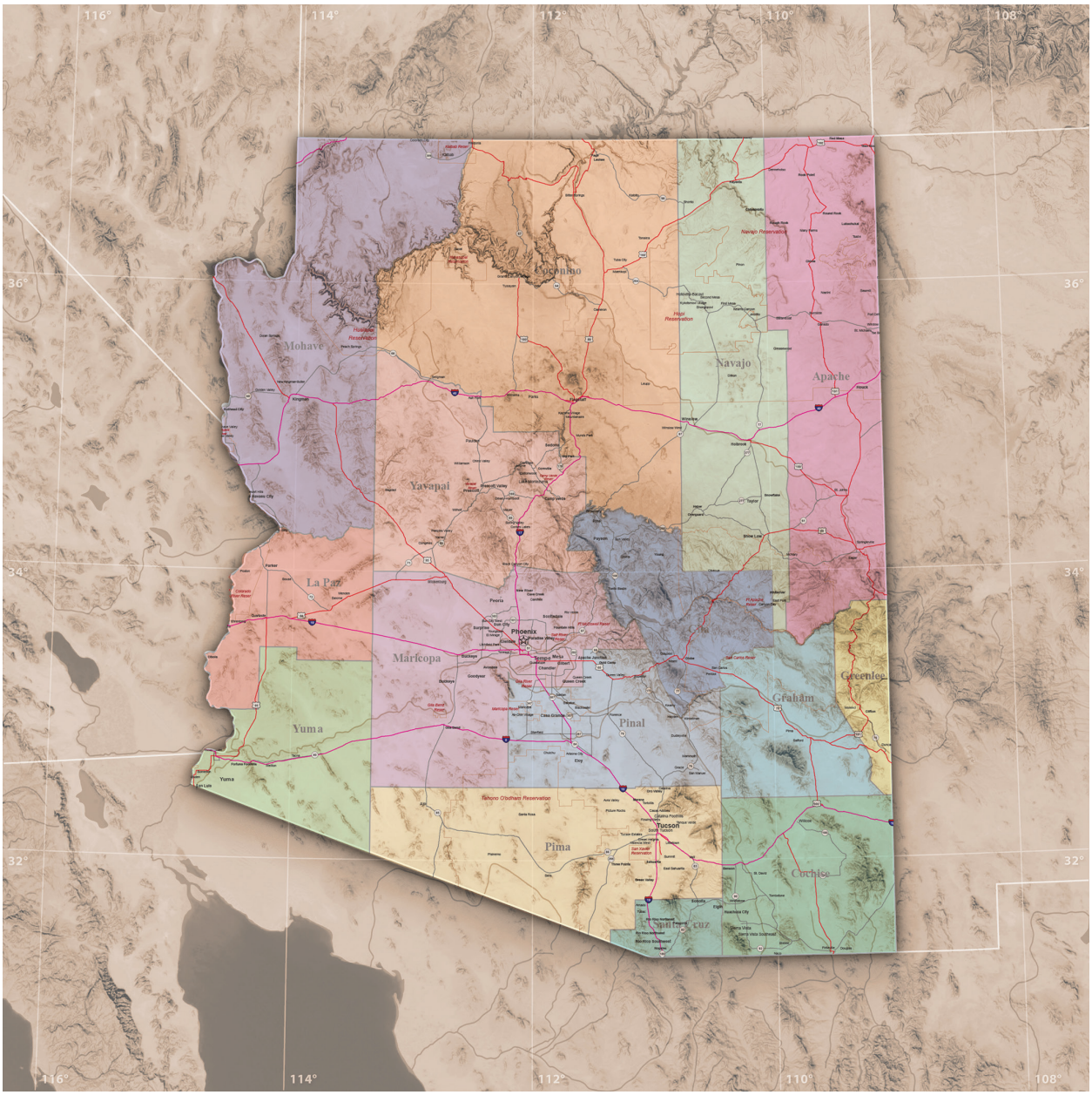
THE UNIVERSITY OF ARIZONA CENTER FOR RURAL HEALTH REPORT

AzCRH 2015 Supply and Demand Study of Arizona Health Practitioners and Professionals



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THE UNIVERSITY OF ARIZONA
MEL & ENID ZUCKERMAN COLLEGE OF PUBLIC HEALTH
Center for Rural Health

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The University of Arizona Center for Rural Health serves Arizona through its mission to improve the health and wellness of rural and vulnerable populations. AzCRH houses Arizona's State Office of Rural Health (AzSORH), the Rural Hospital Flexibility Program (AzFlex), the Small Rural Hospital Improvement Program (AzSHIP), the Western Region Public Health Training Center (WRPHTC), the AzCRH Navigator Consortium and other programs. http://crh.arizona.edu

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Executive Summary

The University of Arizona Center for Rural Health ***AzCRH 2015 Supply and Demand Study of Arizona Health Practitioners and Professionals Report*** updates Arizona's health workforce data and provides analysis of data on certified nurse midwives (CNM), physician assistants (PA), nurse practitioners (NP), physicians (MD, DO), pharmacists and public health professionals using licensing board data, data from state and federal agencies, survey and key informant interviews. Over many years, the Arizona Area Health Education Center (AzAHEC) Program has collaborated with and contributed to funding the University of Arizona Center for Rural Health's (AzCRH) health workforce studies.

The health workforce is a major determinate of the availability, access, and use of quality health services. Provider supply may not be keeping up with the burgeoning demand for services due to many factors including the aging of the population, increasing coverage through Medicaid and the Marketplace, and rapidly changing economic, technologic, and demographic factors. Timely and reliable health workforce data can inform stakeholders, policymakers and interventions at many levels - federal and state, health professions training institutions, students in training, professional organizations, and at hospitals, clinics and health systems.

Health workforce data elements collected by state licensing boards are often incomplete (e.g., do not include clinical full time equivalents (FTE's) or location of practice), can be outdated, and therefore of limited value. State health professional licensing boards are funded and charged to assure professional competency, and not necessarily by statute, funding or inclination able to gather, analyze and report health workforce information. To augment health professional licensing board data, health workforce data sources included federal agency data such as the Health Resources and Services Administration (HRSA) Health Professional Shortage Area (HPSA) data, and state agencies such as the Arizona Department of Health Services.

Key Findings – In Arizona There Are:

- Fewer health providers per 100,000 population in rural than urban areas.
- Proportionately fewer rural primary care providers (PCPs) age < 50 years than in urban areas.
- Many rural providers age 55 or older: CNMs (54%), NPs (31%), PAs (26%).
- More rural pharmacists age 60 or older (38%) compared to urban areas (23%) (Figure 6).
- Almost one-quarter of Arizona physicians (23.2%) planning to significantly reduce their patient care hours or retire in the next five years.
- County health departments reporting difficulties providing services due to budget cuts, and having problems hiring and retaining health staff primarily due to uncompetitive wages.

Strategies to meet the increasing demand for rural health services include:

- Enhancing the health professions training pipeline to include training in rural areas;
- Ensuring reimbursement rates and addressing scope of practice regulations to promote practice in rural areas;
- Better and more timely collecting, analyzing and reporting health workforce data to inform policy interventions;
- Evaluating policy interventions in relation to improving health outcomes, access to care, coverage and satisfaction of both patients and providers.

1. Introduction

The ***AzCRH 2015 Supply and Demand Study of Arizona Health Practitioners and Professionals*** includes data on nurse practitioners, physician assistants, certified nurse midwives, pharmacists, physicians, and registered sanitarians (also known as registered environmental health specialists).

Public health professionals are "those responsible for providing the essential services of public health regardless of the organization in which they work."[1] The public health workforce includes environmental health occupations (e.g., sanitation workers and health inspectors), disease monitors (e.g., epidemiologists), policy analysts, community health workers, nurses working in health departments, occupational safety inspectors, health educators and workers in emergency response and preparedness. Public health nurses comprise one of the largest groups delivering public health services in communities.[2]

There are many types of public health professionals and practitioners that contribute to the health workforce as illustrated in Figure 1 and Table 1.

Figure 1. Percentage of Local Health Departments in U.S. with One or More Employees Working in Occupation[3]

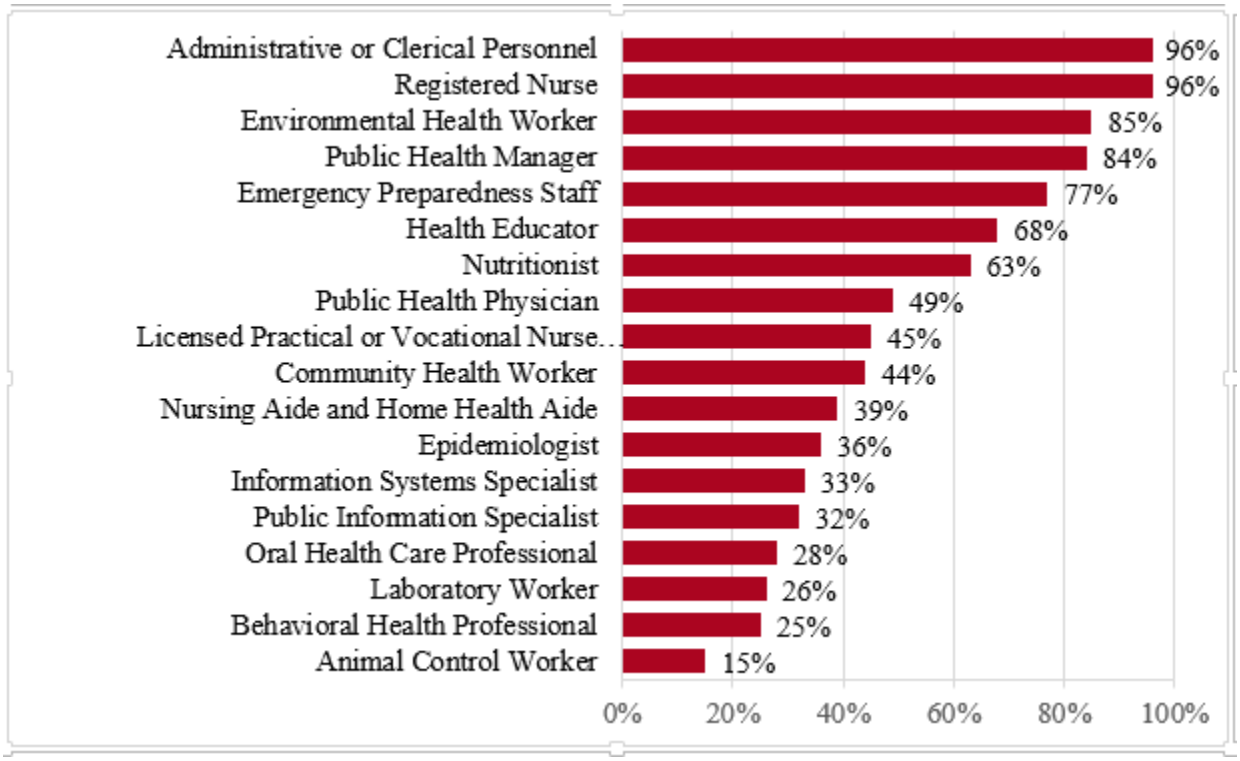


Table 1. Pima County Health Department Workforce.

Type of Work	Number (%)	Hourly wage/salary	
		Minimum	Maximum
Administrative Services	43 (13%)	10.30	67.76
Animal Care Services	65 (19%)	11.95	30.74
Case Manager	4 (1%)	17.88	N/A
Communicable Disease Investigator	8 (2%)	14.39	N/A
Community Nutrition Specialist	16 (5%)	14.10	22.92
Dental Services	1 (0%)	12.48	27.25
Dietetic and Nutritional Services	11 (3%)	18.78	33.02
Driver/Messenger	3 (1%)	10.40	15.10
Environmental Health Services	25 (7%)	14.10	36.34
Epidemiologist	4 (1%)	24.54	36.34
Health Educator	5 (1%)	16.51	26.65
Licensed Practical Nurse	12 (4%)	15.47	N/A
Office Support	34 (10%)	10.76	18.75
Patient Care Services	18 (5%)	20.79	35.06+
Physician/Dentist	3 (1%)	65.03	113.54
Program Management	34 (10%)	18.37	58.70
Public Health & Social Services Aide	15 (4%)	11.74	22.40
Public Health Nurse	27 (8%)	20.79	N/A
Radiology and Medical Specialists	2 (1%)	10.51	25.98
Senior Management	3 (1%)	32.51	113.54
Supply Technician	2 (1%)	12.39	22.40
Veterinary Services	2 (1%)	26.01	58.70
Total Pima County Health Department Workers	**337**		

1.1 Geographic Classification for Urban/Rural Workforce Distribution

There are significant demographic, economic, and infrastructural differences between urban and rural areas. Rural areas compared to urban metropolitan areas have fewer health resources, average incomes are lower, uninsured rates are higher, the per-capita supply of health providers is lower, rates of traumatic injuries and male suicide rates are higher.[4]

Federal and state laws and regulations can mitigate or exacerbate urban-rural population health outcomes and disparities. Rural definitions, criteria and designations vary, change, and can affect state and federal resource allocation. For example, federal designation and scoring as a *Health Professions Shortage Area, Medically Underserved Area*, or *Medically Underserved Population* (HPSA, MUA/P), can translate to federal funding to entice providers to practice in rural areas - loans, scholarships, retention bonuses, and licensing through programs like the National Health Service Corps and Conrad 30 Waiver Program for J-1 Visa physicians to practice in underserved areas.

Population growth changes rural classifications. For example, Arizona's Cochise County is 6,220 square miles, just smaller than the land area of Connecticut and Delaware combined. When the

greater Sierra Vista population grew to 52,745 (the Sierra Vista city proper population was 43,888), it surpassed the U.S. Office of Management and Budget classification threshold of 50,000 for reclassification from Rural to a Metropolitan Statistical Area. Douglas and Sierra Vista form the urban Cochise County clusters. For hospitals in the community and county, such designation changes adversely affect Medicare and Medicaid payment.

Data was stratified by urban and rural to improve the quality, power and utility of the data and analysis. Agencies use different criteria to define urban, rural and frontier areas, including:

- **The U.S. Census Bureau** - bases rurality on a combination of population density, geographic relationship with cities, and population size.
- **The Office of Management and Budget (OMB)** - classifies counties on the basis of their population size and integration with large cities.
- **The U.S. Department of Agriculture** - uses rural typology to identify groups of U.S. non-metropolitan counties sharing important economic and policy traits.
- **The U.S. Administration on Aging** - combines urbanized areas as defined by the U.S. Census Bureau with postal zip codes to classify all zip code areas as either urban or rural.
- **The State of Arizona** - defines rural using the most recent US decennial census as (1) a county with a population less than 400,000 persons, and (2) a census county division with less than 50,000 persons in a county with a population of 400,000 or more.[a]
- **University of Washington** - defines rural-urban commuting areas (RUCAs) by their proximity to urban areas and the portion of the populations that commute from rural to urban areas.[5] *This report uses the RUCA rural classification system*.[b]
- **U.S. Department of Health and Human Services (HHS) Health Resources and Services Administration (HRSA)** - defines *frontier* areas as "sparsely populated rural areas that are isolated from population centers and services."[c] Another frontier definition is a population density of six or fewer people per square mile.

HRSA funded programs to enhance access rural health services include:

- **Area Health Education Centers Program (AHECs)** – enhances access to high quality rural health care through academic-community partnerships to improve the distribution, diversity and supply of the primary care health professions workforce in rural areas;
- **Rural Health Care Services Outreach Grant Program** - creates models of outreach and health care delivery services in rural areas;
- **Rural Health Network Grant Program** - develops integrated rural health care networks with self-generating revenue streams;
- **Medicare Rural Hospital Flexibility Grant Program (Flex)** - helps to stabilize and improve access to America's smallest and most vulnerable rural, critical access hospitals;
- **Small Rural Hospital Improvement Grant Program (SHIP)** - supports small rural hospitals with improving quality, implementing and using electronic health records, adapting to value based payment, improving patient satisfaction as measured by

[a] A.R.S. 36-2171. (2004) http://www.azleg.gov/arizonarevisedstatutes.asp?Title=36.

[b] This report uses the same methodology as previous reports. However, the geography of 'ruralness' has dramatically changed due to rapid population growth in certain areas since the 2000 Census. Some areas exceeded the 50,000 threshold used by the US Census Bureau and other agencies for identifying urbanized areas. US Postal Zip Code boundaries also changed. Population growth in metropolitan Sierra Vista AZ changed its designation from rural to urban.

[c] Definition of frontier. http://www.raconline.org/topics/frontier/faqs/

HCAHPS (Hospital Consumer Assessment of Healthcare Providers and Systems), and assuring patient confidentiality and complying with the Health Insurance Portability and Accountability Act (HIPAA) regulations.

The ***AzCRH 2015 Supply and Demand Study of Arizona Health Practitioners and Professionals*** uses the University of Washington's Rural-Urban Commuting Areas (RUCAs) classification system. (Refer to Appendix A, where Figure 13 illustrates RUCA areas, Figure 14 illustrates fine scale variability in Arizona's population density with respect to county and zip code boundaries.)

1.2 Supply of Practitioners and Professionals - Numbers and Coverage

The number of health providers is larger in urban areas (Table 2). To assess health workforce adequacy for the population living in a defined geographic area, it is common to divide the number of practitioners by the population in the service area per 100,000 population (Table 3). Total population in an area is used for primary care physician ratios, while only the population of women of childbearing age is used for certified nurse midwives. There are fewer practitioners in rural communities and often fewer per 100,000 population. The U.S. practitioners/100,000 ratios are similar to Arizona's (Table 3).

Registered Sanitarians (RS) - in Arizona, two organizations register sanitarians though an exam and continuing education, the Arizona Department of Health Services (ADHS)[d] and the National Environmental Health Association (NEHA).[e] ADHS has regulatory jurisdiction for the 483 registered RSs that have passed their exam and kept their registration current. RS/REHS credentialed by NEHA are not eligible for reciprocity in Arizona, and must also be registered with ADHS if they are to serve as a regulator in the state (e.g., able to shut down businesses that are out of regulatory compliance). There are 131 NEHA registered RS/REHS residing in Arizona. Based on data provided by ADHS there are 405 ADHS RS living in Arizona with 368 (91%) located in urban areas, 33 (8%) in large town rural areas, three (1%) in small town rural areas, and one (0.2%) in small town isolated rural areas.

Table 2. Number of practitioners in Arizona by RUCA classification 2013.[6-9]

Rural Urban Commuting Area Classification	Population (Claritas 2013)	# of Licensed Physicians	# of Licensed Physician Assistants	# of Licensed Nurse Practitioners	# of Licensed Certified Nurse Midwives	# of Licensed Pharmacists
Urban	6,148,248	12,617	1,805	2,827	161	6,322
Large Rural Town	356,863	520	102	87	9	198
Small Rural Town	126,889	147	31	32	4	48
Isolated Small Rural Town	35,596	3	4	9	0	5
Total	6,667,596	13,287	1,942	2,955	174	6,573

[d] http://www.azdhs.gov/phs/oeh/rs/criteria.htm
[e] http://www.neha.org/credential/REHS.html

1.3 Age Distribution

The practitioner age distribution was calculated based on Arizona licensing board data. Physician age distribution and near term workforce supply vary by the ruralness of their practice location. Active Arizona physicians are older in rural than in urban areas (Figure 6). A corollary – rural areas have proportionately fewer primary care physicians (PCPs) age < 50 years than urban areas. Cochise County has >40% of its PCPs over age 60 years, while in Gila, La Paz and Yavapai <30% PCPs are 60 years or older. Santa Cruz and Greenlee Counties have few or no PCPs under age 50.[10]

Table 3. Ratio of health practitioners in Arizona per 100,000 population.[6-9,11]

Rural Urban Commuting Area Classification	Population Coverage Per 100,000 (Claritas 2013)				
	Physicians	Physician Assistants	Nurse Practitioners	Certified Nurse Midwives[f]	Pharmacists
Urban	205.2	29.4	46.0	13.3	102.8
Large Rural Town	145.7	28.6	24.4	15.5	55.5
Small Rural Town	115.8	24.4	25.2	19.5	37.8
Isolated Small Rural Town	8.4	11.2	25.2	0	14.1
United States (Arizona)[g]	242.0 (245.7)	27.0 (32.0)	58.0 (56.0)	17.9 (13.4)	81.2[h] (98.6)

Physician assistants are by far the youngest providers for both rural and urban areas (Figure 3). In contrast, many Arizona NPs are nearing retirement age with 31% over age 55 (Figure 4). The NP age distribution is similar for urban and rural areas. The number of Arizona CNMs is small, with only 24 (13%) under the age of 40, and 46% of urban and 70% of rural CNMs over age 55. As the older CNM cohort retires, fewer will care for pregnant women, especially in rural Arizona (Figure 5), unless they are replaced. Rural areas have older licensed pharmacists (38% are age 60 years or older) compared to urban areas (23%) (Figure 6).

Age data on registered sanitarians was not available from ADHS or NEHA.

[f] Based on population of women of child bearing age from 15 to 44 years of age; Data for US average (http://www.midwife.org/acnm/files/ccLibraryFiles/Filename/000000004838/EssentialFactsAboutMidwives1214.pdf).
[g] Source: Kaiser Family Foundation web site that used other data sources than Arizona licensing boards.
[h] Source: US Census and US Health Resources and Services Administration (http://bhpr.hrsa.gov/healthworkforce/supplydemand/usworkforce/chartbook/chartbookpart1.pdf).

Figure 2. Count of physicians in urban and rural areas by age group.[10]

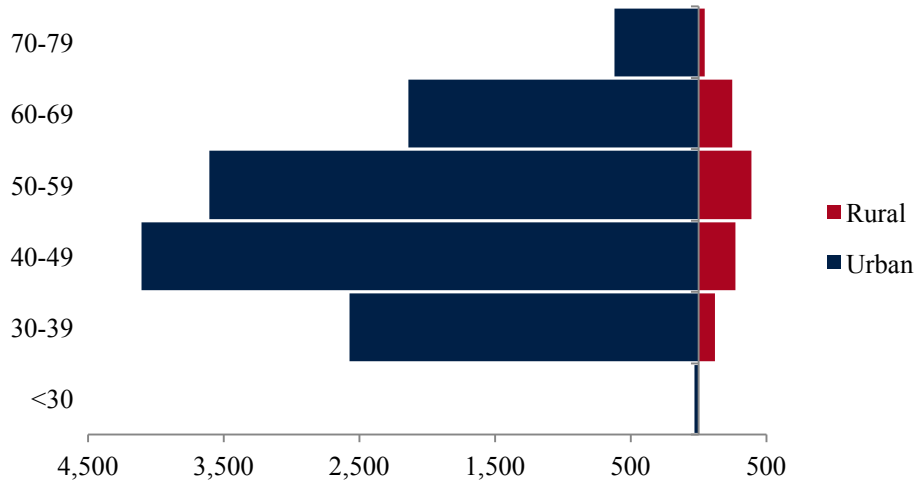


Figure 3. Number of active licensed physician assistants (PAs) by age grouping for urban and rural areas.[12]

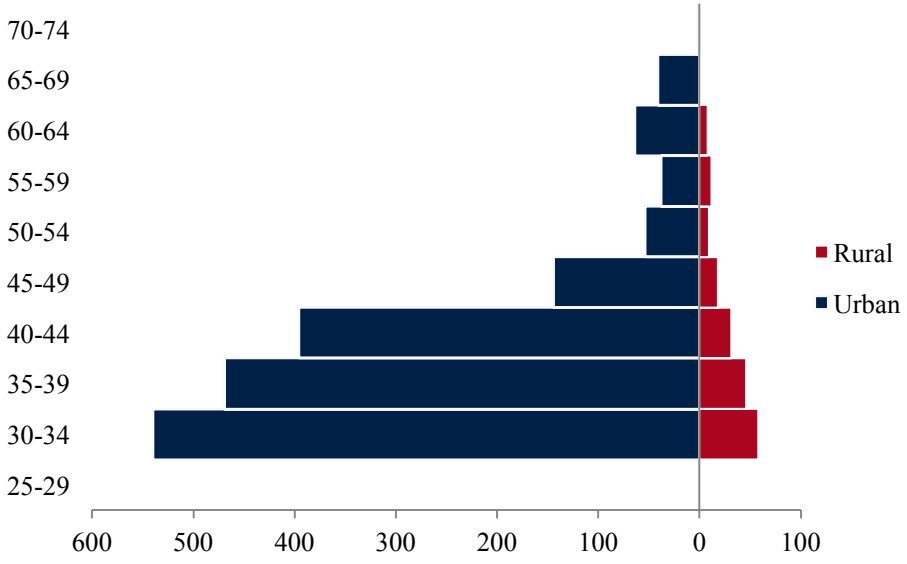


Figure 4. Number of active licensed nurse practitioners (NPs) by age grouping for urban and rural areas.[12]

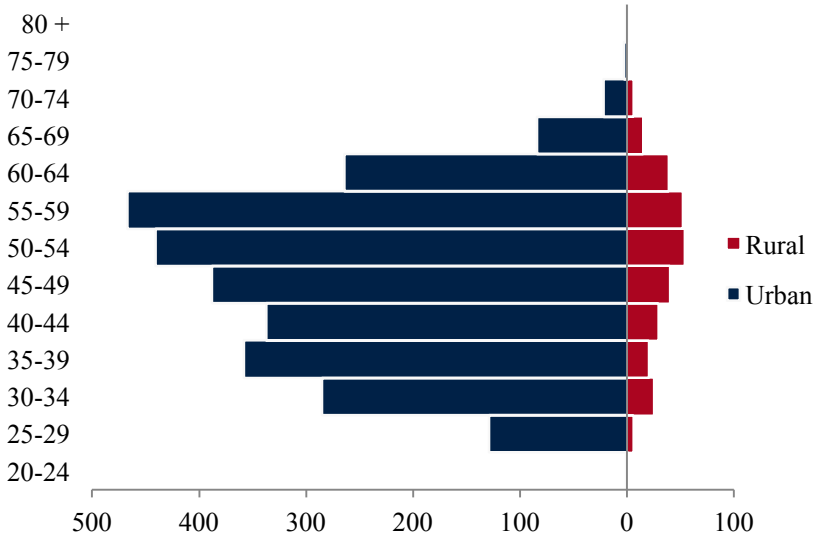


Figure 5. Number of active licensed certified nurse midwives (CNMs) by age grouping for urban and rural areas.[12]

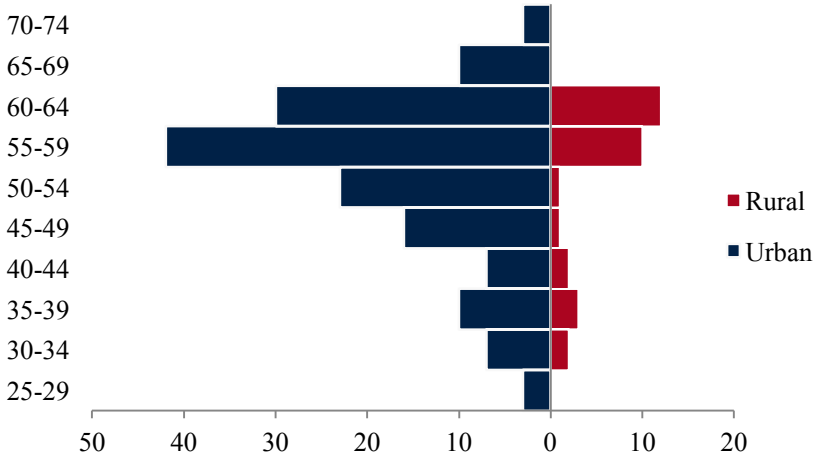
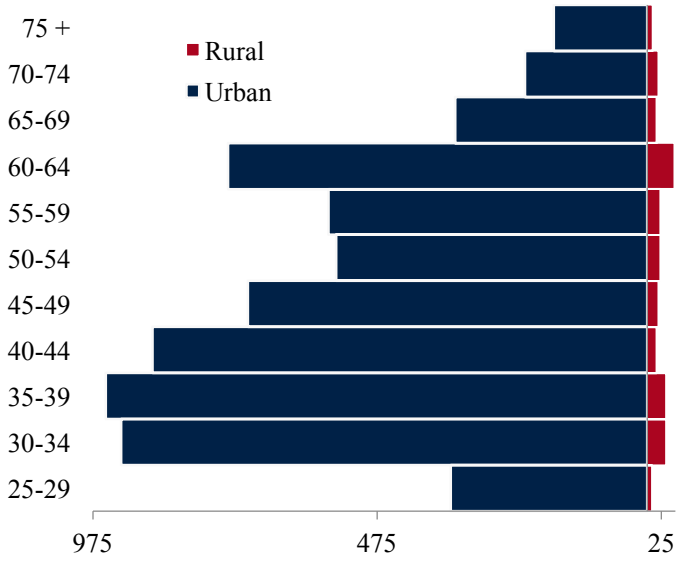


Figure 6. Number of Active Licensed Pharmacists by Age Grouping for Urban and Rural Areas.[12]



2. Survey Results

Gauging health workforce capacity using only licensing data has many limitations. An active state license does not mean that provider is doing direct patient care or providing other health services. Using licensing board data alone tends to overestimate supply and should be used with caution informing policy decisions regarding the training, recruitment, and retention of the health care workforce to meet health service demand. Web based surveys are inexpensive, but low response rates interfere with making precise workforce estimates, detecting differences between comparison groups, or identifying actionable policy interventions based on data and analysis. Methodologies and survey responses of the physician, registered sanitarian, county health department, and pharmacist surveys are described in Appendix 1. Survey questionnaires are presented in Appendices 2-5.

Some states collect data at the time of licensing and renewal, including New Mexico. Such data collection may not be funded, covered by the licensing board's statute, or part of their mandate, funding or inclination. Through legislation or regulation changes, state licensing boards may need appropriations, grants or the autonomy to collect revenues to cover the costs of data collecting, analyzing and reporting.[13-15]

Other ways to improve data collection, analysis and reporting to inform policy interventions beyond using state licensing data include: purchasing private sector provider directory data (e.g., from health insurers); acquiring public sector data (e.g., from providers caring for AHCCCS/Medicaid and Medicare beneficiaries); conducting workforce and health outcomes analysis to inform policy development; contracting with an entity to conduct surveys, analyze and report the data, and make recommendations; and paying for individuals to complete surveys (e.g., $100 to complete a 10-minute survey).

2.1 Physician Survey

The average participant age was 50 years, ranging from age 29 to 69, while 42% (n=25) were female, 5% (3) Hispanic, 90% (53) White Non-Hispanic, 2% (1) African American, 7% (4) Asian, and 2% (1) multiracial. Twenty-two percent (13) reported Spanish language proficiency. Nearly half, 47% (28), had rural practice experience, and 19% (11) reported practicing only in rural areas (Table 4). Fewer participants practice in rural areas based on RUCA classifications of their zip codes of practice. Five participants were practicing in rural zip code areas based on RUCA classification using the 2010 census data.

Physicians reported working an average of 48 weeks per year (range from 40 to 51 weeks), and 44 hours per week (range 12 to 60 hours). Twelve reported providing direct inpatient patient care for an average of 23% of their time (range 10% to 80%). Nearly all, 97% (57), reported providing direct outpatient care for average of 81% of their time (range 30% to 100%). Half (29) reported teaching or precepting an average of 12% of their time (range 10% to 40%), 27 reported an average of 15% of their time spent in administrative tasks (range 10% to 40%). Those reporting 50% or greater time spent on administration were excluded from this analysis. Overall, participants averaged 2.2 outpatient visits per hour (range from 0.6 to 10.0 per hour), with rural physicians averaging 1.8 patient visits/hour. An average of 90% of direct patient care is in the physician's primary or secondary specialties (all included family medicine). Among the participants (5) that had multiple practice locations; none practiced in both urban and rural settings. Almost half of the participants were owner/operators of independent practices (Table 5).

Private insurance covered the majority of patient visits (Table 6). Practice capacity for Medicaid or Medicare beneficiaries was lower than those with private health insurance (Table 7).

Over the next five years the supply of primary care physicians in Arizona may be adversely affected by retirement and reduction of patient care hours (Table 8) for the reasons summarized in Table 9, but mainly due to increased administrative and regulatory burdens. Also, hypothetical thresholds in percent reductions in payment for patient care that result in physicians leaving the Arizona market are most sensitive to reduction in Medicare payments, followed by Medicaid, then private insurance (Table 10, Table 11, Table 12).

Physicians are the most difficult to recruit among the health professions, followed by nurse practitioners and physician assistants (Table 13).

Table 4. Average years of practice in rural and urban areas of Arizona (Question 8).

Years of practice in Arizona	Rural areas	Urban areas
0-5	23.7%	13.6%
5-10	5.1%	28.8%
10-15	6.8%	5.1%
15-20	3.4%	6.8%
>20	8.5%	27.1%
Any	47.5%	81.4%

Table 5. Type of physician practice and practice ownership (Question 16).

Type of Practice		Ownership of Practice	
Solo Physician	11%	Independent practice: Owner/operator	45%
Solo Physician plus NPs & PAs	13%	Independent practice: Employee/staff	8%
Two physicians	13%	Free-standing health center/clinic	4%
Three or four physicians	20%	Public/Non-profit community health center	12%
Five to nine physicians	27%	Other licensed community clinic	4%
Ten or more physicians	16%	Hospital: Outpatient dept./Satellite clinic	12%
		Indian Health Services clinic	8%
		Other	8%

Table 6. Payment sources for patient visits (Question 18).

Payment sources for patient visits	
Private/Commercial Health Insurance	40.5%
Medicaid (AHCCCS including KidsCare)	18.1%
Medicare (including Medicare Advantage)	19.5%
Self-Pay	8.8%
Tricare	3.2%
Workers Compensation	1.5%
Uncompensated Care (charity, bad debt)	2.2%
Other Payer	6.2%

Table 7. Practice capacity by patient care payment source (Question 19).

	Full	Nearly full	Far from full
All Payers	6.5%	26.1%	32.6%
AHCCCS/Medicaid	19.6%	10.9%	10.9%
Medicare	17.3%	21.2%	17.3%
Commercial/Private Insurance	3.8%	19.2%	28.8%

Table 8. Five-year practice plans (Question 20).

Plans for the next 5 years	
Expand my practice at the same location	37.5%
Expand my practice by adding other AZ location(s)	3.6%
Move my practice to another geographical location in Arizona	1.8%
Move my practice out of Arizona	1.8%
Significantly reduce patient care hours	10.7%
Retire from patient care	12.5%
None of the above	48.2%

Table 9. Factors that would reduce patient care at current location through retirement, moving, or reduced time spent on patient care (Question 21).

Factors for retirement, moving, or reduction in patient care	
Age	29.1%
Geographic preference	14.5%
Gross receipts tax	14.5%
Health	30.9%
ICD-9 to ICD-10 conversion	16.4%
Increasing administrative/regulatory burden	56.4%
Lack of job satisfaction	41.8%
Liability insurance	16.4%
Practice environment	16.4%
Reimbursement issues	45.5%
Other[i]	25.5%

Table 10. Average hypothetical Medicaid payment reduction thresholds for actions that would reduce patient care (Question 23).

Actions from decrease in Medicaid payments	% decrease in payments	
	% (n)	Range
Retiring from patient care	23.6% (14)	(10-50%)
Closing my practice to NEW Medicaid patients	14.0% (20)	(0- 60%)
Closing my practice to ALL Medicaid patients	24.3% (21)	(0-100%)
Significantly reducing my patient care hours	19.0% (10)	(0-50%)
Moving practice out of state	20.0% 7)	(0-50%)

Table 11. Average hypothetical Medicare payment reduction thresholds for actions that would reduce patient care (Question 24).

Actions from decrease in Medicare payments	% decrease in payments	
	% (n)	Range
Retiring from patient care	22.8% (25)	(0-50%)
Closing my practice to NEW Medicaid patients	14.6% (35)	(0-50%)
Closing my practice to ALL Medicaid patients	19.2% (36)	(0-50%)
Significantly reducing my patient care hours	16.0% (25)	(0-50%)
Moving practice out of state	17.0% (10)	(0-50%)

Table 12. Average hypothetical commercial/private health insurance payment reduction thresholds for actions that would reduce patient care (Question 25).

Actions from decrease in health insurance payments	% decrease in payments	
	% (n)	Range
Retiring from patient care	23.4% (29)	(0-90%)
Closing my practice to NEW Medicaid patients	19.7% (36)	(0-60%)
Closing my practice to ALL Medicaid patients	22.7% (33)	(0-60%)
Significantly reducing my patient care hours	21.5% (27)	(0-60%)
Moving practice out of state	30.0% (13)	(0-100%)

[i] "Other" responses: issues related to family (4), changing health care system (4), and ACA (3).

Table 13. Experience recruiting health professionals (Question 22).

	Physicians	Nurses	Nurse practitioners	Physician assistants	Other health professionals
Easy	2.8%	18.2%	3.7%	8.7%	26.3%
Somewhat Difficult	27.8%	54.5%	77.8%	69.6%	42.1%
Very Difficult	69.4%	27.3%	18.5%	21.7%	31.6%

2.2 Registered Sanitarian Survey

Registered sanitarians (RS) are public health professionals working in the public and private sectors assuring compliance with environmental health regulations, from food handling to vector control. They have a variety of work responsibilities. Some become administrators; others become health department directors or work in other positions.

There were 51% male and 49% female participants. Female RS are younger than male (Figure 7) and the RS ethnic/racial diversity reflects Arizona's population (Table 14). One-quarter have jobs that do not require registration (Table 15). Nearly all RS are government employees, most in county health departments (Table 16). RS work includes field investigation (31%), regulation compliance (31%), and administration (20%) (Table 17). Food protection is the major environmental health category (Table 18).

RS employment acceptance was most influenced by benefits, location of work, then salary (Table 19). One-fifth plan to retire or reduce work activities within the next five years (Table 20). Most RS have a bachelor degree with a subject matter focus in biology or environmental sciences (Table 21, Table 22). Most become RS because of job requirements (Table 23).

Figure 7. RS survey participants by age and gender (Question 18) demographics.

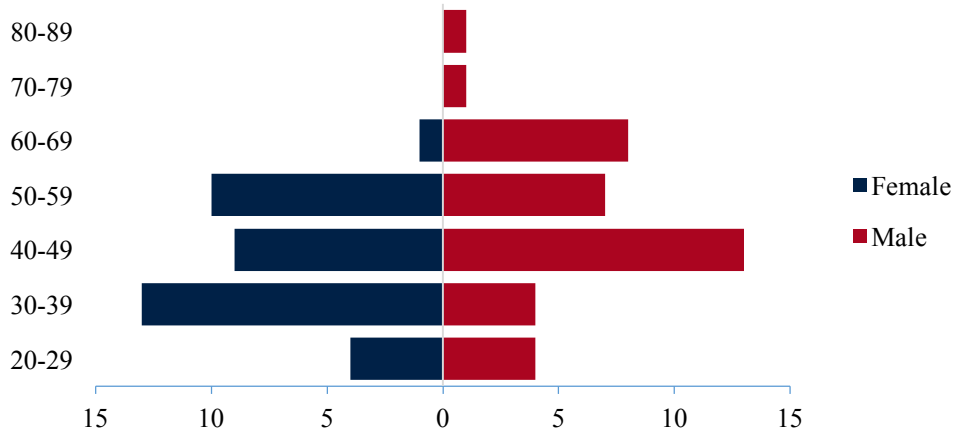


Table 14. RS race/ethnicity demographics (Question 20, 21).

RS Participant Race/ethnicity[j]	%
American Indian or Alaskan Native	4%
Asian / Pacific Islander	1%
Black or African American	0%
Hispanic	8%
White / Caucasian	82%
Other	5%

Table 15. RS work status (Question 1).

RS Work Status	% (n)
Employed as a sanitarian in Arizona	59% (66)
Employed as a sanitarian in a state other than Arizona	4% (5)
Looking for employment as a sanitarian in Arizona	2% (2)
Looking for employment as a sanitarian in a state other than Arizona	0% (0)
Employed in Arizona, sanitarian registration not required	23% (26)
Employed in a state other than Arizona, sanitarian registration not required	4% (5)
Retired or unemployed	6% (7)
Other	1% (1)

Table 16. RS Employment types (Question 2).

RS Employment Type	% (n)
Consultant, independent	2% (2)
City/town government	6% (5)
County health department	55% (48)
State health department	16% (14)
Other county/state/tribal agency	6% 95)
Military	0%
Veterans Administration	0%
Indian Health Service	5% (4)
Other Federal agency	1% (1)
Food services	0%
Food processing	2% (2)
Hotels and resorts	0%
School districts	1% (1)
Universities & colleges	2% (2)
Manufacturing	0%
Retail	1% (1)
Other[k]	3% (3)

[j] 23% RS are fluent in Spanish and 3% are fluent in Navajo.
[k] Two RS work in mining, one in construction.

Table 17. RS type of work responsibilities (Question 4).

RS General Work Responsibilities	Average effort
Administration	20.2%
Supervision of non-RS sanitarians[l]	9.1%
Field investigations	31.1%
Sales	0.1%
Compliance assessment	20.0%
Compliance enforcement	11.4%
Other[m]	8.2%

Table 18. RS environmental health work responsibilities (Question 5).

RS Specific Environmental Health Work Responsibilities	%
Non-sanitarian work responsibilities	15.7%
Food protection	41.1%
Water quality, potable	2.1%
Water quality, swimming pools	5.2%
Water quality, surface	1.9%
Water quality, wells	1.7%
Water quality, waste water	5.3%
Air quality	4.2%
Solid waste	1.9%
Hazardous waste	0.8%
Hazardous substances and/or radiation	0.1%
Industrial hygiene, health, and/or safety	2.1%
Vector, pest, and weed control	1.9%
Animal control	0.4%
Housing quality	0.6%
Product safety	1.6%
Disaster and emergency planning	2.5%
Public outreach and education	4.8%
Other	6.4%

[l] Twelve RS supervise an average 15 (1-80) non-registered sanitarians with an average of 10.6% effort in supervision per non-registered sanitarian.

[m] Most of the descriptions of other type could be categorized as administrative and outreach responsibilities.

Table 19. Factors influencing RS accepting their current job (Question 6).

Factors Influencing Decision to Accept Current Position	Location	Salary	Benefits	Job Description	Other
Most Influential	19%	17%	22%	14%	14%
Extremely Influential	28%	25%	43%	34%	8%
Somewhat Influential	36%	44%	30%	34%	6%
Least Influential	13%	10%	2%	11%	2%
Not Influential	3%	3%	3%	7%	70%

Table 20. RS registration and work plans over next five years (Question 10).

RS Registration and Work Plans over the Next Five Years	%
Currently retired, maintain registration because may want to seek employment as a sanitarian in Arizona	4%
Currently retired, maintain registration because may want to seek employment as a sanitarian in another state	2%
Currently retired, maintain registration but have no plans to seek employment as a sanitarian	2%
Currently retired, will not maintain registration as a sanitarian	0%
Plan to retire within the next 5 years	12%
Maintain my current employment working as a RS	44%
Maintain my current employment not working as a RS	17%
Increase my work activities as a RS	13%
Reduce my work activities as a RS	4%
Stop working as a RS	2%

Table 21. RS formal education degree (Question 13).

Type of degree	Reported Degrees	Educational Attainment % (n)
Non-degree		2% (2)
Associate degree	13	2% (2)
Bachelor degree	74	68% (65)
Master degree	25	26% (25)
Doctorate degree	1	1% (1)
Professional degree	0	0%

Table 22. RS formal education subject matter study areas (Question 14).

Subject of study	%
Animal Science	7%
Biochemistry	4%
Biology	29%
Botany	3%
Biophysics	0%
Biostatistics	0%
Chemical Engineering	0%
Chemistry	16%
Ecology	7%
Entomology	2%
Environmental Health	18%
Environmental Science	21%
Epidemiology	5%
Genetics	1%
Geophysics	0%
Geology	3%
Hydrology	3%
Industrial Hygiene	3%
Infectious Diseases	2%
Medicine	1%
Microbiology	16%
Molecular Biology	3%
Nursing	2%
Occupational Health	3%
Parasitology	0%
Pathology	0%
Pharmacy	1%
Physics	3%
Public Health	19%
Sanitary Engineering	2%
Soil Science	1%
Toxicology	1%
Vector Control	1%
Veterinary Science	1%
Virology	0%
Zoology	2%
Other[n]	16%

[n] Four (4.2%) studied nutrition.

Table 23. Reason survey participants became registered sanitarians (Questions 16).

Reason for becoming a registered sanitarian	%
To seek employment as a sanitarian or other job that requires being a RS.	29%
To increase your competitiveness for employment that does not require being a RS.	5%
Requirement of employer to become permanent employee.	48%
For job promotion requirement.	9%
For job promotion to increase competitiveness.	3%
Other	4%

Table 24. Preference for meeting continuing education requirements (Question 17).

Method of continuing education	%
In-person training courses and exercises	26%
Locally offered conferences	62%
National conferences	1%
Educational webinars and virtual trainings	1%
On-line courses	7%
Other	2%

2.3 Arizona County Health Departments Survey

County health department staffing varies in the ten counties that participated in the survey, both by numbers of employees (9-576) and by the number relative to population served (14-104 per 100,000 population) (Table 25). Most counties have part-time employees or interns.

Table 25. County Health Department Workforce and Workforce Needs.

County	Employees	FTEs	Employees per 100,000 Population	# Positions open (type)
Coconino	137	110-125	100	0
Gila	45	45	85	
Graham	30	20 + 10 employees <10hrs/week	79	1
La Paz	21	17	104	
Maricopa	576	569	14	54
Mohave	82	75	40	
Navajo	59	53	55	
Pima	400	350	40	12
Pinal	128	101	32	3 (nurses)
Santa Cruz	9	8	19	

Smaller population, remote counties report difficulty finding qualified applicants, filling and retaining positions, especially positions that require highly skilled workers. Some hires are overqualified and leave for better jobs (e.g., nurse practitioners, administrators). Hiring and retaining employees for detention nursing positions is particularly difficult. In the two metropolitan, urban counties: Pima County Health Department reports no problems filling

positions and retaining employees; the Maricopa County Health Department reported it had difficulty recruiting and retaining employees, until salaries were raised (Table 26).

Table 26. Workforce Hiring and Retention Issues for County Health Departments.

County	Difficulty filling or retaining positions?
Coconino	Has difficulty recruiting for positions requiring higher skill sets, and with hiring overqualified people that leave for better jobs.
Gila	Has difficulty filling all positions. Director spends time recruiting in the valley and universities for potential employees. Retraining long-term employees is very difficult.
Graham	Is stable, as most employees have been with the County for some time. Detention Nursing positions turn over, two plan to move to different locations in the next 6 months.
La Paz	Has trouble getting qualified people to apply due to low wages (Registered Sanitarians start at $30,000). Hard to get married people if spouse needs a job too.
Maricopa	Has increased salary ranges to attract qualified applicants. A recent market study of PA, NP, RN, LPN, Infection Control Specialist, and Medical Assistant identified recruitment and retention issues due to low compensation.
Mohave	Has trouble filling professional level positions due to lack of response and/or lack of qualified applicants. Retention is not as difficult. Some leave for higher salaries.
Navajo	Has regular turnover in the health educator positions.
Pima	Has no difficulty filling or retaining employees.
Pinal	Has trouble finding Nurse Practitioners and good sanitarians.
Santa Cruz	Has difficulty filling professional positions but not with retention if the workers are from the area. Retention is hard if the worker is from outside the area, or commutes.

County health department workforce reductions are mainly due to budget cuts, with an aging workforce playing a smaller role. Counties shift workforce numbers and priorities based on funding variances. Over half of reporting counties foresee no reduction in workforce (Table 27).

Table 27. Reasons for Changes in County Health Department Workforce.

County	Change in workforce number and reasons
Coconino	Anticipates a workforce decrease due to funding cuts (grant, tax revenue, district funding). Retirement was an issue, but open positions have been filled.
Gila	Forecasts no change in workforce overall, through administrative positions were reduced, the number of grant funded direct service positions increased.
Graham	Plans for no change in numbers, but shifts positions due funding changes.
La Paz	Anticipates a decrease in positions, with a 40% reduction in core public health positions over three years due to budget cuts, not due to retirement or people moving away. Has shifted positions to other departments - environmental health Sanitarians were moved to the Economic Department.
Maricopa	Plans to increase positions supported by funded grants.
Mohave	Plans workforce reductions due to decreased grants and fees for enterprise funds.
Navajo	Forecasts a slight workforce increase in grant funded positions.
Pima	Anticipates no change in workforce.
Pinal	Plans for no change in workforce, stable for 10 years, with a shift in work from grant funded education programs to clinical staff and communicable disease workers.
Santa Cruz	Forecasts no change, after major layoffs in 2008-2009.

Most health departments have multiple funding sources. It is difficult to predict personnel retirements and moves. County health department workforce development programs focus on

early job training (Table 28). County public health staff members would like continuing education, specific to their needs such as technical support, social media training and general outbreak investigation procedures. Some training provided was more appropriate for specialists than for the generalists that comprise most of the rural county health department workforce.

Table 28. Workforce Development Programs for County Health Departments.

County	Program
Coconino	Provides a professional development program through the county, but not public health specific. Training is upon hire.
Gila	Is implementing a workforce development plan with the University of Arizona with a curriculum appropriate for every position in the division.
Graham	Until 2012 administered the federally funded WIA Workforce Development Programs, including Nursing training at the local Community College.
La Paz	Sends staff to available training, but nothing onsite.
Maricopa	Is working on a workforce development plan.
Mohave	Has a training program for RNs and will have training programs for all other new staff. The Emergency Response Program has a workforce development/training plan for all Health Department staff.
Navajo	Is in the early stages of developing a workforce development plan for all staff.
Pima	Has multiple offerings for a variety of job classes.
Pinal	Does not provide workforce development programs.
Santa Cruz	Does not provide workforce development in the department, but there is a county workforce department teaching English as a second language (ESL).

2.4 CRH Pharmacist Survey

Of the 727 individuals that participated in the survey, 56% were female and 44% were male. Sixty-five percent with Bachelor of Science in Pharmacy or Doctor of Pharmacy (PharmD) reported not pursuing additional advance training (Table 29).

Table 29. 2014 Pharmacist Survey Education.

Education	% Participants
PharmD	36%
BS in Pharmacy	29%
Certification Program	14%
Residency	11%
Master's	6%
Doctorate	1%
Fellowship	1%

Community retail businesses were the main employment setting (Table 30), with hospitals employing the second largest number of pharmacists in Arizona. Seventy-three percent of survey participants reported that clinical services were provided at their practice site, and that they provided direct patient care or patient counseling. Forty percent of participants said they will be working for more than 20 years while 18% reported they will retire in the next five years. These

results are consistent with state licensure data (Figure 6) that indicate a relatively young population of pharmacists.

Table 30. CRH 2014 Pharmacist Survey's Top Three Employment Setting.

Top Three Employment Setting	
Community (Retail) %	43.5%
Hospital %	30.7%
Mail Order %	6.5%

Participants reported adopting or expanding an interdisciplinary practice model in their practice: 58% use an interdisciplinary practice model to improve patient care and therapeutic outcomes; 74% plan to expand it in their practices over the next five years; and 43% incorporate interdisciplinary therapy plans or collaborative care agreements, consistent with national efforts to control cost growth and assure value.[16]

Survey participants are expanding services to include drug compounding, drug information, home infusion therapy, immunizations, health screenings, smoking cessation counseling, nutritional support, pharmacokinetic dosing, anticoagulation services, diabetes management, hypertension management, asthma/COPD management, osteoporosis screening/management, and pain and weight management. Participants defined pharmacy technician roles to include: customer service, inventory management, buying and acquisition, medication preparation, medication reconciliation, and administration. They reported that their roles in medication reconciliation, and adminitration will expand over the next five years.

3. Workforce Demand

As Affordable Care Act (ACA) coverage provisions - Medicaid expansion and the Marketplace – are implemented, demand for health care will likely increase, especially in rural areas. Population growth and aging baby-boomers are also expected to increase health services demand. By 2030 there will be 72 million elderly in the US, about 19% of the population.[17]

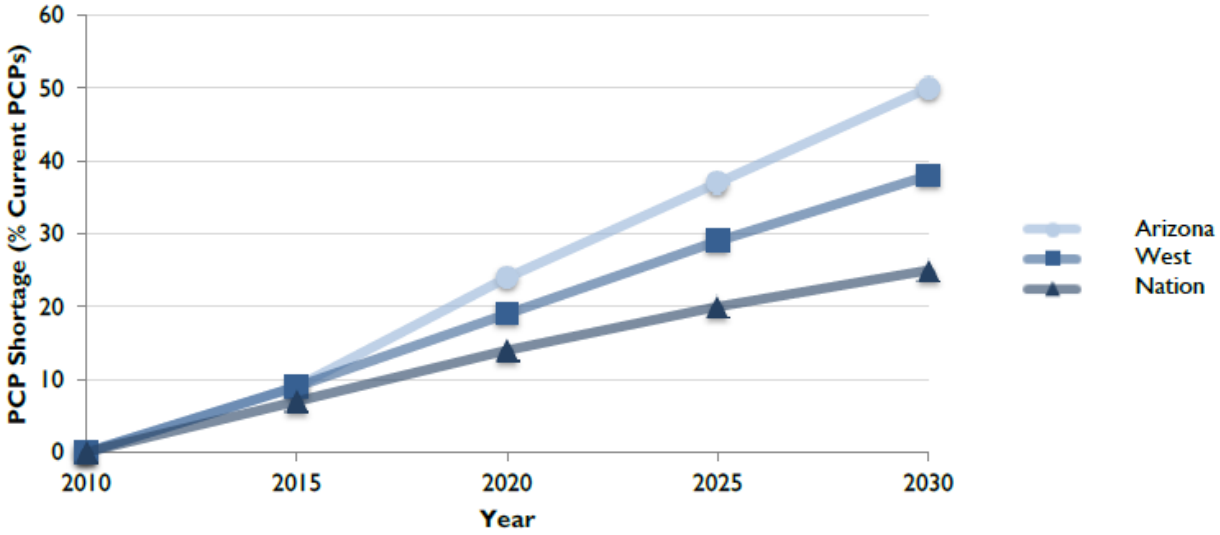
Strategies to meet the growing demand include: increasing the number of health professions students and trainees that practice in Arizona after graduation through scholarships, loan repayment, tuition remission, and tax credits; recruiting licensed health professionals from other states and countries; enhancing the efficiency of care delivery through integration and inter-professional team based care; retaining the existing workforce – through retention incentives. Survey results from physicians, registered sanitarians, county health department personnel, and pharmacists from this report and from a previous AzCRH survey[12] of PAs, NPs, and CNMs enumerate the reasons they stay or leave Arizona, retire, reduce clinical hours, and other factors. This data informs decisions on *how* to meet demand. *Where* to focus training, recruitment, and retention is presented through maps and tables in this and other reports.[12,18,19]

3.1 Physicians

The demand for physicians exceeds supply, especially in Arizona's rural counties. Distributing physicians to areas of need can improve access to care and contribute to the economic health of rural communities. With its aging and growing population, expanded ACA Medicaid and Marketplace coverage, and aging health workforce - Arizona requires new strategies to meet

demand in the 21st century. Nationwide, demand is also growing faster than supply, with a projected physician shortfall of 46,100 to 90,400 physicians by 2025 (Figure 8).[20] Projected primary care shortfalls range between 12,500 and 31,100 physicians by 2025; non-primary care physician demand will exceed supply by 28,200 to 63,700 physicians across all of the many subspecialties.[20] Arizona will require an additional 1,941 primary care physicians by 2030.[21]

Figure 8. Physician Demand Comparison - Arizona, West Region and Nation.[20]



In 2010, Arizona ranked 33rd in the nation in number of physicians relative to its population.[22] Arizona ranks third of four states with a similar land area in physicians per 100,000 population (Table 31).

Table 31. Physician Supply in Four Western States.[22]

State	Total Population	Total Active Physicians			Active M.D.s		Active D.O.s	
		Number	# per 100,000	Rank	Number	# per 100,000	Number	# per 100,000
Arizona	6,676,627	14,694	220.1	33rd	13,027	195.1	1,665	24.9
New Mexico	2,033,875	4,673	229.8	31st	4,418	217.2	255	12.5
Nevada	2,654,751	5,264	198.3	45th	4,771	179.7	493	18.6
Washington	6,746,199	17,796	263.8	17th	16,910	250.7	878	13.0
United States	309,050,816	799,509	258.7		744,224	240.8	55,218	17.9

Physician requirements can be estimated using a needs-based approach (estimating a socially optimal number), a demand-based approach (estimating the number a population can support), or benchmarking based on a previously established metric (i.e., country to country comparison).[23] In 1933, the Committee on Costs of Medical Care conducted the first study of physician supply requirements for a population using the needs-based approach. That study determined the nation

required 140.5 physicians/100,000 population.[24] This approach relied on an expert panel to estimate key metrics of utilization and demand.

The Health Resources and Services Administration (HRSA) uses the demand-based approach to extrapolate current practice patterns of physician service utilization. This method factors in demographic changes and trends in demand. This approach relies on empirical analysis and considers the economics of the health care system. The major criticism of this approach is that it carries current payment and subsidies of health professions education inequities into future projections.

The benchmarking approach identifies a standard of care and extrapolates that to defined populations. This approach has shortcomings - the population requirements between two distinct areas may not be the same, or there may be different health care systems in place between the benchmark location and the comparison location that affect access to and utilization of health care services. The implicit assumption is that the benchmark reflects an efficient mix and number of physicians for the population served.[23]

Two benchmarks identified in the literature are (1) the Bureau of Health Professions benchmark of 231 physicians per 100,000 population and (2) the Graduate Medical Education National Advisory Committee (GEMENAC) benchmark of 195 physicians per 100,000 population.[25] The lowest ranking state (Mississippi) had a ratio of 176.4, while the highest ranking state (Massachusetts) had a ratio of 415.5 in 2010.[22]

Methods and Limitations

Physician-to-population ratios are the most common measures of physician supply in an area.[25] Ratios vary widely depending on data sources and how physicians are counted such as full time equivalent (FTE), direct patient care FTE, primary care vs. other board certified specialty.

Arizona Medical Board (allopathic - MDs) and Arizona Board of Osteopathic Examiners (DOs) physician licensing data was cleaned and aggregated using SAS EG 4.3 to estimate physician supply by community. Data was filtered to physicians with active licenses and practice addresses in Arizona. Twenty-three providers without a valid Arizona practice address were excluded. U.S. Census Bureau data was used to estimate Arizona's city and town populations. Cities with Critical Access Hospitals (CAHs) and hospitals with less than 50 beds were evaluated.

Available data does not include direct patient care effort or work hour data. Thus the clinical FTE could not be calculated. Physicians employed by the federal government (e.g., Indian Health Service, Veterans Administration) are not required to have an Arizona license, thus the size and capacity of the physician workforce in these areas may be underreported.

Results

Coconino, Pima, and Maricopa counties have the highest physician to population ratios while Apache and Pinal counties have the lowest ratios (Table 32). A large portion of Pinal County's population (384,567) is part of the greater Phoenix metropolitan area to the north and a smaller portion is part of the greater Tucson metropolitan area to the south. Maricopa and Pima county physicians serve these communities. Physicians residing in Pinal County (126) mainly serve the larger towns of Casa Grande and Florence. Coconino County has the highest physician to population ratio in the state (Table 32) and other health care professionals (e.g. CRNAs, NPs,

RNs, dentists, dental hygienists, and psychologists).[18] These professionals are not evenly distributed, but concentrated in Flagstaff, while rural Coconino County is underserved.

Table 32. Primary Care Physician (PCP) Supply and Demand in Arizona Based on State Licensing Board and Geographic Health Professional Shortage Area Estimates.

County	Arizona Licensing Board Data (2013)		PCP FTE HPSA[o]		Population (Clarita's 2013)
	# All Physicians	# PCP (per 100,000)	PCP FTE (per 100,00)	PCP Shortage FTE	
Apache	29	12 (16)	50 (68)	3	73,251
Cochise	128	57 (42)	30 (22)	13	134,231
Coconino	328	96 (71)	--[p]	3	134,291
Gila	69	32 (60)	--	2	53,432
Graham	28	19 (51)	12 (31)	5	37,130
Greenlee	7	6 (66)	--	1	9,059
La Paz	16	10 (50)	21 (104)	2	19,895
Maricopa	9,251	2,569 (63)	--	189	4,051,453
Mohave	331	92 (45)	--	11	204,828
Navajo	97	47 (43)	--	17	108,179
Pima	2,219	666 (67)	--	81	991,971
Pinal	126	70 (18)	--	68	384,567
Santa Cruz	33	22 (47)	14 (30)	2	47,245
Yavapai	374	114 (53)	--	17	216,818
Yuma	251	80 (40)	52 (25)	9	201,246
Arizona	13,287	3,892 (58.4)		423	6,667,596

Based on Bureau of Health Professions and GMENAC benchmarks, only three counties - Coconino, Maricopa and Pima - have enough physicians to meet demand. Statewide, Arizona physician supply exceeds the GMENAC benchmark, but the workforce is not distributed in the 12 other Arizona counties, which have significant ADHS and HRSA designated primary care workforce shortage areas (Table 32). ADHS estimates a 423 PCP FTE shortage in 2015.

The U.S. will require an additional 50,000 PCPs by 2025, a three percent increase in the current physician workforce.[26] Competition between states for physicians is fierce, especially for states like Arizona with insufficient resident numbers and outpatient training sites.

Physician Recommendations

Increasing rural physician supply strategies include educating more physicians; recruiting physicians from other states and countries; educating health professionals to work in rural communities; improving efficiency by team- and community-based care to the full extent of

[o] Data compiled from http://datawarehouse.hrsa.gov/tools/DataPortalResults.aspx >Primary Dataset HPSA. Website last updated 1/1/15, accessed 1/20/15. Data updated from 2002 to 2014, varies per HPSA location. Estimates based on telephone interviews of listed providers by ADHS personnel.

[p] -- not a valid comparison since the HPSA population in need is much less that county population.

education and licensing; marketing; retaining physicians and health providers in rural areas; and offering fiscal incentives such as loan repayment, retention bonuses, and tax credits.

Figure 9. Recruitment, Education, Marketing and Retention Strategies.

CAHs, Rural Health Clinics, and Federally Qualified Health Centers can partner with academic health centers (AHCs) to allow students, interns and residents to gain experience in rural areas. Rural field faculty can count a portion of their teaching time toward National Health Service Corps loan repayment programs. AHCs benefit by expanding outpatient, community-based training sites for health professions students, and enhancing the referral network back to the urban, tertiary care teaching hospitals for specialized services, consultations, and procedures.

Education - About 60% of Arizona's primary care and 70% of non-primary care specialist physicians were trained outside the state.[10] Arizona's allopathic and osteopathic medical education capacity is at 27 students per 100,000 population (U.S. = 30 students/100,000). Physician training is long and expensive. Medical school usually takes four years to receive an MD or DO degree. Board certification to be licensed and to practice requires three to four years of residency training for primary care specialties (generally defined as family medicine, general pediatrics, general internal medicine, geriatrics, and sometimes includes obstetrics and gynecology and general surgery), and longer for non-primary care specialties including the many medical, pediatric and surgical subspecialties. Arizona expanded its allopathic and osteopathic medical school capacity over the last ten years, and now has two allopathic medicine campuses at the University of Arizona Health Sciences in Tucson and Phoenix; and two colleges of osteopathic medicine at Midwestern University in Glendale and A. T. Still University in Mesa, AZ.

Marketing - promotes Arizona's unique academic, professional, social, and natural resources. For example, Coconino County emphasizes the beautiful natural environment to recruit health professionals; other communities have innovative strategies to overcome the many challenges to successful recruitment and retention of health professional to practice in rural and remote areas.

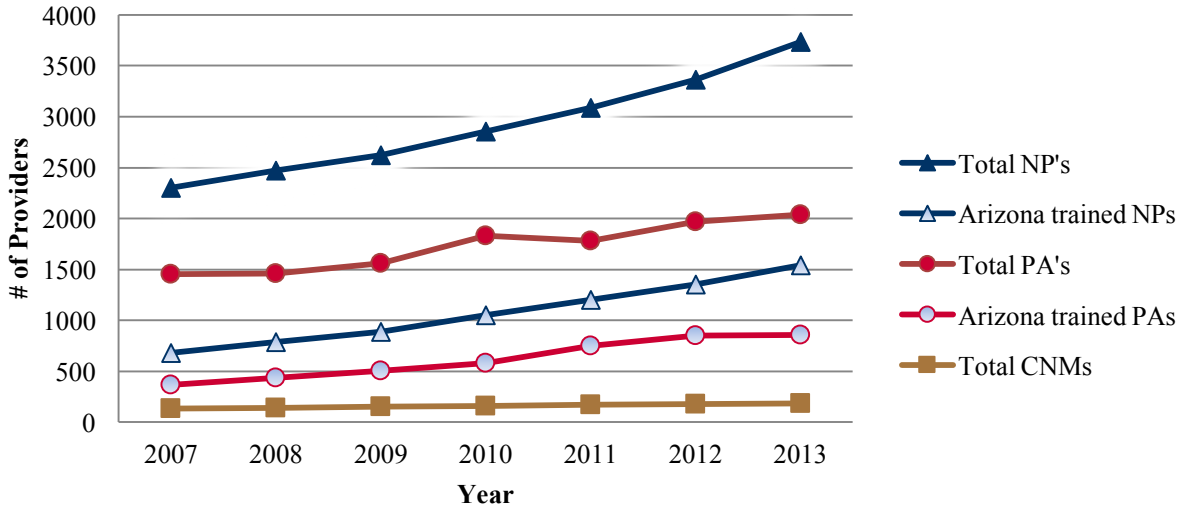
Retention – includes providing fiscal incentives such as a rural health professions tax credit, loan repayment and retention bonuses. Arizona recently expanded its loan repayment program to include high needs specialties beyond primary care to include behavioral health.

3.2 Physician Assistants

Each year more than 6,000 physician assistants (PAs) are added to the U.S. health workforce.[27] PAs work closely with physicians. PA programs are generally two years, are usually housed in a medical school, and require passing a national exam, and state licensing.28 The PA workforce is projected to increase by 58% from 27,770 to 43,900 by 2020, and to 125,000 by 2026.[29,30]

There are approximately 1,942 PAs practicing in Arizona, a provider ratio of 29 per 100,000 population. The number of PAs trained in Arizona is static (Figure 10).

Figure 10. Number of active licensed physician assistants, nurse practitioners, and certified nurse midwives in Arizona from 2007-13 and those that were trained in Arizona. [12]



An indirect method of assessing PA demand involves evaluating the U.S. PA wage scale. The theory is that as wages increase, more enter the PA training pipeline and go on to practice after graduation. As the PA supply increases, wages decrease. PA wages have exceeded inflation for the 14-year period from 2000-2013, suggesting that demand for PAs exceeded supply. PA wages are projected to increase by 40% by 2025 - higher than the projected 35% inflation increase.[31] PA demand is projected to remain strong over the next ten years.

PA Recommendations

Physician assistant workforce capacity can help meet the burgeoning demand for primary care. Expanding PA rural training sites can enhance the likelihood of practice in rural areas after graduation. In Arizona, PAs are required to have physician supervision at least every two weeks if practicing in the same site, and weekly if practicing in a different site than the supervising physician.[32,33]

PAs can issue prescriptions or dispense or issue schedule II or schedule III controlled substances without physician review.[32] Arizona physicians can oversee two PAs, four if practicing in a federally designated primary care Health Professional Shortage Area (HPSA).[32] Doubling the supervising physician requirement from two to four PAs in urban areas, and from four to eight in rural areas could increase access to health care services.

Generally, PAs receive 85% of what a physician receives for performing the same service.[34] While the reimbursement is lower for PAs, so is the median PA compensation, and primary care practices are generally able to maintain a positive fiscal margin despite lower payment.[35] Payment policies that compensate equally for specific primary care services regardless of whether they are provided by an MD, DO, PA or CNP help finance primary care access in underserved areas. Non-physician providers (e.g., medical assistants, community health workers, navigators) can enhance primary care capacity.

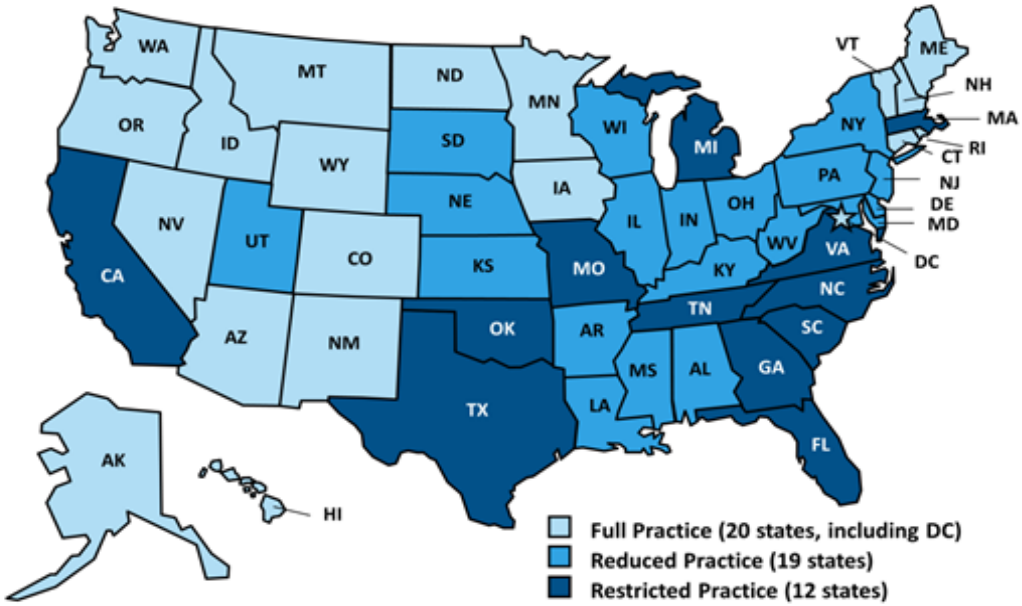
3.3 Nurse Practitioners

As demand increases for primary care, the Institute of Medicine called for expansion of the nurse practitioner (NP) workforce.[36,37] NP supply is projected to increase by 30%, from 55,400 in 2010 to 72,100 in 2020.[30] Arizona's NP workforce is aging with almost one-third age 55 or older; retirements may exacerbate NP shortages over the next ten years.[12]

Five Arizona NP programs are approved by the Arizona State Board of Nursing and accredited by the Commission on Collegiate Nursing Education: (1) Arizona State University - College of Nursing & Health Care Innovation in Tempe; (2) Grand Canyon University - College of Nursing & Health Sciences in Phoenix; (3) Northern Arizona University - School of Nursing in Flagstaff; (4) University of Arizona - College of Nursing in Tucson (online program); and (5) University of Phoenix - College of Health Sciences and Nursing in Phoenix and Tucson.

NPs are registered nurses (RNs) with advanced training which permits them to diagnose patients, order and interpret tests, write prescriptions, and provide treatment for both acute and chronic illnesses.[28] NPs typically complete a two-year NP Master of Science (MS) program, pass a national exam, and are licensed by the state board of nursing.[28] While NP education is regulated by a common accreditation process and national certification examinations, the legal scope of practice for nurse practitioners varies considerably by state.[36] Arizona is one of twenty states considered to have a progressive NP scope of practice (Figure 11). The Arizona State Board of Nursing oversees the scope of practice through licensing, however employers (e.g., hospitals) may limit scopes of practice and require supervision by physicians. The NP reimbursement rates for specific health services are lower than physician reimbursement, with private insurance payment influenced by Medicare payment policies – NPs get 85% of the physician fee schedule.[34,36] When services are billed under a physician's name as "incident to" the services of the physician, the doctor receives Medicare's full fee just as if the doctor performed the service.[38]

Figure 11. Nurse Practitioner State Scope of Practice Environment, 2014. [q]



SOURCE: American Association of Nurse Practitioners, 2014

Private insurance often follows Medicare's lead on reimbursement policies and may adversely affect NP capacity to help meet the nation's growing demand for primary care. A survey of 258 Health Maintenance Organizations on NP autonomy found that only 27% of participants reimburse NPs at the primary care physician level.[39] NPs deliver high-quality, cost-effective primary care to many of the nation's most vulnerable; NP payment parity could improve rural primary care capacity and practice site and provider fiscal viability.[39]

NP Recommendations

Meeting the need and demand for primary care in rural areas require increasing the number of trainees, and distributing graduates to these areas. Attention to the NP training pipeline (increasing class size, providing rural training experiences), recruiting and retaining NPs through loan repayment, tax credits and retention bonuses could help meet demand.

Maintain Beneficial Scope of Practice – Widely variable state scope of practice regulations inhibit NP ability to meet the growing demand for primary care services and practice to the full extent of their education, training, and certification.

Ensure equal pay for services - NPs are most often reimbursed at 85% of what a primary care physician is paid for the same service by public (e.g., Medicare) and often by private insurers.

[q] Tapping Nurse Pactitioners to Meet Risong Demand for Primary Care, The Henery J. Kaiser Family Foundation. http://kff.org/medicaid/issue-brief/tapping-nurse-practitioners-to-meet-rising-demand-for-primary-care/

Payment parity could help attract NPs to practice in the state, and address the demand for primary care services, especially in rural and underserved areas.

Better Data Collection – Licensing data tends to overestimate supply, and thereby diminish federal funds allocated on the basis of provider to population rations to entice practice in rural areas. More timely, full time equivalent direct patient care data is needed to use accurate data to inform policy interventions and assure appropriate federal funding (e.g., National Health Service Corps loan repayment for practice in a HPSA). Provider surveys provide useful information, but tend to have low response rates, and cannot easily be extrapolated due to the small sample size to reliably forecast supply or demand. Data collected at the time of licensing and renewal, can give timely data on active clinical practice FTE, where and in what specialty providers are practicing in the state, and other important data to inform policy interventions. Several states such as New Mexico, Oregon and Michigan conduct license renewal surveys.[40]

3.4 Certified Nurse Midwives

Nurse-midwives are a specialized advanced practice registered nurse educated in midwifery completing a graduate degree program accredited by the Accreditation Commission for Midwifery Education, and passing a national certification exam administered by the American Midwifery Certification Board.[41] There are approximately 13,000 CNMs in the United States[42] and 174 licensed in Arizona. The U.S. Bureau for Labor Statistics projects the CNM workforce to grow by 29% by 2022 driven by an increase in demand for health care services, increased coverage, and a new emphasis on preventive care.[43] Arizona will need to add and estimated 70 CNMs to meet the demand.

Arizona scope of practice laws limit CNMs practice to pregnancy, birth, well-woman gynecology, and newborn care.[44] Generally CNMs receive 100% of what a physician receives for providing a service,[34] however some third party payers may not reimburse CNMs for care unrelated to gynecologic or perinatal care.[44]

Retirement of current CNMs, especially at community health centers,[19] will be dramatic over the next ten years; 70% of rural CNMs, and 46% of urban CNMs are age 55 or older (Figure 4). There are no Arizona CNM training programs. Recruitment will be the primary strategy for meeting the CNM workforce demand. There are CNM graduate programs in the neighboring states of Colorado, New Mexico, Utah, and California. Accredited CNM programs offer post-baccalaureate certificates and master's degrees in nurse-midwifery and midwifery.[45]

CNM Recommendations

Increasing the number of CNMs can help obstetricians, neonatologists, and perinatologists more efficiently and appropriately care for patients. For example, New Mexico's CNMs combine high quality care at lower cost,[46] ranking second nationally in per capita CNMs, and first in attended births. New Mexico's infant mortality rate (5.7 per 1000 live births) is the 13th lowest nationally even though it has the third highest poverty and teen pregnancy rates (48.8 births per 1000). CNMs delivered babies in 23 of New Mexico's 33 counties with the majority in Albuquerque and Las Cruces hospitals.[47-49] The low mortality rates are attributed to ready access to CNMs, socio-demographics factors,[50,51] team-based medical care, and in-house back up by obstetricians, neonatologists, and perinatologists.

3.5 Registered Sanitarians and Other Public Health Professionals

States have public health worker shortages including epidemiologists, laboratorians, environmental health workers, public health nurses, nutritionists, dieticians, dentists, public health physicians and social workers – and demand is increasing.[52] The largest barrier to adequate staffing of governmental public health agencies was budget constraints.[53]

Budget cuts, salary scale (inability to offer a competitive salary), and restrictions on raises were among the major problems identified in recruiting and retaining epidemiologists.[54] Recruitment difficulties were attributed to general shortages of workers within an occupation (e.g., registered nurses, nutritionists), non-competitive salaries, and lengthy processing time for new hires.[53] Rural public health agencies in most states reported drawing their staff from the local labor market and had more difficulty recruiting more educated, skilled public health workers than their urban or suburban counterparts.[53] Highly trained individuals gravitate to urban areas with better salaries and benefits.

The difficulty recruiting public health workers extends beyond the clinical public health workers (i.e., public health nurses and physicians). Recruiting challenges are reported for public health dentists, governmental agencies, health educators, nutritionists, social workers, administrative staff, epidemiologists, dental hygienists and assistants, laboratory personnel, and home health aides.[53] Budget cuts limit paying competitive salaries for highly skilled and educated workers. Local and rural health departments are at a competitive disadvantage recruiting new workers.

3.6 Pharmacists

Pharmacists are the third largest professional health group behind nurses and physicians.[55] A 2012 study by the Department of Health and Human Services estimates a 35% increase in pharmacist supply by 2025.[56] The Bureau of Labor Statistics has predicted an additional 41,000 new positions for pharmacists will be created by 2022.[57] Although this workforce is growing rapidly, it may not be sufficient to meet expanding demand, especially in rural areas.[58] The National Center for Workforce Analysis reported in 2014 that 87% of the 256,918 pharmacists in the US practice in urban areas.[59]

Historically, the fundamental role of pharmacists is to distribute drugs that have been prescribed by a healthcare practitioner to patients.[60] Today, pharmacists leverage their clinical expertise to advise patients and health care providers on the selection, dosage, interactions and side effects of medications.[60] Pharmacists also provide some level of primary care including vaccinations and disease management,[60] and provide referrals to other health care providers.

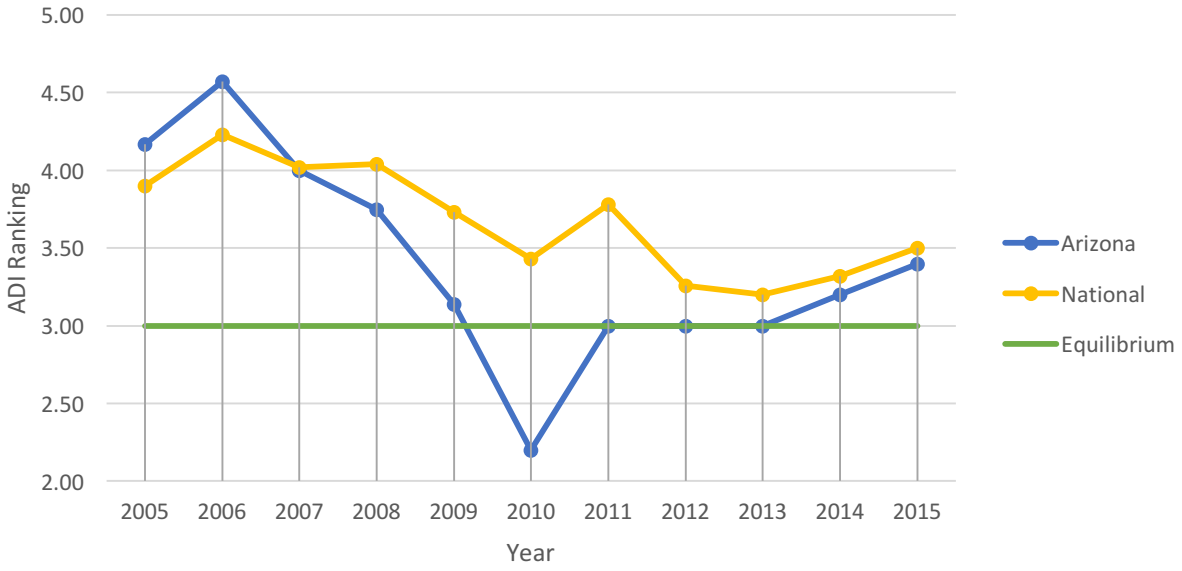
In 2014 House Bill 4190 was introduced into the US House of Representatives. This bill would amend title XVIII of the Social Security Act to provide billable coverage by pharmacists services under the Medicare program.[61] Beyond the potential coverage under Medicare, several factors are driving an increase in demand for pharmacist services.

In 2014 Arizona passed SB 1043 which recognized pharmacists as medical providers.[62] It allowed pharmacists to implement, monitor and modify drug therapy pursuant to a protocol-based drug therapy agreement with a provider. In Arizona it set the stage for more collaboration between providers and pharmacists in managing patients with chronic conditions such as diabetes. Nationally it demonstrated successful classification of pharmacists as providers and allowed services for medically underserved populations to be reimbursed under Medicare Part B.

As pharmacists expand their role in the health care system, the demand for their services is likely to increase.[63] This expansion of the pharmacist's role in the health care system creates new opportunities for delivering health care, and meeting growing demand for health services.

The Pharmacy Workforce Center's aggregate demand index (ADI) is a national report of the demand for pharmacists based on data collected from a panel of individuals who are directly involved in the hiring of pharmacists across the United States (Figure 12).[64] A score of three represents equilibrium between supply and demand, a score lower than three indicates an excess of supply, and a score greater than three indicates an excess of demand. Nationally the ADI has trended downward since 2006 showing that the supply of pharmacist services is roughly balanced with demand. In recent years, Arizona has trended from an oversupply of pharmacists to a balance of supply and demand. The Arizona pharmacist workforce has followed closely with national trends in recent years.

Figure 12. Pharmacist Aggregate Demand Index:[r] Arizona vs. U.S. 2005 to 2015.[64]



The increased number of pharmacists in the US relates to the expansion of accredited schools of pharmacy from 80 in 2000 to 130 in 2015.[65] Arizona has two accredited colleges of pharmacy, the University of Arizona College of Pharmacy in Tucson, and Midwestern University in Glendale. In 2014, 244 new graduates were added to the pharmacy workforce from these two schools (Table 33).

[r] ADI rankings: 1= Demand is much less than the pharmacists supply available (i.e. SURPLUS); 2=Demand is less than the pharmacists supply available; 3=Demand in balance with supply; 4=Moderate demand (some difficulty filling open positions); 5=High demand (difficult to fill open positions) (i.e. SHORTAGE).

Table 33. Pharmacist Graduation Numbers.

School Year	University of Arizona	Midwestern University	Total
2009-10	84	127	211
2010-11	83	120	203
2011-12	94	130	224
2012-13	95	148	243
2013-14	94	150	244

Pharmacy technicians help licensed pharmacists dispense prescription medications to customers or health professionals.[66] The Arizona licensing board requires pharmacy technicians to complete a workforce survey at the time of licensing or renewal, with 5,175 pharmacy technicians completing the survey in 2012-13. Seventy-seven percent of participants indicated they were actively working as pharmacy technicians. The Bureau of Labor Statistics projects employment opportunities for pharmacy technicians will increase 20% by 2022.[66] However, in Arizona 13% of pharmacy technicians reported being unemployed.

New technology, consumer convenience, and cost control measures instituted by insurers drive increasing online purchases and mail delivery of medicines. Two studies suggest that adherence rates are better for medications purchased through mail-order pharmacies than traditional retail pharmacies.[67,68]

Pharmacist Recommendations

Training programs, incentives and strategies intended to expand access to pharmacists in rural and underserved areas and populations include creating rural practice preceptorships, internships and employment, loan repayment and retention incentives. For example, Arizona's Senate Bill 1194, expanded the Arizona loan repayment program to include pharmacists, mental health providers, geriatrics and other health professionals in high demand but in short supply in rural areas in 2015.[69] Improved data collection, analysis and reporting of health workforce data could help track the success of the loan repayment program and other health provider recruitment and retention policy interventions.

4. Conclusions

4.1 Make Informed Decisions from Timely, Accurate Data

Better data collection and analysis could help inform, target and track interventions to assure a well-trained and distributed health workforce for all Arizonans. As more are covered by ACA coverage provisions - the Arizona Marketplace and by Medicaid / AHCCCS - the demand for primary care and other health services will increase. Innovative strategies to meet demand include enhancing the health professions training pipeline to include training in the areas of need, better and more timely collecting and analyzing of workforce data to inform policy interventions, and evaluating the interventions in relation to improving health outcomes, access to care, coverage and satisfaction of both patients and providers.

In 2013, Arizona had a ratio of 199 physicians to 100,000 population, below the Bureau of Health Professions benchmark of 231, and at the GMENAC ratio of 195. The ADHS analysis of

HPSA physician shortages indicates that the state licensing board data overestimates of the number of active primary care physicians in most counties. The Apache County physician workforce is likely underestimated (Table 32), due to its IHS physicians that are not required to be licensed in Arizona.

4.2 Expect a Dynamic Microeconomic Curve of Supply, Demand, and Price

Demand for healthcare is increasing, especially for primary care services, and will for the short- and mid-term through the full implementation of the ACA Marketplace coverage and Medicaid expansion, the growing population, and aging baby-boomers. Meeting demand for health services requires a sufficient number and appropriate distribution of health practitioners and professionals in high needs specialties and disciplines serving populations in areas of need. The dynamic tension between supply, demand, payment and cost of service and other variables make accurate forecasting difficult. Workforce demand models often fail to include two critically important factors: substitution of professions that have overlapping scopes of practice (e.g., physicians, nurse practitioners, and physician assistants), and dynamic efficiency through innovations in service delivery (e.g., team-based care, the substitution of on-site physicians, nurse practitioners, and physician assistants with off-site physicians, telemedicine robots, call centers, and on-site registered nurses).[19]

4.3 Train and Recruit a Workforce for the Future

Tectonic shifts in coverage, care delivery and financing require new education paradigms. Time-honored health professions training emphasizing autonomous physician management in urban hospital and tertiary care sites, will shift to include interprofessional, community- and team-based training and service in home, ambulatory, outpatient and rural sites. New technologies, telemedicine, mobile health (mHealth) and electronic health records are tools with the promise of safer, more accessible and cost-effective healthcare. Payment reforms move from fee-for-service reimbursement to payment for value and outcomes, challenging service-learning conventions that were once appropriate for urban academic health centers. Health professions education programs must adapt to prepare a health workforce with the knowledge and skills to thrive in community-based care settings, assure ready access to high quality care in rural areas, and seamlessly transport patients and train students with skills to manage care remotely, in the home, community, ambulatory, and in tertiary and quaternary care facilities. Publicly subsidized health professions education programs will be held accountable for delivering on their social contract to meet the needs of the patients they serve, while providing leading edge education, training, and research to improve population health outcomes.

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6. Appendices

Appendix 1: Methodology

Licensing board data methods

Datasets for Arizona allopathic (Medical Doctor or M.D.) and osteopathic (Doctor of Osteopathy or D.O.) physicians, physician assistants (PA), nurse practitioners (NP), and certified nurse midwives (CNM) were obtained from Arizona licensing boards.

Workforce summaries are presented as total counts and relative counts of currently licensed practitioners. This overestimates the number of actively practicing, full-time equivalent (FTE) health workers. County and state population estimates were obtained from the U.S. Census Bureau. Relative counts are ratios of the number of practitioners per 100,000 population by county (US Census data) or by RUCA (Nielsen Claritas data).

Rural-urban commuting areas (RUCA) based on postal zip code geography were used to compare health workforce coverage by rurality. RUCAs are based on US Census tract data and provide a standard, nationwide classification of rural (Figure 13). The University of Washington converted RUCA's to zip code geographies (see: http://depts.washington.edu/uwruca/). The four RUCA areas are: 1) urban, 2) large rural town, 3) small rural town, and 4) isolated small rural town. RUCA is similar to the US Office of Management and Budget metro classification.

Zip code and US Census ZCTA approximation for postal zip code boundaries are imperfect for classifying ruralness and allocating program funding. For example the spatial distribution of populations using US Census block data mapped over postal zip code boundaries (Figure 14) shows that large unpopulated areas can occur within rural zip code boundaries and that the zip code boundaries change yearly according to the logistical needs of the US Postal Service. Similarly, US Census boundaries (e.g. blocks, block groups, and tracts) change from one census to the next to conduct the census as cost effectively as possible.

Survey methods

The ***AzCRH 2015 Supply and Demand Study of Arizona Health Practitioners and Professionals*** survey tools were developed for physicians (web based), registered sanitarians (web based), and county health departments (telephone key informant based) and approved by the University of Arizona Institution Review Board. Survey Monkey (physician survey) and Qualtrics (registered sanitarian survey) were used for the web based surveys. Methods used for physician assistants, nurse practitioners, and certified nurse midwives are described in a previous CRH report.[12]

Arizona Physicians: Survey recruitment was conducted though Arizona Academy of Family Physicians through email announcements to their membership. Fifty-nine actively practicing primary care physicians (PCPs) in Arizona completed the web- based survey.

Arizona Registered Sanitarians: There are approximately 500 RS in Arizona, 405 are registered through ADHS, 131 by NEHA, and a few registered with both organizations. Survey recruitment was conducted through email by each organization. If all Arizona's RSs received and read their emails, then overall RS participation rate was approximately 20%. Participation was not uniform throughout the state and ranged from 8% to 100% by county (Table 34). The number of RS per 100,000 population is larger in rural areas (Table 34, Table 35); among

counties the range is 2.1 to 21 per 100,000. Also not all the surveys were competed so total responses for a question can differ; 77 of 82 ADHS RS participants and 26 of 30 NEHA RS participants completed the web-based survey.

Arizona County Health Departments: Health department representatives were contacted by telephone or email and sent a blank table to enter workforce data. Completed tables were returned by email. Responses to key informant survey questions were received by internet and/or telephone. Directors, executive assistants, managers and human resource personnel from ten (of the 15 total) Arizona county health departments responded.

Arizona Pharmacists: The survey was developed in collaboration with Arizona Board of Pharmacy, The Arizona Pharmacy Association, Midwestern University College of Pharmacy and the University of Arizona College Of Pharmacy. The pharmacist survey consisted of 25 questions and was administered in the fall of 2014 via an initial email to 10,410 Arizona licensed pharmacists. While 1,186 pharmacists responded to the survey (11.4%) analysis results were selected based on pharmacists actively practicing in Arizona. This limited the participants for analysis to 727.

Table 34. RS survey participant location, participation rate, and ratio per 100,000 population by Arizona County (Question 3).

County/State	Survey Participants	ADHS RS	RS per 100,000 population	Participation rate
Apache	2	7	9.75	29%
Cochise	2	8	6.28	25%
Coconino	4	18	13.07	22%
Gila	2	5	9.41	40%
Graham	1	6	15.81	17%
Greenlee	1	2	21.40	50%
La Paz	1	2	9.89	50%
Maricopa	60	242	5.92	25%
Mohave	3	18	8.85	17%
Navajo	1	4	3.70	25%
Pima	4	49	4.88	8%
Pinal	4	19	4.73	21%
Santa Cruz	1	1	2.14	100%
Yavapai	4	22	10.05	18%
Yuma	3	13	6.40	23%
Arizona	93	416	6.18	22%

Table 35. ADHS RS ratio per 100,000 population and survey participation rate by RUCA classifications (Question 3).

Geographic Area	RS per 100,000 population		Participation rate	
	ADHS RS			
	RUCA (v2) 2000	RUCA (v3) 2010	RUCA (v2) 2000	RUCA (v3) 2010
Urban	5.60	6.05	20%	20%
Large town rural	10.09	8.97	42%	31%
Small town rural	23.64	7.88	23%	70%
Isolated small town rural	16.86	5.62	33%	0%

Distribution of Arizona's Population - Arizona's fecund (females of child bearing age) and total population age distribution is shown in Figure 15 and Figure 16. Arizona's health practitioner age distribution is found in Figures 2-6.

Figure 13. Location of rural-urban commuting areas (RUCA v.3.0) based on postal zip code geography and Census 2010 data.

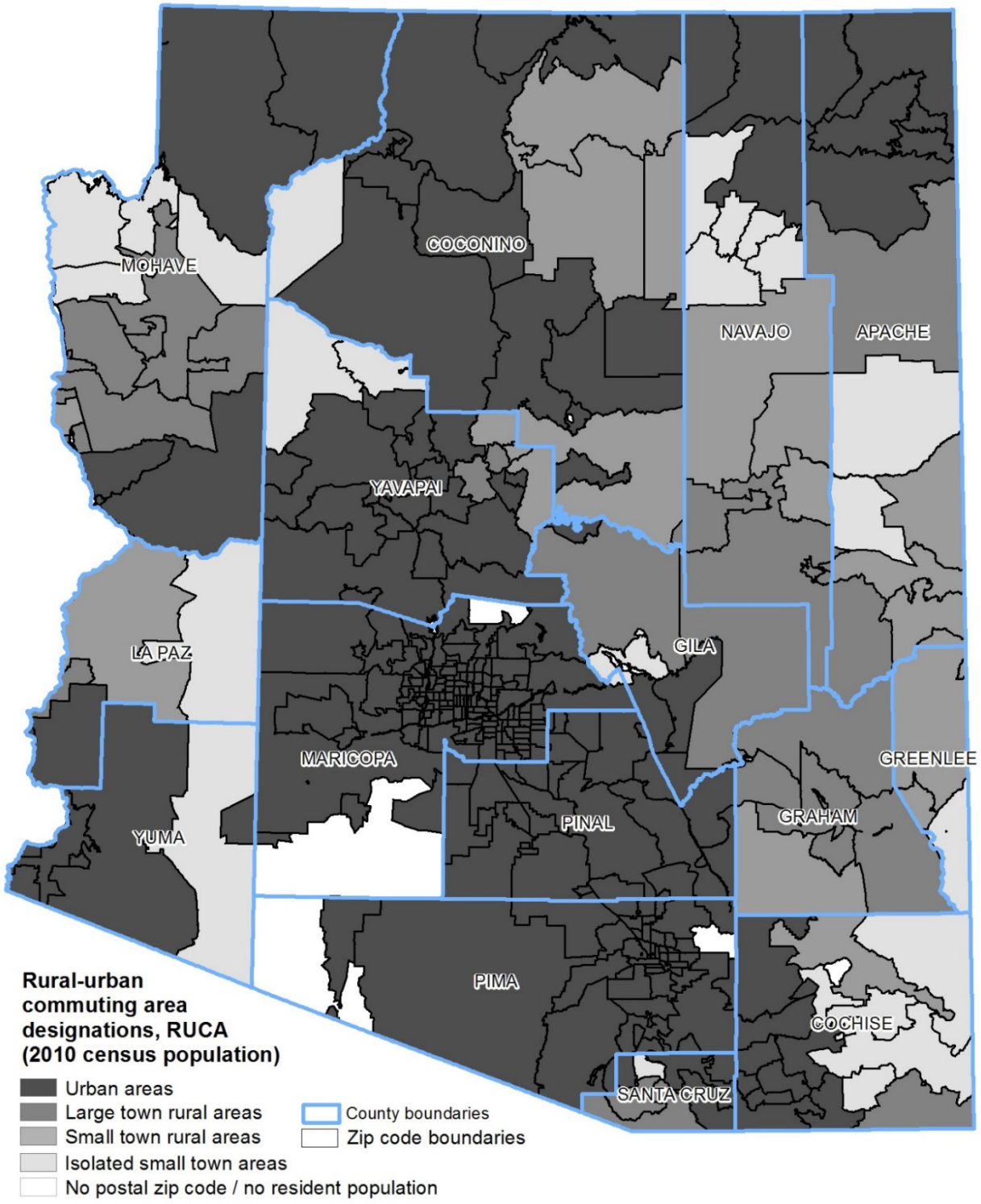


Figure 14. Population Density in Arizona based on Census 2010 block data.

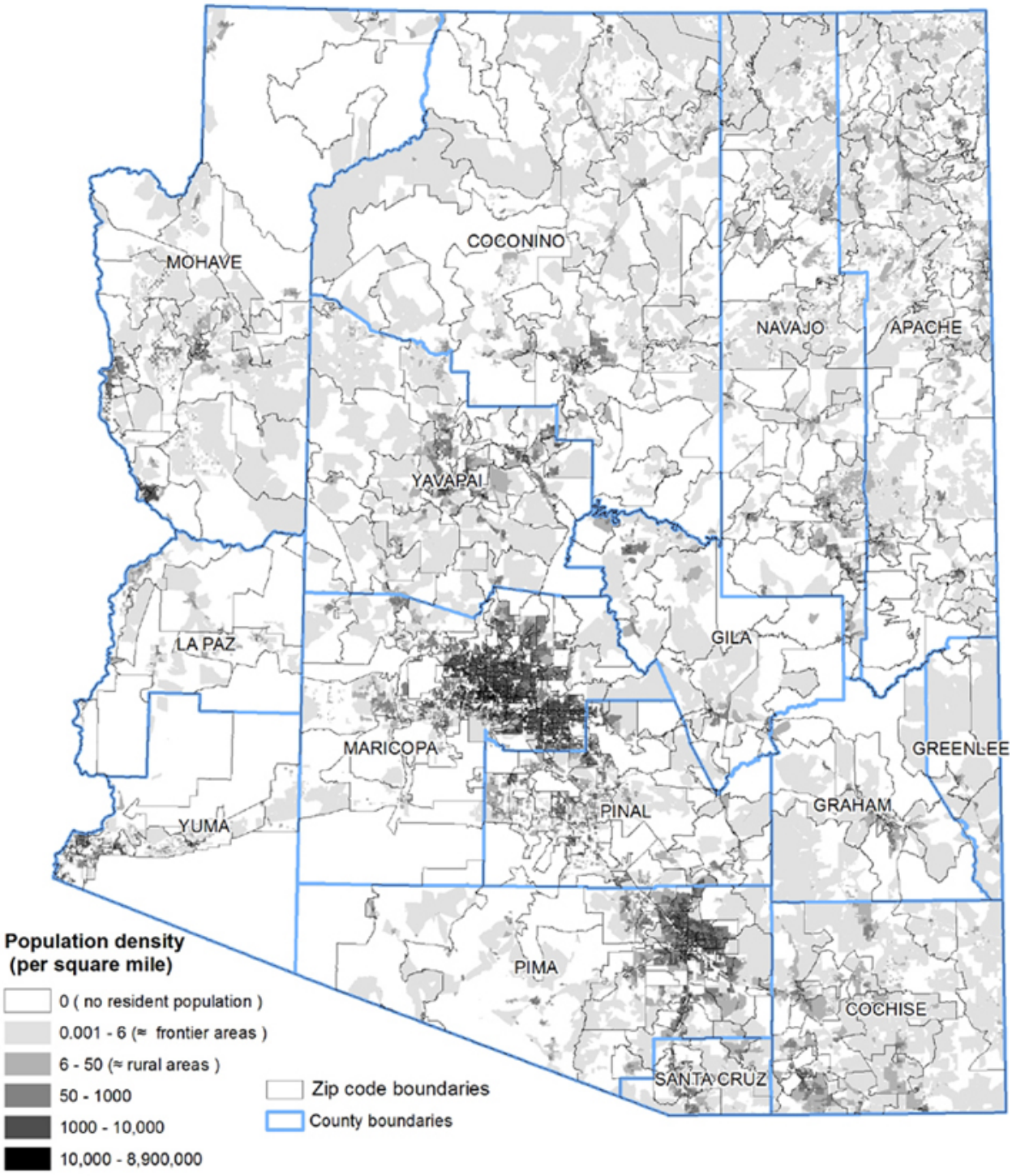


Figure 15. Urban and rural age groupings of Arizona's 2010 population of 6,392,017 (U.S. Census).

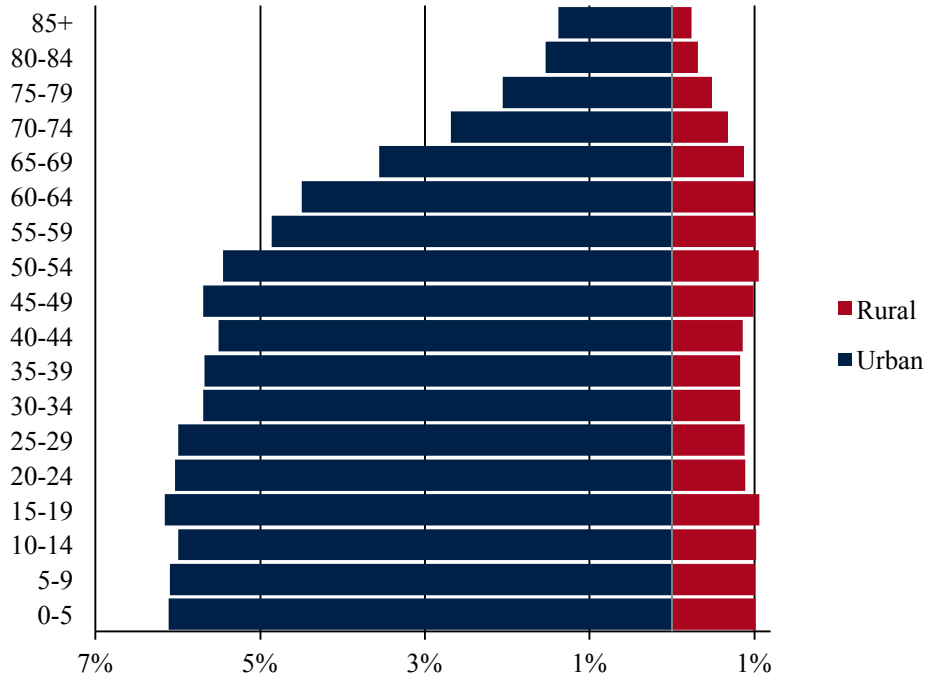
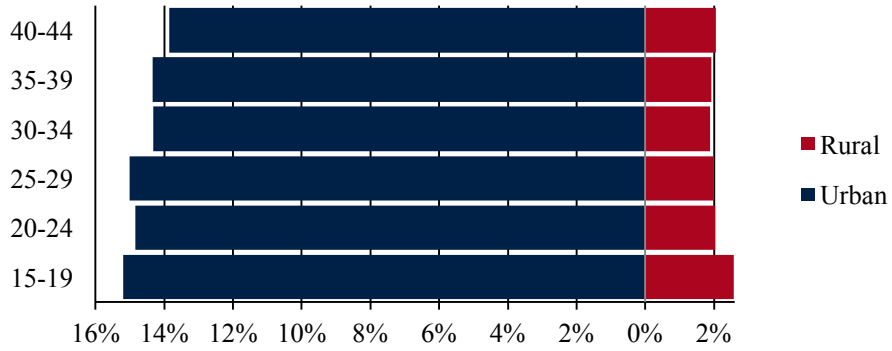


Figure 16. Urban and rural age groupings of Arizona's 2010 fecund population of 1,262,543 (US Census).



Appendix 2: Physician Survey

(Starts next page)

Appendix 3: Arizona Registered Sanitarian (RS) Survey

This survey is used to assess current and future supply of registered sanitarians in Arizona. The survey will take about 10 minutes to complete. Thank you for taking the time to complete the survey.

Q 1. Identify your current work status.

- ❍ Employed as a sanitarian in Arizona (1)
- ❍ Employed as a sanitarian in a state other than Arizona (2)
- ❍ Looking for employment as a sanitarian in Arizona (3)
- ❍ Looking for employment as a sanitarian in a state other than Arizona (4)
- ❍ Employed in Arizona, but not in a field that requires a sanitarian registration (5)
- ❍ Employed in a state other than Arizona, but not in a field that requires a sanitarian registration (6)
- ❍ Retired or unemployed, (skip to question 10). (7)
- ❍ Other (specify): (8) _____

If Retired or unemployed then Skip to End of Block

Q 2. Identify your current work status.

- ❍ Consultant, independent (1)
- ❍ City/town government (2)
- ❍ County health department (3)
- ❍ State health department (4)
- ❍ Other county/state agency (5)
- ❍ Military (6)
- ❍ Veterans Administration (7)
- ❍ Indian Health Service (8)
- ❍ Other Federal agency (9)
- ❍ Food services (e.g. restaurants) (10)
- ❍ Food processing (11)
- ❍ Hotels and resorts (12)
- ❍ School districts (13)
- ❍ Universities & colleges (14)
- ❍ Manufacturing (15)
- ❍ Retail (16)
- ❍ Other (specify): (17) _____

Q 3. What is the zip code (of street address) of your work office?

Q 4. Estimate the percentage (1%-100%) of your time allocated to these activities during your average work year.

_____ Administration (1)
_____ Supervision, and number of non-registered sanitarians supervised, if any. (2)
_____ Field investigations (3)
_____ Sales (4)
_____ Compliance assessment of rules and regulations (5)
_____ Compliance enforcement of rules and regulations (6)
_____ Other (specify): (7)

Q 5. Estimate the percentage (1%-100%) of your time allocated to these issues during your average work year.

_____ Non-sanitarian work responsibilities (1)
_____ Food protection (2)
_____ Water quality, potable (3)
_____ Water quality, swimming pools (4)
_____ Water quality, surface (5)
_____ Water quality, wells (6)
_____ Water quality, waste water (7)
_____ Air quality (8)
_____ Solid waste (9)
_____ Hazardous waste (10)
_____ Hazardous substances and/or radiation (11)
_____ Industrial hygiene, health, and/or safety (12)
_____ Vector, pest, and weed control (13)
_____ Animal control (14)
_____ Housing quality (15)
_____ Product safety (16)
_____ Disaster and emergency planning (17)
_____ Public outreach and education (18)
_____ Other (specify): (19)

Q 6. Please rank the influences for your decision to accept your current position.

	Most Influential (1)	Extremely Influential (2)	Somewhat Influential (3)	Least Influential (4)	Not Influential (5)
Location (1)	❍	❍	❍	❍	❍
Salary (2)	❍	❍	❍	❍	❍
Benefits (3)	❍	❍	❍	❍	❍
Job description (4)	❍	❍	❍	❍	❍
Other: (5)	❍	❍	❍	❍	❍

Q 7. How many hours per week do you normally work?

Q 8. How many miles do you commute from your residence to your work office/site (one way)?

Q 9. Do you use Registered Sanitarian skills in your present work?

- ❍ Yes (1)
- ❍ No (2)

Q 10. To estimate the future supply of Registered Sanitarians (RS) in Arizona, please indicate your work plans over the next 5 years. (select one)

- ❍ Currently retired, maintain registration because may want to seek employment as a sanitarian in Arizona (1)
- ❍ Currently retired, maintain registration because may want to seek employment as a sanitarian in another state (2)
- ❍ Currently retired, maintain registration but have no plans to seek employment as a sanitarian (3)
- ❍ Currently retired, will not maintain registration as a sanitarian (4)
- ❍ Plan to retire within the next 5 years (5)
- ❍ Maintain my current employment working as a RS (6)
- ❍ Maintain my current employment not working as a RS (7)
- ❍ Increase my work activities as a RS (8)
- ❍ Reduce my work activities as a RS (9)
- ❍ Stop working as a RS (10)

Q 11. Select the most appropriate statements that influence your work plans over the next 5 years.

- ❑ Satisfied with my current employment as a RS. (1)
- ❑ Change residence within Arizona. (2)
- ❑ Change residence outside of Arizona. (3)
- ❑ Seek an increase in income. (4)
- ❑ Seek additional education. (5)
- ❑ Seek work with more advancement opportunities. (6)
- ❑ Seek other work that does not require being a RS. (7)
- ❑ Other personal or family reasons. (8)

Q 12. Did you move to Arizona to accept a job for Registered Sanitarians?

- ❍ Yes (1)
- ❍ No (you were already living in Arizona) (2)

Q 13. What educational experiences have you completed? (Check all that apply)

- ❑ Associate degree (1)
- ❑ Bachelor degree (2)
- ❑ Master degree (3)
- ❑ Doctorate degree (4)
- ❑ Professional degree (JD, MD, DO, etc.) (5)
- ❑ Other (specify): (6) _____

Q 14. Identify subject matter focus of your formal education. (Select up to 3 that apply)

- ❑ Animal Science (1)
- ❑ Biochemistry (2)
- ❑ Biology (3)
- ❑ Botany (4)
- ❑ Biophysics (5)
- ❑ Biostatistics (6)
- ❑ Chemical Engineering (7)
- ❑ Chemistry (8)
- ❑ Ecology (9)
- ❑ Entomology (10)
- ❑ Environmental Health (11)
- ❑ Environmental Science (12)
- ❑ Epidemiology (13)
- ❑ Genetics (14)
- ❑ Geophysics (15)
- ❑ Geology (16)
- ❑ Hydrology (17)
- ❑ Industrial Hygiene (18)
- ❑ Infectious Diseases (19)
- ❑ Medicine (20)
- ❑ Microbiology (21)
- ❑ Molecular Biology (22)
- ❑ Nursing (23)
- ❑ Occupational Health (24)
- ❑ Parasitology (25)
- ❑ Pathology (26)
- ❑ Pharmacy (27)
- ❑ Physics (28)
- ❑ Public Health (29)
- ❑ Sanitary Engineering (30)
- ❑ Soil Science (31)
- ❑ Toxicology (32)
- ❑ Vector Control (33)
- ❑ Veterinary Science (34)
- ❑ Virology (35)
- ❑ Zoology (36)
- ❑ Other (specify): (37)

  _____

Q 15. Year that you became a Registered Sanitarian:

Q 16. Please indicate why you became a Registered Sanitarian (RS). (select the most relevant)

- ❍ To seek employment as a sanitarian or other job that requires being a RS. (1)
- ❍ To increase your competitiveness for employment that does not require being a RS. (2)
- ❍ Requirement of employer to become permanent employee. (3)
- ❍ For job promotion requirement. (4)
- ❍ For job promotion to increase competitiveness. (5)
- ❍ Other (specify): (6) _____

Q 17. Select the preferred way that you have obtained continuing education requirements?

- ❍ In-person training courses and exercises (1)
- ❍ Locally offered conferences (i.e. AZEHA, ACDEHSA, AZID, Annual RS Conference, etc.…) (2)
- ❍ National conferences (i.e. NEHA) (3)
- ❍ Educational webinars and virtual trainings (4)
- ❍ On-line courses (5)
- ❍ Other (specify): (6) _____

DEMOGRAPHIC QUESTIONS

Q1 18. What is your birth year?

Q 19. What is your gender?

- ❍ Female (1)
- ❍ Male (2)

Q 20. What race/ethnicity best describes you?

- ❍ American Indian or Alaskan Native (1)
- ❍ Asian / Pacific Islander (2)
- ❍ Black or African American (3)
- ❍ Hispanic (4)
- ❍ White / Caucasian (5)
- ❍ Other (6)

Q 21. What languages other than English can you functionally use to conduct your work activities?

	Oral (1)	Written (2)
Spanish (1)	❍	❍
Navajo (2)	❍	❍
Other Native American Languages (3)	❍	❍
Chinese (4)	❍	❍
Other: (5)	❍	❍

Appendix 4: County Health Department Survey

The following is the semi-structured survey used for key informant interviews by telephone.

- How many employees do you have currently? How does this translate into full time equivalents (FTEs)?
- Do you have any current job openings? How many? Which positions?
- Do you have any difficulty filling openings? Any difficulty retaining employees?
- Is this an increase or a reduction in your workforce based on the past 3 years? What are the reasons?
- Do you foresee any reduction in your workforce in the next 2-3 years? What are the reasons (retirement, benefits reduced, budgets cut, etc.)?
- What services/clinics do you currently provide and are they free or fee?
- Do you have any type of workforce development or training programs? Who are they for and what are they?
- Would you be interested in any (web-based/in-person) training through the University of Arizona?

Appendix 5: Center for Rural Health Pharmacy Survey

(Starts next page)

Physician Identification

***1. Name of physician completing the survey and practice location (responses will be confidential, de-identified and reported in the aggregate):**

Name of Physician:

Practice Name:

Arizona License Number:

Zip code:

Current Work Status

2. What is your current work status in Medicine?

- [ ] Practice medicine in Arizona
- [ ] Current resident or fellowship training in Arizona
- [ ] Practice Medicine in another state
- [ ] Permanently or temporarily inactive in medicine
- [ ] Retired, but maintain an active license
- [ ] Retired and do not maintain an active license
- [ ] Other

Other (please specify)

Demographic Information

3. What is your year of birth?

4. What is your gender?

- ◯ Female
- ◯ Male

5. Are you of Hispanic, Latino, or Spanish origin?

- ◯ Yes
- ◯ No

6. What is your race? Please choose one or more.

- ☐ White
- ☐ Black or African-American
- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ American Indian or Alaska Native
- ☐ Other (please specify)

7. Please indicate your proficiency in languages other than English (check all that apply).

	1. Medical proficiency	2. Basic social situations or greater proficiency
Spanish	◯	◯
Navajo	◯	◯
Arabic	◯	◯
Chinese languages	◯	◯
French	◯	◯
German	◯	◯
Korean	◯	◯
Tagalog	◯	◯
Vietnamese	◯	◯

Please specify other language(s) and proficiencies, e.g. ”Italian 1, Portuguese 2”

Current Activities in Medicine

8. How many years have you practiced in Arizona?

	0-5	5-10	10-15	15-20	>20	N/A
Number of Years practiced in Rural Arizona	◯	◯	◯	◯	◯	◯
Number of Years Practiced in Urban Arizona	◯	◯	◯	◯	◯	◯

*9. On average, how many WEEKS per year and HOURS per week do you work in patient care, research, teaching, administration and other health care activities?

Weeks/Year

Hours/Week

10. For your work reported in #9, approximately what percent of your time was spent in the following activities:(Percent should total 100%, indicate 0% when applicable)

	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
a. Direct patient care, hospital/inpatient	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
b. Direct patient care, outpatient/clinic	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
c. Direct patient care, other	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
d. Research	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
e. Teaching/Precepting	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
f. Health Care Administration	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
g. Other Health Care Activities	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

h. Other Health Care Activities (please specify)

*11. For the time spent in DIRECT patient care (#10 a-c), on average how many patient visits per week do you see?

patient visits per week

12. Select your PRIMARY and SECONDARY practice specialty in which you spend most of your professional time.

	Specialty List
PRIMARY Specialty	
SECONDARY Specialty	

Other (please specify)

*13. What percentage of your DIRECT patient care time (#10 a-c) is spent in your primary and secondary specialties?

Percent time in primary specialty

Percent time in secondary speciality

Patient Care Practice Locations

14. Location of each site where you spend time providing DIRECT patient care (#10 a-c). List the town/city and zipcode below.

Primary location town	
Primary location zip code	
Second location town	
Second location zip code	
Third location town	
Third location zip code	
Fourth location town	
Fourth location zip code	

15. What percentage of your DIRECT patient care time (#10 a-c) is spent at each of your practice locations (total should equal 100% of direct patient care)

Primary location:	
Second location:	
Third location:	
Fourth location:	

Practice Settings

16. What best describes your practice/practitioners, type/ownership per locations?

	Practice/Practitioners	Practice Type/Ownership
PRIMARY Location		
SECOND Location		
THIRD Location		
FOURTH Location		

17. If you are an organizationally-affiliated/employed physician, please specify the organization for each practice location (e.g., Carondelet, Scottsdale/Lincoln, UA Health Network, ACP). Enter "None" if no organizational affiliation.

Primary Location	
Second Location	
Third Location	
Fourth Location	

Patient Billing

*18. Payment sources for your medical practice patient visits during typical week. Record percentages below. (Total equal to 100%)

	Percentage
a. Private/Commercial Health Insurance	
b. Medicaid (AHCCCS including KidsCare)	
c. Medicare (including Medicare Advantage)	
d. Self-Pay	
e. Tricare	
f. Workers Compensation	
g. Uncompensated Care (charity, bad debt)	
h. Other Payer	

Current Practice Capacity

*19. Which describes your current patient care practice capacity?

	All Payers	AHCCCS/Medicaid	Medicare	Commercial/Private Insurance
a. Our practice is FULL. We cannot accept new patients.	☐	☐	☐	☐
b. Our practice is NEARLY FULL. We can accept a few new patients.	☐	☐	☐	☐
c. Our practice is FAR FROM FULL. We can accept many new patients.	☐	☐	☐	☐
d. Not Applicable	☐	☐	☐	☐

Near Future Practice Plans

20. Please indicate if you have plans to do the following in the next 5 years.

	2013-2018
Expand my practice at the same location	◯
Expand my practice by adding other AZ location(s)	◯
Move my practice to another geographical location in Arizona	◯
Move my practice out of Arizona	◯
Significantly reduce patient care hours	◯
Retire from patient care	◯
None of the above	◯

Near Future Practice Plans

21. What are the factors that would lead you to retire, move, and/or reduce your patient care hours in the next 5 years? (select all that apply)

- [ ] Age
- [ ] Geographic preference
- [ ] Gross receipts tax
- [ ] Health
- [ ] ICD-9 to ICD-10 conversion
- [ ] Increasing administrative/regulatory burden
- [ ] Lack of job satisfaction
- [ ] Liability insurance
- [ ] Practice environment
- [ ] Reimbursement issues
- [ ] Other

Other (please specify)

Recruitment Experience

22. How would you describe your experience in recruiting:

	Easy	Somewhat Difficult	Very Difficult	N/A
Physicians	◯	◯	◯	◯
Nurses	◯	◯	◯	◯
Nurse practitioners	◯	◯	◯	◯
Physician assistants	◯	◯	◯	◯
Other health professionals	◯	◯	◯	◯

Hypothetical Payment Thresholds Based on Your Current Practice

23. At what PERCENTAGE DECREASE in your Medicaid (AHCCCS and KidsCare) payment level would you consider:

	N/A	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Retiring from patient care	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Closing my practice to NEW Medicaid patients	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Closing my practice to ALL Medicaid patients	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Significantly reducing my patient care hours	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Moving practice out of state	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

24. At what PERCENTAGE DECREASE in your Medicare payment level would you consider:

	N/A	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Retiring from patient care	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Closing my practice to NEW Medicare patients	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Closing my practice to ALL Medicare patients	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Significantly reducing my patient care hours	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Moving practice out of state	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

25. At what PERCENTAGE DECREASE in your commercial/private health insurance payment level would you consider:

	N/A	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Retiring from patient care	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Closing my practice to NEW private health insurance patients	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Closing my practice to ALL private health insurance patients	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Significantly reducing my patient care hours	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯
Moving practice out of state	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯

Appendix 3: Arizona Registered Sanitarian (RS) Survey

This survey is used to assess current and future supply of registered sanitarians in Arizona. The survey will take about 10 minutes to complete. Thank you for taking the time to complete the survey.

Q 1. Identify your current work status.

- ❍ Employed as a sanitarian in Arizona (1)
- ❍ Employed as a sanitarian in a state other than Arizona (2)
- ❍ Looking for employment as a sanitarian in Arizona (3)
- ❍ Looking for employment as a sanitarian in a state other than Arizona (4)
- ❍ Employed in Arizona, but not in a field that requires a sanitarian registration (5)
- ❍ Employed in a state other than Arizona, but not in a field that requires a sanitarian registration (6)
- ❍ Retired or unemployed, (skip to question 10). (7)
- ❍ Other (specify): (8) _____

If Retired or unemployed then Skip to End of Block

Q 2. Identify your current work status.

- ❍ Consultant, independent (1)
- ❍ City/town government (2)
- ❍ County health department (3)
- ❍ State health department (4)
- ❍ Other county/state agency (5)
- ❍ Military (6)
- ❍ Veterans Administration (7)
- ❍ Indian Health Service (8)
- ❍ Other Federal agency (9)
- ❍ Food services (e.g. restaurants) (10)
- ❍ Food processing (11)
- ❍ Hotels and resorts (12)
- ❍ School districts (13)
- ❍ Universities & colleges (14)
- ❍ Manufacturing (15)
- ❍ Retail (16)
- ❍ Other (specify): (17) _____

Q 3. What is the zip code (of street address) of your work office?

Q 4. Estimate the percentage (1%-100%) of your time allocated to these activities during your average work year.

_____ Administration (1)
_____ Supervision, and number of non-registered sanitarians supervised, if any. (2)
_____ Field investigations (3)
_____ Sales (4)
_____ Compliance assessment of rules and regulations (5)
_____ Compliance enforcement of rules and regulations (6)
_____ Other (specify): (7)

Q 5. Estimate the percentage (1%-100%) of your time allocated to these issues during your average work year.

_____ Non-sanitarian work responsibilities (1)
_____ Food protection (2)
_____ Water quality, potable (3)
_____ Water quality, swimming pools (4)
_____ Water quality, surface (5)
_____ Water quality, wells (6)
_____ Water quality, waste water (7)
_____ Air quality (8)
_____ Solid waste (9)
_____ Hazardous waste (10)
_____ Hazardous substances and/or radiation (11)
_____ Industrial hygiene, health, and/or safety (12)
_____ Vector, pest, and weed control (13)
_____ Animal control (14)
_____ Housing quality (15)
_____ Product safety (16)
_____ Disaster and emergency planning (17)
_____ Public outreach and education (18)
_____ Other (specify): (19)

Q 6. Please rank the influences for your decision to accept your current position.

	Most Influential (1)	Extremely Influential (2)	Somewhat Influential (3)	Least Influential (4)	Not Influential (5)
Location (1)	❍	❍	❍	❍	❍
Salary (2)	❍	❍	❍	❍	❍
Benefits (3)	❍	❍	❍	❍	❍
Job description (4)	❍	❍	❍	❍	❍
Other: (5)	❍	❍	❍	❍	❍

Q 7. How many hours per week do you normally work?

Q 8. How many miles do you commute from your residence to your work office/site (one way)?

Q 9. Do you use Registered Sanitarian skills in your present work?

- ❍ Yes (1)
- ❍ No (2)

Q 10. To estimate the future supply of Registered Sanitarians (RS) in Arizona, please indicate your work plans over the next 5 years. (select one)

- ❍ Currently retired, maintain registration because may want to seek employment as a sanitarian in Arizona (1)
- ❍ Currently retired, maintain registration because may want to seek employment as a sanitarian in another state (2)
- ❍ Currently retired, maintain registration but have no plans to seek employment as a sanitarian (3)
- ❍ Currently retired, will not maintain registration as a sanitarian (4)
- ❍ Plan to retire within the next 5 years (5)
- ❍ Maintain my current employment working as a RS (6)
- ❍ Maintain my current employment not working as a RS (7)
- ❍ Increase my work activities as a RS (8)
- ❍ Reduce my work activities as a RS (9)
- ❍ Stop working as a RS (10)

Q 11. Select the most appropriate statements that influence your work plans over the next 5 years.

- ❑ Satisfied with my current employment as a RS. (1)
- ❑ Change residence within Arizona. (2)
- ❑ Change residence outside of Arizona. (3)
- ❑ Seek an increase in income. (4)
- ❑ Seek additional education. (5)
- ❑ Seek work with more advancement opportunities. (6)
- ❑ Seek other work that does not require being a RS. (7)
- ❑ Other personal or family reasons. (8)

Q 12. Did you move to Arizona to accept a job for Registered Sanitarians?

- ❍ Yes (1)
- ❍ No (you were already living in Arizona) (2)

Q 13. What educational experiences have you completed? (Check all that apply)

- ❑ Associate degree (1)
- ❑ Bachelor degree (2)
- ❑ Master degree (3)
- ❑ Doctorate degree (4)
- ❑ Professional degree (JD, MD, DO, etc.) (5)
- ❑ Other (specify): (6) _____

Q 14. Identify subject matter focus of your formal education. (Select up to 3 that apply)

- ❑ Animal Science (1)
- ❑ Biochemistry (2)
- ❑ Biology (3)
- ❑ Botany (4)
- ❑ Biophysics (5)
- ❑ Biostatistics (6)
- ❑ Chemical Engineering (7)
- ❑ Chemistry (8)
- ❑ Ecology (9)
- ❑ Entomology (10)
- ❑ Environmental Health (11)
- ❑ Environmental Science (12)
- ❑ Epidemiology (13)
- ❑ Genetics (14)
- ❑ Geophysics (15)
- ❑ Geology (16)
- ❑ Hydrology (17)
- ❑ Industrial Hygiene (18)
- ❑ Infectious Diseases (19)
- ❑ Medicine (20)
- ❑ Microbiology (21)
- ❑ Molecular Biology (22)
- ❑ Nursing (23)
- ❑ Occupational Health (24)
- ❑ Parasitology (25)
- ❑ Pathology (26)
- ❑ Pharmacy (27)
- ❑ Physics (28)
- ❑ Public Health (29)
- ❑ Sanitary Engineering (30)
- ❑ Soil Science (31)
- ❑ Toxicology (32)
- ❑ Vector Control (33)
- ❑ Veterinary Science (34)
- ❑ Virology (35)
- ❑ Zoology (36)
- ❑ Other (specify): (37)

  _____

Q 15. Year that you became a Registered Sanitarian:

Q 16. Please indicate why you became a Registered Sanitarian (RS). (select the most relevant)

- ❍ To seek employment as a sanitarian or other job that requires being a RS. (1)
- ❍ To increase your competitiveness for employment that does not require being a RS. (2)
- ❍ Requirement of employer to become permanent employee. (3)
- ❍ For job promotion requirement. (4)
- ❍ For job promotion to increase competitiveness. (5)
- ❍ Other (specify): (6) _____

Q 17. Select the preferred way that you have obtained continuing education requirements?

- ❍ In-person training courses and exercises (1)
- ❍ Locally offered conferences (i.e. AZEHA, ACDEHSA, AZID, Annual RS Conference, etc.…) (2)
- ❍ National conferences (i.e. NEHA) (3)
- ❍ Educational webinars and virtual trainings (4)
- ❍ On-line courses (5)
- ❍ Other (specify): (6) _____

DEMOGRAPHIC QUESTIONS

Q1 18. What is your birth year?

Q 19. What is your gender?

- ❍ Female (1)
- ❍ Male (2)

Q 20. What race/ethnicity best describes you?

- ❍ American Indian or Alaskan Native (1)
- ❍ Asian / Pacific Islander (2)
- ❍ Black or African American (3)
- ❍ Hispanic (4)
- ❍ White / Caucasian (5)
- ❍ Other (6)

Q 21. What languages other than English can you functionally use to conduct your work activities?

	Oral (1)	Written (2)
Spanish (1)	❍	❍
Navajo (2)	❍	❍
Other Native American Languages (3)	❍	❍
Chinese (4)	❍	❍
Other: (5)	❍	❍

Appendix 4: County Health Department Survey

The following is the semi-structured survey used for key informant interviews by telephone.

- How many employees do you have currently? How does this translate into full time equivalents (FTEs)?
- Do you have any current job openings? How many? Which positions?
- Do you have any difficulty filling openings? Any difficulty retaining employees?
- Is this an increase or a reduction in your workforce based on the past 3 years? What are the reasons?
- Do you foresee any reduction in your workforce in the next 2-3 years? What are the reasons (retirement, benefits reduced, budgets cut, etc.)?
- What services/clinics do you currently provide and are they free or fee?
- Do you have any type of workforce development or training programs? Who are they for and what are they?
- Would you be interested in any (web-based/in-person) training through the University of Arizona?

Appendix 5: Center for Rural Health Pharmacy Survey

(Starts next page)

Arizona Pharmacist Workforce Survey

The University of Arizona, Mel and Enid Zuckerman College of Public Health, Center for Rural Health is conducting an Arizona Pharmacist Workforce Survey. This goal of this survey to assess current and future roles of pharmacists in Arizona. The survey will take about 15 minutes to complete. Your participation in the survey is crucial in getting an accurate picture of pharmacist practice in the state. Thank you for taking the time to complete the survey.

Practice Setting Questions:

1. Select your current employment status? (Check one)

- ○ Employed full-time as a pharmacist
- ○ Employed part-time as a pharmacist
- ○ Unemployed as a pharmacist but seeking employment as a pharmacist (go to 11)
- ○ No longer practicing as a pharmacist (go to 20)
- ○ Employed full-time in a pharmacy-related field or position but not practicing as a pharmacist (go to 20)
- ○ Employed part-time in a pharmacy-related field or position but not practicing as a pharmacist (go to 20)

2. For your primary pharmacy practice setting, which of the following best describes your position? (Select one)

Owner/partner

Manager/director/assistant manager/supervisor

Staff/employee pharmacist

Resident/fellow

Other (specify):

3a. Identify your current primary pharmacy practice setting. (Select all that apply)

- Community independent / chain
- Hospital/health system inpatient/outpatient department-clinic
- Community Health Center / Clinic
- IHS, VA, or military services
- Pharmacy education/university
- Other (go to 3b)

3b. Identify your current primary pharmacy practice setting. (Select all that apply)

- Long-term care/nursing home/hospice
- Home IV infusion/home health care
- Health Department
- Local or state government agency
- Pharmacy benefit management (PBM)
- Pharmaceutical manufacturing (industry)
- Pharmaceutical consulting
- Managed care
- Mail order pharmacy
- Medical management company
- Temporary agency
- Nuclear pharmacy
- Other (specify):

4. What is the zip code (of the street address) of your primary practice setting (if not in the US then name the country)?

5. In addition to your primary practice setting, do you work in other pharmacy practice settings?

Yes

No (go to question 7)

6. What is the zip code or country and your percent effort during the past 4 weeks at the other pharmacy practice settings?

	Zip code of street address	Percent of total practice
2nd practice site		
3rd practice site		
4th practice site		

7. Do you (as an individual pharmacist) provide direct care or counseling to your patients at your primary practice setting?

Yes

No

8. Are clinical services provided at your primary practice setting?

Yes

No (go to 10)

9. Approximately what percentage of your patients/clients are provided clinical services?

10. Does your primary practice setting incorporate interdisciplinary therapy plans or collaborative practice agreements?

- Yes
- No

11. To assist us in projecting the supply of Arizona pharmacists in the future, please tell us how much longer you plan to practice as a pharmacist.

- Less than a year
- 1 - 5 years
- 6 - 10 years
- 11 - 15 years
- 16 - 20 years
- More than 20 years
- Don't know

Comparison of current (past 4 weeks) and likely future practice (next 5 years):

12. Indicate the average number of hours/week that you currently dedicate to each practice setting (Enter average hrs/wk by all options that apply).

Not currently working as a pharmacist, enter 0 go to question 13.

Community independent	
Community chain	
Hospital/health system inpatient	
Hospital/health system outpatient department-clinic	
Community Health Center / Clinic	
IHS, VA, or military services	
Pharmacy education/university	
Long-term care/nursing home/hospice	
Home IV infusion/home health care	
Health Department	
Local or state government agency	
Pharmacy benefit management (PBM)	
Pharmaceutical manufacturing (industry)	
Pharmaceutical consulting	
Managed care	
Mail order pharmacy	
Medical management company	
Temporary agency	
Nuclear pharmacy	
Other (specify):	

13. How many hours per week do you anticipate you will be dedicating to the following practice settings over the next five years? (average hrs/wk for each option that applies)

No plans to work as a pharmacist, enter 0 go to question 14	
Community independent	
Community chain	
Hospital/health system inpatient	
Hospital/health system outpatient department-clinic	
Community Health Center / Clinic	
IHS, VA, or military services	
Pharmacy education/university	
Long-term care/nursing home/hospice	
Home IV infusion/home health care	
Health Department	
Local or state government agency	
Pharmacy benefit management (PBM)	
Pharmaceutical manufacturing (industry)	
Pharmaceutical consulting	
Managed care	
Mail order pharmacy	
Temporary agency	
Nuclear pharmacy	

Other (hrs/wk):

Other (describe setting):

14. Which of the following services are currently offered at your primary practice site? (Select all that apply)

- Not currently working as a pharmacist
- Specialty/complex compounding
- Drug information service
- Home infusion
- Immunizations
- Health screening
- Smoking cessation
- Nutritional support
- Pharmacokinetic dosing
- Anticoagulation services
- Diabetes management
- Dyslipidemia management
- Hypertension management
- Asthma/COPD management
- Osteoporosis screening/management
- Pain management
- Weight management
- Other (specify):

15. Which of the following services do you anticipate will be offered at your primary practice site over the next five years? (Select all that apply)

- No plans to work as a pharmacist

Specialty/complex compounding

Drug information service

Home infusion

Immunizations

Health screening

Smoking cessation

Nutritional support

Pharmacokinetic dosing

Anticoagulation services

Diabetes management

Dyslipidemia management

Hypertension management

Asthma/COPD management

Osteoporosis screening/management

Pain management

Weight management

Other (specify) :

16. How would you describe the level of interdisciplinary practice you currently have in your primary practice setting?

Not currently working as a pharmacist

Very involved resulting in significant patient care/therapeutic outcomes

Somewhat involved resulting in some patient care/therapeutic outcomes

Slightly involved resulting in slight patient care/therapeutic outcomes

Minimally involved resulting in few patient

care/therapeutic outcomes

Nonproductive resulting in no documentable patient care/therapeutic outcomes

17. What do you anticipate the level of interdisciplinary practice to be in your primary practice setting over the next five years?

No plans to work as a pharmacist

Very involved resulting in significant patient care/therapeutic outcomes

Somewhat involved resulting in some patient care/therapeutic outcomes

Slightly involved resulting in slight patient care/therapeutic outcomes

Minimally involved resulting in few patient care/therapeutic outcomes

Nonproductive resulting in no documentable patient care/therapeutic outcomes

18. In your primary practice setting indicate the roles that pharmacy technicians currently fill? (Select all that apply)

Not currently working as a pharmacist

Customer service provider

Inventory management

Buying and acquisition

Medication preparation in the distribution process

Medication reconciliation

Management/administrative duties

Study coordination and management (includes financial/budgetary responsibilities)

Verification of inpatient's prior to admit medications

Other (specify):

Not applicable

19. What do you anticipate the roles that pharmacy technicians will fill in your pharmacy practice setting over the next five years? (Select all that apply)

No plans to work as a pharmacist

Customer service provider

Inventory management

Buying and acquisition

Medication preparation in the distribution process

Medication reconciliation

Management/administrative duties

Study coordination and management (includes financial/budgetary responsibilities)

Verification of inpatient's prior to admit medications

Other (specify):

Demographic Questions:

20. What is your Arizona Pharmacist license number?
(The number is used to link to board information. All information will be kept confidential; no individual pharmacist information will be identifiable. All pharmacist data will be reported in aggregate).

21. What is your birth year?

22. What is your gender?

Male

Female

23. Which of the following educational experiences have you completed? (Check all that apply)

BS in Pharmacy

PharmD

Residency

Fellowship

Certification Program (describe)

Masters (describe)

Doctorate (describe)

Other (describe)

24. What is the name of the pharmacy school where you graduated, year, and state or country? (Board information on schools is incomplete, and not available if your Arizona license was initiated prior to 2009)

School name:

Year of graduation:

Indicate state or if not in US, indicate country:

We thank you for your time spent taking this survey.
Your response has been recorded.