

Pre-Pandemic Telehealth Use among Children in Medicaid Managed Care and Fee-for-Service Programs

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Introduction and Purpose

Over the past decade, many state Medicaid programs have shifted from a fee-for-service (FFS) payment system to contracting with managed care organizations (MCOs) to serve their Medicaid populations.¹ States have implemented comprehensive managed care through MCOs and primary care case management (PCCM), where primary care providers contract to serve as medical homes, or where specialty services, such as behavioral health, have been “carved out.”² As a result of this move toward comprehensive managed care, in over a third of states more than 90 percent of the Medicaid population was enrolled in MCOs in 2018, and in over two thirds of states more than 65 percent of the Medicaid population was enrolled in MCOs.¹ Because MCOs have incentives to maximize the value of the health care they deliver, and because telehealth approaches may offer opportunities to enhance cost-effectiveness,³ increased MCO penetration in Medicaid may have implications for telehealth use rates among Medicaid beneficiaries. The purpose of this brief is to assess differences in the use of telehealth services among rural and urban children by enrollment in state Medicaid MCOs, PCCM, and FFS programs using Medicaid administrative claims datasets from 20 states.

Background

Because MCOs are responsible for the financing and delivery of health services for their enrolled populations, Medicaid MCOs have an incentive to maximize the cost-effectiveness of the health care services they provide, and telehealth modalities may under some circumstances contribute to this effort.³ Limited evidence suggests a positive correlation between the extent of Medicaid MCO penetration and the prevalence of telehealth use among Medicaid beneficiaries in a given state. For example, in 2017, Arizona, New Mexico, and Tennessee had telehealth usage rates of 60 percent, 33 percent, and 23 percent, respectively, with corresponding MCO enrollment rates of 93 percent, 90 percent, and 100 percent.¹ These rates stand in contrast to those observed in 2011, when most state Medicaid programs had substantial proportions of FFS enrollees: a 42-state study using 2011 data showed that only 0.26 percent of rural non-dual Medicaid beneficiaries were telehealth users.⁴

MCOs have become the predominant service delivery model for Medicaid programs in recent years, with 72 percent of the nationwide Medicaid population enrolled in MCOs as of 2020, compared to 67 percent in 2010.¹ Given the apparent association between MCO enrollment and use of telehealth services, this shift may have encouraged broader provision of telehealth services and increased telehealth use by Medicaid beneficiaries. However, no

Key Findings

- Children aged 1-19 years enrolled in state Medicaid managed care organizations (MCOs) and primary care case management (PCCM) in 2018 were more likely to use telehealth services (OR = 1.4 and 1.1, respectively) than were children enrolled in Medicaid fee-for-service (FFS) programs.
- Rural Medicaid children were more likely to use telehealth services in 2018 (OR = 1.7) than were urban Medicaid children.

After controlling for beneficiary characteristics and health status differences:

- MCO enrollment and rural residence remained predictive of telehealth use.
- Medicaid beneficiaries with mental, behavioral, or neurodevelopmental disorders were more likely to use telehealth (OR = 15.4) than were beneficiaries without these disorders.

research has specifically examined the association between MCO penetration and telehealth use among child Medicaid members in rural areas.

Telehealth can be an effective tool for improving health care access and quality among underserved rural populations,⁵⁻⁹ and may be especially important as a means of addressing the unmet needs of rural children with behavioral health issues.¹⁰⁻¹² Mental, behavioral, and neurodevelopmental disorders occur with similar frequency among rural and urban children aged 18 years or younger, with a somewhat higher prevalence in small rural areas (18.6 percent) than in urban areas (15.2 percent).¹³ However, rural children are more likely than their urban counterparts to face access barriers due to shortages of behavioral health providers.^{14, 15}

In this investigation, we examined how MCO enrollment and rurality of residence were related to child Medicaid beneficiaries' telehealth use before and after controlling for demographic and health status characteristics.

Methods

Data Sources. We used data from the 2018 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) for 20 states (see Study Population below). The TAF are compiled by the Centers for Medicare & Medicaid Services (CMS) from data provided by states on their Medicaid and Child Health Insurance Program (CHIP) beneficiaries.¹⁶ We used data from the TAF Demographic Eligibility (DE) and Other Services (OT) files. We acquired 100 percent samples from the DE and OT files of all states included in the study. The DE file contains beneficiary eligibility, enrollment, socioeconomic, and demographic information, including ZIP codes for beneficiary residence. The OT file comprises claims and managed care encounter records for health care services other than inpatient or institutional long-term care. Thus, it provides data on outpatient hospital, physician, clinic, dental, and other outpatient services. The OT records include procedure codes from the Current Procedure Terminology (CPT) system or Healthcare Common Procedure Coding System (HCPCS), along with modifiers designating telehealth services. We also used data on the market characteristics of beneficiaries' counties of residence from the 2018 Area Health Resources File (AHRF), a product of the Health Resources and Services Administration (HRSA).¹⁷

Study Population. We chose a group of 20 states distributed across all four census regions for inclusion in the study. Within each region, we included states where TAF data quality was adequate for the key data elements in our analysis. The following states were selected: New Hampshire, Vermont, and Maine (Northeast); Indiana, Iowa, Kansas, Nebraska, South Dakota, and Wisconsin (Midwest); Alabama, Kentucky, Mississippi, North Carolina, Oklahoma, South Carolina, and Tennessee (South); and Montana, New Mexico, Oregon, and Wyoming (West).

Among Medicaid/CHIP beneficiaries in these 20 states, we included children and youth between the ages of one and 18 years who were not dually enrolled in Medicare and who had at least 10 months of Medicaid enrollment. We excluded dual enrollees because their telehealth use might not have been fully captured in the TAF if they received any telehealth services through Medicare. Infants under age one were excluded because they were not likely to have been enrolled in Medicaid for 10 months or more. Our study sample consisted of 6,446,412 children enrolled in Medicaid across the 20 states.

Identification of Telehealth Services. To identify telehealth services, we used codes and modifiers included in a previously published telehealth definition developed by Barsky and colleagues¹⁸ for a study based on private insurance and Medicare Advantage claims. The codes included in this definition were CPT modifiers for interactive videoconferencing (GT) and asynchronous telecommunications (GQ); the telehealth Place of Service Code (02); a series of telehealth-specific CPT and 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).

Measures. Outcome: Telehealth User. We created an indicator variable to designate telehealth user status. Beneficiaries with any claims for telehealth services were classified as telehealth users, and those without such claims were designated telehealth non-users.

Primary Explanatory Variables: Rurality of Beneficiary Residence and Enrollment Type. To measure rurality of beneficiary residence, we used 2010 Rural-Urban Commuting Area Codes (RUCAs). Developed by the United States

Department of Agriculture's Economic Research Service, the RUCA system classifies ZIP codes along a continuum of rurality.¹⁹ We linked beneficiary ZIP codes in the TAF DE file to RUCA codes. Using a classification scheme devised by the WWAMI Rural Health Research Center, we aggregated RUCA codes into four categories designating urban, large rural, small rural, and isolated areas.²⁰ We then combined all three rural categories, producing a dichotomous measure that coded residential ZIP codes as either urban or rural.

We assigned beneficiaries to one of three categories of enrollment type. Beneficiaries were classified as MCO enrollees if they received Medicaid services through comprehensive managed care plans; managed long-term services and supports; or behavioral health organizations, including prepaid inpatient health plans (PIHPs). Beneficiaries were identified as PCCM enrollees if they received services through a traditional, enhanced, or health home PCCM provider arrangement. Beneficiaries enrolled in any other type of plan (e.g., non-comprehensive PIHPs) were categorized as FFS enrollees.²¹⁻²⁴

Beneficiary Characteristics. We examined beneficiary characteristics including age, gender, race/ethnicity, census region of residence, and health status. Health status was described in terms of clinical conditions identified using the Clinical Classifications Software Refined (CCSR).²⁵ Designed for the Healthcare Cost and Utilization Project (HCUP), the CCSR tool creates an indicator variable for each clinical condition. Because individuals can have multiple clinical conditions, a count of clinical conditions was created as a measure of health-risk severity.

Analyses. At the bivariate level, we conducted chi-square tests within each of the 20 states to ascertain whether beneficiaries' telehealth user status differed by enrollment type and rurality, and to assess differences in telehealth use by demographics, census region, and health status.

At the multivariate level, we constructed three sets of logistic regression models to explore associations between telehealth use and other variables of interest. In the first model, we included only our primary explanatory variables of interest, i.e., enrollment type and rurality of residence. In models 2 and 3, we explored whether the relationships between telehealth use and the explanatory variables of interest persisted after controlling for beneficiaries' demographic and health status characteristics. All models included state fixed effects to account for differences in states' economic and policy environments.

Because race/ethnicity was missing for approximately a third (29 percent) of the pediatric population, including race/ethnicity in our adjusted models resulted in a substantial reduction in sample size. Therefore, we present two versions of the models adjusting for demographic characteristics: model 2 omits race/ethnicity but controls for the other covariates listed above. Thus, this model reflects the experience of the entire child population (n = 6,446,412) across the 20 states. Model 3 includes race/ethnicity and reflects the experience of the subset of the child population with valid race/ethnicity indicators (n = 4,091,952).

Beneficiaries enrolled in programs that represented less than one percent of a state's Medicaid populations were excluded from the analyses (n = 941). Sensitivity analyses including these beneficiaries yielded findings that did not differ significantly from those presented below.

Findings

Program Enrollment in Rural and Urban Areas. Within the 20 states included in the study sample, approximately three quarters of all Medicaid children were enrolled in MCOs, 15 percent were enrolled in FFS, and just over 10 percent were enrolled in PCCM programs (Table 1). In over half of the states (11 out of 20), 90 percent or more of the pediatric population was enrolled in a Medicaid MCO. FFS programs predominated in three states (Oklahoma, Vermont, Wyoming), and in four states (Maine, South Dakota, Alabama, and Montana), 80 percent or more of the pediatric population was enrolled in PCCM programs. North Carolina had enrollees in each of the three programs: MCO (79 percent), FFS (15 percent), and PCCM (6.6 percent).

In the overall sample, the rate of pediatric MCO enrollment was lower in rural areas (73 percent) than in urban areas (76 percent), while the rate of pediatric enrollment in FFS was higher (16 percent rural versus 14 percent urban), as was the PCCM enrollment rate (11 percent rural versus 10 percent urban).

Table 1. Percentage of Children Enrolled in Medicaid Fee-for-Service, Managed Care, and Primary Care Case Management by State Program(s), Census Regions, and Rural-Urban Location, 2018

| Census Regions | States | Sample Size | Percent of State Populations Enrolled in Each Program | | | | | | | | |
|----------------|----------------|-------------|---|-------|-------|------------------|-------|-------|------------------|-------|-------|
| | | | State Population | | | Rural Population | | | Urban Population | | |
| | | | FFS | MCO | PCCM | FFS | MCO | PCCM | FFS | MCO | PCCM |
| Northeast | Maine | 82,857 | 13.73 | --- | 86.27 | 13.07 | --- | 86.93 | 14.36 | --- | 85.64 |
| | New Hampshire | 75,063 | NA | 100 | --- | --- | 100 | --- | --- | 100 | --- |
| | Vermont | 28,115 | 100 | --- | --- | 100 | --- | --- | 100 | --- | --- |
| Midwest | Indiana | 583,112 | 6.11 | 93.89 | --- | 6.60 | 93.40 | --- | 5.97 | 94.03 | --- |
| | Iowa | 271,383 | 2.05 | 97.95 | NA | 2.01 | 97.99 | --- | 2.09 | 97.91 | --- |
| | Kansas | 207,147 | NA | 100 | --- | --- | 100 | --- | --- | 100 | --- |
| | Nebraska | 135,040 | --- | 100 | --- | --- | 100 | --- | --- | 100 | --- |
| | South Dakota | 56,815 | 7.42 | --- | 92.58 | 6.96 | --- | 93.04 | 8.00 | --- | 92.00 |
| | Wisconsin | 395,075 | 12.49 | 87.51 | --- | 13.92 | 86.08 | --- | 11.98 | 88.02 | --- |
| South | Alabama | 463,430 | 15.74 | --- | 84.26 | 14.49 | --- | 85.51 | 16.15 | --- | 83.85 |
| | Kentucky | 517,236 | 4.09 | 95.91 | --- | 4.33 | 95.67 | --- | 3.83 | 96.17 | --- |
| | Mississippi | 315,623 | 2.55 | 97.45 | --- | 2.66 | 97.34 | --- | 2.40 | 97.60 | --- |
| | North Carolina | 1,003,155 | 14.76 | 78.63 | 6.60 | 13.99 | 79.57 | 6.44 | 15.03 | 78.31 | 6.66 |
| | Oklahoma | 414,127 | 100 | --- | NA | 100 | --- | --- | 100 | --- | --- |
| | South Carolina | 505,010 | 9.09 | 90.91 | --- | 7.62 | 92.38 | --- | 9.49 | 90.51 | --- |
| | Tennessee | 649,772 | 4.08 | 95.92 | --- | 3.88 | 96.12 | --- | 4.15 | 95.85 | --- |
| West | Montana | 101,533 | 20.30 | --- | 79.70 | 20.79 | --- | 79.21 | 19.46 | --- | 80.54 |
| | New Mexico | 287,722 | 9.13 | 90.87 | --- | 11.98 | 88.02 | --- | 7.72 | 92.28 | --- |
| | Oregon | 323,672 | 4.40 | 95.60 | NA | 5.17 | 94.83 | --- | 4.15 | 95.85 | --- |
| | Wyoming | 30,525 | 94.05 | 5.95 | --- | 94.01 | 5.99 | --- | 94.14 | 5.86 | --- |
| | Total | 6,446,412 | 14.90 | 74.83 | 10.27 | 16.26 | 72.66 | 11.08 | 14.25 | 75.88 | 9.87 |

Data Source: 2018 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF).

Notes: NA = Not Applicable because the cell size is less than 1 percent of the state's child Medicaid population, FFS = Fee for Service, MCO = Managed Care Organization, PCCM = Primary Care Case Management.

Telehealth Use. Rates of telehealth use varied widely across states and programs, from a low of 0.01 percent for Kentucky's urban FFS population, to just over 4 percent for Maine's urban PCCM population (Table 2). Apart from Maine, Vermont, Mississippi, and Oregon, children living in rural areas of the remaining 16 states were more likely to use telehealth than children living in urban areas. This finding held true for all program types.

Table 2. Percentage of Medicaid Children Using Telehealth by State Program(s), Census Regions, and Rural-Urban Location, 2018

| Census Regions | States | Sample Size | Percent of State Populations Using Telehealth Within Each Program | | | | | | | | |
|----------------|----------------|-------------|---|------|------|------------------|-------|-------|------------------|------|------|
| | | | State Population | | | Rural Population | | | Urban Population | | |
| | | | FFS | MCO | PCCM | FFS | MCO | PCCM | FFS | MCO | PCCM |
| Northeast | Maine | 82,857 | 3.38 | --- | 3.50 | 3.38 | --- | 2.97* | 3.38 | --- | 4.07 |
| | New Hampshire | 75,063 | --- | 0.18 | --- | --- | 0.25 | --- | --- | 0.13 | --- |
| | Vermont | 28,115 | 0.02 | --- | --- | 0.02 | --- | --- | 0.03 | --- | --- |
| Midwest | Indiana | 583,112 | 1.50 | 0.39 | --- | 2.79* | 1.03* | --- | 1.12 | 0.22 | --- |
| | Iowa | 271,383 | 1.01 | 1.66 | --- | 1.74* | 2.4* | --- | 0.47 | 1.09 | --- |
| | Kansas | 207,147 | --- | 1.69 | --- | --- | 2.93* | --- | --- | 0.92 | --- |
| | Nebraska | 135,040 | --- | 0.72 | --- | --- | 1.34* | --- | --- | 0.42 | --- |
| | South Dakota | 56,815 | 1.61 | --- | 0.50 | 2.66* | --- | 0.78* | 0.45 | --- | 0.13 |
| | Wisconsin | 395,075 | 1.95 | 0.35 | --- | 2.07 | 0.40* | --- | 1.90 | 0.33 | --- |
| South | Alabama | 463,430 | 0.39 | --- | 0.68 | 0.65* | --- | 0.98* | 0.32 | --- | 0.57 |
| | Kentucky | 517,236 | 0.01 | 0.83 | --- | 0.02 | 0.99* | --- | 0.01 | 0.66 | --- |
| | Mississippi | 315,623 | 2.07 | 0.54 | --- | 1.80* | 0.44* | --- | 2.49 | 0.69 | --- |
| | North Carolina | 1,003,155 | 0.03 | 0.94 | 0.58 | 0.04 | 1.44* | 0.78* | 0.02 | 0.77 | 0.51 |
| | Oklahoma | 414,127 | 0.80 | --- | --- | 1.20* | --- | --- | 0.57 | --- | --- |
| | South Carolina | 505,010 | 0.59 | 0.69 | --- | 0.96* | 0.97* | --- | 0.51 | 0.62 | --- |
| | Tennessee | 649,772 | 0.02 | 0.92 | --- | 0.04* | 1.70* | --- | 0.01 | 0.64 | --- |
| West | Montana | 101,533 | 0.86 | --- | 0.82 | 0.87 | --- | 0.86 | 0.85 | --- | 0.76 |
| | New Mexico | 287,722 | 0.19 | 1.27 | --- | 0.36* | 1.67* | --- | 0.07 | 1.09 | --- |
| | Oregon | 323,672 | 1.17 | 1.95 | --- | 1.04 | 1.33* | --- | 1.22 | 2.14 | --- |
| | Wyoming | 30,525 | 1.44 | 0.50 | --- | 1.60* | 0.33 | --- | 1.07 | 0.82 | --- |
| | Total | 6,446,412 | 0.72 | 0.92 | 0.87 | 1.02* | 1.28* | 1.23* | 0.56 | 0.74 | 0.84 |

Data Source: 2018 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF).

Notes: FFS = Fee for Service, MCO = Managed Care Organization, PCCM = Primary Care Case Management.

* Telehealth rates within program differed by rural and urban residence at the 0.05 level.

Characteristics of Telehealth Users. Overall, 0.8% of children included in our study sample were telehealth users in 2018 (Table 3). Children using telehealth services were more likely to be older and over age six, male, non-Hispanic White, living in rural areas, and living in the West. They were also more likely to be enrolled in MCO or PCCM programs than in FFS programs. Telehealth users had higher numbers of disease conditions (mean = 4.8) compared to non-telehealth users (mean = 3.4). The percent of children with diagnoses of mental, behavioral, and neurodevelopmental disorders was substantially higher among telehealth users (88.6 percent) than non-telehealth users (24.0 percent).

Table 3. Socioeconomic, Health Status and Programmatic Differences among Medicaid Children By Telehealth Use, 2018

| Variable | | Telehealth | No Telehealth | Total |
|---|---|----------------|--------------------|-------------------|
| Sample Size | | 57,231 0.8% | 6,389,181 99.2% | 6,446,412 100% |
| Mean Age (years) * | | 11.8 | 9.1 | 9.2 |
| Age Categories (percent) * | Ages 1-5 | 7.34 | 29.29 | 29.09 |
| | Ages 6-14 | 61.91 | 51.76 | 51.85 |
| | Ages 15-18 | 30.75 | 18.95 | 19.06 |
| Male (percent) * | | 57.04 | 51.10 | 51.15 |
| Race/ Ethnicity Categories (percent) * | Non-Hispanic White | 56.76 | 45.96 | 46.06 |
| | Non-Hispanic Black | 16.07 | 23.76 | 23.70 |
| | Non-Hispanic Asian | 1.22 | 2.31 | 2.30 |
| | Non-Hispanic American Indian/Native Alaskan | 3.61 | 4.16 | 4.15 |
| | Hispanic | 21.31 | 22.44 | 22.43 |
| | Non-Hispanic Other | 1.03 | 1.37 | 1.36 |
| Missing Race/Ethnicity (percent) | | 28.9 | 28.8 | 28.80 |
| Rural (percent) * | | 45.40 | 32.54 | 32.65 |
| Census Regions (percent) * | Northeast | 5.29 | 2.86 | 2.89 |
| | Midwest | 24.62 | 25.58 | 25.57 |
| | South | 51.15 | 60.09 | 60.01 |
| | West | 18.93 | 11.47 | 11.53 |
| Program Enrollment (percent) * | Fee for Service (FFS) | 12.10 | 14.93 | 14.90 |
| | Managed Care Organization (MCO) | 76.62 | 74.81 | 74.83 |
| | Primary Care Case Management (PCCM) | 11.28 | 10.26 | 10.27 |
| Healthcare Cost and Utilization Project (HCUP) Primary Diagnosis Groups (percent) | | | | |
| Diseases of the blood and blood-forming organs* | | 1.82 | 1.45 | 1.46 |
| Diseases of the circulatory system* | | 6.13 | 2.89 | 2.92 |
| Diseases of the digestive system* | | 18.85 | 15.15 | 15.19 |
| Diseases of the ear and mastoid process* | | 16.67 | 18.98 | 18.96 |
| Endocrine, nutritional, and metabolic diseases* | | 11.78 | 4.10 | 4.18 |
| Diseases of the eye and adnexa* | | 39.25 | 28.72 | 28.82 |
| Other factors influencing health status* | | 76.83 | 73.32 | 73.35 |
| Diseases of the genitourinary system* | | 13.64 | 7.53 | 7.59 |
| Certain infectious and parasitic diseases* | | 11.35 | 10.72 | 10.73 |
| Injury, poisoning* | | 30.28 | 21.10 | 21.20 |
| Congenital malformations, chromosomal abnormalities* | | 3.97 | 3.09 | 3.10 |
| Mental, behavioral, and neurodevelopmental disorders* | | 88.56 | 23.99 | 24.65 |
| Musculoskeletal system and connective tissue* | | 21.83 | 13.51 | 13.59 |
| Neoplasms* | | 1.23 | 0.98 | 0.98 |
| Diseases of the nervous system* | | 15.42 | 7.60 | 7.68 |
| Certain conditions originating in the perinatal period | | 0.59 | 0.56 | 0.56 |
| Pregnancy, childbirth and the puerperium* | | 0.64 | 0.39 | 0.40 |
| Diseases of the respiratory system* | | 49.50 | 40.82 | 48.04 |
| Diseases of the skin and subcutaneous tissue* | | 16.83 | 14.79 | 14.81 |
| Abnormal clinical and laboratory findings* | | 52.65 | 39.95 | 40.08 |
| Number of disease conditions* | | 4.78 | 3.37 | 3.38 |

Data Source: 2018 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF).

* Differences by telehealth use were statistically significant at the 0.001 level.

Regression Analyses. In the first logistic regression model (Table 4), children enrolled in Medicaid MCOs and PCCM programs were more likely to use telehealth than children enrolled in Medicaid FFS (ORs = 1.4 and 1.1, respectively). Children living in rural areas were also more likely than their urban peers to use telehealth (OR = 1.7) (Table 4).

Table 4. Logistic Regression Estimating the Use of Telehealth Among Children Aged 1-18 Enrolled in Medicaid, 2018

| Sample Size: n = 6,446,412 | OR | SE | LL 95 CI | UL 95 CI |
|--|--------|------|----------|----------|
| Model 1 (limited to the independent variables of primary interest) | | | | |
| MCO (reference = FFS) | 1.41* | 0.03 | 1.36 | 1.47 |
| PCCM | 1.10* | 0.03 | 1.04 | 1.17 |
| Rural (reference = Urban) | 1.71* | 0.01 | 1.68 | 1.74 |
| Model 2 (adjusting for demographic and health status characteristics, excluding race/ethnicity as independent variables) | | | | |
| Sample Size: n = 6,446,412 | OR | SE | LL 95 CI | UL 95 CI |
| MCO (reference = FFS) | 1.18* | 0.03 | 1.13 | 1.23 |
| PCCM | 1.28* | 0.04 | 1.21 | 1.35 |
| Rural (reference = Urban) | 1.67* | 0.01 | 1.64 | 1.70 |
| Ages 6-14 (reference = Ages 1-5) | 2.90* | 0.05 | 2.80 | 3.00 |
| Ages 15-18 | 3.46* | 0.06 | 3.33 | 3.59 |
| Male (reference = Female) | 1.15* | 0.01 | 1.13 | 1.17 |
| Endocrine, nutritional, and metabolic diseases | 1.51* | 0.03 | 1.46 | 1.56 |
| Mental, behavioral, and neurodevelopmental disorders | 15.38* | 0.26 | 14.87 | 15.90 |
| Count of disease conditions | 1.26* | 0.01 | 1.24 | 1.29 |
| Model 3 (adjusting for demographic and health status characteristics, including race/ethnicity as independent variables) | | | | |
| Sample Size: n = 4,091,952 | OR | SE | LL 95 CI | UL 95 CI |
| MCO (reference = FFS) | 1.18* | 0.03 | 1.12 | 1.24 |
| PCCM | 0.97 | 0.03 | 0.90 | 1.04 |
| Rural (reference = Urban) | 1.51* | 0.02 | 1.47 | 1.54 |
| Ages 6-14 (reference = Ages 1-5) | 2.71* | 0.06 | 2.60 | 2.82 |
| Ages 15-18 | 3.23* | 0.07 | 3.09 | 3.37 |
| Male (reference = Female) | 1.15* | 0.01 | 1.13 | 1.17 |
| Non-Hispanic Black (reference = Non-Hispanic White) | 0.87* | 0.01 | 0.84 | 0.90 |
| Non-Hispanic Asian | 0.51* | 0.03 | 0.46 | 0.56 |
| Non-Hispanic American Indian/Alaska Native Alaskan | 0.71* | 0.02 | 0.67 | 0.76 |
| Hispanic | 0.66* | 0.01 | 0.64 | 0.68 |
| Non-Hispanic Other | 1.00 | 0.05 | 0.90 | 1.11 |
| Endocrine, nutritional, and metabolic diseases | 1.51* | 0.03 | 1.45 | 1.58 |
| Mental, behavioral, and neurodevelopmental disorders | 16.05* | 0.34 | 15.40 | 16.72 |
| Count of disease conditions | 1.30* | 0.02 | 1.27 | 1.33 |

Data Source: 2018 Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF).

Notes: OR = Odds Ratio, SE = Standard Error, CI = Confidence Interval, FFS = Fee for Service, MCO = Managed Care Organization, PCCM = Primary Care Case Management; models adjusted for state fixed effects, diagnostic groupings, and number of disease conditions (partial results shown).

* Odds ratios were statistically significant at the 0.001 level.

Results from our second model (excluding race/ethnicity as independent variables) show that even after controlling for age, gender, and health status (i.e., disease conditions), odds of telehealth use were higher for children in MCOs and PCCM programs than for those in FFS (ORs = 1.2 and 1.3, respectively). In our third model, we limited the sample to the subpopulation with non-missing race/ethnicity information while controlling for age, gender, race, and health status, and found that enrollment in Medicaid MCOs was still associated with higher odds of using telehealth than Medicaid FFS (OR = 1.2); however, PCCM enrollment was no longer associated with telehealth use.

In the models adjusting for demographics and health status, rural residence was related to higher odds of telehealth use than urban residence (Model 2 OR = 1.7; Model 3 OR = 1.5). Children with mental, behavioral, and neurodevelopmental disorders were more likely to use telehealth than were beneficiaries with no disease conditions (Model 2 OR = 15.4; Model 3 OR = 16.1). Model 3 revealed significant differences by race/ethnicity in telehealth use: children belonging to Black (OR = .87), Asian (OR = .51), American Indian/Alaska Native (OR = .71), and Hispanic (OR = .66) groups all had lower odds of use than their White counterparts.

Discussion

To our knowledge, this is the first study to document a relationship between enrollment type and telehealth use in the child Medicaid population, with children in MCOs and PCCMs showing higher odds of use than those in FFS. Given that many Medicaid MCOs operate within a capitated risk-based environment, they have strong incentives to coordinate care and to manage costs, utilization, and quality. Thus, MCOs are motivated to incorporate services such as telehealth that have the potential to improve access to timely, cost-effective preventive and specialty care, including medication management. Incentives for MCOs differ from those in the FFS sector, where providers are rewarded for generating high-volume services that may or may not promote better health outcomes and lower costs rather than for maximizing the value of care.

Since the majority of Maine's Medicaid population was enrolled in the PCCM program, the finding that the PCCM populations were also more likely to use telehealth may have been attributable in part to the fact that Maine's Medicaid program actively works to support telehealth adoption through policies such as coverage for care provided over interactive real-time video and remote patient monitoring; lack of restrictions on eligible patient settings, covered services, or eligible providers; reimbursement of originating site facility fees; and coverage parity.²⁶⁻²⁸ Maine's level of telehealth use was, on average, twice that of the other states. These findings suggest the potential importance of favorable telehealth policies for telehealth use among Medicaid beneficiaries.

In keeping with earlier findings on telehealth use in Medicaid,^{4, 29} this study focused on child Medicaid beneficiaries' documented very low usage rates, ranging from 0.01 percent in rural areas of Kentucky to just over 4 percent in urban areas of Maine. Note, however, that child Medicaid beneficiaries' telehealth use increased dramatically during the COVID-19 pandemic, as state Medicaid programs attempted to offset pandemic-related barriers to in-person care by expanding telehealth service delivery: from March to October 2020, telehealth use among child Medicaid enrollees increased from 31 to 62 services per 1,000 children.³⁰

As in previous pre-pandemic research on Medicaid samples,^{4, 29} this study determined that prevalence of telehealth use was higher for rural than for urban residents. Again, proportions of rural and urban users may have shifted in recent years, as many state Medicaid programs took steps to make telehealth services more accessible to all their members during the pandemic. For example, after North Carolina's Medicaid program launched an effort to accelerate telehealth expansion in 2020 as part of its response to the COVID-19 public health emergency, overall increases in telehealth use were observed, but rates were higher for urban than for rural beneficiaries.³⁰

Among those child beneficiaries for whom data on race/ethnicity were available, children belonging to Black, Asian, American Indian/Alaska Native, and Hispanic groups had lower odds of receiving telehealth services than did White children. Limited data indicate that even during the period of pandemic-related telehealth expansion, telehealth access may have been more limited for Black,^{31, 32} Hispanic,³¹ and Asian³¹ individuals than for those who are White. Further research is needed to determine the extent to which disparities by race and ethnicity persist in pediatric Medicaid populations, and mitigation of these disparities should be a target for future Medicaid telehealth policy.

The finding that behavioral health needs were a significant driver of children's telehealth use is consistent with past studies showing that behavioral health disorders were the most common target for telehealth in Medicaid populations.^{4, 29} A growing body of literature suggests that telehealth is an effective model for delivering behavioral health services to children.¹⁰⁻¹² Further research is needed to specify the types of behavioral health services being accessed by child Medicaid beneficiaries in rural and urban areas.

Policy Implications

Prior to the pandemic, Medicaid MCOs and PCCM programs appear to have promoted children's telehealth use, particularly in rural areas. State policymakers interested in enhancing access to cost-effective services may want to leverage the incentives that MCO and PCCM programs generate. Expanding opportunities to provide cost-effective, telehealth-mediated preventive services, specialty care, and consultation is an emerging focus in ongoing efforts to reform rural health systems.

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