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Factors in Recruiting and Retaining Health Professionals for Rural Practice

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ABSTRACT: ***Context:*** *Rural communities, often with complex health care issues, have difficulty creating and sustaining an adequate health professional workforce.* ***Purpose:*** *To identify factors associated with rural recruitment and retention of graduates from a variety of health professional programs in the southwestern United States.* ***Methods:*** *A survey collecting longitudinal data was mailed to graduates from 12 health professional programs in New Mexico. First rural and any rural employment since graduation were outcomes for univariate analyses. Multivariate analysis that controlled for extraneous variables explored factors important to those who took a first rural position, stayed rural, or changed practice locations.* ***Findings:*** *Of 1,396 surveys delivered, response rate was 59%. Size of childhood town, rural practicum completion, discipline, and age at graduation were associated with rural practice choice ($P < .05$). Those who first practiced in rural versus urban areas were more likely to view the following factors as important to their practice decision: community need, financial aid, community size, return to hometown, and rural training program participation ($P < .05$). Those remaining rural versus moving away were more likely to consider community size and return to hometown as important ($P < .05$). Having enough work available, income potential, professional opportunity, and serving community health needs were important to all groups.* ***Conclusion:*** *Rural background and preference for smaller sized communities are associated with both recruitment and retention. Loan forgiveness and rural training programs appear to support recruitment. Retention efforts must focus on financial incentives, professional opportunity, and desirability of rural locations.*

Rural Americans lack adequate health care access and quality.[1] More than 10% of Americans live in federally designated health professional shortage areas where they have limited or nonexistent health care services. The shortages apply to physicians, nurses, nurse practitioners, physician assistants, dentists, pharmacists, and many allied health professionals. Generally, the smaller, more isolated, and poorer the community, the worse the shortage problem becomes.[2]

To make matters worse, rural populations are older and poorer than their urban counterparts and often have more limited insurance coverage.[3,4] People in rural communities often have high rates of chronic conditions, accompanied by increased prevalence of problem health behaviors including smoking, obesity, and lack of exercise.[2] The need for core health services (eg, primary care, medical and hospital services, long-term care, oral health care, and public health services) is enormous.

Rural communities have difficulty creating, recruiting, and sustaining an adequate health care workforce. Closures of rural hospitals throughout the 1980s[3] and national health policies designed to address urban health delivery problems[5] have only compounded the problem. Rural health care demands diverse and specialized skills, and providers must

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work with fewer diagnostic and treatment resources than those in urban areas.[6]

An Institute of Medicine Committee on the Future of Rural Health Care suggests a multifaceted approach to addressing rural health care problems, with a key focus on enhancing the health professions workforce in rural areas.[2] Recommendations include establishing outreach programs to rural communities to attract qualified applicants to health professional programs, locating a meaningful portion of health professional educational training in rural areas, and developing rural training opportunities coupled with financial incentives for rural practice.

Programs designed to promote rural practice have tended to use several strategies including tuition payment programs and other financial incentives, telemedicine initiatives, rural clinical rotations, matching potential rural providers with prospective communities, and attention to spousal needs.[7] These strategies have usually focused on medical care, and physicians in particular, in spite of the fact that rural health care needs are typically interdisciplinary, requiring the services of many different health professionals.[8]

Previous studies have shown the following factors to increase physician recruitment to rural practice: rural background, family physician specialty, rural training, a rural-oriented medical curriculum, having family in the rural area, professional opportunities, economic incentives, practice relief, interest in working with underserved populations, and opportunities for family members (spousal employment, good schools for children, etc.).[9-11] Rural background and specialty preference have been found to be associated with recruitment of physicians to rural locations; medical school rural curriculum focus and rural training opportunities have been found to be associated with retention.[12] Interestingly, women are less likely to practice medicine in rural areas than men.[13]

There is much less information about other health professionals' choice to practice in rural areas. Nurses are the largest group of rural health providers,[3] but there is limited information on how and why they choose rural practice. One study of nurse practitioners found that growing up in a rural area, previous rural work experience, and completing clinical rotations in rural areas were all important factors.[14] The choice of rural practice for nurse practitioners is negatively influenced by concerns about isolation and long work hours.[15] Studies of rural occupational and physical therapists found that factors affecting practice choice included viewing a rural lifestyle as attractive, job opportunities for self and for one's spouse, and proximity to family.[16,17]

The purpose of this study was to identify factors associated with recruitment and retention to rural areas of health professional graduates from a public university in the southwest United States. Graduates from medicine, nursing, pharmacy, physical therapy, occupational therapy, dental hygiene, respiratory therapy, speech pathology, public health, physician assistant, social work, and medical laboratory sciences were surveyed to determine factors associated with choosing a rural location for their first practice as well as factors associated with retention in rural areas. Thus, the study was innovative in that it sampled over 10 years of graduates from a variety of health disciplines.

Methods

Subjects. Participants in this study consisted of graduates from 12 health professional programs in New Mexico, 10 within the University of New Mexico Health Sciences Center (UNMHSC), and 2 from community college programs. Participants graduated from their respective programs between 1991 and 2002. This study stemmed from an outcome evaluation of the UNMHSC Rural Health Interdisciplinary Program (RHIP), an elective federally funded interdisciplinary program that typically includes rural practicum experiences.[18,19] All graduates of RHIP (n = 475) were included. Using stratified sampling, a comparison group was selected composed of non-RHIP students from the same discipline and class year as the RHIP participants (n = 1,135). If the number of those who did not participate in RHIP in a given class was more than 4 times the number of RHIP participants, for each RHIP participant, 4 comparison students from that class were randomly selected.

For univariate analyses, the RHIP and comparison groups were combined in order to analyze their practice patterns in rural or urban locations. RHIP and comparison group students were found to be quite similar in most respects (discipline, gender, ethnicity, age at graduation, size of childhood town, and importance of loan forgiveness in choosing their first practice location).[20] RHIP students attended weekly 3-hour problem-based tutorials over the course of 5 months; the education of RHIP and comparison students was otherwise the same. Since rural practicum experience is a desired component of RHIP, 89% of RHIP respondents compared to 40% of the comparison group reported having a rural practicum.

Due to small numbers, some health professional disciplines were combined for purposes of analysis. Disciplines were combined on the basis of length of training, degree granted, level of independence in practice, and typical work setting. Nurse practitioner,

nurse midwife, and physician assistant students were combined into a Mid-level Practitioner category; physical and occupational therapy, and speech-language pathology into Therapies; and dental hygiene, respiratory therapy, RN-BSN nursing, medical laboratory science, and other disciplines with small sample sizes into Other. Both Medicine and Pharmacy remained as separate discipline categories.

Instrument. The same 7-page survey was mailed to all participants. The survey was piloted among UNMHSC graduates who were in practice and revised following the pilot and ensuing focus group. The survey was not identified in any way with a specific UNMHSC program and was titled Health Professional Student Follow-up Survey.

The survey inquired about demographics, including gender, marital status, date of birth, and ethnicity. In order to determine the influence of hometown location, respondents were asked the city and state in which they lived longest from age 5 to 18 and the estimated population of this location at the time they lived there. For analysis, this item's 7 response categories were combined into 2: less than 50,000 and greater than or equal to 50,000 population.

Participants were asked to list employment sites since the time they received a degree or certificate in the discipline, which made them eligible for the survey. For each employment site, respondents were asked the dates of employment, employer, city, county and state, and whether the site was either rural or underserved. The survey defined rural as "outside of an urbanized area with less than 50,000 inhabitants," which was derived from a US Census Bureau definition used for federal health care policy.[21] For the purposes of this study, employment of medical school graduates in residency programs was excluded from data analyses.

Two survey items asked respondents to rate on a 5-point scale the importance of each of 17 factors in their decision to practice in their first practice location and, if they had changed jobs, in their current practice location. The items included factors that had been considered in previous studies to be associated with rural practice choice.[9-11,14,16,17] For analysis, each factor was expressed as a dichotomous variable: extremely or somewhat important versus neutral, somewhat or extremely unimportant. Finally, a survey item asked participants whether they had participated in a rural practicum during their health professional education.

Survey Administration. The study was approved by the UNMHSC Human Research Review Committee. Return of the survey was construed as consent to participate. Last recorded addresses of participants were obtained from each health professional program and were updated using professional licensing board lists, University of New Mexico Alumni Office records, and from surveys returned by the post office with a current address. A first mailing of the survey, cover letter, and preaddressed stamped return envelope were sent to all participants, followed by a postcard reminder. Two follow-up mailings containing the survey, revised cover letter, and return envelope were sent to nonrespondents.

Responses were manually entered into a Microsoft ACCESS database. If the respondent did not indicate whether or not the practice location was rural (n = 32), this information was obtained from the US Census Bureau Web site.[22] All other missing responses were coded as missing data. Inconsistent data, missing demographic data, and outliers were manually checked for accuracy. All surveys were then manually checked against the database for errors and corrected as necessary. The rate of error in this manual check was approximately 0.8%. The ACCESS database was transferred to a SAS database for analysis. The data analysis for this article was generated using SAS software, Version 9 of the SAS System for Windows (copyright© 2002-2003 SAS Institute Inc., Cary, NC).

Data Analysis. Dependent variables for univariate analyses were whether the respondent's first site of employment following graduation was rural (first rural) and whether any of the respondent's employment sites following graduation was rural (any rural). Univariate associations of these 2 dependent variables with demographic and other participant characteristics, the importance of various factors in choosing a first rural or urban employment location, as well as the importance of various factors to participants who stayed in or changed employment location, were assessed using Pearson χ^2 tests with a significance level of 0.05. All pairwise comparisons were conducted using a Bonferroni multiple comparison procedure.

Multivariate analyses were calculated using logistic regression procedures for 3 dependent variables: those whose first practice location was rural versus urban; of those whose first practice location was rural, those who stayed rural compared to those who moved to an urban location; and of those whose first practice location was urban, those who moved to a rural location compared to those who remained urban. Since sampling strata were defined by RHIP or comparison group, discipline, and year of graduation, these variables were included in all models. Additional variables were selected by stepwise procedures from demographic variables (gender and ethnicity) and survey questions regarding the importance of specific factors in choosing a first

practice location. Variables that were significant at $P < .05$ remained in the final models.

Results

Of the 1,610 surveys mailed, 214 were returned by the postal service and addressees could not be located. Of the 1,396 surveys that were delivered, 820 were completed and returned, generating a response rate of 59%. Fifty-five respondents (6.7%) did not graduate from their program or work as health professionals following graduation, worked only as residents or fellows following graduation, or did not complete the employment history question. These participants were excluded from data analyses. The final study sample consisted of 765 participants, 244 of whom had participated in the RHIP program. The Therapies group comprised the largest proportion of respondents (33%), followed by Pharmacy (23%), Other (23%), Medicine (12%), and Mid-level Practitioners (8%).

With the exception of gender and year of graduation, all variables representing demographic and other participant characteristics were associated with rural practice (Table 1). For both first employment site following graduation and any employment site following graduation, students in their 40s were more likely than younger students to be employed in a rural location. Size of childhood town and completion of a rural practicum or clerkship as part of training were associated both with first employment and with any employment in a rural location. Discipline also showed a statistically significant association with the outcomes. Pairwise analysis showed Mid-level Practitioners to choose a rural practice location at any time after graduation (any rural) significantly more often than all discipline categories except Therapies, and to choose a rural location for their first practice (first rural) more often than the Pharmacy and Other groups.

Table 2 presents respondents' ratings of the importance of various factors in choosing their first job following graduation, and pertains to recruitment. When comparing the percentage of respondents who considered factors as either extremely or somewhat important (vs neutral, somewhat, or extremely unimportant), 6 factors were rated significantly higher ($P < .05$) by graduates who chose to first practice rurally.

To explore issues of retention as well as recruitment, the study cohort was divided into 4 groups: those whose first and most recent employment sites were rural (stayed rural), those whose first and most recent employment sites were urban (stayed urban), and those who moved from rural to urban or from urban to rural practice locations. When looking at factors important to choosing a first practice location, 8 factors showed statistically significant differences ($P < .05$) across the 4 groups (Table 3). Over 76% of all groups considered *enough work to support self/family* and *opportunity for professional experiences* to be important. At least 69% of all groups considered *income potential* and *serving health needs in the community* to be important. In a separate analysis (across the same 4 groups) of factors important to the selection of their *most recent* job, a survey item limited to respondents who changed practice location, it is notable that the same 4 factors emerged as important to all groups (data not shown).

Multiple logistic regression analysis was performed to control for extraneous variables. To construct the multivariate models, the following independent variables were put into logistic regression models to estimate odds ratios: whether or not the respondent was an RHIP participant, discipline, year of graduation, gender, ethnicity, and each of the 17 factors that respondents rated in importance to their initial practice decision. Dependent variables included rural versus urban first practice setting, whether initially rural practitioners stayed rural versus moved urban, and whether initially urban practitioners moved rural versus stayed urban. Because RHIP participation, discipline, and year of graduation were used in defining the sampling strata, these variables were retained in the models whether or not they were significant. Table 4 shows results for all discipline categories and for those factors that reached statistical significance ($P < .05$).

Mid-level Practitioners had the greatest likelihood of beginning practice in a rural area. For those who began practice in an urban location, Therapies showed the greatest odds ratio for moving to a rural practice setting. Looking again at factors important to first practice location choice, 7 factors show statistically significant differences between those who first practiced in a rural versus urban location. Results are similar to those of Table 2, with community health needs, financial aid obligation, size of community, return to hometown, and participation in a rural training program considered important to the rural practitioners. For those who first practiced in a rural location compared to an urban location, the odds ratio was 0.5 for rating as important the desire to live in a certain geographic region. They also appeared less likely to consider proximity to colleagues and friends. When comparing those who remained in a rural location to those who began rurally but moved, only size of community and return to hometown remained as significant factors. And proximity to extended family appears significantly less important for those who began in an urban location but moved rurally compared to those who began and remained in an urban location.

Table 1. Practice Location by Graduate Characteristic*

	N	First Rural†		Any Rural‡	
		n (%)	*P* Value	n (%)	*P* Value
Total	765	181 (24)		262 (34)	
Gender			.92		.30
Male	199	48 (24)		62 (31)	
Female	563	133 (24)		199 (35)	
Year of graduation			.41		.54
1991-1994	79	14 (18)		28 (35)	
1995-1998	385	95 (25)		138 (36)	
1999-2002	301	72 (24)		96 (32)	
Age at graduation (y)			.02		.001
20-29	343	69 (20)a′		102 (30)a′	
30-39	255	59 (23)		84 (33)a′	
40-49	133	43 (32)a		65 (49)a	
50+	25	9 (36)		9 (36)	
Ethnicity			.66		.049§
Non-Hispanic white	525	127 (24)		188 (36)	
Hispanic	165	40 (24)		59 (36)	
Asian	39	6 (15)		6 (15)	
Other	31	7 (23)		8 (26)	
Discipline			<.001		<.001
Medicine	90	20 (22)		28 (31)b′	
Pharmacy	178	34 (19)b′		45 (25)c′	
Therapies	256	69 (27)		106 (41)a, c	
Mid level‖	65	26 (40)a, b		36 (55)a, b, c	
Other¶	176	32 (18)a′		47 (27)a′	
Size of childhood town			.02		<.001
<50,000	315	89 (28)		136 (43)	
≥50,000	418	86 (21)		116 (28)	
Rural practicum/clerkship			<.001		<.001
Yes	421	127 (30)		176 (42)	
No	335	52 (16)		84 (25)	

*a-a′, b-b′, c-c′ denote significant pairwise differences between groups, overall $P < .05$ for the Bonferroni multiple comparison procedure.
†Participants who took their first job following graduation in a rural location.
‡Participants who took any job following graduation in a rural location.
§There were no significant pairwise differences between groups.
‖Mid-level disciplines include nurse practitioner, nurse midwife, and physician assistant.
¶Other disciplines include dental hygiene, master in public health, medical laboratory sciences, RN-BSN nursing, respiratory therapy and social work.

Discussion

Because this study collected longitudinal data, we were able to investigate career choices beyond a first job, making this one of the few studies that examine issues of retention as well as recruitment. The study is also unique in exploring these issues within multiple health care professions. We were able to compare graduates who began practice in rural locations with those who began in urban areas and with those who changed practice location over time. Some factors found to be important to rural recruitment in previous studies were found here to be important to all graduates regardless of practice location.

Recruitment. The results of this study are congruent with previous studies concerning health professional recruitment to rural areas.[9-11,14] Notable are the importance of a rural background, participation in a rural training program, and the desire to serve community health needs (Tables 1-4). Return to hometown was associated with both first and any rural practice choice (Tables 2-4). This reinforces the need for outreach programs to recruit health professions students from rural areas, students who enter their professions with an awareness of rural living and the health needs of their hometown. Similar to previous findings, completion of a rural practicum

Table 2. Percentage of Respondents Rating a Factor as Somewhat or Extremely Important When Choosing Their First Practice Site in a Rural or Urban Practice Location

Factors Important in Choosing First Practice Location	First Practice Location		*P* Value
	Rural, n = 180* (%)	Urban, n = 582* (%)	
Income potential	76	72	.34
Serving health needs in the community	83	70	<.001
Influence of spouse/partner	42	42	1.00
Quality of education for child(ren)	35	34	.85
Financial aid obligations/loan forgiveness	43	24	<.001
Multiculturalism (many cultures existing in 1 community)	44	34	.02
Proximity to extended family/relatives	53	54	.86
Proximity to friends/colleagues	35	43	.08
Cultural and recreational activities	50	51	.86
Opportunity for career advancement	57	63	.19
Opportunity for professional experiences	83	86	.47
Desire to live in a certain geographic region	64	69	.24
Desire to work in certain size/population of community	52	40	.01
Desire to return to hometown	31	22	.02
Enough work to support self/family	79	79	.92
Participation in rural training program	23	8	<.001
Location of previous clinical training/practicum/residency	29	31	.78

*Three respondents did not answer this survey item. Sample size for individual factors ranged from 712 to 760, with a mean of 751, due to missing data.

or clerkship was strongly associated with rural practice location (Tables 1 and 4). Participation in a rural training program showed a fairly large measure of effect in Table 4, where the odds of considering this item important for those choosing a first rural location were 270% of the odds for those choosing a first urban location. These findings affirm the importance of rural training as part of health professional education and provide more evidence that establishing and maintaining rural training programs is an effective educational strategy to build a rural health professional workforce. Serving health needs in the community emerged as significant in all analyses and was also found to be important to a high percentage of all groups regardless of their practice location (Tables 2-4).

Some factors found in previous studies to increase recruitment to rural practice[9-11,16,17] were not supported by our data. When we compared those who chose a first rural practice site to those who did not, influence of partner or spouse, professional opportunities, and income potential were not significantly different between groups (Tables 2 and 4). The latter 2 were important to all respondents in selecting a first job location (Table 3). Therefore, while this study does not support attention to spousal needs as a recruitment strategy, it does assert the need to offer financial incentives and opportunity for professional development.

One economic incentive that is specific to rural recruitment is financial aid tied to rural practice. In this study, the importance of financial aid obligations or loan forgiveness programs was associated with choosing a first rural practice location (Tables 2 and 4). The odds for rating financial aid obligations as important to their initial practice decision were 190% greater for those practicing rurally than for their urban counterparts. Most states offer loan repayment programs to targeted health professionals who choose to practice in underserved areas in exchange for repayment of outstanding student loans.[22,23] New Mexico is one of the few states that offers a loan for service program in which students with the intention of practicing in state-defined health professional shortage areas after graduation receive funds while in school. Such loans are available to medical, nursing, and allied health professional students. Currently in New Mexico, students may receive up to $12,000 per year.[24] Findings in this study reinforce the importance of continuing and expanding such programs as a viable recruitment strategy.

Table 3. Percentage of Respondents in 4 Groups (Which Indicate Status of First Practice and Current Practice) Rating a Factor as Somewhat or Extremely Important When Choosing Their First Practice Location*

Factors Important in Choosing First Practice Location	Stayed Rural, n = 115† (%)	Rural to Urban, n = 65† (%)	Stayed Urban, n = 527† (%)	Urban to Rural n = 55† (%)	*P* Value
Income potential	75	77	72	69	.68
Serving health needs in the community	84a	82	70a′	73	.01
Influence of spouse/partner	44	37	41	43	.82
Quality of education for child(ren)	40	25	35	27	.18
Financial aid obligations/loan forgiveness	43a	42a	24a′	26	<.001
Multiculturalism (many cultures existing in 1 community)	46	42	34	33	.09
Proximity to extended family/ relatives‡	58	45	55	36	.02
Proximity to friends/colleagues	37	32	44	35	.16
Cultural and recreational activities	52	46	51	46	.81
Opportunity for career advancement‡	59	54	65	47	.03
Opportunity for professional experiences	82	86	87	76	.12
Desire to live in a certain geographic region	72a	49a′	69a	64	.01
Desire to work in certain size/ population of community	61a	37a′	40a′	38	<.001
Desire to return to hometown	36a	22	22a′	21	.02
Enough work to support self/ family	80	78	79	78	.98
Participation in rural training program	27a	16	8a′	11	<.001
Location of previous clinical training/practicum/residency	32	24	30	39	.35

*a-a′ denote significant pairwise differences between groups, overall $P < .05$ for the Bonferroni multiple comparison procedure.
†One respondent who stayed rural and 2 respondents who stayed urban did not answer this survey item and are not included in this table. Sample size for individual factors ranged from 712 to 760, with a mean of 751, due to missing data.
‡There were no significant pairwise comparisons between groups for these factors.

Discipline was also related to rural practice choice (Tables 1 and 4). Mid-level practitioners (nurse practitioner, nurse midwife, and physician assistant) were more likely to take a rural position than most other discipline categories. This is not surprising—those entering professions geared to rural practice are taking more rural jobs. This finding may also be related to a combination of other factors, such as rural practicums and loan forgiveness programs. Advanced practice nursing students (88% of our mid-level practitioner sample) all complete rural practicum experiences at UNMHSC and form a large proportion of applicants for state loan forgiveness programs.

Retention. Of those who first began practice in a rural setting, we compared those who stayed rural to those who moved to urban practices (Table 4). Only 2 factors important to an initial practice decision—desire to work in a certain size of community and desire to return to hometown—showed statistically significant differences, both with large effect sizes. In this discussion, we assume that rural respondents who rated the *desire to work in a certain size of community* as important were referring to a preference for a smaller sized community. For those who remained in rural settings compared to those who stayed in urban locations (Table 3), rural practitioners rated the desire to serve community health needs, financial aid obligation, preference for a certain size community, return to hometown, and rural training program participation as more important in their initial practice choices. Of these, serving community health needs and preference for a smaller community were

Table 4. Multivariate Analysis*†

Variable	First Job‡Rural Versus Urban (N = 762) OR (95% CI)	First Rural Job§Stayed Rural Versus Rural to Urban (N = 180) OR (95% CI)	First Urban Job‖Urban to Rural Versus Stayed Urban (N = 582) OR (95% CI)
Discipline			
Pharmacy	1.0	1.0	1.0
Medicine	1.2 (0.6, 2.5)	0.6 (0.2, 2.2)	2.0 (0.7, 5.7)
Therapies	1.4 (0.8, 2.3)	1.9 (0.7, 4.8)	2.7 (1.2, 6.3)
Mid-level practitioners	2.4 (1.2, 4.8)	0.6 (0.2, 1.9)	1.8 (0.5, 6.5)
Other	0.6 (0.4, 1.2)	0.8 (0.3, 2.3)	1.2 (0.5, 3.2)
Serving health needs in the community		—	—
Not important or neutral	1.0		
Somewhat or extremely important	1.7 (1.0, 2.7)		
Financial aid obligations/loan forgiveness		—	—
Not important or neutral	1.0		
Somewhat or extremely important	1.9 (1.3, 2.9)		
Proximity to extended family/relatives	—	—	
Not important or neutral			1.0
Somewhat or extremely important			0.5 (0.3, 0.8)
Proximity to friends/colleagues		—	—
Not important or neutral	1.0		
Somewhat or extremely important	0.6 (0.4, 0.8)		
Desire to live in a certain geographic region		—	—
Not important or neutral	1.0		
Somewhat or extremely important	0.5 (0.3, 0.8)		
Desire to work in certain size/population of community			—
Not important or neutral	1.0	1.0	
Somewhat or extremely important	1.6 (1.1, 2.5)	3.5 (1.7, 7.4)	
Desire to return to hometown			—
Not important or neutral	1.0	1.0	
Somewhat or extremely important	1.7 (1.1, 2.7)	2.8 (1.3, 6.1)	
Participation in rural training program		—	—
Not important or neutral	1.0		
Somewhat or extremely important	2.7 (1.6, 4.8)		

*OR, odds ratio; CI, confidence interval.
†Models adjusted for Rural Health Interdisciplinary Program participation and year of graduation.
‡Those whose first practice location was rural (n = 180) compared to those who first practiced in an urban location (n = 582).
§Of those whose first practice location was rural, those who stayed rural (n = 115) compared to those who moved to an urban location (n = 65).
‖Of those whose first practice location was urban, those who moved to a rural location (n = 55) compared to those who remained urban (n = 527).

important to over 60% of the respondents who stayed in rural practice locations. A large proportion of those who move to and stay in rural areas appear to have in mind at the start a desire to live in and serve a small community, perhaps their childhood town.

Although mid-level practitioners present a significant difference between disciplines in choosing a first rural practice, there were no significant differences between disciplines in terms of those who stayed in rural practice and those who were initially employed in a rural location but later moved to an urban one (Table 4). This finding may be related to lack of statistical power (see below). Interestingly, the Therapies group (physical and occupational therapy and speech-language pathology) appears more likely than other discipline categories to move to a rural area from an urban first practice location compared to those who stayed urban. These students may choose urban practice initially, for example, to gain experience in a larger urban facility, with the intention to practice rurally in the future.

While the importance of financial aid obligations was associated with choosing a first rural practice

location, it did not distinguish those who stayed in rural locations from those who did not (Tables 3 and 4). Desire to work in a smaller community and return to one's hometown were associated with both rural recruitment and retention. Loan repayment and loan for service programs may therefore be time-limited incentives, as graduates eventually pay off their debt, while the desirability of the location may influence longer term practice decisions.

Proximity to extended family was associated with urban retention (Table 4). Proximity to family and career advancement opportunity were rated as important by high percentages of those who stayed in both rural and urban locations compared to those who changed practice location (Table 3). Possibly related to lack of statistical power (see below), the latter differences did not reach statistical significance. Although these factors do not appear to be as important to initial practice decisions, they may be more important to retention as the health professional gains experience and/or starts a family.

The following 4 factors were considered important to all graduates when choosing jobs regardless of the location in which they started or ended up: sufficient work to support oneself and one's dependents, opportunity for professional experiences, income potential, and the desire to serve community health needs (Tables 2 and 3). And those who initially chose rural versus urban practices rated the latter factor to be more important (Table 4). The importance of these factors to health professional recruitment and retention is obvious, and underscores the value of offering sufficient and well-paid employment and opportunity for professional growth. Rural communities might also do well to promote awareness of their important health care needs.

Study Limitations. One limitation of this study is that nearly one third of the sample consisted of voluntary participants in the UNMHSC Rural Health Interdisciplinary Program, a self-selected group, nearly all of whom (89%) completed a rural practicum as a part of the training. The total study sample therefore may have had a greater proportion of students who were interested in rural practice, and who completed both a rural practicum and a rural training program, than is typical. This poses a concern regarding external validity.

Small sample sizes may have created a lack of statistical power. Several sizeable differences between the stayed rural and smaller urban to rural and rural to urban groups did not reach statistical significance (Table 3). The small sample sizes when respondents were subdivided by discipline or change of practice location in the multivariate models is reflected in the width of the confidence intervals and also may have resulted in type II statistical error. More factors important to retention may have emerged had those who stayed rural or moved from rural to urban locations been larger in number.

RN-BSN nursing, advanced practice nursing, and medicine were poorly represented in this study, partly due to the length of time required before medical students enter practice, and to past obstacles to nursing student participation in RHIP, both of which decreased the sample pool from these disciplines. This is of concern because these disciplines represent a large and vital segment of the health care workforce. Because physicians and mid-level practitioners are generally independent in practice and advanced in training, greater representation of these disciplines in our sample may have boosted the importance of factors such as career and professional opportunity and income potential. We may have also seen a significant difference in retention as well as recruitment for mid-level professionals. Although most published research in this area has focused on physicians, further research into the practice patterns of RN-BSN and advanced level nursing is indicated.

In addition to the lack of statistical power, small sample sizes in many disciplines led to the combining of like professions for the purpose of analysis. Although there was a rational basis for these combinations, we are making here an unverified assumption that these professionals behave alike for similar reasons.

Additional studies are needed to support the results found here. Larger sample sizes drawn from totally randomly selected samples of equally represented disciplines and conducted over time might lead to firmer conclusions regarding factors that determine health professional rural practice choice.

Conclusions

We conclude from this study that a number of factors are associated with recruitment and/or retention of health professionals to rural areas. Successful recruitment is supported by loan forgiveness programs, rural training programs and practicum experiences, as well as competitive salaries and professional opportunities. Retention efforts must focus on the provision of economic incentives, such as earnings potential and promotion opportunity, professional development, and community appeal.

Communities and universities need to work collaboratively. Educational programs can provide, encourage, and perhaps require rural practicum experiences and rural training programs. They can initiate outreach programs to attract students with

rural backgrounds. Communities need to focus on the provision of financial incentives, professional opportunities, increasing awareness of their own community's health needs, and on improving the attractiveness of their community as a place to live. Together they can put together the puzzle pieces that result in successful rural recruitment and retention.

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