

National Neighborhood Data Archive (NaNDA): Urbanicity by Census Tract, United States, 2010



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nanda_urbanicity_tract_2010_01P.dta
nanda_urbanicity_tract_2010_01P.csv
nanda_urban2010T.sas7bdat

Overview and Data Dictionary

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Dataset Overview

Description

This dataset contains measures of the urban/rural characteristics of each census tract in the United States. These include proportions of urban and rural population, population density, rural/urban commuting area (RUCA) codes, and RUCA-based four- and seven- category urbanicity scales.

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Data Sources

Urban and rural population figures come from the 2010 decennial census, summary file 1 (United States Census Bureau, 2010). Rural/urban commuting area (RUCA) codes, land area, and population density figures come from the USDA Economic Research Service (USDA Economic Research Service, 2019).

Coverage

The dataset contains one observation per census tract in the United States, including Puerto Rico. Urban and rural population figures (those derived from census data) are missing for Alaska, Hawaii, and Puerto Rico.

Methodology

This dataset synthesizes measures of urbanicity, or the urban/rural qualities of United States census tracts. In health research, urbanicity refers to the urban or rural characteristics of a geographic area at a given point in time. Studies have demonstrated the effect of living in an urban area on many aspects of health and health behavior, such as obesity (Xu & Wang, 2015), depression (Sampson et al., 2020), and health literacy (Halverson et al., 2013), and for many populations, including older adults (Cohen et al., 2017), adolescents (Evans et al., 2020), and migrants (Schofield et al., 2017). Yet the definition of what constitutes an urban or rural area is not straightforward (Hall et al., 2006, Goodall et al., 1998). Multiple measures exist and can be used to investigate urbanicity in different ways.

To create this dataset, we began with two different measures of urbanicity by census tract. The first comes from the 2010 decennial census. The Census Bureau categorizes all regions of the country into three categories: urbanized areas (UAs), which have a population of 50,000 or more; urban clusters (UCs) which have a population between 2,500 and 50,000; or rural areas, which have a population less than 2,500 (Ratcliffe et al., 2016). Since these classifications apply at the census block level, each census tract may contain a mix of people living in UAs, UCs, and/or rural areas. We obtained UA, UC, and rural populations for each census tract from the Census Bureau. We then created variables showing the percent of population residing with urban areas (UAs or UCs) and the percent residing within rural areas.

The second measure of urbanicity by census tract comes from the United States Department of Agriculture's rural/urban commuting area (RUCA) codes. RUCA codes categorize census tracts based on their population density and commuting patterns. Tracts are classified into one of ten categories based on their population and primary commuting flow (e.g. metropolitan core, small town high commuting) and subdivided into 22 categories according to secondary commuting flow (USDA Economic Research Service, 2020).

We obtained and merged in RUCA primary and secondary codes and population density figures from USDA. (There are two versions of the secondary RUCA codes. One contains the codes as they appear in the USDA data, e.g. 10.1 for "Rural area: primary flow to a tract outside a UA or UC, secondary flow 30% to 50% to a UA." The other contains the codes multiplied by 10 and labeled with their display label, e.g. the code for "Rural area: primary flow to a tract outside a UA or UC, secondary flow 30% to 50% to a UA" is labeled 101.) Complete lists and definitions of all RUCA primary and secondary categories are available in appendices A and B of this document.

Lastly, following the example of the University of Washington Rural Health Research Center, we used the secondary RUCA codes to create two additional urbanicity measures. One is a four category measure based on population density (urban, large rural, small rural, and isolated), and the other has seven categories which highlight the difference between cores and peripheries (urban, other urban [i.e. urban periphery], large rural core, other large rural, small rural core, other small rural, and isolated) (Rural Health Research Center, n.d.). Lists of urbanicity values and their corresponding RUCA codes are available in appendices C and D.

Variables

Variable	Type	Obs	Unique	Mean	Min	Max	Variable Label	Additional Information
tract_fips10	string	74002	74002	.	.	.	Tract FIPS code, 2010	
tot_pop_census	long	72539	9100	4227.726	0	37452	Total population, 2010 (urban_pop + rural_pop)	
urban_pop	long	72539	9183	3412.425	0	33133	Total urban population, 2010 (ua_pop + uc_pop)	
ua_pop	long	72539	8976	3014.024	0	33133	Total urban population within urbanized areas, 2010	The Census Bureau defines an urbanized area as an area containing 50,000 or more people.
uc_pop	int	72539	5069	398.4008	0	20905	Total urban population inside urban clusters, 2010	The Census Bureau defines an urban cluster as an area containing more than 2,500 but fewer than 50,000 people.
rural_pop	int	72539	6272	815.301	0	12394	Total rural population, 2010	
tract_urban_pct	float	72043	18829	0.793375	0	1	Proportion of tract population within urban areas (urban_pop / tot_pop_census)	
tract_rural_pct	float	72043	18831	0.206626	0	1	Proportion of tract population within rural areas (rural_pop / tot_pop_census)	
urbanicity	float	72539	4	2.578516	0	3	Three-category urbanicity variable based on tract_urban_pct (1: <=25%, 2: 25-75%, 3: >=75%, 0: .)	
tot_pop_ruca	long	74002	9139	4222.471	0	37452	Total population, 2010 (urban_pop + rural_pop)	
land_area_sqmiles	double	74002	73466	47.77343	0	85425.73	Land area (square miles)	
pop_density	double	73642	73427	5235.823	0	508697.5	Population density (square miles), 2010	
ruca_primary	byte	74002	11	2.557931	1	99	Primary RUCA code, 2010	The primary code represents the primary commuting flow within a tract. See Appendix A for definitions.

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Variable	Type	Obs	Unique	Mean	Min	Max	Variable Label	Additional Information
ruca_secondary	double	74002	22	2.561002	1	99	Secondary RUCA code, 2010	The secondary code represents a secondary community flow within a tract, if one exists. See Appendix B for definitions.
ruca_secondaryx10	long	74002	22	25.61002	10	990	Secondary RUCA code(*10, for value labels), 2010	See Appendix B for definitions.
ruca4	float	73678	4	1.307731	1	4	Four-category urbanicity scale	Characterizes the tract's urbanicity based on groupings of secondary RUCA codes. See Appendix C for values and corresponding RUCA codes.
ruca7	float	73678	7	1.7852	1	7	Seven-category urbanicity scale	Characterizes the tract's urbanicity in one of seven categories based on groupings of secondary RUCA codes. See Appendix D for values and corresponding RUCA codes.

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Appendices

Appendix A. RUCA Primary Codes

Code	Definition
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 5% 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

Appendix B. RUCA Secondary Categories

Code	Definition
1	Metropolitan area core: primary flow within an urbanized area (UA), no additional code
1.1	Metropolitan area core: primary flow within an urbanized area (UA), secondary flow 30% to 50% to a larger UA
2	Metropolitan area high commuting: primary flow 30% or more to a UA, no additional code
2.1	Metropolitan area high commuting: primary flow 30% or more to a UA, secondary flow 30% to 50% to a larger UA
3	Metropolitan area low commuting: primary flow 10% to 30% to a UA, no additional code
4	Micropolitan area core: primary flow within an urban cluster of 10,000 to 49,999 (large UC), no additional code
4.1	Micropolitan area core: primary flow within an urban cluster of 10,000 to 49,999 (large UC), secondary flow 30% to 50% to a UA
5	Micropolitan high commuting: primary flow 30% or more to a large UC, no additional code
5.1	Micropolitan high commuting: primary flow 30% or more to a large UC, secondary flow 30% to 50% to a UA
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), no additional code
7.1	Small town core: primary flow within an urban cluster of 2,500 to 9,999 (small UC), secondary flow 30% to 50% to a UA
7.2	Small town core: primary flow within an urban cluster of 2,500 to 9,999 (small UC), secondary flow 30% to 50% to a large UC
8	Small town high commuting: primary flow 30% or more to a small UC, no additional code
8.1	Small town high commuting: primary flow 30% or more to a small UC, secondary flow 30% to 50% to a UA
8.2	Small town high commuting: primary flow 30% or more to a small UC, secondary flow 30% to 50% to a large UC
9	Small town low commuting: primary flow 10% to 30% to a small UC, no additional code
10	Rural areas: primary flow to a tract outside a UA or UC, no additional code
10.1	Rural areas: primary flow to a tract outside a UA or UC, secondary flow 30% to 50% to a UA
10.2	Rural areas: primary flow to a tract outside a UA or UC, secondary flow 30% to 50% to a large UC
10.3	Rural areas: primary flow to a tract outside a UA or UC, secondary flow 30% to 50% to a small UC
99	Not coded: Census tract has zero population and no rural-urban identifier information

Appendix C. Four-Category Urbanicity Scale

Code	Definition	Corresponding RUCA Secondary Codes
1	urban	1, 1.1, 2, 2.1, 3, 4.1, 5.1, 7.1, 8.1, 10.1
2	large rural	4, 5, 6, 6.1
3	small rural	7, 7.2, 8, 8.2, 9
4	isolated	10, 10.2, 10.3

Appendix D. Seven-Category Urbanicity Scale

Code	Definition	Corresponding RUCA Secondary Codes
1	urban core	1, 1.1
2	other urban	2, 2.1, 3, 4.1, 5.1, 7.1, 8.1, 10.1
3	large rural core	4
4	other large rural	5, 5.2, 6, 6.1
5	small rural core	7, 7.2
6	other small rural	8, 8.2, 9
7	isolated rural	10, 10.2, 10.3