

Assessing Career Dissatisfaction and Plans to Leave Patient Care Among the Rural Pennsylvania Health Workforce

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Executive Summary

A number of population trends are affecting the Pennsylvania health care system and have the potential to exacerbate health care worker shortages found in rural areas. These trends include a growing and aging population, a likely increase in Medicaid enrollments, and a growing rural veteran population. Whether the health care workforce is equipped to handle such demand pressures is an important question for communities and policymakers.

A good understanding of the workforce itself is essential to verify whether such shortages are likely and to formulate potential responses.

This research analyzed survey data for four health workforces in Pennsylvania, namely physicians, physician assistants, dentists, and dental hygienists, to identify any rural/urban differences in the workforce makeup, career satisfaction, and plans to leave patient care.

The research used the 2012-2013 Pennsylvania Health Workforce Surveys for the analysis. The surveys collect a variety of information on health care workers, including their age, gender, educational background, employment, and job satisfaction levels.

According to the research, the number of rural physicians and dentists nearing retirement age is larger than the number of physicians and dentists early in their careers. In rural areas, physicians and dentists who are 30 to 39 years old make up a smaller percent-

age of their workforces than those in urban areas.

In rural areas, most physician assistants and dental hygienists are under 45 years old. The age distribution of these professionals is similar in urban areas.

Only 24 percent of all rural physicians are female, including 39 percent of those age 40 and younger. However, a much larger percentage of younger urban physicians are female (47 percent), suggesting that there may be barriers or preferences that sway females from practicing in rural areas. While females make up a smaller percentage of dentists overall (21 percent), the results suggest stronger female representation among dentists beginning their careers (45 percent) in both rural and urban settings.

Overall, 14 percent of physicians report dissatisfaction with their careers in the past year, with slightly more rural physicians reporting dissatisfaction. After controlling for other factors, the research indicated that rural physicians have 17 percent higher odds of reporting dissatisfaction, which is important given the strong links between career satisfaction and decisions to leave practice. Higher rural odds of dissatisfaction tended to be stronger for the following subgroups of physicians: males, primary care practitioners, white physicians, those 60 years old and older, and those practicing in a single-specialty office.

Rural physician assistants, dentists, and dental hygienists nearing retirement age also have higher odds

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sustain the vitality of Pennsylvania's rural and small communities.

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of retiring in the next 6 years than their urban counterparts.

As the research could not determine why rural health care workers report dissatisfaction and plans to leave their professions, the researchers recommend future research to focus on a number of areas, including: qualitative studies to help uncover the reasons for higher rural dissatisfaction and plans to leave patient care, as well as reasons why female and younger physicians and dentists are underrepresented in rural areas; county-level studies to identify specific factors that drive rural/urban differences identified in this research; and studies into what fraction of the health care workforce is equipped to provide services for veteran and elderly patient populations and the potential barriers that may exist to meeting the growing demand from these populations.

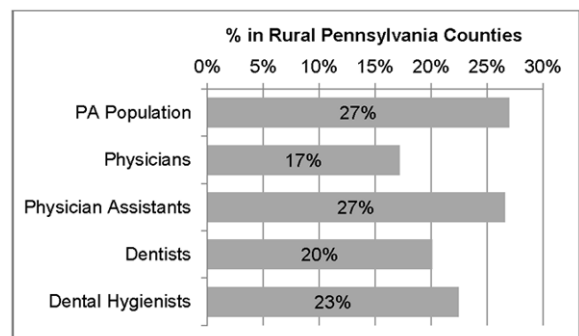
Introduction

Thirty of Pennsylvania’s 67 counties include geographic areas designated by the U.S. Department of Health and Human Services as Health Professional Shortage Areas (HPSAs). Of the 30 HPSAs, 26 are located in rural Pennsylvania, resulting in more than half of the state’s 48 rural counties having areas with shortages of primary care providers; one-fifth of rural counties have a shortage of mental health professionals¹. The shortage of health care professionals has a number of consequences for patients, including upward pressures on health care costs, longer wait times in scheduling, longer wait times at the doctor’s office, and longer periods between follow-up visits. The shortage also has consequences for providers, including seeing more patients, working more hours, holding off retirement, and reducing the likelihood of relocating or changing specialty (U.S. Department of Health and

Human Services, 2008). Such shortages are expected to worsen, as the growth of the physician workforce is not expected to match the growing demand for services. According to the U.S. Department of Health and Human Services (HHS), nationwide, physician supply is expected to increase by 17 percent from 2005 to 2020, while the demand for physician services is expected to grow by 22 percent (2008). Similar trends have been found in dentistry, which is especially troubling given the growing evidence that oral health and general health are inter-related (HHS, 2005).

To better understand these shortages, this research analyzed the makeup of the health workforce, the levels of dissatisfaction in the profession, and professionals’ plans to leave patient care. The research focused on four essential workforces in Pennsylvania: physicians, physician assistants, dentists, and dental hygienists. Using data provided by the Pennsylvania Department of Health’s Bureau of Health Planning (PABHP), the research identified a number of rural/urban differences in the health care workforce that can potentially exacerbate such shortages.

Figure 1: Pennsylvania’s Rural Population and Rural Health Workforces Studied



Source: Authors’ calculations, Health Workforce Surveys (2012, 2013). Pennsylvania population information from the Center for Rural Pennsylvania (2014). Note: Analysis of 26,544 physicians, 4,568 physician assistants, 5,187 dentists, and 5,570 dental hygienists. Health workforces consist of those in direct patient care at the time of survey.

1. According to the Health Resources and Services Administration (HRSA), “HPSAs are designated using several criteria, including population-to-clinician ratios. This ratio is usually: 3,500:1 for primary care; 5,000:1 for dental health care; and 30,000: 1 for mental health care.” (HRSA, 2014)

Figure 1 shows the rural makeup of the state's population to the makeup of the four workforces included in the study. Although 27 percent of the state's residents live in rural counties, only 17 percent of physicians and 20 percent of dentists work in rural counties. While Pennsylvania has a larger percentage of rural residents than the national average, the population-to-physician discrepancies are similar. Approximately 20 percent of the U.S. population lives in rural areas but 11 percent of the nation's physicians practice in rural communities (Fordyce et al., 2007).

Many primary and preventive care services are shifting from physicians and dentists to professional assistants. Physician assistants are medical professionals who are licensed to practice under the supervision of a licensed doctor. Research has found that physician assistants tend to enhance health care delivery, frequently perform services in rural areas, supplement care given by physicians, lower patient wait times, and increase patient volume (Henry et al., 2011). A study in Pennsylvania found that rural physician assistants saw more patients, spent more time with them, and were the principal provider for more patients than urban physician assistants (Martin, 2000). However, more recent evidence from 13 states suggests that physician assistants are less likely than physicians to provide services beyond the outpatient setting (Doescher et al., 2014).

Dental hygienists provide many preventive services, including teeth cleaning and oral health education. Starting in 2010, public health dental hygiene practitioners (PHDHPs) were licensed in Pennsylvania to address health professional shortages. According to the Pennsylvania Department of Health, PHDHPs "perform educational, preventive, therapeutic, intra-oral and radiologic procedures without the direct supervision of a dentist at identified practice sites. PHDHPs are required to refer patients to a dentist annually" (Pennsylvania Bureau of Health Planning, 2012b). This research found that only 6 percent of Pennsylvania dental hygienists are licensed PHDHPs.

Understanding the differences between rural and urban health care workforces is essential to addressing potential workforce shortages. Previous research highlighted a number of factors that may be contributing to such shortages. Nationwide, more than 40 percent of active physicians were 55 years old or older in 2010, suggesting a need to focus on the potential impacts of retirement (Dyrbye et al., 2013; Association of American Medical Colleges, 2012; Landon et al., 2006).

According to data from the Bureau of Labor Statistics' Current Population Survey (2014), 12 percent of

physicians are 65 years old and older, compared to 7 percent of managers and 10 percent of lawyers. Recent research suggests that rural areas may be more affected by the retirement of primary care providers (Fordyce et al., 2013).

In addition to age, rural/urban differences exist in gender. Previous research consistently found that female physicians are more likely to practice in urban areas than their male counterparts (Henry et al., 2011; Gamm et al., 2010; Bellinger, 2009; Rosenblatt and Hart, 2000). Data from the Association of American Medical Colleges (AAMC) suggest that less than one-third of active physicians in the U.S. were female as of 2010, although half of residents and fellows were female (2012). While female and male physicians are almost equally likely to be satisfied with their careers (Biscardi et al., 2013; Brazil et al., 2010; Keeton et al., 2007), female physicians are more likely to leave their careers than male physicians (AAMC, 2012; Bahrami and Jacobson, 2011; Landon et al., 2006; Spickard et al., 2002).

In addition to age and gender, a number of other factors have been shown to increase burnout or the likelihood of a career change, including excessive or uncontrollable work hours (Keeton et al., 2007; Spickard et al., 2002), not owning a practice (Landon et al., 2006; Pathman et al., 2004), depression, and anxiety (Williams et al., 2010; Keeton et al., 2007; Spickard et al., 2002).

Career dissatisfaction has a strong association with plans to leave patient care (Landon et al., 2006; Dyrbye et al., 2013; Williams et al., 2010).

This research also analyzed the factors related to career dissatisfaction in each of the four health workforces and identified rural/urban discrepancies. Much of the previous research on this subject focused on physician satisfaction related to three areas: professional autonomy, providing quality care, and personal security and well-being. First, when physicians feel as though their professional autonomy, or their ability to determine the best course of action, is restricted, they are more likely to be dissatisfied with their jobs (Plomp and Van der Beek, 2014; Moreau and Mageau, 2012; Solomon, 2008; Landon, 2003; Mechanic, 2003; Spickard et al., 2002). Hierarchical management structures are also credited with decreased physician career satisfaction (Brazil, 2010). Second, physicians greatly value providing high quality care (Elder et al., 2010; Mechanic, 2003). Difficulties in collaborating with specialists (Thind et al., 2009), patient visit time limits (Solomon, 2008), and managed care (Landon et al., 2003; Wil-

liams et al., 2001; Stoddard et al., 2001; Linzer et al., 2000; Hadley et al., 1999; and Cykert et al., 1997) have been correlated with lower job satisfaction. Third, physician satisfaction is associated with personal security and well-being (Leigh et al., 2011; Deshpande and DeMello, 2010; Williams et al., 2010; Keeton et al., 2007; Frank et al., 1999). Workplace stress and administrative burden can lead to burnout or personal distress (Plomp and Van der Beek, 2014; Behmann et al., 2012; Elder et al., 2010). Malpractice suits and income levels are also associated with career satisfaction (Deshpande and DeMello, 2010).

Compared to the research on physicians, less research has been conducted on the reasons why physician assistants, dentists, and dental hygienists either leave patient care or find dissatisfaction in their careers. Research on physician assistants suggests that the main factors that discourage recruitment to and retention in rural areas are professional isolation, low income, long hours, a lack of medical equipment or technology, social isolation, and low pharmacy availability (Henry et al., 2011). Both male and female dentists tend to rate their careers as satisfying, however, female dentists have lower levels of practice ownership, postgraduate qualifications, and continuing-education attendance, suggesting that substantial barriers keep female dentists from greater career development (Ayers et al., 2008). Among dental hygienists, hand or wrist pain due to physical demands often lead to reduced work hours and office and professional conflicts are highly cited as reasons for relocation (Yee et al., 2005).

Goals and Objectives

The goal of this research was to help key stakeholders better understand certain dynamics in the health care workforce for Pennsylvania. The research analyzed survey data on four health workforces in Pennsylvania – physicians, physician assistants, dentists, and dental hygienists – to identify any rural/urban differences in the workforce makeup (e.g., age, gender, race, and practice characteristics), career satisfaction, and plans to leave patient care. Better understanding the current health workforce, their satisfaction, and their plans — and how these may differ across rural areas and specialties — constitutes a first step in understanding the overall direction of health service delivery.

Methodology

Data for the analysis came from the 2012 and 2013 Pennsylvania Health Workforce Surveys². The Pennsylvania State Board of Medicine and the State Board of Osteopathic Medicine are responsible for licensing physicians and physician assistants, while the State Board of Dentistry licenses dentists and dental hygienists. All four groups are required to renew their license to practice every 2 years (PABHP, 2012a; PABHP, 2012b). The Pennsylvania Department of Health’s Bureau of Health Planning surveyed physicians and physician assistants renewing their license in 2012 and dentists and dental hygienists renewing their license in 2013. Using files provided by the Bureau of Health Planning, this research analyzed the survey data on 26,544 physicians, 4,568 physician assistants, 5,187 dentists, and 5,570 dental hygienists who were actively practicing patient care in Pennsylvania at the time of the survey.

Information collected in these surveys include the following: age; sex; race; education; experience; employment; primary practice setting and specialty; hours spent in various activities; satisfaction with career and job; use of health information technology; and future plans and reasons for leaving a health career. The health workforce data files also indicate whether a person practices in a rural county, defined by the Center for Rural Pennsylvania as “having a population density below the statewide average of 284 persons per square land mile. Urban counties have a density at or above the statewide average.” Forty-eight of Pennsylvania’s 67 counties have a density below 284 and are coded as “rural counties.” A second geographical variable indicated whether a health care professional is practicing in the western or eastern part of the state, with Potter, Clinton, Centre, Blair, Bedford, and all counties further west designated as “western counties” by the Center for Rural Pennsylvania (29 of 67 counties).

To focus on the active Pennsylvania health care workforce, the researchers placed a number of restrictions on the data, reducing the number of observations analyzed. First, health care workers who do not practice in Pennsylvania or work in medical care were removed from the dataset, including more than 30 percent of physicians, 10 percent of physician assistants, 20 percent of dentists, and 20 percent of dental hygienists. Second, less than 1 percent of observations were dropped for missing data for a variable of interest used in the analy-

2. Health workforce data were supplied by the Bureau of Health Planning, Pennsylvania Department of Health. The Pennsylvania Department of Health specifically disclaims responsibility for any analyses, interpretations or conclusions.

sis. Third, survey respondents reported the average number of hours spent providing direct patient care and other activities over the past year. A number of health care professionals report either working relatively few hours (indicating a loose attachment to the workforce) or relatively many hours (potentially indicating misreporting). To address potential problems with work hours, the researchers restricted the data based on low and high hours, and for the multivariate analysis, controlled for the number of hours worked among the remaining observations. Data restrictions due to hours were described as follows:

Three percent of physicians, 4 percent of physician assistants, and 6 percent of dentists reported working less than 20 hours per week and were dropped from the sample. Since more than 80 percent of the sample worked 35 hours per week or more, low work hours may have reflected past decisions to scale back due to dissatisfaction. The research team chose to separate low-hour workers to focus on current demands, dissatisfaction and future plans to leave patient care. On the other hand, dental hygienist observations were not dropped for low hours because many work several, part-time jobs. While 20 percent of dental hygienists work 20 hours or less per week in their primary job (half work 30 hours or less per week), more than one-fourth hold more than one position in the field.

One percent of physicians (449) reported averaging more than 110 work hours per week over the past year and were dropped from the sample. This level of work is more than two standard deviations above the sample mean (56 hours) and consists of misreporting (i.e. 100+ reported never sleeping on average). Similarly, less than 1 percent of physician assistants reported averaging more than 100 work hours per week and were dropped from that workforce sample.

The researchers used these methods to restrict and analyze the workforce by age to make the presentation more clear and to better isolate age effects from other effects in the analysis of dissatisfaction and plans to leave. Very few physicians (less than 1 percent of the sample) began practice before their 30s, due to the lengthy education and residency process. The few who did may have had different reasons for dissatisfac-

tion than the typical age cohort. Similarly, 1 percent of physicians work beyond age 78 and likely do not have plans to retire that are typical of physicians near the standard age of retirement. To focus on the main distribution of health care professionals, observations below and above an age threshold (30 and 78 years for physicians and dentists and 25 and 64 years for physician assistants and dental hygienists) were dropped, or about 3 percent of each workforce.

The researchers also tested for statistical significance for rural and urban areas separately and together for the four workforces³.

For the career dissatisfaction and plans to leave variables, the researchers compared rural vs. urban means across subgroups of the workforce, by age group, race, practice setting (e.g., office, hospital), and specialty. For instance, key information can be obtained by comparing career dissatisfaction for physicians early in their careers and those closing in on retirement separately. The researchers combined subgroups with low observations in rural areas into “other” categories. Rural Pennsylvania counties have few observations (less than 50) for a number of specific racial, setting, and specialty subgroups, so combining these small groups into “other” categories allowed the researchers to test for statistically significant differences without dropping the observations.

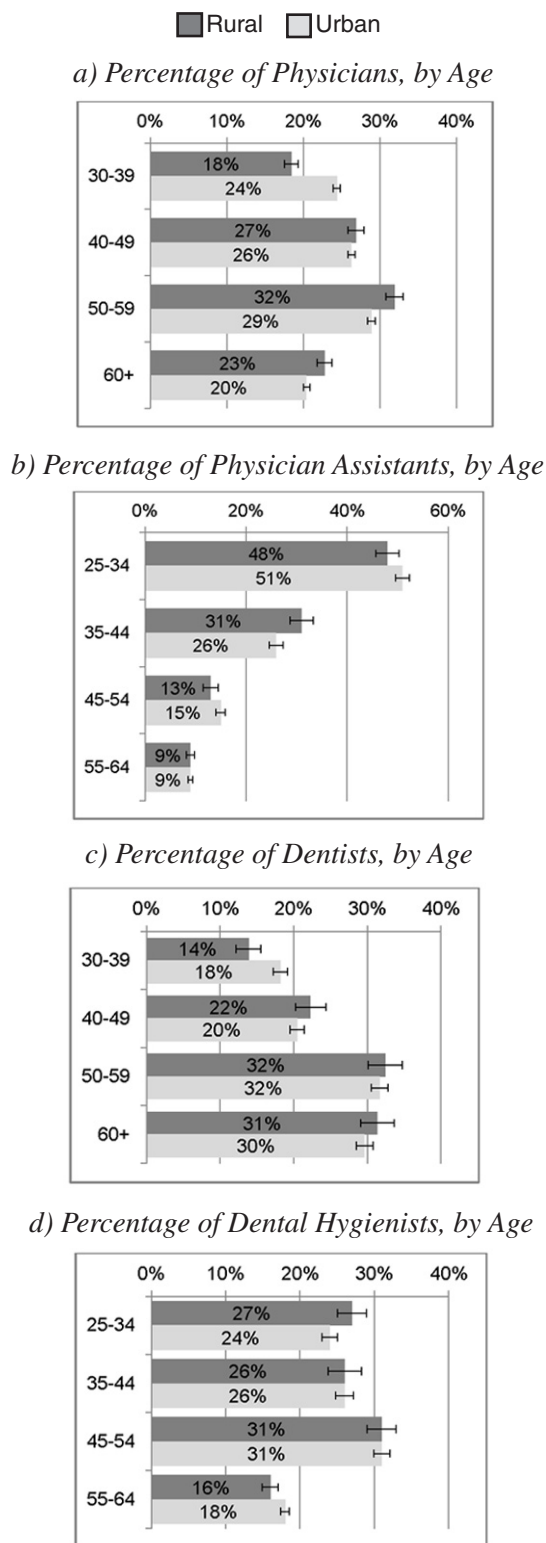
The researchers also used multivariate regression to isolate the effect that working in a rural setting has on career dissatisfaction and plans to leave the workforce. They controlled for other potential factors including: age; race; gender; practice in western vs. eastern Pennsylvania; experience; the ratio of hours in administration, teaching, and research to hours in patient care; total hours of work (or work hour categories for dentists and dental hygienists); practice setting and specialty categories; and practice characteristics including ownership, and Medicaid/Medicare coverage⁴. The estimates were calculated to indicate rural-to-urban odds ratios: higher odds ratios suggest that rural professionals have higher odds of being dissatisfied or higher odds of planning to leave their careers.

Regarding to plans to leave, the survey asked whether the respondent was planning to leave practice or patient

3. Based on calculations by Knol et al., 2011, this research compares 89 percent confidence intervals to arrive at Type 1 error probability of 0.05. Thus, in the bar charts reported in this report, non-overlapping confidence intervals approximate a statistically significant difference at $p < 0.05$. When confidence intervals were close, the researchers double-checked graphical results with the statistical means test.

4. Regression models for the various workforces varied slightly due to differences in the survey instruments. For instance, hours worked were reported as categories (i.e. 1-10, 11-19, 20-30, 31-40) for dentists and dental hygienists but as specific totals for physicians and physician assistants.

Figure 2: Distribution of Health Workforces Across Age Groups, Rural/Urban Comparison



Source: Authors' calculations, Health Workforce Surveys (2012, 2013).
 Note: Analysis of 26,544 physicians, 4,568 physician assistants, and 5,187 dentists. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces. Distributions describe the entire sample but may not add to 100 percent due to rounding.

care. If respondents indicate they are planning to leave within the next 6 years, a follow-up question asks the reason. For every workforce, retirement is the primary reason but is mainly restricted to those 55 years or older. The researchers calculated many regressions on the plans to leave to differentiate plans to retire from plans to leave for other reasons. The results are presented in three stages: for the entire sample; for those 55 years and older; and for those under 55. Since dissatisfaction has been shown to affect plans to leave one's career, the researchers performed regressions both with and without controls for dissatisfaction.

Results

Describing Rural-Urban Workforce Differences

A number of demographic and professional characteristics differ across the rural and urban workforces and are highlighted below.

Age and Experience

On average, rural physicians and dentists are about 1 year older than their urban counterparts⁵. Figure 2 presents the age groups of the rural and urban workforces. For rural and urban comparisons, non-overlapping confidence intervals (black bars in graphs) indicate a statistically significant difference.

As shown in Figure 2a, 18 percent of rural physicians are 30 to 39 years old and 23 percent are 60 years and over. Among urban physicians, 24 percent are 30 to 39 years old and 20 percent are 60 years and over.

As mentioned above, physicians are underrepresented in rural areas, compared to the population. This gap is larger for physicians under 40 years old:

- one of four Pennsylvanians lives in rural areas,
- one of six physicians practices in rural areas (4,561 of 26,544),
- one of seven physicians under 40 practices in rural areas (841 of 6,201).

If urban physicians stay in urban areas, rural areas will see fewer physicians per population as those over 50 years begin to retire. However, as discussed below, relocation is common and more information is needed on the rate that mid-career physicians move to/from urban environments.

Figure 2b presents the age breakdown for physician assistants. Two findings should be noted here: the age makeup of rural physician assistants is similar to the

5. All urban/rural differences described in the text have been tested for statistical significance and are statistically significant ($p < 0.05$) unless otherwise noted.

urban workforce, indicated by overlapping confidence intervals for nearly each age group; and nearly 80 percent of physician assistants are under 45 years old, in both rural and urban settings. The relative youth of this workforce perhaps mirrors the short history of the profession, as the National Commission on Certification of Physician Assistants (NCCPA) first issued certificates to physician assistants in 1975.

Figures 2c and 2d illustrate the age distribution of dentists and dental hygienists. The distributions for these groups are somewhat similar to those of physicians and physician assistants: a majority of dentists are over 50 years old and rural areas have a smaller percentage of dentists 30 to 39 years old. On the other hand, most hygienists are under 45 years old and the age distribution is similar across rural and urban areas.

Years of practice breakdowns (not shown) reinforce those of age. More than 45 percent of physicians and 60 percent of dentists have been practicing for 16 years or more, and more than 80 percent of physician assistants and 50 percent of dental hygienists have less than 16 years of experience.

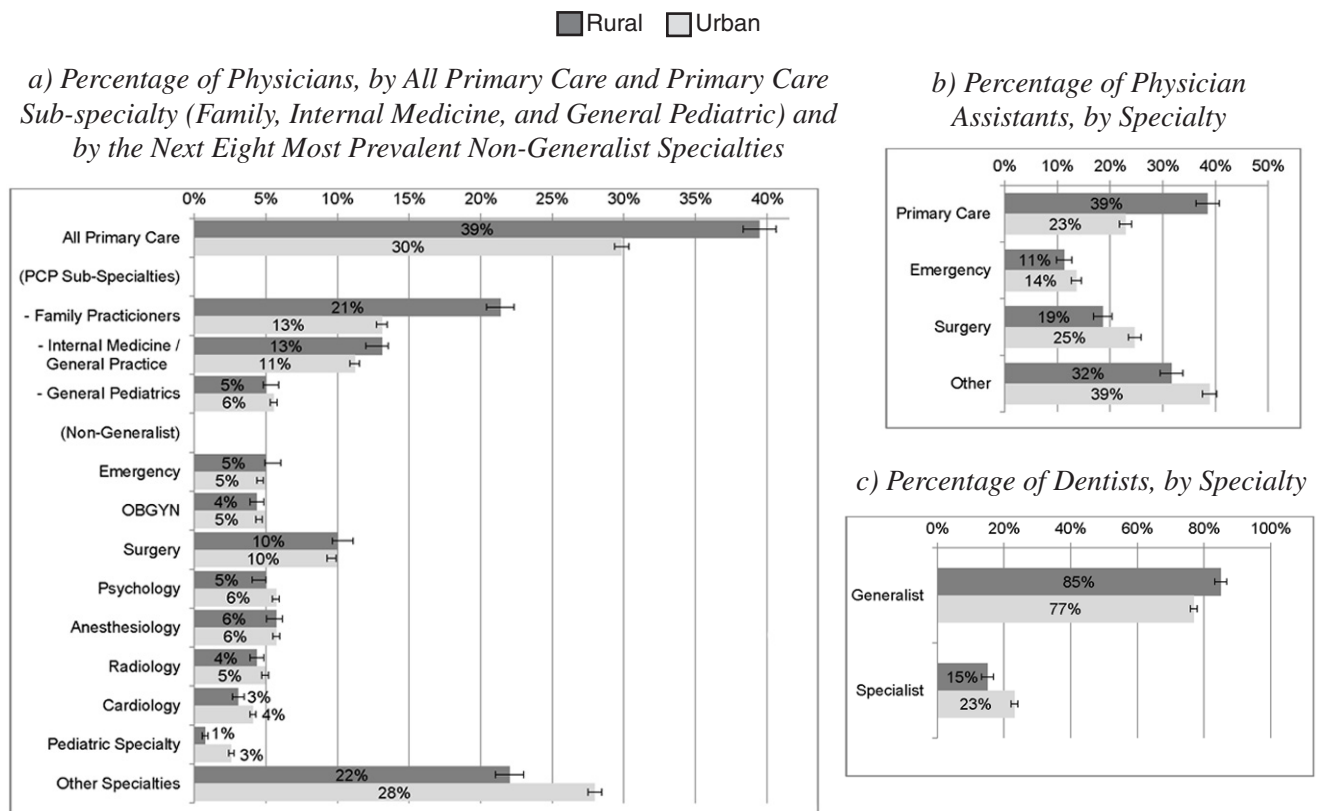
Practice Specialty and Setting

Larger percentages of rural health professionals are primary care providers (PCPs). As defined by the American Academy of Family Physicians, PCPs include physicians whose primary specialty consists of one of the following: family practice physicians; internal medicine or general practice; and general pediatrics.

Thirty-nine percent of rural physicians provide primary care, compared to 30 percent of urban physicians. Figure 3a illustrates the difference as well as differences among the 11 largest areas of specialization. Twenty-one percent of rural PCPs specialize in family practice and 13 percent of urban physicians specialize in family practice. Non-PCP specialties are referred to throughout this report as “non-generalist specialties,” (Fordyce et al., 2007). Rural and urban physicians practice in similar rates across the next 10 specialties listed, including surgery.

Smaller percentages of rural physicians practice other specialties. One example is pediatric specialties, where 3 percent of urban physicians practice compared to about 1 percent of rural physicians. In fact, over 94

Figure 3: Distribution Across Primary Specialty Area, Rural/Urban Comparison



Source: Authors' calculations, Health Workforce Surveys (2012, 2013). Note: Analysis of 26,544 physicians, 4,568 physician assistants, and 5,187 dentists. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces. Distributions describe the entire sample but may not add to 100 percent due to rounding.

percent of pediatric specialists (as opposed to generalists) practice in urban settings. Categorizing the remaining specialties, 28 percent of urban physicians practice “other specialties” compared to 22 percent of rural physicians⁶.

A larger difference in specialties exists among physician assistants, as 39 percent of rural physician assistants practice in a PCP specialty compared to 23 percent of urban physician assistants (See Figure 3b). Figure 3c shows that 85 percent of rural dentists are generalist practitioners compared to 77 percent of urban dentists.

While the underrepresentation of non-generalist physicians in rural areas may seem like a barrier to patients seeking access to these services, rural Pennsylvania actually fairs better than the national average in the representation of rural specialists (61 percent and 51 percent, respectively) (See Table 1). Table 1 also shows that the percentage of physicians that are non-generalists in rural Pennsylvania is closer to the national average for urban areas (61 percent and 66 percent, respectively). This does not suggest that Pennsylvanians have a harder time finding a PCP than the national average. Table 2 compares Pennsylvania’s physician-to-population ratio to the U.S. average as well as surrounding states. In most specializations, including PCPs, the physician ratio for Pennsylvania is higher than the national average but falls near the middle of bordering states. However, state averages do not capture rural disparities, the focus of this report.

How health professionals are spread across practice settings also differs for rural and urban areas. Physicians and physician assistants are asked about the practice setting where they work the most hours each week. Figure 4 presents the distribution of professionals across the five most prevalent setting categories — office/clinic (multi-specialty, single-specialty, or solo), hospital (inpatient or

Table 1: Percentage of Physicians Practicing Primary Care in Urban and Rural Areas, U.S. and Pennsylvania

	Rural U.S.	Rural PA	Urban U.S.	Urban PA
Primary Care	49%	39%	34%	30%
Non-Generalist	51%	61%	66%	70%

Source: Authors’ calculations for Pennsylvania Health Workforce Surveys (2012); U.S. numbers in Fordyce et al. (2007).

outpatient) — and other settings⁷. Compared to urban physicians, a larger percentage of rural physicians practice in office settings, as opposed to hospitals. This overrepresentation in offices is similar for rural physician assistants, shown in Figures 4a and 4b.

Practice ownership rates differ between rural and urban counties for dentists but not physicians. Ownership has been shown to play a role in career satisfaction and the feeling of professional autonomy (Landon et al., 2006; Pathman et al., 2004). For both rural and urban areas, approximately 30 percent of physicians have either full- or part-ownership in their practices. However, ownership structure among dentists and employment settings for hygienists differ depending on area, as shown in Figures 5a and 5b. Solo dental practices make up a larger percentage of rural areas, while practice partnerships are more prevalent in urban areas. Such

Table 2: Physicians per 100,000 Population by Specialization, Surrounding States and National Comparison

	United States	New Jersey	Maryland	New York	Pennsylvania	Ohio	Delaware	West Virginia
PCP	73.8	85.2	88.2	82.2	80.4	75.1	71.3	76.6
General/Family Practice	29.7	19.7	20.8	18.5	34.0	31.6	29.7	42.9
Internal Medicine	28.7	41.3	44.4	41.7	31.2	28.6	24.0	22.4
Pediatricians	57.8	94.0	89.1	88.7	61.5	56.9	69.2	48.3
OB/GYN	21.3	27.4	27.5	25.6	20.2	21.2	18.2	16.7
General Surgeons	8.7	9.8	10.4	9.9	10.1	9.4	8.3	10.6
Psychiatrists	9.4	12.1	15.3	17.8	11.1	7.6	8.2	6.3
Dentists	59.4	80.5	69.9	72.4	59.3	51.1	45.3	46.7

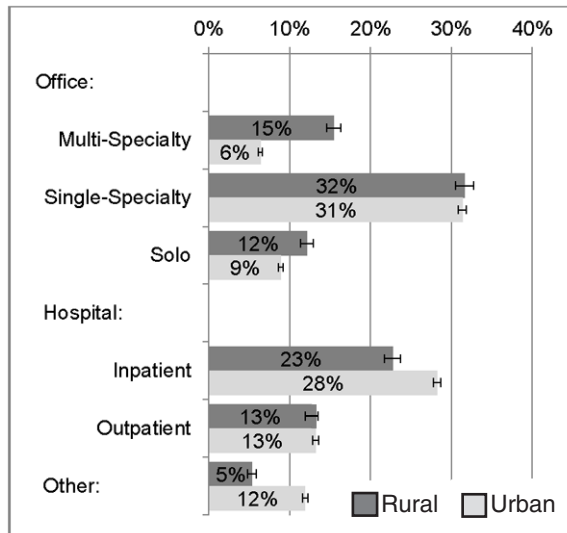
Source: State Health Resources Comparison Tool (HRSA, 2014).

6. “Other specialties” include: Adolescent Medicine, Allergy and Immunology, Critical Care Medicine, Dermatology, Endocrinology, Diabetes and Metabolism, Gastroenterology, Geriatric Medicine, Hematology, Hospice and Palliative Medicine, Hospitalist, Infectious Diseases, Maternal and Fetal Medicine, Medical Genetics, Neonatal-Perinatal Medicine, Nephrology, Neurology, Neuromusculoskeletal Medicine, Nuclear Medicine, Occupational Medicine, Oncology, Ophthalmology, Otolaryngology, Pathology, Preventive Medicine, Pulmonary Disease, Radiation, Oncology, Rheumatology, and Urology.

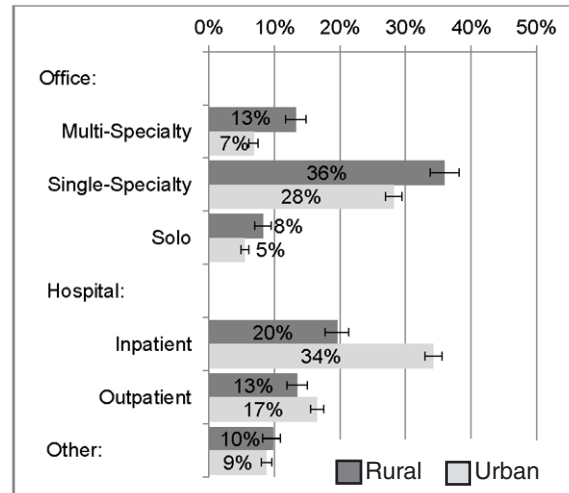
7. The distribution describes 100 percent of the sample. The “other” category includes: medical schools, federal/state hospitals, business/industry, ambulatory surgical facilities, public health (federal/state/local), research laboratories, nursing homes or extended-care facilities, free/no charge offices/clinics, home health, and an open-answer category. Rural counties have fewer than 50 observations in each of these categories, except for the open-answer category.

Figure 4: Physician and Physician Assistant Practice Setting, Rural/Urban Comparison

a) Distribution of Physicians across Practice Settings



b) Distribution of Physician Assistants across Practice Settings



Source: Authors' calculations, Health Workforce Surveys (2012) Note: Analysis of 26,544 physicians and 4,568 physician assistants. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces. Distributions describe the entire sample but may not add to 100 percent due to rounding.

partnerships also employ a larger percentage of dental hygienists in urban counties.

Gender Differences in the Urban, Rural Workforces

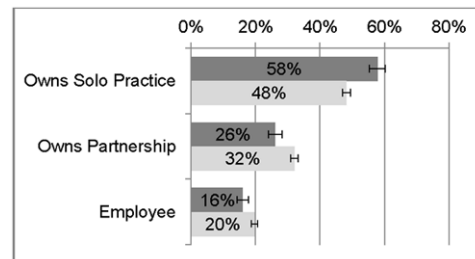
A strong gender imbalance exists across the four workforces. Approximately one out of three physicians and one out of five dentists are female. However, 73 percent of physician assistants and 99 percent of dental hygienists are female. Younger segments of each workforce have relatively more female professionals than older age segments. However, the rural workforce has a lower percentage of females relative to the urban workforce.

Figures 6 and 7 (See Pages 10 and 11) compare the female representation of the rural and urban workforces: physicians, physician assistants, and dentists (dental hygienists are withheld since there are less than 100 males in the sample of 5,570). Thirty-two percent of urban physicians and 24 percent of rural physicians are female, shown in Figure 6. This rural/urban difference is large across all age groups of physicians. Females make up a much larger percentage of physicians under 40 years old than those over 60, suggesting that the overall workforce will move toward a more balanced gender makeup as the latter group moves into retirement. Female representation of younger physicians is significantly lower in rural areas. Forty-seven percent of urban physicians under 40 are female, compared to 39 percent of rural physicians. Future research should

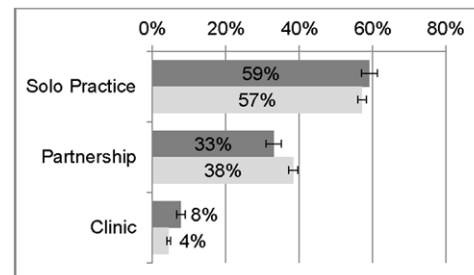
Figure 5: Dental Practice Ownership and Employment, Rural/Urban Comparison

■ Rural □ Urban

a) Percentage of Dentists, by Ownership

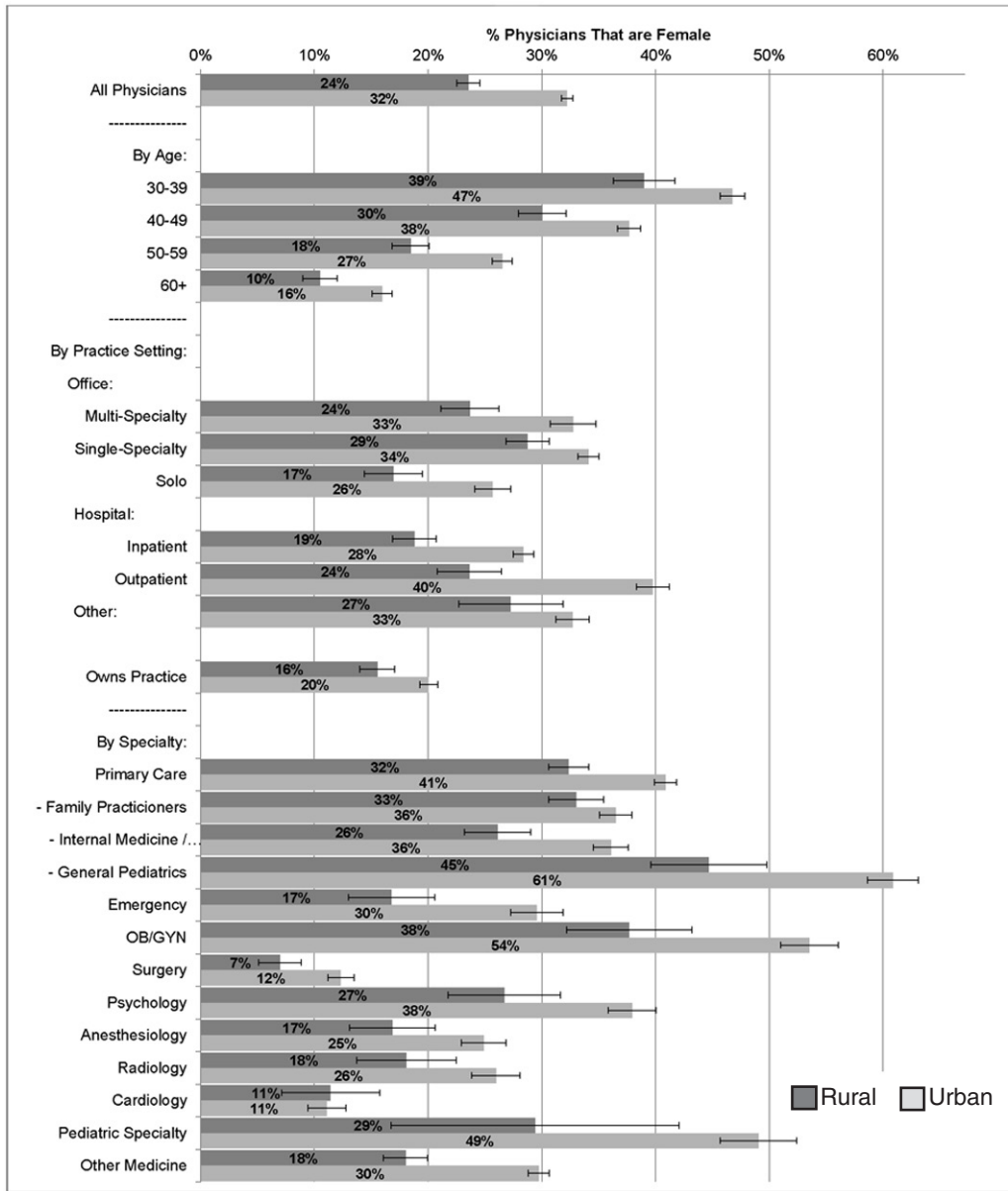


b) Percentage of Dental Hygienists, By Employment Setting



Source: Authors' calculations, Health Workforce Surveys (2013). Note: Analysis of 5,187 dentists and 5,570 dental hygienists. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces.

Figure 6: Female Makeup of Physicians, by Subgroup, Rural/Urban Comparisons



Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 26,544 physicians. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces.

investigate the potential barriers for female physicians and reasons for the relatively lower rural representation.

Figure 6 also illustrates female representation across practice settings and ownership. The rural/urban differences are largest in hospitals. For instance, 40 percent of physicians working in urban outpatient hospitals are female, compared to only 24 percent of those in rural outpatient hospitals. Female physicians are less likely than males to own their practice as 16 percent of rural practices and 20 percent of urban practices are female owned.

Female representation varies widely across primary specialty. General pediatrics (61 percent) and OB/GYN (54 percent) have more female than male physicians in urban settings but not in rural settings (45 percent of rural general pediatricians and 38 percent of rural OB/GYN physicians are female). However, both rural and urban settings have low female representation in surgery specialties and cardiology (less than 15 percent female).

The physician assistant workforce is more than 70 percent female: 68 percent female in rural areas and 74 percent in urban areas. Figure 7 shows the female representation of this workforce by age, setting, and specialty. As opposed to the physician workforce, physician assistants have greater female representation with smaller rural/urban differences.

Figure 8 (See Page 12) illustrates the female makeup of the

dentist workforce. The workforces for dentists and dental hygienists have greater gender imbalances than physicians and physician assistants: only 21 percent of all dentists are female while more than 99 percent of dental hygienists are female (the figure for dental hygienists is withheld because less than 100 hygienists in Pennsylvania are male). The female representation for dentists resembles that of physicians: younger age groups have greater female representation; the percentage of female owners is low; and females are more underrepresented in rural areas than urban areas.

Pennsylvania’s low representation of females in the physician and dentist workforces resembles the nationwide gender makeup. For the U.S., approximately 30 percent of all physicians and 20 percent of all dentists are female (AAMC, 2012; Valachovic, 2009).

Dissatisfaction with Career

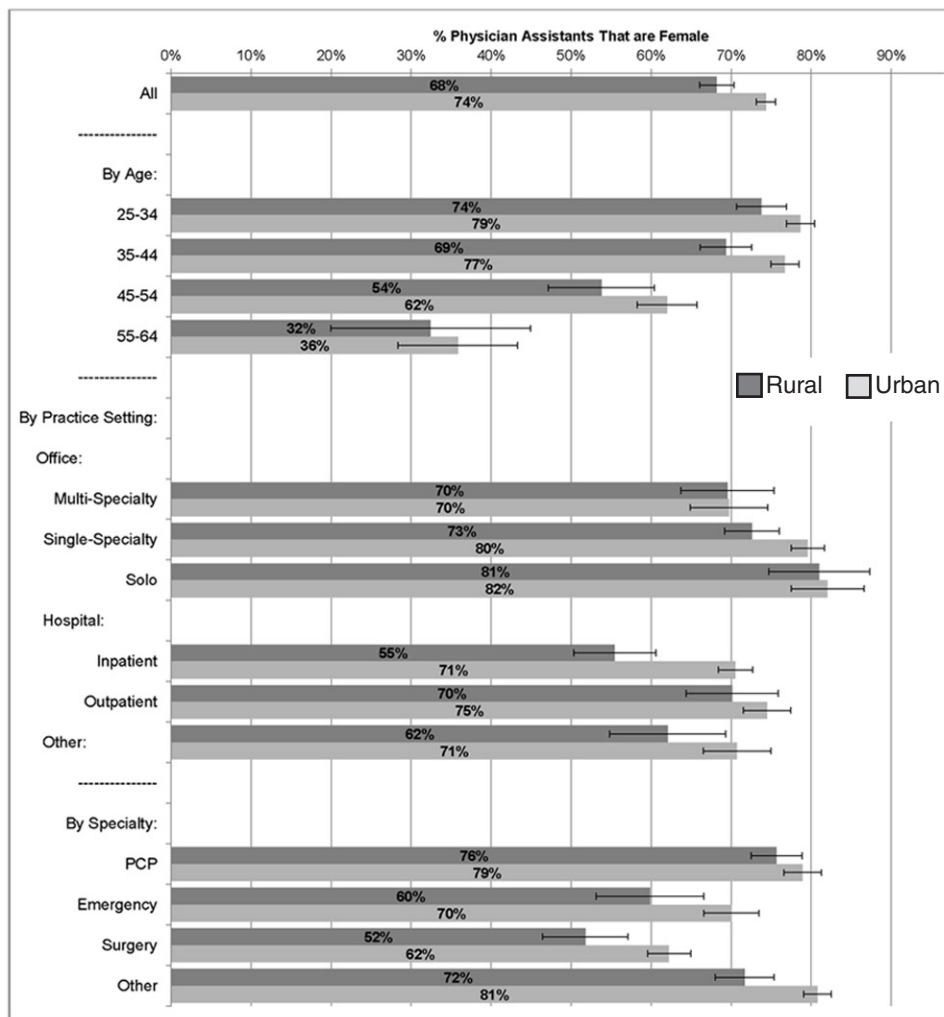
Fourteen percent of physicians (nearly 3,800 of 26,544) report being either dissatisfied or very dissatisfied with their career in the past year. Rural physicians report dissatisfaction at higher rates, shown in Figure 9a (See Page 12). Dissatisfaction rates for the other health professions are considerably lower and similar across rural/urban areas, as shown in the other panels of Figure 9. Dental hygienists were not asked questions about the sources of dissatisfaction in the Health Workforce Survey.

Among physicians and physician assistants, the primary source of dissatisfaction in both rural and urban areas is the lack of leisure time (See Figure 10 on Page 13). Rural and urban differences appear when looking at some of the other sources of dissatisfaction. For instance, rural physicians report a lack of decision-making autonomy as the primary source of dissatisfaction at somewhat higher rates than urban physicians (11.2 percent and 8.6 percent, respectively). On the other hand, both rural physicians and physician assistants report salary/income as the primary source of dissatisfaction less frequently than urban professionals. The category of “other financial reasons/insurance” is most reported by dentists as the primary source of dissatisfaction (See Figure 10c). Rural dentists cite this reason as the primary source of dissatisfaction more frequently than urban dentists, 43 percent and 39 percent, respectively.

Similar to physicians and physician assistants, income is less of a concern for rural professionals than urban professionals.

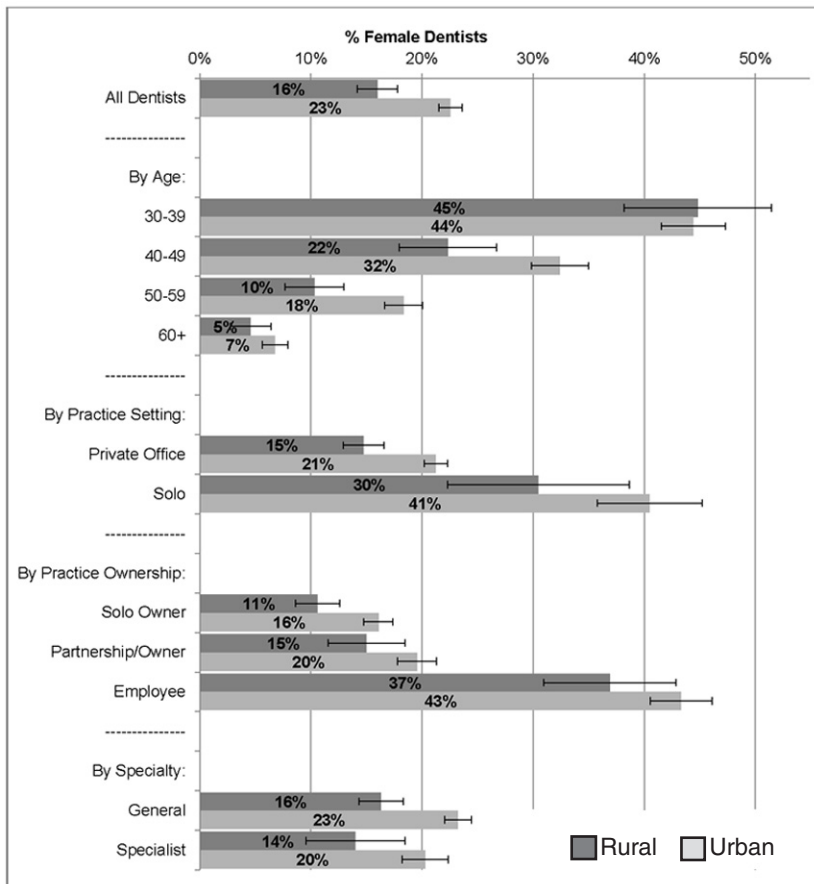
Given the way that dissatisfaction varies across age, gender, specialty, and source, the research used multivariate methods to separate the impact these factors have on dissatisfaction from that of practicing in a rural area. Figure 11 (See Page 13) presents the rural-to-urban odds ratio of being dissatisfied with one’s medical career. A dot further to the right suggests that rural physicians have higher odds of dissatisfaction than urban physicians, after controlling for factors such as age, gender, specialty, setting, east/west county, and various practice characteristics (e.g., owning the practice and employing a physician assistant). A dot in the middle of the graph suggests no difference between rural and urban dissatisfaction.

Figure 7: Female Makeup of Physician Assistants, by Subgroup, Rural/Urban Comparisons



Source: Authors’ calculations, Health Workforce Surveys (2012). Note: Analysis of 4,568 physician assistants. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces.

Figure 8: Female Makeup of Dentists, by Subgroup, Rural/Urban Comparisons

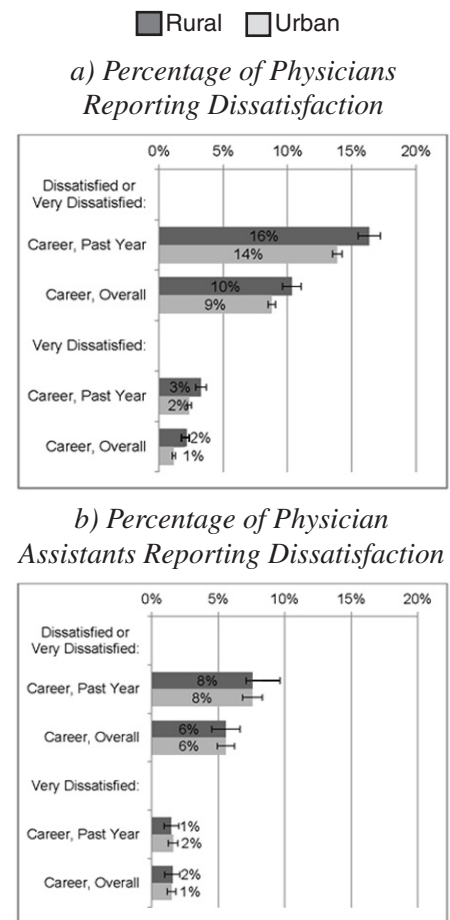


Source: Authors' calculations, Health Workforce Surveys (2013). Note: Analysis of 5,187 dentists. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces.

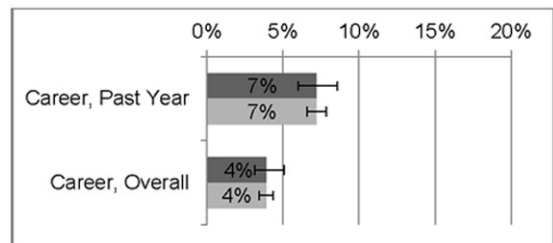
Measured across four indicators of satisfaction, rural physicians have higher odds of being dissatisfied than urban physicians. More specifically, the odds of rural physicians being dissatisfied are: 17 percent higher for being dissatisfied or very dissatisfied in the past year; and 17 percent higher for being dissatisfied or very dissatisfied with one's career overall.

Figure 11 also isolates the relationship between practicing in a rural area and the source of dissatisfaction. Rural physicians have 23 percent higher odds of reporting the lack of autonomy as the greatest source of dissatisfaction. However, they have 32 percent lower odds of reporting salary as the primary source, compared to urban physicians. Leisure time, finance/insurance, patient relationships, and the practice environment overlap the equal odds line, indicating no difference between rural and urban areas. The open-ended "other reasons" category does show a difference: rural physicians have 16 percent higher odds of reporting other reasons being the primary source of dissatisfaction.

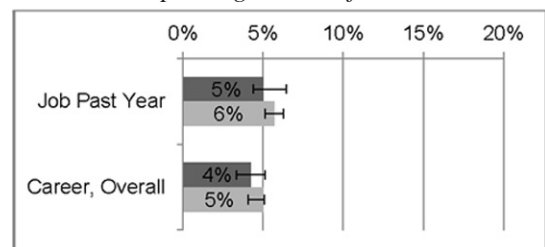
Figure 9: Rates of Dissatisfaction with Career in the Past Year and Overall, Rural/Urban Comparisons



c) Percentage of Dentists Reporting Dissatisfaction



d) Percentage of Dental Hygienists Reporting Dissatisfaction

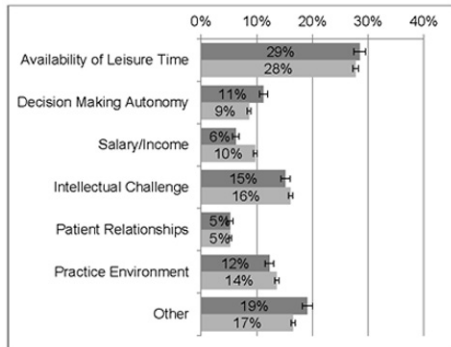


Source: Authors' calculations, Health Workforce Surveys (2012, 2013). Note: Analysis of 26,544 physicians, 4,568 physician assistants, 5,187 dentists, and 5,570 dental hygienists. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces.

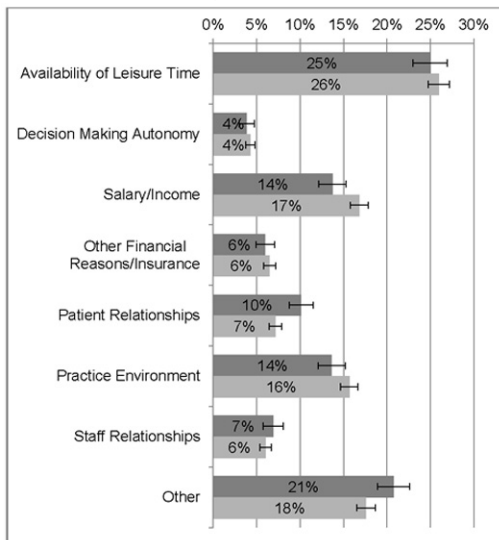
Figure 10: Greatest Sources of Professional Dissatisfaction, Rural/Urban Comparisons

■ Rural □ Urban

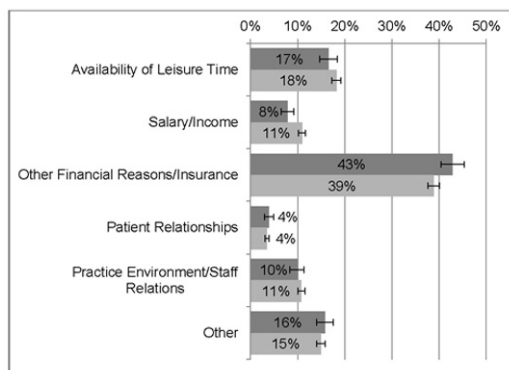
a) Percentage of Physicians, by Source



b) Percentage of Physician Assistants, by Source

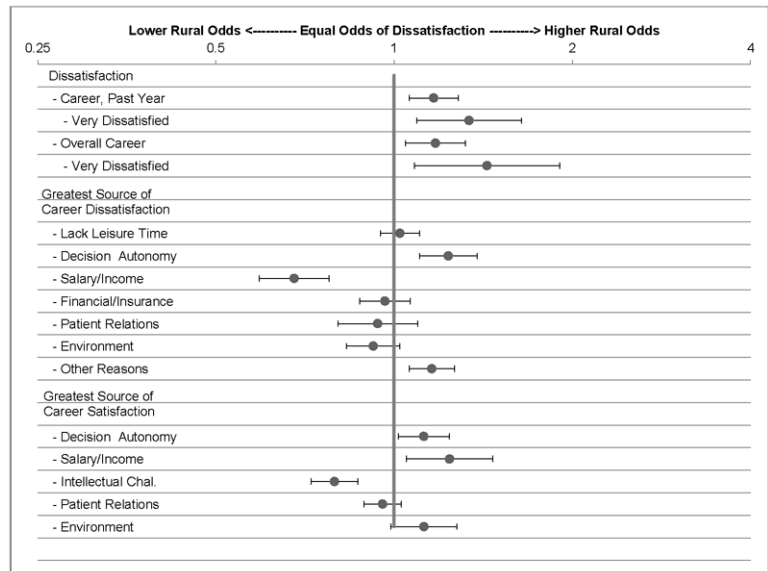


c) Percentage of Dentists, by Source



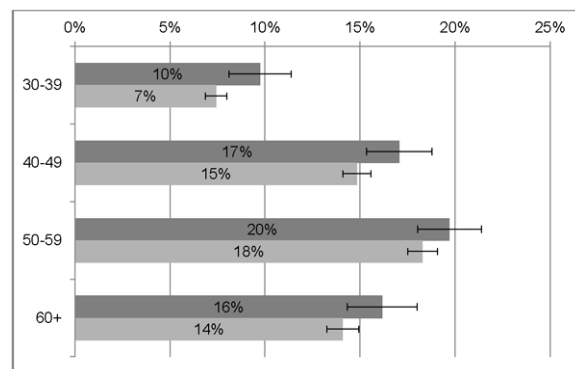
Source: Authors' calculations, Health Workforce Surveys (2012, 2013). Note: Analysis of 26,544 physicians, 4,568 physician assistants and 5,187 dentists (dental hygienists were not asked about sources of dissatisfaction). Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces. The "Other" category here represents the respondents who chose "Other" as their primary source on the survey questionnaire.

Figure 11: Rural-to-Urban Physicians Odds of Career Dissatisfaction and Sources of Dissatisfaction and Satisfaction



Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 26,544 physicians. Rural-to-urban odds ratios were calculated by logistic regressions on yes/no answers to the dissatisfaction-related questions listed in the graph. Each regression controls for age, gender, specialty, setting, and various practice characteristics (i.e. owning the practice and employing a physician assistant). Error bands represent the 95-percent confidence interval. An estimate with bands crossing the vertical, dark-grey line at one suggests even rural/urban odds. Estimates and bands to the right of the grey line suggest greater rural odds and vice versa for estimates to the left of this line.

Figure 12: Rural and Urban Physician Dissatisfaction in the Past Year, by Age Group



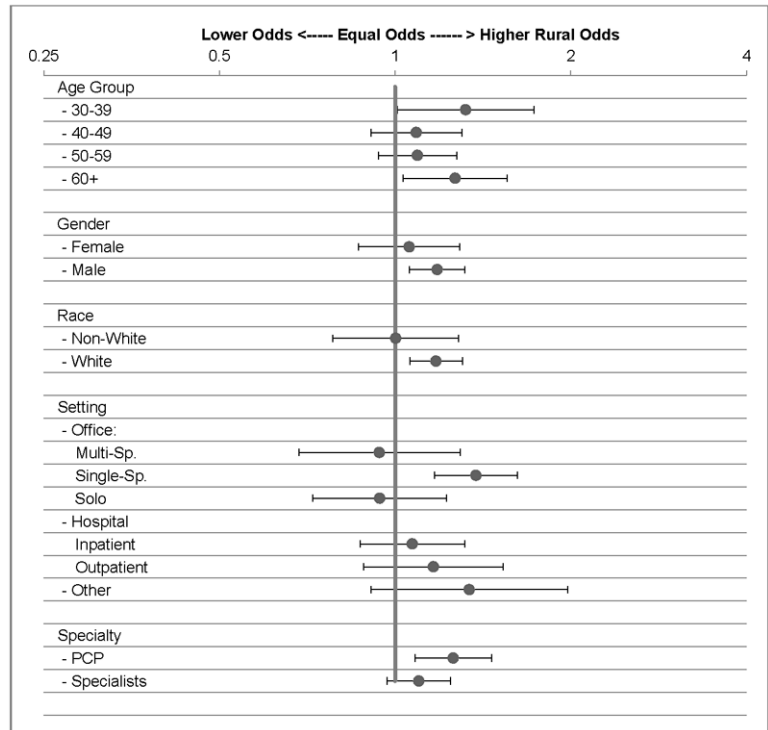
Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 26,544 physicians. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces.

Physicians were also asked about their greatest source of career satisfaction. To complete the picture, Figure 11 reports rural/urban differences in sources of satisfaction. Interestingly, rural physicians have 12 percent higher odds of reporting decision autonomy as the main source of satisfaction. That decision autonomy is associated with both dissatisfaction and satisfaction among rural physicians may be explained partly by the variety of daily decisions that physicians make: administrative, insurance, patient care, etc. More than 7 percent of the physicians who cited autonomy as their primary source of dissatisfaction also cited it as their primary source of satisfaction. Regarding other sources of satisfaction, rural physicians have 24 percent higher odds of reporting salary/income and 21 percent lower odds of reporting intellectual challenge as the greatest source.

To better understand the association between rural areas and career dissatisfaction, this research further explored which subgroups of physicians showed the strongest relative rural dissatisfaction relationships. Figure 12 (Page 13) suggests that career dissatisfaction in the past year varies strongly by age group, with physicians under age 40 reporting dissatisfaction at lower rates than older age groups. However, rural physicians under age 40 have a higher rate of dissatisfaction compared to urban ones (10 percent and 7 percent, respectively).

As seen in Figure 13, the relative association between rural areas and dissatisfaction is shown to be strongest for physicians under 40 and those over 60. Rural physicians under 40 have 32 percent higher odds of dissatisfaction while those over 60 have 27 percent higher odds. Working in rural areas has no association with dissatisfaction for physicians in their 40s and 50s. Other subgroup comparisons stand out in Figure 13: rural physicians are relatively more dissatisfied among male but not female physicians; among white but not physicians of other races; among physicians in a single-specialty office but not those in other settings; and among PCPs but not non-generalist specialties. A similar analysis was performed for physician assistants, dentists, and dental hygienists. Being in a rural area was not found to be associated with dissatisfaction for these groups.

Figure 13: Rural-to-Urban Physicians Odds of Being Dissatisfied or Very Dissatisfied with Career in the Past 12 Months, Comparison of Physicians by Subgroup



Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 26,544 physicians. Rural-to-urban odds ratios were calculated by logistic regressions on yes/no answers to career dissatisfaction in the past year, separately for each subgroup listed on the graph. Error bands represent the 95 percent confidence interval. An estimate with bands crossing the vertical, dark-grey line at one suggests even rural/urban odds. Estimates and bands to the right of the grey line suggest greater rural odds and vice versa for estimates to the left of this line.

Plans to Leave Direct Patient Care⁸

One quarter of physicians and one-fifth of dentists plan on leaving patient care in the next 6 years. Comparatively, about one-eighth of physician assistants and dental hygienists plan on leaving in that time. In each of these workforces, retirement is the leading reason

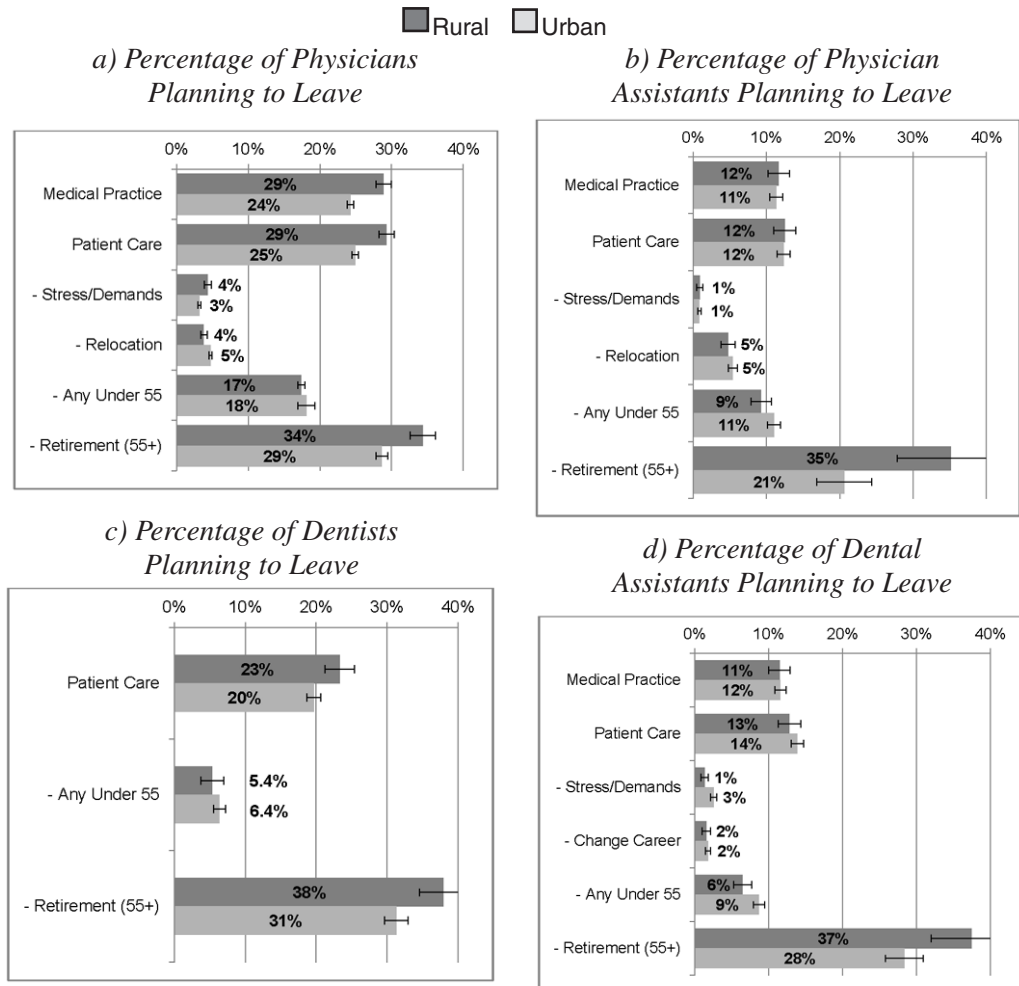
8. The results in this section were tested for robustness by estimating models both with and without controlling for career dissatisfaction. On the one hand, one might expect dissatisfaction to predict a physician's plans to leave. On the other, these variables may be simultaneously decided. The dissatisfaction control was typically statistically significant and associated with higher odds of leaving; however adding this control had little to no effect on rural vs. urban estimates. Estimates of the model without controls for dissatisfaction are presented here.

9. Both questions are asked on the Health Workforce Survey because many physicians are not necessarily providing direct patient care, instead working on teaching, research, or administration. As discussed in the Methods section, those not practicing direct patient care were removed for the purposes of the current analysis.

for leaving. Figure 14 shows the percentage of health care workers with plans to leave.

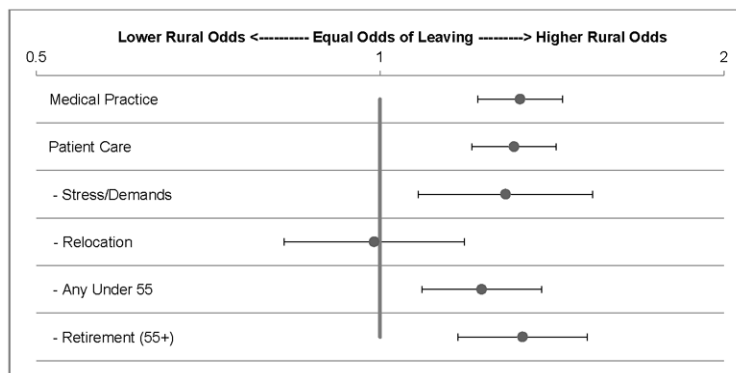
Physicians were asked how long they anticipate practicing medicine and how long they anticipate practicing direct patient care⁹. If a physician responds that she anticipates leaving patient care in the next 6 years, she is asked the primary reason for leaving. Figure 14a shows the rates for physicians' plans to leave in rural and urban areas. Rural physicians have higher rates of both planning to discontinue medical practice and to leave direct patient care, compared to urban physicians (approximately 29 percent and 24 percent, respectively). The figure also reports various reasons to leave direct patient care for those under and over 55 years old. Less than 5 percent of physicians plan to leave patient care due to

Figure 14: Plans to Leave Practice or Patient Care and Reasons for Leaving Patient Care in the Next 6 Years



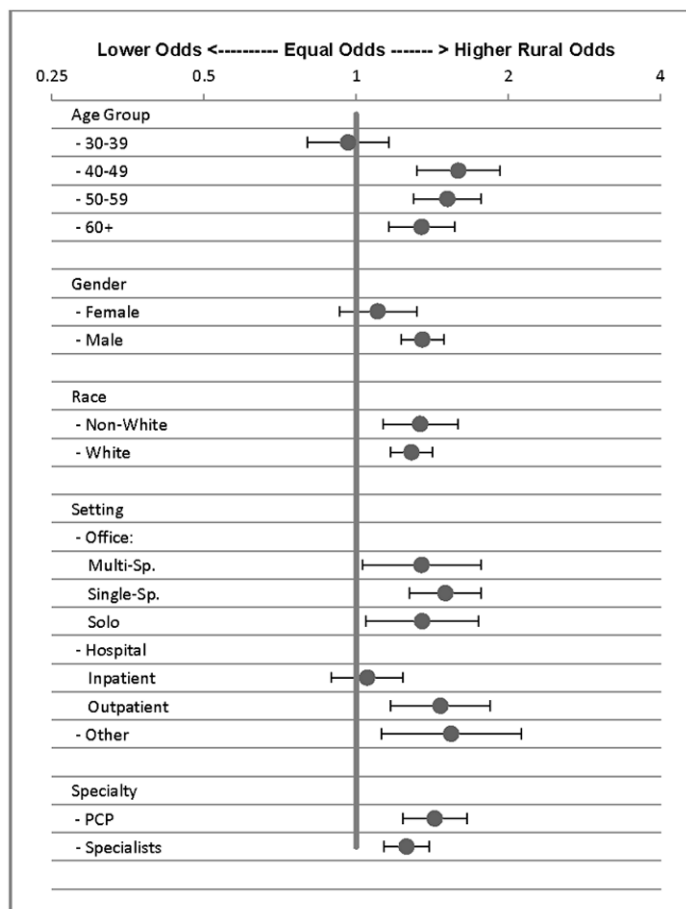
Source: Authors' calculations, Health Workforce Surveys (2012, 2013). Note: Reasons (stress, relocation, etc.) refer to leaving direct patient care. Analysis of 26,544 physicians, 4,568 physician assistants, 5,187 dentists, and 5,570 dental hygienists. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces. Due to few observations, the authors withheld results for dentists planning to leave for reasons other than retirement.

Figure 15: Rural-to-Urban Physicians Odds of Leaving Practice or Patient Care in 6 Years or Less



Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 26,544 physicians. Rural-to-urban odds ratios were calculated by logistic regressions on yes/no answers to the "plans to leave" questions listed in the graph. Each regression controls for age, gender, specialty, setting, and various practice characteristics (i.e. owning the practice and employing a physician assistant). Error bands represent the 95 percent confidence interval. An estimate with bands crossing the vertical, dark-grey line at one suggests even rural/urban odds. Estimates and bands to the right of the grey line suggest greater rural odds and vice versa for estimates to the left of this line.

Figure 16: Rural-to-Urban Physicians Odds of Leaving Direct Patient Care in Next Six Years, Comparison of Physicians by Subgroup

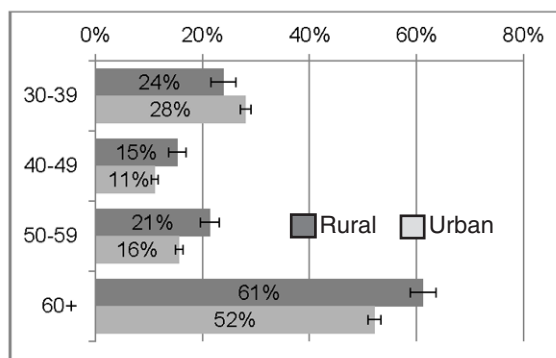


Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 26,544 physicians. Rural-to-urban odds ratios were calculated by logistic regressions on yes/no answers to whether one plans to leave direct patient care in the next six years, separately for each subgroup listed on the graph. Error bands represent the 95-percent confidence interval. An estimate with bands crossing the vertical, dark-grey line at one suggests even rural/urban odds. Estimates and bands to the right of the grey line suggest greater rural odds and vice versa for estimates to the left of this line.

stress, physical or practice demands or relocation. For all physicians under 55 years old, close to 18 percent plan on leaving in the next 6 years for any reason, with similar rates for both rural and urban areas. However, the primary reason for leaving is retirement, with rural physicians reporting higher rates. Thirty-four percent of rural physicians over 55 years old plan to leave patient care in the next 6 years compared to 18 percent of urban physicians.

All four workforces had higher rural rates concerning the plans to retire among professionals 55 years and over. Figure 14b, 14c, and 14d shows rates for the other workforces with little difference between rural

Figure 17: Rural and Urban Physician Plans to Leave Patient Care, by Age Group



Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 26,544 physicians. Overlap of confidence intervals indicates no statistically significant difference between rural and urban workforces.

and urban areas, except for plans to retire. Eighty-five percent of dentists (806 of 954 dentists) who plan to leave patient care in the next 6 years cite retirement as the reason.

Rural vs. Urban Physicians and Plans to Leave

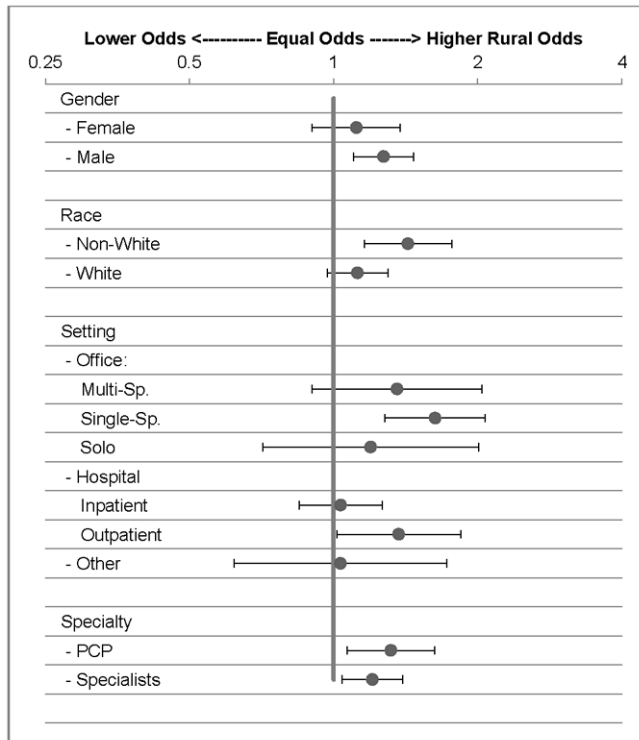
Practicing in a rural area is associated with leaving the medical practice and direct patient care, controlling for age, gender, specialty, and a number of practice characteristics. Figure 15 (See Page 15) gives the rural-to-urban odds ratio for physicians' plans to leave in the next 6 years. Overall, rural physicians have:

- 33 percent higher odds of leaving practice;
- 32 percent higher odds of leaving patient care;
- 29 percent higher odds of leaving patient care due to stress, physical or practice demands;
- 23 percent higher odds of leaving patient care for any reason among physicians under 55 years old; and,
- 33 percent higher odds of leaving patient care due to retirement among those 55 years and older.

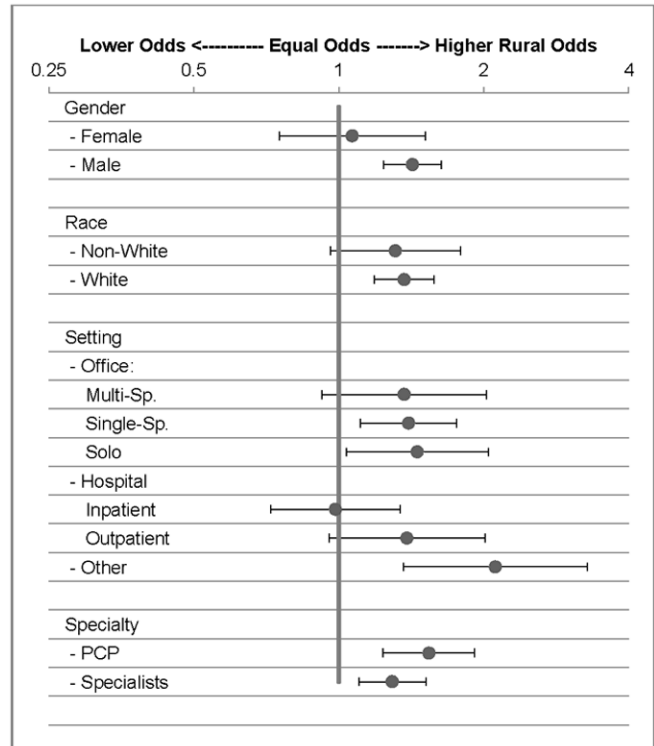
Due to the striking rural/urban difference in plans to leave, it was important to investigate whether the difference was particularly large among some groups of physicians. Figure 16 illustrates which subgroups of rural physicians have relatively higher odds of leaving patient care compared to urban physicians in the same subgroup. Although rural physicians under 40 years old are not more likely than urban physicians to leave patient care, those between the ages of 40 and 49 have 59 percent higher odds of leaving than urban physicians, controlling for other factors. Rural physicians age 50-

Figure 18: Physicians Odds of Leaving Patient Care in Next 6 Years, Comparison of Physicians by Subgroup

a) Physicians Under 55, Leaving for Any Reason



b) Physicians 55+, Retirement



Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 17,012 physicians Under 55 and 9,532 physicians 55 years and over. Rural-to-urban odds ratios were calculated by logistic regressions on yes/no answers to whether one plans to leave direct patient care in the next six years, separately for each subgroup listed on the graph. Error bands represent the 95-percent confidence interval. An estimate with bands crossing the vertical, dark-grey line at one suggests even rural/urban odds. Estimates and bands to the right of the grey line suggest greater rural odds and vice versa for estimates to the left of this line.

59 and those over 60 also have higher odds of leaving care, compared to urban physicians of the same age (52 percent and 35 percent higher, respectively). Figure 16 suggests that rural physicians have higher odds of leaving among the following groups: male physicians, but not female; both white and non-white physicians; physicians in each office setting; physicians in outpatient hospitals, but not inpatient hospitals; and physicians practicing both primary care (PCPs) and non-generalist areas of medicine.

In other words, the higher relative association between rural practice and plans to leave is spread across different groups of physicians.

Plans to Leave: Physicians Under and Over 55 Years

As discussed earlier, 55 percent of rural physicians are 50 years old and older and closing in on a time when many begin to plan for retirement. In addition, rural physicians have 33 percent higher odds of retiring

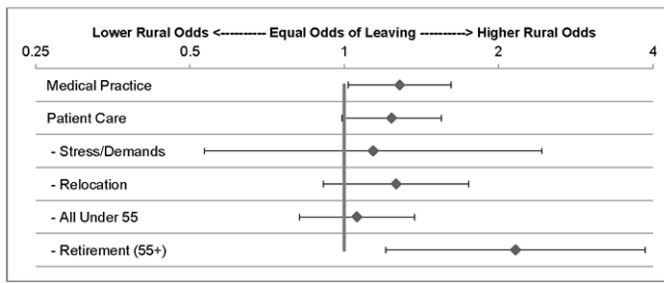
in the next 6 years, compared to urban physicians, controlling for age, gender, race, and a number of practice characteristics. However, younger groups report the desire to leave patient care for other reasons: including stress/burnout and relocation.

Figure 17 compares the urban and rural rates of plans to leave patient care in the next 6 years. Physicians under age 40 report plans to leave at higher rates than physicians in their 40s or 50s. Additionally, among the youngest group of physicians, those in rural areas report plans to leave less often than their urban counterparts (24 percent and 28 percent, respectively). In each of the older age groups, rural physicians report plans to leave at higher rates than urban physicians, and this difference is largest for the group over 60 years old (61 percent and 52 percent, respectively).

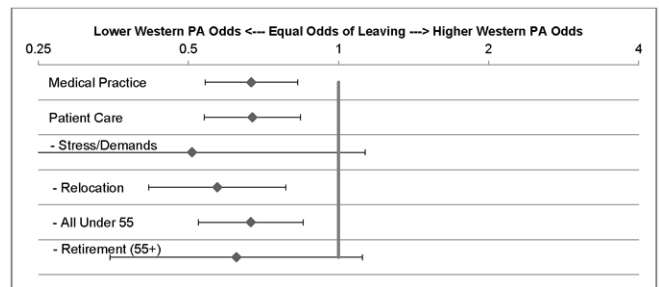
The percentage of rural physicians reporting plans to leave mid-career is not inconsequential and stress or physical or practice demands play a large role. Fifteen

Figure 19: Physician Assistants Odds of Leaving Practice or Patient Care in 6 Years or Less

a) Rural-to-Urban Odds Ratios



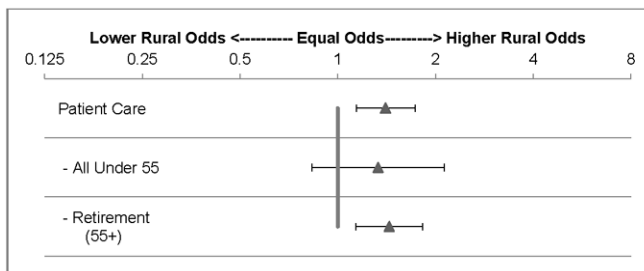
b) Western-to-Eastern Pennsylvania Odds Ratios



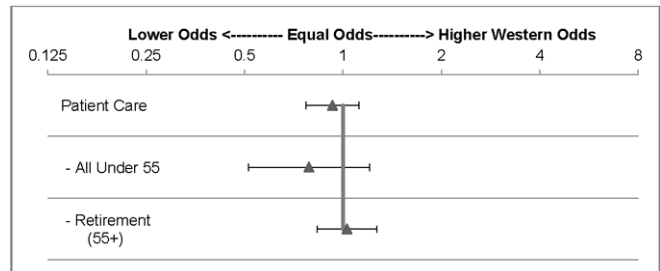
Source: Authors' calculations, Health Workforce Surveys (2012). Note: Analysis of 4,568 physician assistants. Odds ratios were calculated by logistic regressions on yes/no answers to the "plans to leave" questions listed in the graph. Each regression controls for rural/urban, east/west, age, gender, specialty, setting, and various practice. Error bands represent the 95 percent confidence interval. An estimate with bands crossing the vertical, dark-grey line at one suggests even rural/urban odds in Panel 19a and even western/eastern odds in Panel 19b. Estimates and bands to the right of the grey line suggest greater rural odds in Panel 19a and greater western odds in Panel 19b.

Figure 20: Dentists and Dental Hygienists Odds of Leaving Practice or Patient Care in 6 Years or Less

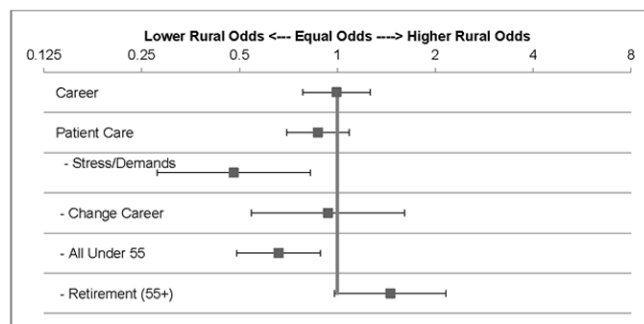
a) Dentists Rural-to-Urban Odds Ratios



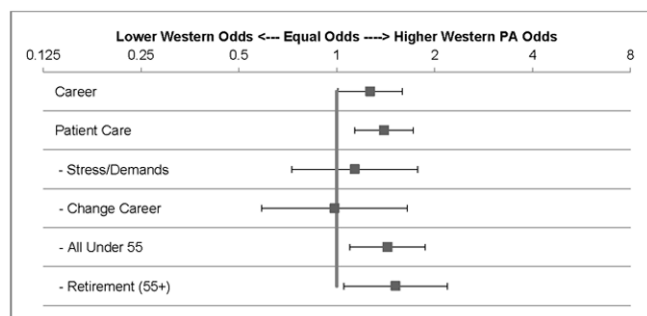
b) Dentists Western-to-Eastern PA Odds Ratios



c) Dental Hygienists Rural-to-Urban Odds Ratios



d) Dental Hygienists Western-to-Eastern PA Odds Ratios



Source: Authors' calculations, Health Workforce Surveys (2013). Note: Analysis of 5,187 dentists and 5,570 dental hygienists. Odds ratios were calculated by logistic regressions on yes/no answers to the "plans to leave" questions listed in the graph. Each regression controls for rural/urban, east/west, age, gender, specialty, setting, and various practice characteristics. Error bands represent the 95 percent confidence interval. An estimate with bands crossing the vertical, dark-grey line at one suggests even rural/urban odds in Panel 20a and 20c and even western/eastern odds in Panel 20b and 20d.

percent of rural physicians 40-49 years old plan to leave, and one-fifth of these cite stress or demands as the primary reason. For rural physicians 50-59 years old, 21 percent plan to leave and one-third of these cite stress or demands as the primary reason. As shown in Figure 15, rural physicians of all ages have 29 percent higher odds of leaving due to stress/demands than urban physicians.

Figure 18 (Page 17) presents the rural-to-urban odds ratios of leaving patient care for physicians under 55 years old due to any reason (in the left-panel) and those 55 years old and older due to retirement (in the right panel). Reinforcing the results presented earlier, the odds of leaving are higher for rural physicians than for urban physicians in six of the 12 under-55 subgroups (by gender, race, setting, and specialty) and seven of the 12 55+ subgroups. On the other hand, there is not one subgroup where urban physicians have higher odds of leaving patient care. For both age groups, rural female physicians do not have higher odds of leaving than their urban counterparts. For both groups under- and over-55, there are even rural/urban odds of leaving among physicians in inpatient hospitals.

Physician Assistants Plans to Leave

Geographical differences are associated with the likelihood of leaving patient care for the three other workforces. However, unlike the case of physicians, these differences fall along eastern/western Pennsylvania lines rather than rural/urban ones.

Rural physician assistants have higher odds of leaving both the practice of medicine and direct patient care (See Figure 19a). This is largely driven by retirement, for which rural physician assistants have more than double the odds of urban ones. However, due to the relative youth of this workforce (only 9 percent of physician assistants are over 55 years old), the potential effects of retirement will likely be larger for physicians. After controlling for rural/urban locations, plans to leave the workforce are relatively lower for those working in western Pennsylvania, compared to those working in the eastern Pennsylvania (See Figure 19b). Western Pennsylvanian physician assistants have lower odds of relocating or moving for any reason among those under 55 years old. About 11 percent of physician assistants under 55 responded that they plan to leave patient care in the next 6 years, the reasons for physician assistants wanting to relocate from eastern Pennsylvania should be explored further.

Dentists and Dental Hygienists Plans to Leave

Both rural dentists and dental hygienists have higher odds of leaving patient care due to retirement than urban professionals, illustrated on the left panels of Figure 20. Since few dentists plan to leave the workforce for reasons other than retirement, the factors behind those reasons were not analyzed separately. For dental hygienists however, plans to leave due to stress/demands are associated more with urban areas, as are any plans to leave among those under 55 years old, shown in Figure 20c. Dental hygienists in western Pennsylvania have higher odds of leaving among both those under and over 55 years old (See Figure 20d). No east/west differences in plans to leave were found among dentists (See Figure 20b).

Conclusions

The results highlighted rural areas' lower relative ability to attract and keep health care professionals who are satisfied with their careers — problems potentially related to health professional shortages. First, the number of rural physicians and dentists nearing retirement age is larger than the number of physicians and dentists early in their careers. In urban areas, physicians and dentists who are 30-39 years old make up a larger fraction of their workforces, compared to the rural workforces. Physician assistants and dental hygienists are mostly made up of professionals under 45 years old. Second, 24 percent of all rural physicians are female, including 39 percent of those 40 years old and younger. This indicates that the rural physician workforce may become more female as older physicians begin to retire. However, a much larger fraction of younger urban physicians are female (47 percent), suggesting that barriers or preferences may exist that sway females from practicing in rural areas. While females make up a smaller fraction of dentists overall (21 percent), the results suggested stronger female representation among dentists who are beginning their careers (45 percent) in both rural and urban settings. Third, 14 percent of physicians report being dissatisfied with their careers in the past year, something more prevalent in rural counties. After controlling for other factors, rural physicians have 17 percent higher odds of reporting dissatisfaction, which is important given the strong links between career satisfaction and decisions to leave practice. Higher rural odds of dissatisfaction tended to be stronger for the following subgroups of physicians: males, primary care practitioners (PCPs), white physicians, those 60 years

old and older, and those practicing in a single-specialty office. Such findings lead to a fourth potential problem area: rural physicians having higher odds of leaving patient care for both retirement and stress/burnout, for those in their mid- and later-careers, for those across office/hospital settings, and for PCP and non-generalist specialties. Rural physicians have higher odds of leaving their career even after adjusting for dissatisfaction levels. Rural physician assistants, dentists, and dental hygienists nearing retirement age all have higher odds than their urban counterparts of retiring in the next 6 years.

These results suggest a number of barriers both restricting the supply of rural health care professionals and potentially restricting its growth. Since the Health Workforce Survey data capture only a snapshot of the workforce, further research should seek to identify potential trends in rural supply. Such work should be given high priority, given the number of population trends with the potential to further stress the Pennsylvania health care system and increase shortages found in rural areas. First, veterans make up more than 12 percent of adults in rural Pennsylvania counties and the veteran demand for health care has risen dramatically in the past decade (Behney et al., 2012; NCVAS, 2012). For example, in the 14 county service area of the James E. Van Zandt VA Medical Center (located in Altoona, PA), demand is expected to increase substantially over the next 10 years: an 8 percent increase for primary care, 11 percent increase for ambulatory specialties, 36 percent increase for non-institutional long-term care, and 22 percent increase for pharmacy (Young, 2013)¹⁰. Second, the Affordable Health Care Act is expected to increase Medicaid enrollments in Pennsylvania; increased Medicaid access has been shown to increase the use of health care¹¹. Third, the greatest challenge to health care delivery may be the aging and growth of the Pennsylvanian population. For instance, the group of people age 65 and older is expected to increase from 15 percent of the total Pennsylvania population in 2010 to 23 percent in 2030 (Pennsylvania Department of Aging, 2014). Due to population growth, the Institute of Medicine of the National Academies predicts the nation will need 3.5 million more health care providers in 2030 to maintain the current provider-to-population ratio

(IMNA, 2008). A large number of these will be needed in Pennsylvania — among U.S. states, Pennsylvania has the fourth largest percentage of the population age 65 and over (Pennsylvania Department of Aging, 2014).

The precise mechanism leading to greater rural physician dissatisfaction and plans to leave is hard to identify and may require additional pieces of information. First, the Health Workforce Surveys do not ask questions about income. Previous studies suggest that income plays a role in dissatisfaction and plans to leave (Deshpande and DeMello, 2010; Henry et al., 2011). This research indicated that about 10 percent of physicians and dentists and 15 percent of physician assistants report dissatisfaction with income, with greater dissatisfaction in urban settings. Given the relatively greater income satisfaction in rural areas, regression results, which do not control for income, may be underestimating the rural-to-urban odds of being dissatisfied overall — rural dissatisfaction may be greater if not for the more satisfactory incomes. On the other hand, regression results may be overestimating the rural vs. urban odds for plans to leave, as rural professionals may be more able to save (i.e., due to lower costs of living in these areas) and prepare for retirement or a change of career. Second, the survey data do not identify the county of practice setting. However, given the diversity of counties in Pennsylvania, county-specific variables may indicate why strong rural vs. urban differences arise in the results. Differences in county-level physician-to-population ratios, levels of health care infrastructure, number of shortage areas, child or elderly population, poverty or unemployment rates, or distance to hospitals may explain the relatively higher rural workforce dissatisfaction and plans to leave. County-level data would also allow for calculation of physician-to-population ratios for various specialties, helping to better identify particularly problematic shortage areas. Third, the survey data do not capture the number of professionals who actually leave patient care or relocate. A respondent answering that they plan to leave the career may do so out of recent frustration and not follow through. In addition, a health care professional may have recently chosen a rural-urban or urban-rural move for various reasons, which is not captured in the present study.

This analysis represents a first step to understanding

10. The Van Zandt Center covers the following counties: Bedford, Blair, Cambria, Cameron, Centre, Clearfield, Clinton, Elk, Huntingdon, Indiana, Jefferson, Juniata, Mifflin, and Somerset.

11. Estimates of new adult enrollments in Pennsylvania range from 12,000 (Independent Fiscal Office) to roughly 90,000 (Urban Institute), reported online at <http://www.dpw.state.pa.us>.

barriers to rural health care supply growth and points to three areas where future research is likely to uncover more specific, actionable information. For one, qualitative studies may help uncover the reasons for higher rural dissatisfaction among particular groups of physicians, such as those early and late in their careers, and those working in single-specialty offices or practicing primary care. Better understanding the specific aspects of autonomy or “other reasons” for dissatisfaction would help pinpoint why rural areas have higher dissatisfaction rates. Similarly, it may help uncover the particular drivers leading to rural/urban differences in those under 55 years old who consider leaving patient care or those over 55 who consider

retirement. A second area to explore consists of identifying what role income and county-level factors may play in the rural/urban differences identified in this research. Third, as veteran and elderly patient populations are primary drivers of health care demand growth, asking health professionals about the percentage of their practice focusing on these patients and barriers to serving these groups may inform where and how future shortage areas may arise. An emphasis on the above research should be to seek what barriers keep female and younger physicians and dentists from practicing in rural areas and whether they are likely to relocate later in their careers, or what incentives might lead them to make such a change.

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