

## Methodology

### Arizona Health Workforce Core Profile Report | 2021

#### Data Sources

##### *Health Professionals*

The data on health professionals for the Core Profile report is from the Arizona licensing boards. The boards provide public mailing list files upon request. The board data represented in this report includes:

- The Arizona Board of Behavioral Health Examiners <https://www.azbbhe.us/>
- The Arizona Medical Board <https://www.azmd.gov/>
- The Arizona Board of Osteopathic Examiners <https://www.azdo.gov/>
- Arizona Board of Psychologist Examiners <https://psychboard.az.gov/>
- The Arizona Regulatory Board of Physician Assistants <https://www.azpa.gov/>
- Arizona State Board of Nursing <https://www.azbn.gov/>

The licensure data used in this report represents a snapshot of the licensed health workforce on the date the data file was received. For the current 2021 report, the data files were requested between January 2019 and March 2020.

The data in the report is limited to professionals with an active license (if license status is included in the source data) and those with an Arizona practice or business address. Addresses were geo-coded to connect the location to relevant geographies (e.g., county, or tribal area).

##### *Geographies*

US Census data from the decennial 2010 Census was used for geographic information including counties, Tribal Areas, ZIP Code Tabulation Areas (ZCTAs), and Legislative areas. The [Rural-Urban Commuting Area](#) (RUCA) code information is from the United States Department of Agriculture (USDA), Economic Research Service (ERS). The four-level grouping of RUCA codes into urban, large rural, small rural, and isolated small rural follows an [approach](#) from the University of Washington Rural Health Research Center. RUCA codes are based on data at the census tract level. In this report, a ZIP code to RUCA code crosswalk is used.

##### *Population*

US Census data from the decennial 2010 Census was used for population counts at the different geographies. Currently counties, RUCAs and ZCTAs have professional per 10,000 population ratios included in the report. Count of professionals and population are used to create the professional to population ratios. To calculate the ratios, the health workforce in an area is multiplied by 10,000 then divided by the population of that area. For example if there are 5 health professionals in a county with a population of 20,000, then to create the professional per 10,000 population ratio, we multiple 5 by 10,000 and divide by the county population of 20,000,  $(5 \times 10,000) / 20,000$ , resulting in a ratio of 2.5 professionals per 10,000.

## Professional Groups

The health workforces in this report are grouped into several professional groups. The professions and the license types included in each profession are included in the table below.

Profession Group	Licenses Included
Behavior Analysts	BA
Counselors	LAC, LPC
Marriage and Family Therapists	LAMFT, LMFT
Nurses- Advanced Practice Registered Nurse	APRN-RNP, APRN-CNM, APRNS-CNS, APRN-CRNA
Nurses - Nurse Assistant	UCNA, CNA, CMA, LNA
Nurses – Practical Nurse	LPN
Nurses – Registered Nurse	RN
Physicians	MD, DO
Physician Assistants	PA
Psychologists	PSYCH
Social Workers	LBSW, LCSW, LMSW
Substance Abuse Counseling	LASAC, LISAC, LSAT

## Use of Scaled Counts on Heat Maps

Scaled counts are utilized to inform heat map gradients affected by outliers (very large or very small numbers). To determine a scaled count, the mean (average) and the standard deviation are calculated. Counts of professionals that are greater than the sum of the mean and a single standard deviation are scaled down to equal the sum of the mean and standard deviation. This approach allows greater distinction between gradients. Counts and ratios are provided in the map tool-tip and the charts.

## ZIP Codes and ZIP Code Tabulation Areas

ZIP codes represent postal delivery routes and locations and are maintained by the United States Postal Service (USPS). ZIP codes do not represent geographic areas with boundaries. The US Census has developed ZIP Code Tabulation Areas or ZCTAs to provide an area approximation of the USPS ZIP code delivery routes. Find more information on the US Census ZCTAs [here](#). There is not always a direct one to one match between ZIP codes and ZCTAs. We used a ZIP to ZCTA [cross-walk](#) available from the Robert Graham Center, used in their Uniform Data System (UDS) Mapper. On the ZCTA map in the Core Profile Report, there are some areas that do not have an assigned ZCTA, this includes large land areas that have no ZCTA assigned or ZCTAs where there is no workforce.

## Other Considerations

The data in this report should be considered an estimate of the selected health workforce in Arizona. The data represents a snapshot in time from the date the data was requested. Additionally, the health workforce included in the report are those who have an active license (if license status is available in the data). An individual may maintain a license but not necessarily be active in their field.

Some licensees may have multiple license types. If this occurs within a single board dataset we apply a selection process to identify a primary license associated with an individual. This is implemented to limit potential over-counting of individuals. To select the primary license, we rely on a selection function that examines the license active date as well as the type of license and its associated education and training requirements.

The nurse public licensing data contains nurse mailing address, however the information available in this field indicates most entries are unlikely to represent an employment address. Therefore, in this data we use the nurse ZIP code to represent their possible employment location.

Practice location may be missing for some health workforce professionals for several reasons, sometimes an address is entered incorrectly and cannot reasonably be corrected. Additionally, under [A.R.S. § 32-3226](#), licensees that do not maintain a business address may opt out of the requirement to include their residential address in the public mailing list.

### **Updates**

Planned updates to the 2021 report are scheduled for 2023. New health profession data may also be integrated in future reports. Census data will be updated in 2023 to the most recent decennial Census from 2020.

If you have questions please contact Bryna Koch, MPH at [brynak@email.arizona.edu](mailto:brynak@email.arizona.edu).