

# AHRF Mapping Tool

## Data Sources, Definitions, and Notes

All data used to calculate the measures presented in the AHRF Mapping Tool reside within the Area Health Resources Files System. Original data source references and definitions for each measure presented are noted below.

### Health Professionals

#### Total Physicians

**Source:** The 2012 AMA Non-Federal M.D. and D.O. Specialty data were obtained from the 2012 American Medical Association Physician Masterfile ©. The 2012 Census Population data are from the *Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2012*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Data from the AMA Masterfile include Total Non-Federal MDs and DOs and are broken out by Specialty and Major Professional Activity for 2012. Major Professional Activity and Self-Designated Practice Specialty classifications are reported by the physicians in the Physicians' Practice Arrangements (PPA) questionnaire. The reporting period for data is as of December 31, 2012.

Total physicians include the total number of non-federal MDs and DOs under age 75 who are not hospital residents and whose major professional activity is classified as patient care.

The total physicians to population ratios are calculated by dividing the total number of total physicians by the total population and multiplying by 100,000 to derive the ratio of primary care physicians per 100,000 population.

#### Primary Care Physicians

**Source:** The 2012 AMA Non-Federal M.D. and D.O. Specialty data were obtained from the 2012 American Medical Association Physician Masterfile ©. The 2012 Census Population data are from the *Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2012*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

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Primary Care Physicians include those non-federal MDs and DOs under age 75 who are not hospital residents and whose major professional activity is classified as patient care and whose self-designated practice specialty is identified as General Practice; General Family Medicine; General Internal Medicine; or General Pediatrics.

The primary care physician to population ratios are calculated by dividing the total number of primary care physicians by the total population and multiplying by 100,000 to derive the ratio of primary care physicians per 100,000 population.

## **General Practice/Family Practice Physicians**

**Source:** The 2012 AMA Non-Federal M.D. and D.O. Specialty data were obtained from the 2012 American Medical Association Physician Masterfile ©. The 2012 Census Population data are from the *Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2012*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Data from the AMA Masterfile include Total Non-Federal MDs and DOs and are broken out by Specialty and Major Professional Activity for 2012. Major Professional Activity and Self-Designated Practice Specialty classifications are reported by the physicians in the Physicians' Practice Arrangements (PPA) questionnaire. The reporting period for data is as of December 31, 2012.

General Practice/Family Practice Physicians include those non-federal MDs and DOs under age 75 who are not hospital residents and whose major professional activity is classified as patient care and whose self-designated practice specialty is identified as General Practice or General Family Medicine.

The general practice/family practice physician to population ratios are calculated by dividing the total number of general practice/family practice physicians by the total population and multiplying by 100,000 to derive the ratio of general practice/family practice physicians per 100,000 population.

## **Internal Medicine Physicians**

**Source:** The 2012 AMA Non-Federal M.D. and D.O. Specialty data were obtained from the 2012 American Medical Association Physician Masterfile ©. The 2012 Census Population data are from the *Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2012*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Data from the AMA Masterfile include Total Non-Federal MDs and DOs and are broken out by Specialty and Major Professional Activity for 2012. Major Professional Activity and Self-Designated Practice Specialty classifications are reported by the physicians in the Physicians' Practice Arrangements (PPA) questionnaire. The reporting period for data is as of December 31, 2012.

Internal Medicine Physicians include those non-federal MDs and DOs under age 75 who are not hospital residents and whose major professional activity is classified as patient care and whose self-designated practice specialty is identified as General Internal Medicine.

The internal medicine physician to population ratios are calculated by dividing the total number of internal medicine physicians by the total population and multiplying by 100,000 to derive the ratio of internal medicine physicians per 100,000 population.

## Pediatricians

**Source:** The 2012 AMA Non-Federal M.D. and D.O. Specialty data were obtained from the 2012 American Medical Association Physician Masterfile ©. The 2012 Census Population data are from the *Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2012*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Data from the AMA Masterfile include Total Non-Federal MDs and DOs and are broken out by Specialty and Major Professional Activity for 2012. Major Professional Activity and Self-Designated Practice Specialty classifications are reported by the physicians in the Physicians' Practice Arrangements (PPA) questionnaire. The reporting period for data is as of December 31, 2012.

Pediatricians include those non-federal MDs and DOs under age 75 who are not hospital residents and whose major professional activity is classified as patient care and whose self-designated practice specialty is identified as General Pediatrics.

The pediatricians to population ratios are calculated by dividing the total number of pediatricians by the total population under 20 years of age and multiplying by 100,000 to derive the ratio of pediatricians per 100,000 population.

## Obstetricians/Gynecologists

**Source:** The 2012 AMA Non-Federal M.D. and D.O. Specialty data were obtained from the 2012 American Medical Association Physician Masterfile ©. The 2012 Census Population data are from the *Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2012*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Data from the AMA Masterfile include Total Non-Federal MDs and DOs and are broken out by Specialty and Major Professional Activity for 2012. Major Professional Activity and Self-Designated Practice Specialty classifications are reported by the physicians in the Physicians' Practice Arrangements (PPA) questionnaire. The reporting period for data is as of December 31, 2012.

Obstetricians/Gynecologists include those non-federal MDs and DOs under age 75 who are not hospital residents and whose major professional activity is classified as patient care and whose self-designated practice specialty is identified as General Obstetrics-Gynecology.

The obstetricians/gynecologists to population ratios are calculated by dividing the total number of obstetricians/gynecologists by the total female population and multiplying by 100,000 to derive the ratio of obstetricians/gynecologists per 100,000 population.

## General Surgeons

**Source:** The 2012 AMA Non-Federal M.D. and D.O. Specialty data were obtained from the 2012 American Medical Association Physician Masterfile ©. The 2012 Census Population data are from the *Annual Resident Population Estimates, Estimated Components of Resident Population Change, and Rates of the Components of Resident Population Change for States and Counties: April 1, 2010 to July 1, 2012*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Data from the AMA Masterfile include Total Non-Federal MDs and DOs and are broken out by Specialty and Major Professional Activity for 2012. Major Professional Activity and Self-Designated Practice Specialty classifications are reported by the physicians in the Physicians' Practice Arrangements (PPA) questionnaire. The reporting period for data is as of December 31, 2012.

General Surgeons include those non-federal MDs and DOs under age 75 who are not hospital residents and whose major professional activity is classified as patient care and whose self-designated practice specialty is identified as General Surgery.

The general surgeons to population ratios are calculated by dividing the total number of general surgeons by the total population and multiplying by 100,000 to derive the ratio of general surgeons per 100,000 population.

## Dentists

**Source:** The 2010 Dentists are from the 2010 American Dental Association Masterfile. The 2010 Census Population data are from the *2010 Census Redistricting Data (Public Law 94-171) Summary File*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** The 2010 Dentists include all professionally active licensed dentist included on the ADA Masterfile. Data were processed using a ZIP to FIPS conversion file based on ZIP codes from the US Postal Service. Invalid ZIP codes were resolved matching city and state names and manually.

The total dentists to population ratios are calculated by dividing the total number of total dentists by the total population and multiplying by 100,000 to derive the ratio of total dentists per 100,000 population.

## Nurse Practitioners

**Source:** The 2013 Nurse Practitioners with an NPI are from the Centers from Medicare and Medicaid (CMS) *National Provider Identification (NPI) File*. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** The Administrative Simplification provisions of the *Health Insurance Portability and Accountability Act of 1996 (HIPAA)* mandated the adoption of standard unique identifiers for health care providers and health plans. The NPI is a unique identifier developed by CMS. Covered health care providers and all health plans and health care clearinghouses must use the NPIs in the administrative and financial transactions adopted under HIPAA.

Data were processed using a ZIP to FIPS conversion file based on ZIP codes from the US Postal Service. Invalid ZIP codes were resolved matching city and state names and manually.

A nurse practitioner is a registered nurse provider with a graduate degree in nursing prepared for advanced practice involving independent and interdependent decision making and direct accountability for clinical judgment across the health care continuum or in a certified specialty. A nurse practitioner has completed additional training beyond basic nursing education and provides primary health care services in accordance with state nurse practice laws or statutes. Task performed by nurse practitioners vary with practice requirements mandated by geographic, political, economic, and social factors. Nurse practitioner specialists include, but are not limited to, family nurse practitioners, gerontological nurse practitioners, pediatric nurse practitioners, obstetric-gynecologic nurse practitioners, and school nurse practitioners.

The total nurse practitioners to population ratio are calculated by dividing the total number of total nurse practitioners by the total population and multiplying by 100,000 to derive the ratio of total nurse practitioners per 100,000 population.

### **Certified Registered Nurse Anesthetists (CRNA)**

**Source:** The 2013 Certified Registered Nurse Anesthetists (CRNA) were obtained from the National Board on Certification & Recertification of Nurse Anesthetists (NBCRNA). These data are included on the Area Health Resources Files: Dept of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Nurse anesthetists are advanced practice, highly educated nurses who are licensed to provide anesthesia for the full range of surgical and medical procedures.

The total certified registered nurse anesthetists to population are calculated by dividing the total number of certified registered nurse anesthetists by the total population and multiplying by 100,000 to derive the ratio of total certified registered nurse anesthetists per 100,000 population.

### **Certified Nurse Midwives (CNM)**

**Source:** The 2013 Certified Nurse Midwives (CNM) were obtained from the Association of Certified Nurse Midwives. These data are included on the Area Health Resources Files: Dept of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Total Certified Midwives are included.

Data were processed using a ZIP to FIPS conversion file based on the ZIP codes from the US Postal Service. Invalid ZIP codes were resolved matching city and state names and manually.

The total certified nurse midwives to population ratios are calculated by dividing the total number of certified nurse midwives by the total population and multiplying by 100,000 to derive the ratio of total certified registered nurse midwives per 100,000 population.

### **Physician Assistants (PA)**

**Source:** The 2013 Physician Assistants data were obtained from the National Commission on the Certification of Physician Assistants (NCCPA). These data are included on the Area Health Resources Files: Dept of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Data were processed using a ZIP to FIPS conversion file based on the ZIP codes from the US Postal Service.

The total physician assistants to population ratios are calculated by dividing the total number of physician assistants by the total population and multiplying by 100,000 to derive the ratio of total physician assistants per 100,000 population.

## Population

**Source:** The 2010 Census Population and later Census Population Estimates were used to calculate providers per 100,000 population ratios, depending on the year of the provider data. These data are included on the Area Health Resources Files: Dept of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Computed by dividing the number of providers by the total population for the respective year times 100,000.

## State Employment

**Source:** The Bureau of Labor Statistics provides many estimates and projections of wages and employment as well as detailed information about different professions. Health occupations data included on the map tool are from the BLS May 2013 Occupational Employment Statistics (OES) file.<sup>1</sup> These data are included on the Area Health Resources Files: Dept of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** The OES collects wage and employment data from all US employers on a three-year cycle (on a rotating panel of roughly 200,000 each six months). The OES does not collect data from self-employed.

BLS total physicians data have been calculated as the sum of the reported physicians by specialty data (SOC 29-1061 through 29-1069). For any state having one or more specialties not reported, the BLS total physicians data is not reported.

As a final note, BLS has computed the relative standard error (RSE) of the employment estimates, and has provided the percent RSE for each employment value. If the PSRE of any employment estimate exceeds 30.0 percent, the value is not reported.

The following occupations are included on the AHRF as reported by BLS.

- Physicians
- Physician Assistants
- Registered Nurses
- Licensed Practical and Licensed Vocational Nurses
- Dentists
- Dental Hygienists
- Dental Assistants
- Pharmacists
- Veterinarians
- Chiropractors
- Optometrists
- Opticians, Dispensing
- Clinical, Counseling, and School Psychologists
- Mental Health Counselors
- Rehabilitation Counselors

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<sup>1</sup> <http://www.bls.gov/oes>

- Substance Abuse and Behavioral Disorder Counselors
- Healthcare Social Workers
- Mental Health and Substance Abuse Social Workers
- Physical Therapists
- Physical Therapist Assistants and Aides
- Physical Therapist Assistants
- Physical Therapy Aides
- Occupational Therapists
- Respiratory Therapists
- Speech-Language Pathologists
- Massage Therapists
- Dietitians and Nutritionists
- Medical and Health Services Managers
- Medical Secretaries
- Medical and Clinical Laboratory Technologists
- Medical and Clinical Laboratory Technicians
- Nuclear Medicine Technologists
- Diagnostic Medical Sonographers
- Radiologic Technologists
- Emergency Medical Technicians and Paramedics
- Dietetic Technicians
- Pharmacy Technicians
- Psychiatric Technicians
- Respiratory Therapy Technicians
- Surgical Technologists
- Medical Records and Health Information Technicians
- Medical Assistants
- Pharmacy Aiders
- Personal Care Aides
- Home Health Aides
- Nursing Assistants
- Psychiatric Aides

## State Workforce

**Source:** State Workforce health professions data are from the American Community Survey Public Use Microdata Sample (ACS) data from the U.S. Census Bureau.<sup>2</sup> These data are included on the Area Health Resources Files: Dept of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** The 2010-2012 ACS data file is approximately a 3 percent sample of the U.S. population by combining the 1 percent samples in the 2010, 2011, and 2012 ACS. The ACS data are collected throughout each calendar year and represent the aggregate characteristics over a 3-year period. There are over 9 million records in the 3-year 2010-2012 ACS data file.

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<sup>2</sup> U.S. Census Bureau at [http://www2.census.gov/acs2011\\_3yr/pums/](http://www2.census.gov/acs2011_3yr/pums/). See U.S. Census Bureau. A Compass for Understanding and Using American Community Survey Data: What PUMS Data Users Need to Know. Washington, DC: U.S. Government Printing Office; February 2009 ([http://www.census.gov/acs/www/guidance\\_for\\_data\\_users/handbooks/](http://www.census.gov/acs/www/guidance_for_data_users/handbooks/)).

The race/ethnicity categories reported are White (Non-Hispanic), Black/African American (Non-Hispanic), Hispanic, Asian/Native Hawaiian/Pacific Islander (Non-Hispanic), American Indian/Alaska Native (Non-Hispanic), and Multiple/Other Race (Non-Hispanic).<sup>3</sup>

Age groups reported are: less than 35 years old, 35-55 years old, and more than 55 years old.

Workforce settings are reported for each profession, as applicable. The number of settings reported varies by profession.

Data are not reported for any value where the percent relative standard error (PRSE) is greater than 30%. In addition, work settings for a given profession for which there were fewer than 10 states reported and for which the national total for that setting in that profession represented less than 3% of the total for that profession are not reported.

For each profession, the workforce is defined as individuals employed in the profession, and those individuals whose last job was in the profession and who are still in the workforce seeking employment.

The following professions are included on the AHRF as reported on the ACS.

- Physicians
- Physician Assistants
- Registered Nurses
- Licensed Practical and Licensed Vocational Nurses
- Dentists
- Dental Hygienists
- Dental Assistants
- Pharmacists
- Veterinarians
- Chiropractors
- Optometrists
- Opticians, Dispensing
- Psychologists
- Counselors
- Social Workers
- Physical Therapists
- Physical Therapist Assistants and Aides
- Respiratory Therapists
- Speech-Language Pathologists
- Massage Therapists
- Dieticians and Nutritionists
- Medical and Health Services Managers
- Medical Secretaries
- Clinical Laboratory Technologists and Technicians
- Diagnostic Related Technologists and Technicians
- Emergency Medical Technicians and Paramedics
- Health Practitioner Support Technologists and Technicians
- Medical Records and Health Information Technicians
- Medical Assistants and Other Healthcare Support Professionals
- Personal Care Aides
- Nursing, Psychiatric and Home Health Aides

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<sup>3</sup> This category scheme for analysis of race/ethnicity is commonly used to capture Hispanic as an ethnicity apart from race among Non-Hispanics.

## Environment

**Source:** 2010 Population per Square Mile and Housing Unit Density per Square Mile are from the *2010 Census Redistricting Data (Public Law 94-171) Summary File*, U.S. Census Bureau. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Source:** 2011 Air Quality data are from the Environmental Protection Agency (EPA), AirData Air Quality Index Report. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** Air Quality Index (AQI) is an indicator of overall air quality, because it takes into account all of the criteria air pollutants measured within a geographic area. Although AQI includes all available pollutant measurements, many areas have monitoring stations for some, but not all, of the pollutants.

For additional information see [http://www.epa.gov/airquality/airdata/ad\\_rep\\_aqi.html](http://www.epa.gov/airquality/airdata/ad_rep_aqi.html).

**Source:** End of FY 2013 Human Exposure Environmental Indicator sites are from the Environmental Protection Agency (EPA). These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Workforce, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** End of FY 2013 Human Exposure Environmental Indicator sites are provided for counties in which there are sites considered under control and/or which are not under control. Under control is defined as the current human exposure to contamination is under control or falls within the levels specified as safe by EPA. For details and definitions, see:

<http://www.epa.gov/superfund/accomp/ei/ei.htm>.

## Population

The **2010 and later Population Estimates** are from the Bureau of the Census, and include the calculated number of people living in an area as of July 1. These data are included on the Area Health Resources Files: Dept. of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions, Area Health Resources Files (AHRF), 2014 Rockville, MD.

**Definition and Notes:** The estimated population is calculated from a components of change model that incorporates information on natural change (births, deaths) and net migration (net internal migration, net international migration) that has occurred in an area since a Census 2010 reference date for estimates after 2010.