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Rural Behavioral Health, Primary Care, and Obstetrical Care Workforce: A State-Level Analysis

DATA SOURCES

Workforce Data

Data on all health care professions were obtained from the National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) data from the Centers for Medicare & Medicaid Services (CMS) in January 2025.[1] The profession for each clinician in the NPPES data was identified based on their primary specialty taxonomy codes (Table 1). For advanced practice midwives and midwives, we used methods previously described by Vanderlaan and Jefferson to re-classify midwives' practice level in the NPPES data.[2] We included all clinicians for each profession with an individual NPI (Entity Type Code=1) whose practice addresses were located in the 50 states or District of Columbia (excluding clinicians with addresses in U.S. territories and military personnel stationed overseas).

Table 1. NPPES Taxonomy Codes to Identify Behavioral Health, Primary Care, and Obstetrical Care Professions[a]

Profession	Taxonomy codes
Psychiatrists	Addiction Medicine - 2084A0401X; Addiction Psychiatry - 2084P0802X; Behavioral Neurology & Neuropsychiatry - 2084B0040X; Child & Adolescent Psychiatry - 2084P0804X; Geriatric Psychiatry - 2084P0805X; Hospice & Palliative Medicine - 2084H0002X; Pain Medicine - 2084P2900X; Psychiatry - 2084P0800X; Psychosomatic Medicine - 2084P0015X; Sleep Medicine - 2084S0012X
Psychologists	Psychologist - 103T00000X, Addiction (Substance Use Disorder) - 103TA0400X, Adult Development and Aging - 103TA0700X, Clinical - 103TC0700X, Clinical Child & Adolescent 103TC2200X, Cognitive and Behavioral - 103TB0200X, Counseling - 103TC1900X, Educational - 103TE1000X, Family - 103TF0000X, Group Psychotherapy - 103TP2701X, Health - 103TH0004X, Health Service - 103TH0100X, Intellectual and Developmental Disabilities - 103TM1800X, Prescribing (Medical) - 103TP0016X, Psychoanalysis - 103TP0814X, Psychotherapy - 103TP2700X, Rehabilitation - 103TR0400X, School - 103TS0200X, Women - 103TW0100X
Psychiatric nurse practitioners	Nurse Practitioner: Psychiatric/Mental Health - 363LP0808X
Social workers	Social Worker - 104100000X, Clinical Social Worker - 1041C0700X, School - 1041S0200X
Counselors	Counselor - 101Y00000X, Addiction (Substance Use Disorder) - 101YA0400X, Pastoral 101YP1600X, Professional - 101YP2500X, School - 101YS0200X, Behavioral Analyst - 103K00000X, Clinical Neuropsychologist - 103G00000X, 103GC0700X, Poetry Therapist - 102X00000X, Psychoanalyst - 102L00000X, Marriage and Family Therapist - 106H00000X
Family physicians	Family Medicine - 207Q00000X, Adolescent Medicine - 207QA0000X, Adult Medicine - 207QA0505X, Geriatric Medicine - 207QG0300X, General Practice - 208D00000X
General internists	Internal Medicine - 207R00000X, Adolescent Medicine - 207RA0000X, Geriatric Medicine - 207RG0300X
General pediatricians	Pediatrics - 208000000X, Adolescent Medicine - 2080A0000X
Nurse practitioners	Nurse Practitioner - 363L00000X, Adult Health - 363LA2200X, Family - 363LF0000X, 363LG0600X, Pediatrics - 363LP0200X, Primary Care - 363LP2300X, School - 363LS0200X, Women's Health - 363LW0102X
Physician assistants	Physician Assistant - 363A00000X, Medical - 363AM0700X, Surgical - 363AS0400X
Obstetricians	Obstetrics & Gynecology - 207V00000X, Obstetrics - 207VX0000X, Maternal & Fetal Medicine - 207VM0101X, Reproductive Endocrinology - 207VE0102X
Advanced practice midwives[b]	Advanced Practice Midwife - 367A00000X
Midwives[b]	Midwife - 176B00000X, Lay Midwife - 175M00000X

[a]Taxonomy codes available from the National Uniform Claim Committee (NUCC): https://taxonomy.nucc.org/
[b]Data on advanced practice midwives and midwives were obtained from the NPPES NPI data using these taxonomy codes and then reclassified using methods described by Vanderlaan and Jefferson.[2]

Population Data

All population data was obtained from the U.S. Census Bureau.[3,4] We used total county population (2024) to calculate the supply of clinicians per 100,000 population for the majority of professions, with the exceptions of:

- Pediatricians, for which we used youth population, ages 0-24 (2023), and
- Obstetricians, advanced practice midwives, and midwives, for which we used a population of women of childbearing age, ages 15-49 (2023).

Rural Definition

Counties are classified based on the FORHP Rural Grant Eligibility Definition (November 2024).[5] Rural counties include:

1. all noncore and micropolitan counties,
2. outlying metropolitan counties with no population from an urban area of 50,000 or more people, and
3. counties with all census tracts meeting the FORHP rural definition.

All other counties are considered urban. Full details available at the HRSA webpage: "How We Define Rural."

DATA ANALYSIS

We linked each clinician's practice location ZIP Code obtained through NPPES to a county using the U.S. Department of Housing and Urban Development (HUD)-U.S. Postal Service ZIP Code Crosswalk files.[6] We calculated clinician counts for each U.S. county (n=3,138) and state. We calculated the ratio per 100,000 relevant population for each county, state, and the rural and urban counties within each state. We used Version 9.4 of the SAS System for Windows for the data analyses, and Tableau version 2026.1 to create the maps. This research involved the secondary analysis of existing publicly available data and did not involve interaction with human subjects, so it is considered exempt from Institutional Review Board (IRB) review.

LIMITATIONS

The NPPES dataset used in this analysis was designed for administrative purposes. Professions whose members more frequently bill independently for services with Medicare and Medicaid, such as physicians, are better represented in the data than those who more frequently bill under another clinician's NPI or a group or organization NPI, such as social workers.[7] The NPPES data also does not capture clinicians who do not bill insurance (eg, cash-only practices). Updates to the NPPES are self-reported and voluntary. Clinicians who are not actively practicing can still have an NPI number and will be counted in this data. Classifying clinicians to a county based on their primary practice location ZIP Code does not account for clinicians who practice in multiple locations, either in person or via telehealth. Despite these limitations, the NPPES data provides a reasonably accurate picture of the relative availability of health care professions across states.[7,8]

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FUNDING

This study was supported by the Federal Office of Rural Health Policy (FORHP), Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services (HHS) under cooperative agreement #U1CRH03712. The information, conclusions and opinions expressed in this paper are those of the authors and no endorsement by FORHP, HRSA, or HHS is intended or should be inferred.

ACKNOWLEDGMENTS

The authors gratefully acknowledge Beverly Marshall for her assistance with manuscript production.

SUGGESTED CITATION

Woolcock SC, Andrilla CHA, Garberson LA, Graves JM. *Rural Behavioral Health, Primary Care, and Obstetrical Care Workforce: A State-Level Analysis.* Technical Appendix. WWAMI Rural Health Research Center, University of Washington; August 2026

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