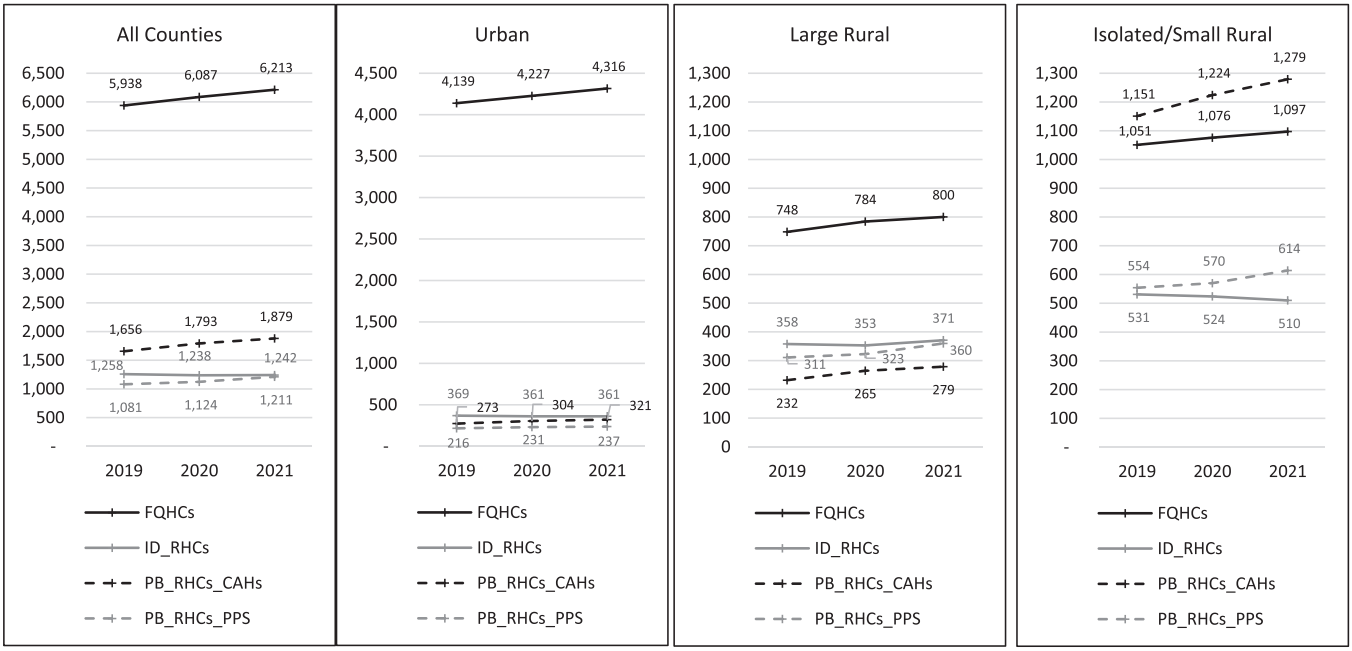
## Risk adjustment

Previous studies have documented that patients accessing services through telehealth tend to have more complex health conditions than patients who were not using telehealth.[17,18] Primary diagnoses codes were grouped using the ICD10Data.com diagnosis code groupings at the large level.[19] The Johns Hopkins ACG System Resource Utilization Bands (RUBs)[20] were used to describe differences in health risk profiles of beneficiaries using or not using telehealth to access services at FQHCs and RHCs. Higher RUB categories indicate patients have greater morbidity and higher health care needs as follows: (1) healthy users and (2) low, (3) moderate, (4) high, and (5) very high morbidity. The RUBs were also used to account for higher levels of health service use attributable to poorer health status (i.e., greater morbidity) in regression models.

## Analyses

Using the Medicare FFS files, we established baseline telehealth use by FQHCs and RHCs pre-PHE (2019) and changes in the levels of telehealth use during the PHE (2020–2021) following the passage of the CARES Act and the regulatory flexibility provided to FQHCs and RHCs to expand telehealth use. We also assessed any changes in the types of services clinics were providing through telehealth, patients' health conditions addressed via telehealth, and the types of providers facilitating access to care via telehealth as the PHE continued in 2020–2021.

We used tests for differences in proportions to address whether the percentage of outpatient visits conducted using telehealth differed by clinic type. Differences were considered significant at the $p \leq 0.05$ level. Finally, we used logistic regression to identify factors predictive of telehealth use, including changes in the use of telehealth over time (pre-PHE [2019] and during the PHE [2020–2021]), rural–urban county location for the clinics (urban, LR, and I/SR), and type of clinic (FQHC, ID_RHC, PB_RHCs affiliated with CAHs, and PB_RHCs affiliated with PPS hospitals). We ran adjusted models to control for the effect of clinic size and possible differences among the health status of the populations served by the clinics on the probability of using telehealth. Because clinics in rural areas were eligible to bill for telehealth as an originating site prior to the PHE, and the telehealth flexibilities introduced during the PHE allowed all clinics to bill as both originating and/or distant site providers, our models included two- and three-way interaction terms controlling for the effect of time (pre and during the PHE), rurality, and clinic type. The adjusted models included demographic (age, gender, and race) and health risk profiles (RUBs) of the populations served by the clinics, full-year (defined as dual eligible for 10 months or more) and part-year dual eligibles, and clinic visit volume. Finally, we report out the marginal effects (ME) as the differences in




Data Source: 2019-2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files
Notes: FQHC = Federally Qualified Health Center, RHC = Rural Health Clinic, ID_RHC = Independent RHC, PB_RHC_CAH = Provider-Based RHC affiliated with a Critical Access Hospital (CAH), PB_RHC_PPS = Provider-Based RHC affiliated with a Prospective Payment System (PPS) hospital.

**FIGURE 1** Number of Federally Qualified Health Centers and independent and provider-based Rural Health Clinics by rural–urban location, 2019–2021.

the probability of using telehealth for specific comparison groups of interest.[21]

## FINDINGS

In this section, we first enumerate our sample of FQHCs and RHCs in rural and urban counties and then present trends in telehealth visits, in-person visits, and all visits (telehealth and in-person) for each clinic type. We present these trends three ways: the overall volume of Medicare FFS visits, the average number of visits per clinic, and the percent of visits conducted using telehealth. We then present the types of services provided via telehealth, the health conditions of patients using telehealth, the types of providers facilitating access to services through telehealth, and the results of logistic regression analyses predicting the use of telehealth services.

### Sample of FQHCs and RHCs

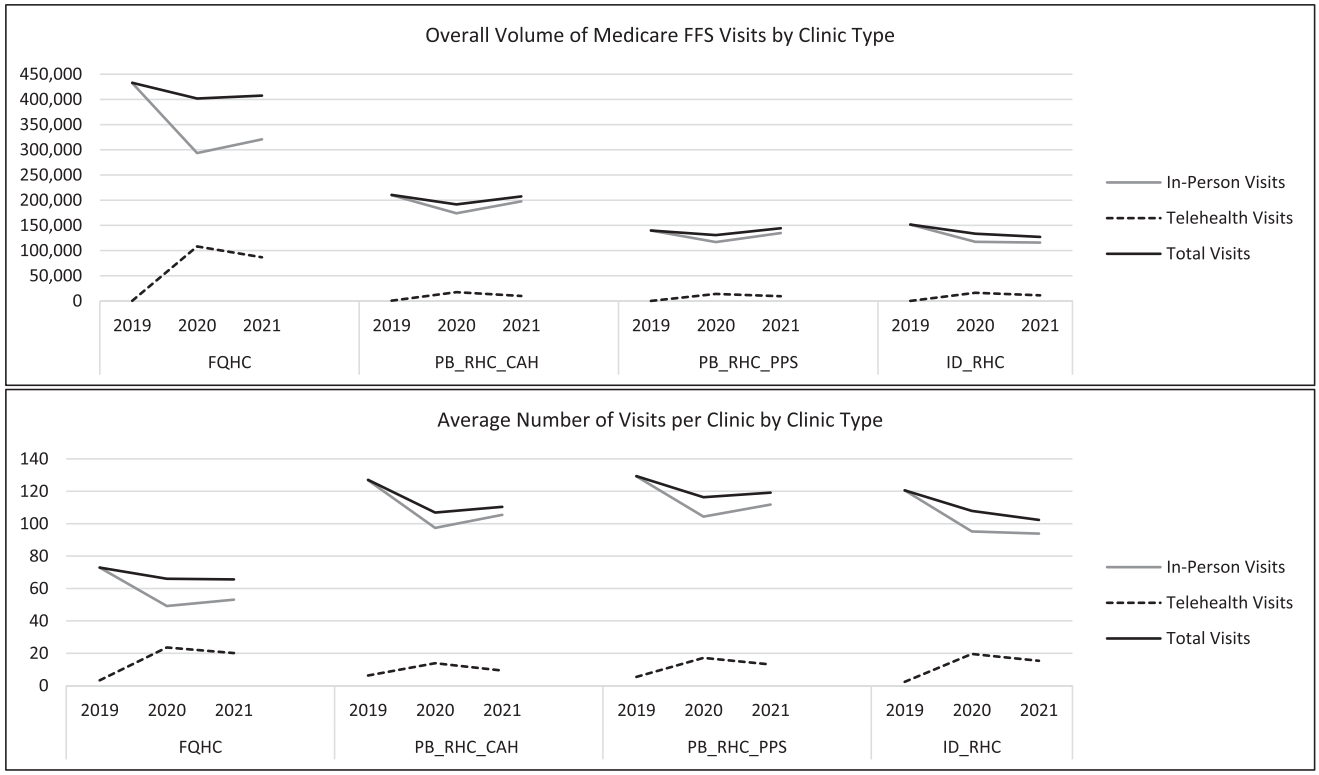
In terms of the number of clinics in rural and urban counties, FQHCs outnumbered RHCs in both urban and LR counties and were second only to PB_RHCs affiliated with CAHs in I/SR counties (Figure 1). Although the number of FQHCs in urban counties was steadily increasing from 4,139 to 4,316 in 2019–2021, the highest numbers of RHCs were in I/SR areas where PB_RHCs affiliated with CAHs outnumbered not only FQHCs but ID_RHCs and PB_RHCs affiliated with PPS hospitals as well. Although the number of PB_RHCs has been steadily increasing in all rural locations, from 2019 to 2021, the number of ID_RHCs has either held steady or has been declining, particularly in more remote (I/SR) rural counties.

### Trends in in-person, telehealth, and total outpatient visits

The number of in-person outpatient clinic visits to FQHCs and RHCs fell significantly in 2020 from 2019 pre-pandemic levels (Figure 2). Although the use of telehealth served to curb the decline in outpatient clinic visits for all clinic types in 2020 and 2021, the overall volume of Medicare FFS visits (including in-person and telehealth visits) for FQHCs and ID_RHCs did not return to pre-pandemic levels in 2021. In contrast, the 2021 volume of Medicare FFS visits to PB_RHCs was similar to 2019 levels.

Similarly, the average number of visits per clinic in 2021 (including in-person and telehealth visits) was lower than pre-pandemic levels across all clinic types and continued to decline from 2019 levels for FQHCs and ID_RHCs. This was not the case for PB_RHCs, where the average volume of visits per clinic was rebounding in 2021 from 2020 lows, despite the observed decline in the average number of telehealth visits per clinic observed across all clinics.

In the pre-pandemic year of 2019, both FQHCs and RHCs were using telehealth for less than 1% of their outpatient visits (Figure 3). During the pandemic years of 2020 and 2021, the percent of health services provided through telehealth significantly increased for FQHCs and RHCs and was highest for FQHCs regardless of rural–urban loca-




Data Source: 2019-2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files
Notes: FQHC = Federally Qualified Health Center, RHC = Rural Health Clinic, ID_RHC = Independent RHC, PB_RHC_CAH = Provider-Based RHC affiliated with a Critical Access Hospital (CAH), PB_RHC_PPS = Provider-Based RHC affiliated with a Prospective Payment System (PPS) hospital

**FIGURE 2** In-person, telehealth, and total outpatient visits among a 5% random sample of Medicare Fee-for-Service (FFS) beneficiaries using services at Federally Qualified Health Centers and independent and provider-based Rural Health Clinics, 2019–2021.

tion (e.g., in 2020, FQHCs ranged from 18% to 31% across rural and urban counties, respectively, whereas ID_RHCs and PB_RHCs ranged from 8% to 14% across rural and urban counties, respectively). Although there was a significant decrease in the percent of telehealth visits across all clinic types from 2020 to 2021, the percent of visits using telehealth was still higher than the pre-pandemic period.

## Types of services provided through telehealth

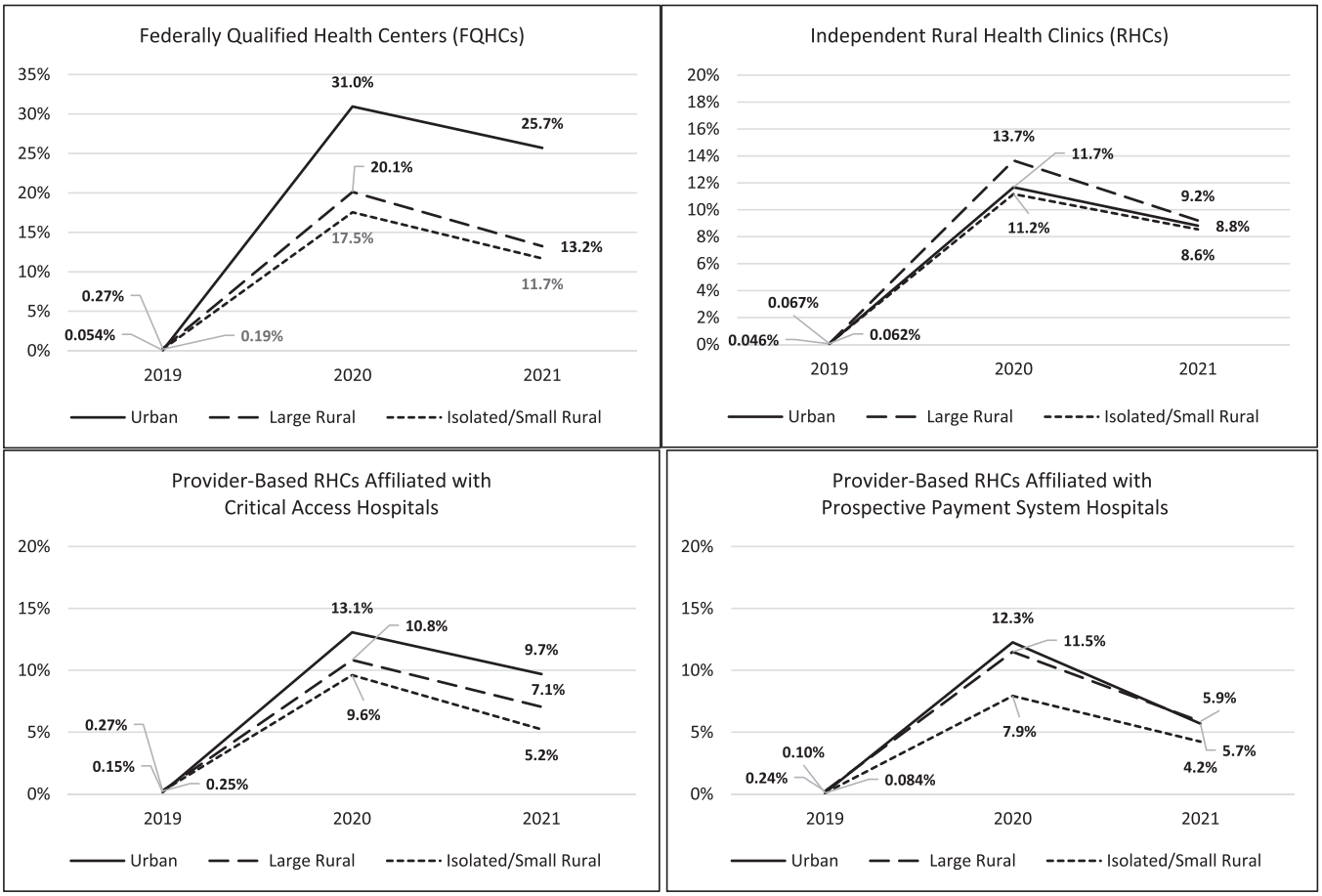
Apart from ID_RHCs in 2019, telehealth was largely being used within wellness and preventive office visits in 2019–2021, accounting for 89%–96% of all telehealth visits (Table A2). Within these office visits, 5%–7% of telehealth visits within FQHCs were specifically addressing mental health issues, compared to 0.8%–1.6% of telehealth visits within RHCs. ID_RHCs were more likely to use telehealth to provide services to residents at nursing facilities (20% of visits) in 2019 than FQHCs (4.6% of visits) and PB_RHCs (5.2%). ID_RHCs were also more likely to use telehealth for chronic care management (14% of visits) in 2019 than FQHCs (2.7%) and PB_RHCs (0.3%). However, those percentages dropped to 0%–5% during the pandemic years of 2020–2021, and all clinic types were then using telehealth primarily within wellness and preventive office visits.

Although 100% of originating site visits were billed as wellness or preventive office visits prior to and during the pandemic, 1%–14% of the originating site office visits were also addressing mental health issues, particularly among FQHCs. A relatively small percentage (1%–2%) of originating site visits also billed for labs, pathology, or imaging.

Similarly, both FQHC and RHC distant site providers were largely billing for wellness or preventive services in 2020 and 2021, once the telehealth flexibilities were in place. A range of 3%–5% of distant site providers at FQHCs addressed mental health issues, whereas mental health comprised a much smaller percentage of distant site visits (0.2%–0.4%) for RHCs.

## Top 10 primary diagnoses for originating and distant site use of telehealth

Mental, behavioral, and neurodevelopmental disorders were the most common diagnoses for telehealth users at FQHCs and PB_RHCs serving as originating sites in 2019–2021 (Figure A1) as well as for FQHCs and PB_RHCs serving as distant site providers in 2020–2021 (Figure A2). Alternatively, the most common conditions addressed by originating and distant site providers at ID_RHCs were much more




Data Source: 2019-2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files
Differences between provider types for all years 2019, 2020 and 2021 were significant at $p < 0.05$.

**FIGURE 3** Percent of outpatient visits conducted using telehealth by clinic type, rural–urban location, and year, 2019–2021.

varied and consisted of not only mental and behavioral disorders but also diseases of the circulatory system, musculoskeletal system, and endocrine, nutritional, and metabolic diseases.

## Health risk profiles of telehealth and non-telehealth users

Telehealth users were more likely to fall into higher risk profiles (RUB categories 4–5) than non-telehealth users prior to and during the pandemic (Table A3). In addition, pre-pandemic telehealth users were more likely to fall into the highest risk profiles (i.e., RUB 5) than telehealth users during the pandemic.

## Types of providers

When FQHCs and RHCs were serving as originating sites, the most common types of providers that beneficiaries were receiving care from were psychiatry, family practice, and nurse practitioners (Table A4). Alternatively, over a third of RHC and FQHC providers serving as distant site providers were family practice (33%–40%), followed by nurse practitioners (23%–29%), internal medicine (13%–19%), and physician assistants (6%–9%) (Table A5). Psychiatry accounted for a higher proportion of distant site providers in FQHCs (6%–8%) than in RHCs (1%–3%).

## Logistic regression predicting telehealth use

### Baseline telehealth provision (pre-pandemic year 2019)

Reflecting the fact that prior to the pandemic, Medicare limited telehealth reimbursement to those clinics serving as originating sites in rural areas, risk adjusted logistic regression models predicting the use of telehealth confirmed that during the pre-pandemic year of 2019, FQHCs located in rural (LR and I/SR) areas were more likely to provide telehealth than FQHCs located in urban counties (ME = 0.0011 and 0.0016, respectively) (Table 1).

In 2019, the use of telehealth was consistently low among all clinic types and differed by less than 1% among RHCs and FQHCs across

**TABLE 1** Logistic regression: predicting the use of telehealth by rural–urban location, clinic type, and time—PHE (2019) and during the PHE (2020-2021).

| | ME | SE | *p*-value | 95% CI_LL | 95% CI_UL |
|---|---|---|---|---|---|
| Variables (rurality, clinic type, PHE) | | | | | |
| I/SR (ref = urban) | 0.0011 | 0.00023 | <0.0001 | 0.00068 | 0.0016 |
| LR | 0.0016 | 0.00035 | <0.0001 | 0.00093 | 0.0023 |
| ID_RHC (ref = FQHC) | −0.000028 | 0.00010 | 0.780 | −0.00023 | 0.00017 |
| PB_RHC_CAH | 0.00080 | 0.00038 | 0.036 | 0.00051 | 0.0016 |
| PB_RHC_PPS | 0.00045 | 0.00045 | 0.327 | −0.00045 | 0.0013 |
| PHE (2020–2021) (ref = 2019) | 0.246 | 0.0019 | <0.0001 | 0.242 | 0.249 |
| Two-way interactions | | | | | |
| PHE × I/SR | 0.144 | 0.0025 | <0.0001 | 0.139 | 0.149 |
| PHE × LR | 0.158 | 0.0028 | <0.0001 | 0.152 | 0.163 |
| PHE × ID_RHC | 0.105 | 0.0032 | <0.0001 | 0.099 | 0.111 |
| PHE × PB_RHC_CAH | 0.093 | 0.0029 | <0.0001 | 0.087 | 0.099 |
| PHE × PB_RHC_PPS | 0.110 | 0.0035 | <0.0001 | 0.103 | 0.117 |
| LR × ID_RHC | −0.0004 | −0.00013 | 0.722 | −0.0003 | −0.00020 |
| LR × PB_RHC_CAH | 0.00150 | 0.00065 | 0.021 | −0.0022 | 0.0028 |
| LR × PB_RHC_PPS | 0.00163 | 0.00067 | 0.015 | 0.00032 | 0.0029 |
| I/SR × ID_RHC | −0.0004 | 0.00013 | <0.0001 | −0.0003 | 0.00022 |
| I/SR × PB_RHC_CAH | 0.0012 | 0.00051 | 0.0219 | 0.00018 | 0.0022 |
| I/SR × PB_RHC_PPS | −0.0001 | 0.00048 | 0.713 | −0.0011 | 0.00077 |
| Three-way interactions | | | | | |
| PHE × LR × ID_RHC | 0.117 | 0.0028 | <0.0001 | 0.111 | 0.122 |
| PHE × LR × PB_RHC_CAH | 0.086 | 0.0026 | <0.0001 | 0.081 | 0.091 |
| PHE × LR × PB_RHC_PPS | 0.089 | 0.0024 | <0.0001 | 0.084 | 0.093 |
| PHE × I/SR × ID_RHC | 0.102 | 0.0032 | <0.0001 | 0.096 | 0.108 |
| PHE × I/SR × PB_RHC_CAH | 0.062 | 0.0012 | <0.0001 | 0.060 | 0.065 |
| PHE × I/SR × PB_RHC_PPS | 0.077 | 0.0018 | <0.0001 | 0.074 | 0.081 |
| Age | | | | | |
| Age 65–74 years (ref = age < 65 years) | −0.0336 | 0.00134 | <0.0001 | −0.0362 | −0.0310 |
| Age 75–84 years | −0.0483 | 0.00145 | <0.0001 | −0.0512 | −0.0465 |
| Age 85 years and older | −0.0499 | 0.00170 | <0.0001 | −0.0532 | −0.0465 |
| Gender | | | | | |
| Male (ref = female) | −0.0128 | 0.00094 | <0.0001 | −0.0146 | −0.0193 |
| Race | | | | | |
| Black (ref = White) | −0.0159 | 0.00144 | <0.0001 | −0.0187 | −0.01303 |
| Asian | 0.0418 | 0.00303 | <0.0001 | 0.0359 | 0.0478 |
| Hispanic | 0.00360 | 0.00182 | 0.048 | 0.0000381 | 0.00717 |
| North American Native | −0.00657 | 0.00408 | 0.108 | −0.0146 | 0.00143 |
| Unknown | 0.0104 | 0.00270 | <0.0001 | 0.00511 | 0.0157 |
| RUBs | | | | | |
| 2: Low morbidity (ref = healthy user) | 0.00680 | 0.00374 | 0.069 | −0.00053 | 0.0141 |
| 3: Moderate morbidity | 0.0109 | 0.00303 | <0.0001 | 0.00491 | 0.0170 |
| 4: High morbidity | 0.0183 | 0.00314 | <0.0001 | 0.0122 | 0.0245 |
| 5: Very high morbidity | 0.0221 | 0.00318 | <0.0001 | 0.0159 | 0.0283 |

(Continues)

**TABLE 1** (Continued)

| | ME | SE | *p*-value | 95% CI_LL | 95% CI_UL |
|---|---|---|---|---|---|
| Clinic visit volume (*n*) (quartiles) | | | | | |
| Q2: $16 \leq n \leq 40$ (ref = Q1: $n < 16$) | 0.0103 | 0.00173 | <0.0001 | 0.00688 | 0.0137 |
| Q3: $40 < n \leq 100$ | 0.0155 | 0.00168 | <0.0001 | 0.0123 | 0.0188 |
| Q4: $n > 100$ | 0.0196 | 0.00158 | <0.0001 | 0.0165 | 0.0227 |
| Duals | | | | | |
| Full-year dual (ref = non-dual) | 0.0345 | 0.00121 | <0.0001 | 0.0322 | 0.0369 |
| Part-year dual | 0.00964 | 0.00167 | <0.0001 | 0.00637 | 0.0129 |

*Note*: Regression analysis adjusted for differences in patient age, gender, race, and health status (measured using Johns Hopkins ACG System Resource Utilization Bands [RUBs]) and clinic size (measured using clinic visit volume); regression analysis clustered.
Abbreviations: CI_LL, confidence interval lower level; CI_UL, confidence interval upper level; FQHC, Federally Qualified Health Center; FTE, full-time equivalent; I/SR, isolated small rural/small rural; ID_RHC, independent RHC; LR, large rural; ME, marginal effect; PB_RHC_CAH, provider-based RHC affiliated with a Critical Access Hospital (CAH); PB_RHC_PPS, provider-based RHC affiliated with a prospective payment system (PPS) hospital; PHE, Public Health Emergency 2020–2021; ref, reference; RHC, Rural Health Clinics; SE, standard error.
*Source*: 2019–2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files.

all geographic areas (Table 2, Column B). ID_RHCs were less likely to provide telehealth services than FQHCs across urban and rural counties in 2019 (probabilities [i.e., MEs] <0), whereas PB_RHCs affiliated with CAHs were more likely to provide telehealth services in urban and rural counties than FQHCs (probabilities [i.e., MEs] >0) (Table 2, Column B). Similarly, in the pre-pandemic period, PB_RHCs affiliated with PPS hospitals were also more likely to provide telehealth in urban and LR counties than FQHCs (where the probability of using telehealth was 0.044% and 0.046% higher than FQHCs, respectively), but less likely to provide telehealth in more remote (I/SR) counties than FQHCs (probabilities [i.e., ME] <0).

## Change in telehealth provision pre-pandemic to during the pandemic

During the pandemic years of 2020 and 2021, FQHCs across all geographic areas realized the largest increase in the probability of telehealth use compared to 2019. Specifically, the probability of using telehealth among FQHCs increased by 24.6% in urban, 15.8% in LR, and 14.4% in I/SR (Table 2, Column A). Although the levels of telehealth use across all RHCs were in the 8%–14% range in 2020 (Figure 3), lower baseline rates of pre-pandemic telehealth use by ID_RHCs in rural and urban counties, and by PB_RHCs affiliated with PPS hospitals in I/SR counties contributed to the pandemic's greater impact on the likelihood of telehealth use among these clinics. Among ID-RHCs, the probability of using telehealth increased by 11.7% in LR counties and 10.2% in I/SR counties and by 8.9% in LR and 7.7% in I/SR for PB_RHCs affiliated with PPS hospitals (Table 2, Column A). Alternatively, higher baseline (pre-pandemic) rates of telehealth use among PB_RHCs affiliated with CAHs translated into the pandemic having less of an impact on their use of telehealth: an 8.6% increase in telehealth use in LR and 6.2% in I/SR. Ultimately, the dramatic increase in the use of telehealth among ID_RHCs and PB_RHCs affiliated with PPS hospitals during the pandemic narrowed the difference in telehealth usage rates between ID_RHCs and PB_RHCs (Figure 3).

## Telehealth use by RHCs compared to FQHCs during the pandemic

During the pandemic years of 2020–2021, all types of RHCs in rural and urban counties were less likely to provide telehealth services than FQHCs (probabilities [i.e., MEs] <0) (Table 2, Column C).

## Other predictors of telehealth Use

Approximately a third (32.6%) of the sample of Medicare FFS beneficiaries who had used services at FQHCs and RHCs were full-year duals and 8.3% were part-year duals. In logistic regression, dual eligibles were significantly more likely to use telehealth than non-duals (see Table 1). Larger clinic size (measured by clinic visit volume) and greater patient (health risk) complexity were associated with higher probabilities of using telehealth services.

# DISCUSSION AND CONCLUSIONS

Although telehealth played a key role in facilitating access to services during the height of the pandemic (2020) and continued in 2021, the use of telehealth only partially offset the decline in in-person outpatient visits for Medicare FFS beneficiaries using outpatient services at FQHCs and RHCs. Reflecting the fact that Medicare payment policies were limited to the provision of telehealth at originating sites in rural locations prior to the pandemic, RHCs—particularly PB_RHCs affiliated with CAHs—were more likely to provide telehealth services in 2019 than urban FQHCs. The exception to this were ID_RHCs and PB_RHCs affiliated with PPS hospitals located in I/SR counties, where

**TABLE 2** Logistic regression: probability of using telehealth for a selected set of contrasts reflecting three-way interaction terms—rural–urban location, clinic type, and pre- PHE (2019) to 2020/2021.

| | Probability of telehealth use relative to the pre-PHE period (2019) | Probability of telehealth use relative to FQHCs | |
|---|---|---|---|
| Clinic type | A. 2019 to 2020/2021 | B. 2019 | C. 2020/2021 |
| **Urban** | | | |
| FQHCs | 24.6 | NA | NA |
| ID_RHCs | 10.5 | −0.0003 | −14.07 |
| PB_RHCs_CAHs | 9.3 | 0.080 | −15.19 |
| PB_RHCs_PPS | 11.0 | 0.044 | −13.53 |
| **Large rural** | | | |
| FQHCs | 15.8 | NA | NA |
| ID_RHCs | 11.7 | −0.170 | −4.30 |
| PB_RHCs_CAHs | 8.6 | 0.068 | −7.08 |
| PB_RHCs_PPS | 8.9 | 0.046 | −6.87 |
| **Isolated/Small rural** | | | |
| FQHCs | 14.4 | NA | NA |
| ID_RHCs | 10.2 | −0.119 | −4.29 |
| PB_RHCs_CAHs | 6.2 | 0.087 | −8.04 |
| PB_RHCs_PPS | 7.7 | −0.085 | −6.74 |

*Note*: Marginal effects are the differences in probabilities for selected contrasts and are listed as percentages in this table. Models were adjusted for differences in patient age, gender, race, and health status (measured using Johns Hopkins ACG System Resource Utilization Bands [RUBs]) and clinic size (measured using clinic visit volume). Regression analysis clustered by person and clinic. See Table 1 for original model estimates for two- and three-way interaction terms.

Abbreviations: FQHC, Federally Qualified Health Center; ID_RHC, independent RHC; PB_RHC_CAH, provider-based RHC affiliated with a Critical Access Hospital (CAH); PB_RHC_PPS, provider-based RHC affiliated with a prospective payment system (PPS) hospital; PHE, Public Health Emergency 2020–2021; RHC, Rural Health Clinics.

*Source*: 2019–2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files.

they were less likely to provide telehealth services in 2019 than urban FQHCs.

The telehealth flexibilities introduced during the pandemic were associated with significant increases in clinics' use of telehealth services. This was particularly true for FQHCs in urban counties, where they outpaced RHCs in adapting to the demand for telehealth services. Thus, RHCs realized a lower probability of using telehealth services than FQHCs, and lower telehealth usage rates during the pandemic.

## Limitations

These findings pertain to the Medicare FFS population and are not generalizable to the Medicare population that includes Medicare Advantage (MA) enrollees. Although MA enrollment rates in rural areas have quadrupled from 11% to 40% over the past decade, MA enrollment levels were still lower in rural areas (40%) compared to metropolitan areas (53%) in 2023.[22] Based on a study analyzing the use of telehealth among both FFS and MA enrollees in 2021, MA beneficiaries were more likely to have a provider that offered telehealth, yet they were 3.5 percentage points less likely to use telehealth services than FFS beneficiaries.[23] Thus, this study likely overestimates the impact of the telehealth flexibilities on the use of telehealth by the general Medicare population inclusive of MA beneficiaries, particularly in urban areas. Given the higher penetration rates of MA plans in urban counties, the inclusion of MA enrollees would likely also yield less of a difference in the use of telehealth among rural and urban facilities. Nevertheless, our findings are consistent with that of other studies documenting trends in the use of telehealth services during the pandemic.[24,25]

Given that the 5% Medicare LDS files are representative of the Medicare FFS population, and that the number of FQHCs and RHCs identified in the files is comparable to the national number of clinics throughout the United States, any limitations associated with the use of the 5% sample in terms of the generalizability of the results to the experience of FFS Medicare population(s) using RHC and FQHC services should be minimal.

## POLICY IMPLICATIONS

This study is among the first to document the extent to which FQHCs and RHCs were providing telehealth services during the pandemic. Relaxing telehealth regulations during the COVID-19 PHE encouraged greater use of telehealth services, particularly TBH services among FQHCs and RHCs, but did not make up for the overall decline in the use of services early on in the pandemic. Yet, as demonstrated by the dramatic increase in the use of telehealth services by FQHCs and RHCs during the pandemic, and the continued use of telehealth at higher levels than in 2019 signals telehealth's potential to facilitate access to care, and reduce rural-urban health and behavioral health disparities.[26,27]

The fact that FQHCs located in rural counties were more likely to provide telehealth services in the pre-pandemic period than urban FQHCs may be attributable—in part—to Medicare regulations limiting the use of telehealth to originating sites in rural locations. The finding that PB_RHCs affiliated with CAHs were more likely to provide telehealth services in 2019 than urban FQHCs may also be reflective of pre-pandemic telehealth regulations. In addition, RHCs affiliated with CAHs may have access to a greater set of resources supporting the use of telehealth through their parent organizations (CAHs) than ID_RHCs.

Lower probabilities of telehealth use and lower overall telehealth usage rates among RHCs compared to FQHCs during the pandemic—particularly in more remote rural locations—aligns with the studies documenting barriers to accessing care (and telehealth services) in rural areas, namely staffing shortages,[28] the need for additional staff

training related to the use of telehealth for smaller clinics,[29] a lack of broadband in more remote rural locations,[30] and lower levels of digital literacy among aging rural populations.[31] Assurances of continued coverage of telehealth services for distant site providers, and equitable reimbursement for telehealth versus in-person visits across RHCs' payor mix may encourage continued use of telehealth as a tool to ensure access to care. Future research addressing the potential need for technical and/or financial assistance related to implementing telehealth within smaller (independent) RHCs as well as supporting RHCs in facilitating telehealth access to behavioral health and other specialty services is needed.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

## DISCLOSURES

None.

## ORCID

*Yvonne Jonk PhD* https://orcid.org/0000-0003-3309-3445
*John Gale MS* https://orcid.org/0000-0002-3449-8818

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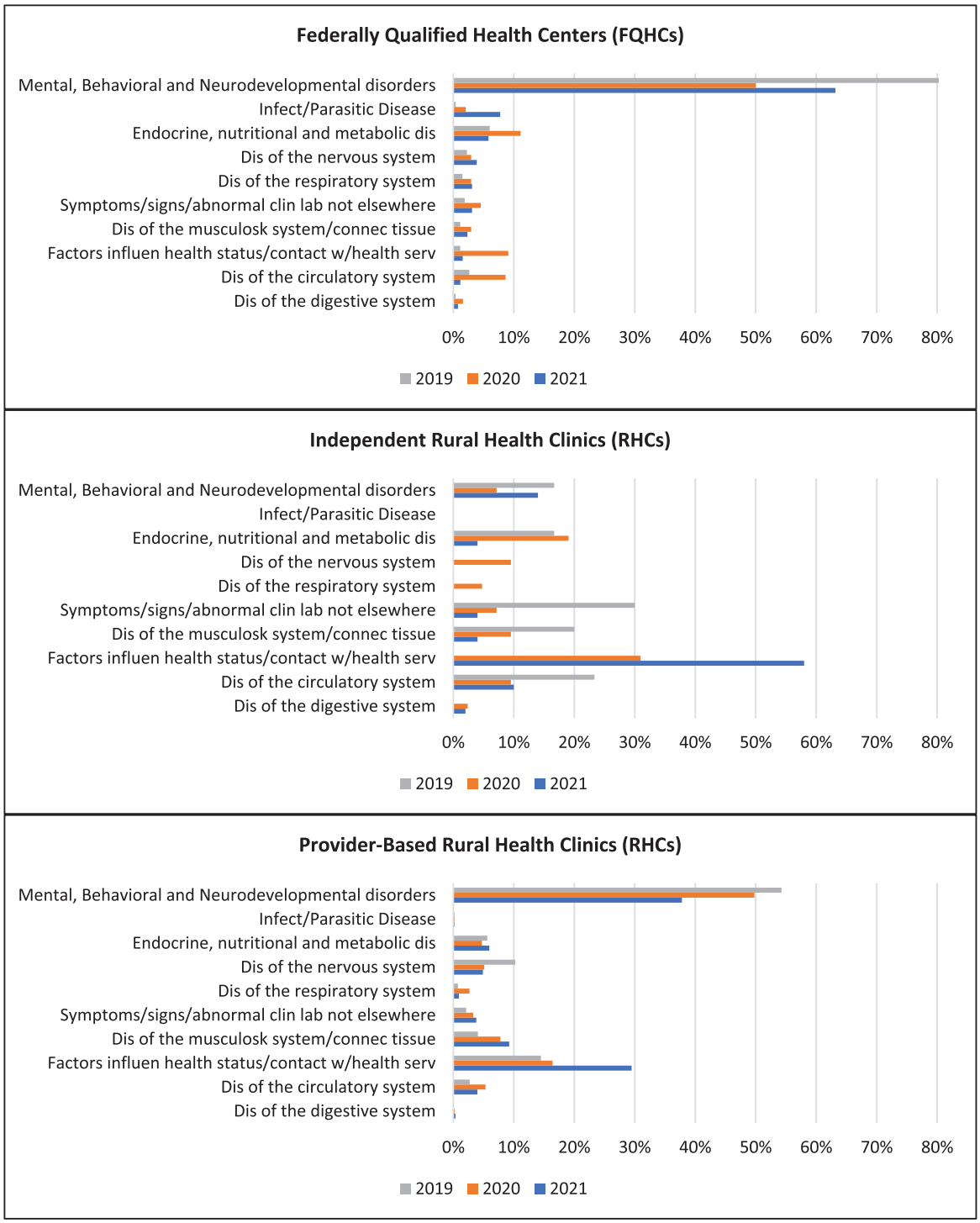
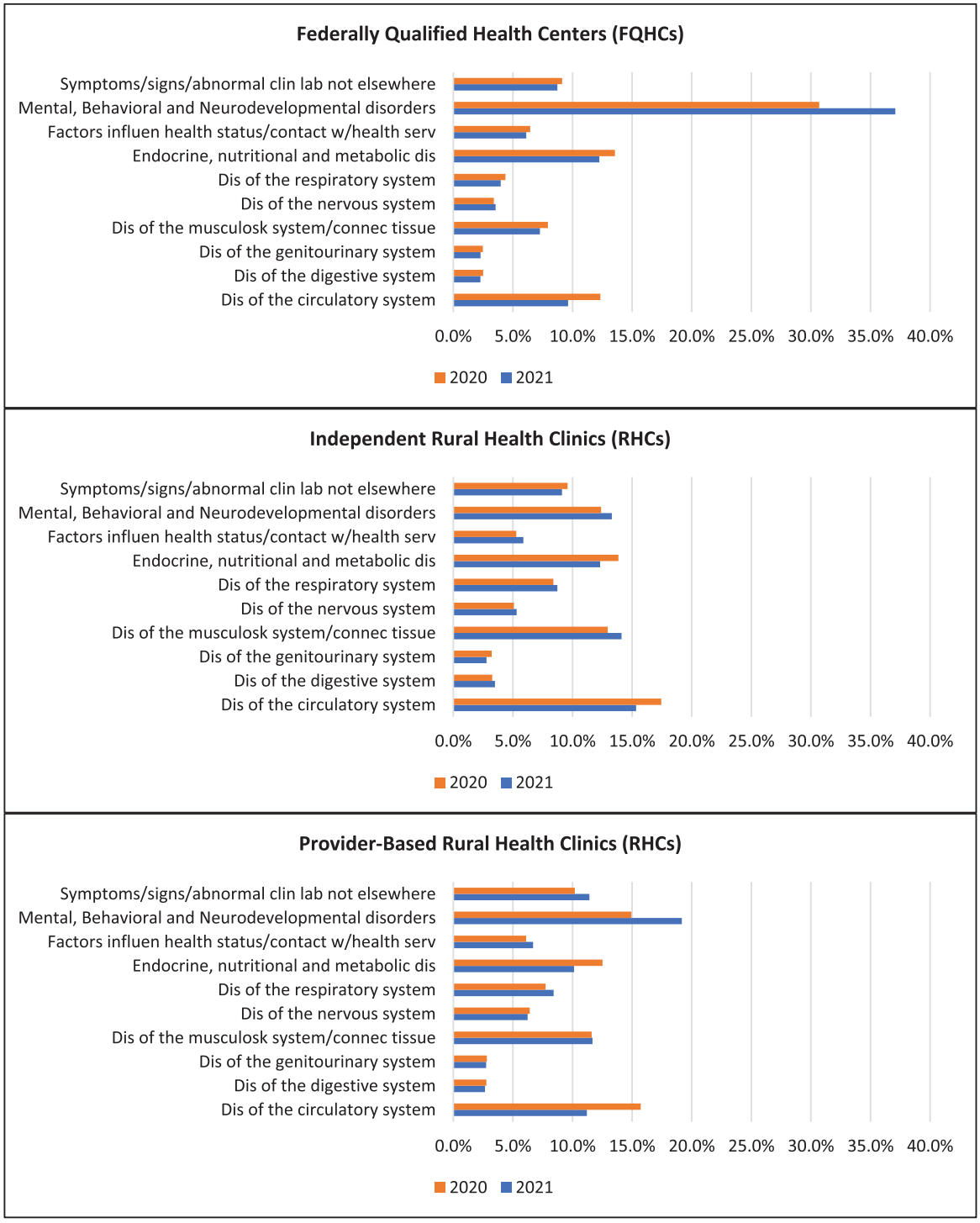
## APPENDIX




Data Source: 2019-2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files (SAFs)
Notes: Dis = Diseases; Diagnoses codes were grouped using the ICD10Data.com diagnosis code groupings at the large level.

**FIGURE A1** Top 10 primary diagnoses for Medicare Fee-for-Service beneficiaries using telehealth at Federally Qualified Health Centers and independent and provider-based Rural Health Clinics serving as originating sites, 2019–2021.




Data Source: 20209-2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files (SAFs)
Notes: Dis = Diseases; Diagnoses codes were grouped using the ICD10Data.com diagnosis code groupings at the large level.

**FIGURE A2** Top 10 primary diagnoses for Medicare Fee-for-Service beneficiaries using telehealth via distant site providers affiliated with Federally Qualified Health Centers and independent and provider-based Rural Health Clinics, 2020–2021.

**TABLE A1** Codes used to identify telehealth visits in Medicare Fee-for-Service administrative claims data, 2019–2021.

| Code | Description |
|---|---|
| G0071 | Federally Qualified Health Center (FQHC) and Rural Health Clinic (RHC) telehealth services |
| G0406 | Inpatient/Telehealth follow-up 15 min |
| G0407 | Inpatient/Telehealth follow-up 25 min |
| G0408 | Inpatient/Telehealth follow-up 35 min |
| G0425 | Inpatient/Emergency-department tele-consult 30 min |
| G0426 | Inpatient/Emergency-department tele-consult 50 min |
| G0427 | Inpatient/Emergency-department tele-consult 70 min |
| G0459 | Telehealth inpatient pharmacy management |
| G2025 | FQHC and RHC telehealth services; audio-only services (telehealth CPT codes 99441, 99442, and 99443) are billable under the new G2025 code |
| G2061 | Qualified non-physician health care professional online assessment and management, for an established patient, for up to 7 days, cumulative time during the 7 days; 5–10 min |
| G2062 | Qualified non-physician health care professional online assessment and management service, for an established patient, for up to 7 days, cumulative time during the 7 days; 11–20 min |
| G2063 | Qualified non-physician qualified health care professional assessment and management service, for an established patient, for up to 7 days, cumulative time during the 7 days; 21 or more minutes |
| 99421 | Online digital evaluation and management service, for an established patient, for up to 7 days, cumulative time during the 7 days; 5–10 min |
| 99422 | Online digital evaluation and management service, for an established patient, for up to 7 days, cumulative time during the 7 days; 11–20 min |
| 99423 | Online digital evaluation and management service, for an established patient, for up to 7 days, cumulative time during the 7 days; 21 or more minutes |
| 99441 | Telephone E/M service (5–10 minutes) |
| 99442 | Telephone E/M service (11–20 min) |
| 99443 | Telephone E/M service (20–30 min) |
| 99446 | Interprofessional telephone/Internet assessment |
| 99447 | Under interprofessional telephone/Internet/Electronic Health Record consultations |
| 99448 | Under interprofessional Telephone/Internet/Electronic Health Record consultations |
| 99449 | Non-face-to-face evaluation and management services, interprofessional telephone/Internet/Electronic Health Record consultations |
| 99451 | Interprofessional telephone/Internet/Electronic Health Record assessment and management service provided by a consultative physician |
| G2010 | Remote evaluation of recorded video and/or images submitted by an established patient (e.g., store and forward), including interpretation with follow-up with the patient within 24 business hours, not originating from a related E/M service provided within the previous 7 days nor leading to an E/M service or procedure within the next 24 h or soonest available appointment |
| G2012 | Virtual check-in |
| 98966-68 | Telephone assessment and management service provided by a qualified non-physician health care professional to an established client, parent, or guardian |
| 98970 | Qualified non-physician health care professional online digital evaluation and management service |
| 98971-72 | Non-face-to-face non-physician services, Online Digital Assessment and Management Service by qualified non-physician health care professional |
| 0188T | Remote real-time interactive video-conferenced critical care services (stopped in 2019) |
| 99452 | Non-face-to-face evaluation and management services, interprofessional telephone/Internet/Electronic Health Record consultations |
| G0508 | HCPCS code for telehealth consultation, critical care |
| G0509 | Telehealth consultation, critical care |
| G2250 | Documentation assessment (Remote) |

(Continues)

**TABLE A1** (Continued)

| Code | Description |
|---|---|
| G2251 | Brief communication technology-based service, e.g., virtual check-in |
| G2252 | Brief communication technology-based service, e.g., virtual check-in |
| 95250 | Ambulatory continuous glucose monitoring of interstitial tissue fluid via a subcutaneous sensor for a minimum of 72 h |
| 95251 | Ambulatory continuous glucose monitoring of interstitial tissue fluid via a subcutaneous sensor for a minimum of 72 h |
| 99091 | Non-face-to-face evaluation and management services, digitally stored data and remote physiologic monitoring services |
| 99454 | Supplying and monitoring patients with remote patient monitoring devices |
| 99457 | Chronic care remote patient monitoring |
| 99453 | Setup code for Remote patient monitoring and reimburses physicians for the time it takes to help patients set up and learn how to use their devices |
| Q3014 | Telehealth originating site facility fee |
| Modifiers | |
| 95 | Synchronous telemedicine service rendered via a real-time interactive audio and video telecommunication system |
| GT | Session was administered via a telecommunications system |
| GQ | Services delivered via asynchronous telecommunications system |
| G0 | Effective January 1, 2019: telehealth services furnished for purposes of diagnosis or evaluation |
| 93 | Synchronous telemedicine service rendered via telephone or other real-time interactive audio-only telecommunications system |

**TABLE A2** Types of services provided through telehealth for Medicare Fee-for-Service beneficiaries by Federally Qualified Health Centers (FQHCs) and independent and provider-based Rural Health Clinics (RHCs), 2019–2021.

| | Percent of all telehealth visits | | | Percent of originating site visits | | | Percent of distant site visits | | |
|---|---|---|---|---|---|---|---|---|---|
| | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 | 2019 | 2020 | 2021 |
| **FQHCs (*n* visits, %)** | **474** | **108,175** | **86,706** | **266** | **440** | **258** | | **85,961** | **77,082** |
| Wellness/Preventive office visit | 94.3 | 93.4 | 96.3 | 100 | 100 | 100 | NA | 100 | 100 |
| Substance use disorder | – | – | 0.1 | – | – | – | NA | – | – |
| Other | 0.8 | 0.3 | 0.5 | – | 4.8 | – | NA | 0.2 | 0.5 |
| Nursing facility | 4.6 | 0.6 | 0.3 | – | – | – | NA | 0.3 | – |
| Mental health | 7.0 | 6.4 | 5.4 | 5.3 | 11.4 | 14.3 | NA | 4.5 | 3.2 |
| Lab/Path/Imaging | 7.6 | 0.3 | 0.3 | 1.9 | 2.3 | 1.6 | NA | 0.2 | 0.2 |
| Drugs/Inject | 2.7 | 0.1 | 0.2 | – | – | – | NA | 0.1 | 0.1 |
| Chronic care management | 2.7 | 5.1 | 1.8 | – | 4.1 | 1.6 | NA | 0.1 | 0.1 |
| Acute care/physical health | 5.9 | 0.1 | 0.1 | – | 0.2 | – | NA | – | – |
| **Independent RHCs (*n* visits, %)** | **90** | **16,269** | **11,273** | **30** | **42** | **50** | | **12,147** | **9,569** |
| Wellness/Preventive office visit | 65.6 | 90.7 | 94.9 | 100 | 100 | 100 | NA | 100 | 100 |
| Substance use disorder | – | – | 0.1 | – | – | – | NA | – | 0.1 |
| Other | – | 0.1 | 0.2 | – | – | – | NA | – | – |
| Nursing facility | 20.0 | 5.3 | 2.4 | – | 4.8 | – | NA | 1.2 | 0.8 |
| Mental health | – | 0.8 | 0.9 | – | – | 4.0 | NA | 0.3 | 0.2 |
| Lab/Path/Imaging | 1.1 | 0.4 | 0.4 | – | – | – | NA | 0.3 | 0.1 |
| Drugs/Inject | – | 0.2 | 0.1 | – | – | – | NA | 0.2 | 0.1 |
| Chronic care management | 14.4 | 4.7 | 2.8 | – | – | – | NA | 0.5 | 0.3 |
| Acute care/physical health | 4.4 | 0.4 | 0.2 | – | – | – | NA | 0.1 | – |
| **Provider-based RHCs (*n* visits, %)** | **686** | **31,439** | **19,319** | **518** | **488** | **553** | | **23,272** | **15,325** |
| Wellness/Preventive office visit | 93.4 | 89.0 | 94.4 | 100 | 100 | 100 | NA | 100 | 100 |
| Substance use disorder | – | 0.1 | 0.1 | – | – | – | NA | 0.1 | 0.1 |
| Other | 0.1 | 0.2 | 0.3 | 0.2 | – | – | NA | 0.2 | 0.4 |
| Nursing facility | 5.2 | 4.2 | 2.4 | – | 0.4 | – | NA | – | 0.1 |
| Mental health | 1.0 | 1.2 | 1.6 | 1.0 | 4.1 | – | NA | 0.3 | 0.4 |
| Lab/Path/Imaging | 1.7 | 0.4 | 0.6 | 1.0 | 0.2 | – | NA | 0.3 | 0.4 |
| Drugs/Inject | 0.6 | 0.3 | 0.3 | – | 0.6 | 0.7 | NA | 0.2 | 0.1 |
| Chronic care management | 0.3 | 6.2 | 2.1 | 0.2 | 0.4 | – | NA | 0.6 | 0.1 |
| Acute care/physical health | 7.4 | 0.8 | 0.8 | – | 0.4 | 0.4 | NA | 0.1 | 0.1 |

*Note*: Percentages may not sum to 100% as each visit could have more than one type of Healthcare Common Procedure Coding System (HCPCS) or Current Procedural Terminology (CPT) code. Service codes were grouped using the Restructured BETOS Classification System (RBCS) and the Healthcare Cost and Utilization Project (HCUP) Clinical Classifications Software (CCS).
*Source*: 2019–2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files.

**TABLE A3** Risk profiles of telehealth and non-telehealth users by clinic type, 2019–2020.

| | Non-telehealth users | | | | Telehealth users | | | |
|---|---|---|---|---|---|---|---|---|
| Year/RUBs (%) | FQHC | ID_RHC | PB_RHC_CAH | PB_RHC_PPS | FQHC | ID_RHC | PB_RHC_CAH | PB_RHC_PPS |
| **2019** | **Urban** | | | | | | | |
| RUB1: Healthy users | 1.3 | 1.3 | 1.3 | 1.2 | NR | –0- | –0- | –0- |
| RUB2: Low morbidity | 5.7 | 5.0 | 4.1 | 4.5 | –0- | –0- | NR | –0- |
| RUB3: Moderate morbidity | 53.0 | 46.9 | 45.4 | 46.9 | 38.7 | NR | 26.1 | NR |
| RUB4: High morbidity | 21.6 | 23.1 | 24.4 | 24.6 | 27.7 | NR | 32.6 | 13.3 |
| RUB5: Very high morbidity | 18.4 | 23.7 | 24.8 | 22.8 | **32.8**** | **65.0**** | **39.1*** | **73.3**** |
| **Large rural** | | | | | | | | |
| RUB1: Healthy users | 1.0 | 1.3 | 1.1 | 1.1 | –0- | –0- | –0- | –0- |
| RUB2: Low morbidity | 4.7 | 4.5 | 4.5 | 4.5 | –0- | NR | NR | –0- |
| RUB3: Moderate morbidity | 50.4 | 49.1 | 46.6 | 45.3 | 28.4 | 30.3 | 24.5 | 15.9 |
| RUB4: High morbidity | 23.9 | 23.3 | 24.6 | 24.5 | 30.7 | 30.3 | 32.1 | 31.7 |
| RUB5: Very high morbidity | 20.1 | 21.7 | 23.2 | 24.6 | **40.9**** | **36.4*** | **41.5**** | **52.4**** |
| **Isolated/Small rural** | | | | | | | | |
| RUB1: Healthy users | 1.3 | 1.3 | 1.1 | 1.0 | NR | –0- | NR | –0- |
| RUB2: Low morbidity | 5.3 | 5.5 | 4.4 | 4.3 | NR | NR | NR | –0- |
| RUB3: Moderate morbidity | 50.2 | 47.3 | 47.0 | 46.7 | 31.5 | 30.0 | 18.8 | NR |
| RUB4: High morbidity | 23.1 | 23.8 | 24.3 | 24.6 | **31.5*** | 27.5 | **33.0**** | 27.1 |
| RUB5: Very high morbidity | 20.1 | 22.0 | 23.2 | 23.4 | **34.2**** | **40.0**** | **46.7**** | **58.3**** |
| **2020** | **Urban** | | | | | | | |
| RUB1: Healthy users | 3.6 | 2.1 | 1.7 | 1.1 | 1.4 | 0.56 | NR | NR |
| RUB2: Low morbidity | 8.7 | 6.6 | 5.7 | 5.0 | 4.6 | 3.1 | 2.5 | 2.4 |
| RUB3: Moderate morbidity | 56.3 | 49.9 | 51.2 | 52.4 | 50.7 | 43.7 | 40.3 | 40.2 |
| RUB4: High morbidity | 17.3 | 21.1 | 22.4 | 22.4 | **23.3**** | **24.3**** | **26.9**** | **26.3**** |
| RUB5: Very high morbidity | 14.2 | 20.2 | 19.0 | 19.0 | **20.1**** | **28.4**** | **29.9**** | **30.7**** |
| **Large rural** | | | | | | | | |
| RUB1: Healthy users | 2.0 | 1.9 | 1.4 | 1.5 | 1.0 | 0.75 | NR | 0.44 |
| RUB2: Low morbidity | 7.0 | 6.4 | 5.7 | 5.8 | 3.5 | 2.7 | 1.8 | 2.0 |
| RUB3: Moderate morbidity | 54.1 | 53.3 | 51.0 | 49.7 | 45.3 | 42.0 | 40.9 | 38.8 |
| RUB4: High morbidity | 20.6 | 20.4 | 23.4 | 22.9 | **25.5**** | **26.4**** | **27.2**** | **26.5**** |
| RUB5: Very high morbidity | 16.3 | 18.0 | 18.5 | 20.0 | **24.6**** | **28.1**** | **29.9**** | **32.2**** |
| **Isolated/Small rural** | | | | | | | | |
| RUB1: Healthy users | 1.3 | 1.7 | 1.3 | 1.5 | 0.67 | NR | 0.40 | NR |
| RUB2: Low morbidity | 5.3 | 6.8 | 5.8 | 5.4 | 3.3 | 2.9 | 2.4 | 2.2 |
| RUB3: Moderate morbidity | 50.2 | 51.6 | 51.1 | 51.4 | 46.3 | 42.4 | 37.3 | 38.2 |
| RUB4: High morbidity | 23.1 | 21.3 | 22.6 | 22.0 | **25.3**** | **25.3**** | **27.8**** | **27.0**** |
| RUB5: Very high morbidity | 20.1 | 18.7 | 19.2 | 19.6 | **24.4**** | **29.0**** | **32.2**** | **32.5**** |

*Note*: "**"/"*" is significant at $p \leq 0.01/0.05$, respectively. Bolded percentages highlight the findings that telehealth users were more likely to fall into higher risk profiles (RUB categories 4–5) than non-telehealth users. Although telehealth users tended to have higher comorbidity than non-telehealth users, pre-pandemic telehealth users were more likely to fall into higher risk profiles (i.e., RUB 5) than telehealth users during the pandemic.

Abbreviations: FQHC, Federally Qualified Health Center; ID_RHC, independent RHC; NR, not reported due to cell sizes less than 10 persons; PB_RHC_CAH, provider-based RHC affiliated with a Critical Access Hospital (CAH); PB_RHC_PPS, provider-based RHC affiliated with a prospective payment system (PPS) hospital; RHC, Rural Health Clinics; RUB, Resource Utilization Band (identified using Johns Hopkins ACG System).

*Source*: 2019–2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files.

**TABLE A4** Types of providers serving Medicare Fee-for-Service beneficiaries at Federally Qualified Health Centers and independent and provider-based Rural Health Clinics serving as originating sites, 2019–2021.

| 2019 | | 2020 | | 2021 | |
|---|---|---|---|---|---|
| **Federally Qualified Health Centers (FQHCs)** | | | | | |
| Unknown specialty | 39.8% | Nurse practitioner | 20.9% | Psychiatry | 24.8% |
| Psychiatry | 30.1% | Psychiatry | 18.9% | Family practice | 24.0% |
| Neurology | 13.5% | Unknown specialty | 18.2% | Nurse practitioner | 21.7% |
| General practice | 9.8% | Family practice | 15.0% | General practice | 13.2% |
| Internal medicine | 2.3% | Internal medicine | 12.7% | Unknown specialty | 11.2% |
| Addiction medicine | 1.1% | General practice | 5.0% | Physician assistant | 3.1% |
| Nurse practitioner | 1.1% | Neurology | 3.0% | Internal medicine | 2.3% |
| Family practice | 0.8% | Physician assistant | 1.8% | | |
| Physician assistant | 0.8% | Gastroenterology | 0.7% | | |
| | | Geriatric medicine | 0.7% | | |
| | | Cardiology | 0.5% | | |
| | | Licensed clinical social worker | 0.5% | | |
| | | Otolaryngology | 0.2% | | |
| | | Mammography | 0.2% | | |
| | | Podiatry | 0.2% | | |
| | | Emergency medicine | 0.2% | | |
| | | Hospitalist | 0.2% | | |
| **Independent Rural Health Clinics (RHCs)** | | | | | |
| General practice | 43.3% | Family practice | 57.1% | Family practice | 58.0% |
| Unknown specialty | 33.3% | Nurse practitioner | 16.7% | Nurse practitioner | 22.0% |
| Family practice | 16.7% | Internal medicine | 9.5% | Physician assistant | 10.0% |
| Psychiatry | 6.7% | General practice | 7.1% | Unknown specialty | 4.0% |
| | | Unknown specialty | 7.1% | Cardiology | 2.0% |
| | | Physician assistant | 2.4% | Emergency medicine | 2.0% |
| | | | | Hospitalist | 2.0% |
| **Provider-Based Rural Health Clinics (RHCs)** | | | | | |
| Psychiatry | 33.4% | Psychiatry | 33.8% | Family practice | 31.1% |
| Unknown specialty | 32.8% | Family practice | 19.1% | Psychiatry | 19.5% |
| Family practice | 10.6% | Nurse practitioner | 11.5% | Unknown specialty | 11.4% |
| Internal medicine | 6.6% | Internal medicine | 10.0% | Nurse practitioner | 9.6% |
| Sleep medicine | 5.6% | Unknown specialty | 8.8% | Internal medicine | 7.8% |
| Physical medicine/rehab | 2.1% | General practice | 3.5% | Hospitalist | 4.7% |
| General practice | 1.7% | Cardiology | 2.5% | Physician assistant | 2.9% |
| Hematology/oncology | 1.5% | Anesthesiology | 1.8% | General practice | 2.4% |
| Cardiology | 1.0% | Sleep medicine | 1.8% | Physical medicine/rehab | 2.0% |
| Interventional pain Mgt | 1.0% | Hospitalist | 1.8% | Neurology | 1.4% |
| Pulmonary disease | 1.0% | Physician assistant | 1.6% | Podiatry | 1.4% |
| Anesthesiology | 0.8% | Interventional pain Mgt | 0.8% | Rheumatology | 1.1% |
| | | Physical medicine/rehab | 0.8% | Anesthesiology | 0.9% |
| | | Endocrinology | 0.8% | Orthopedic surgery | 0.7% |
| | | Hematology/oncology | 0.8% | Cardiology | 0.5% |
| | | Podiatry | 0.6% | Gastroenterology | 0.5% |
| | | Rheumatology | 0.6% | Endocrinology | 0.5% |
| | | Neurology | 0.4% | Infectious disease | 0.2% |
| | | | | Emergency medicine | 0.2% |
| | | | | Interventional cardiology | 0.2% |

*Note*: Annual percentages by clinic type may not sum to 100% due to missing values and because more than one provider type can be listed on a claim (less than 1% of visits).
*Source*: 2019–2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files (SAFs).

**TABLE A5** Types of distant site providers serving Medicare Fee-for-Service beneficiaries at Federally Qualified Health Centers and independent and provider-based Rural Health Clinics, 2020–2021.

| 2020 | | 2021 | |
|---|---|---|---|
| **Federally Qualified Health Centers (FQHCs)** | | | |
| Family practice | 32.6% | Family practice | 29.1% |
| Nurse practitioner | 20.3% | Unknown physician specialty | 18.6% |
| Unknown physician specialty | 14.9% | Nurse practitioner | 18.2% |
| Internal medicine | 13.1% | Internal medicine | 12.6% |
| Psychiatry | 6.2% | Psychiatry | 8.2% |
| Physician assistant | 6.0% | Physician assistant | 5.8% |
| General practice | 2.7% | General practice | 2.7% |
| Neurology | 0.4% | Neurology | 0.7% |
| Hospitalist | 0.4% | Hospitalist | 0.5% |
| Pediatric medicine, obstetrics/gynecology | 0.3% | Licensed clinical social worker | 0.3% |
| Licensed clinical social worker | 0.2% | Pediatric medicine, obstetrics/gynecology | 0.3% |
| Cardiology | 0.2% | Gastroenterology, cardiology | 0.2% |
| Podiatry, gastroenterology | 0.2% | Certified clinical nurse specialist | 0.2% |
| Certified clinical nurse specialist | 0.2% | Emergency medicine, general surgery | 0.1% |
| **Independent Rural Health Clinics (RHCs)** | | | |
| Family practice | 39.1% | Family practice | 36.4% |
| Nurse practitioner | 23.4% | Nurse practitioner | 28.5% |
| Internal medicine | 18.5% | Internal medicine | 16.1% |
| Physician assistant | 6.5% | Physician assistant | 6.1% |
| General practice | 4.9% | Unknown physician specialty | 5.4% |
| Unknown physician specialty | 4.4% | General practice | 3.5% |
| Psychiatry | 1.0% | Psychiatry | 1.2% |
| Hospitalist | 0.2% | Anesthesiology, cardiology, emergency medicine | 0.2% |
| | | Hospitalist, certified clinical nurse specialist | 0.1% |
| | | Pediatric medicine, interventional pain Mgt | 0.1% |
| | | General surgery, Obstetrics/gynecology | 0.1% |
| **Provider-Based Rural Health Clinics (RHCs)** | | | |
| Family practice | 39.9% | Family practice | 34.1% |
| Nurse practitioner | 22.6% | Nurse practitioner | 23.2% |
| Internal medicine | 14.9% | Internal medicine | 15.7% |
| Physician assistant | 8.4% | Physician assistant | 8.8% |
| Unknown physician specialty | 4.3% | Unknown physician specialty | 6.8% |
| General practice | 3.2% | Psychiatry | 3.4% |
| Psychiatry | 1.9% | General practice | 2.0% |
| Cardiology | 0.7% | Cardiology | 1.0% |
| Hospitalist | 0.5% | Anesthesiology | 0.4% |
| Pain management | 0.3% | Interventional pain Mgt | 0.4% |
| Neurology | 0.3% | Hospitalist | 0.4% |
| Sleep medicine | 0.3% | Pain Management | 0.4% |
| Gastroenterology | 0.3% | Emergency medicine | 0.4% |
| Emergency medicine | 0.3% | General surgery | 0.3% |
| Anesthesiology | 0.2% | Neurology | 0.3% |
| Obstetrics/Gynecology | 0.2% | Obstetrics/gynecology | 0.3% |
| General surgery | 0.2% | Urology | 0.3% |
| Urology, interventional pain Mgt | 0.2% | Sleep medicine, Gastroenterology, Nephrology | 0.2% |
| Interventional pain Mgt | 0.2% | Physical medicine/rehabilitation | 0.2% |

*Note*: Annual percentages by clinic type may not sum to 100% due to missing values and because more than one provider type can be listed on a claim (less than 1% of visits).
*Source*: 2019–2021 Medicare Limited Data Set (LDS) 5% Standard Analytic Files (SAFs).