Guidelines for Using Rural-Urban Classification Systems for Community Health Assessment

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Executive summary

- These Department of Health guidelines are a resource on how to choose from and use existing rural-urban classification systems for various contexts.
- Living in rural or urban areas influences the health status of populations and is one of the measures used to assess health disparities.
- Definitions of urban and by extension rural areas are various and change over time.
- Researchers should consider three main factors when choosing a rural-urban classification system at the county or sub-county level:

  a) The unit of geography in which the health event and population data are available
  b) Special interest in a particular level of rural or urban geography, and
  c) Comparability with other states or the nation and the importance of reproducibility of the findings.

- It is worth noticing, especially when exploring trends, that rural-urban classification systems built on the decennial censuses are not directly comparable due to methodological changes and absence of bridging data among census decades.

- Differences in health status indicators between rural and urban residents might be a reflection of underlying differences in the economic and socio-demographic characteristics. Researchers should consider multivariate adjustments where appropriate.

- Researchers need to update and document the classification system(s) used, explaining the reasons for selection, discussing strengths, limitations and possible biases. Three major types of classification systems currently exist:

    1. Block-group level rural-urban classification system
    2. County level rural-urban classification systems
    3. Sub-county level rural-urban classification system

- These guidelines update rural-urban classification systems using census 2010-based data and information. The guidelines underscore the importance of rural-urban distinctions at the sub-county levels for use in public health, and foster consistency, comparability, interpretability, and relevance to promote best practice.

- These guidelines highlight four schemes of aggregation of Rural-Urban Commuting Area (RUCA) codes for sub-county level of analyses and identify conditions favoring the use of each one.

Introduction

The Assessment Operations Group (AOG) in the Washington State Department of Health (DOH) coordinates the development of data management and analysis guidelines to promote best practice among staff involved in assessment activities at DOH and in Local Health Jurisdictions in Washington.

The 2009 DOH guidelines for using rural-urban classification systems put existing rural-urban classification systems in context and recommended a modified four-tier rural-urban classification scheme at the sub-county level of geography. The approach used to develop these updated guidelines follows the basic framework of RUCA codes: metropolitan, micropolitan, small town and rural delineations. Availability of the 2010 census-based data and information, and the newer (Appendix 1) RUCA 3.10 primary and secondary codes, prompted this 2016 update. The guidelines update the commonly used rural-urban classification systems, with emphasis on: context-based sets of RUCA codes, population size and density, land area, land area use, and commuting patterns.

While there are other systems at the county level, the Rural-Urban Commuting Area (RUCA) system developed by the Federal Office of Rural Health and Policy (FORHP) is the only multi-level classification available at census tract and ZIP code levels of aggregations. Because the RUCA codes assign primary and secondary codes at smaller geographic units, they are more precise than county-based alternatives. They incorporate commuting patterns that serve as a proxy indicator for economic ties and access to resources that potentially influence people's health status. The distinguishing feature of the 2016 DOH guidelines is that they implement the commonly used concept of rurality at the sub-county level, with four options of variables and categories incorporating varying sizes of population density. This will help researchers better assess their community's health disparities.

The Office of Community Health Systems (OCHS) and other offices in DOH have documented significant differences in health status indicators between rural and urban residents. Rural areas in Washington State tend to have lower percentages of population with: health insurance, a personal healthcare provider, or routine dentistry. On the other hand, the percent of the population in rural areas who postponed a visit to a doctor due to cost, are overweight or obese, or who smoke cigarettes are higher than the respective percentages in urban areas. Rural area residents also tend to show lower use of preventive screening services. In general, the farther away a place of residence is from an urban core area and the lower the levels of commuting, the greater the magnitude of health disparities.

Purpose

The 2016 DOH guidelines commonly use rural-urban classification systems using census 2010 data and information. They identify criteria to determine which classification scheme to use to describe rural-urban differences in demographics, health outcomes, risk factors and access to services.

While the 2016 DOH guidelines are intended for audiences of differing levels of data management and analytic skill, they assume a basic knowledge of epidemiology and biostatistics. They focus on issues common in public health practice and, where applicable, refer to issues unique to Washington State. These guidelines do not address the use of rural-urban classification systems to determine eligibility for state or federal assistance programs. Public health practitioners who would like to use existing systems for state or federal assistance programs should refer to each program's specific eligibility criteria.

Methodological considerations

Health data are commonly available at a range of location identifiers or levels of geography. Common levels of geography include: individuals' residential addresses; census blocks, census block groups and census tracts; and ZIP codes, towns/cities, and counties. Depending on the desired unit of analysis, researchers may classify each level by itself or aggregate to a higher level of geography. Methodological considerations include:

1. Choosing the right classification system

Researchers should consider three main factors when choosing a rural-urban classification system at the county or sub-county level:

a) The unit of geography in which the health event and population data are available: The decision on which classification system to use may be driven by the level of geo-coding in the health dataset and the availability of population denominators, if the researcher needs to generate rates. Although many health datasets include ZIP or county codes, the complete street address required for geo-coding to census tract is less commonly available and may have more missing values. Population estimates, especially by age, sex and year, are commonly available at the county level. Estimates at smaller geographic levels are less available. (See Guidelines for Population Denominators and Rates).

b) Special interest in a particular level of rural or urban geography: The Office of Management and Budget (OMB) commonly refers to metropolitan counties as "urban" and nonmetropolitan counties as "rural." The Washington State Office of Financial Management (OFM) also defines counties as urban and by extension rural. However, county-level geography and sociodemographic characteristics are not homogeneous. Any rural-urban health profiles determined at a county level are less likely to reflect the realities in both rural and urban counties. County-level classification systems with a larger

number of classes, such as Rural-Urban Continuum Codes (RUCC) or Urban Influence Codes (UIC), differentiate remote rural areas from less remote rural areas (Appendix 2). Thus, they are relatively appropriate when rural-to-rural comparisons are of special interest and data are available only at the county level. On the other hand, sub-county classification systems (e.g., RUCA codes) are more effective at identifying populations with identical geographic and socio-demographic characteristics, unrestricted by county borders. Thus, they are more appropriate when rural-to-urban or rural–to-rural comparisons are of special interest and data are available at sub-county levels.

c) Comparability with other states or the nation and highlighting the importance of reproducibility of the findings: In some cases, the value of adopting a more widely used classification system outweighs that of choosing a system that might be more precise or more suited to answering a specific question. Nationally, the OMB's metropolitan-nonmetropolitan system for counties and the RUCA sub-county classification are the two most widely used rural-urban classification systems.

Choosing the right rural-urban classification will minimize subjectivity, nurture a valid representation of any effect measure estimates, and avoid erroneous conclusions.

2. Trend analysis

In community health assessments, measured exposures and health outcomes in a population can only be understood fully if examined in terms of person, place and time. Trend analysis is one dimension of this analytic triangle used for public health surveillance, monitoring, program evaluation, and policy analysis. It is also useful for investigating potentially causal relationships between risk factors and outcomes. Studying trends may focus on the overall pattern of change in a particular indicator and allow comparison from one time period to another. It can also enable future projections.

While trend analysis gives researchers an opportunity to explore those areas, the process is not straightforward due to variability in methods, the level of detail used to measure exposures or outcomes, and the methods used to classify rural-urban areas over time. For instance, five major changes occurred between the 2000 and 2010 US censuses that complicate attempts to track trends in rural-urban disparities:

1) Census block delineations changed and subsequently, census block groups and census tract boundaries were reconfigured. An overlay of 2000 and 2010 Washington census tracts shows realignments were particularly noticeable in the rapidly growing areas surrounding major population centers (Appendix 3).

2) Between 2000 and 2010, the data source for daily commuting patterns switched from the decennial census (measuring one point in time during a census year, 2000) to the American Community Survey (ACS), providing five-year average commuting patterns during 2006-2010. More importantly, the 2010 census did not use the long form that provides detailed social and economic information; instead, it used the short form with a limited number of questions. As with all survey data, ACS estimates are subject to variability because they are based on a subsample; the smaller the sample size, the larger the degree of uncertainty.

3) The US Census Bureau revised the methodology for establishing urbanized areas and urban clusters in the 2010 census, resulting in the expanded boundaries of urbanized areas. Comparison of 2010 urbanized areas using census tracts and 2000 urbanized areas using census block groups showed an increase in urbanized area population and urbanized land area. Because most rural classification systems use the urbanized area definition as a starting point, this change could have broad ramifications for making comparisons over time.

4) County-based rural-urban classification systems were also affected by the US Census Bureau revised methods for establishing metropolitan and nonmetropolitan areas in 2013. This change also affected other classifications tied to metropolitan definitions, such as the Urban Influence Codes and Rural Urban Continuum Codes.
5) The secondary RUCA codes were reduced to 21 in 2010 (RUCA 3.1) compared to 33 in 2000 (RUCA 2.0) based on reconfigured census tract boundaries.

Trends in risk factors, risk/protective behaviors, commuting patterns, access to healthcare services, and use of healthcare services across rural-urban categories during 2000 and 2010 may be obscured due to the magnitude and complexity of the above mentioned changes and the absence of bridging methods. Furthermore, a misclassification bias could be introduced, from using a classification at a point in time, if the factor being explored (e.g., motor vehicle crashes) was correlated with a factor used in classification (e.g., commuting), and if the factor being explored was correlated with another factor that was also correlated with the classification (i.e., a confounding variable).

Recommendations for trend analyses

- Because classification systems built on the 1990, 2000 and 2010 US censuses are not comparable; the AOG recommends beginning trend analysis in 2005 and using a classification for the area that is based on 2010 census data.
    - The trend analysis will use an area, based on a classification at a point in time (2010), but data on commuting are extracted from the five-year average commuting patterns during 2006-2010 from the American Community Survey. Some areas, particularly those with large population change, might change classification if we had data to explore.
- If assessing trends beginning prior to 2005 using systems based on 2000 or 2010 US censuses is considered, any misclassification bias could even be more pronounced and, it is recommended that the researcher:
    - Explore the extent of classification changes before treating the data as a continuous series.
    - Clearly show on trend lines or charts where major methodological changes occurred.
    - Interpret trends with caution.

3. Other methodological points

In general, the residents of rural Washington are more elderly, have lower incomes and fewer years of formal education, and may come from different racial and ethnic backgrounds than urban residents. Differences in health status may reflect these underlying differences in demographics, and analysts should consider restricting the analysis to similar populations, age-adjustment for age-related public health indicators and/or multivariate adjustments to account for population differences. (See Rates guideline for a discussion of age-adjustment).

There are also regional variations in the demographics of rural Washington. The Hispanic population has a strong presence in Central Washington, and tribal populations have a strong presence in Northeast Washington. San Juan and Island Counties in Northwest Washington are more white and affluent.

Some rural counties in Washington (according to OFM's definition, see (Appendix 2) – Walla Walla, Whitman, Kittitas, and since 2008 Yakima—host universities which influence age and economic factors. Island County, another rural county, has a very large military presence.

Matching and stratification will minimize differences as result of measured covariates, when examining health indicators or population demographics. In certain instances, sensitivity analyses may be warranted when there are concerns with regard to unmeasured covariates. For additional information, see http://www-stat.wharton.upenn.edu/~rosenbap/BehStatSen.pdf

Table 1: Commonly used systems to classify rural-urban concept

Classification System	# of Classes	Geographic Unit and Possible Indications for Use	First Developed (Latest Revision)	Classification Data Elements
Urban Areas (Urbanized Areas, Urban Clusters,) and Rural Areas (US Bureau of the Census)	3	Census Block Group May be used as the basis for any desired geographic consolidation system.	1900 – 1910, 2002, (2012*)	Population Size of , Population Density, Adjacency to and Density of Settled Territory
Metropolitan, Micropolitan, and Noncore (US Office of Management and Budget (OMB))	3	County May be used when rural-urban comparison is needed, and data is available only at the county level. It is also a commonly used system.	1940s, 2003, (Feb 2013*)	Urbanized areas based on Population Density, Population Size, Adjacency and Commuting ties with the Core
Rural-Urban Continuum Codes (RUCC) (US Department of Agriculture - Economic Research Service (USDA-ERS))	9	County When rural-to-rural comparisons are of special interest, and data are available only at the county level	Mid 1970s, 2003, (2013)	Population Size, degree of urbanization, and Adjacency to Metropolitan Areas
Urban Influence Codes (UIC) (US Department of Agriculture - Economic Research Service (USDA-ERS))	12	County When rural-to-rural comparisons are of special interest and data are available only at the county level.	Mid 1990s, 2003, (2013)	Population Size of metro areas, and for non-metro counties size of the largest city or town and proximity to metro and micro areas
Rural Counties (Washington State Office of Financial Management (OFM))	2	County For selected program indicated rural-urban comparisons. Such as rural Washington, loan fund and economic development, public facilities loans and grants.	1990s, 2008, (2014)	Population Density, Land size of Counties
Rural Urban Commuting Areas (RUCA) (US Health Resources and Services Administration - Federal Office of Rural Health Policy /US Department of Agriculture Economic Research Service (FORHP)	10 primary 21 secondary Users defined tiers of consolidated RUCA codes	Sub-county Census Tract or ZIP Code When rural-to-urban or rural-to-rural comparisons are of special interest and data are available at a sub-county level.	Late 1990s, 2000, (2013, 2014)	Population Density, Urbanization, and Daily Commuting

***** *Year published in the Federal Register*.

Commonly used systems to classify rural-urban concept

The Census Bureau, OMB, USDA-ERS, FORHP, and OFM provide systems to classify geographical locations and respective populations as rural-urban (Table 1). The Census Bureau classification system is the basis for the OMB, USDA-ERS, and FORHP classification systems. The Census Bureau delineates urban and rural at the census block-group level, OMB, FDA-ERS, and OFM at the county level, and the OFRHP at the sub-county level. The Census Bureau and OMB classifications are published in the federal register, and the Revised Code of Washington (RCW) backs OFM's classification of rural counties.

1. Block-group level rural-urban classification system

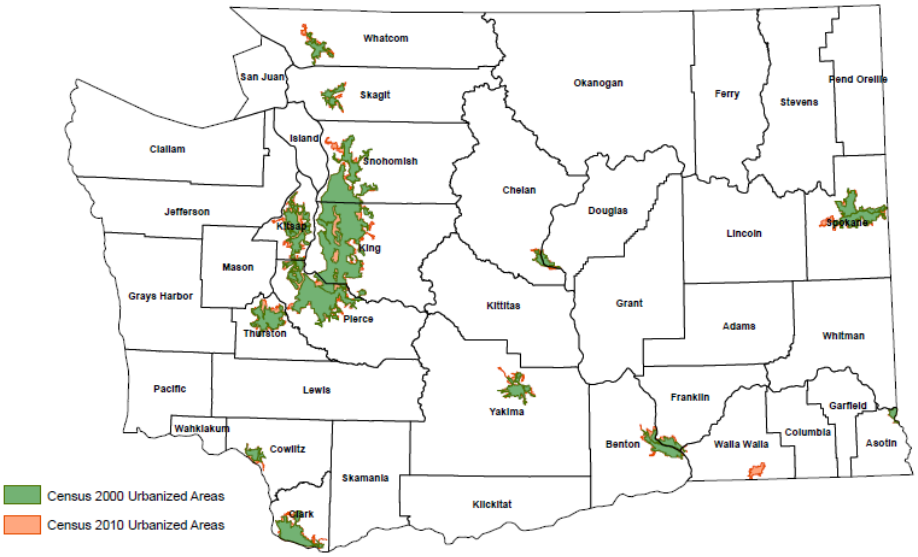
The US Census Bureau identifies urban areas and rural areas. The definition of "urban" has changed in response to changes in settlement patterns, data use needs, and available technology. In the 1880, 1890 and 1900 censuses, places were deemed urban based on minimum population sizes of 8,000, 4,000, and 2,500 respectively. In 1910, the minimum population threshold for an urban area was 2,500.

Urban Areas (Urbanized Areas, Urban Clusters) and Rural Areas:
In 2000, the US Census Bureau defined "urban" as all territory, population, and housing units in urbanized areas and urban clusters with 2,500 or more people based on the census block group. Urbanized areas are contiguous built-up areas with a population density of more than 1,000 people per square mile, and a contiguous set of block groups with a population of 50,000 or more. An urban cluster is a contiguous set of block groups with population density similar to urbanized areas, and populations of between 2,500 and 49,999.

The identification of initial urban area cores in census 2000 was based on census block group and block population density and size thresholds. On the other hand, in 2010, the US Census Bureau identification of initial urban area cores was based on census tract and block population density, count, and size thresholds. While boundaries of urban areas in Washington State changed in 2010, the only new urbanized area added was Walla Walla, with a population of 55,805. Figure 1 shows how the boundaries of urbanized areas in Washington changed between the 2000 and 2010 censuses. The Census Bureau has continued to define "rural" by exclusion, as all territory, people, and housing units not defined as urban. Details about the methodological changes in 2010 and a list of urbanized areas are available from the Census Bureau, Federal Register / Vol. 77, No. 59 / Tuesday, March 27, 2012 / Notices.

These binary classifications based mainly on population size and density gave way to more complex county coding systems such as RUCC and UCI. Other existing rural-urban classification systems are also derivations of the Census Bureau definition of urban and rural areas, and fall under two major categories: county and sub-county based rural-urban classification systems.

Figure 1. Urbanized Areas in Washington State, US Census Bureau 2000 and 2010



2. County-level rural-urban classification systems

Most county-level classification systems (OMB, RUCC and UIC) begin with US Census classification but distinguish metropolitan counties from nonmetropolitan counties. Metropolitan counties are defined by the population size of their metro area. Nonmetropolitan counties are defined by degree of urbanization, adjacency to a metro area, and commuting patterns. (Appendix 2) presents a summary of Washington State rural-urban classification systems by county.

In most cases, county-level classification systems are typically used because county lines tend to be stable over time, and health, social and economic indicators are readily available for counties. However, county-level classification systems tend to misclassify both urban residents in rural counties, and rural residents in urban counties. In 2005, Hart et al. reported that 11 percent of residents of US metropolitan counties, as defined by the OMB classification as living in rural areas by the US Census Bureau's block group (census 2000) classifications, and seven percent of residents of nonmetropolitan counties classified as living in urban areas.

In Washington State, 12.3 percent of residents of metropolitan counties, as defined by the OMB classification, were identified as living in rural areas by the US Census Bureau's block group (census 2000) classifications, and 65.2 percent of residents of nonmetropolitan counties identified as living in urban areas. Similarly, 11.8 percent of residents of Washington metropolitan counties, as defined by the OMB classification were identified as living in rural areas by the US Census Bureau's block group (census 2010) classifications, and 48.6 percent of residents of nonmetropolitan counties identified as living in urban areas.

Metropolitan, Micropolitan and Noncore

The OMB has used this form of national classification system since the 1940s for statistical reporting and allocating funds. Until recently, this system classified counties as metropolitan or nonmetropolitan.

In 2013, OMB redefined metropolitan (metro) areas as broad labor-market areas that include:

a) Central counties with one or more urbanized areas; urbanized areas are densely settled areas with 50,000 or more people.

b) Outlying counties that are economically tied to the central counties as measured by labor-force commuting. Outlying counties are included if 25 percent of workers living in the county commute to the central counties, or if 25 percent of the employment in the county consists of workers coming out from the central counties—the so-called "reverse" commuting pattern.

OMB defined nonmetropolitan counties as outside the boundaries of metropolitan areas and as one of two types:

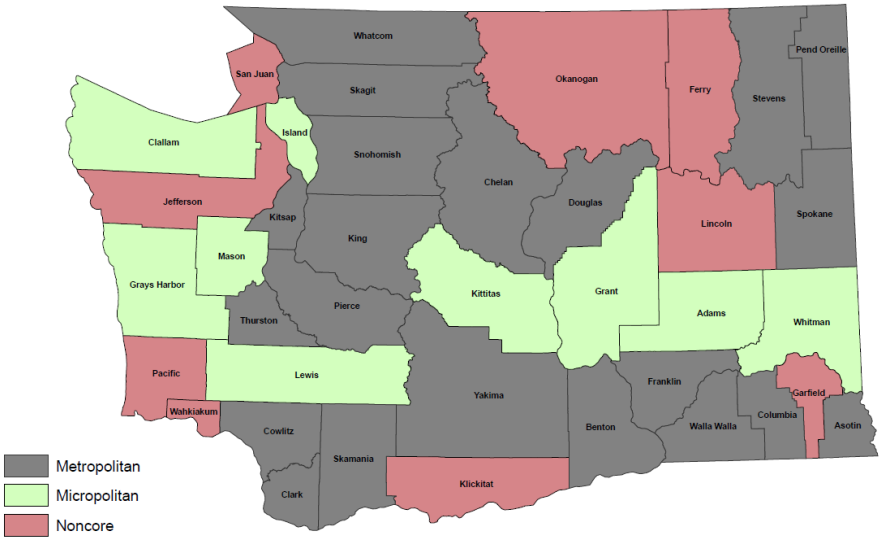
a) Micropolitan (micro) areas are nonmetropolitan labor-market areas centered on urban clusters of 10,000-49,999 persons and defined with the same criteria as metro areas.

b) Noncore areas are all remaining nonmetropolitan counties.

For more information, see http://www.ers.usda.gov/topics/rural-economy-population/rural-classifications/what-is-rural.aspx

Figure 2 shows a map of Washington counties classified by the 2013 OMB system.

Figure 2: Metropolitan, Micropolitan, Noncore Counties in 2013



Rural-Urban Continuum Codes (RUCC)

The US Department of Agriculture (USDA-ERS) developed the nine-level RUCC system, also known as the Beale code system, in the mid-1970s. It was a forerunner of the Urban Influence Codes and the present Rural-Urban Commuting Area (RUCA) system. The system uses metropolitan, micropolitan and noncore area classifications as a starting point. Metropolitan counties are classified into three population categories. Nonmetropolitan counties are classified into six categories based on total population in US Census Bureau's degree of urbanization and adjacency to a metro area. This system better differentiates between central and fringe metropolitan areas than the OMB's three-level system. The most recent update of the RUCC classification system was in 2013. For more information and to download codes see http://www.ers.usda.gov/Data/RuralUrbanContinuumCodes

Urban Influence Codes (UIC)

The USDA developed the 12-level UIC classification scheme in the mid-1990s to emphasize the tendency of economic systems to centralize around very large metropolitan counties. This system was most recently updated in 2013. Metropolitan counties are classified as large metropolitan (population of at least one million), or small metropolitan (population less than one million).

Nonmetropolitan counties have been subdivided into 10 nonmetropolitan categories according to their adjacency to large or small metropolitan counties. Counties in noncore area are classified by their adjacency to metropolitan and micropolitan areas and whether they contain a town of at least 2,500 residents. For more information and to download codes see http://www.ers.usda.gov/data-products/urban-influence-codes.aspx.

Rural Counties

In 1999, RCW 82.14.370 was revised to include a rural county definition based on population density. According to the Washington State Office of Financial Management (OFM), "rural county" is defined as "… a county with a population density less than 100 persons per square mile." Subsequent legislation expanded the definition to include "... a county smaller than two hundred twenty-five square miles." Several statutes now use this definition for taxes and other assistance programs. In 2014, 31 of Washington State's 39 counties were defined as rural.
For more information, see http://apps.leg.wa.gov/RCW/default.aspx?cite=82.14.370.

3. Sub-county level rural-urban classification system

Sub-county level classification systems, while often more precise than those at the county level, are more subject to variation over time. For example, ZIP code and census tract boundaries change more frequently than do county boundaries, adding to the complexity of classification systems.

The Rural-Urban Commuting Area (RUCA) system

The Federal Office of Rural Health and Policy—in collaboration with the US Department of Agriculture, the Department of Health and Human Services, and the (Washington, Wyoming, Alaska, Montana and Idaho (WWAMI) Rural Health Research Center—developed the RUCA system in the late 1990s. It is the only detailed system available at the census tract or ZIP code level of geography. For sub-county analyses that use geographical stratifications, we recommend using the RUCA system.

The RUCA classification system codes fall under two major components: primary and secondary RUCA codes. For census tracts, the primary RUCA codes assign a 10-tier classification system based on the US Census Bureau definitions of urbanized areas and urban clusters and commuting relationships. The 10 whole numbers shown in Table 3 and Appendix 1 refer to the primary (single largest) commuting share. The secondary RUCA codes assign a 21-tier classification system representing the secondary (second largest) commuting flows to core areas. For both the primary and secondary codes, the commuting patterns are identified using commuting data from the American Community Survey 2006-2010 five-year estimates. For detailed documentation of the RUCA codes see http://ers.usda.gov/data-products.aspx.

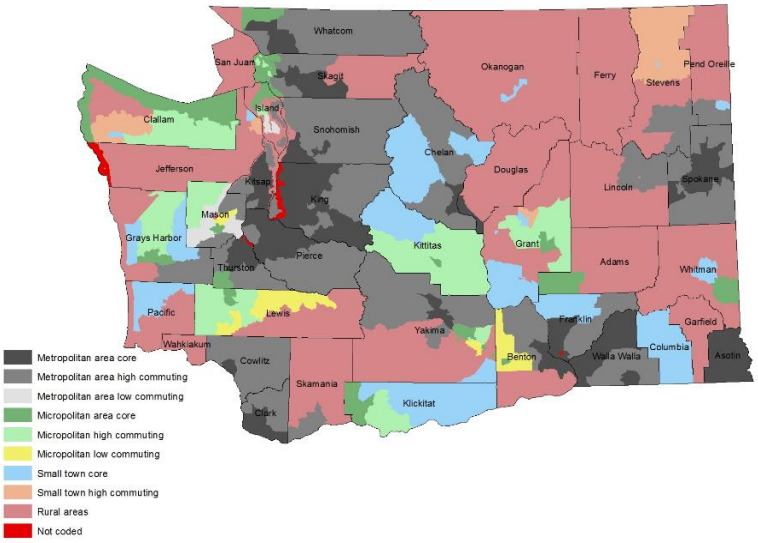
Table 3: Rural Urban Commuting Area (RUCA) Primary Codes Classification System‡

General Classification	Core Area Codes	High Commuting Primary Flow (at least 30% to Urbanized Area) Codes	Low Commuting Primary Flow (between 10-30% to Urbanized Area) Codes
Metropolitan (Urban) (50,000 or more)	1	2	3
Micropolitan (Large Town) (10,000 - 49,999)	4	5	6
Small Town (2,500 – 9,999)	7	8	9
Rural (Isolated Rural) (under 2,500)	10		

‡ Ten primary RUCA codes based on 2010 census and commuting flow based on 2006-2010 American Community Survey 5-year estimates.

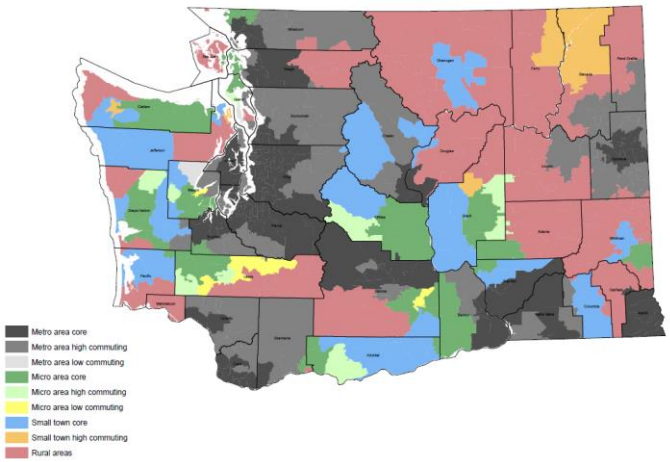
The 1990, 2000 and 2010 versions of RUCA codes use the same primary classification system (1-10) but are not directly comparable because many census tracts are reconfigured during each decade. For example, 10 primary RUCA codes were subdivided into 33 secondary codes in the census 2000-based RUCA codes. In 2010, the 10 primary RUCA codes were subdivided into 21 secondary codes. See (Appendix 1) for a listing of the primary and secondary codes. Because of census tract reconfigurations, some secondary RUCA codes (4.2, 5.2, 6.1, 7.3, 7.4, 8.3, 8.4, 9.1, 9.2, 10.4, 10.5, 10.6,) on the 2000 census-based RUCA codes are dropped from the 2010 census-based secondary RUCA codes. There are also changes in labeling, such as “small rural town core” to “small town core” and “small rural town high commuting” to “small town high commuting,” etc. Washington State RUCA primary codes are mapped in Figure 3. The codes 9 and 8.1 are not associated with any census tracts in Washington State.

Figure 3: 2010 Census Tract Rural Urban Commuting Area (RUCA) Primary Codes for Washington State



A 2013 ZIP code approximation of the 2010 RUCA version 3.1 codes posted at http://ruralhealth.und.edu/ruca is mapped in Figure 4. ZIP code approximation is less accurate than the census tract version because ZIP codes do not uniformly correspond to census blocks.

Figure 4: 2013 ZIP Code Rural Urban Commuting Area (RUCA) Primary Codes for Washington State



Recommendations on consolidating RUCA codes at the sub-county levels

The previous versions of these guidelines have shown a continued usefulness of consolidating the RUCA codes for assessing and monitoring health indicators in Washington State. In general, the farther away a place of residence is from urban core areas, the greater are the gaps in health disparities, demonstrating the importance of continuing to use an appropriate geographic unit of analysis.

When datasets are large enough, and a specific program need exists to use the finer granularity of the RUCA codes, the 10 primary and the 21 secondary codes are options to use. However, many datasets do not have sufficient sample size to support analysis using a 21-tier or a 10-tier system. One of the advantages of the RUCA codes is that they are flexible and allow context-based consolidations of the primary or secondary codes.

We identify four different context-based consolidation schemes described under this section.

The process of creating the four consolidation schemes recommended here follows the basic framework of RUCA 3.1 codes: metropolitan, micropolitan, small town and rural delineations.

Overall, the consolidation schemes represent the following categories. Further delineation of 5-level and 6-level consolidations is recommended based on different population densities:

- Urban Core: contiguous built-up areas of 50,000 people or more. These areas correspond to the US Census Bureau's urbanized areas.
- Suburban: areas, often in metropolitan counties, with primary high commuting flows to urban cores (e.g., Eatonville in Pierce County) and all other areas with secondary commuting flows of 30%-49% of the population to urban cores.
- Large Town: towns with populations of 10,000-49,999 and surrounding rural areas with 10% or more primary commuting flows to these towns, and towns with secondary commuting flows of 10% or more to Urban Cores.
- Small Town/Rural Areas: towns with populations below 10,000 and surrounding commuter areas with more than a one-hour driving distance to the closest city.

The four recommended schemes:

Scheme 1. This scheme uses the RUCA 3.10 basic framework and is created with emphasis on population size, population density and daily commuting pattern. In the scheme dataset, this classification scheme is called tier4_2010_ruca_commuting.

Context – This consolidation scheme uses both primary and secondary commuting patterns to incorporate the concept of potential access to resources and services in its broadest sense. In Asotin County, one census tract was designated as suburban and two census tracts as small town/rural, a departure from their original assignments to urban core. Most people living in suburban areas, under this scheme, can get to an urban area if they need to. Some people in the suburban tracts may actually be quite isolated, but most are living in a town that has a highway connection to the city. Small towns and rural areas have little active commerce with the cities, and urban-based services are difficult to access.

Level	Secondary RUCA Codes
Urban core	[1.0, 1.1]
Suburban	[2.0, 2.1, 3.0]
Large rural	[4.0, 4.1, 4.2, 5.0, 5.1, 5.2, 6.0, 6.1]
Small town/rural	[7.0, 7.1, 7.2, 7.3, 7.4, 8.0, 8.1, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2,10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6]

Note: When using scheme 1, based on census tracts, [53003960600] might be re-classified to Suburban; and [53003960100 and 53003960200] re-classified to small-town/rural.

Recommended use – Scheme 1 might be used when the primary intent of the analysis is to examine health status indicators influenced by access to urban–based services.

Scheme 2. This scheme focuses on population size and density, and daily commuting patterns. RUCA 3.1 codes modifying the assigned codes for "suburban" and "large town" are constrained to a population density over 100 per square mile; and "small town/rural" are constrained to population density less than 100 per square mile. In the scheme dataset, this classification scheme is called tier4_2010_ruca_den100.

Context – Population density, as well as commuting patterns, are considered when describing the communities and environments in which people live. Schemes 2, 3 and 4 are similar in their development, with varying degrees of specificity in rural settings. In this context, suburban means living in a densely populated bedroom community on the outskirts of a city. Most of the land is developed. Small towns and rural areas are less densely populated, with more land either undeveloped or agricultural.

Level	Secondary RUCA Codes
Urban core	[1.0, 1.1]
Suburban	[2.0, 2.1, 3.0] AND population density 100+/sq. mi
Large rural	[4.0, 4.1, 4.2, 5.0, 5.1, 5.2, 6.0, 6.1] AND population density 100+/sq. mi
Small town/rural	[7.0, 7.1, 7.2, 7.3, 7.4, 8.0, 8.1, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2,10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6] OR Not urban core with population density < 100/sq. mi

Recommended use – Scheme 2 might be used when the primary intent of the analysis is to examine differences in demographics, or health status indicators related to population density.

Scheme 3. This scheme starts with scheme 2 and further divides small town/rural into small town and rural. A population density of less than 50 per square mile defines the division. In the scheme dataset, this classification scheme is called tier5_2010_ruca_den100_50.

Context – Scheme 3 distinguishes between small town and rural environments. People living in small towns live in communities with neighbors and community facilities close by. People living in rural areas have fewer near neighbors and must travel farther to access community resources. It identifies rural areas that may be difficult to reach.

Level	Secondary RUCA Codes
Urban core	[1.0, 1.1]
Suburban	[2.0, 2.1, 3.0] AND population density 100+/sq. mi
Large rural	[4.0, 4.1, 4.2, 5.0, 5.1, 5.2, 6.0, 6.1] AND population density 100+/sq. mi
Small town	[7.0, 7.1, 7.2, 7.3, 7.4, 8.0, 8.1, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2,10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6] OR IF Not urban core with 50 ≤ population density <100/sq. mi
Rural	IF Not urban core with population density less than 50/sq. mi

Recommended use – Scheme 3 might be used when the primary intent of the analysis is to examine demographics, and health status indicators related to emergency services, capturing hard-to-reach rural areas.

Scheme 4. This scheme starts with scheme 3 and modifies the assigned codes for "rural." The division is defined by a population density of less than 5 per square mile. In the scheme dataset, this classification scheme is called tier6_2010_ruca_den100_50_5.

Context – Scheme 4 distinguishes between rural and isolated environments. People living in isolated areas have very few neighbors, and are largely cut off from community resources. In particular, emergency services may not be able to reach these areas effectively. It identifies rural and isolated areas that may be extremely difficult to reach.

Level	Secondary RUCA Codes
Urban core	[1.0, 1.1]
Suburban	[2.0, 2.1, 3.0] AND population density 100+ / sq. mi
Large rural	[4.0, 4.1, 4.2, 5.0, 5.1, 5.2, 6.0, 6.1]
Small town	[7.0, 7.1, 7.2, 7.3, 7.4, 8.0, 8.1, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2,10.0, 10.1, 10.2, 10.3, 10.4, 10.5, 10.6] OR Not urban core, with 50 ≤ density < 100/sq. mi
Rural	IF Not urban core, with 5 ≤ density < 50
Isolated	IF Not urban core, with population density less than five

Recommended use – Scheme 4 might be used when the primary intent of the analysis is to examine demographics and health status indicators related to emergency services, capturing extremely isolated areas.

The respective maps for the four consolidation schemes created above, based on census tract and ZIP code, are in (Appendix 4), and selected analyses using BRFSS sample data are in (Appendix 5).

How rural is Washington State?

The percent of Washington residents who live in rural areas depends on the classification systems used and varies over time. For instance:

- Comparing US Census 2000 and 2010 data on population size, population density, and adjacency to densely settled population areas, residents living in rural areas constituted 18% and 16% of the population, respectively.

- Using the 2010 Office of Management and Budget (OMB) designation of metro and non-metro areas, 12.3% of residents lived in rural areas.

- In 2013, the Washington State Office of Financial Management (OFM) identified 31 counties as rural, 13 of which were classified as metropolitan using the OMB designations.

This pattern suggests that there is no consensus on the defining features of rural areas, primarily because of complexities in defining the concept of rurality. Some classification systems measure rurality based on population size and density, others by economic or commuting connections. Among existing classifications, the choice of the geographic unit (county, ZIP code, or census tract) for analysis introduces additional complexities and variations.

Regardless of the classification system, Washington State is becoming more urbanized, over time. Researchers comparing health and health-related indicators in rural and urban areas should consider that effect measure estimates may be worse in rural areas compared to urban areas but, with very few exceptions, the total number of affected people is much higher in urban areas.

Conclusion

Living in rural or urban areas (place of residence) is a useful concept for community health assessment to better identify health disparities. Place of residence is used as a proxy measure for distance from necessary resources that influence population health, such as jobs and healthcare services. It can also help identify high-risk populations based on their local exposures to environmental and social determinants of health like schools, healthy foods, clean water and clean air. Thus, it is important that researchers looking at rural health disparities examine existing rural-urban classification systems and choose the classification system best meeting their analysis needs.

These guidelines highlight crucial issues in commonly used rural-urban classification systems and accommodate different circumstances and research needs. The guidelines also help promote consistency, comparability and best practice among statewide analyses that look at health disparities in general and rural health in particular.

Furthermore, local public health assessments and performance measures also benefit from consistent classification systems that compare local health data to areas with similar populations and settlement patterns across the state and nationwide.

We hope these guidelines will assist analysts with selecting rural-urban classification systems to better illuminate disparities, help structure policies focused on eliminating identified disparities, promote consistency and comparability and ultimately, strengthen evidence-based public health practice.

List of acronyms

DOH	Washington State Department of Health
OFM	Washington State Office of Financial Management
OMB	US Office of Management and Budget
RUCA	Rural-Urban Commuting Areas
RUCC	Rural-Urban Continuum Codes
UIC	Urban Influence Codes
USDA	US Department of Agriculture
WWAMI	Washington, Wyoming, Alaska, Montana, and Idaho.

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Appendix 1: RUCA codes, based on census 2010

Primary RUCA Codes

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 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
99 Not coded: Census tract has zero population and no rural-urban identifier information

Secondary RUCA Codes

1 Metropolitan area core: primary flow within an urbanized area (UA)
1.0 No additional code
1.1 Secondary flow 30% to 50% to a larger UA

2 Metropolitan area high commuting: primary flow 30% or more to a UA
2.0 No additional code
2.1 Secondary flow 30% to 50% to a larger UA

3 Metropolitan area low commuting: primary flow 10% to 30% to a UA
3.0 No additional code

4 Micropolitan area core: primary flow within an Urban Cluster of 10,000 to 49,999 (large UC)
4.0 No additional code
4.1 Secondary flow 30% to 50% to a UA

5 Micropolitan high commuting: primary flow 30% or more to a large UC
5.0 No additional code
5.1 Secondary flow 30% to 50% to a UA

6 Micropolitan low commuting: primary flow 10% to 30% to a large UC
6.0 No additional code

7 Small town core: primary flow within an Urban Cluster of 2,500 to 9,999 (small UC)
7.0 No additional code
7.1 Secondary flow 30% to 50% to a UA
7.2 Secondary flow 30% to 50% to a large UC

8 Small town high commuting: primary flow 30% or more to a small UC
8.0 No additional code
8.1 Secondary flow 30% to 50% to a UA
8.2 Secondary flow 30% to 50% to a large UC

9 Small town low commuting: primary flow 10% to 30% to a small UC
9.0 No additional code

10 Rural areas: primary flow to a tract outside a UA or UC
10.0 No additional code
10.1 Secondary flow 30% to 50% to a UA
10.2 Secondary flow 30% to 50% to a large UC
10.3 Secondary flow 30% to 50% to a small UC

99 Not coded: Census tract has zero population and no rural-urban identifier information

Appendix 2: Rural urban classification systems for Washington counties

Table 6: Summary of Commonly Used Rural Urban Classifications for Washington Counties

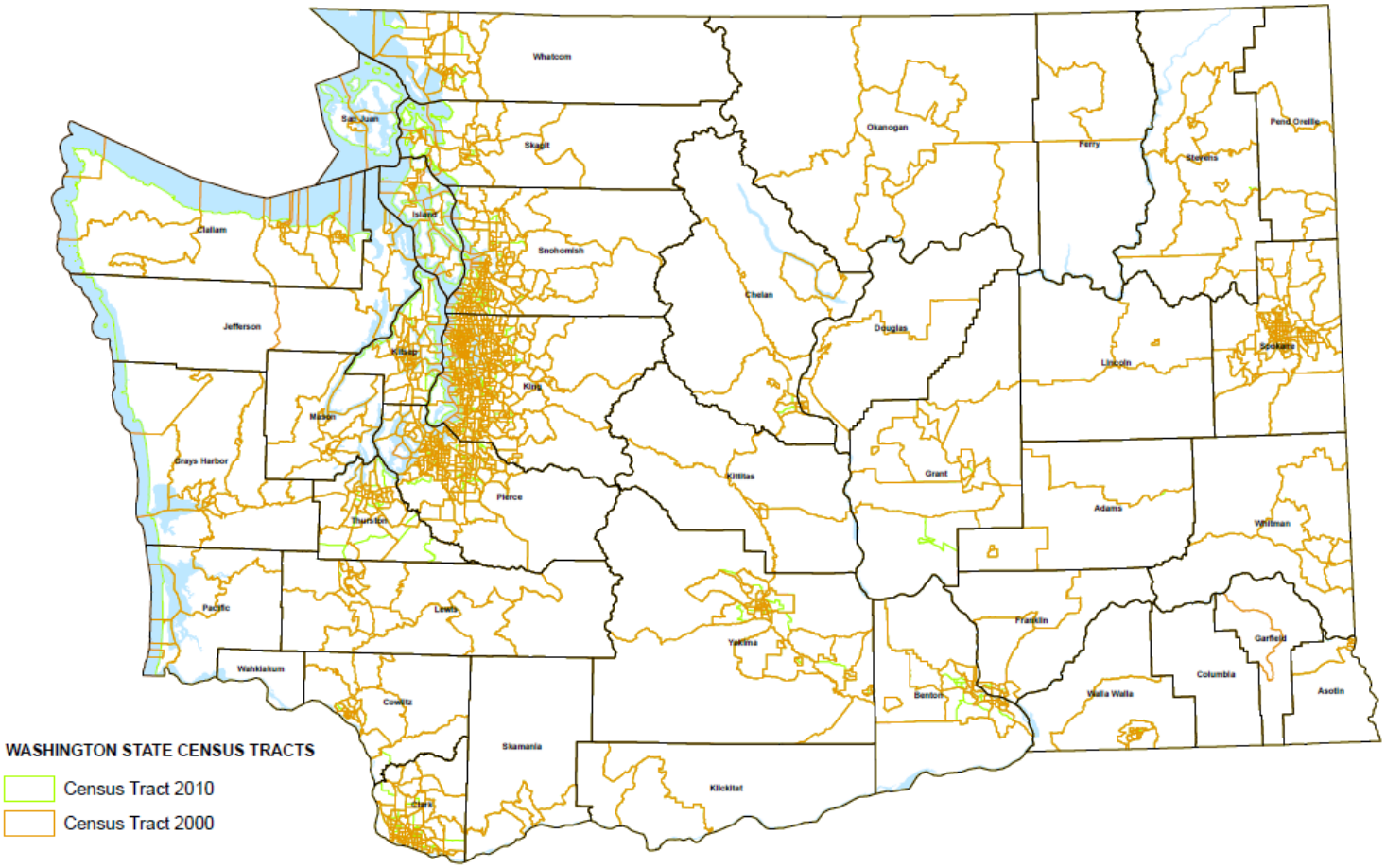
County	2013 Metropolitan, Micropolitan, Noncore (OMB)	2013 Rural Urban Continuum Codes (USDA)	2013 Urban Influence Codes (USDA)	April 2014 Rural (OFM)	April 1, 2014 Population (OFM)
Adams	Micropolitan	Urban population of 2,500 to 19,999, adjacent to a metro area	Micropolitan area adjacent to small metro area	Rural	19,400
Asotin	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	21,950
Benton	Metropolitan	Counties in metro areas of 250,000 to 1 million population	In small metro area of less than 1 million residents	Urban	186,500
Chelan	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	74,300
Clallam	Micropolitan	Urban population of 20,000 or more, not adjacent to a metro area	Micropolitan area not adjacent to a metro area	Rural	72,500
Clark	Metropolitan	Counties in metro areas of 1 million population or more	In large metro area of 1+ million residents	Urban	442,800
Columbia	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	4,080
Cowlitz	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	103,700
Douglas	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	39,700
Ferry	Noncore	Completely rural or less than 2,500 urban population, not adjacent to a	Noncore not adjacent to metro or micro area and does not contain a town of at least	Rural	7,660

		metro area	2,500 residents		
Franklin	Metropolitan	Counties in metro areas of 250,000 to 1 million population	In small metro area of less than 1 million residents	Rural	86,600
Garfield	Noncore	Completely rural or less than 2,500 urban population, adjacent to a metro area	Noncore adjacent to small metro area and does not contain a town of at least 2,500 residents	Rural	2,240
Grant	Micropolitan	Urban population of 20,000 or more, not adjacent to a metro area	Micropolitan area not adjacent to a metro area	Rural	92,900
Grays Harbor	Micropolitan	Urban population of 20,000 or more, adjacent to a metro area	Micropolitan area adjacent to small metro area	Rural	73,300
Island	Micropolitan	Urban population of 20,000 or more, adjacent to a metro area	Micropolitan area adjacent to large metro area	Rural	80,000
Jefferson	Noncore	Urban population of 2,500 to 19,999, adjacent to a metro area	Noncore adjacent to small metro area and contains a town of at least 2,500 residents	Rural	30,700
King	Metropolitan	Counties in metro areas of 1 million population or more	In large metro area of 1+ million residents	Urban	2,017,250
Kitsap	Metropolitan	Counties in metro areas of 250,000 to 1 million population	In small metro area of less than 1 million residents	Urban	255,900
Kittitas	Micropolitan	Urban population of 20,000 or more, adjacent to a metro area	Micropolitan area adjacent to large metro area	Rural	42,100
Klickitat	Noncore	Urban population of 2,500 to 19,999, adjacent to a metro area	Noncore adjacent to large metro area	Rural	20,850

Lewis	Micropolitan	Urban population of 20,000 or more, adjacent to a metro area	Micropolitan area adjacent to large metro area	Rural	76,300
Lincoln	Noncore	Completely rural or less than 2,500 urban population, adjacent to a metro area	Noncore adjacent to small metro area and does not contain a town of at least 2,500 residents	Rural	10,700
Mason	Micropolitan	Urban population of 20,000 or more, adjacent to a metro area	Micropolitan area adjacent to large metro area	Rural	62,000
Okanogan	Noncore	Urban population of 2,500 to 19,999, adjacent to a metro area	Noncore adjacent to small metro area and contains a town of at least 2,500 residents	Rural	41,700
Pacific	Noncore	Urban population of 2,500 to 19,999, not adjacent to a metro area	Noncore adjacent to micro area and contains a town of at least 2,500 residents	Rural	21,100
Pend Oreille	Metropolitan	Counties in metro areas of 250,000 to 1 million population	In small metro area of less than 1 million residents	Rural	13,210
Pierce	Metropolitan	Counties in metro areas of 1 million population or more	In large metro area of 1+ million residents	Urban	821,300
San Juan	Noncore	Completely rural or less than 2,500 urban population, not adjacent to a metro area	Noncore not adjacent to metro or micro area and does not contain a town of at least 2,500 residents	Rural	16,100
Skagit	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	119,500
Skamania	Metropolitan	Counties in metro areas of 1 million population or more	In large metro area of 1+ million residents	Rural	11,370
Snohomish	Metropolitan	Counties in metro areas of 1 million population or more	In large metro area of 1+ million residents	Urban	741,000

Spokane	Metropolitan	Counties in metro areas of 250,000 to 1 million population	In small metro area of less than 1 million residents	Urban	484,500
Stevens	Metropolitan	Counties in metro areas of 250,000 to 1 million population	In small metro area of less than 1 million residents	Rural	43,900
Thurston	Metropolitan	Counties in metro areas of 250,000 to 1 million population	In small metro area of less than 1 million residents	Urban	264,000
Wahkiakum	Noncore	Completely rural or less than 2,500 urban population, adjacent to a metro area	Noncore adjacent to large metro area	Rural	4,010
Walla Walla	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	60,150
Whatcom	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	207,600
Whitman	Micropolitan	Urban population of 20,000 or more, adjacent to a metro area	Micropolitan area adjacent to small metro area	Rural	46,500
Yakima	Metropolitan	Counties in metro areas of fewer than 250,000 population	In small metro area of less than 1 million residents	Rural	248,850

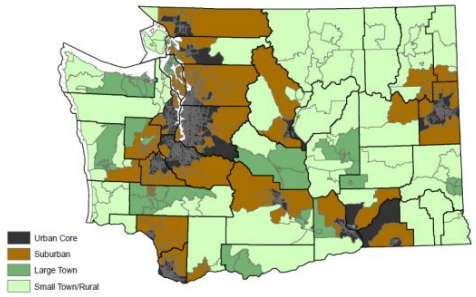
Appendix 3: Comparison of the 2000 and 2010 census tracts



A downloadable version of this map is also available at ftp://ftp.doh.wa.gov/geodata/layers/2000_2010censustracts_WA.pdf

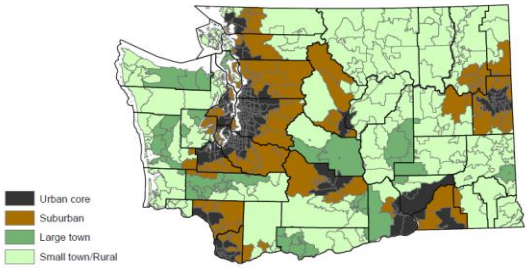
Appendix 4: Census tract and ZIP code based sample maps

Scheme 1: census_tract2010_4-tier_rurality_commuting



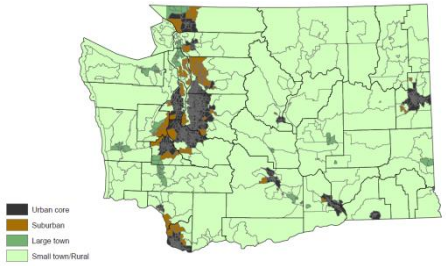
ftp://ftp.doh.wa.gov/geodata/layers/Scheme1_rurality_censustracts_WA.pdf

Scheme 1: ZIP2013_4-tier_rurality_commuting



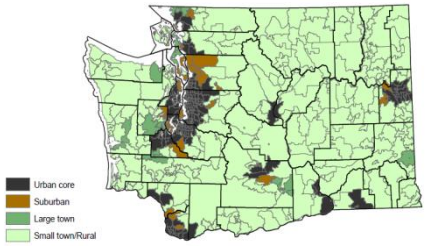
ftp://ftp.doh.wa.gov/geodata/layers/Scheme1_rurality_zipcodes_WA.pdf

Scheme 2: census_tract_2010_4-tier_rurality_localdenlt100



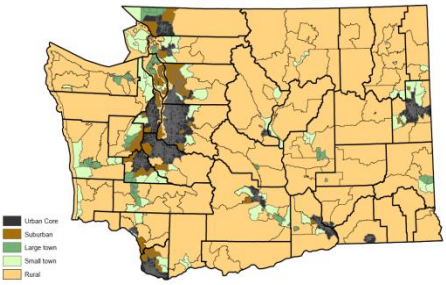
ftp://ftp.doh.wa.gov/geodata/layers/Scheme2_rurality_censustracts_WA.pdf

Scheme 2: ZIP2013_4-tier_rurality_locldenlt100



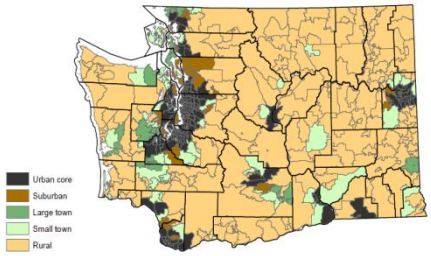
ftp://ftp.doh.wa.gov/geodata/layers/Scheme2_rurality_zipcodes_WA.pdf

Scheme 3: cenus_tract_2010_5-tier_rurality_localdenlt100_50



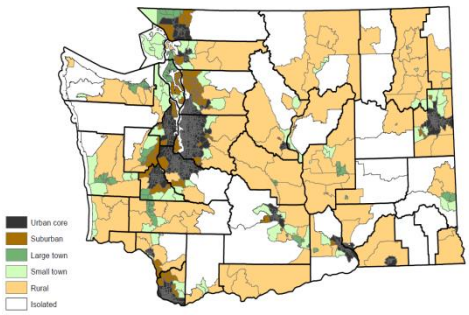
ftp://ftp.doh.wa.gov/geodata/layers/Scheme3_rurality_censustracts_WA.pdf

Scheme 3: ZIP2013_5-tier_rurality_locldenlt100_50



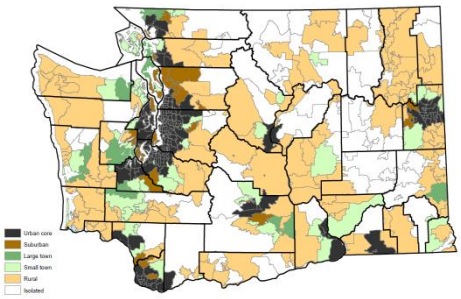
ftp://ftp.doh.wa.gov/geodata/layers/Scheme3_rurality_zipcodes_WA.pdf

Scheme 4: census_tract_2010_6-tier_rurality_localdenlt100_50_5



ftp://ftp.doh.wa.gov/geodata/layers/Scheme4_rurality_censustracts_WA.pdf

Scheme 4: ZIP2013_6-tier_rurality_locldenlt100_50_5



ftp://ftp.doh.wa.gov/geodata/layers/Scheme4_rurality_zipcodes_WA.pdf

Appendix 5. Selected sample data, BRFSS 2012-2014

Indicator	Variable	Level	Percent	SE	RSE	Lower	Upper	MOE
No health insurance (age < 65)	All	Statewide	18.6	0.4	2.0	17.9	19.4	0.7
	Scheme 1	Urban	17.4	0.4	2.4	16.6	18.3	0.8
		Suburban	17.1	1.1	6.5	15.1	19.4	2.2
		Large town	24.4	1.5	6.2	21.6	27.5	3.0
		Small town / rural	27.7	1.6	5.6	24.8	30.9	3.0
	Scheme 2	Urban	17.2	0.4	2.5	16.3	18.0	0.8
		Suburban	16.0	1.4	8.6	13.5	18.9	2.7
		Large town	22.9	2.0	8.9	19.1	27.1	4.0
		Small town / rural	24.4	1.0	4.0	22.6	26.4	1.9
	Scheme 3	Urban	17.2	0.4	2.5	16.3	18.0	0.8
		Suburban	16.0	1.4	8.6	13.5	18.9	2.7
		Large town	22.9	2.0	8.9	19.1	27.1	4.0
		Small town	22.3	1.4	6.2	19.7	25.2	2.7
		Rural	26.4	1.3	5.1	23.9	29.2	2.6
	Scheme 4	Urban	17.2	0.4	2.5	16.3	18.0	0.8
		Suburban	16.0	1.4	8.6	13.5	18.9	2.7
		Large town	22.9	2.0	8.9	19.1	27.1	4.0
		Small town	22.3	1.4	6.2	19.7	25.2	2.7
		Rural	27.4	1.5	5.3	24.6	30.3	2.8
		Isolated	16.8	2.7	15.9	12.2	22.7	5.3

Indicator	Variable	Level	Percent	SE	RSE	Lower	Upper	MOE
No checkup in the past year	All	Statewide	38.7	0.4	0.9	38.0	39.5	0.7
	Scheme 1	Urban	38.1	0.4	1.1	37.2	38.9	0.8
		Suburban	37.6	1.2	3.1	35.4	39.9	2.3
		Large town	41.5	1.3	3.2	38.9	44.1	2.6
		Small town / rural	42.3	1.3	3.1	39.8	44.8	2.5
	Scheme 2	Urban	38.1	0.4	1.2	37.2	39.0	0.9
		Suburban	37.1	1.5	4.0	34.3	40.0	2.9
		Large town	40.4	1.7	4.3	37.1	43.8	3.4
		Small town / rural	40.6	0.9	2.2	38.9	42.3	1.7
	Scheme 3	Urban	38.1	0.4	1.2	37.2	39.0	0.9
		Suburban	37.1	1.5	4.0	34.3	40.0	2.9
		Large town	40.4	1.7	4.3	37.1	43.8	3.4
		Small town	40.0	1.3	3.3	37.5	42.6	2.6
		Rural	41.0	1.2	2.8	38.8	43.4	2.3
	Scheme 4	Urban	38.1	0.4	1.2	37.2	39.0	0.9
		Suburban	37.1	1.5	4.0	34.3	40.0	2.9
		Large town	40.4	1.7	4.3	37.1	43.8	3.4
		Small town	40.0	1.3	3.3	37.5	42.6	2.6
		Rural	41.8	1.3	3.0	39.3	44.3	2.5
		Isolated	34.5	2.8	8.0	29.2	40.1	5.4

Indicator	Variable	Level	Percent	SE	RSE	Lower	Upper	MOE
General health fair or poor	All	Statewide	16.0	0.3	1.7	15.5	16.5	0.5
	Scheme 1	Urban	15.2	0.3	2.1	14.5	15.8	0.6
		Suburban	17.1	0.9	5.3	15.3	18.9	1.8
		Large town	18.2	1.0	5.5	16.3	20.2	2.0
		Small town / rural	20.6	1.1	5.2	18.6	22.8	2.1
	Scheme 2	Urban	15.1	0.3	2.2	14.4	15.7	0.6
		Suburban	17.3	1.2	6.7	15.2	19.7	2.3
		Large town	17.9	1.3	7.3	15.4	20.6	2.6
		Small town / rural	18.6	0.7	3.6	17.3	19.9	1.3
	Scheme 3	Urban	15.1	0.3	2.2	14.4	15.7	0.6
		Suburban	17.3	1.2	6.7	15.2	19.7	2.3
		Large town	17.9	1.3	7.3	15.4	20.6	2.6
		Small town	18.3	1.0	5.4	16.4	20.3	2.0
		Rural	18.9	0.9	4.8	17.2	20.7	1.8
	Scheme 4	Urban	15.1	0.3	2.2	14.4	15.7	0.6
		Suburban	17.3	1.2	6.7	15.2	19.7	2.3
		Large town	17.9	1.3	7.3	15.4	20.6	2.6
		Small town	18.3	1.0	5.4	16.4	20.3	2.0
		Rural	18.8	1.0	5.2	17.0	20.8	1.9
		Isolated	19.4	2.1	10.7	15.7	23.8	4.1

Indicator	Variable	Level	Percent	SE	RSE	Lower	Upper	MOE
Obese (bmi >= 30)	All	Statewide	27.1	0.3	1.2	26.5	27.8	0.6
	Scheme 1	Urban	26.3	0.4	1.4	25.6	27.1	0.7
		Suburban	29.7	1.1	3.7	27.6	31.9	2.1
		Large town	30.0	1.3	4.2	27.6	32.6	2.5
		Small town / rural	31.0	1.2	4.0	28.7	33.5	2.4
	Scheme 2	Urban	26.1	0.4	1.5	25.4	26.9	0.8
		Suburban	29.0	1.4	4.8	26.3	31.8	2.7
		Large town	30.4	1.7	5.6	27.2	33.8	3.3
		Small town / rural	30.6	0.8	2.7	29.0	32.2	1.6
	Scheme 3	Urban	26.1	0.4	1.5	25.4	26.9	0.8
		Suburban	29.0	1.4	4.8	26.3	31.8	2.7
		Large town	30.4	1.7	5.6	27.2	33.8	3.3
		Small town	30.0	1.2	4.0	27.7	32.4	2.4
		Rural	31.2	1.1	3.5	29.1	33.4	2.1
	Scheme 4	Urban	26.1	0.4	1.5	25.4	26.9	0.8
		Suburban	29.0	1.4	4.8	26.3	31.8	2.7
		Large town	30.4	1.7	5.6	27.2	33.8	3.3
		Small town	30.0	1.2	4.0	27.7	32.4	2.4
		Rural	31.6	1.2	3.8	29.3	33.9	2.3
		Isolated	28.0	2.5	9.0	23.3	33.2	4.9