

Issue Brief: Using Rural-Urban Commuting Area Codes (RUCAs) for Expanded APCD Analyses

Data from all-payer claims databases (APCDs), which typically include healthcare claims data from commercial, Medicaid, and Medicare health plans, can provide researchers, policymakers, and the public alike with crucial insights into how costs, utilization, and access vary across a wide range of factors, including geographies.

Commonly used geographical domains like counties – which, depending on the state, may comprise the city center, suburbs, exurbs, and outlying rural areas – may not offer researchers and policymakers the context they need to understand the challenges facing residents of a specific community. Even defining whether an area is rural, suburban, or urban is not straightforward. Additionally, areas that have similar population density may vary widely in terms of healthcare resources depending on their commuting distance to cities or large towns.

Supplementing APCDs' claims data with other data sources can provide helpful context and expand the opportunities for analysis. One example is Rural-Urban Commuting Area codes (RUCAs), which were developed by the Economic Research Service (ERS) of the U.S. Department of Agriculture and are a standardized way of classifying rurality and urbanity, helping explore how healthcare can be impacted by a person's relative proximity to large urban areas.

In 2023, in collaboration with Washington State's Office of the Insurance Commissioner (OIC), Onpoint used RUCAs to provide additional geographical context as part of an analysis centered on the prevalence of mental health conditions among Washington residents with commercial insurance between 2017 and 2022.

In this issue brief, we explore how we used RUCAs to provide the state with additional geographical context for this study and offer recommendations for analysts seeking to do the same.

Recommendations for Using RUCAs in Healthcare Analyses

1. Rural-Urban Commuting Area codes (RUCAs) offer a good starting point for classifying rurality and urbanity.
2. For many analyses, RUCAs may have too many categories and can be consolidated to create broader groupings.
3. Analysts may benefit from understanding if there are existing standards already being used in their state.
4. The address data reported to an APCD likely will impact the ability to link to RUCAs and may affect project objectives.

RECOMMENDATION #1: RUCAS OFFER A GOOD STARTING POINT FOR CLASSIFYING RURALITY & URBANITY

Created using population data from the U.S. Census and commuting data from the American Community Survey, RUCAs are based on [concepts used by the U.S. Office of Management and Budget \(OMB\) to define metropolitan and micropolitan areas](#).

“Primary” RUCA codes assign a value of ‘1’ to ‘10’ to each geographical area, with ‘1’ designating the highest level of urbanity and ‘10’ designating the most rural. In addition to these primary codes, secondary codes provide additional refinement and detail. For our analyses, we used the primary RUCA codes listed in the table below.

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

RUCA crosswalks are available for two geographical levels: (1) U.S. Census tracts and (2) ZIP codes. For analyses where data is available at either of these levels, RUCAs are a good option for providing information regarding rural and urban areas at the sub-county level. Crosswalks are [available for download on the ERS website](#).

RECOMMENDATION #2: FOR MANY ANALYSES, RUCAS MAY HAVE TOO MANY CATEGORIES & CAN BE CONSOLIDATED TO CREATE BROADER GROUPINGS

While the 10 primary RUCA categories offer useful specificity regarding the rurality or urbanity of different communities, conducting an analysis with many categories can create challenges. Merging multiple RUCA categories into broader groups may offer advantages such as the following:

- **Aggregating categories allows analysts to summarize data while maintaining patient privacy.** CMS blinding rules for public reporting require the blinding of cells in analyses when the result is fewer than 11 patients. Onpoint follows these guidelines for our public reporting.

As shown in the table below, the population in each RUCA category can vary widely, and some RUCAs – for example, RUCAs 3, 5, 6, 8, and 9 – have comparatively low numbers (highlighted in green).

RUCA	Description	WA 2010 Census Population (%)
1	Metropolitan area core: primary flow within an urbanized area (UA)	5,079,000 (75.5%)
2	Metropolitan area high commuting: primary flow 30% or more to a UA	754,000 (11.2%)
3	Metropolitan area low commuting: primary flow 10% to 30% to a UA	23,000 (0.3%)
4	Micropolitan area core: primary flow within an urban cluster (UC) of 10,000 to 49,999 (large UC)	397,000 (5.9%)
5	Micropolitan high commuting: primary flow 30% or more to a large UC	77,000 (1.1%)

RUCA	Description	WA 2010 Census Population (%)
6	Micropolitan low commuting: primary flow 10% to 30% to a large UC	33,000 (0.5%)
7	Small town core: primary flow within a UC of 2,500 to 9,999 (small UC)	146,000 (2.2%)
8	Small town high commuting: primary flow 30% or more to a small UC	23,000 (0.3%)
9	Small town low commuting: primary flow 10% to 30% to a small UC	0 (0.0%)
10	Rural areas: primary flow to a tract outside a UA or UC	192,000 (2.9%)

In our analysis for the OIC, we understood that once we began to explore specific conditions and patient groups, we would be unlikely to have sufficient volume to report results for specific mental health conditions and services for some of the smaller RUCAs. To address this concern, Onpoint’s analysts consolidated the low-population RUCAs.

- **Aggregated data lends itself to more useful data visualizations.** While it can be illuminating to see results across all 10 primary RUCA categories, it also can make it more challenging to easily see trends or quickly spot key findings. Ten categories may cause visual clutter, and the inclusion of categories with small numbers may contribute more statistical noise than insight.

Case Study: Rates of Mental Health Conditions by RUCA Category in WA’s Commercial Population

For our work with Washington State’s OIC, we used definitions from the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) to identify patients who had been diagnosed with mental health conditions.

Onpoint aggregated data from the RUCAs with small populations into larger groups that were able to show differences in the percentage of patients with mental health conditions and by rurality of patient address. Key takeaways from this analysis:

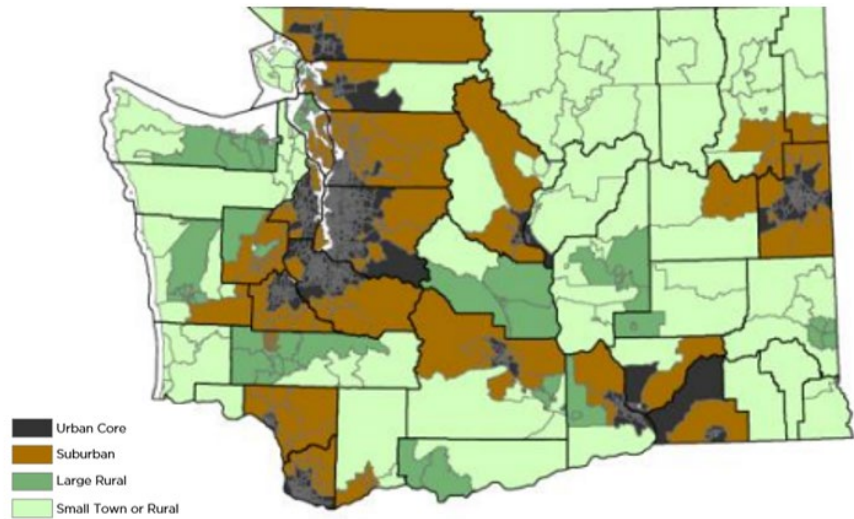


- For each RUCA grouping, the percentage of patients with mental health conditions increased between 2017 and 2022.
- The rate of diagnoses of mental health conditions was highest for those in the Urban Core RUCA and lowest for those in the Small Town or Rural RUCA.

Note that the study included diagnoses of mental health captured in claims data and does not include the uninsured population and patients who were not diagnosed or treated in the healthcare system.

RECOMMENDATION #3: ANALYSTS MAY BENEFIT FROM UNDERSTANDING IF THERE ARE EXISTING STANDARDS ALREADY BEING USED IN THEIR STATE

As part of our research, we performed a literature scan to identify information regarding how other projects in Washington State have used RUCAs. Among our findings: In 2016, Washington State’s Department of Health (DOH) developed [guidelines for using RUCAs for Community Health Assessment](#). The DOH recommended four approaches, or “schemes,” to consolidating RUCA categories, encouraging analysts to consider the sample size of their data set and the intended use of the analysis when selecting their approach.



As part of the pre-work for our project, we reviewed these approaches and opted to use Scenario 1 from the Washington DOH (see image above) for our analysis, which was recommended when the primary intent of the analysis is to examine health status indicators influenced by access to urban-based services. This scenario includes four distinct categories: Urban Core, Suburban, Large Rural, and Small Town or Rural.

The table below shows the population in each of the RUCA groups created using this approach. While most of the population remained in the Urban Core RUCA, consolidating the smaller RUCAs supported reporting population groups without the need to excessively blind data. With only four key categories, the data and visualizations would be easily understood by end users.

Group	RUCA	Description	WA 2010 Census Population (% of Total)	APCD Commercial Members in 2022 (% of Total)
Urban Core	1	Metropolitan area core: primary flow within an urbanized area (UA)	5,078,000 (75.5%)	1,503,000 (79.5%)
Suburban	2	Metropolitan area high commuting: primary flow 30% or more to a UA	777,000 (11.6%)	191,000 (10.1%)
	3	Metropolitan area low commuting: primary flow 10% to 30% to a UA		
Large Rural	4	Micropolitan area core: primary flow within an urban cluster (UC) of 10,000 to 49,999 (large UC)	506,000 (7.5%)	124,000 (6.6%)
	5	Micropolitan high commuting: primary flow 30% or more to a large UC		
	6	Micropolitan low commuting: primary flow 10% to 30% to a large UC		
Small Town or Rural	7	Small town core: primary flow within an urban cluster of 2,500 to 9,999 (small UC)	361,000 (5.4%)	73,000 (3.9%)
	8	Small town high commuting: primary flow 30% or more to a small UC		
	9	Small town low commuting: primary flow 10% to 30% to a small UC		

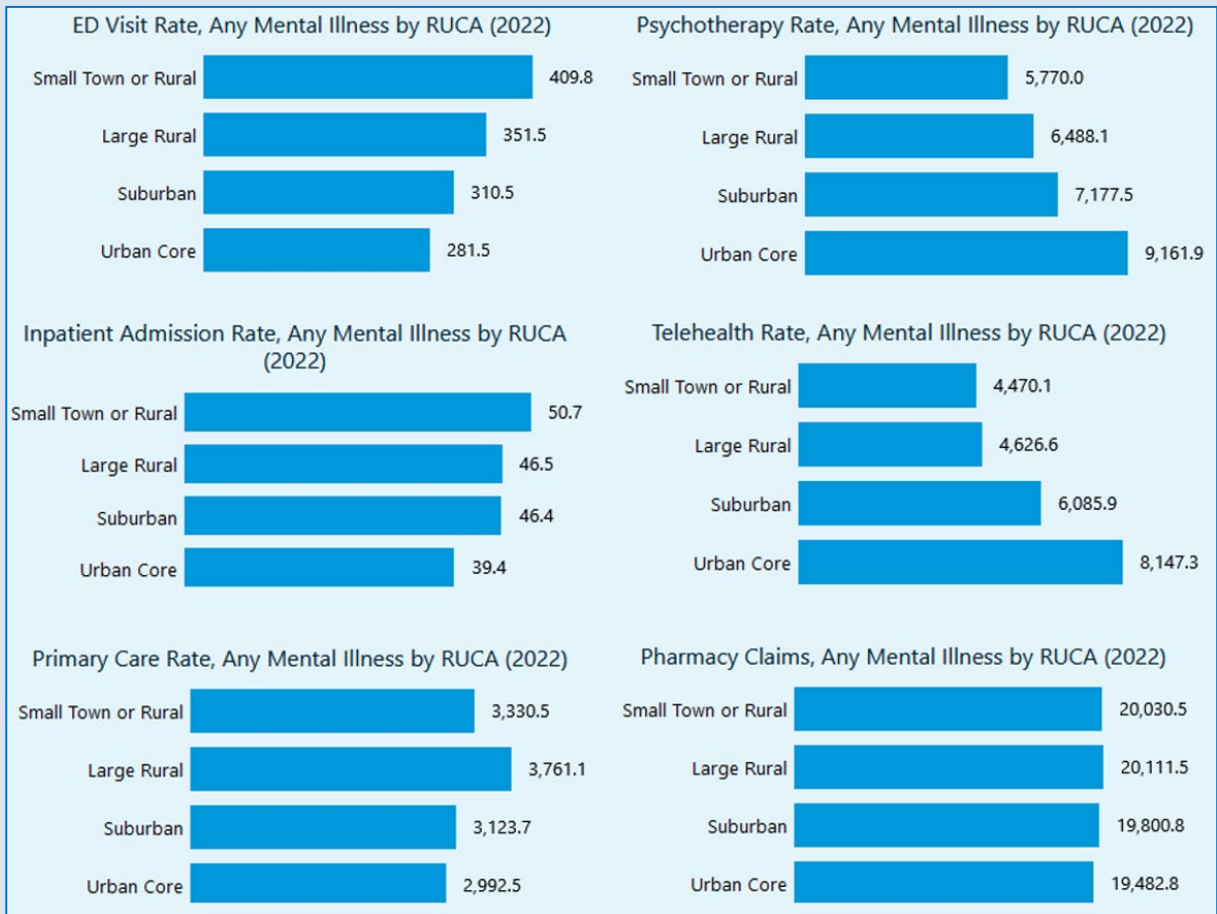
Group	RUCA	Description	WA 2010 Census Population (% of Total)	APCD Commercial Members in 2022 (% of Total)
	10	Rural areas: primary flow to a tract outside a UA or UC		

This table also shows the number of patients in our data set when limited to Washington residents in the Washington All-Payer Health Care Claims Database (WA-APCD) who were commercially insured, shifting the numbers further towards the Urban Core RUCA.

Case Study: Rates in Service Use by Patients with Mental Health Diagnoses

Rurality can impact where patients with mental health conditions seek care, as seen in the figure below. For example:

- Patients in the Large Rural and Small Town or Rural RUCAs were more likely to seek care in the emergency department, primary care office, or through a hospital inpatient admission.
- Those grouped in the Urban Core RUCA had higher rates of psychotherapy and telehealth.



RECOMMENDATION #4: THE ADDRESS DATA REPORTED TO AN APCD WILL IMPACT THE ABILITY TO LINK TO RUCAS & MAY AFFECT PROJECT OBJECTIVES

State APCDs include several types of address information that can be linked to RUCAs to enable analyses of rural and urban healthcare delivery. Before engaging in a study using RUCAs, it is important to evaluate the availability and completeness of the address data available in the APCD to understand the level at which the data are available. Typically, this includes:

- **Member ZIP code.** For our study in Washington State, we were primarily interested in patients' access to care, utilization, and cost, so we assigned our RUCAs based on member address. Member eligibility data in researcher extracts typically is limited to the ZIP code of member residence – not a more granular level – to preserve patient privacy. In most cases, if a researcher wants to classify members by RUCA codes, linking member ZIP code to the RUCA crosswalk is the best option.

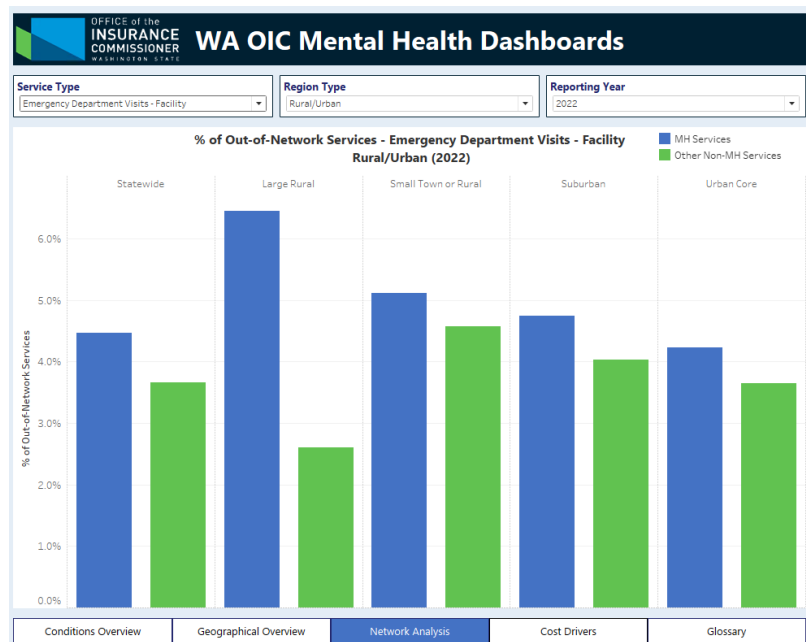
When requested, Onpoint also offers geocoding at the more detailed member address data received from submitters, tying to the Census tract level using SAS or other programs.

- **Provider ZIP code.** For analysts seeking to examine the provider level – rather than the patient level – location is likely more useful. When using provider address data, it is important to distinguish between rendering and billing provider location. Billing providers may be located at a centralized location that is not always the location where care was rendered.

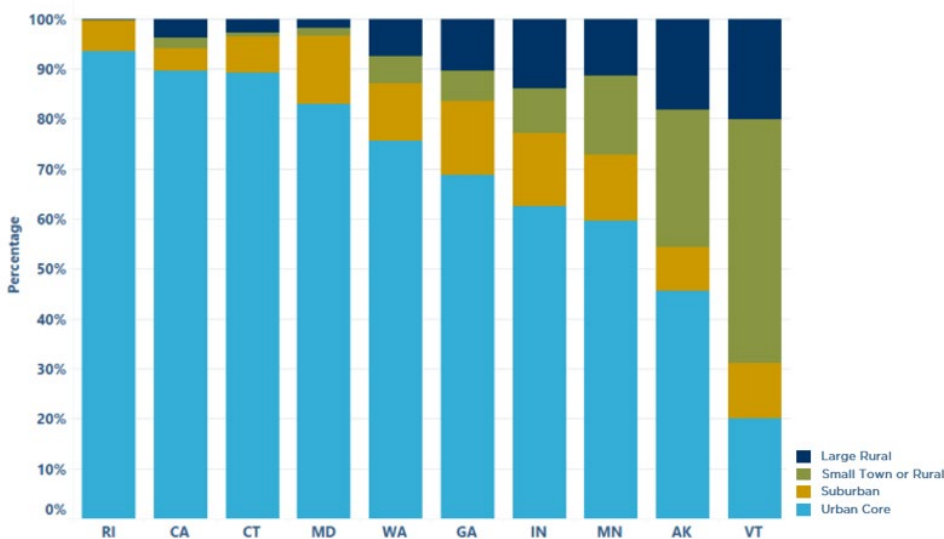
Provider ZIP codes typically are available and enable studies based on the RUCA classification of the ZIP code where care was provided. As with member data, Onpoint also can offer more detailed geocoding results.

HIGHLIGHTING THE RESULTS FOR WASHINGTON STATE

Along with our colleagues at the OIC, Onpoint's analytics team presented our study results at a recent conference of the National Association of Health Data Organizations (NAHDO), which recognized the OIC's publicly available dashboards with NAHDO'S 2024 "Innovation in Data Dissemination Award."



APCD CLIENTS VARY SIGNIFICANTLY IN DEGREE OF RURALITY



Onpoint's APCD clients span the rural-urban spectrum, with a wide range of the population – 20% to 94% – living in the Urban Core setting. Using the revised 2010 RUCAs, which draw on the 2006–2010 American Community Survey and other data from the U.S. Census, we calculated the percentage of the total population that belonged in each RUCA group for each state. The

data in the figure at left includes the full Census population and, unlike other data presented in this paper, is not limited to members with data in an APCD.

Despite the great variation in the percentage of urban dwellers across states, most had a significant portion of their population in both rural and urban areas. For example:

- Although 90% of California's population lived in the metropolitan core, half a million California residents lived in rural areas.
- While Vermont is primarily a rural state, more than 100,000 residents resided in the urban Burlington area.

Though these states have nearly opposite profiles, rural/urban disparities in healthcare are equally impactful and important to study in both.

CONCLUSION

Most states have a continuum of rural, suburban, and urban areas. For researchers and policymakers seeking to use APCD data to classify healthcare diagnoses, use, and cost by rurality, RUCAs offer a useful, supplemental data source that allows for deeper geographical analysis and provide categories that may be more meaningful than counties. To maximize their usefulness, however, RUCAs may need to be consolidated into broader categories for ease of use and protection of patient privacy.

ABOUT ONPOINT HEALTH DATA

Onpoint Health Data is a nonprofit organization that specializes in collecting, integrating, and analyzing health data to provide our clients with enriched data sets and innovative analytic solutions tailored to their specific needs. We are an independent, nonpartisan organization supporting federal, state, and regional health improvement initiatives for more than 40 years.



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