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Graduates of Rural-centric Family Medicine Residencies: Determinants of Rural and Urban Practice

KEY FINDINGS

- About two of five graduates of rural-centric family medicine residency programs—those requiring at least eight weeks of rural training—chose rural practice in the first one to six years after completing residency.
- Physicians' positive perceptions of their rural residency training experiences, more than the amount of time spent in rural training, were associated with choosing rural practice. These experiences included both educational activities, such as rural rotations, and rural life outside of training.
- The influence of community amenities—whether rural recreation or urban shopping—differentiated between physicians who chose rural versus urban practice.
- Physicians practicing in smaller rural communities were distinct from other rural physicians or urban physicians. They were more apt to have rural experience before medical school, a sense of being better prepared for rural living after residency, a partner or spouse from a rural area who had to be considered when choosing a career or practice location, or post-residency obligations to provide care in shortage areas or underserved communities as a result of receiving incentives such as scholarships, loan repayment, or J-1 visa waivers.
- Some physicians are clearly self-selected into rural practice, but much needs to be done, particularly during and after residency training, to sustain their interests and to stimulate others on the pathway toward rural careers.

BACKGROUND

Compared with U.S. urban populations, rural residents rely more on family physicians for their healthcare, but many rural areas continue to face primary care shortages.[1] A systematic review of studies internationally[2] on factors that may discourage health professionals in general from rural practice identified demanding working conditions, substandard medical equipment and facilities, inadequate remuneration, inadequate opportunities for personal and professional growth, safety concerns, lack of spousal job opportunities, and lack of educational opportunities for children.

Complementing these findings is a body of research from the U.S. and other countries that has identified a variety of "nature" and "nurture" variables that influence physician practice choices.[3-5] These influential variables have included the following:

- background factors, including being male, rural origin, and spouse's rural origin;[4-9]
- premedical education factors, such as rural educational experiences;[5,7]
- medical education factors, including rural experiences such as rural clerkships and participating in rural medical school tracks;[4,5,7,10-12]
- residency factors, such as rural rotations;[3,7] and
- post-residency factors, such as rural lifestyle, amenities, career possibilities, and incentives.[4,6,9]

A number of studies have focused on residency education as the most proximal to ultimate career choice, offering opportunities for interventions to encourage rural practice. Exposing resident physicians to rural clinical experiences and educating them in a broad range of clinical skills appear to promote rural practice.[3,13-15] Indeed, graduates of family medicine residency programs that offer a substantial amount of rural training are about twice as likely as other family physicians to choose rural practice.[14,15] Research on graduates of "rural training track" (RTT) residency programs in the late 1990s found that 76% were in rural practice,[16] but recent studies of RTTs and other "rural-centric" residencies have yielded estimates of about one third to one half of graduates in rural practice.

The reasons for an apparent drop in rural yield from programs with a mission to produce rural physicians are not entirely clear,[a] but half or more of graduates from rural-centric residencies appear to opt for urban practice in the early years of their careers. Because rural-centric residencies are thought to attract physician residents with a strong interest in rural practice, the fact that perhaps half their graduates choose to locate in urban areas deserves examination. This study examined the characteristics, experiences, and attitudes that influenced the practice location choices of graduates from rural-centric family medicine residencies.

METHODS

SAMPLE

We conducted a survey of family medicine residency programs in 2013 that identified rural-centric family medicine residency programs, those that actively recruited applicants with an interest in rural practice and required at least 8 weeks of rural training for some or all of their graduates. We asked these programs to provide the names and graduation year of their recent graduates. Twenty-six of the 58 rurally focused programs identified 364 graduates from July 2007 through June 2013. Using the National Plan and Provider Enumeration System (NPPES) National Provider Identifier (NPI) database we found each graduate's current practice address. These 364 graduates were the sample for this survey.

QUESTIONNAIRE

Questionnaire content focused on potential factors affecting graduates' choice of practice location after residency, including the following topic areas: experiences before and during medical school, experiences during and post residency, influences on choice of initial practice location after residency and subsequent choices to stay in or move from their initial practice location. Graduates were also asked to provide information about their current practice location and background/demographic information.

[a]Small numbers, selection bias, different populations studied, and different sources of practice location data all likely play a part in differences between estimates, but it is also quite possible that interest in rural practice has declined. Studies have used different definitions of "rural," but this is a less likely explanation for the difference. Using physicians' primary office ZIP codes, Rosenthal et al,[16] defined "rural" as communities of less than 25,000 population and "limited urban influence" (not defined), but more recent studies by the WWAMI Rural Health Research Center,[14,15] also using practice ZIP codes but classifying them according to Rural-Urban Commuting Area (RUCA) codes (http://depts.washington.edu/uwruca/index.php), have counted larger communities up to 49,999 population as rural. This definition also accounts for urban influence based on commuting patterns, such that communities up to 49,999 are considered urban when residents commute frequently to urbanized areas. Thus despite using a definition of rural that is probably no more restrictive than that of Rosenthal et al,[16] these recent studies show fewer graduates in rural practice.

SURVEY PROCEDURES

In September 2014 we mailed a survey packet to the sample of 364 family physicians by United States Postal Service priority mail, including a letter introducing the study, 12-page questionnaire, postage-paid return envelope, and $20 incentive. We followed up with a postcard reminder one week later, a first class mailing with a replacement questionnaire and envelope to non-respondents two weeks after the initial mailing, and a final first class mailing of a survey packet 11 days later. We received responses from 213 physicians, yielding an overall response rate of 62.3%, after excluding 22 physicians who could not be located.

ANALYSIS

Usable responses were obtained from 197 physicians. We linked physician records from the American Medical Association (AMA) Physician Masterfile. We classified physicians' reported current practice locations according to ZIP codes into three groups using Rural-Urban Commuting Area (RUCA) codes,[b] including one urban and two rural categories: (1) large rural and (2) small or isolated small rural (hereafter referred to as "smaller rural"). We calculated descriptive statistics (proportions, means and standard deviations) for each variable and the primary outcomes and tested the association of the independent variables of interest with the proportion of respondents whose current practice location was in a rural place using chi-square analysis ($p<0.05$). We compared group means using t-tests and ANOVA as appropriate. When differences were significant, we conducted pairwise comparison using Tukey's adjustment for multiple comparisons. We only report detailed results by rural category that were significantly different from each other. If there were no significant differences, only overall means or proportions are reported.

Analyses were done using SAS software Version 9.4 for Windows and SPSS software Version 22. This research study was approved by the University of Washington Human Subjects Division.

RESULTS

Almost two in five (38.1%) graduates reported their current main practice site was in a rural location, 21.3% in a large rural location compared with 16.8% in smaller rural locations. The vast majority of physicians (71.5%) reported that their current practice location was the same as their initial location upon completing residency. Table 1 displays physicians' characteristics and experiences by their current practice locations.

DEMOGRAPHICS

The average age of respondents was 39.7 years, and slightly more than half were female (52.5%). Most respondents self-identified as non-Hispanic white (75.7%). A larger percentage of physicians who practiced in large rural (87.2%) and smaller rural places (93.1%) were Non-Hispanic whites compared with urban physicians (67.3%). The vast majority, 88.7%, were currently married or living with a partner.

BEFORE MEDICAL SCHOOL

More physicians in smaller rural places (96.9%) had lived in a rural place prior to medical school than those practicing in large rural (67.5%) or urban areas (71.4%). One-third (33.9%) of physicians reported attending a rural college for some or all of their undergraduate degree. Almost three-quarters (74.7%) said they participated in a paid or volunteer activities as an undergraduate serving rural or underserved urban populations.

[b]We used the RUCA version 3.1 2010 ZIP approximation. RUCA codes were grouped as follows: large rural (4.0, 5.0, 6.0) and smaller rural, including small rural (7.0, 7.2, 8.0, 8.2, 9.0) and isolated small rural town (10.0, 10.2, 10.3). All other codes were urban. See http://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx.

Table 1. Physician characteristics and experiences by current practice location[a]

	Smaller rural[b] (n=33)	Large rural (n=42)	Urban (n=122)	Total (n=197)
Demographics				
Age	36.2	36.9	41.4	39.7
Female	48.3%	47.5%	55.3%	52.5%
Non-Hispanic white**	93.1%	87.2%	67.3%	75.7%
Currently married or living with a partner	87.9%	92.7%	87.6%	88.7%
Before medical school				
Lived in a rural place**	96.9%	67.5%	71.4%	74.9%
Attended a rural college	48.5%	35.7%	29.2%	33.9%
Participated as an undergraduate in paid or volunteer activities serving urban underserved or rural populations	68.8%	73.2%	76.9%	74.7%
During medical school				
Attended medical school in home state	66.7%	47.2%	51.2%	53.1%
Completed a clerkship in an urban underserved community	65.6%	61.9%	73.5%	69.6%
Completed a clerkship in rural community	90.9%	85.7%	78.8%	82.4%
International medical graduate*	9.1%	21.4%	29.8%	24.5%
During and after residency				
Total required months of rural training	14.1	14.5	15.4	15.0
Total elective months of rural training	6.7	6.0	7.0	6.7
U.S. citizen or permanent resident upon completion of residency	96.9%	92.5%	92.4%	93.2%
Felt "very prepared" for rural practice after completing residency	81.8%	73.2%	62.5%	68.0%
Felt "very prepared" for rural living after completing residency*	80.0%	57.5%	53.5%	58.6%
Had to consider a spouse or significant other from a rural area when choosing career or practice location***	50.0%	37.5%	17.7%	27.2%
Completed post-residency service obligation*	68.8%	42.9%	42.2%	46.7%
Currently practicing in the same community as initial practice community post-residency*	79.3%	84.2%	65.2%	71.5%

* $p < .05$
** $p < .01$
*** $p < .001$
[a]Does not include respondents who indicated an item was "not applicable."
[b]Geographic groupings based on Rural-Urban Commuting Area (RUCA) codes: "smaller rural" combines small rural and isolated small rural categories.

DURING MEDICAL SCHOOL

About half (53.1%) of all physicians said they attended medical school in their home state. More graduates from international medical schools were in urban areas (29.8%) than in smaller rural areas (9.1%). During medical school, 82.4% recalled participating in a clerkship in a rural area and 69.6% in an underserved community.

DURING AND AFTER RESIDENCY

Graduates located in rural and urban areas did not differ significantly in the number of months in required rural (15.0) and elective rural (6.7) clinical training during residency. The percentage of physicians that were U.S. citizens upon completion of residency

was 93.2%. Overall, 68.0% of physicians felt "very prepared" for rural practice after completing residency. A higher percentage of physicians practicing in smaller rural locations (80.0%) felt "very prepared" for living in a rural area after completing their residency than physicians from urban (53.5%) or large rural places (57.5%). Significantly more physicians in smaller rural places (50.0%) and large rural places (37.5%) reported having a spouse, partner or significant other who was from a rural area to consider when choosing a career or practice location, compared with urban physicians (17.7%). A larger proportion of physicians located in smaller rural places (68.8%) reported completing a post-residency service obligation, such as the National Health Service Corps, Indian Health Service, or state-funded loan repayment, than physicians practicing in either urban locations (42.2%) or large rural places (42.9%).

INFLUENCES ON INTEREST IN RURAL PRACTICE DURING RESIDENCY

Respondents were asked to rate the influence of rural educational and living experiences during residency on their interest in rural practice on a five-point scale from 2, "increased greatly," to -2, "decreased greatly" (see Table 2). The top residency experiences that increased interest in rural practice for all graduates (whether currently in rural or urban practice) included both rural skills content and rurally located training: training in a broad scope of practice skills, full-time training in a rural location, participation in a rural rotation, and having a continuity clinic in a rural area. Exposure to training in a broad scope of practice skills had the highest mean score for every group. Living in a rural community during training and having relationships with rural patients outside of the clinical setting were also factors that increased interest in rural practice. When comparing all physicians in rural locations (both large and smaller) with urban physicians, rural physicians reported a significantly larger effect of all factors except "living in a rural community during training" and "having relationships with rural patients outside of the clinical setting."

Table 2. Influences on interest in rural practice during residency by current practice location: mean responses[a]

Scale: 2=increased greatly, 1=increased somewhat, 0=did not change, -1=decreased somewhat,-2=decreased greatly	Smaller rural[b] (n=33)	Large rural (n=42)	Urban (n=122)	Total (n=197)
Educational experiences				
Rural rotation**	1.0	1.5	0.9	1.0
Continuity clinic in a rural area*	1.0	1.4	0.9	1.0
Full time training in a rural area*	1.3	1.4	0.9	1.1
Having relationships with rural patients outside the clinical setting during training	1.1	1.1	0.7	0.9
Living in a rural community during training*	1.2	1.2	0.8	1.0
Broad scope of practice skills training**	1.4	1.7	1.2	1.3
Rural living experiences				
Rural way of life	1.0	0.9	0.7	0.8
Rural recreational and cultural activities	0.9	0.8	0.5	0.7
Quality of education for children	0.6	0.3	0.1	0.2

* $p < .05$
** $p < .01$
[a]Does not include respondents who indicated an item was "not applicable."
[b]Geographic groupings based on Rural-Urban Commuting Area (RUCA) codes: "smaller rural" combines small rural and isolated small rural categories.

INFLUENCES ON INITIAL CHOICE OF PRACTICE LOCATION AFTER RESIDENCY

Respondents were asked to rate the influence of numerous factors on their choice of initial practice location using a five-point scale from 2, "strongly positive," to -2, "strongly negative" (Table 3). As noted earlier, most physicians had stayed in the same location until the time of the survey.

The top positive influences on initial practice location choice were being able to exercise a broad scope of practice, the need for healthcare in the community, the desire to live in an environment similar to where one grew up, and rural way of life. Numerous other factors were also perceived as positive influences in choosing the initial practice location: the spouse or partner's satisfaction in the community, perceived fiscal stability of the hiring organization, rural recreational and cultural activities, proximity to the physician's friends and family, income potential, reputation for high quality care in the community, and sufficient providers in the practice to share call duty.

Table 3. Influences on initial choice of practice location after residency by current practice location: mean responses[a]

Scale: 2=strongly positive, 1=somewhat positive, 0=neither positive nor negative, -1=somewhat negative,-2=strongly negative	Smaller rural[b] (n=33)	Large rural (n=42)	Urban (n=122)	Total (n=197)
Broad scope of practice*	1.4	1.5	1.2	1.3
Need for healthcare in the community	1.3	1.0	1.1	1.1
Desire to live in similar environment to the one where you grew up	1.4	0.8	1.0	1.0
Rural way of life***	1.5	1.1	0.8	1.0
Spouse/partner's satisfaction in the community	1.2	1.0	0.8	0.9
Perceived fiscal stability of the hiring organization	1.0	1.0	0.9	0.9
Rural recreational and cultural activities***	1.4	0.9	0.5	0.8
Proximity to my friends or family	1.1	0.5	0.7	0.8
Income potential	0.8	0.8	0.8	0.8
Reputation for high quality care in the community	0.9	1.0	0.8	0.8
Sufficient providers to share call duty	0.7	0.7	0.8	0.7
Quality of education for children	0.9	0.5	0.4	0.5
Spouse/partner's work or school opportunities	0.3	0.6	0.4	0.5
Proximity to spouse/partner's friends or family	0.8	0.2	0.4	0.5
Electronic medical record/health information technology*	0.2	0.7	0.4	0.4
Proximity to shopping and other urban amenities*	0.0	-0.1	0.4	0.2

* $p < .05$
** $p < .01$
*** $p < .001$
[a]Does not include respondents who indicated an item was "not applicable."
[b]Geographic groupings based on Rural-Urban Commuting Area (RUCA) codes: "smaller rural" combines small rural and isolated small rural categories.

There were several significant differences between physicians by current urban or rural practice location. Compared with urban physicians, physicians in smaller rural places reported a significantly more positive influence of the rural way of life and rural recreational and cultural activities on their current practice location choice. Physicians in large rural areas reported a stronger positive influence of both broad scope of practice and rural recreational and cultural activities than did urban physicians. Physicians in large rural areas also reported that electronic medical record (EMR) and health information technology (HIT) had a significantly

more positive influence on their practice location choice than physicians in smaller rural locations. Proximity to shopping and other urban amenities was the only factor that urban practicing physicians reported as more positively influencing their choice of current practice location.

LIMITATIONS

This study has some limitations. The small sample size may have prevented detection of significant rural-urban differences. Respondents provided retrospective interpretations of their experiences, and their own interpretations of what "rural" means, which could be biased. Though the response rate was fairly high for a study of physicians, we do not know the extent to which the sample was representative of the entire population of physicians attending rural-centric family medicine residencies, but a larger proportion of U.S. medical graduates responded to the survey than international medical graduates (67.8% vs. 50.9% respectively, $p<.01$). The response rate also varied by US census region ($p< .001$): Northeast (36.1%), Midwest (70.2%), South (52.0%), and West (71.4%). Respondents and nonrespondents did not differ, however, in their average age, gender, graduation year or type of medical school (allopathic vs. osteopathic).

CONCLUSIONS AND POLICY IMPLICATIONS

The proportion of physicians in rural practice (about two of five) was consistent with other recent analyses, including a larger sample that included these physicians.[15] Also consistent with other studies, fewer physicians of racial and ethnic minority groups chose rural practice.

During residency, the rural training "dosage" per se, in terms of time reportedly spent in rural rotations, had no effect on rural practice choice, in contrast to past research. But physicians did rate the rural training experiences themselves—particularly a broad scope of skills training, but also training full time or having continuity clinic and rotations in rural areas—as important in increasing their interest in rural practice. The experiences of rural living and relationships with patients outside of practice were also important.

The appeal of rural amenities did not differentiate between physicians in rural and urban practice until after residency. This finding may suggest that the quality of educational experiences was more influential for residents in training but that community amenities—whether rural recreation or urban shopping—came into play more when physicians were choosing a practice location to fulfill one's desired overall quality of life.

Physicians practicing in smaller rural communities were distinct from other rural physicians or urban physicians in a number of ways. Those who had lived in rural communities before medical school and who felt more prepared for rural living after residency were more likely to be found in smaller rural places. These physicians were also more attuned to a rural way of life and amenities. Particularly notable was that half of physicians in smaller rural places had a spouse or significant other from a rural area at the time they made their career choice. Thus the more rural physicians had a more rural orientation overall throughout the life course, supported by their significant personal relationships.

A large majority of physicians in smaller rural areas also had post-residency obligations as a result of receiving incentives such as scholarships, loan repayment, or J-1 visa waivers. These incentives operate in a variety of ways to recruit or retain physicians or both. The greater participation in these programs by physicians in smaller rural areas points to potentially greater difficulty recruiting and retaining providers in these communities. This pattern also raises the question of how long physicians in small rural areas will stay after obligations end. In contrast, physicians in large rural areas were attracted more by aspects of their practices, such as being able to employ a broad scope of skills and the presence of EMRs and HIT.

It is clear that careful selection of residency candidates who have a rural orientation, whether developed early or later in their lives, and social support for this choice are important. Rurally relevant educational experiences leading to a broad scope of practice and an appreciation of rural life also spur and sustain rural interest. Yet a recent study of the rural-centric residency programs from which the current sample of graduates were recruited showed significant variability among programs in the coverage of important rural skills and the amount of training that occurred in rural areas.[17] The experiences of these physicians graduating from programs with a strong rural emphasis thus offer important lessons for national and state decision-makers as well as educators in family medicine who wish to recruit physicians to rural training and rural practice. This study's findings suggest that although some physicians are clearly self-selected into rural practice, there remains much that needs to be done, particularly during and after residency, to sustain their interests and to stimulate others on the pathway toward rural careers.

REFERENCES

1. Chen FM, Andrilla CHA, Doescher MP, Morris C. *Family Medicine Residency Training in Rural Locations*. Final Report #126. Seattle, WA: WWAMI Rural Health Research Center, University of Washington. http://depts.washington.edu/uwrhrc/uploads/RHRC_FR126_Chen.pdf. Published July 2010. Accessed July 15, 2016.
2. Grobler L, Marais BJ, Mabunda SA, Marindi PN, Reuter H, Volmink J. Interventions for increasing the proportion of health professionals practising in rural and other underserved areas. *Cochrane Database Syst Rev.* 2009(1):Cd005314.
3. Brooks RG, Walsh M, Mardon RE, Lewis M, Clawson A. The roles of nature and nurture in the recruitment and retention of primary care physicians in rural areas: a review of the literature. *Acad Med*. 2002;77(8):790-798.
4. Wilson NW, Couper ID, De Vries E, Reid S, Fish T, Marais BJ. A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. *Rural Remote Health*. 2009;9(2):1060.
5. Orzanco MG, Lovato C, Bates J, Slade S, Grand'Maison P, Vanasse A. Nature and nurture in the family physician's choice of practice location. *Rural Remote Health*. 2011;11(3):1849.
6. Kazanjian A, Nino P. Key factors in physicians choice of practice location: findings from a survey of practitioners and their spouses. *Health & Place,* 1996;2(1):27-34.
7. Laven G, Wilkinson D. Rural doctors and rural backgrounds: how strong is the evidence? A systematic review. *Aust J Rural Health.* 2003;11(6):277-284.
8. Chan BT, Degani N, Crichton T, et al. Factors influencing family physicians to enter rural practice: does rural or urban background make a difference? *Can Fam Physician*. 2005;51:1246-1247.
9. Daniels ZM, Vanleit BJ, Skipper BJ, Sanders ML, Rhyne RL. Factors in recruiting and retaining health professionals for rural practice. *J Rural Health*. 2007;23(1):62-71.
10. Barrett FA, Lipsky MS, Lutfiyya MN. The impact of rural training experiences on medical students: a critical review. *Acad Med.* 2011;86(2):259-263.
11. Petrany SM, Gress T. Comparison of academic and practice outcomes of rural and traditional track graduates of a family medicine residency program. *Acad Med*. 2013;88(6):819-823.
12. Crump WJ, Fricker RS, Ziegler C, Wiegman DL, Rowland ML. Rural track training based at a small regional campus: equivalency of training, residency choice, and practice location of graduates. *Acad Med.* 2013;88(8):1122-1128.
13. Bowman RC, Penrod JD. Family practice residency programs and the graduation of rural family physicians. *Fam Med.* 1998;30(4):288-292.
14. Patterson DG, Schmitz D, Longenecker R, Andrilla CHA. *Family Medicine Rural Training Track Residencies: 2008-2015 Graduate Outcomes.* Seattle, WA: WWAMI Rural Health Research Center, University of Washington. http://depts.washington.edu/fammed/rhrc/wp-content/uploads/sites/4/2016/02/RTT_Grad_Outcomes_PB_2016.pdf. Published February 2016. Accessed July 15, 2016.

15. Patterson DG, Andrilla CHA, Schmitz D, Longenecker R, Evans DV. *Outcomes of Rural-centric Residency Training to Prepare Family Medicine Physicians for Rural Practice.* Policy Brief #158. Seattle. WA: WWAMI Rural Health Center, University of Washington. http://depts.washington.edu/fammed/rhrc/wp-content/uploads/sites/4/2016/03/RHRC_PB158_Patterson.pdf. Published March 2016. Accessed July 15, 2016.
16. Rosenthal TC, McGuigan MH, Anderson G. Rural residency tracks in family practice: graduate outcomes. *Fam Med.* 2000;32(3):174-177.
17. Evans D, Patterson DG, Andrilla CHA, Schmitz D, Longenecker R. Do residencies that aim to produce rural family physicians offer relevant training? *Family Medicine* (in press).

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