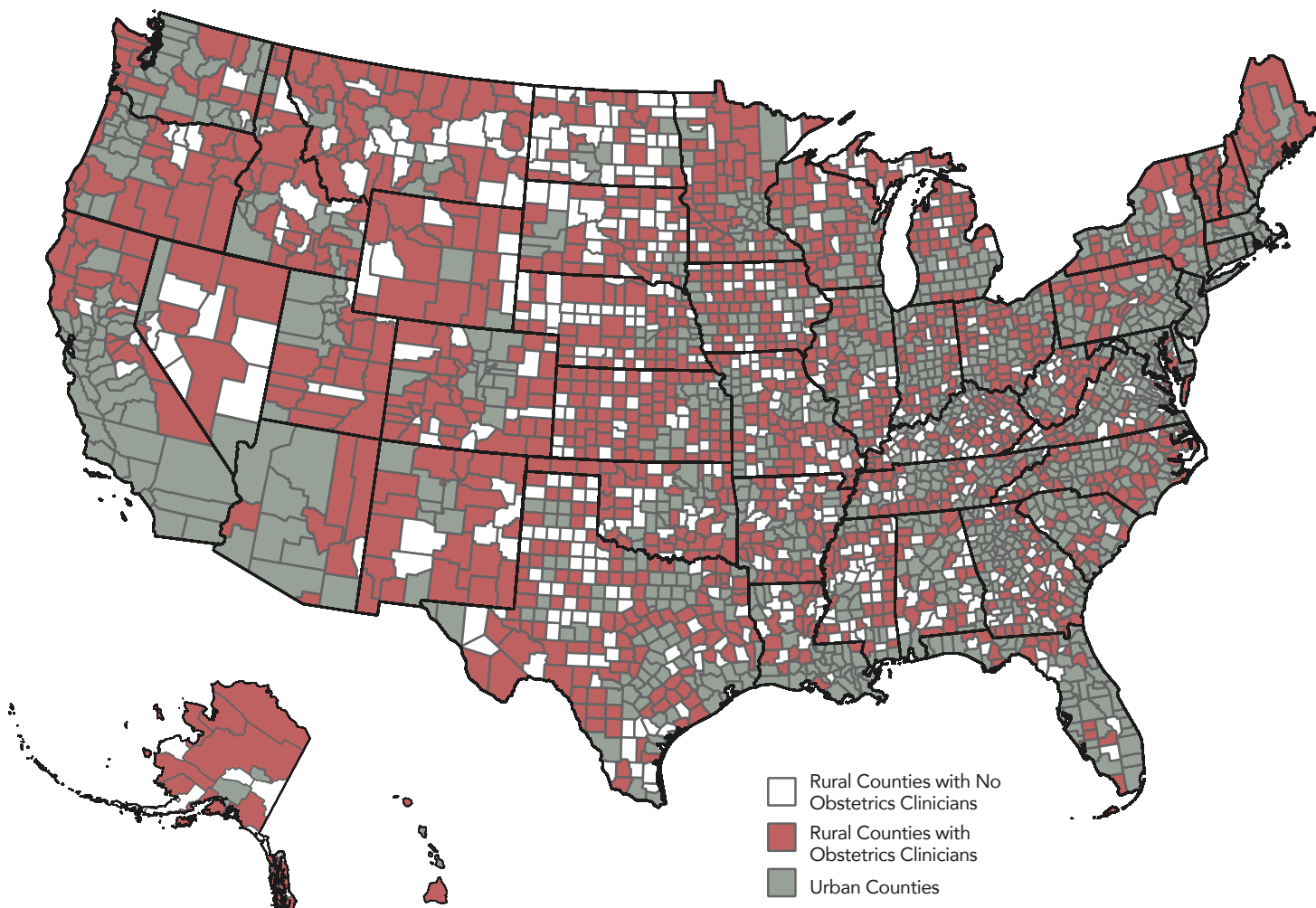


The Supply and Rural-Urban Distribution of the Obstetrical Care Workforce in the U.S.

KEY FINDINGS

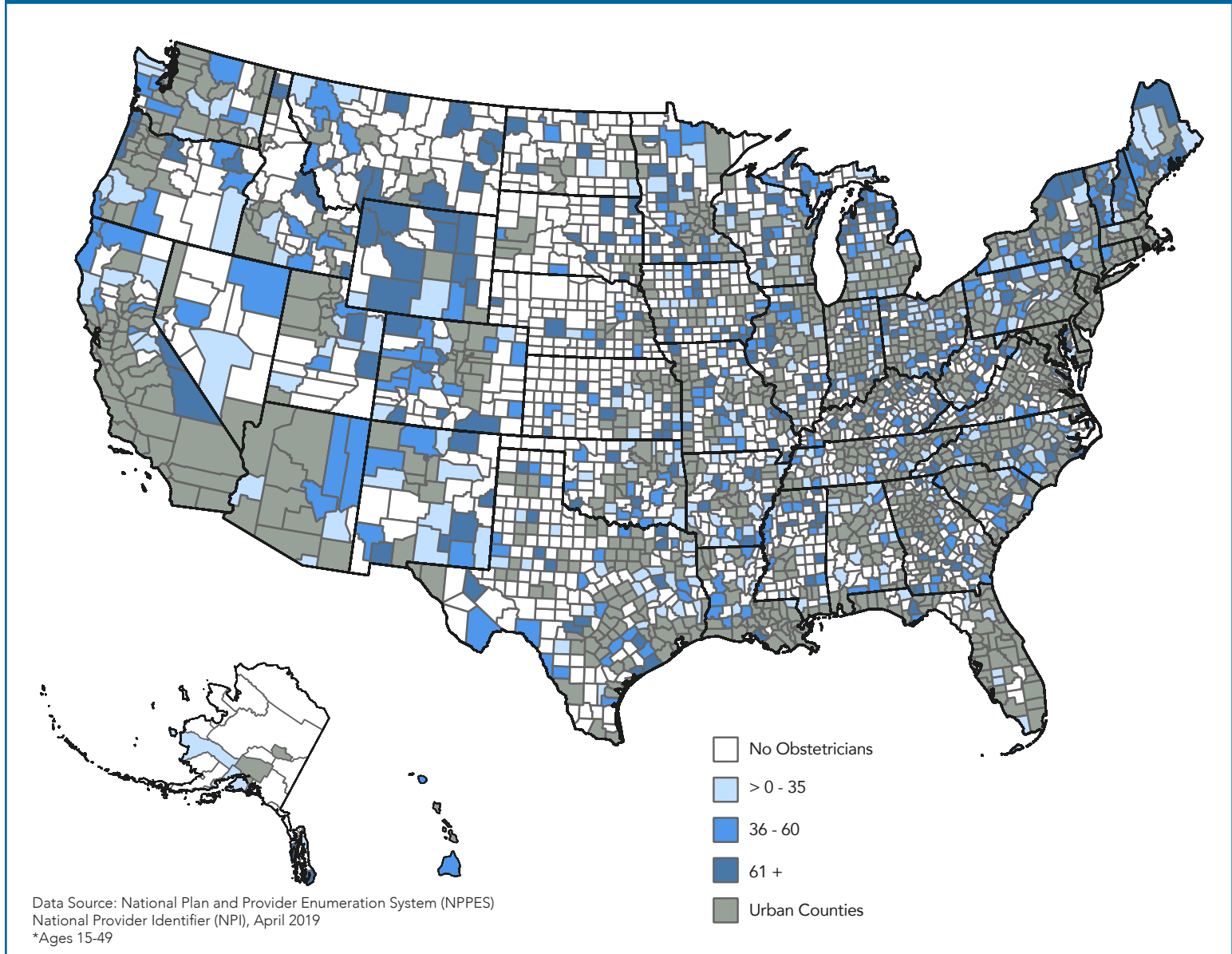
- Significant disparities exist between rural and urban areas in the supply of clinicians who provide obstetrical services.
- Nearly a third (31%) of nonmetropolitan counties have no obstetrics clinicians.
- The more rural their location, the more likely family physicians are to deliver babies.
- Obstetricians are far more prevalent in metropolitan than nonmetropolitan counties.
- Midwives and advanced practice midwives are a much smaller share of the obstetrics workforce in both metropolitan and nonmetropolitan areas compared with other obstetrics clinicians.

Figure 1: U.S. Rural Counties Without Obstetrical Service Clinicians, 2019



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

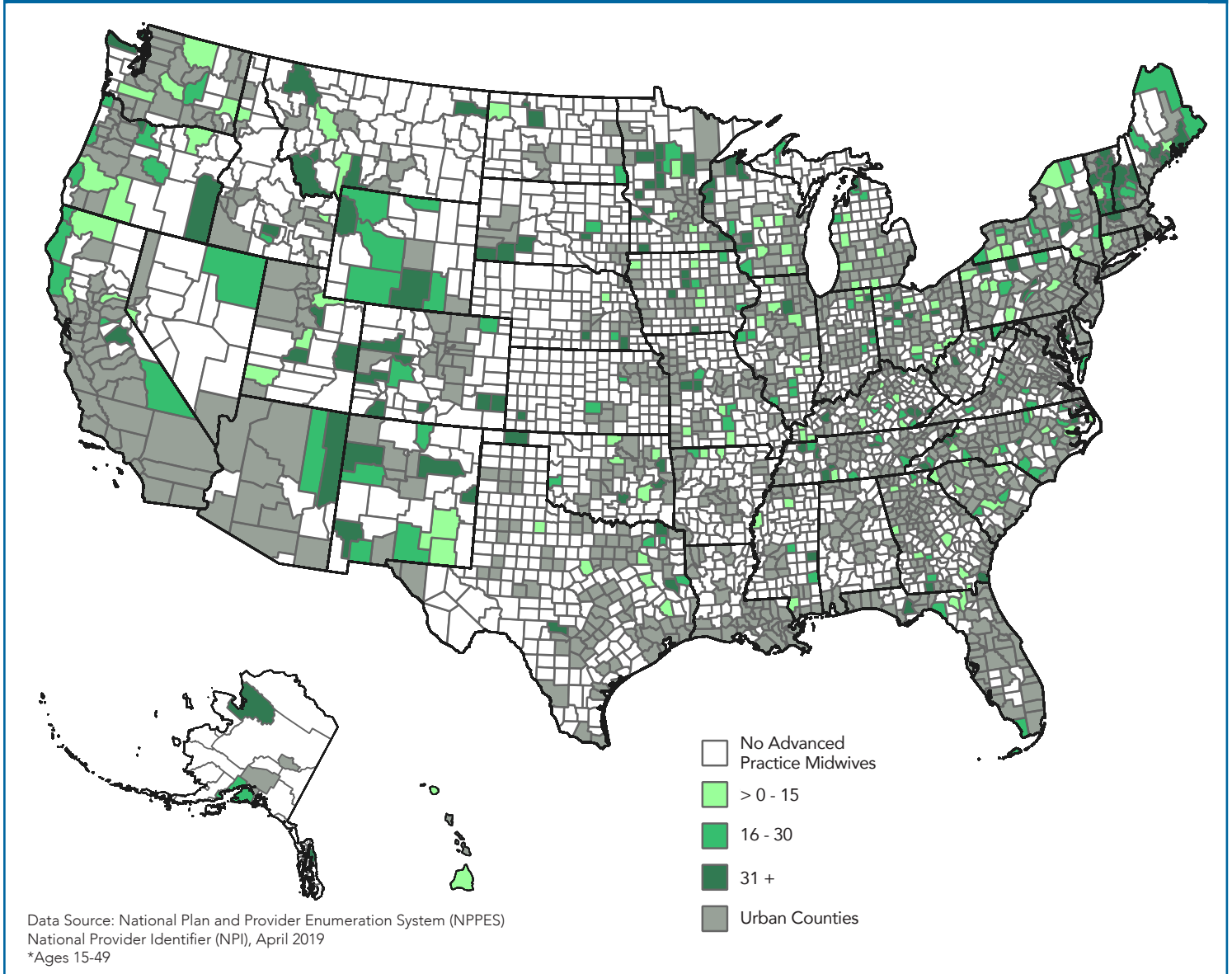
Figure 2: Obstetricians per 100,000 Women of Childbearing Age* in Rural U.S. Counties, 2019



Maternal health care outcomes in the U.S. have deteriorated precipitously over the past three decades, with pregnancy-related deaths more than doubling from 1987 to 2014.^{1,2} Lack of access is a contributing cause, and access to obstetrical (OB) care in the rural U.S. has declined significantly in recent years, due to closure of obstetrical units and decreasing availability of clinicians who deliver babies.¹⁻⁴ Monitoring the rural and urban supply and distribution of clinicians who provide OB services, including obstetricians, advanced practice midwives, midwives (not advanced practice), and family physicians, is important for identifying areas that may lack access to OB care and identifying solutions.⁴

Obstetricians tend to be concentrated in urban areas,^{4,5} and increasingly pursue subspecialization.^{4,6} Midwives, including advanced practice nurses (certified nurse midwives [CNMs]), certified midwives, and certified professional midwives,^{2,4} are also important providers of OB care, and their integration into regional health systems is associated with better birth outcomes,^{2,4,7} but this varies widely across geographies.² A survey in nine states found that CNMs performed deliveries in 31.6% of rural hospitals offering obstetric services,⁸ suggesting that their potential role in OB care systems has not been fully maximized. Hospitals that

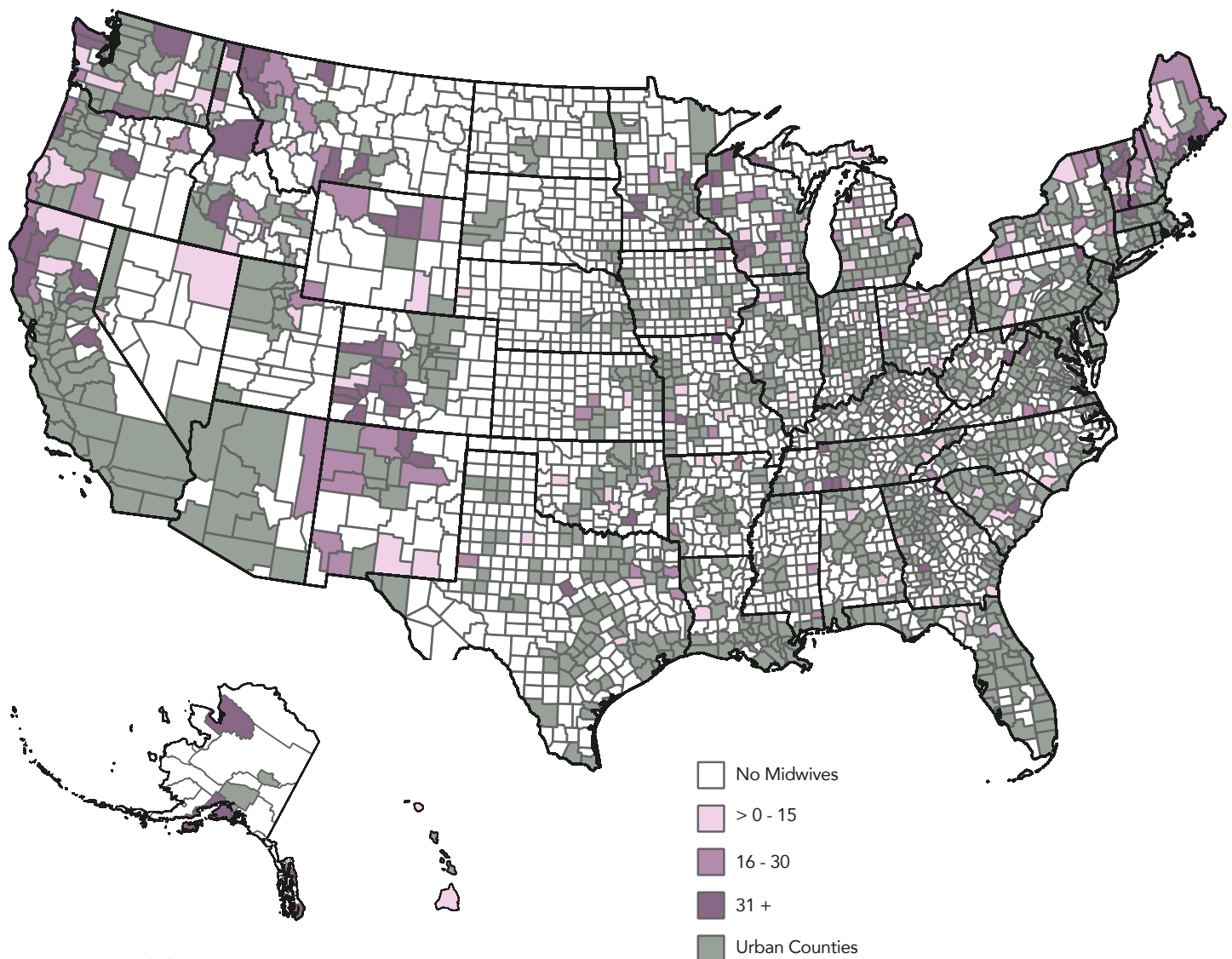
Figure 3: Advanced Practice Midwives per 100,000 Women of Childbearing Age* in Rural U.S. Counties, 2019



rely more heavily on CNMs have higher birth volumes, and some rural hospitals may lack sufficient birth volume to employ clinicians who are devoted mainly to maternity care.⁹ The reasons that more CNMs do not attend births in some areas are not fully understood, but substantial geographic variation in employment of CNMs offers the possibility that policy changes in education, credentialing, practice laws, payment, or other factors could enable greater utilization of CNMs.⁹

Family physicians have historically provided a disproportionately greater share of OB care in rural areas.^{2,10} However, OB care by family physicians has decreased substantially over time.¹¹⁻¹³ The proportion performing any deliveries dropped from 17.0% in 2003 to 10.1% in 2009¹¹; the proportion delivering more than 50 babies annually dropped from 2.3% in 2003 to 1.1% in 2016.¹³ The reasons for the decline are multiple. Family medicine residency programs frequently do not provide sufficient surgical OB training, and hospital credentialing for cesarean section births can be challenging.⁵ Nearly 60% of all new family physicians, both rural and urban, report that the practices they have joined do not offer the opportunity to deliver babies and that lifestyle considerations are also a factor.¹⁴ Family medicine maternity care fellowships offer advanced OB training appropriate to rural practice,¹⁵ but these fellowship positions are extremely few¹⁶ compared with rural population need.

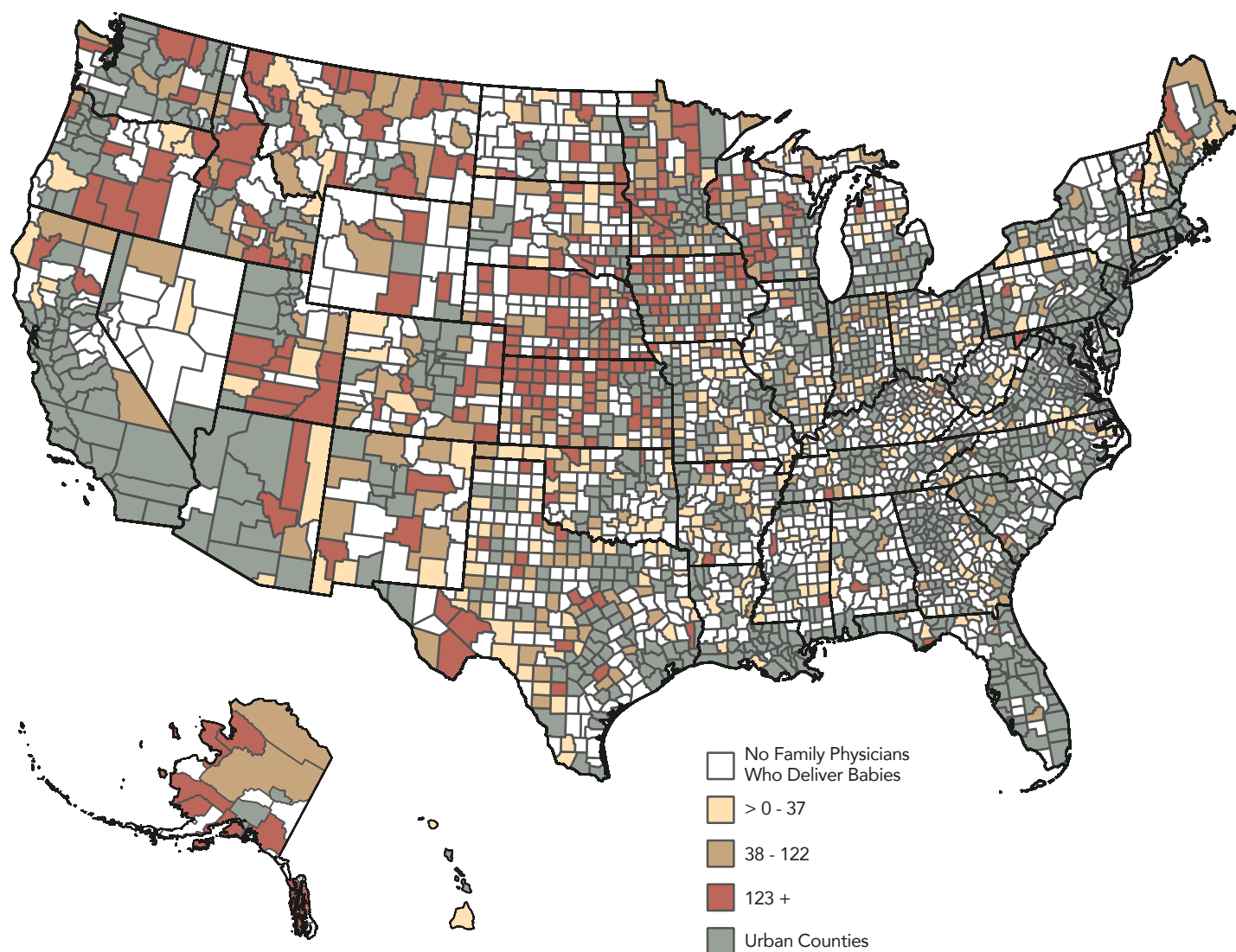
Figure 4: Midwives per 100,000 Women of Childbearing Age* in Rural U.S. Counties, 2019



Data Source: National Plan and Provider Enumeration System (NPPES)
National Provider Identifier (NPI), April 2019
*Ages 15-49

This brief describes the supply and geographic distribution of four types of OB clinicians: obstetricians, advanced practice midwives, midwives (not advanced practice), and family physicians. We used data from the April 2019 National Plan and Provider Enumeration System (NPPES) file to conduct analyses of obstetricians, advanced practice midwives, midwives, and family medicine physicians. We used data from the American Board of Family Medicine on family physicians reporting that they deliver babies on the Family Medicine Certification Examination Registration Questionnaire from 2014 through 2018 to estimate the number of family physicians delivering babies in each county. We linked county OB workforce supply estimates to county-level Urban Influence Codes (UICs), and 2019 Claritas population data to derive estimates of each clinician type per 100,000 women of child-bearing age (15 through 49 years). We describe supply and distribution for rural versus urban U.S. counties and among rural counties, micropolitan versus non-core counties. Individual state OB workforce profiles can be found at https://depts.washington.edu/fammed/rhrc/wp-content/uploads/sites/4/2020/06/RHRC_DB168_Patterson.pdf. Methodological details can be found in the Data and Methods Appendix.

Figure 5: Family Physicians Who Deliver Babies per 100,000 Women of Childbearing Age* in Rural U.S. Counties, 2019



Data Sources: National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI), April 2019.
American Board of Family Medicine Certification Examination Registration Questionnaire (2014-2018).
*Ages 15-49

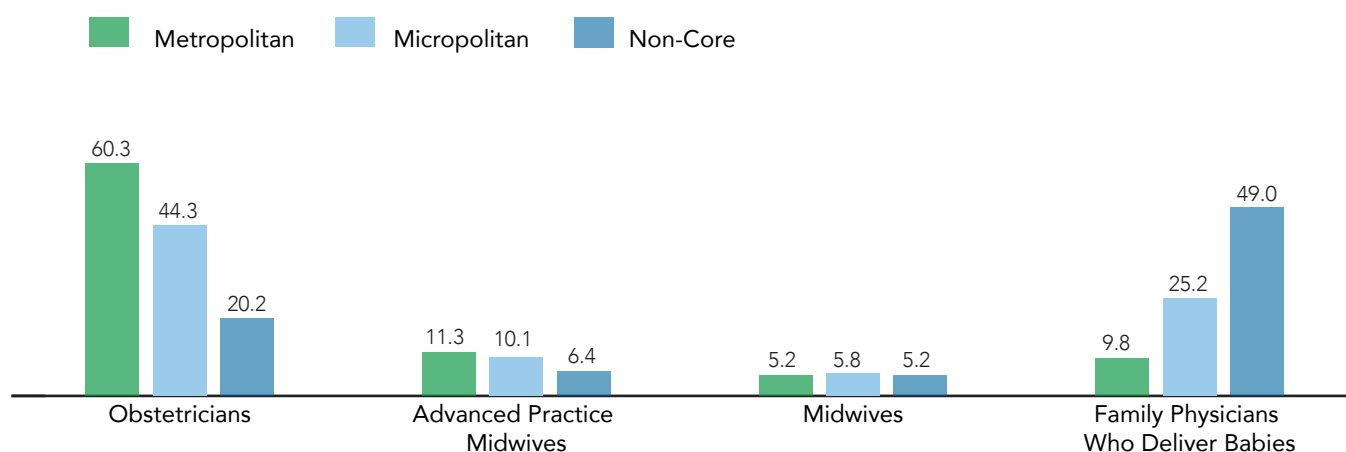
Table 1 shows that nationally, the per capita supply of obstetricians, advanced practice midwives, and midwives in rural (nonmetropolitan) areas is substantially lower than in urban (metropolitan) areas and decreases with increasing rurality (non-core versus micropolitan counties). In contrast, family physicians are more likely to deliver babies the more rural their location. Table 2 displays the number and percentage of rural counties without each type of OB clinician. An estimated 58.7% of rural counties have no obstetricians, 81.7% have no advanced practice midwives, and 56.9% have no family physicians who delivered babies, and the scarcity is even greater in non-core rural counties. Nearly a third of rural counties (608, 30.8%) have no OB clinicians, shown in Figure 1.

Large variations exist in workforce supply not only across types of rural areas but also across regions of the U.S., as evident in Figures 2-5, which show tertiles of supply in rural counties with at least one clinician of each type. These maps should be

interpreted with caution because they are based on estimates of workforce supply, especially for family physicians. Thus, they are best viewed as providing a picture of relative rural versus urban availability of obstetric services rather than precise numbers of clinicians in each county (as explained further in the Data and Methods Appendix).

Obstetricians are much more prevalent in metropolitan counties than in micropolitan and non-core counties, while the distribution of family physicians who deliver babies is the opposite, with the highest numbers in nonmetropolitan, particularly non-core, counties (Figure 6). Midwives and advanced practice midwives are a much smaller share of the obstetrics workforce in all geographies compared with other clinicians. Obstetricians are in a large majority of micropolitan counties, but most of these counties do not have advanced practice midwives, midwives, or family physicians delivering babies (Figure 7). The OB provider supply disparity between non-core and metropolitan counties is even more extreme. This description of the supply and geographic distribution of the OB workforce in rural America should be useful to policymakers, 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.

Figure 6: Obstetrical Service Clinicians per 100,000 Women of Childbearing Age* in U.S. Counties by Urban Influence Category, 2019



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. American Board of Family Medicine Certification Examination Registration Questionnaire (2014-2018).

*Ages 15 to 49

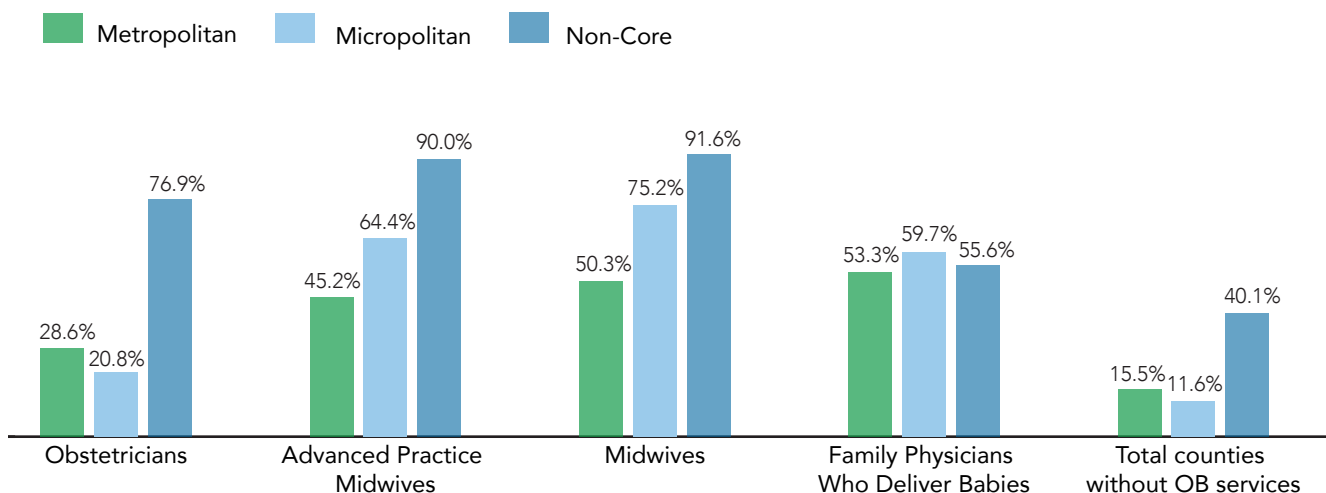
Table 1: Obstetrical Service Clinicians - Total and Ratios per 100,000 Women of Childbearing Age* in U.S. Counties by Urban Influence Category, 2019

	Obstetricians/ 100,000 Women of Childbearing Age (Count)	Advanced Practice Midwives/ 100,000 Women of Childbearing Age (Count)	Midwives/ 100,000 Women of Childbearing Age (Count)	Family Physicians Who Deliver Babies/100,000 Women of Childbearing Age (Count)
US	57.2 (42,930)	10.9 (8,212)	5.2 (3,929)	12.8 (9,631)
Metropolitan	60.3 (39,653)	11.3 (7,400)	5.2 (3,406)	9.8 (6,418)
Non-Metro	35.1 (3,277)	8.7 (812)	5.6 (523)	34.4 (3,212)
Micropolitan	44.3 (2,550)	10.1 (335)	5.8 (335)	25.2 (1,453)
Non-Core	20.2 (727)	6.4 (188)	5.2 (188)	49.0 (1,759)

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.
American Board of Family Medicine Certification Examination Registration Questionnaire (2014-2018).

*Ages 15 to 49

Figure 7: U.S. Counties Without Obstetrical Service Clinicians by Urban Influence Category, 2019



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.
American Board of Family Medicine Certification Examination Registration Questionnaire (2014-2018).

Table 2: U.S. Counties Without Obstetrical Service Clinicians by Urban Influence Category, 2019

	Counties without Obstetricians (Percent)	Counties without Advanced Practice Midwives (Percent)	Counties without Midwives (Percent)	Counties without Family Physicians Who Deliver Babies (Percent)	Counties without Any Obstetric Providers (Percent)
US	1,489	2,136	2,286	1,742	788
(3,135 counties)	(47.5%)	(68.1%)	(72.9%)	(55.6%)	(25.1%)
Metropolitan	333	526	586	620	180
(1,164 counties)	(28.6%)	(45.2%)	(50.3%)	(53.3%)	(15.5%)
Non-Metro	1,156	1,610	1,700	1,122	608
(1,971 counties)	(58.7%)	(81.7%)	(86.3%)	(56.9%)	(30.8%)
Micropolitan	133	412	481	382	74
(640 counties)	(20.8%)	(64.4%)	(75.2%)	(59.7%)	(11.6%)
Non-Core	1,023	1,198	1,219	740	534
(1,331 counties)	(76.9%)	(90.0%)	(91.6%)	(55.6%)	(40.1%)

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. American Board of Family Medicine Certification Examination Registration Questionnaire (2014-2018).

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APPENDIX: 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, the American Board of Family Medicine (ABFM) Certification Examination Registration Questionnaire from 2014 through 2018, and the 2019 Claritas U.S. population data.

We categorized all U.S. counties into one of three geographic categories using the Economic Research Service Urban Influence Codes grouped as follows: Metropolitan (UIC 1,2), Micropolitan (UIC 3,5,8), and Non-Core (UIC 4,6,7,9-12).

We used NPPES NPI data for analyses of obstetricians, advanced practice midwives, midwives, and family medicine physicians according to the following NPPES taxonomy descriptions and codes:

- Obstetrician Physicians: Obstetrics & Gynecology - 207V00000X, Obstetrics - 207VX0000X, Maternal & Fetal Medicine - 207VM0101X, Reproductive Endocrinology - 207VE0102X
- Advanced Practice Midwife: 367A00000X
- Midwife: Midwife - 176B00000X
- Family Medicine Physicians: Family Medicine - 207Q00000X, Adult Medicine - 207QA0505X, General Practice - 208D00000X

We calculated obstetrician, advanced practice midwife, and midwife counts and the number of each clinician type per 100,000 women of child-bearing age (defined as 15-49 years old) for each U.S. county using clinicians' practice addresses from the NPPES file. We calculated comparable estimates for family physicians providing obstetric services using the NPPES and data from ABFM Family Medicine Certification Examination Registration Questionnaire for the years 2014 through 2018. The questionnaire asks all ABFM-certified physicians registering for the examination if they deliver babies, and the ABFM provided the number of family physicians responding to the 2014-2018 questionnaires and the number who reported delivering babies by county. For each county with no family physicians responding to the survey from 2014 through 2018, we estimated the percentage delivering babies. To derive this estimate, we pooled data from all counties within the state in the same UIC category and calculated the overall percentage of physicians in that UIC category who reported delivering babies on the 2014-2018 surveys. We multiplied this estimated county-specific percentage of family physicians who delivered babies by the number of family physicians in each county to yield the estimated number of family physicians providing OB services. This number was used to calculate the ratio of family physicians to 100,000 women of child-bearing age. Further details on methods are available from the authors.

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. Time lags can occur between when recent graduates appear at their new practice addresses rather than their training sites, and though health professionals are required to update changes in status or location, the extent of compliance is unknown. NPPES data also do not indicate whether health professionals are clinically active. For these reasons, NPPES NPI data may miscount the total numbers of individual health professionals. Nonetheless, the NPI data should provide a reasonably accurate picture of relative workforce supply across various geographic classifications.

ABFM data limitations include the fact that family physicians who are not board-certified are not surveyed, resulting in an undercount that disproportionately excludes osteopathic physicians, an important type of physician in rural areas. The imputation of values in counties with no board-certified family physicians who responded to the survey between 2014-2018, means that the data on family physicians are also best viewed as estimates of relative rural versus urban availability of obstetric services rather than precise numbers of clinicians in each county.

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