Rural Populations and Health Care Providers

A Map Book

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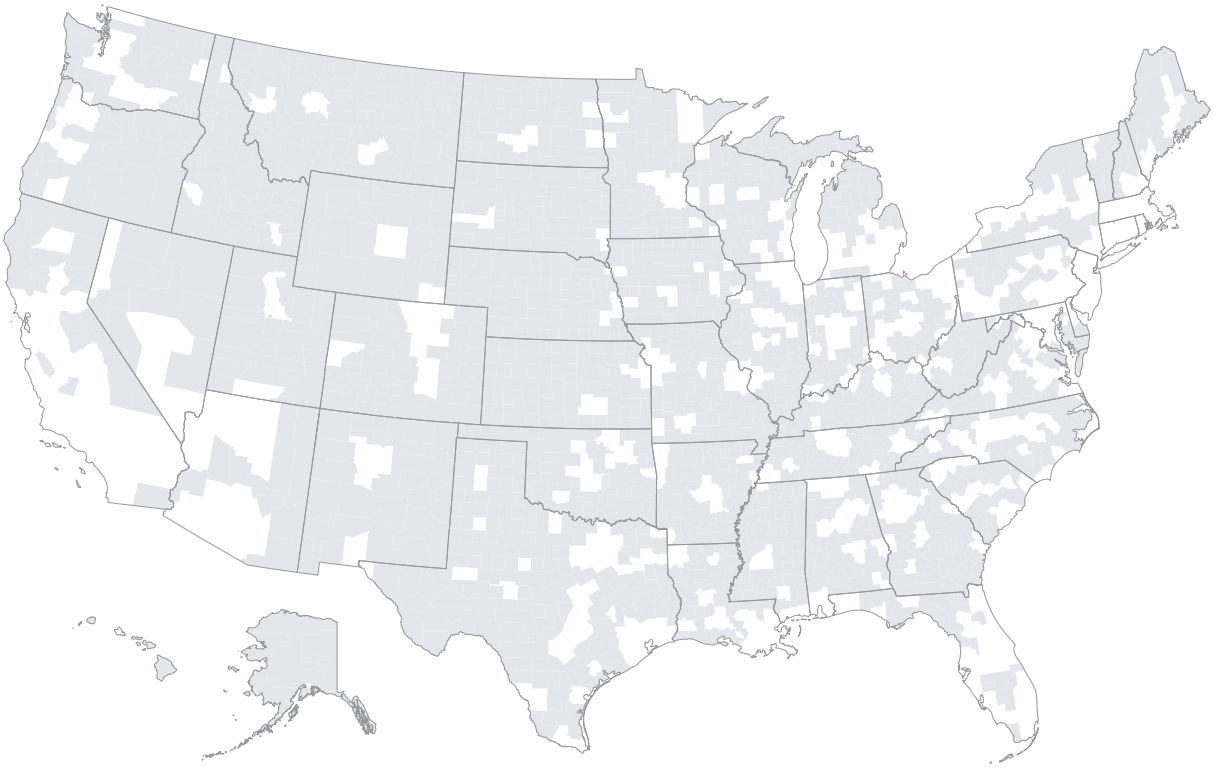

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Introduction

In our dynamic and mobile society, the release of data from the United States Census 2000 provides the opportunity to reassess where rural people live, how the racial and ethnic nature of rural populations is changing, and whether the distribution of health care providers matches the population distribution. This book, through the use of maps, provides a visual picture of the geographic distribution of rural populations and the health care providers that serve them.

Using this Book

All population data are presented at the county level. National maps are grouped by topic and preceded by explanatory text. To offer more precision, following the national maps are nine Appendices, containing maps, but no text, for each of the nine census divisions.

Figure 1 - Census Divisions

In order to create maps of continuous data, the cartographer must simplify the data for the many areas shown by aggregating the data into categories and choosing colors for those categories. Choosing break points between categories is a process that requires balancing several conflicting goals: to offer enough categories to show precise data for areas, but few enough categories to have colors that are easily distinguished; to emphasize variation across the area studied, without exaggerating differences between similar areas; and to break categories at easily remembered, round-number values. Therefore, the reader is encouraged to pay special attention to the legends on each map. In order to visually capture the range of variation in the data, which differs across population sub-groups and across geographic divisions, there are some variations in the categories used for different maps that are presenting similar themes.

Though thematic maps can be used to convey a general impression of the data being presented, the map legend can help show the extremes in the data. The minimum value for the counties shown is included in the lowest category on the map, as is the maximum value in the highest. For example, the lowest category in the "Total Population 2000, Nonmetropolitan Counties" map could have been labeled "Fewer than 5,000", but it is labeled "67 to 4,999", because the least populous nonmetropolitan county had 67 residents in the 2000 Census. Similarly, the upper category is labeled "50,000 to 186,742", showing that the most populous nonmetropolitan county had 186,742 residents.

Definition of Rural

There are several approaches to identifying rural areas for studying trends in demography and health services. We have chosen to use the metropolitan area (MA) designations published by the U.S. Office of Management and Budget (OMB) as the means of distinguishing urban and rural areas. As is common with binary rural/urban systems, rural areas as described by OMB are not affirmatively defined, but are the remaining areas that are not designated as urban. Metropolitan designations for data available during the writing of this book were based on 1999 Census Bureau data interpreted under the 1990 MA standards. Briefly, these standards require an MA to contain minimum populations of 50,000 people in the area's central city or 50,000 in an Urbanized Area and 100,000 in the total metro area. The guidelines also specify neighboring areas that can be included in a metropolitan area based on residents commuting to work in the MA's core.

The metropolitan area designations are typically assigned to counties, but are defined by cities, towns and townships in the New England census division (the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont), where only 75,000 metropolitan residents are required to constitute a Metropolitan Area. When summarizing designations for New England at the county level, only counties with no MAs anywhere within their borders are considered nonmetropolitan. New England County Metropolitan Areas (NECMAs) are offered by OMB as a county-based alternative to the city- and town-based New England MAs. These designate counties as metropolitan by a majority-metropolitan rule, rather than an any-metropolitan rule. Under these standards seven counties are classified as nonmetropolitan despite having some metropolitan population within their boundaries. In this book, NECMAs are used to define rural areas in New England.

Though the rule for designating areas remained unchanged from the 1990 to the 2000 census, the demographics and commuting patterns cause the metropolitan designations for some counties to change. This book uses the 1999 metropolitan designations for both the 1990 and the 2000 data. To enable the reader to clearly identify rural areas, all urban areas are omitted and appear as plain, white fields.

Census 2000 population

Total Population

The first two maps display the distribution of the total rural population in 2000, and the change in population between 1990 and 2000. Metropolitan Status in the New England census division is defined using New England County Metropolitan Area (NECMA) designation.

Table 1: Census Population in Counties that were Nonmetropolitan in 1999

	Total Population	Population in Nonmetropolitan Counties	Percent of Population in Nonmetropolitan Counties
2000 Census	281,421,906	55,346,731	19.67
1990 Census	248,709,873	50,219,814	20.19
Change Over Decade	**32,712,033**	**5,126,917**	**-0.53**

Hispanic Population

The Census Bureau considers Hispanic or Latino ethnicity a classification system that is distinct from race. On Census forms, questions about Hispanic or Latino ethnicity are presented before questions about race in order to clarify this distinction. In both the 1990 and 2000 census, respondents were allowed a single yes/no response to the question for Hispanic ethnicity: "Is Person 1 Spanish/Hispanic/Latino?"

Table 2: Census Hispanic/Latino Population in Counties that were Nonmetropolitan in 1999

	Total Hispanic Population	Hispanic Population in Nonmetropolitan Counties	Percent of Hispanic Population in Nonmetropolitan Counties
2000 Census	35,305,818	3,137,835	8.89
1990 Census	21,900,089	1,840,201	8.40
Change Over Decade	**13,405,729**	**1,297,634**	**0.48**

Information on the distribution of the rural Hispanic or Latino population is presented in four ways. Following the map of the distribution of the 2000 Hispanic population is a map that displays the absolute increase or decrease in the number of Hispanics residing in each county over the last decade. The third map in this series depicts the percent of people in each county who identified themselves as Hispanic. As the percent of the population that one subgroup represents depends not only on the absolute number of individuals in that subgroup, but also the total population of the county, the distribution of counties with a high percent of Hispanic people does not exactly mirror the distribution of counties with large Hispanic populations. The final map in this series categorizes counties by the absolute change in the percent of population that is Hispanic. In this case, absolute change is measured by the change in percentage points. For example, if 20% of a county's residents identified themselves as Hispanic in 1990, and 27% identified themselves as Hispanic in 2000, that is an absolute change of 7 percentage points, and that county would be classified in the group having the largest increase (5 to 24.4 percentage points over the 10 years from 1990 to 2000).

Racial Identity in Census 2000

On October 30, 1997, the U.S. Office of Management and Budget (OMB) announced the first revised federal standards for collecting data on race and ethnicity since 1977. The new policy requires that respondents be allowed to choose one or more of the race categories, as well as changing the content and naming of racial and ethnic categories. The implementation of the new rule in Census 2000 — allowing the choice of one or all of the five race categories plus "Some Other Race" — yields 63 possible combinations of race classifications, as compared with the previous system, which had four mutually exclusive races plus the optional "Other Race" category.

The new race typology complicates exploring race-specific trends from data gathered under the previous, single-choice system. Several models have been designed to compare data in Census 2000 with the single-choice data from the 1990 Census. These models differ by the method in which they assign individuals who identified themselves as more than one race in the 2000 Census to a single race category. For any given race, these models are bounded by the minimum number of individuals who can be assigned to that category — including only individuals that chose that race and no other — and the maximum — including all individuals selecting that race, without regard to whether they chose another race or races.

For each race category, in the maps of total population and percent of total population, we include all individuals who identified themselves as belonging to the specific race, regardless of whether or not they also identified themselves as belonging to another race. This decision best reflects the intent of the revised federal standards of not constraining individuals to a single racial identity, but it does mean that those individuals who chose more than one racial identity are at least double counted, as they are included in the total population for every race that they chose. The decision regarding how to classify multiple-race individuals when looking at trends over time is not as simple, since it is reasonable to assume that, when constrained to a single race choice in 1990, there would be variation across multiple race individuals as to which race they chose. Therefore, change in total population and change in percent of population between 1990 and 2000 are displayed in two maps, one for the maximum and one for the minimum numbers of individuals who could be assigned to a given race category, as discussed above.

Finally, although the 2000 Census categorizes "Asian" separately from "Native Hawaiian or Other Pacific Islander," these races were all combined in the 1990 Census. Unfortunately, this necessitates aggregating the data in 2000 to be able to look at changes over time. For the "Choosing This Race Alone or With Other(s)" tabulations, combining "Asian" and "Native Hawaiian or Other Pacific Islander" required combining data from the 63-category race data in order to not double-count respondents that chose both of these categories. In this table column and for the comparable maps, the combined data is not the simple sum of the two individual categories.

Table 3: Change in Racial Composition of Counties that were Nonmetropolitan in 1999: Population

Race	1990 Census Population for This Race	2000 Population Choosing Only This Race	2000 Population Choosing This Race Alone, or With Other(s)	Change: 1990 to 2000: Population Choosing Only This Race	Change: 1990 to 2000: Population Choosing This Race Alone or With Other(s)
White	43,865,782	46,896,644	47,628,617	**3,030,862**	**3,762,835**
Black or African American	4,301,573	4,764,776	4,992,514	**463,203**	**620,941**
American Indian and Alaska Native	895,980	1,054,044	1,419,053	**158,064**	**523,073**
Asian, Native Hawaiian or Other Pacific Islander	399,477	477,085	676,721	**77,608**	**277,244**
Asian		417,263	585,943		
Native Hawaiian and Other Pacific Islander		59,822	145,713		
Some Other Race	757,002	1,319,687	1,555,244	**562,685**	**798,242**

Table 4: Change in Racial Composition of Counties that were Nonmetropolitan in 1999: Percentage

Race	1990 Census Population for This Race	2000 Population Choosing Only This Race	2000 Population Choosing This Race Alone, or With Other(s)	Change: 1990 to 2000 Population Choosing Only This Race	Change: 1990 to 2000 Population Choosing This Race Alone or With Other(s)
White	87.35	84.73	86.06	**-2.62**	**-1.29**
Black or African American	8.57	8.61	8.89	**0.04**	**0.33**
American Indian and Alaska Native	1.78	1.90	2.56	**0.12**	**0.78**
Asian, Native Hawaiian or Other Pacific Islander	0.80	0.86	1.22	**0.07**	**0.43**
Asian		0.75	1.06		
Native Hawaiian and Other Pacific Islander		0.11	0.26		
Some 0ther Race	1.51	2.38	2.81	**0.88**	**1.30**

Health Care Providers

Five maps illuminate the relationship between rural population location and provider supply. The first map categorizes rural counties by their population to primary care physician ratio, and indicates those counties with no primary care physician. Primary care physicians include both Medical Doctors and Doctors of Osteopathy practicing in general practice, family medicine, general internal medicine, general pediatrics, and general obstetrics/gynecology. The primary care physicians are further constrained to exclude those employed by the federal government and include only those practicing patient care in office-based locations.

Following, four national maps display the location of hospitals (both short-term general and critical access hospitals), federally qualified health centers, rural health clinics, and skilled nursing beds (in both skilled nursing facilities and hospital swing beds). In these maps, facilities located in metropolitan counties are also included, as they may be the closest available source of care for some rural residents. In the Appendices, which include the same maps for each census division, facility locations are overlaid on county population category, to give a sense of the facility distribution relative to population.

The federally qualified health center locations can be classified as Grantees or Sites. Grantees are administrative locations — which may or may not be locations where medical or public health services are provided — and sites are locations established for providing medical or public health services. These sites are distinguished from each other in the maps, because of the differences in their health services roles.

Data Sources and Dates

The data displayed in these maps represents the latest available information. Point location of providers was obtained by address geocoding. Data sources and dates for health care providers vary by provider type.

Population data come from the Census 2000 Redistricting Data (Public Law 94-171) Summary File; U.S. Census Bureau, 2001 and 1990 Census Standard Tape File 3, 1992.

The relative supply of primary care physicians was calculated by combining data from the Census 2000 and the 2001 Area Resource File published by the National Center for Health Workforce Information & Analysis, Bureau of Health Professions, Health Resources and Services Administration, Department of Health and Human Services. Primary Care physicians were defined as all office based, patient care American Medical Association Medical Doctors with primary specialties in: General Practice (1999), Family Practice (1999), General Internal Medicine (1999), General Pediatrics (1999), General Obstetrics/Gynecology (1999) and American Osteopathic Association Doctors of Osteopathy in General/Family Practice (1998), General Pediatrics (1998), General Internal Medicine (1998), Obstetrics and Gynecology (1998).

The addresses for hospitals, rural health clinics, and skilled nursing facilities were found in the CMS/HCFA Provider of Services (POS) file of the Online Survey and Certification Reporting (OSCAR) system data base; U.S. Department of Health and Human Services, Centers for Medicare and Medicaid Services, Office of Information Services; 2002. The addresses for Federally Qualified Health Centers (FQHCs) and FQHC Look-alikes were found in the Primary Care Programs Directory, 2001, from Bureau of Primary Healthcare, Health Resources and Services Administration, Department of Health and Human Services. FQHC Look-alikes are facilities that provide services similar to FQHCs and are eligible for cost-based reimbursement from Medicaid and Medicare, but do not receive section 330 Federal funding. The source data for facility locations includes only street addresses. These files were geocoded in address-matching software, which estimates spatial coordinates (longitudes and latitudes) from street address information. The locations determined by the geocoding process determine the facility “dots” in this book.