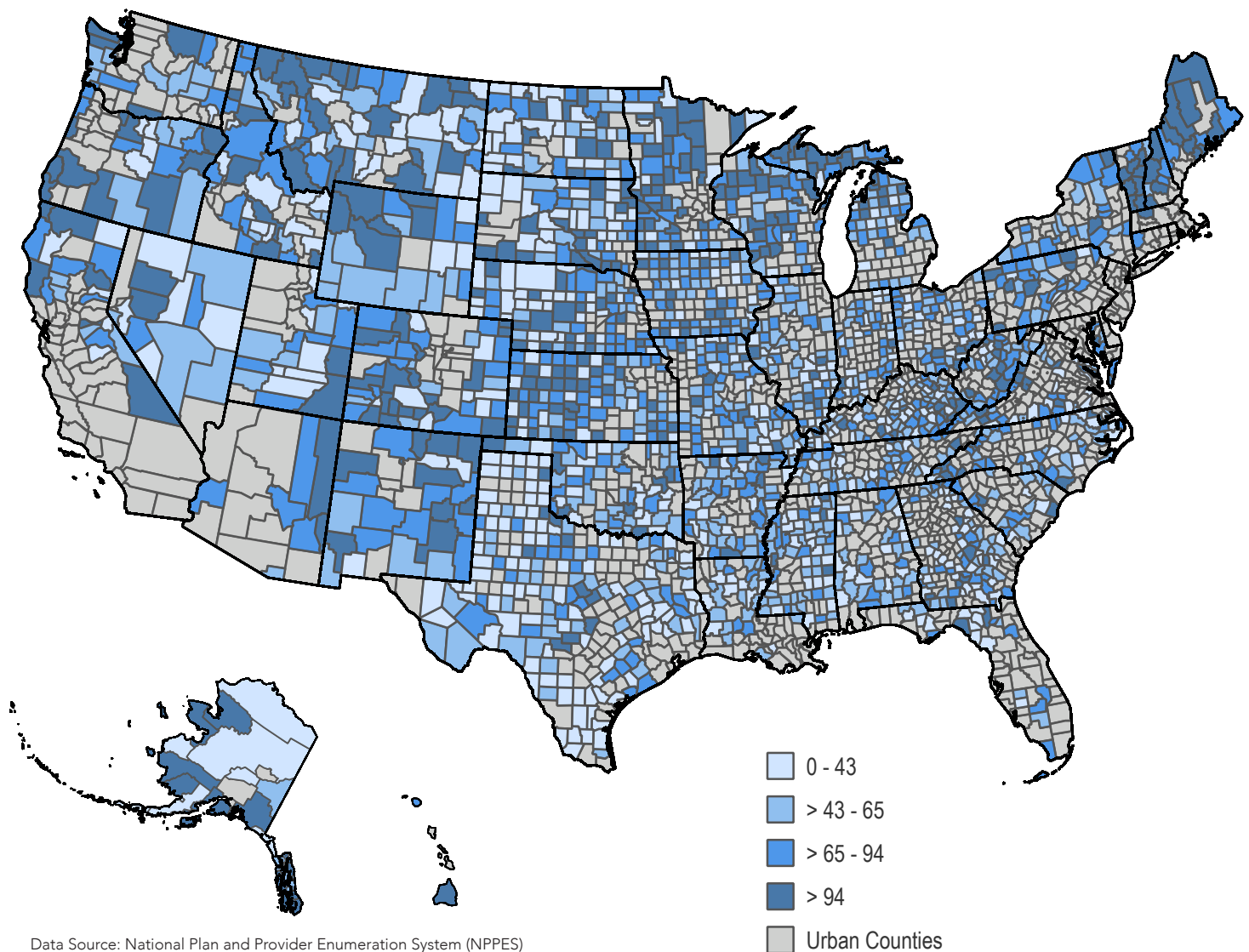


# Supply and Distribution of the Primary Care Workforce in Rural America: 2019

*"Primary care is the provision of integrated, accessible health care services by clinicians who are accountable for addressing a majority of personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community."<sup>1</sup>*

**Figure 1: Primary Care Physicians\* in U.S. Counties per 100,000 Population**

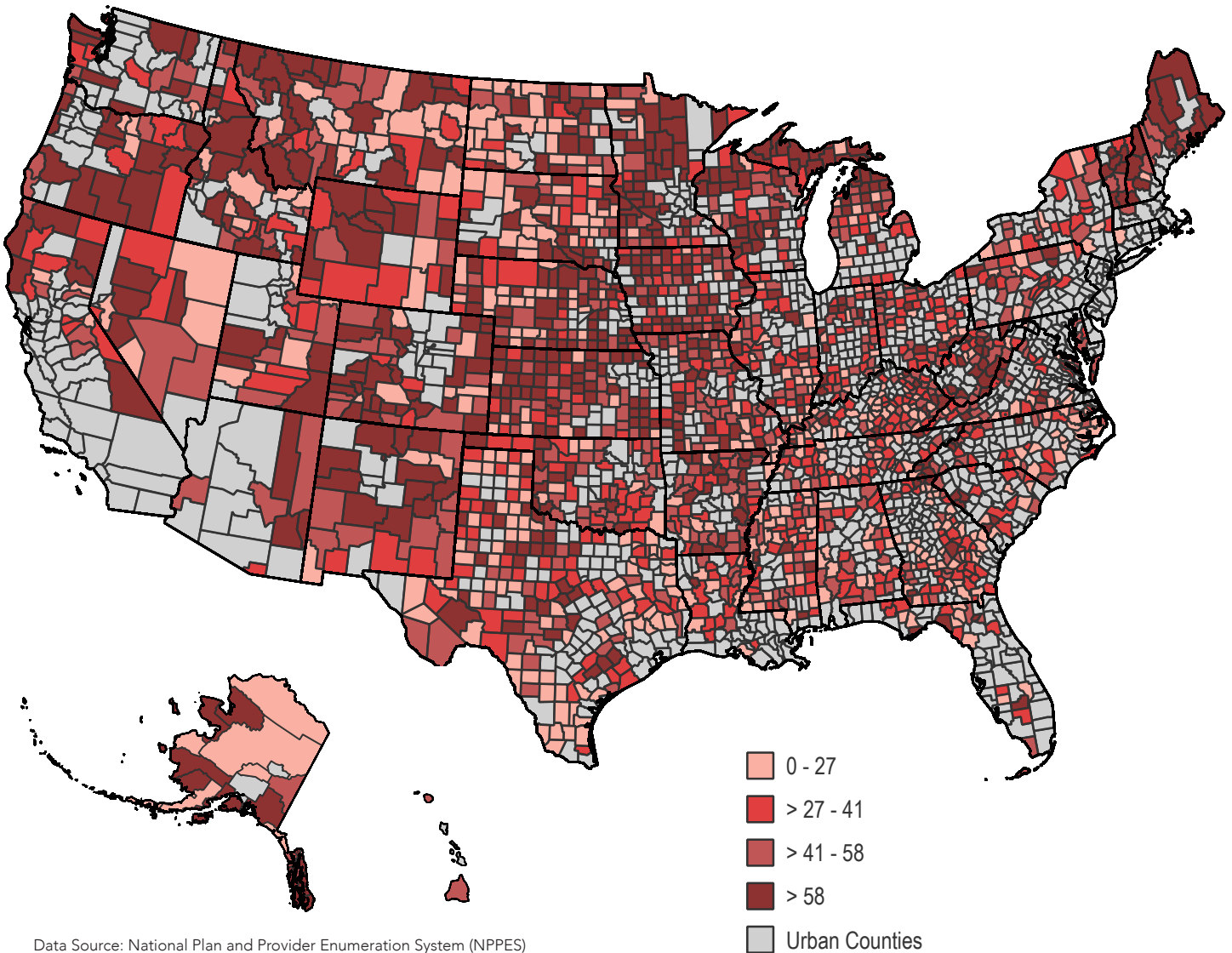


Data Source: National Plan and Provider Enumeration System (NPPES)  
National Provider Identifier (NPI), April 2019  
\*Family Physicians, General Internists, General Pediatricians

Rural residents in many parts of the United States have faced chronic and sometimes severe shortages of primary care providers for decades, and maintaining an adequate supply of primary care providers has been, and remains, one of the key challenges in rural health care.<sup>2-6</sup> Rural hospitals and clinics face difficulties in recruiting and retaining providers, an aging workforce, and a financially challenging environment. Compared to urban populations, rural populations experience higher rates of poverty, higher rates of chronic conditions, and are more likely to have no health insurance.<sup>2,4,7-11</sup> All of these factors contribute to the provider shortages extant in many rural areas of the United States.

In addition, rural populations often depend on primary care providers in ways that urban residents do not. The four principal characteristics of primary health care practice, elucidated by Starfield are 1) first-contact access for each new need, 2) long-term, person-focused (not disease-focused) care, 3) comprehensive care for most health needs, and 4) coordinated care for when it must be sought elsewhere.<sup>12-13</sup> While all four characteristics are important to the provision of “integrated, accessible health

**Figure 2: Family Physicians in U.S. Counties per 100,000 Population**

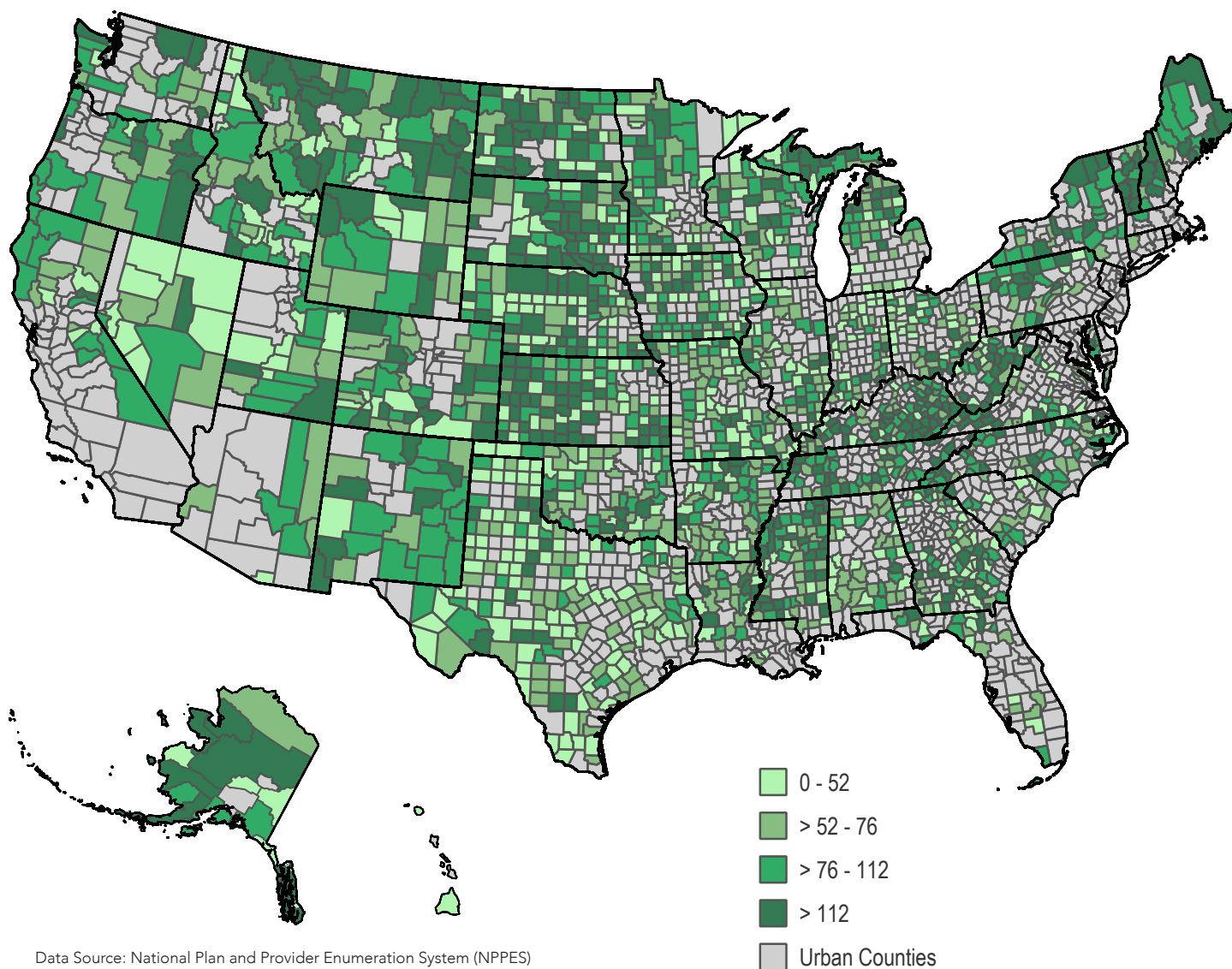


Data Source: National Plan and Provider Enumeration System (NPPES)  
National Provider Identifier (NPI), April 2019

care services” (as noted above in the Institute of Medicine definition of primary care), comprehensive and coordinated care are particularly important in the rural context. Given the dearth of locally available medical specialists in rural areas, rural primary care providers deliver a wider range of direct patient care services than their urban counterparts.<sup>14-16</sup> Primary care providers are also essential in connecting rural patients to specialty care services in urban centers when necessary.<sup>3</sup> Good rural access to primary care also requires a geographical distribution of providers that assures reasonable travel times for patients. Geographic maldistribution of providers, as measured by provider-to-population ratios, leaves rural areas in some regions and some types of rural areas relatively well supplied with providers, while other rural areas face severe shortages.<sup>2,6,11</sup> Poorer and more isolated rural areas in particular often face chronic shortages of providers.<sup>4</sup>

The current (2019) supply and geographic distribution of primary health care providers are explored in the work presented below. Data from the April, 2019 National Plan and Provider Enumeration System (NPPES) file, linked to county-level Urban Influence Codes (UICs), and 2019 Claritas population data, were used to conduct these analyses.\* In this brief, we define the primary care

**Figure 3: Nurse Practitioners and Physician Assistants in U.S. Counties per 100,000 Population**

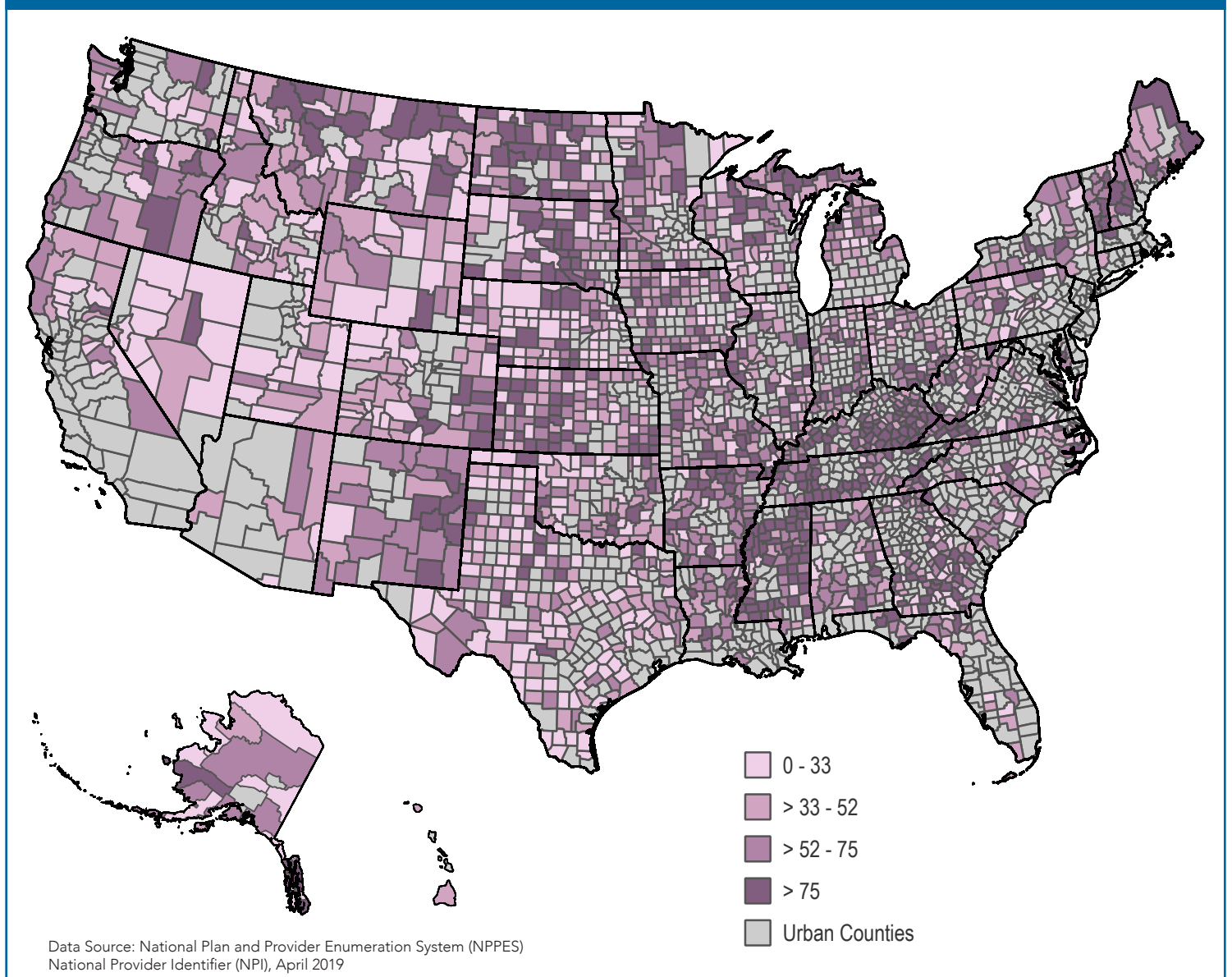


Data Source: National Plan and Provider Enumeration System (NPPES)  
National Provider Identifier (NPI), April 2019

workforce as family physicians, general internists, general pediatricians, plus nurse practitioners (NPs) and physician assistants (PAs). The three physician groups have been recognized as the core of the physician-based primary care “specialty” since the 1990s.<sup>1,12</sup> NPs and PAs have become an important part of the rural primary care workforce as primary care physician shortages have persisted.<sup>15,17</sup> Between 2010 and 2016, the overall physician workforce in the United States grew at an annual rate of 1.1% while the annual rates of increase in the number of PAs and NPs during the same period were 2.5% and 9.4%, respectively.<sup>19</sup> The fact that the number of NPs and PAs being trained continues to increase rapidly while production of primary care physicians has increased at a much slower rate indicates that the contribution of NPs and PAs to the provisions of primary care in rural areas will continue to grow.<sup>7,15-19</sup>

The national maps (Figures 1-5), tables (Tables 1-2), and charts (Figures 6-7) in this brief describe the current (2019) supply and geographic distribution of primary health care providers in the United States. (Maps, tables and charts for individual states can be found at [[https://depts.washington.edu/fammed/rhrc/wp-content/uploads/sites/4/2020/06/RHRC\\_DB167\\_Larson.pdf](https://depts.washington.edu/fammed/rhrc/wp-content/uploads/sites/4/2020/06/RHRC_DB167_Larson.pdf)].)

**Figure 4: Nurse Practitioners in U.S. Counties per 100,000 Population**

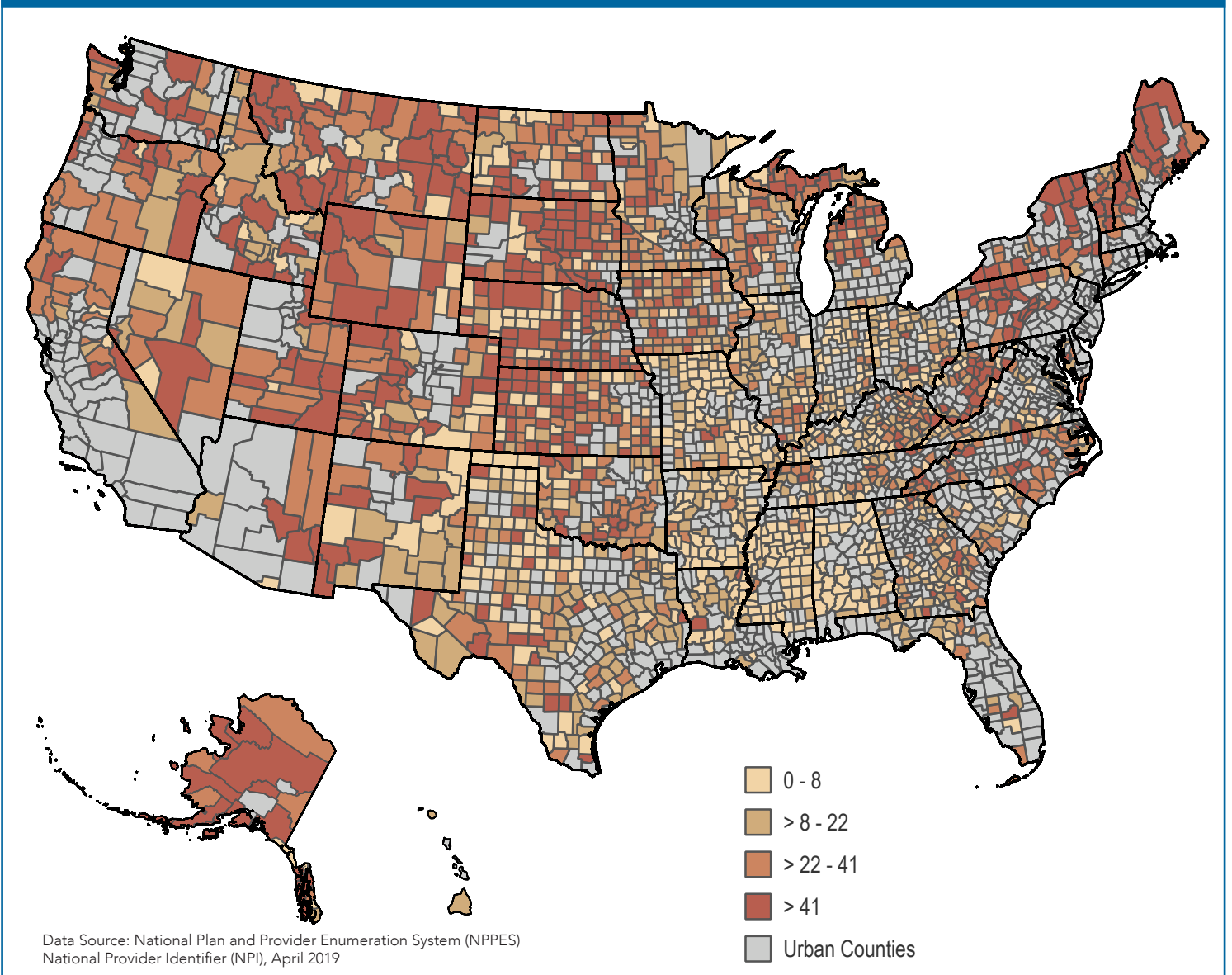




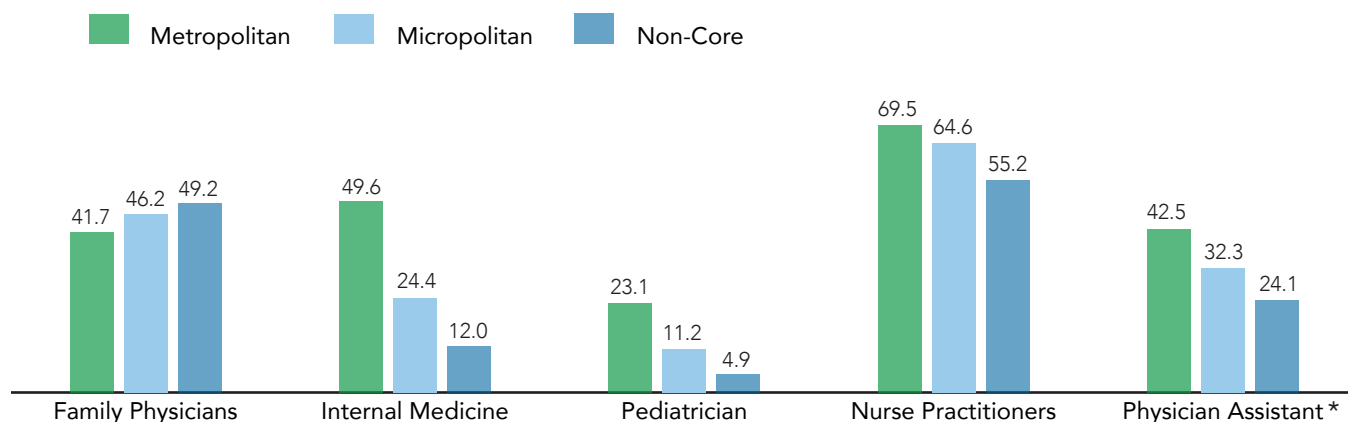
Supply and distribution are described for rural vs. urban counties and among rural counties, micropolitan vs. non-core counties. Nationally, the per capita supply of primary care providers in rural areas is substantially lower than in urban areas. While the provider-to-population ratio of family physicians is slightly higher in rural areas than in urban areas, the supply of the four other types of primary providers is lower (Figure 6). In addition, large variations exist in provider supply across regions and types of rural areas. About five percent of rural counties (mostly non-core rural counties) have no family physicians. An up-to-date description of the supply and geographic distribution of primary care providers in rural America should be useful to policy-makers, medical and nursing educators, and communities working to improve rural health care access and address persistent shortages in this crucial component of the rural health workforce.

\* Methodological details can be found in the Data and Methods section on page 8.

**Figure 5: Physician Assistants in U.S. Counties per 100,000 Population**



**Figure 6: Primary Care Providers per 100,000 Population in U.S. Counties by Urban Influence Category**



Data Sources: National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) data, April 2019, the U.S. Department of Agriculture Economic Research Service (ERS) Urban Influence Codes, 2013, and the 2019 Claritas U.S. population data.

\*Data is for all PAs because PA specialty could not be determined using NPPES taxonomy codes. See "Data and Methods" section for details.

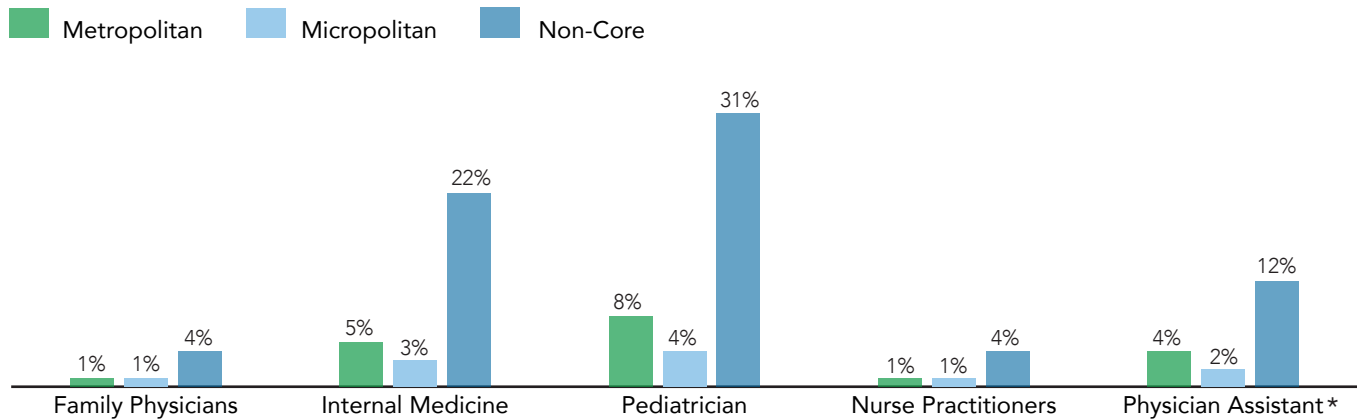
**Table 1: Primary Care Providers per 100,000 Population in U.S. Counties by Urban Influence Category**

	Family Physician Provider/100,000 Pop (Count)	Internal Medicine Provider/100,000 Pop (Count)	Pediatrician Provider/100,000 Pop (Count)	Nurse Practitioner Provider/100,000 Pop (Count)	Physician Assistant* Provider/100,000 Pop (Count)
<b>U.S.</b>	42.5 (139,969)	45.4 (149,446)	21.1 (69,334)	68.3 (224,806)	40.6 (133,699)
<b>Metropolitan</b>	41.7 (118,099)	49.6 (140,513)	23.1 (65,339)	69.5 (196,776)	42.5 (120,343)
<b>Non-Metro</b>	47.4 (21,870)	19.4 (8,933)	8.7 (3,995)	60.8 (28,030)	29.0 (13,356)
Micropolitan	46.2 (12,680)	24.4 (6,684)	11.2 (3,075)	64.6 (17,724)	32.3 (8,856)
Non-core	49.2 (9,190)	12.0 (2,249)	4.9 (920)	55.2 (10,306)	24.1 (4,500)

Data Sources: National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) data, April 2019, the U.S. Department of Agriculture Economic Research Service (ERS) Urban Influence Codes, 2013, and the 2019 Claritas U.S. population data.

\*Data is for all PAs because PA specialty could not be determined using NPPES taxonomy codes. See "Data and Methods" section for details.

**Figure 7: U.S. Counties Without Primary Care Providers by Urban Influence Category**



Data Sources: National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) data, April 2019, the U.S. Department of Agriculture Economic Research Service (ERS) Urban Influence Codes, 2013, and the 2019 Claritas U.S. population data.

\*Data is for all PAs because PA specialty could not be determined using NPPES taxonomy codes. See "Data and Methods" section for details.

**Table 2: U.S. Counties Without Primary Care Providers by Urban Influence Category**

	Counties without Family Physicians Provider (Percent)	Counties without Internal Medicine Provider (Percent)	Counties without Pediatrician Provider (Percent)	Counties without Nurse Practitioner Provider (Percent)	Counties without Physician Assistant* Provider (Percent)
<b>U.S</b> (3,135 counties)	179 (6%)	892 (29%)	1,298 (43%)	158 (5%)	543 (18%)
<b>Metropolitan</b> (1,164 counties)	22 (1%)	159 (5%)	235 (8%)	19 (1%)	116 (4%)
<b>Non-Metro</b> (1,971 counties)	157 (5%)	733 (24%)	1,063 (35%)	139 (5%)	427 (14%)
Micropolitan (640 counties)	23 (1%)	78 (3%)	127 (4%)	18 (1%)	60 (2%)
Non-core (1,331 counties)	134 (4%)	655 (22%)	936 (31%)	121 (4%)	367 (12%)

Data Sources: National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) data, April 2019, the U.S. Department of Agriculture Economic Research Service (ERS) Urban Influence Codes, 2013, and the 2019 Claritas U.S. population data.

\*Data is for all PAs because PA specialty could not be determined using NPPES taxonomy codes. See "Data and Methods" section for details.

## DATA AND METHODS

This study used the National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) data downloaded April 2019, the U.S. Department of Agriculture Economic Research Service (ERS) Urban Influence Codes, 2013, and the 2019 Claritas U.S. population data.

All U.S. counties were categorized into one of three geographic categories: Metropolitan, Micropolitan and Non-core using the ERS Urban Influence Codes (UIC). The 12 UIC categories were grouped as follows: Metropolitan (UIC 1,2), Micropolitan (UIC 3,5,8), and Non-Core (UIC 4,6,7,9-12). Provider counts and provider-to-population ratios were calculated for each type of provider in each county.

The following taxonomy descriptions and codes were included for each of the five provider types included in these analyses:

Family Medicine Physicians: Family Medicine - 207Q00000X, Family Medicine: Adolescent Medicine - 207QA00000X, Family Medicine: Adult Medicine - 207QA0505X, Family Medicine: Geriatric Medicine - 207QG0300X, General Practice - 208D00000X.

Internal Medicine Physicians: Internal Medicine - 207R00000X, Internal Medicine: Adolescent Medicine - 207RA00000X, Internal Medicine: Geriatric Medicine - 207RG0300X.

Pediatricians: Pediatrics - 208000000X, Pediatrics: Adolescent Medicine - 2080A0000X.

Nurse Practitioners: Nurse Practitioner - 363L00000X, Nurse Practitioner: Adult Health - 363LA2200X, Nurse Practitioner: Family - 363LF0000X, Nurse Practitioner: Gerontology - 363LG0600X, Nurse Practitioner: Pediatrics - 363LP0200X, Nurse Practitioner: Primary Care - 363LP2300X, Nurse Practitioner: School - 363LS0200X, Nurse Practitioner: Women's Health - 363LW0102X.

Physician Assistants: Physician Assistant - 363A00000X, Physician Assistant: Medical - 363AM0700X, Physician Assistant: Surgical - 363AS0400X.

The NPPES NPI data have some limitations. Individuals in a group practice may obtain either an individual NPI and/or a group NPI, depending on how their practice is structured. Additionally, the data only include providers that have billed the Centers for Medicare and Medicaid Services (CMS) for services provided.<sup>20</sup> For these reasons, NPPES NPI data may undercount total numbers of individual providers. In the particular case of the Physician Assistant data, however, it was not possible to distinguish between primary care and non-primary care PAs, so all PAs are included in the analysis. National data indicates that about 21 percent of urban PAs work in primary care compared to 39 percent in rural areas.<sup>21</sup> Nonetheless, the NPI data should provide a reasonably accurate picture of the relative availability of providers across various geographic classifications.



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