Minnesota's Primary Care Workforce, 2011-2012

September 2013

MINNESOTA MDH DEPARTMENT OF HEALTH

OFFICE OF RURAL HEALTH & PRIMARY CARE

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Table of Contents

Introduction

Policy interest in the primary care workforce may be at an all-time high. As the most far-reaching parts of the 2010 Patient Protection and Affordable Care Act (ACA) near implementation deadlines in 2014 – increasing the need for primary care – and as the "Age Wave" further reshapes both supply and demand for such care, debate intensifies about whether the U.S. will have enough primary care providers, who should provide such care, and if those providers will be accessible to all who need them.

This report seeks to inform those questions by describing the existing primary care workforce in Minnesota as of 2011-2012. While it cannot answer whether the state will have enough primary care providers to meet the need, it does provide a valuable snapshot of the current workforce: the number of primary care clinicians currently practicing in the state and how they are distributed, geographically as well as by age, gender, race/ethnicity and future plans to practice.

The analysis is based on information the Minnesota Department of Health (MDH) collects in cooperation with the Minnesota Board of Medical Practice (BMP) and the Minnesota Board of Nursing (BON). Specifically, it combines two types of data: (1) license renewal data the two Boards require from all clinicians when they apply for or renew a license to practice, and (2) responses to an MDH workforce survey that providers are asked to complete as part of the licensing renewal process. Unless otherwise noted, the graphs and narrative are based on the more complete BMP/BON licensing data, which is required from all providers (versus data from the surveys, where response rates vary).

Defining primary care

This report defines "primary care workforce" as the following:

1. **Physicians**: physicians with a single, general board certification in family medicine; internal medicine; or pediatrics (based on the definition of primary care physician in Minnesota Statutes section 137.38).[1]
2. **Nurse practitioners (NPs)**: NPs certified in one or more of the following specialties: adult health, family health, gerontology, pediatrics or women's health (based on the "primary care competencies" for NPs as defined by the federal Health Resources and Services Administration [HRSA]).[2]
3. **Physician assistants (PAs)**: All, as the profession has only recently begun offering "specialty certifications" and this data is still too minimal to provide an accurate number of PAs providing primary care versus specialty care (as of August 2013, only 14 Minnesota PAs had these additional certifications).[3] Including all PAs in this analysis therefore overstates the size of the primary care PA workforce (others estimate that only 31 to 43 percent of PAs practice primary care),[4] but is unavoidable given current data available. See the PA section below for more on this issue.

Importantly, no consensus definition of "primary care provider" exists at the state or national level. Other common definitions include physicians with OB/GYN specialties, for example, or geriatricians. Even Minnesota's own laws and programs use inconsistent definitions, and no single Minnesota law defines primary care in an overall sense (see Appendix A for other ways primary care is defined). Given these differences, it is recognized that the definitions used here – and the resulting data – are imprecise, as some of the providers included may not necessarily be practicing primary care and others who were excluded may be practicing such care.

Summary of Key Findings

Overall

- In 2011-2012, Minnesota had a primary care workforce totaling 9,076 clinicians: 5,064 physicians, 2,447 nurse practitioners (NPs) and 1,565 physician assistants (PAs).
- Of the three provider types, Minnesota's physician assistants (PAs) are the youngest, with only 28 percent older than 45. In comparison, more than half of nurse practitioners (NPs) and physicians are over 45 and therefore closer to retirement.
- Women represent the majority of Minnesota's primary care workforce, except in the case of physicians, where men remain more than half of the workforce (58 percent).
- Individuals of color, and particularly Black and Hispanic clinicians, are underrepresented in the state's primary care workforce.
- The majority of Minnesota's primary care providers are concentrated in urban areas. Only 10 to 11 percent live in small and isolated rural areas, though 17 percent of the state's population is located there.
- The regional concentration of primary care providers reflects the location of Minnesota's largest cities and medical facilities.

Primary care physicians

- Family medicine physicians represent half of the state's primary care physician workforce, with general internists accounting for 34 percent and general pediatricians approximately 16 percent.
- Although men outnumber women in the primary care workforce overall, women outnumber men in younger cohorts (particularly those under 45) and in pediatrics.
- Nearly one third of the state's primary care doctors are over 55, though over half intend to continue practicing for more than 10 years. Roughly 20 percent intend to work less than five years more.
- Of the three physician types, family physicians are most likely to be practicing in rural areas.
- Pediatricians are most likely to have collaborative management agreements with NPs, while family medicine physicians are more likely to have working agreements with PAs.

Primary nurse practitioners (NPs)

- Nearly half (43 percent) of the Advanced Practice Registered Nurses (APRNs) in Minnesota practice primary care, with nearly half of the primary care NPs specializing in family medicine.
- Over half (56 percent) of Minnesota's primary care NPs are over 44 years old and nearly one third are eligible to retire in 7 to 10 years.
- Although men are entering the RN workforce in growing numbers, as of 2011-2012 they represented only 5 percent of Minnesota's primary care NP workforce.
- The great majority (94 percent) of Minnesota's primary care NPs are White. Black and Latino/Hispanic Minnesotans are underrepresented in the profession.
- Minnesota's primary care NPs are disproportionately concentrated in urban and large rural areas, even more so than in the U.S. overall: only 11 of the state's primary care NPs live in small and rural isolated areas (compared to 11 percent nationally), while 17 percent of the state's population lives there.

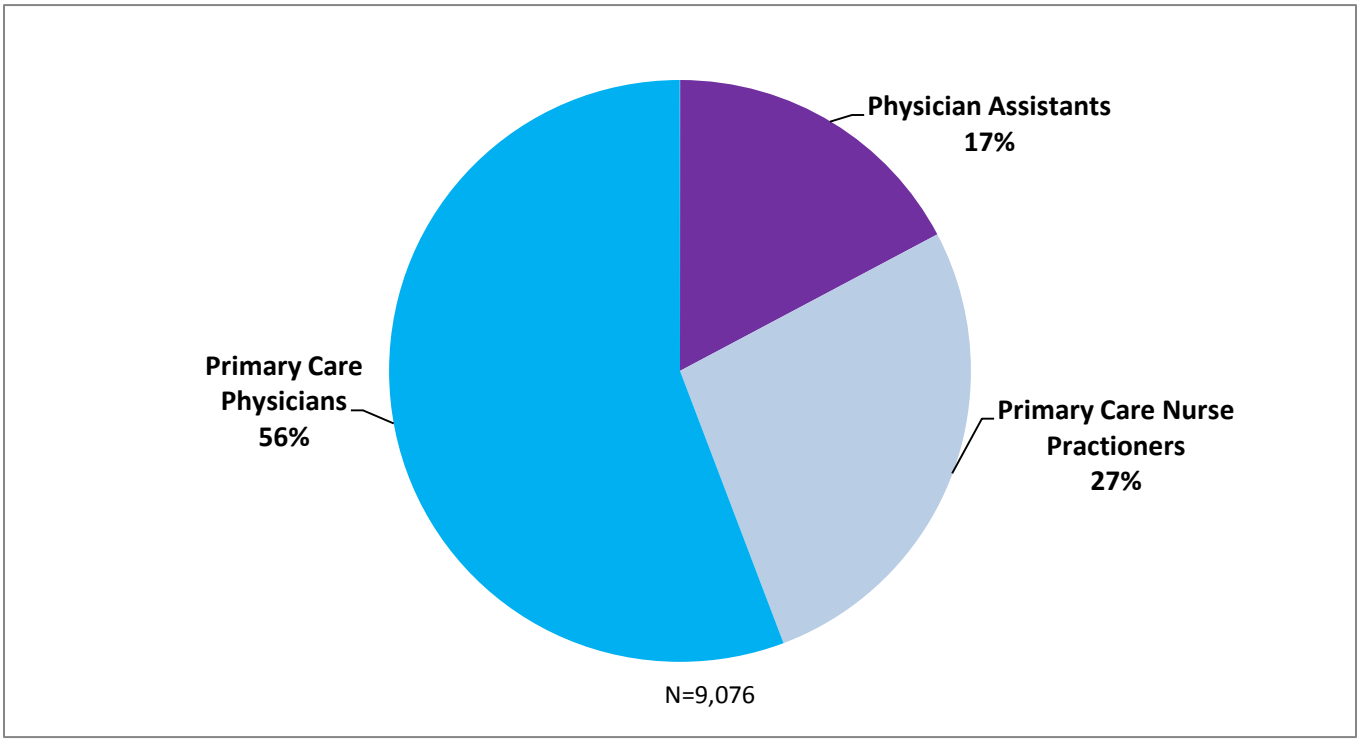
Physician assistants (PAs)

- Minnesota's PA workforce is young: nearly half (41 percent) are 34 years old or younger.
- Men have historically made up the majority of PAs, but today the majority of PAs younger than 55 years old are women.
- Nationally, 13 percent of the PA workforce is located in small and isolated rural areas (compared to 10 percent of the U.S. population), but in Minnesota only 10 percent of the state's PAs live in those areas (compared to 17 percent of the state's population).
- Though rural areas of the state have a comparatively older PA workforce, most of those PAs (65 percent) intend to practice 10 or more years.

Section I. Primary care workforce overall

This section of the report examines the primary care provider workforce in Minnesota as a whole. As described above, that workforce is defined to include three specific categories of providers. It is important to note, however, that the three professions have different training requirements and work within different scopes (and limitations) of practice. PAs and NPs cannot do all that a physician can do, and both must work with a physician to some degree (see the PA and NP sections of the report for more on their respective requirements and scopes of practice). Despite those differences – and despite disagreement regarding the roles each should play in delivering care – all three provider types provide substantial amounts of Minnesota's primary care and increasingly work together within certified Health Care Homes and other emerging interdisciplinary, team-based models of care.[5]

Figure 1-1. Primary Care Providers in Minnesota by Type, 2011-2012

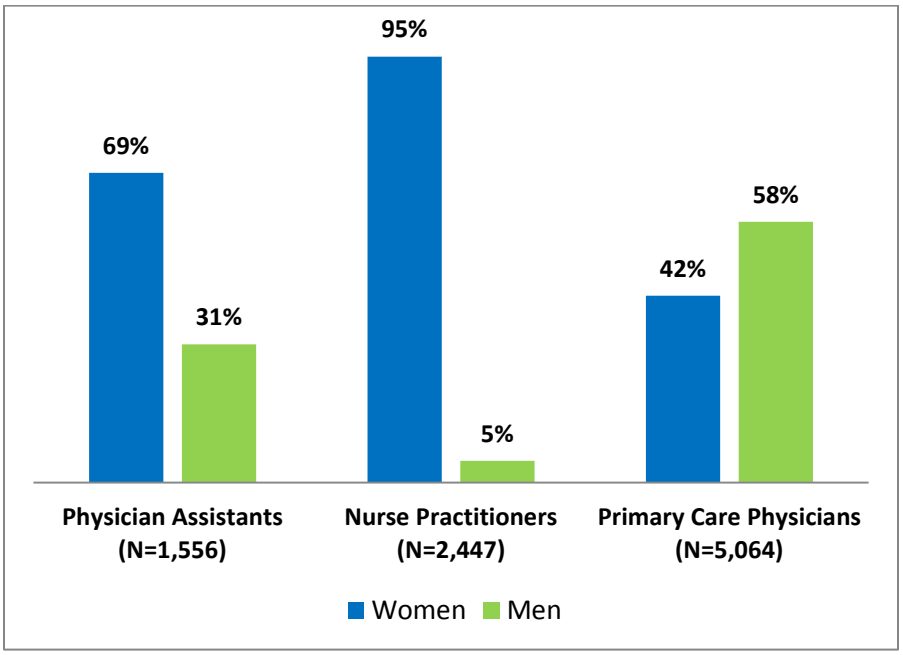


Source: Minnesota Board of Medical Practice (BMP), Minnesota Board of Nursing (BON) and Minnesota Department of Health (MDH)

- As of 2011-2012, a total of 9,076 primary care providers were licensed to practice in Minnesota.
- Physicians still deliver most primary care in Minnesota, followed by primary care NPs. Primary care physicians total 5,064, primary care NPs total 2,447 and PAs total 1,565.

Demographics

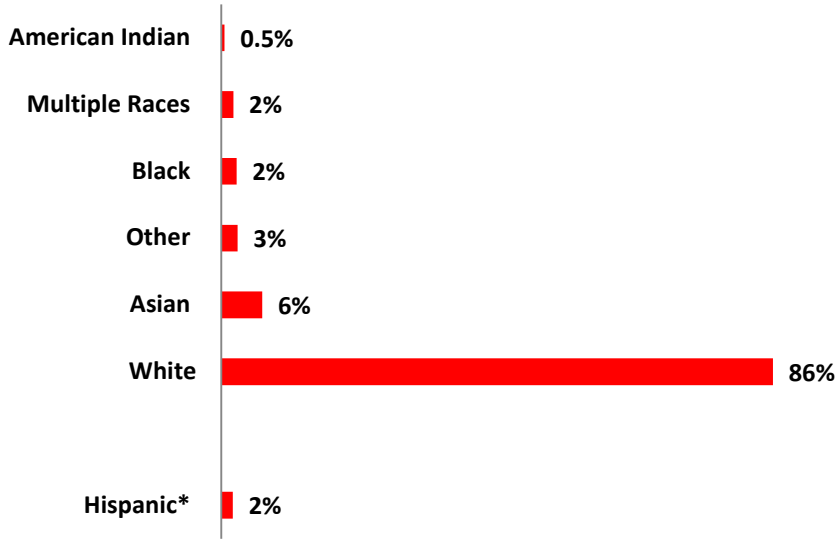
Figure 1-2. Gender of Primary Care Providers, by Profession



Source: BMP, BON, MDH

- Gender differs significantly across the three provider types.
- The primary care NP workforce is disproportionately female (95 percent).
- One-third of PAs are male.
- Primary care physicians are the only provider type where men remain the majority, although growing numbers of women are also becoming physicians.

Figure 1-3. Race and Ethnicity of Primary Care Providers in Minnesota

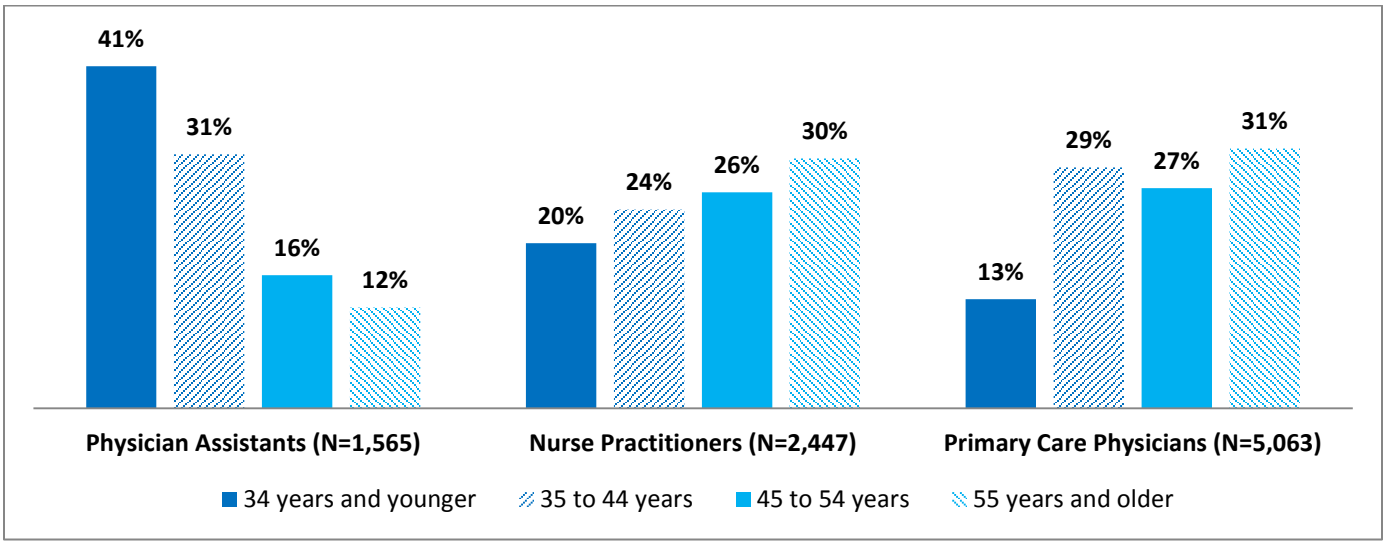


*Individuals identifing as Hispanic can be of any race, and on the surveys Hispanic origin is asked in a question separate from the question about race. Total response to the question of race was n=4,687 and total response to the question of Hispanic ethnicity was n=5,194.

Source: MDH health care workforce surveys, 2011-2012

- Minnesota's mostly white primary care workforce does not yet reflect the state's growing diversity.
- Black and Hispanic/Latino Minnesotans are especially underrepresented. Individuals identifying as Black represent 5 percent of the state's population but only 2 percent of the primary care workforce. Similarly, Hispanic/Latino Minnesotans represent 5 percent of the state but only 2 percent of its primary care providers.[6]

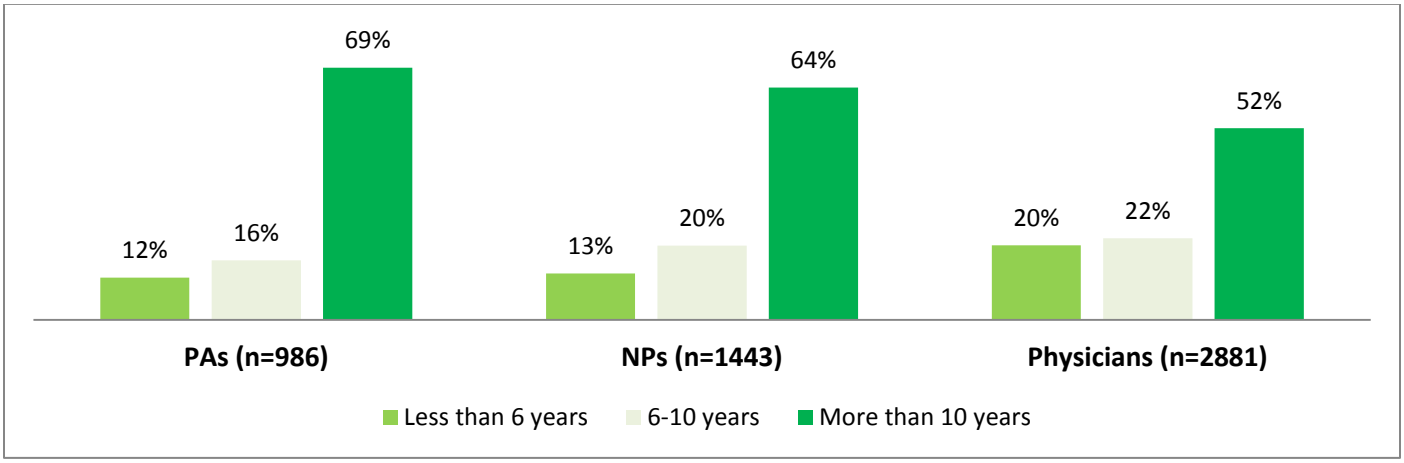
Figure 1-4. Age Distribution of Primary Care Workforce, by Provider Type



Source: BMP, BON, MDH

- Physician Assistants are the youngest of the providers, with only 28 percent older than 45.
- Differing education and training requirements are important considerations when analyzing age differences by provider type. Physicians having the longest training (four years of medical school and three years of residency) and PAs the shortest (a two-year Master's degree after completing four years of undergraduate education). All NPs are registered nurses and after completing four years of undergraduate education go on to complete a two-year Master's and/or three-year Doctorate program.
- More than half of the NPs and physicians are 45 years and older, so it is likely a third of these providers will begin retiring from the primary care workforce in the next 10 years. This is a concern given the longer training requirements for these two professions compared to PAs.

Figure 1-5. Intent to Continue Practicing in Minnesota, by Provider Type



Source: MDH health care workforce surveys, 2011-2012

- Physicians were more likely than other primary care providers to indicate they intended to practice in Minnesota for only 5 years or less.
- The large percentage of physician assistants indicating they intend to practice more than 10 years likely reflects their younger age and the comparatively shorter training period for that profession.

Rural-urban distribution

To understand the urban-rural distribution of the state's primary care workforce, this report uses four Rural-Urban Commuting Area (RUCA) categories – urban, large rural, small rural and isolated rural areas. RUCAs measure the "rurality" of a location based on community population size, commuting distance and driving time to larger population centers.[7]

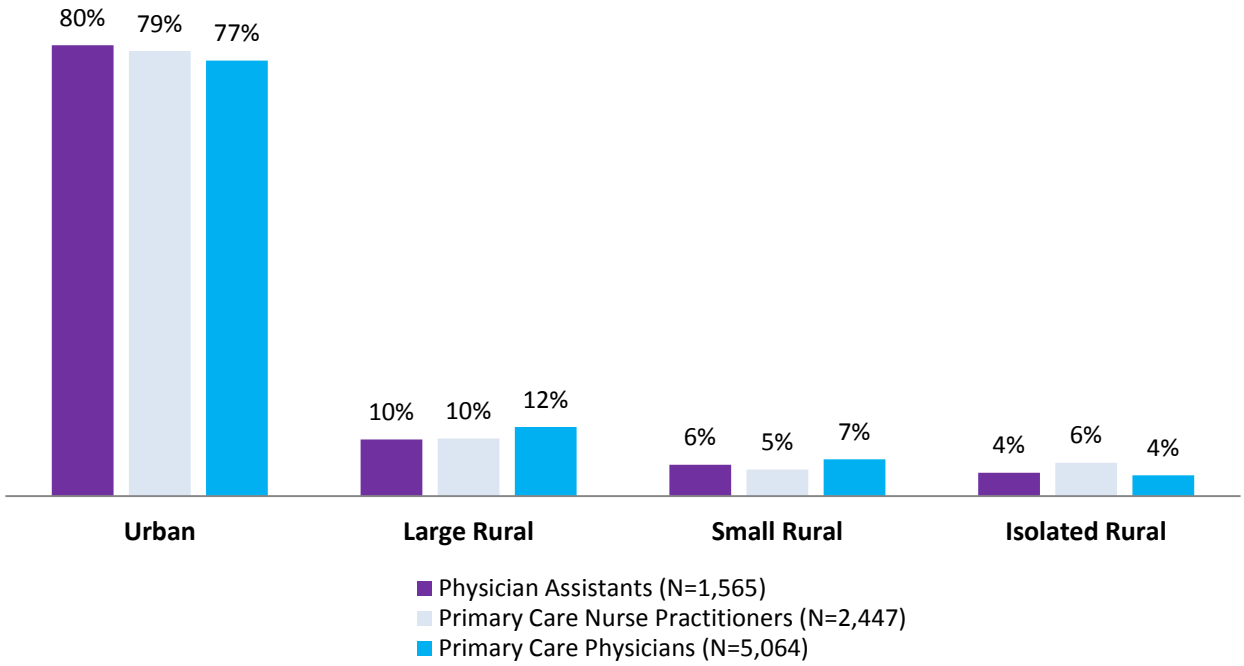
Table 1-1. Rural-Urban (RUCA) Distribution of Primary Care Providers, Minnesota versus U.S.

	Physician Assistants		Nurse Practitioners		Physicians		Population	
	MN	US	MN	US	MN	US*	MN	US
Urban	80%	75%	79%	72%	77%	n/a	70%	80%
Large Rural	10%	12%	10%	11%	12%	n/a	13%	10%
Small Rural	6%	7%	5%	8%	7%	n/a	7%	5%
Isolated Rural	4%	6%	6%	9%	4%	n/a	10%	5%
Total	100%	100%	100%	100%	100%	n/a	100%	100%

Source: Agency for Healthcare Research and Quality, AHRQ Pub No. 12-P001-4-EF. ; MDH; U.S. Census. ***Comparable physician counts unavailable to create primary care aggregate percentages by RUCA.**

Minnesota is slightly more rural than the United States as a whole, particularly in the percentage of the state's population living in small rural or isolated rural (17 percent of Minnesota compared to 10 percent of the nation). However, only 10 to 11 percent of the state's primary care workforce serves the 17 percent of its population living in these areas (Figure 1-6). In large rural areas, physician distribution overall is closer proportionally to the population, though certain physician specialties are still underrepresented there (see Section II).

Figure 1-6. Rural-Urban Distribution of Minnesota's Primary Care Workforce, by Provider Type



Source: BMP, BON, MDH

Regional distribution

Regions offer another useful lens for analyzing the geographic distribution of the state's primary care workforce. The graph below shows how the three primary care provider types are distributed across the six planning regions defined by the Minnesota Department of Employment and Economic Development (DEED).[8]

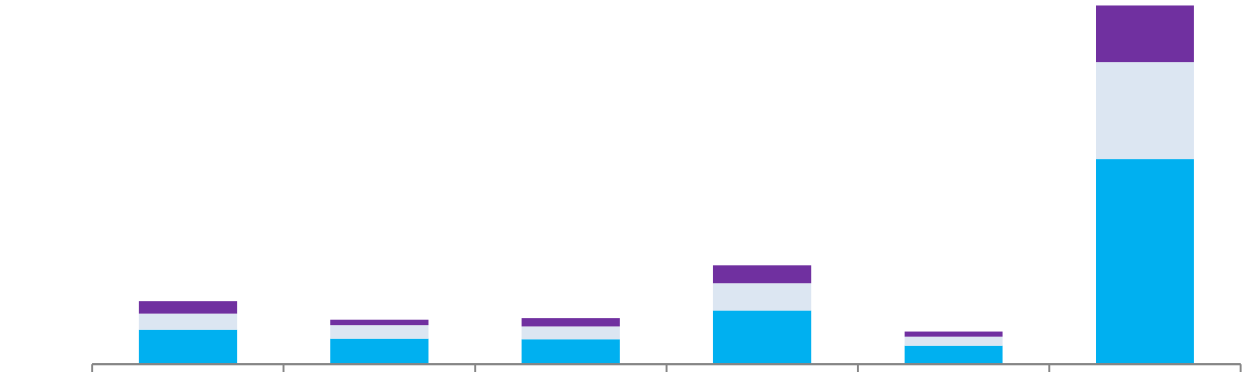
Table 1-2. Regional Distribution of Primary Care Providers and Population in Minnesota

Minnesota Region	Physician Assistants		Nurse Practitioners		Physicians		Population	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Central	170	11%	223	9%	485	10%	684,001	13%
Northeast	75	5%	187	8%	359	7%	326,225	6%
Northwest	116	7%	177	7%	350	7%	553,805	10%
Southeast	247	16%	380	16%	751	15%	494,684	9%
Southwest	72	5%	125	5%	259	5%	395,643	8%
Twin Cities	885	57%	1,355	55%	2,860	56%	2,849,567	54%
Minnesota	1,565	100%	2,447	100%	5,064	100%	5,303,925	100%

Source: BMP, MDH, U.S. Census

- The regions of the state with the biggest cities – and medical facilities – have the greatest number of primary care providers.
- The northwest and southwest regions of the state are its most rural, and this is reflected in the lower number of providers located there. These border regions are also served by providers located in North and South Dakota, however, just as residents in southern Minnesota often visit providers in Iowa. Similarly, Minnesota providers in these regions also serve residents of bordering states.

Figure 1-7. Number of Primary Care Providers, by Region of Minnesota



	Central	Northeast	Northwest	Southeast	Southwest	Twin Cities seven-county region
PAs	170	75	116	247	72	885
NPs	223	187	177	380	125	1355
MDs	485	359	350	751	259	2860

Source: BMP, BON, MDH

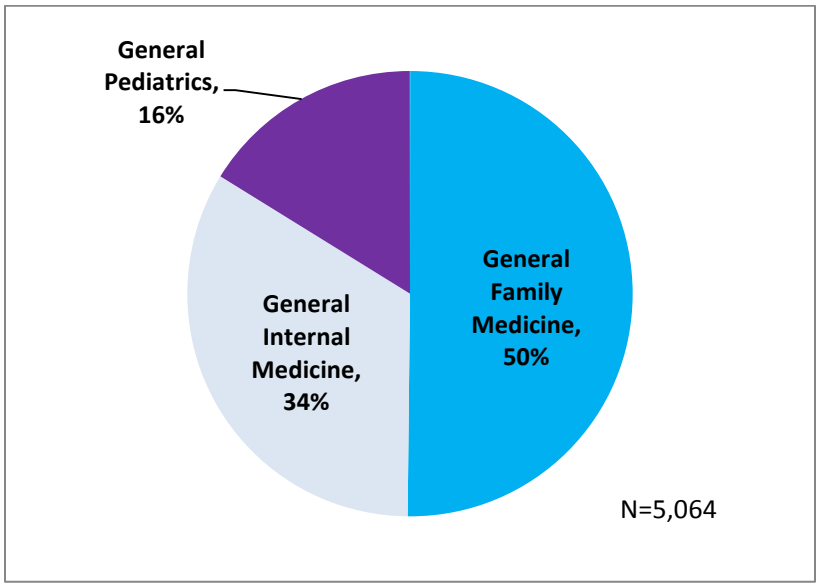
Section II. Physicians

This section profiles the physician component of Minnesota's primary care workforce. "Primary care physician" is defined here as encompassing three types of doctors: family practice physicians, general internists and general pediatricians, and specifically those Minnesota-licensed physicians with a single board certification in family medicine, internal medicine or pediatrics. This definition is based on a specific Minnesota statute (Minnesota Statutes section 137.38, Education and Training of Primary Care Physicians). See also "Defining Primary Care" in the report Introduction above, as well as Appendix A, for more detail on definitions and methodology used.

To obtain a license to practice medicine in Minnesota, a physician must have graduated from an accredited medical or osteopathic school, completed an accredited graduate clinical medical training residency, and passed the U.S. Medical Licensing Examination or approved equivalents.[9] In addition to licensure, a physician may become "board certified" in an area of practice or specialty. To become certified, a physician must not only possess a medical license (issued by the State of Minnesota), but he or she must also successfully pass one or more examinations that evaluate mastery of the specific medical or surgical field. Examining boards for each specialty field issue these certificates (thus the term "board-certified specialty"). The State of Minnesota recognizes two of the umbrella medical specialty certification board associations: the American Board of Medical Specialties (ABMS) and the Certifying Boards of the American Osteopathic Association (AOA).

As of 2011-2012, a total of 5,064 primary care physicians were licensed to practice in Minnesota.

Figure 2-1. Primary Care Physician Mix in Minnesota

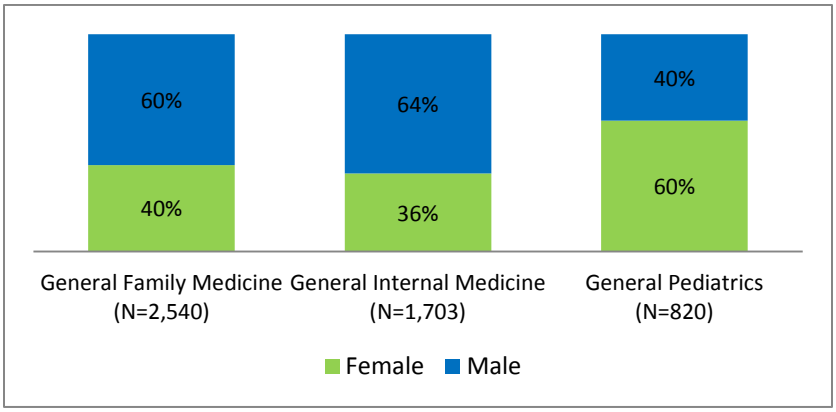


Source: BMP and MDH

- Half of Minnesota's primary care physician workforce is composed of board-certified family medicine providers.
- Over one third of the state's primary care physicians are board-certified general internists, although the MDH workforce survey suggests that up to 30 percent may be working as hospitalists in acute care settings rather than in primary care clinics.
- Board-certified general pediatricians represent the smallest cohort.

Demographics

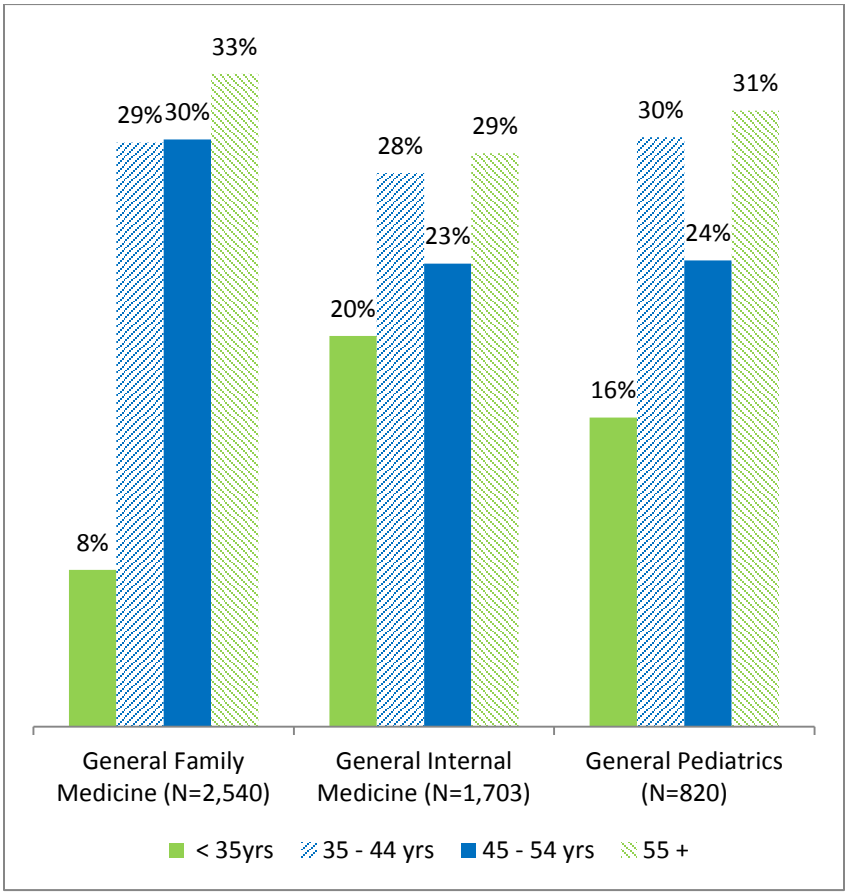
Figure 2-2. Gender Distribution of Primary Care Physicians in Minnesota



Source: BMP and MDH

- The general family and internal medicine primary care physician workforce is predominately male.
- Women account for the largest percentage of general pediatricians.

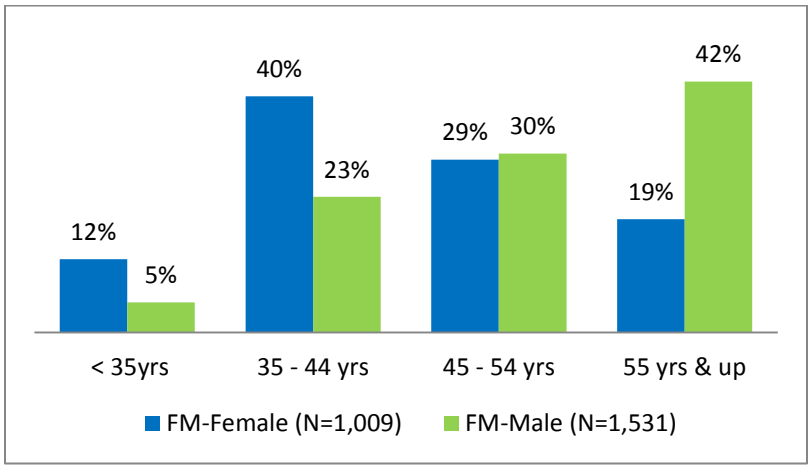
Figure 2-3. Age Distribution of Primary Care Physicians in Minnesota



Source: BMP and MDH

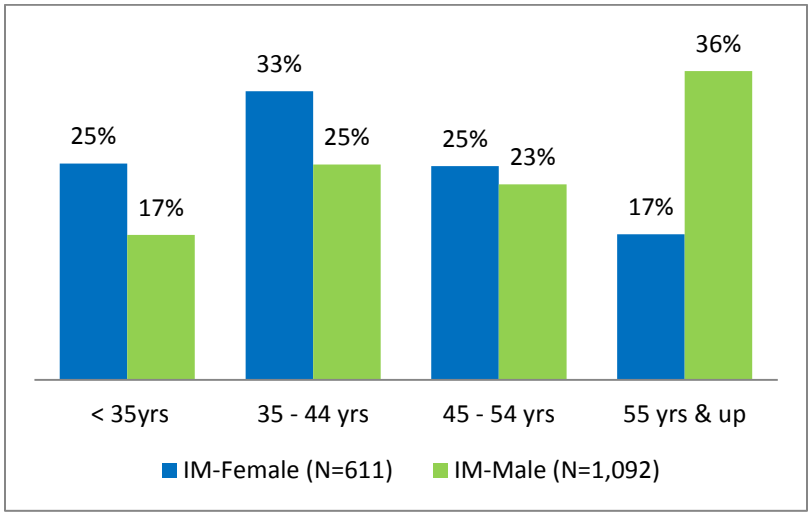
- Of the three primary care physician types, family medicine physicians are the oldest, and have the smallest percentage of younger (less than 34 years old) physicians available to replace their retiring peers.
- Among primary care physicians, general internists and pediatricians were the youngest (median ages 49, 46 and 47 years respectively).
- The dip in the age 45-54 age cohort for internists and pediatricians may reflect that many generalists go on to subspecialize and thus fall out of the primary care cohort.

Figure 2-4. Family Medicine Physicians, Age by Gender



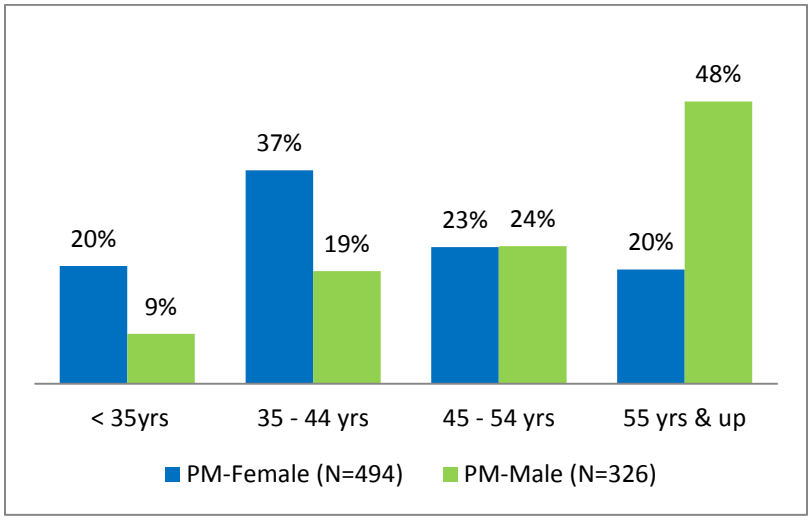
- While men represented more than half of the family medicine physicians, they tended to be older (the median age for males was 52 compared to 44 for females).
- Fifty-two percent of female family physicians were 44 years and under. Only 28 percent of male family doctors were in this age group.

Figure 2-5. General Internal Medicine, Age by Gender



- As in the case of family physicians, male general internists accounted for a larger percentage of the profession, but female IMs tended to be younger (median age for males was 49 years versus 42 years for females).
- Fifty-eight percent of the female internists were 44 years of age and younger versus 42 percent of the males.

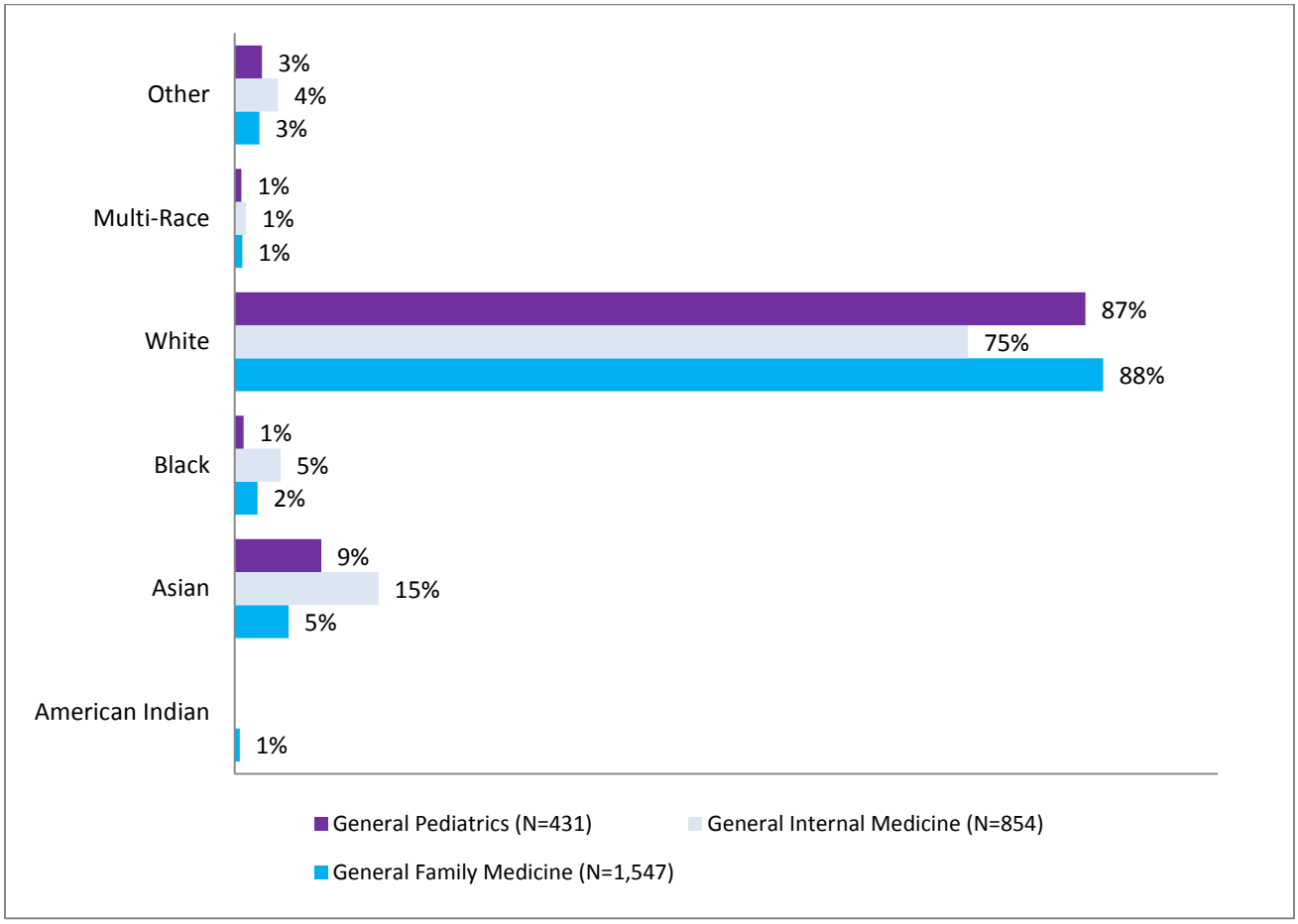
Figure 2-6. General Pediatrics, Age by Gender



- General pediatrics has become a female-dominated specialty, with males tending to be older (median age 54) and females younger end (median age 43).
- Fifty-seven percent of female general pediatricians were 44 years of age and younger compared with 28 percent of the males.

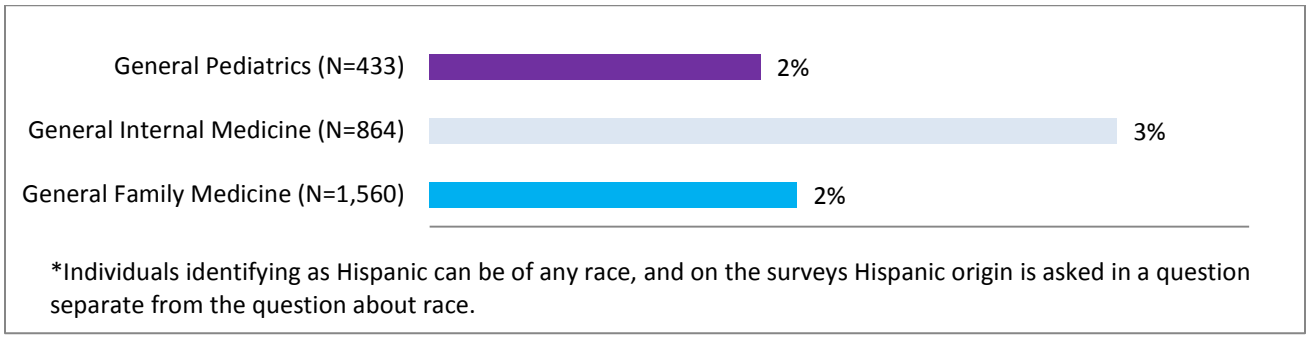
Source for Figures 2-4 through 2-6: BMP and MDH

Figure 2-7a. Racial Distribution of Primary Care Physicians in Minnesota



Source: MDH Physician Workforce Survey

Figure 2-7b. Hispanic Ethnicity Distribution of Primary Care Physicians in Minnesota



Source: MDH Physician Workforce Survey

- Minnesota's primary care physicians are predominately white.
- General internists were the most racially diverse of the three primary specialties.
- Family medicine physicians as a group were the least racially diverse.
- Among internists and pediatricians, Asian physicians are the second largest racial group behind White doctors.

Rural-urban distribution

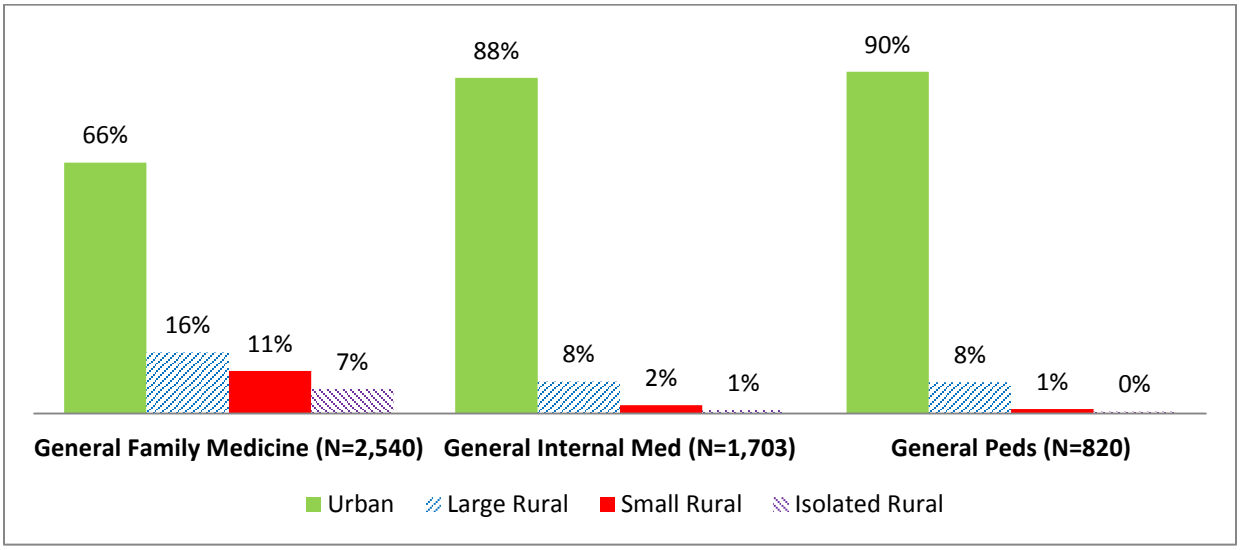
Table 2-1. Rural-Urban Distribution of Primary Care Physicians, Minnesota versus U.S.

	Family Physicians		General Internists		General pediatricians		Population	
	MN	US	MN	US	MN	US	MN	US
Urban	66%	78%	88%	90%	90%	91%	70%	80%
Large Rural	16%	11%	9%	7%	8%	6%	13%	10%
Small Rural	11%	7%	2%	2%	1%	2%	7%	5%
Isolated Rural	7%	4%	1%	1%	1%	1%	10%	5%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Source: Agency for Healthcare Research & Quality, *Primary Care Workforce Facts and Stats No. 3*, Pub. No. 12-P001-1-EF, January 2012; MDH; U.S. Census.

- Thirty-four percent of Minnesota-based family physicians were located in rural areas of the state, compared to 22 percent of U.S. family physicians overall.
- The urban-rural distributions of general internists and pediatricians across the state nearly parallel those of the U.S., but with slightly larger percentages clustered into large rural areas.
- Of the three primary care physician specialties defined in Minnesota statute, physicians board-certified in family medicine were most likely to locate to rural areas of the state.

Figure 2-8. Rural-Urban Distribution of Minnesota's Primary Care Physicians

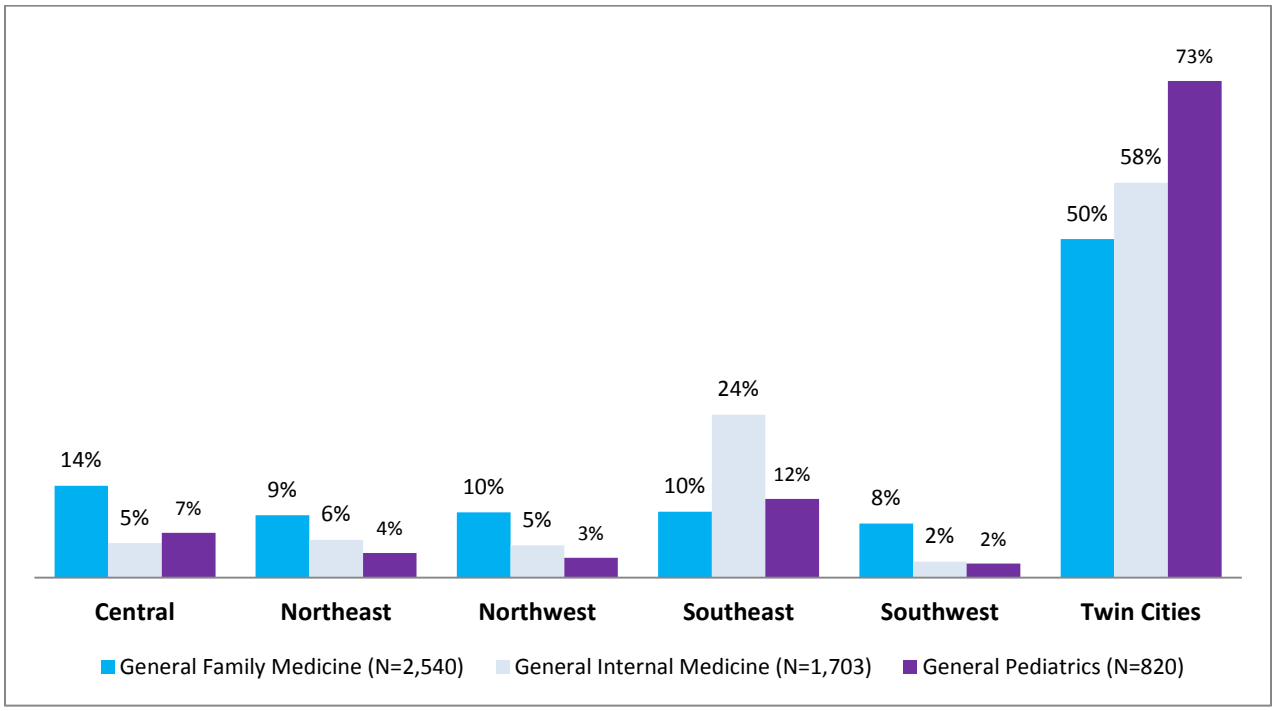


Source: BMP and MDH

- All three physician specialties were most highly concentrated in urban areas of the state, with pediatricians and internists most concentrated.
- Family medicine physicians had the most rural presence of the three specialties.
- Few general internists and pediatricians were located in small and isolated rural areas.

Regional distribution

Figure 2-9. Regional Distribution of Minnesota's Primary Care Physicians

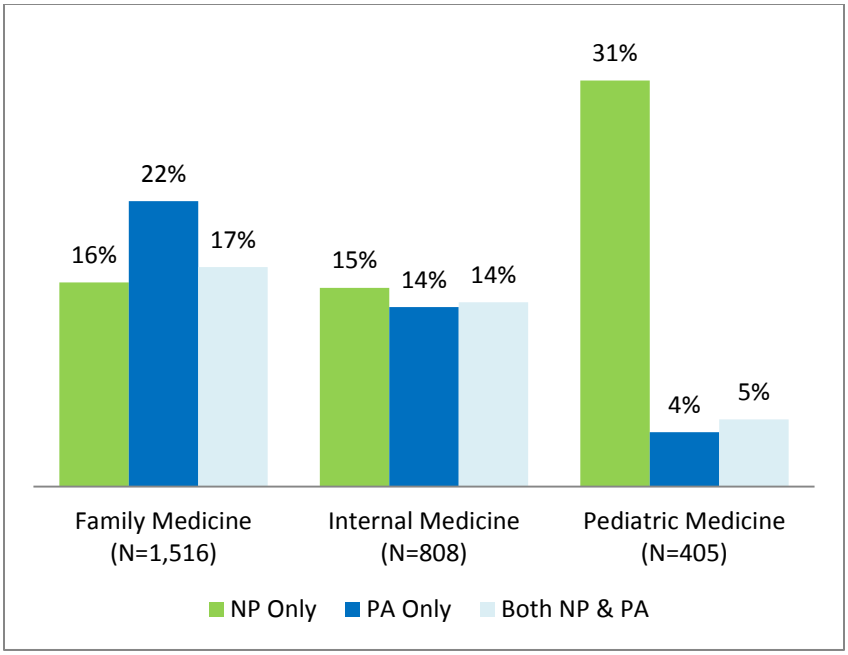


Source: BMP and MDH

- The majority of Minnesota's primary care physicians were located in the Twin Cities region.
- Of the three specialties, family medicine physicians were more distributed around the state than either general internists or pediatricians.
- Pediatricians were highly concentrated in the Twin Cities region while general internists were concentrated in the Twin Cities and Southeast regions.

Work relationships and future plans

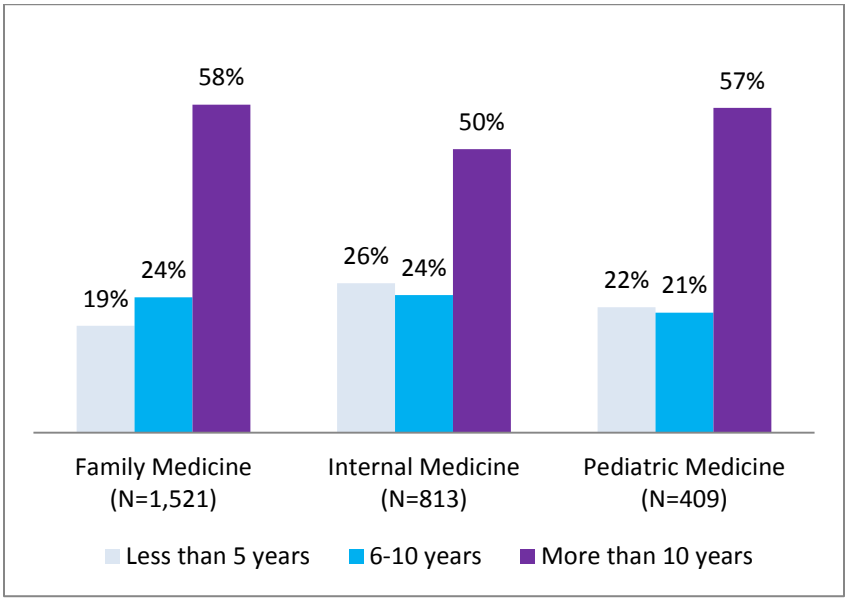
Figure 2-10. Minnesota Primary Care Physicians Working with NPs or PAs



Source: MDH Health Care Workforce Survey. Note: The sum of percentages in each section is a result of the number of survey "Yes" responses. The number of "No" responses is reflected in the remaining percentage.

- Roughly half of the physicians who responded to MDH's survey have formal working relationships with NPs, PAs or both.
- Pediatricians were more likely than other primary care physicians to have collaborative relationships with NPs.
- Family physicians tended to have more PA agreements than other primary care specialties.
- Family and internal medicine physicians were more likely to have practice agreements with NPs and PAs.
- General internists tended to have a nearly equal mix of PA and NP agreements.

Figure 2-11. Intent to Continue Practicing in Minnesota, by Specialty



Source: MDH Health Care Workforce Survey

- Half or more of primary care physicians said they intended to work more than 10 years in their field.
- A smaller percentage of family medicine physicians responded that they would be working fewer than 6 years than those in internal or pediatric medicine.
- These results likely reflect the age composition of each specialty (see also Figures 2-3 and 2-4).

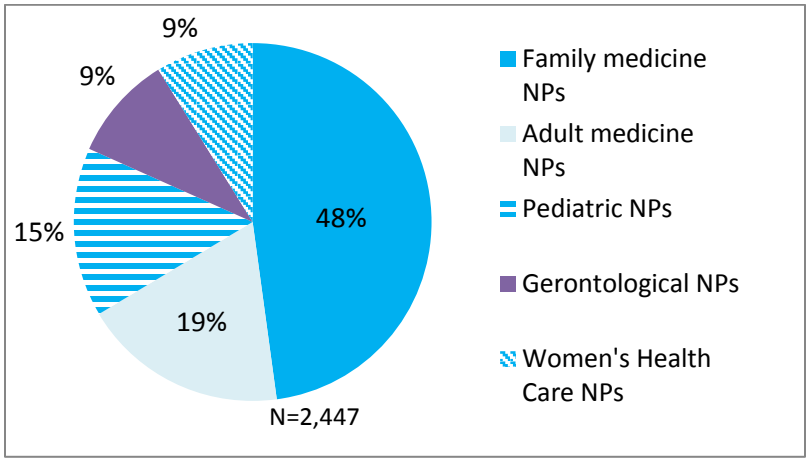
Section III. Nurse practitioners

This section profiles the nurse practitioner (NP) component of Minnesota's primary care workforce. It defines primary care NPs as nurse practitioners certified in one or more of the following specialties: adult health, family health, gerontology, pediatrics or women's health.[10] This classification is based on HRSA's definition of NP "primary care competencies."[11] Using this definition, Minnesota had 2,447 primary care NPs in 2011-2012.

NPs are one type of Advanced Practice Registered Nurse, or APRN, which is in turn one segment of the registered nurse (RN) workforce. APRNs have obtained advanced nursing degrees by either obtaining a Master's, post-Master's or Doctorate degree and are certified in one or more of four categories of advanced practice nursing: Certified Nurse Practitioner (CNP), Certified Nurse Anesthetist (CNA), Clinical Nurse Specialist (CNS or Certified Nurse Midwife [CNM]). Nurse Practitioners comprise more than half (58 percent) of the APRNs in Minnesota, followed by CNAs at 29 percent, CNSs at 9 percent, and CNMs at 4 percent. As with other provider types, it is important to note that other APRNs beyond those included in this report may also be providing primary care, and not all of those captured here necessarily provide primary care.[12]

Individual states determine the types of clinical services and level of care provided by NPs, and the extent to which NPs can practice independently without physician oversight. Minnesota's Nurse Practice Act defines the NP scope of practice as follows: "within the context of collaborative management, nurse practitioner practice means (1) diagnosing, directly managing, and preventing acute and chronic illness and disease; and (2) promoting wellness, including nonpharmacologic treatment" (Minnesota Statutes section 148.171). Minnesota is considered one of 34 states with restrictions on NPs' ability to practice independently (in 16 states and the District of Columbia, NPs have full practice authority to diagnose, treat and prescribe medication in place of a physician).[13]

Figure 3-1. Primary Care NPs in Minnesota, by specialty

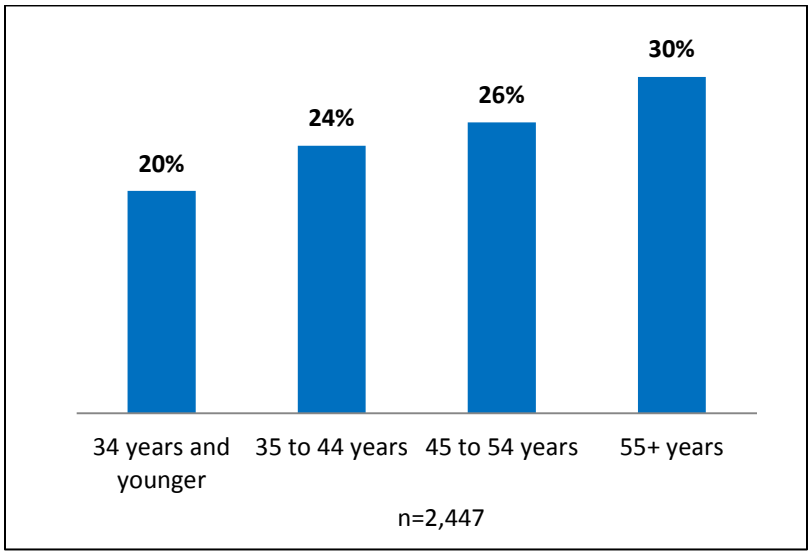


Source: Minnesota Board of Nursing (BON) and MDH

- Similar to physicians, NPs obtain additional academic credentialing, with most obtaining certification with a primary care focus.
- Primary care NPs represented 43 percent of all APRNs in the state.
- Nearly half of primary NPs specialize in family medicine.
- Of the 2,773 NPs with mailing addresses listed in Minnesota, 88 percent (2,447) were certified in primary care.

Demographics

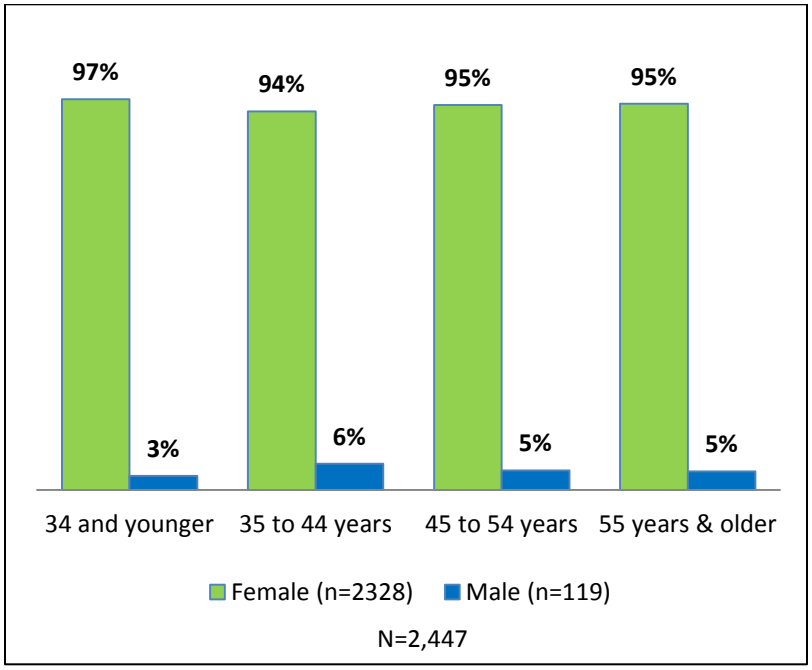
Figure 3-2. Age of Primary Care NPs in Minnesota



Source: BON and MDH

- Primary Care NPs in Minnesota are aging, with 30 percent eligible for retirement in 7 to 10 years.
- More than half (56 percent) of the Primary Care NP workforce is 45 years and older.
- The median age of the Primary Care NP workforce in Minnesota was 47 years, compared to 48 years for all of Minnesota's APRNs.

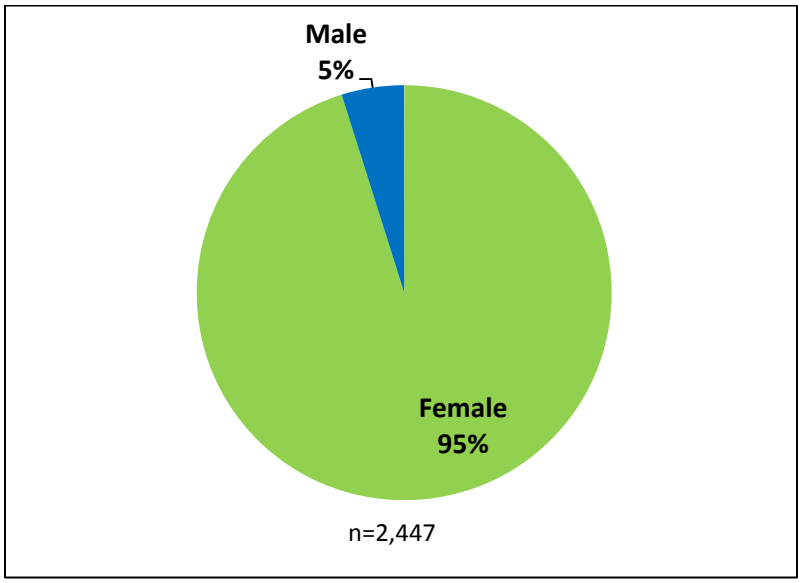
Figure 3-3. Primary Care NPs in Minnesota, Age by Gender



Source: BON and MDH

- Male primary care NPs represent only a small fraction of the advanced practice registered nurse workforce, even with growing public acceptance of male nurses.
- Nationally, men comprise just over 7 percent of all registered nurses, a number projected to grow. Over 11 percent of students in nursing baccalaureate programs in the 2010-2011 school year were men, according to the American Association of Colleges of Nursing.[14]

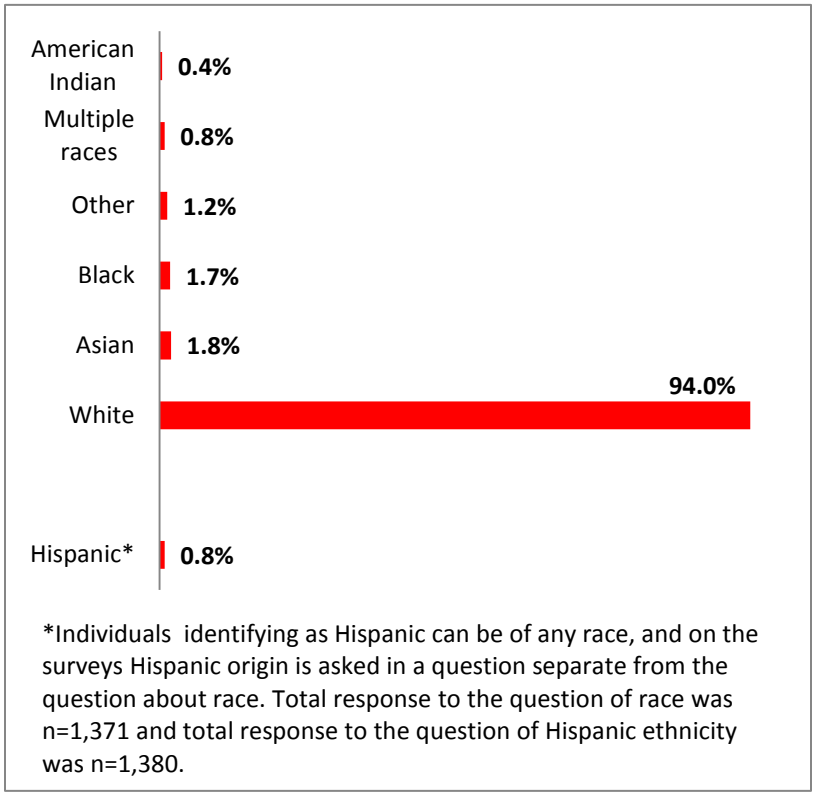
Figure 3-4. Gender of Primary Care NPs in Minnesota



Source: BON and MDH

- The average primary care NP in Minnesota is female (95 percent).
- Traditionally, nursing has been a female-dominated profession. Only recently have larger numbers of men become nurses. During the past decade, the proportion of men in the registered nurse workforce increased from 8 to 9 percent nationwide.[15]

Figure 3-5. Race and Ethnicity of Primary Care NPs in Minnesota

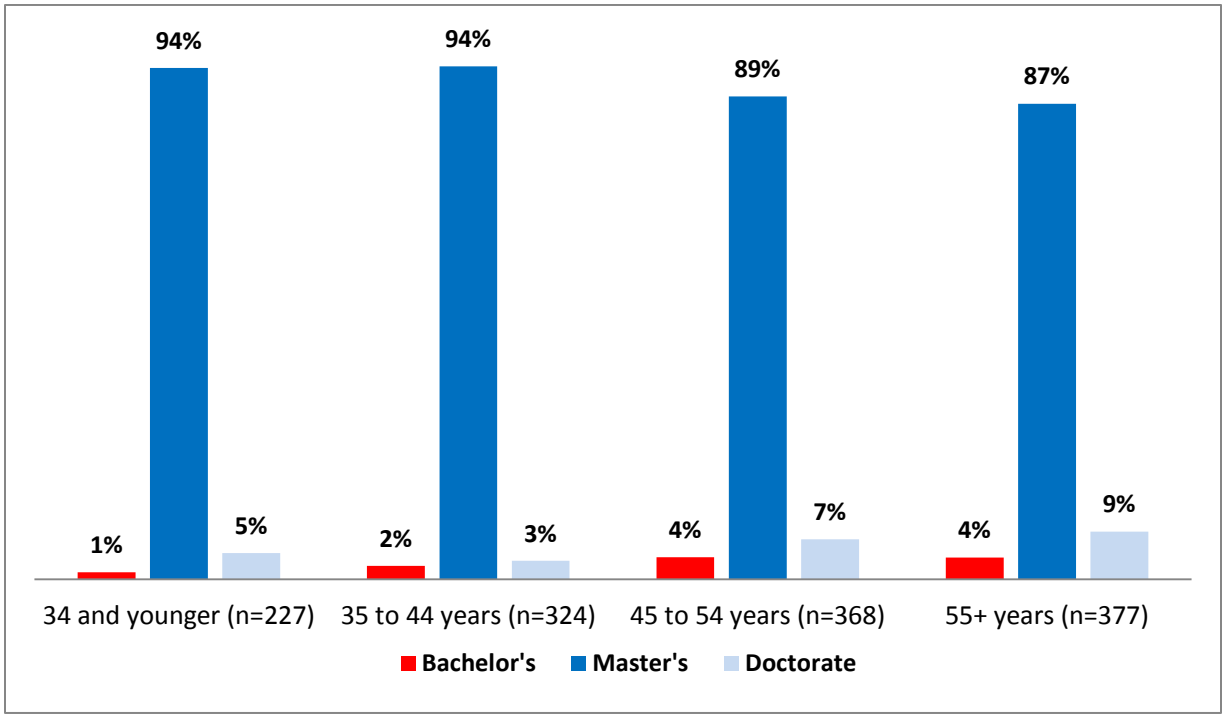


Source: MDH Registered Nurse Workforce Survey, 2011-2012

- Most of the primary care NP workforce described itself as white (94 percent).[16]
- As of 2011-2012, the growing diversity of Minnesota's population entering the nursing field is not yet reflected in the current primary care NP workforce. Black and Latino Minnesotans are especially underrepresented. Individuals identifying as Black represent 5 percent of the state's population, but only 1.7 percent of the primary NP workforce. Similarly, Hispanic/Latino Minnesotans represent 5 percent of the state but less than 1 percent of its primary NPs.[17]

Education

Figure 3-6. Academic Training of Minnesota Primary Care NPs, by Age



Source: MDH Registered Nurse Workforce Survey, 2011-2012

- One becomes an NP in one of three ways: a Master's, a post-Master's, and a Doctorate of Nursing Practice. Like a majority of APRNs, the primary care NP usually acquires a minimum of a Master's degree (81 percent).
- In 2007, the University of Minnesota converted its APRN program from Master's level to a Doctorate of Nursing Practice (DNP), making it the terminal degree for advanced nurse practice.
- Overall, only a small proportion of primary care NPs had a Doctorate (6 percent), though 9 percent of older primary care NPs 55+ years of age reported having earned their Doctorate.
- The nursing profession continues to evolve and some of the earliest NPs did not obtain an advanced degree. Those NPs were grandfathered in when additional requirements to become an APRN in Minnesota were implemented.

Rural-urban distribution

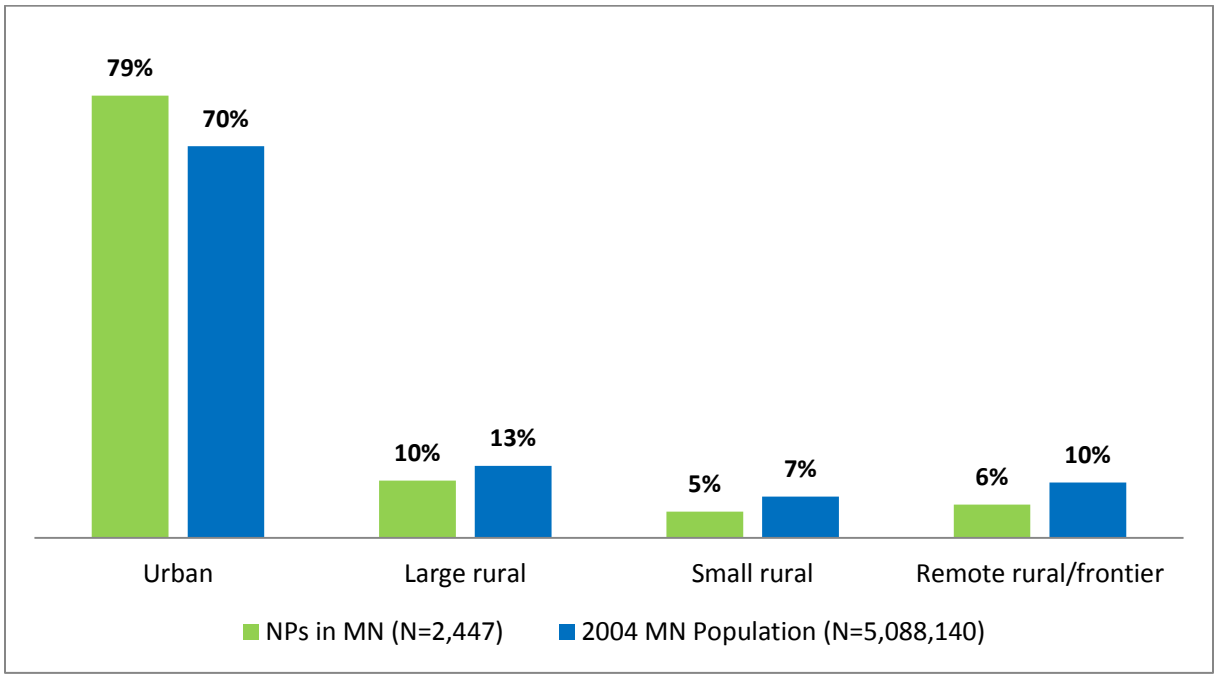
Table 3-1. Rural-Urban Distribution of Primary Care NPs, Minnesota versus U.S.

	Primary Care Nurse Practitioners		Population	
	MN	US	MN	US
Urban	79%	72%	70%	80%
Large Rural	10%	11%	13%	10%
Small Rural	5%	8%	7%	5%
Isolated Rural	6%	9%	10%	5%

Source: BON, MDH, U.S. Census

- Geographic distribution of primary care NPs in Minnesota differs from the distribution of primary care NPs in the United States as a whole. Nationally, small and isolated rural areas -- with a combined 10 percent of population -- appear to have a greater concentration of primary care NPs (17 percent) compared to the rural and isolated regions of Minnesota, where approximately 17 percent of the population resides, but only 11 percent of primary care NPs practice.
- Primary care NPs are disproportionately concentrated in urban locations of Minnesota, despite such areas having only 70 percent of the state's population.

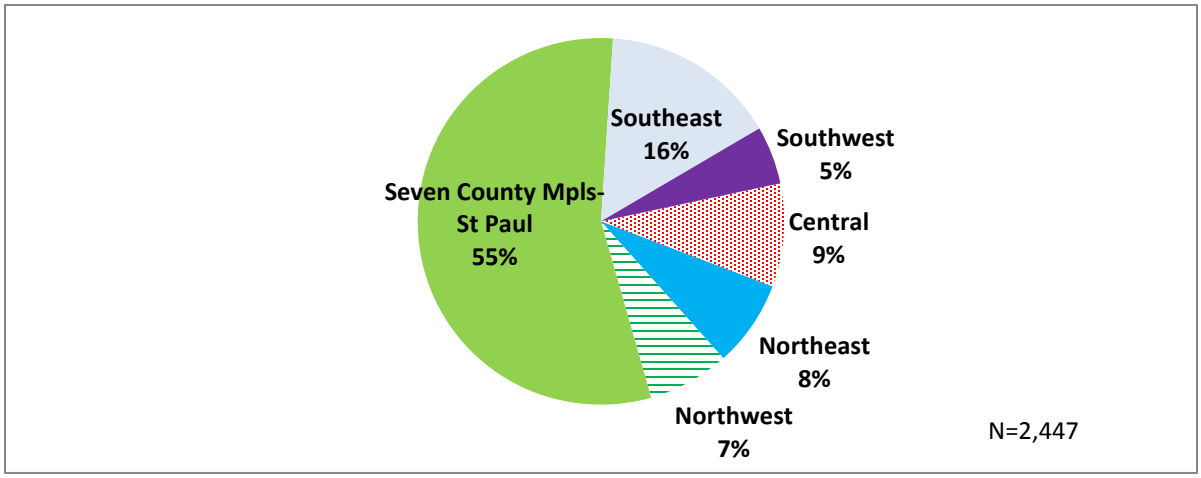
Figure 3-7. Urban-Rural Distribution of Minnesota NPs



Source: BON, MDH and WWAMI Rural Health Research Center

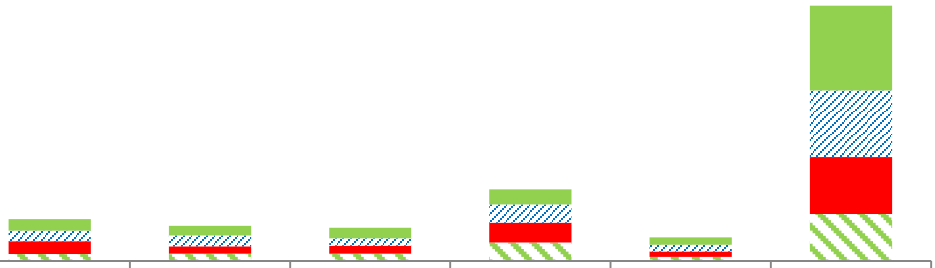
Regional distribution

Figure 3-8. Regional Distribution of Minnesota's Primary Care NP Workforce



Source: BON and MDH

Figure 3-9. Regional Distribution of Minnesota's Primary Care NPs, by Age Group



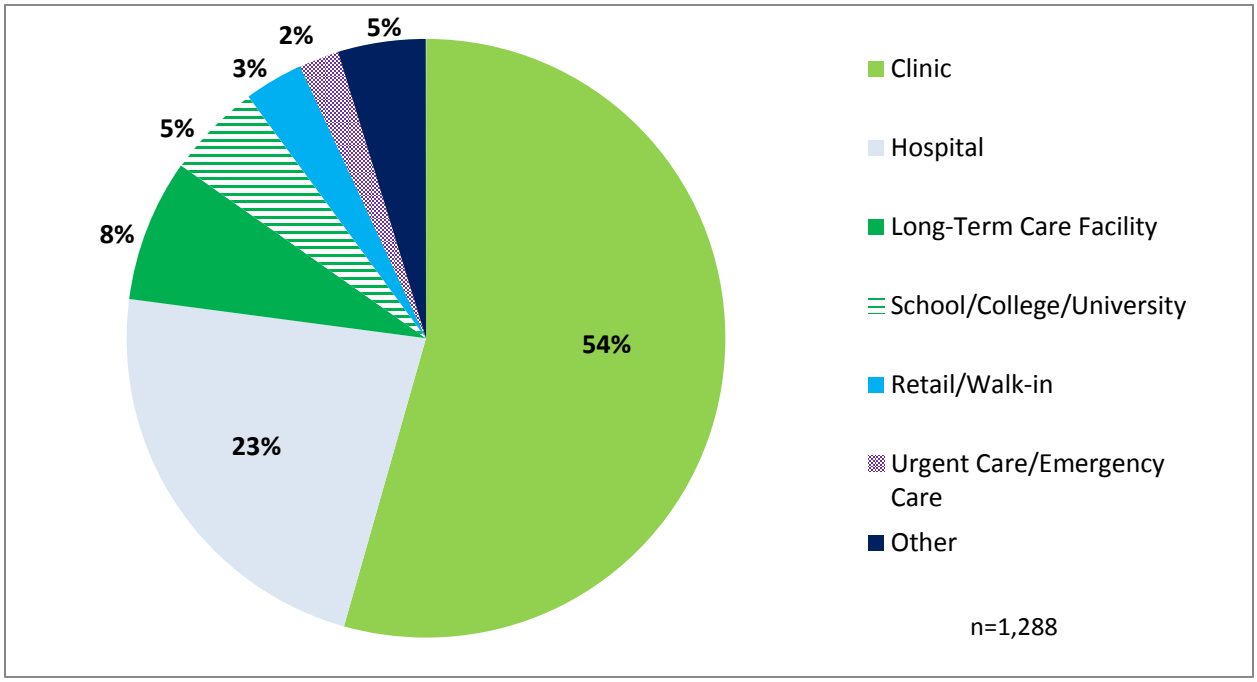
N=2,447	Central	Northeast	Northwest	Southeast	Southwest	Seven County Mpls-St Paul
55 years and older	62	51	56	79	39	450
45 to 54 years	55	57	40	97	35	353
35 to 44 years	68	39	41	106	29	303
34 and younger	38	40	40	98	22	249

Source: BON and MDH

- More than half of the primary care NP workforce is concentrated in the Twin Cities region.
- Except for the Southeast region, the youngest generation of primary care NPs (34 years and younger) represents less than a quarter of the NP workforce in each region.
- Two very rural regions (the Northwest and Southwest), as well as the Twin Cities region, had the highest proportion of older primary care NPs.
- The Twin Cities region had the highest median age (49 years) and southeast region the lowest (43 years).

Work settings and future plans

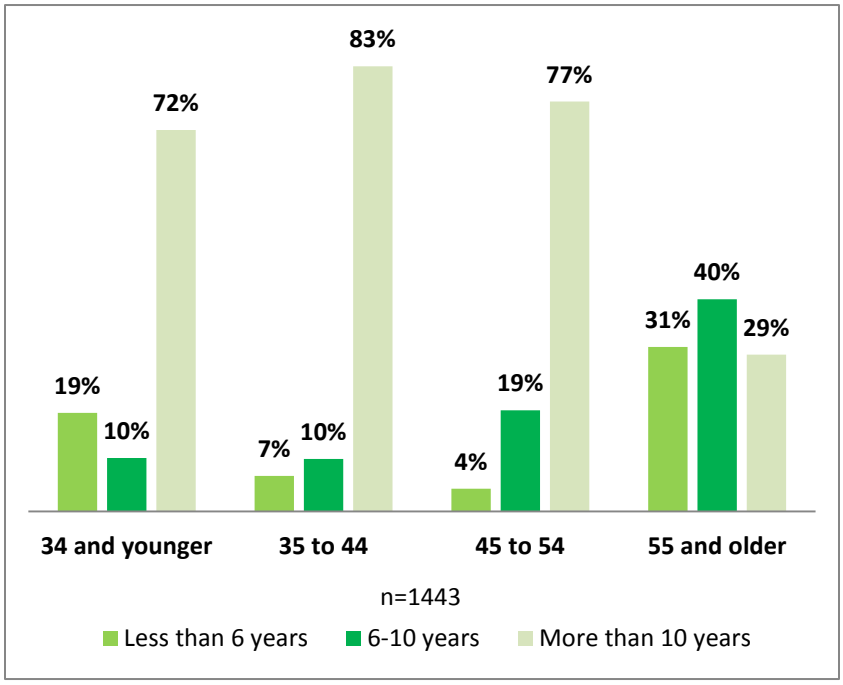
Figure 3-10. Primary Work Settings of Minnesota Primary Care NPs



Source: MDH Registered Nurse Workforce Survey

- Most (77 percent) of primary care NPs work in clinics or hospitals.
- Primary care NPs in long-term care facilities worked in skilled nursing and assisted living facilities as well as home health agencies and frequently hospice.

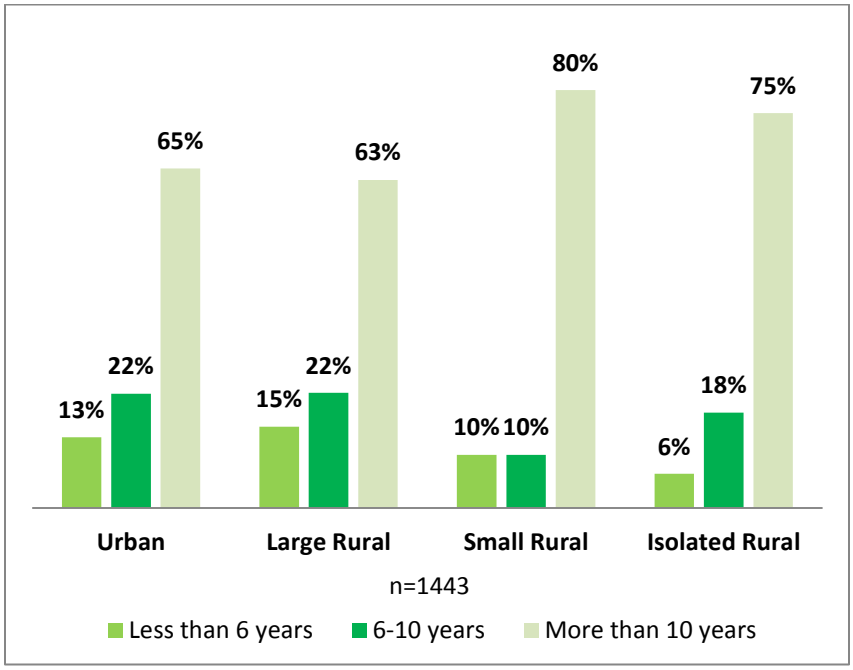
Figure 3-11. Primary Care NPs' Intent to Continue Practicing in Minnesota, by Age



Source: MDH Registered Nurse Workforce Survey

- Overall, as primary care NPs age, the more likely they are to discontinue practicing.
- A higher proportion of younger primary care NPs (34 years and younger) planned to stop practicing in the next 5 years than NPs between the ages of 35 and 54.

Figure 3-12. Future Plans of Minnesota Primary Care NPs, by Rural-Urban Location



Source: MDH Registered Nurse Workforce Survey

- Although 64 percent of primary care NPs overall planned to practice more than 10 years into the future, plans to practice more than 10 years go up to 80 percent in small rural areas and 75 percent in isolated rural areas.

Section IV. Physician assistants

This section profiles Minnesota's physician assistant (PA) workforce. PAs are one of the fastest-growing health care professions. Between 2009 and 2011, the number of licensed PAs in Minnesota grew by 28 percent (from 1,371 to 1,753 PAs).

Physician assistants are health care professionals licensed to practice medicine under physician supervision. The profession dates from the late 1960s to provide fast-track training of military doctors during World War II. The initial goal of the profession was to extend the supervising physicians' reach, especially in underserved areas.[18] PA training programs usually take two years to complete and commonly require at least two years of college and health care working experience. Accredited PA programs are offered by a wide variety of institutions, including baccalaureate colleges, university schools of allied health, community colleges and the military. Licensing requires a passing score on the Physician Assistant National Certifying Examination.

Every PA works in conjunction with a supervising physician. Their scope of practice is defined by Minnesota Statute section 147A.09.[19] PAs are allowed to perform duties and patient services outlined in their physician-physician assistant delegation agreement, which is reviewed at least annually when PAs renew their licenses. As defined by statute, these duties can include taking patient histories, performing physical examinations, providing primary care instructions, assisting the physician or following specific medical orders as needed, and potentially prescribing, administering and dispensing medication.

Why include all physician assistants as primary care providers?

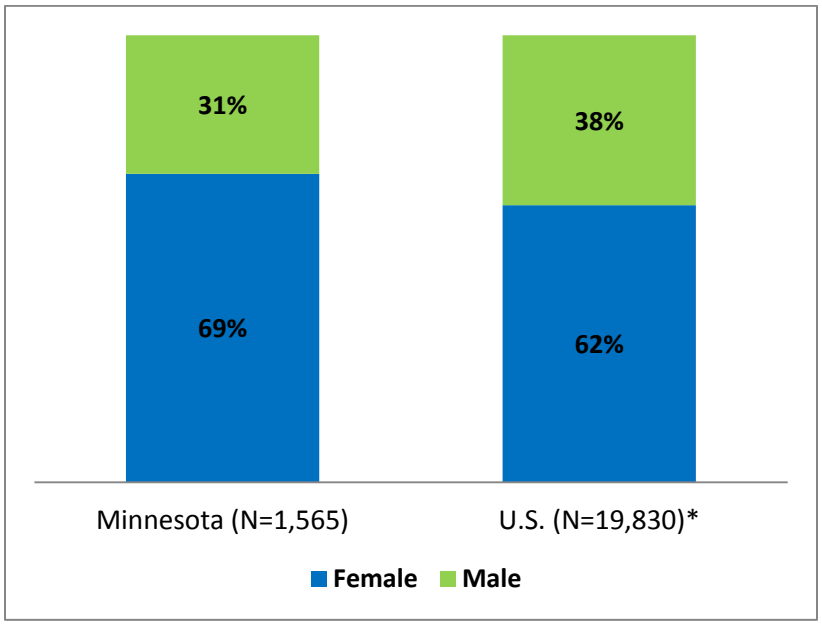
Not all PAs practice primary care, but data on the number who do (versus those who provide more specialized care) remain insufficient. While licensed PAs may obtain additional specialty certifications from the National Commission on Certification of Physician Assistants, the first specialty exams were first offered in September 2011 and these additional credentials are only now being collected by the Minnesota Board of Medical Practice (BMP). The American Academy of Physician Assistants (AAPA) surveys its members on the type of care practiced, but the most recent data available at the state level is from 2008. A national study in 2009 used National Provider Identifier (NPI) data to measure how many PAs were practicing primary care, but the authors of that study recently acknowledged this method may overstate the total.[20]

Given these limitations (particularly in the state-level data), this analysis includes all PAs licensed in Minnesota, but acknowledges that this method overestimates the primary care workforce. The national studies referenced above estimated that only 31 to 43 percent of PAs were practicing primary care in 2009-2010.[21] At the state level, the AAPA estimated that 42 percent of Minnesota PAs were providing primary care in 2008.[22] However, preliminary analysis of responses to the MDH PA workforce survey in 2013, the first year the survey asked PAs if they were practicing primary care, suggest that approximately two-thirds of Minnesota PAs are practicing primary care.

The issue is further complicated by geography. Though few studies have focused on the role of PAs in rural areas, some evidence suggests they are more likely to providing primary care and in general have a broader scope of practice than their urban counterparts.[23]

Demographics

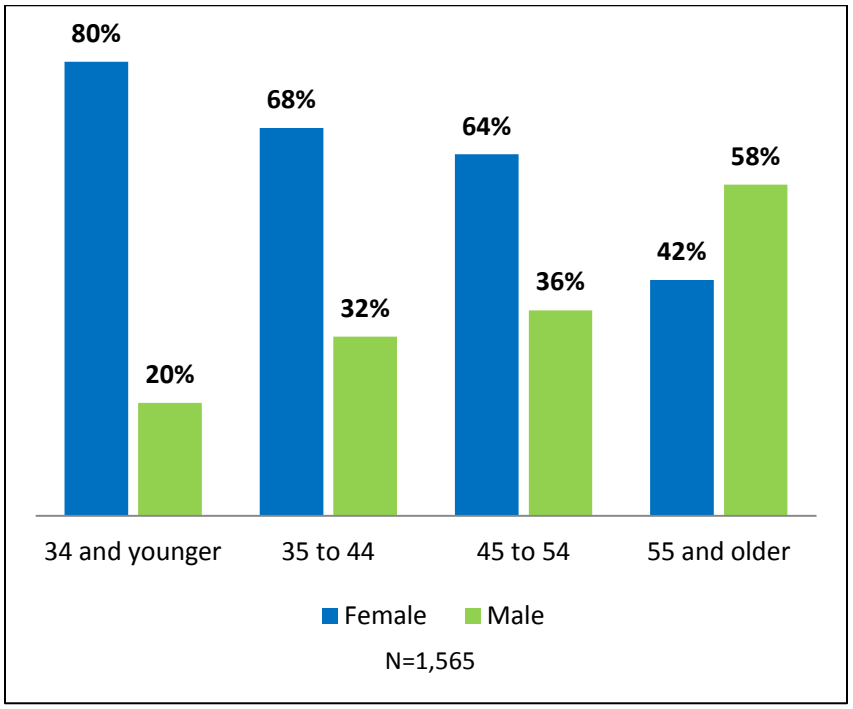
Figure 4-1. Gender Distribution of PAs, Minnesota vs. U.S.



Source: BMP, MDH and *survey data from 2010 American Academy of Physician Assistants census.

- Minnesota had a total of 1,565 licensed PAs as of 2011-2012. Over two-thirds were women.
- Minnesota has slightly more female PAs and slightly fewer male PAs than the national average.[24]
- Nationwide, the proportion of female PAs is decreasing (a 3 percent decrease from 2009-2010), but the reverse is true in Minnesota (a 3 increase over the same period).[25]

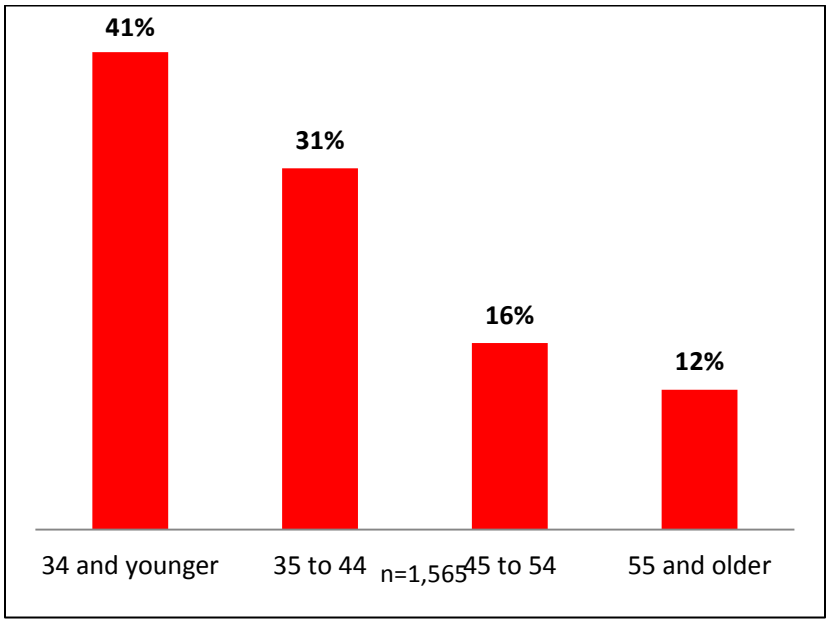
Figure 4-2. Age by Gender, PAs in Minnesota



Source: BMP and MDH

- Women make up the greatest proportion of the younger PA workforce.
- In progressively older age groups, men represent an increasingly larger percentage of the PA workforce. Men make up the larger proportion of PAs who are 55 and older. Women make up the greater proportion in all other age groups.

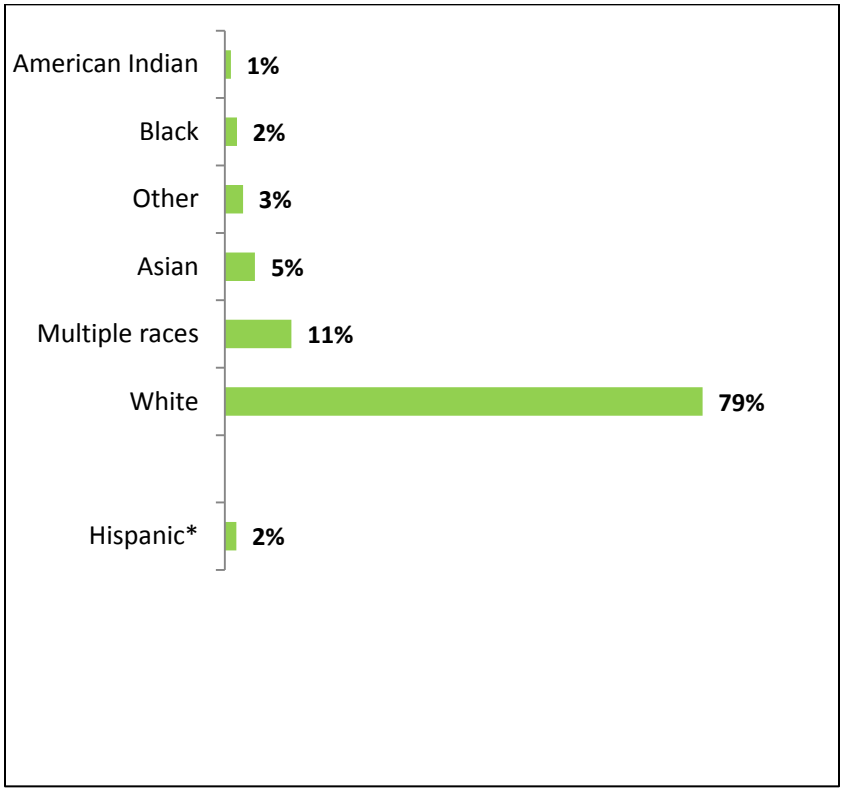
Figure 4-3. Age of PAs in Minnesota



Source: BMP and MDH

- Overall, physician assistants in Minnesota are young.
- Nationally, about 40 percent of PAs are under 35. This is similar to the proportion of Minnesota physician assistants under 35.[26]
- This youthful age distribution likely reflects, in part, the comparatively briefer training period required for PAs.

Figure 4-4. Race/ethnicity of Minnesota PAs

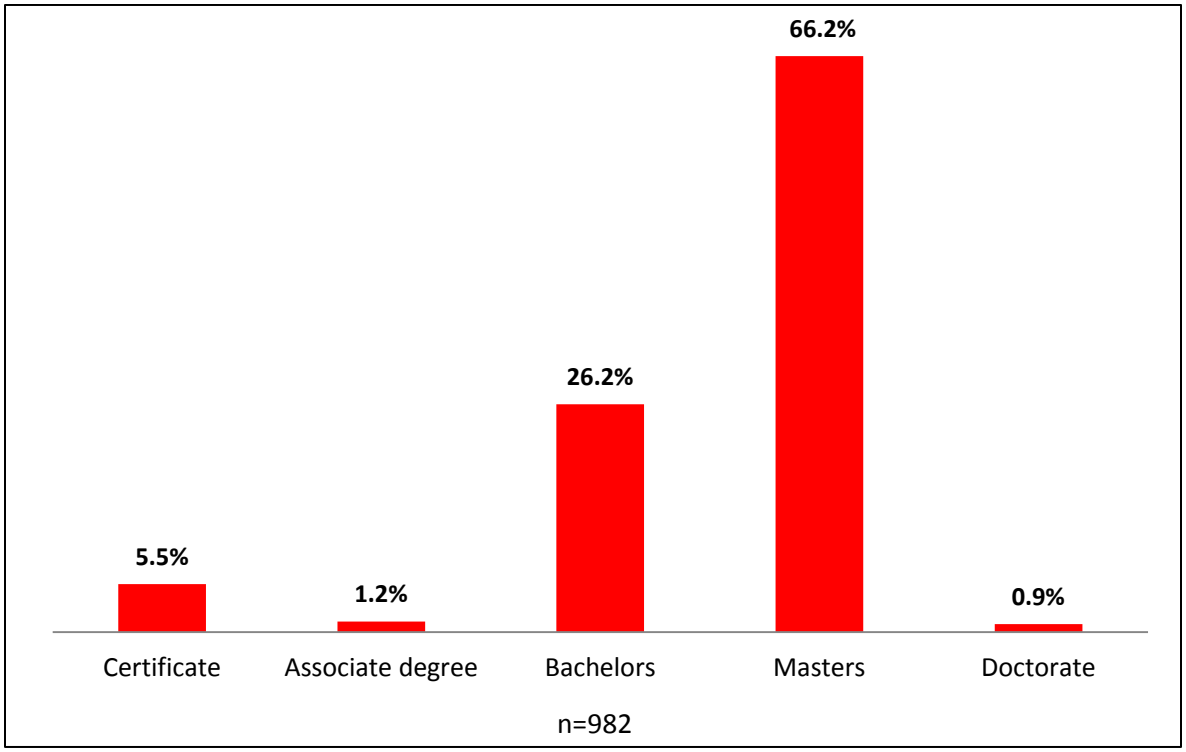


Source: MDH Physician Assistant Workforce Survey

- Most Minnesota PAs are White.
- Over 10 percent of Minnesota PAs identify as being of multiple races, compared to 2.4 percent of the state's population.
- The proportion of PAs who identify as Black or Hispanic is lower than the state's population (which is 5 percent Black and 5 percent Hispanic).

Education

Figure 4-5. Academic Training of Minnesota PAs



Source: MDH Physician Assistant Workforce Survey

- The majority of PAs earn a Master's degree. Currently, Minnesota has three PA academic programs and a fourth program is slated for 2016 at St. Scholastica.
- Most other PAs practice with either a certificate or a Bachelor's degree, reflecting the history of the profession (see introduction). Doctoral PA programs are quite new and still unavailable in Minnesota.

Rural-urban distribution

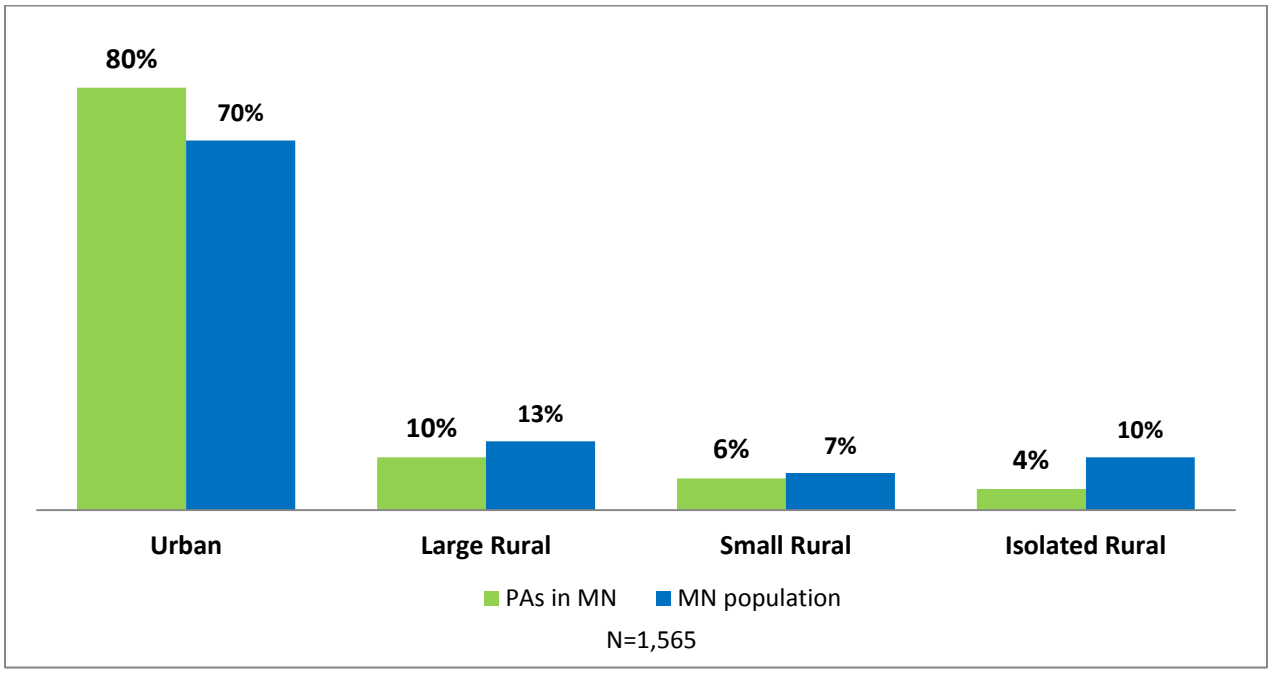
Table 4-1. Rural-Urban Distribution of Physician Assistants, Minnesota versus U.S.

	Physician Assistants		Population	
	MN	US	MN	US
Urban	80%	75%	70%	80%
Large Rural	10%	12%	13%	10%
Small Rural	6%	7%	7%	5%
Isolated Rural	4%	6%	10%	5%

Source: BMP, MDH, U.S. Census

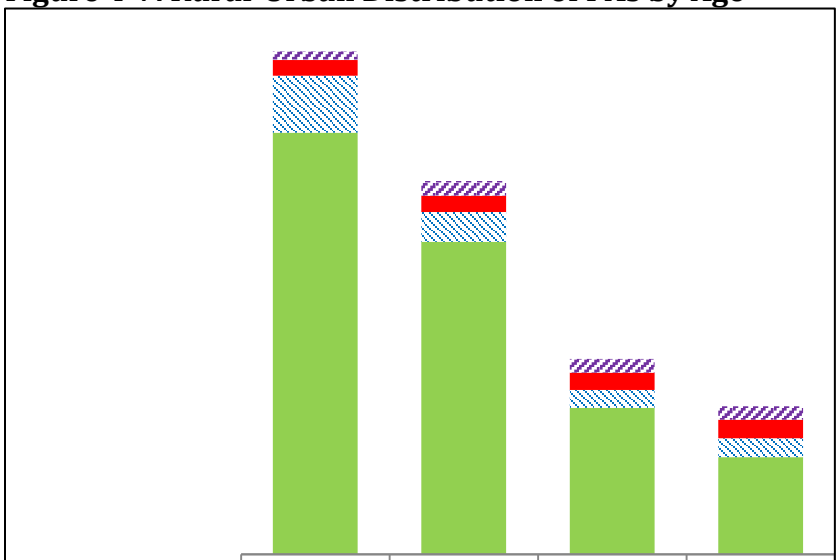
- Minnesota physician assistants are more concentrated in urban areas than in the overall United States. Eighty percent of Minnesota PAs are located in urban areas, compared to 75 percent of all U.S. PAs.
- Ten percent of Minnesota-based PAs are located in small rural and isolated rural areas of the state, compared to 13 percent of U.S. PAs overall.

Figure 4-6. Rural-Urban Distribution of Minnesota PAs



Source: BMP and MDH

Figure 4-7. Rural-Urban Distribution of PAs by Age



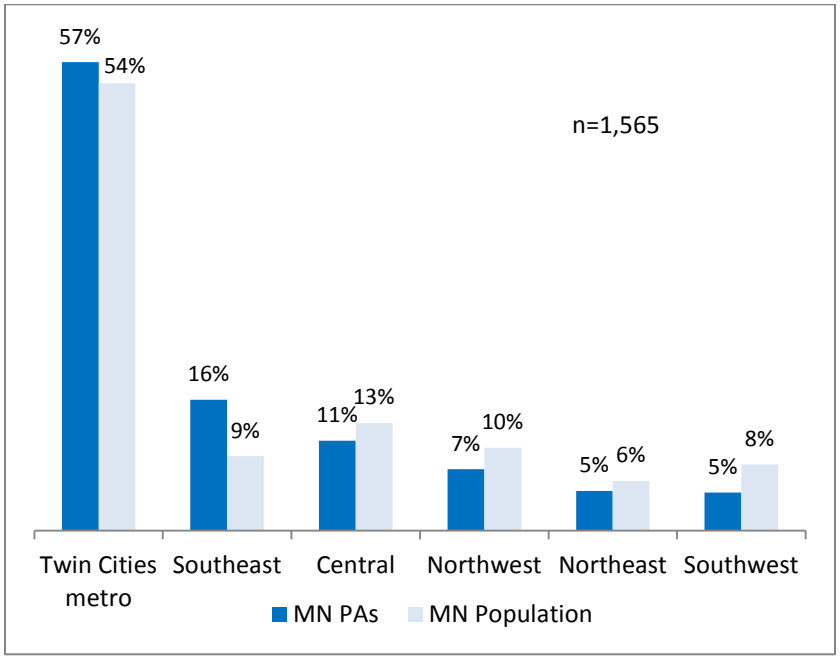
n=1,565	34 and younger	35 to 44	45 to 54	55 and older
Isolated Rural	11	19	18	17
Small Rural	20	21	22	24
Large Rural	73	38	23	24
Urban	541	401	188	125

Source: BMP and MDH

- As age increases, a greater proportion of PAs are located in more rural areas.
- Among PAs who are 55 and older, 13 percent are located in small rural areas. Only 3 percent of PAs who are 34 and younger are in these areas. By numbers alone, more PAs who are in older age groups practice in isolated and small rural areas than PAs who are youngest.

Regional distribution

Figure 4-8. Regional Distribution of Minnesota PAs

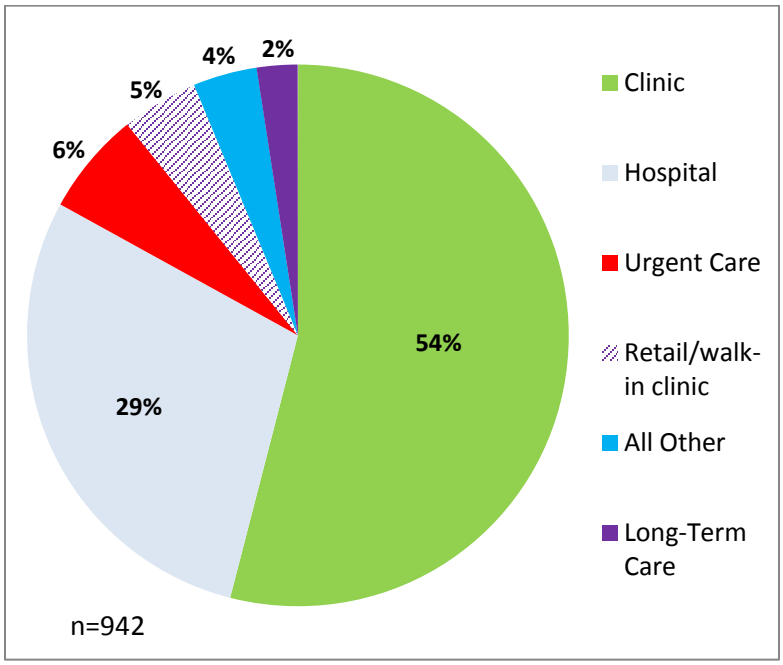


Source: BMP and MDH

- Most (57 percent) PAs are located in the Twin Cities metro area.
- Most others practice in the Southeast and Central regions.
- This distribution reflects, in part, the fact that Minnesota's large urban and medical centers are located in the seven-county metro, the southeast region (with Rochester) and the central region (with St. Cloud).

Work settings and future plans

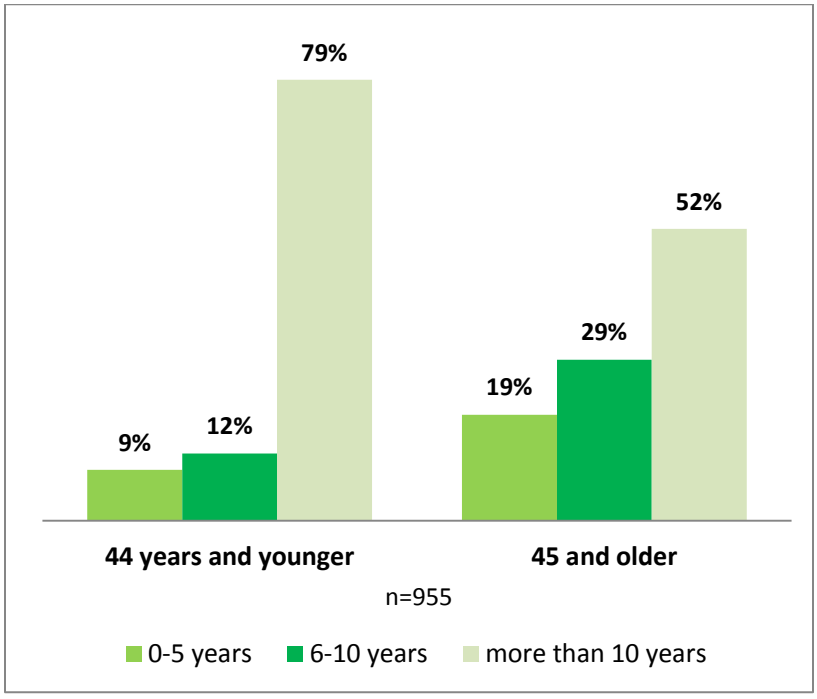
Figure 4-9. Primary Work Settings of Minnesota PAs



Source: MDH Physician Assistant Workforce Survey

- The majority of Minnesota PAs report a clinic as primary worksite. Most others report working primarily in a hospital.
- Worksites included in the "All Other" category are rehabilitation facilities, schools or university settings, independent practice, public health agencies, and more.

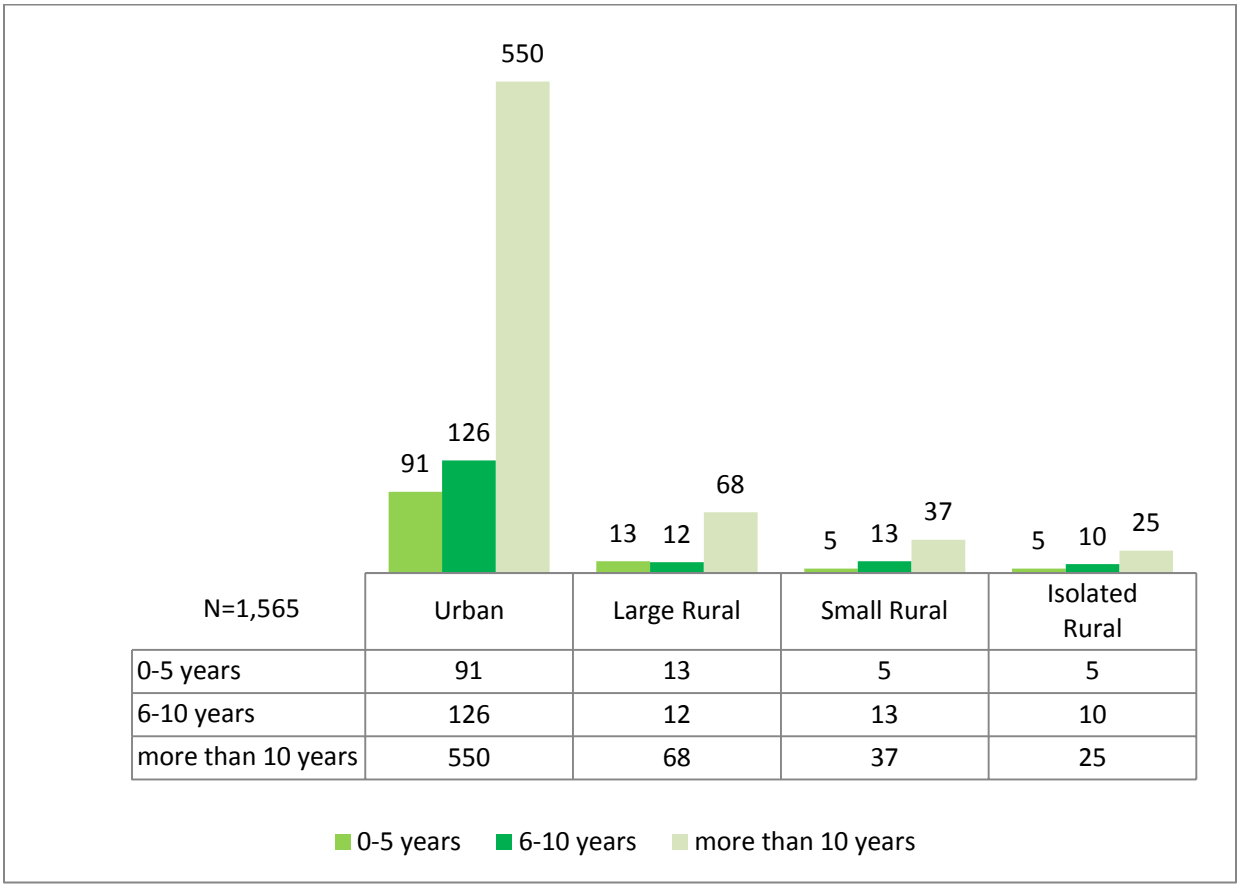
Figure 4-10. PA Intent to Continue Practicing in Minnesota, by Age



Source: BMP and MDH Physician Assistant Workforce Survey

- Regardless of age, most Minnesota PAs plan to practice for more than 10 years.
- Nearly 80 percent of PAs under 45 plan to practice for more than 10 years, compared to over 50 percent who are 45 or older.

Figure 4-11. PA Intent to Continue Practicing in Minnesota, by Rural-Urban Location



N=1,565	Urban	Large Rural	Small Rural	Isolated Rural
0-5 years	91	13	5	5
6-10 years	126	12	13	10
more than 10 years	550	68	37	25

Source: MDH Physician Assistant Workforce Survey

- Despite an aging PA workforce in most rural areas of Minnesota, most PAs in those areas said they planned to continue working 10 years or more (65 percent).
- A predominately older PA workforce in the most rural areas of Minnesota suggests a future deficit of PAs in those areas unless greater numbers of younger PAs select to practice in small rural and isolated communities.

APPENDIX A: Primary Care Definitions

The following is a compilation of the different ways "primary care" and "primary care providers" have been defined recently, both within and outside Minnesota.

Organization	Source	How Primary Care Defined	Notes
MDH - ORHPC	Minnesota's Primary Care Workforce (this report)	Primary Care providers defined by license and specific certifications: • Physicians with General Internal Medicine, Family Practice and General Pediatrics certifications; • Nurse Practitioners with Adult, Family, Gerontological, Pediatric, and Women's Health Care certifications; • Physician Assistants.	In adopting this definition for **physicians**, ORHPC is drawing on Minnesota Statutes section 137.38 on Education and Training of Primary Care Physicians: (Subd. 2) "'primary care' means a type of medical care delivery that assumes ongoing responsibility for the patient both health maintenance and illness treatment. It is personal care involving a unique interaction and communication between the patient and physician. It is comprehensive in scope, and includes…the overall coordination of the care of the patient's health care problems including biological, behavioral, and social problems… Primary care physicians include family practitioners, general pediatricians and general internists." *Other Minnesota statutes and programs define primary care differently, however (see below).* This definition also aligns with the "Patient Protection and Affordable Care Act", Subtitle D, Sec. 5301; PHS Act Title VII) (see below), and with the Agency for Healthcare Research and Quality (US-DHHS) report, "Primary Care Workforce Facts and Stats" defining primary care providers as NPs, PAs, Family Physicians/GPs, General Internal Medicine, and General Pediatrics. See: http://www.ahrq.gov/research/findings/factsheets/primary/pcworkforce/index.html This report's definition of primary care **nurse practitioners (NPs)** is

Organization	Source	How Primary Care Defined	Notes
			based on the federal Health Resources and Service's (HRSA's) definition of NP "primary care competencies." See *Nurse Practitioner Primary Care Competencies in Specialty Areas: Adult, Family, Gerontological, Pediatric, and Women's Health*, U.S. Department of Health and Human Services, Health Resources and Services Administration - Bureau of Health Professions, Division of Nursing, April 2002.
State of Minnesota	Minnesota Statutes, Laws and Rules	Varies (see notes).	1. In the Minnesota statute on **Education and Training of Primary Care Physicians**; 137.38 Subdivision 2, Primary Care: "For purposes of sections 137.38 to 137.40, 'primary care' means a type of medical care delivery that assumes ongoing responsibility for the patient in both health maintenance and illness treatment. It is personal care involving a unique interaction and communication between the patient and the physician. It is comprehensive in scope, and includes all the overall coordination of the care of the patient's health care problems including biological, behavioral, and social problems. The appropriate use of consultants and community resources is an important aspect of effective primary care. Primary care physicians include family practitioners, general pediatricians, and general internists." 2. In a statute on **Health Care Homes**, 256B.0751, one of the criteria for the standards for health care homes is that they "include the use of primary care physicians, advanced practice nurses, and physician assistants as personal clinicians," though "personal clinician" is defined quite broadly in the same statute: "a physician licensed under chapter 147, a physician assistant licensed and practicing under chapter 147A, or an advanced practice nurse licensed and registered to practice under chapter 148." Primary care itself is defined as "A related statute, Coordinated Care Through a Health Care Home, 256B.0757, requires the commissioner of health to establish "health teams" to support health care homes. The "health teams" are defined as "community-based, interdisciplinary, interprofessional teams of health care providers that support primary care practices." The providers on

Organization	Source	How Primary Care Defined	Notes
			such teams may come from a broad spectrum of disciplines: "These providers may include medical specialists, nurses, advanced practice registered nurses, pharmacists, nutritionists, social workers, behavioral and mental health providers, doctors of chiropractic, licensed complementary and alternative medicine practitioners, and physician assistants." In the definitions for Health Care Homes in the Minnesota Administrative Rules (4764.0020), "health care home team" is defined slightly differently: "'Health care home team' or 'care team' means a group of health care professionals who plan and deliver patient care in a coordinated way through a health care home in collaboration with a participant. The care team includes at least a personal clinician or local trade area clinician and the care coordinator and may include other health professionals based on the participant's needs." Primary care itself is defined as "overall and ongoing medical responsibility for a patient's comprehensive care for preventive care and a full range of acute and chronic conditions, including end-of-life care when appropriate." 3. As of 2013, the Minnesota statute on **Health Plan Companies** (Chapter 62Q) was amended in 62Q.01 to include a definition of "primary care provider" as "a health care professional who specializes in the practice of family medicine, general internal medicine, obstetrics and gynecology, or general pediatrics and is a licensed physician, a licensed and certified advanced practice registered nurse, or a licensed physician assistant." 4. In the Minnesota Administrative Rules on **Health Maintenance Organizations** 4685.0100 defines a "primary care provider" as "a primary care physician as defined in subpart 12a [see below] or a licensed practitioner such as a licensed nurse, optometrist, or chiropractor who, within that practitioner's scope of practice as defined under the relevant state licensing law, provides primary care services." It defines "primary care physician" as "a licensed physician, either employed by or under contract with the health

Organization	Source	How Primary Care Defined	Notes
			maintenance organization, who is in general practice, or who has special education, training, or experience, or who is board-certified or board-eligible and working toward certification in a board approved by the American Board of Medical Specialists or the American Board of Osteopathy in family practice, pediatrics, internal medicine, or obstetrics and gynecology." 5. In the Minnesota Administrative Rules on **Health Care Programs** (Chapter 9505), 9505.2165 defines "primary care provider" as "a provider designated by the department [of human services] who is a physician or a group of physicians, nurse practitioner, or physician assistant practicing within the scope of the provider's practice, who is responsible for the direct care of a recipient, and for coordinating and controlling access to or initiating or supervising other health services needed by the recipient."
Governor's Workforce Development Council (GWDC)	*Minnesota's Primary Care Provider Shortage – Strategies to Grow the Primary Care Workforce* December 2011 report	Primary care defined as physicians (specifically "family practitioners"), physician assistants and nurse practitioners.	
U.S. Government – Health reform	Patient Protection and Affordable Care Act of 2010 – Title V, Health Care Workforce		The ACA includes two primary care definitions: 1. A "primary care provider" is defined as "a clinician who provides integrated, accessible health care services and who is accountable for addressing a large majority of personal health care needs, including providing preventive and health promotion services for men, women, and children of all ages, developing a sustained partnership with patients, and practicing in the context of family and community, as recognized by a State licensing or regulatory authority, unless otherwise specified in this section."

Organization	Source	How Primary Care Defined	Notes
			2. A "primary care practitioner" is defined as "an individual (i) who (I) is a physician…who has a primary specialty designation of family medicine, internal medicine, geriatric medicine, or pediatric medicine; or (II) is a nurse practitioner, clinical nurse specialist, or physician assistant…and ' (ii) for whom primary care services accounted for at least 60 percent of the allowed charges under this part…."
U.S. General Accounting Office	"*Primary Care Professionals: Recent Supply Trends, Projections, and Valuation of Services,"* Testimony Before the U.S. Senate Committee on Health, Education, Labor and Pensions, February 12, 2008.	For the purposes of testimony, the GAO "considered primary care physicians to be those practicing in family medicine, general practice, general internal medicine, and general pediatrics. . . . We defined primary care physician assistants as those practicing in family practice, general practice, general internal medicine, and general pediatrics. We defined primary care nurse practitioners as those practicing in adult, family, and pediatric medicine."	
U.S Department of Health and Human Services, Health Resources and Services Administration (HRSA)	Bureau of Clinician Recruitment and Service (BCRS)	The National Health Service Corps (NHSC) defines primary care physician as one in "Family medicine; general internal medicine; general pediatrics; geriatrics; obstetrics and gynecology; and psychiatry." The Primary Care Loan Fund defines primary care physician as one in "Family medicine; internal	

Organization	Source	How Primary Care Defined	Notes
		medicine; osteopathic general practice; pediatrics; combined medicine/pediatrics; and preventive medicine."	
American Academy of Family Physicians	*Regarding Primary Care Access*, Statement to the *U.S.* Senate Health, Education, Labor and Pensions Committee, Subcommittee on Primary Care and Aging, January 29, 2013.	Primary care physicians defined as family physicians, general internists, general pediatricians, and general practice physicians.	The American Academy of Family Physicians website provides a five part definition of the domain of primary care: 1. "Primary care is that care provided by physicians specifically trained for and skilled in comprehensive first contact and continuing care for persons with any undiagnosed sign, symptom, or health concern, not limited by problem origin, organ system, or diagnosis." 2. "Primary care practice serves as the patient's first point of entry into the health care system and as the continuing focal point for all needed health care services." 3. "A primary care physician is a generalist physician who provides definitive care to the undifferentiated patient at the point of first contact and takes continuing responsibility for providing the patient's care. Such a physician must be specifically trained to provide primary care services. Primary care physicians devote the majority of their practice to providing primary care services to a defined population of patients. The style of primary care practice is such that the personal primary care physician serves as the entry point for substantially all of the patient's medical and health care needs - not limited by problem origin, organ system, or diagnosis. Primary care physicians are advocates for the patient in coordinating the use of the entire health care system to benefit the patient." 4. "Physicians who are not trained in the primary care specialties of family medicine, general internal medicine, or general pediatrics may sometimes provide patient care services that are usually delivered by primary care physicians." 5. "There are providers of health care other than physicians who render some primary care services. Such providers may include nurse practitioners, physician assistants and some other health care providers." Accessed May 6, 2013 from the AAFP website: http://www.aafp.org/online/en/home/policy/policies/p/primarycare.html

Organization	Source	How Primary Care Defined	Notes
American Medical Association	*Physician Characteristics and Distribution in the US – 2013 Edition*	Primary Care specialties are defined as "(1) the general primary care specialties of Family Medicine, General Practice, Internal Medicine, Obstetrics and Gynecology, and Pediatrics, *excluding* subspecialties associated with these general specialties and (2) the primary care subspecialties *including only* the subspecialties of the general specialties listed in group one." (xvii)	Data compiled from the AMA Physician Masterfile. See, *Physician Characteristics and Distribution in the US – 2013 Edition*, p. xvii.
Association of American Medical Colleges (AAMC)	*2011 State Physician Workforce Data Book*	"Physicians are counted as primary care physicians if their self-designated primary specialty is . . . adolescent medicine, family medicine, general practice, geriatric medicine, internal medicine, internal medicine/pediatrics, or pediatrics."	
Association of American Medical Colleges (AAMC)	*2012 Physician Specialty Data Book*, November 2012	Primary care specialties defined as internal medicine, family medicine/general practice, pediatrics, and internal medicine/pediatrics. (See Note page 1, and Key Findings, p 2.)	
Institute of Medicine	*Primary Care: America's Health in a New Era*, National Academy Press (Washington),	Primary care defined as "the provision of integrated, accessible health care services by clinicians who are accountable for addressing a large majority of	IOM report intended to define primary care "for all parties involved in the delivery and financing of primary care and . . . institutions responsible for the education and training of primary care clinicians." (33-4)

Organization	Source	How Primary Care Defined	Notes
	1996.	personal health care needs, developing a sustained partnership with patients, and practicing in the context of family and community." (33)	The definition provided in this monograph is a functional definition in contrast to a definition of who are primary care providers/clinicians. "The Committee [on the Future of Primary Care] (the authors) acknowledges that the use of a functional definition of primary care does not provide a definitive answer to those who must count primary care clinicians and develop policies regarding payment for primary care services . . . the committee preferred not to use the definition to differentiate among clinicians . . . If pushed to differentiate among clinicians . . . the committee would use as a reference its knowledge of how clinicians are currently trained and what they generally do in their practices. From this perspective, it seems clear that those trained in family medicine, general internal medicine, general pediatrics, many nurse practitioners, and physician assistants are trained in and are generally most likely to practice primary care." (44-5) Noting that other specialists in many instances are functionally involved with the provision of primary care (for example, "the committee . . . recognize[s] that many women use OB-GYN specialists as their main, or even sole, health care providers."), "other specialists and subspecialists are not, for workforce planning purposes, considered primary care physicians." (154)

APPENDIX B: Methods

Primary Care Provider Analysis Methods

Licensing Board Data – Since 1993, the Minnesota Department of Health's Workforce Analysis and Planning Program has maintained a cooperative data-sharing relationship with several state licensing boards overseeing health care professions as directed in Minnesota Statutes sections 144.051–144.052 and 144.1485. For this report, the Minnesota Board of Medical Practice and Minnesota Board of Nursing were the source of demographic and licensing data for the physicians, physician assistants, and nurse practitioners described as primary care providers. These data provide the basis for several value-added fields used by MDH in the analysis, such as region and rural urban commuting area, or medical specialty certification and constitute the denominators for various calculations. Records for both new initial licenses and active license renewals constitute the population of licensed professionals for analysis. When licensing board data is received at MDH, duplicates are removed to reflect the most current information.

Workforce Survey Data – The Minnesota Department of Health surveys many licensed health care professionals in the state at the time of their license renewal. Survey items include questions about education, future practice plans, work status, hours worked, practice sites and activities, relationships with other professionals, and demographic information not collected during license application or renewal. Originally conceived as a census, the survey is non-probability in design. Results are subject to both self-selection error, a type of sampling error, when some professionals chose not to respond to the survey at all, and nonresponse error, when some respond to selected survey questions but not others. Furthermore, only professionals renewing their state license have the opportunity to respond, thus representing a subset of all licensed professionals, not the total population. For example, overall there were 987 new physician licensees included in the March 2012 BMP dataset of physicians from which primary care physicians were selected. Of these overall new licenses, 153 were board certified primary care physicians. The 153 were included in licensing board based statistics, but not the survey based reports. Despite reasonably high overall response rates among license renewals (50% or more), these errors are still present. No adjustments for them were attempted for this analysis.

Merging Licensing Board and Survey Data – Merging of the two data sets occurs based upon license number, regardless of board. Licensing boards have differing renewal requirements for different professions, for example physician and physician assistants renew annually while registered nurses renew every two years. Because of this renewal cycle, the most current licensing data is merged with the most recent survey cycle. This frequently results in a time lag between the two sources. Some licensees may respond to a previous survey cycle but not the most recent and are consequently flagged as nonresponders for the most current merged dataset. Survey response rates and survey question response rates are calculated from a denominator of license renewals only. New licensees, with no opportunity to respond to the survey, are excluded from the denominator used to calculate the response rates.

Primary Care Physicians Defined

The physicians included in this report were classified as "primary care" providers based upon Minnesota statute and their specialty board certifications.[27] Minnesota does not require specialty board certification to obtain a license to practice medicine. To obtain a license, a physician must have graduated from an accredited medical or osteopathic school, completed an accredited graduate clinical medical training residency, and passed the US Medical Licensing Examination, or approved

equivalents.[28] The types of clinical residency and/or fellowship programs completed typically reflect the practice areas in which physicians may engage, for example family medicine or general surgery.

To become "board certified" in an area of practice or specialty, a physician must not only meet state requirements for obtaining a license to practice medicine, but also successfully complete a rigorous testing and peer review process in each specific area of clinical practice, with the aim of ensuring that candidates for certification are knowledgeable about current evidence-based guidelines, national standards of care, and the best practices in their chosen area of expertise. For example, board certifications are available for the practice of primary care in general family medicine, general internal medicine, and general pediatrics. The State of Minnesota recognizes two of umbrella medical specialty certification board associations, the American Board of Medical Specialties (ABMS) or the Certifying Boards of the American Osteopathic Association (AOA). ABMS represents the largest certifying umbrella organizations, with over 750,000 US physicians having received certification from one or more of its 24 member Boards.

> *Family Medicine/General* – Physicians classified into this category were those with a current single general certificate in family medicine or family practice from the American Board of Family Medicine (ABFM) or the Family Physicians board of the AOA. There are a few exceptions to the single certification requirement. A number of family physicians are board certified by both the ABMS and AOA. These physicians are still counted as family medicine generalists.
>
> *Internal Medicine/General* – Physicians classified into this category were those with a current single certificate issued by the American Board of Internal Medicine or the Internal Medicine board of AOA. There were a few exceptions to the single certification requirement. A number of internists are board certified by both the ABMS and AOA. These physicians are still counted as internal medicine generalists.
>
> *Pediatrics/General* – Physicians classified into this category were those with a current single general certificate from the American Board of Pediatrics or Pediatrics board of AOA.

Many physicians have more than one board certification. Those with any subspecialty certification were not classified as a primary care physician. Physicians with certifications in two primary care disciplines, for example pediatrics and internal medicine were classified as mixed specialists and therefore not primary care providers. See Appendix A of the following report for more details of the physician specialty classification schema:
http://www.health.state.mn.us/divs/orhpc/pubs/workforce/docrpt2012.pdf

Primary Care Nurse Practitioners Defined

Certified nurse practitioners (NP) are advance practice registered nurses (APRN) who have completed nursing training, passed their registered nurse licensing exams, then completed additional academic and clinical training, typically at Master's degree level or beyond, to meet the requirements for certification as NPs. There is no separate license for RNs and APRNs. Many NPs go on to complete additional specialty certification. Since this report focuses upon the delivery of primary care in Minnesota, attention is being given only to NPs who have credentials in one or more of the following specialty areas all of which are classified as "primary care competencies"[29]:

Adult Health
Family Health
Gerontology

Pediatrics
Women's Health Care

Similar to physicians, some NPs have earned more than one specialty certification and some were also certified are other types of APRN practitioners, such as being both a nurse practitioner and a clinical nurse specialist. As long these providers were certified as nurse practitioners and had the additional specialty certifications above, they were counted as nurse practitioners. Nurse practitioners without specialty certifications were assumed to provide primary care and were also included.

Primary Care Physician Assistants Defined

While licensed physician assistants (PA) can obtain specialty certifications of added qualifications from the National Commission on Certification of Physician Assistants, these additional credentials are only now being collected by the Minnesota Board of Medical Practice. Consequently, there are a very few physician assistants with added qualifications of record in the BMP data used for this analysis. Therefore, for this analysis, it is assumed that all PAs are providing primary care in some form and must do so under the supervision of a licensed physician.

Notes

[1] This definition is based on Minnesota Statutes section 137.38, Education and Training of Primary Care Physicians, which defines "primary care physician" as encompassing three types of doctors: family practice physicians, general internists and general pediatricians.

[2] This classification is based on HRSA's definition of NP "primary care competencies." U.S. Department of Health and Human Services, Health Resources and Services Administration- Bureau of Health Professions, Division of Nursing. *Nurse Practitioner Primary Care Competencies in Specialty Areas: Adult, Family, Gerontological, Pediatric, and Women's Health*. Rockville (MD): HRSA; April 2002. Available from: http://www.aacn.nche.edu/education-resources/npcompetencies.pdf. The Minnesota Board of Nursing recognizes certifications from the following certifying organizations:

- American Academy of Nurse Practitioners
- American Association of Critical-Care Nurses Certification Corporation
- American Nurses Credentialing Center
- American Midwifery Certification Board
- Council on Certification of Nurse Anesthetists
- Pediatric Nursing Certification Board
- National Certification Corporation for the Obstetric, Gynecological, and Neonatal Nursing Specialties

[3] These certifications are offered through the National Commission on Certification of Physician Assistants (NCCPA). The NCCPA first offered these specialty exams in September 2011, allowing licensed PAs to obtain Certificates of Added Qualifications (CAQs). According to the NCCPA website, as of August 19, 2013 a total of 14 PAs in Minnesota had earned CAQs in one of the following specialties: Emergency Medicine, Psychiatry and Cardiovascular & Thoracic Surgery. These additional credentials are only now being collected by the Minnesota Board of Medical Practice (BMP). Therefore for this analysis, it is assumed that all PAs are providing primary care in some form. Despite this necessary assumption, varied reports show that many PAs do indeed specialize and may not actively be providing primary care. See also section on PAs.

[4] American Academy of Physician Assistants. *Physician Assistant Census Report: Results from the 2010 AAPA Census*. Alexandria (VA): 2011. Available from: http://www.aapa.org/uploadedFiles/content/Common/Files/2010_Census_Report_Final.pdf.
Agency for Healthcare Research and Quality. The Number of Nurse Practitioners and Physician Assistants Practicing Primary Care in the United States. *Primary Care Workforce Facts and Stats No. 2*. Rockville (MD): AHRQ; October 2011. Available from: http://www.ahrq.gov/research/findings/factsheets/primary/pcwork2/index.html.

[5] See, for example, a report issued by a statewide work group convened by MDH in 2008. Minnesota Department of Health. *Health Workforce Shortage Study Report: Report to the Minnesota Legislature 2009*. St. Paul: MDH; January 2009. Available at: http://www.health.state.mn.us/healthreform/workforce/WorkforceFinalReport.pdf.

[6] State population data is from the U.S. Census Bureau. See also the Minnesota State Demographic Center's website: http://www.demography.state.mn.us/.

[7] RUCAs were developed by the U.S. Health Resources and Services Administration, Office of Rural Health Policy in partnership with the U.S. Agriculture Department's Economic Research Service and the WWAMI Rural Health Research Center at the University of Washington. See the following for more background on RUCAs: http://www.ers.usda.gov/briefing/rurality/ruralurbancommutingareas/ and http://depts.washington.edu/uwruca/.

[8] For a map and list of which counties are included in which region, see the Planning Areas page of the Minnesota Department of Employment and Economic Development (DEED) website: http://www.positivelyminnesota.com/assets/lmi/areamap/plan.shtml.

[9] Minnesota Board of Medical Practice. *Physician Fact Sheet*. MDFS1/2011. Available from: http://mn.gov/health-licensing-boards/images/Physician_Fact_Sheet_041703095702_Form-MDFactSheet2011-MOC.pdf.

[10] The Minnesota Board of Nursing recognizes nurse certifications from the following organizations:

- American Academy of Nurse Practitioners
- American Association of Critical-Care Nurses Certification Corporation
- American Nurses Credentialing Center
- American Midwifery Certification Board
- Council on Certification of Nurse Anesthetists
- Pediatric Nursing Certification Board
- National Certification Corporation for the Obstetric, Gynecological, and Neonatal Nursing Specialties

[11] U.S. Department of Health and Human Services, Health Resources and Services Administration-Bureau of Health Professions, Division of Nursing. *Nurse Practitioner Primary Care Competencies in Specialty Areas: Adult, Family, Gerontological, Pediatric, and Women's Health*. Rockville (MD): HRSA; April 2002. Available from: http://www.aacn.nche.edu/education-resources/npcompetencies.pdf.

[12] According to the American Academy of Nurse Practitioners, 89 percent of NPs are trained in primary care, and more than 75 percent practice in primary care settings. Yee T, Boukus E, Cross D, Samuel D. Primary Care Workforce Shortages: Nurse Practitioner Scope-of-Practice Laws and Payment Policies. *Research Brief No. 13*. National Institute for Health Care Reform, February 2013. Available from: http://www.nihcr.org/PCP-Workforce-NPs.

[13] Institute of Medicine. *Accessing Primary Care: Barriers to Nurse Practitioner Practice*. Released October 5, 2010. Available from: http://www.iom.edu/Reports/2010/The-Future-of-Nursing-Leading-Change-Advancing-Health/Figure-3-3.aspx.

[14] Robert Wood Johnson Foundation. *Male Nurses Break Through Barriers to Diversity Profession*. September 28, 2011. Available from: http://www.rwjf.org/en/about-rwjf/newsroom/newsroom-content/2011/09/male-nurses-break-through-barriers-to-diversify-profession.html.

[15] National Center for Health Workforce Analysis, Health Resources and Services Administration, U.S. Health and Human Services. *The U.S. Nursing Workforce: Trends in Supply and Education.* Washington, D.C.: HRSA; April 2013. Available from: http://bhpr.hrsa.gov/healthworkforce/reports/nursingworkforce/index.html .

[16] The 2011-2012 survey questions pertaining to race and ethnicity are two separate question and both had a 56 percent response rate.

[17] U.S. Census Bureau, 2010.

[18] Kimball BA, Rothwell WS. Physician assistant practice in Minnesota: Providing care as part of a physician-directed team. *Minnesota Medicine*. May 2008: 45-48.

[19] Minnesota Statutes section 147A.09. Scope of Practice, Delegation.

[20] Petterson SM, Phillips RL, Bazemore AW, Burke BT, Koinis GT. Relying on NPs and PAs does not avoid the need for policy solutions for primary care. *Am Fam Physician*. 2013 Aug 15;88(4):230. Available from: http://www.graham-center.org/online/graham/home/publications/onepagers/2013/rely-np-pa.html.

[21] American Academy of Physician Assistants. *Physician Assistant Census Report: Results from the 2010 AAPA Census*. Alexandria (VA): 2011. Available from: http://www.aapa.org/uploadedFiles/content/Common/Files/2010_Census_Report_Final.pdf.

Agency for Healthcare Research and Quality. The Number of Nurse Practitioners and Physician Assistants Practicing Primary Care in the United States*. Primary Care Workforce Facts and Stats No. 2*. Rockville (MD): AHRQ; October 2011. Available from: http://www.ahrq.gov/research/findings/factsheets/primary/pcwork2/index.html.

[22] American Academy of Physician Assistants. *2007 AAPA Physician Assistant Census*. Alexandria (VA): 2008.

[23] Henry LR, Hooker RS, Yates KL. The role of physician assistants in rural health care: A systematic review of the literature. *The Journal of Rural Health* 27 (2011):220-229.

[24] American Academy of Physician Assistants. *Physician Assistant Census Report: Results from the 2010 AAPA Census*. Alexandria (VA): 2011. Available from: http://www.aapa.org/uploadedFiles/content/Common/Files/2010_Census_Report_Final.pdf.

[25] In the 2009 American Academy of Physician Assistants census, 65 percent of respondents were female and 35 percent were male. The proportion in 2010 was 62 percent female and 38 percent male. This trend is the reverse in Minnesota, where the 2009 proportion was 66 percent female and 34 percent male and the 2011 proportion was 69 percent female and 31 percent male. American Academy of Physician Assistants. *2009 AAPA Physician Assistant Census*. Alexandria (VA): 2010 . Office of Rural Health & Primary Care, Minnesota Department of Health. *Minnesota Physician Assistants Facts and Data 2009.* St. Paul: MDH; January 2010. Available from: http://www.health.state.mn.us/divs/orhpc/pubs/workforce/pa09.pdf.

[26] American Academy of Physician Assistants. *Physician Assistant Census Report: Results from the 2010 AAPA Census*. Alexandria (VA): 2011. Available from: http://www.aapa.org/uploadedFiles/content/Common/Files/2010_Census_Report_Final.pdf.

[27] Minnesota Statutes section 137.38, Sub. 2.

[28] Minnesota Board of Medical Practice. *Physician Fact Sheet*. MDFS1/2011. Available from: http://mn.gov/health-licensing-boards/images/Physician_Fact_Sheet_041703095702_Form-MDFactSheet2011-MOC.pdf.

[29] U.S. Department of Health and Human Services, Health Resources and Services Administration-Bureau of Health Professions, Division of Nursing. *Nurse Practitioner Primary Care Competencies in Specialty Areas: Adult, Family, Gerontological, Pediatric, and Women's Health*. Rockville (MD): HRSA; April 2002. Available from: http://www.aacn.nche.edu/education-resources/npcompetencies.pdf.