Findings Brief
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# Rural-Urban Medicaid and CHIP Enrollee Comparisons Using the 2019 T-MSIS Analytic File

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**KEY FINDINGS**

Overall, we found Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF) 2019 demographic data were useful for national rural and urban comparisons except for income. Race and ethnicity data were also limited for many states, which restricted our analysis. In addition, we found:

- a higher percentage of children were enrolled in rural versus urban areas;
- a higher percentage of white people were enrolled in rural versus urban areas; and
- rural enrollees were more likely to have continuous coverage than urban enrollees.

## BACKGROUND

Medicaid and the Children's Health Insurance Program (CHIP) are important components of ensuring access to health care in the U.S. and in rural areas, in particular. In 2019, nearly 25 percent of rural residents under age 65 had Medicaid or CHIP health insurance coverage.[1] Rural populations on average are older, in worse health, have lower incomes, and are more likely to be underinsured, uninsured, or enrolled in government sponsored health insurance (e.g., Medicaid or Medicare) compared to those living in urban areas.[2] Medicaid and CHIP are also an important source of income for rural hospitals, many of which face significant financial challenges.[3,4]

Developing policies to ensure access to health care is a challenge often made more difficult by limited data. Researchers rely on health insurance claims data to learn more about where and how health care is used. Over the years, Medicare claims data have been easier to use for national-level rural research than Medicaid claims data. As a federal program, Medicare claims are standardized and processed at the federal level, which allows researchers to compare data across all states, counties, ZIP Codes, etc. Medicaid claims data are processed at the state level, and until 2019, were of limited comparability for national analysis. In 2019, the Centers for Medicare & Medicaid Services (CMS) released the Transformed Medicaid Statistical Information System (T-MSIS) Analytic Files (TAF),[5] a compilation of state Medicaid claims data. Prior to TAF's release, most rural Medicaid claims analysis focused on individual state data or Medicaid Analytic eXtract (MAX) data. One example, Bennett, Jones, and Probst (2018) used MAX data from 35 states to look at rural-urban differences in 2012 Medicaid enrollee characteristics.[6] More recently, CMS released a data brief using TAF to compare rural and urban 2020 Medicaid enrollees.[7] CMS compared the proportions of rural and urban enrollees by residence, state, race and ethnicity, disability, and managed care.[7] Our brief expands on this and previous rural Medicaid analyses by using TAF to examine demographic indicators at a national level and stratifying the indicators by level of rurality. We look at 2019 data, which is pre-Covid-19 and before the implementation and impact of public health emergency policies (e.g., continuous enrollment), which led to 32.4% growth in Medicaid enrollment.[8]

## METHODS

We used data from the 2019 T-MSIS Analytic Files (TAF) to compare urban and rural residents enrolled in either fee-for-service or managed care Medicaid. We looked at whether enrollees had 12 continuous months of full-scope benefits and whether they had full dual enrollment in Medicare and Medicaid. We compared demographic data such as sex, age, race and ethnicity, and income across levels of rurality. We also looked at Medicaid enrollment by state

and levels of rurality. Other studies have reported quality issues (missingness and reliability) with TAF race and ethnicity.[9,10,11] The CMS Data Quality (DQ) Atlas reports that in 2019, for 21 states, 20-100 percent of enrollees were missing race and ethnicity data.[11] Due to these concerns, we presented results in broader categories of non-Hispanic White, non-Hispanic Black, any race with Hispanic, and Other race or ethnicity. The "Other race" category combines non-Hispanic Asian, non-Hispanic American Indian or Alaska Native; non-Hispanic Native Hawaiian or Other Pacific Islander; and non-Hispanic multiracial.

In their 2023 brief, CMS was able to present more detailed race and ethnicity data by using the 2020 TAF Race/Ethnicity Imputation (REI) Companion File[12] to impute race and ethnicity data for 26 percent of enrollees who had missing data in 2020.[7] Unfortunately, the REI file is not available publicly or to researchers through ResDAC.[13] Without the REI file, we were not able to assign race for the missing data in the 2019 files. As data quality improves and/or additional files are developed and shared, more broad research can be conducted on finer categorizations of race.

Our sample includes Medicaid and CHIP enrollees from 48 states and Washington, D.C with full-scope benefits at any point in 2019 (including those dually enrolled in Medicaid and Medicare). We excluded enrollees with partial benefits (e.g., some dual enrollees who are not eligible for full Medicaid benefits but receive assistance with Medicare premiums and some of the Medicare out-of-pocket costs). We also excluded enrollees with missing data for sex, age, and/or ZIP Code; or if they had a ZIP Code that could not be classified as rural or urban (4.1%). Two states (Rhode Island and Idaho) were excluded. Rhode Island was missing ZIP Code data for all 2019 claims. More than 90% of Idaho's enrollees were coded as having had partial benefits.[14] It's possible some enrollees with partial benefits had comprehensive benefits, which may be more similar to full-scope benefits. Future analysis could consider this.[14]

We used 2010 Rural Urban Commuting Area (RUCA)[15] codes to define rurality so we could compare urban to rural subpopulations. RUCA codes use population density and commuting flow to assign each ZIP Code a number from 1 to 10. Table 1 shows the RUCA code grouping we used to present levels of rurality (Urban, Large Rural, Small Rural, and Isolated Rural).

**Table 1. 2010 RUCA Code Categories and Levels of Rurality**

| Code | Rurality | RUCA Classification |
|---|---|---|
| 1 | Urban | Metropolitan area core: primary flow within an urbanized area (UA) |
| 2 | Urban | Metropolitan area high commuting: primary flow 30% or more to a UA |
| 3 | Urban | Metropolitan area low commuting: primary flow 10% to 30% to a UA |
| 4 | Large Rural | Micropolitan area core: primary flow within an urban cluster (UC) of 10,000 to 49,999 (large UC) |
| 5 | Large Rural | Micropolitan high commuting: primary flow 30% or more to a large UC |
| 6 | Large Rural | Micropolitan low commuting: primary flow 10% to 30% to a large UC |
| 7 | Small Rural | Small town core: primary flow within an urban cluster of 2,500 to 9,999 (small UC) |
| 8 | Small Rural | Small town high commuting: primary flow 30% or more to a small UC |
| 9 | Small Rural | Small town low commuting: primary flow 10% to 30% to a small UC |
| 10 | Isolated Rural | Rural areas: primary flow to a tract outside a UA or UC. |

## RESULTS

Of the Medicaid and CHIP enrollees with full-scope benefits in any month in 2019 (n = 75,981,713), 12.9 million (16.9 percent) lived in a rural area (includes Large, Small, and Isolated Rural combined) (see Table 2). Of the 12.9 million rural enrollees, 9.5 percent (7.2 million) lived in Larger Rural areas, compared to 4.6 percent (3.5 million) in Small Rural, and 2.8 percent (2.1 million) in Isolated Rural areas. Table 2 includes results for sex, age, race and ethnicity, income, 12-month (continuous) full-scope benefits, and full dual Medicare and Medicaid and CHIP enrollment.

**Sex.** Overall, there were more females enrolled in Medicaid and CHIP than males. Females made up more than half of the enrollees in both urban and rural areas; 54.3 percent of urban enrollees and 54.7 percent of rural enrollees were female. Percentages of females were lower in Isolated Rural areas (54.0 percent).

**Table 2. 2019 Medicaid Enrollment Demographics by Levels of Rurality**

| | U.S. | Urban | Rural | Large Rural | Small Rural | Isolated Rural |
|---|---|---|---|---|---|---|
| | N (%) | N (%) | N (%) | N (%) | N (%) | N (%) |
| **Total** | 75,981,713 (100%) | 63,120,682 (83.1%) | 12,861,031 (16.9%) | 7,226,118 (9.5%) | 3,508,460 (4.6%) | 2,126,453 (2.8%) |
| **Sex** | | | | | | |
| Male | 34,653,439 (45.6%) | 288,22,035 (45.7%) | 5,831,404 (45.3%) | 3,269,019 (45.2%) | 1,583,206 (45.1%) | 979,179 (46.0%) |
| Female | 41,328,274 (54.4%) | 34,298,647 (54.3%) | 7,029,627 (54.7%) | 3,957,099 (54.8%) | 1,925,254 (54.9%) | 1,147,274 (54.0%) |
| **Age** | | | | | | |
| <18 | 35,499,561 (46.7%) | 29,414,493 (46.6%) | 6,085,068 (47.3%) | 3,445,698 (47.7%) | 1,664,409 (47.4%) | 974,961 (45.8%) |
| 18-64 | 34,521,087 (45.4%) | 28,665,672 (45.4%) | 5,855,415 (45.5%) | 3,294,564 (45.6%) | 1,572,964 (44.8%) | 987,887 (46.5%) |
| 65 and older | 5,961,065 (7.8%) | 5,040,517 (8.0%) | 920,548 (7.2%) | 485,856 (6.7%) | 271,087 (7.7%) | 163,605 (7.7%) |
| **Race-Ethnicity** | | | | | | |
| Hispanic (any race) | 15,870,702 (20.9%) | 14,328,471 (22.7%) | 1,542,231 (12.0%) | 1,037,214 (14.4%) | 354,139 (10.1%) | 150,878 (7.1%) |
| Non-Hispanic White | 27,224,035 (35.8%) | 20,065,335 (31.8%) | 7,158,700 (55.7%) | 3,856,601 (53.4%) | 1,966,723 (56.1%) | 1,335,376 (62.8%) |
| Non-Hispanic Black | 14,219,304 (18.7%) | 12,999,177 (20.6%) | 1,220,127 (9.5%) | 771,938 (10.7%) | 332,502 (9.5%) | 115,687 (5.4%) |
| Other | 4,833,267 (6.4%) | 4,159,605 (6.6%) | 673,662 (5.2%) | 287,079 (4.0%) | 187,696 (5.3%) | 198,887 (9.4%) |
| Unknown/missing | 13,834,405 (18.2%) | 11,568,094 (18.3%) | 2,266,311 (17.6%) | 1,273,286 (17.6%) | 667,400 (19%) | 325,625 (15.3%) |
| **Income** | | | | | | |
| 0-100% FPL | 28,047,508 (36.9%) | 21,713,691 (34.4%) | 6,333,817 (49.2%) | 3,704,304 (51.3%) | 1,682,810 (48.0%) | 946,703 (44.5%) |
| 101-200% FPL | 7,417,811 (9.8%) | 6,252,157 (9.9%) | 1,165,654 (9.1%) | 641,887 (8.9%) | 313,791 (8.9%) | 209,976 (9.9%) |
| over 200% FPL | 586,521 (0.8%) | 484,861 (0.8%) | 101,660 (0.8%) | 55,946 (0.8%) | 26,847 (0.8%) | 18,867 (0.9%) |
| Missing | 39,929,873 (52.6%) | 34,669,973 (54.9%) | 5,259,900 (40.9%) | 2,823,981 (39.1%) | 1,485,012 (42.3%) | 950,907 (44.7%) |
| **12-month, (Continuous) Full-scope Benefits** | | | | | | |
| No | 25,350,342 (33.4%) | 21,178,466 (33.6%) | 4,171,876 (32.4%) | 2,346,663 (32.5%) | 1,126,493 (32.1%) | 698,720 (32.9%) |
| Yes | 50,631,371 (66.6%) | 41,942,216 (66.4%) | 8,689,155 (67.6%) | 4,879,455 (67.5%) | 2,381,967 (67.9%) | 1,427,733 (67.1%) |
| **Full Dual Medicare & Medicaid Enrollment** | | | | | | |
| No | 67,125,517 (88.3%) | 55,870,546 (88.5%) | 11,254,971 (87.5%) | 6,364,483 (88.1%) | 3,038,140 (86.6%) | 1,852,348 (87.1%) |
| Yes | 8,856,196 (11.7%) | 7,250,136 (11.5%) | 1,606,060 (12.5%) | 861,635 (11.9%) | 470,320 (13.4%) | 274,105 (12.9%) |

Note: Excludes enrollees with partial coverage; missing data for sex, age, ZIP Code, or RUCA and/or FAR Codes. Excludes Idaho and Rhode Island.

**Age.** We calculated the percentage of people enrolled in Medicaid and then stratified by age in rural and urban areas. Rural areas had a higher percentage of Medicaid enrollees who were children less than age 18 years old (47.3 compared rural to 46.6 percent urban). Adults ages 18-64 made up 45.5 percent of rural Medicaid enrollees and 45.4 percent of urban Medicaid enrollees. Rural areas had a lower percentage of adults ages 65 and older enrolled in Medicaid; 7.2 percent of rural Medicaid enrollees were 65 and older compared to 8.0 percent of urban Medicaid enrollees. Large Rural areas had the highest percentage of Medicaid enrollees who were children less than 18 years old (47.7percent) and the lowest percentage of Medicaid enrollees that were older adults (6.7 percent). The percentage of Medicaid enrollees who were older adults was higher in Small and Isolated Rural areas (7.7 percent).

Note that the denominator for the discussion above is Medicaid enrollees. It is also instructive to look at the percent of the population enrolled in Medicaid. For example, the percent of the aged (age 65 or over) population who are enrolled in Medicaid is higher in urban RUCAs than in rural RUCAs - 12.2% vs 9.5% (data not shown).[16]

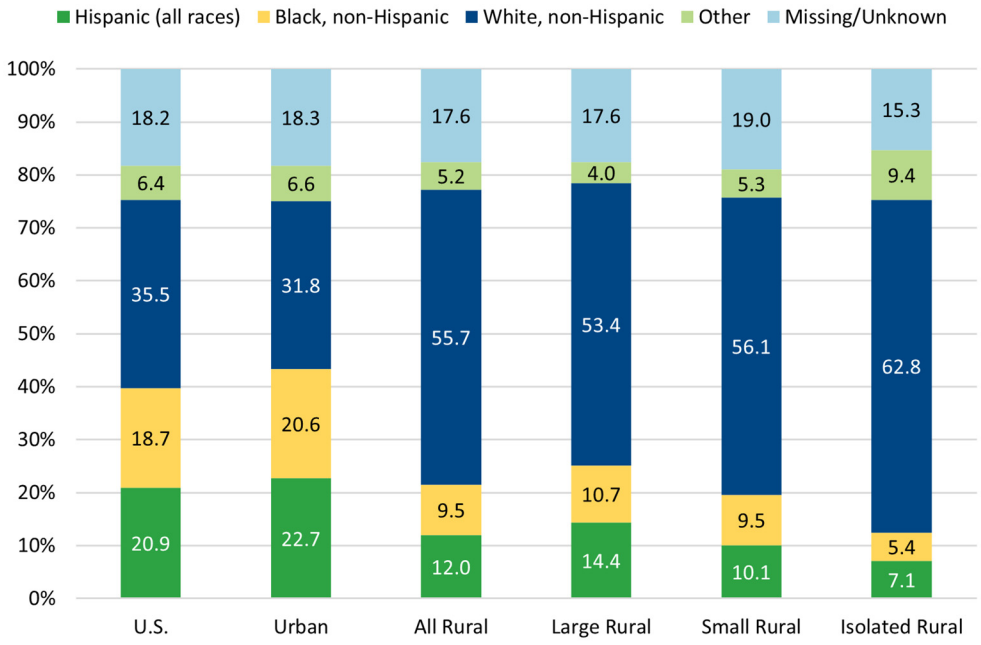
**Race and Ethnicity.** The TAF compiles 17 T-MSIS race and seven ethnicity categories into 20 combined race/ethnicity categories and then condenses those into seven race/ethnicity categories, which include 1) Hispanic (all races) and six non-Hispanic races/ethnicities: 2) Black, 3) White, 4) Asian, 5) American Indian and Alaska Native, 6) Hawaiian/Pacific Islander, and 7) Multiracial.[11] Data reporting and quality vary by state. We used the Data Quality (DQ) Atlas to learn more about data quality and methods.

Race/ethnicity data in the 2019 TAF were unknown or unreliable for many enrollees. The CMS DQ Atlas reports medium to high concern about the quality of data for all but 15 states. Race/ethnicity data for five states were considered unusable (Alabama, Kansas, Massachusetts, Rhode Island, and Tennessee).[11] For these reasons, we limited our analyses to the most reported race/ethnicity categories—Hispanic, Black, White, and we combined all other races to create the fourth category, Other.

Roughly 18.2 percent (13,834,405) of Medicaid and CHIP enrollees had unknown/missing race. Of the Medicaid and CHIP enrollees with reported race data, most were White—about 35.8 percent (27,224,035), followed by 20.9 percent (15,870,702) who were Hispanic, 18.7 percent (14,219,304) who were Black, and 6.4 percent (4,833,267) were Other races combined.

When comparing rural and urban enrollees, the percentage of enrollees with missing data was the same (17.6 percent). However, the percentage of rural White enrollees was much higher. Figure 1 shows that in rural areas, White enrollees made up 55.7 percent of Medicaid enrollees compared to 31.8 percent in urban areas. Hispanic and Black enrollees in urban areas were 22.7 percent and 20.6, respectively. Hispanic and Black enrollees made up smaller percentages of enrollees in rural areas, and percentages dropped as they became more rural. From Large Rural to Isolated Rural, Hispanic enrollee percentages dropped from 14.4 to 7.1 percent, and Black enrollee percentages fell from 10.7 to 5.4 percent. All Other races combined made up 6.4 percent of Medicaid enrollees in the U.S., with 6.6 percent in urban areas and 5.0 percent in rural. Rural Other race enrollee percentages grew with increasing rurality from 4.0 percent in Large Rural areas to 9.4 percent in Isolated Rural areas.

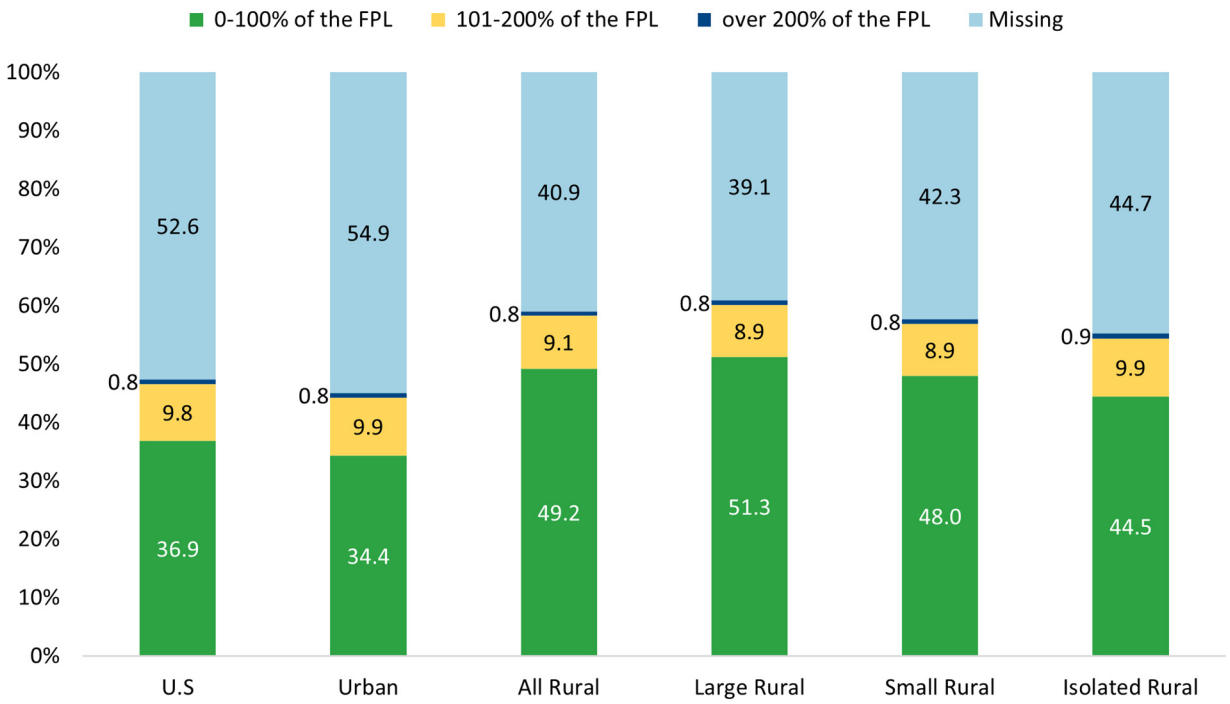
**Figure 1. Race and Ethnicity by Level of Rurality among Medicaid and CHIP Enrollees, 2019**




Note: Excludes enrollees with partial coverage; missing data for sex, age, ZIP Code, or RUCA and/or FAR Codes. Excludes Idaho and Rhode Island.

***Income.*** Figure 2 shows that more than half of 2019 Medicaid and CHIP enrollees had missing income data, with 54.9 percent of urban enrollees and 40.9 percent of rural enrollees missing data. Among rural enrollees, missingness increased with increasing levels of rurality. Overall, the large amount of missing data makes the 2019 income variable in TAF unreliable.

**Figure 2. Medicaid and CHIP Enrollees by Income and Level of Rurality, 2019**



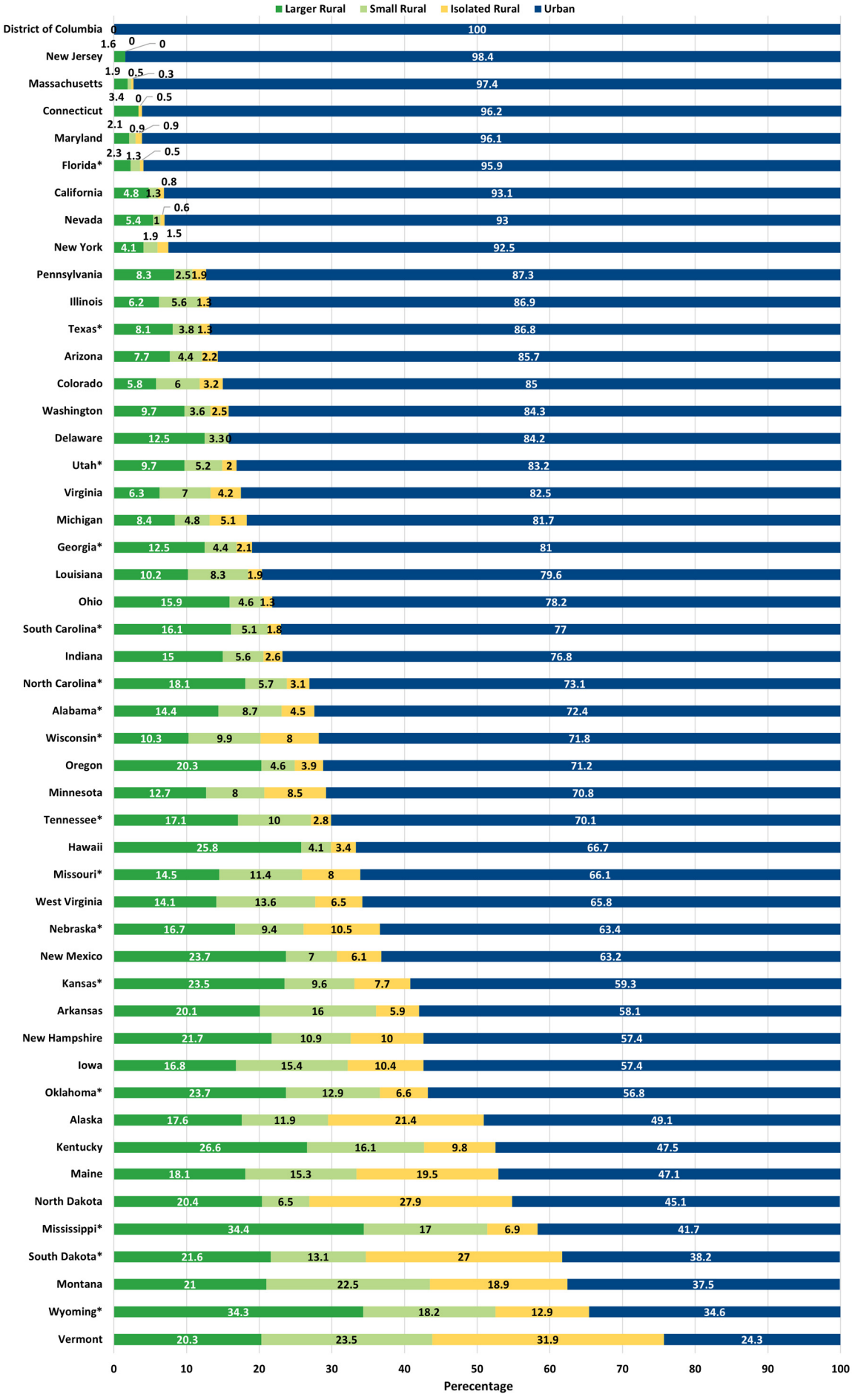

Note: Excludes enrollees with partial coverage; missing data for sex, age, ZIP Code, or RUCA and/or FAR Codes. Excludes Idaho and Rhode Island. FPL = Federal Poverty Level

**Enrollees with 12 months (continuous) full-scope benefits.** Across the nation, about two-thirds of Medicaid and CHIP enrollees (66.6 percent) had full-scope benefits for 12 continuous months, leaving roughly one-third with coverage somewhere between 1-11 months. A higher percentage of rural enrollees had continuous coverage than urban enrollees (67.6 percent vs. 66.4 percent). Some Medicaid eligibility criteria may fluctuate (e.g., income changes, pregnancy), leaving some enrollees with a temporary or permanent loss of coverage—a pattern known as churning. Loss of coverage, even temporary, can limit access to care, increase risk for preventable hospitalization, and lead to higher administrative costs.[17] A Kaiser Family Foundation study using 2018 Medicaid and CHIP enrollment data estimated that 11.2 percent of children and 12.1 percent of full-benefit adults lost and regained Medicaid coverage at some point within that year.[17] Churn rates vary by state, and rates are higher among partially enrolled people.[17,18]

**Dual enrollment in Medicare and Medicaid.** Overall, 11.7 percent of Medicaid and CHIP enrollees were dually enrolled in both programs with full benefits. Dual enrollment was more common in rural than urban areas; 12.5 percent of rural enrollees compared to 11.5 percent of urban enrollees were dually enrolled with full coverage. A higher percentage of Medicaid and CHIP enrollees in Small Rural (13.4 percent) and Isolated Rural (12.9 percent) had full dual coverage compared to Large Rural areas.

**State.** Figure 3 shows rural and urban Medicaid and CHIP enrollment by state. States with larger proportions of Medicaid and CHIP enrollees in rural areas are at the bottom of the chart. Nine states had more than 50 percent of their Medicaid and CHIP enrollees residing in rural areas. These states include Alaska (50.9 percent), Kentucky (52.5 percent), Maine (52.9 percent), North Dakota (54.8 percent), Mississippi (58.3 percent), South Dakota (61.7 percent), Montana (62.4 percent), Wyoming (65.4 percent), and Vermont (75.7 percent). Of those, Mississippi, South Dakota, and Wyoming had not expanded Medicaid by 2019.[19]

## Figure 3. Percent of Medicaid and CHIP Enrollees by State and Level of Rurality in 2019




* States that had not expanded Medicaid in 2019[18]

Note: Excludes enrollees with partial coverage; missing data or sex, age, ZIP Code, or RUCA and/or FAR Codes. Excludes Idaho and Rhode Island.

## DISCUSSION

Millions of rural residents depend on Medicaid and CHIP as a source of health care coverage. The release of national level Medicaid TAF provides researchers an opportunity to learn more about rural residents with Medicaid and CHIP coverage and their health care access. We used the TAF to compare rural and urban enrollment and demographic characteristics to assess the quality of the data to make rural-urban comparison. TAF data for sex, age, 12-month (continuous) full-scope benefits, and dual enrollment appear to be complete enough to make rural and urban comparisons. However, data for race and ethnicity beyond non-Hispanic Black and White, and Hispanic all races have limited use without the use of methods to estimate a large percentage of missing or unreliable state-reported data. In the recent CMS brief on 2020 Rural Medicaid and CHIP Enrollees, CMS imputed race and ethnicity data for 26% of enrollees using the 2020 Race/Ethnicity Imputation (REI) Companion File.[7] The REI file is not available to researchers or the public,[13] so this is not an option for us or other researchers using TAF. We also found the 2019 income data are not useful for rural-urban analyses. Attention should be paid to the Data Quality Atlas[11] when designing studies. Below are a few notes about differences, potential follow-up research, and policy relevance.

### Sex

Females made up a higher proportion of enrollees in urban (54.3 percent) and rural areas (54.7 percent), which follows past research findings that females made up a larger portion of Medicaid enrollees and that Medicaid is an important source of coverage for low-income birthing people.[20] As with children, federal law requires states to provide coverage to low-income pregnant and postpartum people. While they may have coverage, access to services like maternity care may be less available in rural areas.[21] Future studies could use TAF to examine changes over time. Data could also be stratified further by age, sex, race, county, and state for rural-urban comparisons in areas that may have lost their local maternity or other women's health care.

### Age

Children less than 18 years old made up the largest proportion of enrollees. In rural areas, 47.3 percent of enrollees were children (less than age 18). Federal law requires states to cover low-income children, so rates for children have always made up a large proportion of the population covered. While we only looked at one year of data in this study, TAF could be used to compare rural and urban trends in age over time, especially as many states end continuous enrollment and people are at risk of losing coverage. It's also important to note the higher percentage of older adults in Small and Isolated Rural areas (7.7 percent). These enrollees are likely to need more services, which may not be available in more remote areas.

### Rural-Urban Race and Ethnicity

Given known challenges with race and ethnicity data and to avoid challenges with missing data,[9,10,11] we limited our race and ethnicity analysis to four race/ethnicity categories. Among these categories, we found White residents made up the majority (55.7 percent) of rural Medicaid and CHIP enrollees compared to urban enrollees (31.8 percent). This is not surprising as, overall, the rural U.S. is less diverse than urban U.S. According to the 2020 Census, 76 percent of U.S. rural residents were White[22] compared to 57.3 percent of U.S. urban residents.[23] In 2019, people who are Hispanic made-up 9.0 percent of the rural population and 12 percent of rural Medicaid and CHIP enrollees.[24] Black residents accounted for 7.7 percent of the rural population and 9.5 percent of rural Medicaid and CHIP enrollees. Interestingly, percentages of Hispanic and Black enrollees decreased as areas became more rural, while the percentage of enrollees in the Other race category increased as areas became more rural. *Other* race enrollees made-up 6.4 percent of Medicaid and CHIP enrollees in rural and urban areas, but 9.4 percent in isolated rural areas.

Combining race/ethnicity categories falsely homogenizes the race and ethnicity of enrollees—making it harder to learn about differences among these populations. Medicaid and CHIP cover large percentages of the populations that are being grouped as Other, especially children. According to a Kaiser Family Foundation report, in 2021, Medicaid/Other Public insurance covered 29 percent of Asian children, 59 percent American Indian Alaskan Native children, and 52 percent Native American Other Pacific Islander children.[25] Medicaid also covers 60 percent of Black children, 55 percent of Hispanic children, and 33 percent of White children.[24] CMS and others are making efforts to improve data collection, reporting, and statistical methods for race and ethnicity (e.g., the DQ Atlas, imputing for missing values).[7,11,26]

CMS's race/ethnicity results did not match ours. The dataset used in its analysis had 12 million more beneficiaries than in ours, so the inclusion criteria clearly differed. Although our results were not the same, the patterns were similar.[7] Estimating methods may be a way to deal with missing and unreliable demographic data.

Understanding that race and ethnicity data are layered with challenges, TAF's race/ethnicity variables may still be useful for researchers making national comparisons of Black, White, and Hispanic populations in rural areas. For TAF, the variation in collection and reporting across states makes reporting on other races challenging to use in national-level analyses. Without access to the REI Companion file, researchers will struggle to provide more detailed analysis for race and ethnicity.

**Full 12-Month/Continuous Coverage and Dual Enrollment**

There was a 1.3 percentage point difference between rural and urban enrollees with full-scope benefits for the whole year (67.6 percent in rural; 66.4 percent in urban). Continuous enrollment is an ongoing policy debate. The Families First Coronavirus Response Act (FFCRA) required states to provide continuous enrollment from March 2020 through the end of the public health emergency (May 11, 2023). Researchers and policy makers should continue to monitor changes in enrollment as many states have ended continuous enrollment, and it might impact rural and urban residents differently.

**Dual Enrollment in Medicare & Medicaid/CHIP**

A higher percentage of Medicaid-covered people who were dually enrolled in Medicaid and Medicare lived in rural areas, and percentages were generally higher in more rural areas. People who are dually enrolled in Medicaid and Medicare are among the poorest and sickest of the Medicare population.[27,28] This is also a more diverse population.[27] Researchers and policy makers have recommended integrated and coordinated care systems to help improve outcomes for dual enrollees.[27,29] As Medicare Advantage penetration grows in rural areas, there is opportunity and concern over how dual enrollees could benefit and receive more cost-effective and coordinated care.[30] TAF data could be used to learn more about dual enrollees in rural areas considering age, disability status, access to services, and race and ethnicity.

**State Enrollment**

In 2019 about 15.7 percent of the U.S. population lived in rural areas;[16] 16.9 percent of Medicaid and CHIP enrollees with full-scope benefits at some point in 2019 were rural residents. We found that in 29 states, rural residents made up 20 percent or more of the state's Medicaid and CHIP enrollees (more than 50 percent for nine of these same states, three of which had not expanded Medicaid at the time–Mississippi, South Dakota, and Wyoming). In 2019, rural uninsured rates for states that had not expanded Medicaid were nearly twice as those that had expanded Medicaid.[31] While we did not do it in this study, it would be possible to use TAF to compare rural and urban sex, age, and race/ethnicity data in the states that have not expanded Medicaid. Focusing on a smaller subset of states might make it possible to include more races than we included in our study (since data quality varies by state).

**Large proportion of income data missing**

The DQ Atlas also reports that for 2019, 30 states had income data assessed as unusable or high concern. This was true in our findings. Depending on the geography, we found 39.1 to 54.9 percent of the income data missing. This seems to be improving over time. For 2021, the DQ Atlas shows 17 states still had data categorized as unusable or high concern, which is better, but still not enough for national comparisons.[11]

## LIMITATIONS

There are several limitations to this research. First, our population consisted only of those with full-scope benefits as opposed to those with partial coverage, such as some dually eligible Medicare-Medicaid beneficiaries. Demographic characteristics among those who are enrolled in Medicaid but do not qualify for full-scope benefits may differ from those who are fully eligible. It's also possible that some enrollees with partial coverage have comprehensive benefits, and those may be more similar to full-scope than we considered in this study. In addition, we only used data from a single year, which did not allow us to examine any trends over time. The 2019 data is also pre-COVID-19 and, thus, does not reflect any demographic changes due to the COVID-19 pandemic, which began in 2020 and substantially affected Medicaid enrollment as states halted redeterminations and disenrollments during the public health emergency.

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