The Primary Care Physician Workforce in Massachusetts: Implications for the Workforce in Rural, Small Town America

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ABSTRACT: ***Context:*** *Small towns across the United States struggle to maintain an adequate primary care workforce.* ***Purpose:*** *To examine factors contributing to physician satisfaction and retention in largely rural areas in Massachusetts, a state with rural pockets and small towns.* ***Methods:*** *A survey mailed in 2004-2005 to primary care physicians, practicing in areas designated by the state as rural, queried respondents about personal and practice characteristics as well as workforce concerns. Predictors of satisfaction and likelihood of remaining in current or rural practice somewhere were assessed.* ***Findings:*** *Of 227 eligible physicians, 160 returned their surveys (response rate, 70.5%). Approximately one third (34.0%) reported they had grown up in communities of 100,000 or larger. Factors associated with higher overall practice satisfaction included not feeling overworked ($P = .043$) or professionally isolated ($P = .004$), and being involved in their practice ($P = .045$) and home communities ($P = .036$) as well as ease of seeking additional physicians for practice and obtaining CME credits ($P = .014$ and $P = .017$, respectively). Female physicians were more likely to report an intention to remain in rural practice somewhere for the next decade ($P = .034$). In rating their satisfaction with various aspects of the rural practice environment, physicians reported greatest satisfaction with their practice overall (67%) and their call group size (66%). They were least satisfied with their current (30%) and likely future income (40%). In multivariate analyses, larger practice community size was positively related to the dependent variable of overall satisfaction and negatively related to likelihood of staying in current practice or in rural practice somewhere.* ***Conclusions:*** *Our findings reaffirm the importance of rural medical education opportunities in physician recruitment, retention, and practice satisfaction. They also indicate that in a small New England state, a major source of physicians for rural and small town communities is physicians who have been raised in urban/suburban communities and who were trained outside of the region but who were prepared to live and to practice in rural and small town communities.*

Difficulties related to delivering health care services to and within rural communities have been well documented. These include: long travel times, low rates of health insurance coverage, an aging and less prosperous population, inadequate technology, aging physical structures, and too few providers.[1-7] The pervasive and persisting shortage of physicians in rural areas is well chronicled.[6,8,9] Many of the reasons that physicians elect to enter, to remain and/or to leave rural practice have been identified, as have the effects of training programs designed specifically to influence the young physician's choice of practice location.[9-17]

Carried out mainly in predominantly rural states, studies on rural medical workforce indicate that workload demands, income, isolation, difficulty obtaining coverage for vacations, local school academic quality, and other community factors influence how

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long a physician stays in a rural practice.[8,12,15] The physician's connectedness to the community and his/her family's embrace of rural living are also strong predictors of retention.[18–21] Rural training and rural life experiences can be important in helping physicians feel comfortable with the medical and social demands of rural practice.[11,12,14,22–24]

With workforce system changes largely being led by states,[25] state level assessments are needed to gain specific insights to rural practice. While states have sought to understand their own physician distribution, this body of research appears to have focused mainly on states known to be largely rural. Few studies have addressed rural physician workforce issues in less predominantly rural states where rural primary care issues may be different. Rural origin or rural training factors may be less important in states that do not have frontier rural areas. In some ways, the challenges can be greater for physicians in rural primary care. Their needs and the needs of their patients and communities can easily be ignored as issues related to urban health overshadow them. Relying on information gathered from states that are largely rural and/or frontier to recruit and retain physicians for states that have pockets of rural communities and many small towns may result in wasted efforts and failed initiatives.

Using information gathered through a mail survey, this study reports the demographic, educational, economic, and practice characteristics related to primary care physician retention in Massachusetts—a small state whose rural areas frequently are found in reasonably close proximity to an urban core. Using the state's definition as described in Methods, 46% of its 351 towns are rural and home to 11% of its population. These towns comprise 65% of the state's land mass.[26] Identifying factors that influence physicians to continue practicing in these regions can help ensure that workforce efforts for these areas will be evidence-based.

Methods

A list of physicians practicing in Massachusetts was obtained from the state's Board of Registration in Medicine. From that list, we identified physicians whose addresses indicated that they were in a community that the Massachusetts Department of Public Health's Office of Rural Health had classified as rural.[27] A municipality in Massachusetts is considered rural if it meets the following criteria: it is in a non-metropolitan county, or in an area designated non-urban by the US Census or by the Rural-Urban Commuting Area (RUCA) classification system, or has a population less than 10,000 people and a population density below 500 people per square mile. We selected further for physicians, both allopathic and osteopathic, who were listed either as practicing primary care specialties defined as family medicine, internal medicine, or pediatrics, or who did not have a specialty noted.

Combining elements of an unpublished earlier qualitative study with questionnaire topics that have been used in prior physician surveys, we developed a 4-page questionnaire. Physician perceptions about the importance of factors related to preparation for rural and small town practice, factors important for producing good physicians for rural and small town communities, concerns about selected workforce issues, and levels of community involvement were assessed by items using a 5-point Likert scale. Physicians were also asked to rate (on a 5-point scale) their satisfaction with various practice aspects as well as with their satisfaction overall and the likelihood of continuing to practice at their current or another rural/small town site. These questions were augmented by several open-ended queries and items assessing the respondent's demographic profile. The size of the respondents' practice communities and home towns were self-reported. The questionnaire was pilot tested with six primary care doctors and amended to maximize clarity, then sent to subjects in 2004-2005.

Guided by Dillman's Total Design Method,[28] questionnaires not returned within 2 weeks resulted in a second survey packet mailed to non-respondents. If there was no response within 2 weeks of the second mailing, a telephone call was made to the physician's office, encouraging him/her to complete and return the survey. As an incentive, physicians who returned their survey were eligible to win 1 of 3 $50 bookstore gift certificates. Survey packets returned and marked "Undeliverable" were checked with the state Board of Registration's database to obtain more accurate addresses when available. Physicians who were subsequently identified as being retired, not in primary care, or not in a rural area or small town were excluded from analysis. The study protocol was approved by the University of Massachusetts Medical School's Human Subject Committee.

Data were analyzed using SPSS/PC statistical software (V14, 2006, SPSS Inc., Chicago, Ill). Frequency and percentile distributions, means and medians were used to describe characteristics of the responding physicians. Depending on the categorical or continuous nature of the data, chi square tests, *t* tests, correlations and one-way analyses of variance were used to assess significance at the 0.05 level. For analysis, questions with a 5-point Likert scale response were expressed as dichotomous variables: very or somewhat versus

neutral, not very or not at all. Three stepwise logistic regressions were used to evaluate the association between our dependent variables—overall practice satisfaction, likelihood of remaining in current rural practice, and likelihood of remaining in rural practice somewhere—and independent variables that included demographics, practice and setting characteristics, community involvement, and training factors.

Results

From the original sample of 316 physicians, 89 had retired, left primary care or rural/small town practice in Massachusetts, or had no forwarding address. These physicians were considered ineligible. Among the remaining 227 physicians, 160 returned completed surveys for a response rate of 70.5%.

Demographic characteristics of respondents are shown in Table 1. Of note, the majority (60.4%) reported practicing in towns with populations less than 10,000; although most (73.2%) had grown up in larger towns with populations of 10,000 or greater. Non-respondents were more likely than respondents to be practicing in larger communities (50.5% and 39.6%, respectively), to be practicing internal medicine (53.0% and 35.4%, respectively), and to have attended medical school outside of New England (77.6% and 65.3%, respectively). The gender distribution of non-respondents and respondents was similar.

Only 25.9% of responding physicians had attended medical school in Massachusetts; a full 65.3% having attended a school outside of New England. Similarly, slightly more than one quarter (28.1%) reported having done their residency training in Massachusetts; 56.8% trained outside of New England.

When asked what attributes were needed to be a good physician for a small town/rural community, more than half of the respondents indicated that the overall residency training experience (68.8%) and being involved in the practice community (61.0%) were either very important or important. Slightly less than half noted the following experiences to be very important or important: having rural mentors (49.7%), having specific rural or small town experiences during residency (46.7%), having rural or small town exposures/experiences during medical school (45.7%), and having "frontier" experiences, (ie, experiences in areas remote from tertiary care) (46.6%). Surprisingly, only one quarter (24.3%) thought growing up in a small town was important or very important.

Respondents reported that finding time for and actually obtaining continuing medical education (CME) was not difficult (56.7% and 63.7%, respectively), nor was getting time off for vacation (55.4% felt it was easy or very easy). Their reported difficulty arose in finding additional physicians for their practice (78.6%). While a minority of physicians thought the current number of physicians and/or nurse practitioners in rural/small town areas as well as of other health professionals was

Table 1. Characteristics of Primary Care Physicians in Rural and Small Town Massachusetts Communities

Characteristic	Study Population N (%)
Gender (n = 160)	
Male	105 (65.6)
Female	55 (34.4)
Age (n = 158)	
< = 30 years	1 (.6)
30-39 years	41 (25.9)
40-49 years	44 (27.8)
50-59 years	55 (34.8)
> = 60 years	17 (10.8)
Population* of town where practicing (n = 159)	
< = 4,999	40 (25.2)
5,000-9,999	56 (35.2)
> = 10,000	63 (39.6)
Population* of town where grew up (n = 156)	
< = 4,999	26 (16.7)
5,000-9,999	16 (10.3)
10,000-19,999	21 (13.5)
20,000-49,999	26 (16.7)
50,000-99,999	14 (9.0)
> = 100,000	53 (34.0)
Medical specialty (n = 160)	
Internal medicine	57 (35.6)
Family medicine	68 (42.5)
Pediatrics	35 (21.9)
Total years in practice (n = 160)	
<5	34 (21.3)
5-9	26 (16.3)
10-14	18 (11.3)
15-19	22 (13.8)
≥20	60 (37.5)
Years in current practice (n = 159)	
<5	58 (36.5)
5-9	25 (15.7)
10-14	22 (13.8)
15-19	15 (9.4)
≥20	39 (24.5)
Location of medical school attended (n = 147)	
Massachusetts	38 (25.9)
Other New England state	13 (8.8)
Other	96 (65.3)
Location of residency (n = 139)	
Massachusetts	39 (28.1)
Other New England state	21 (15.1)
Other	79 (56.8)

*Self-reported.

adequate (33.3% and 38.3%, respectively), a majority were concerned about the expected inadequacy of physician supply for their communities in the next decade (61.1%).

A majority of physicians (67.3%) reported being satisfied with their practice overall. Asked about 7 elements specific to their practice and 1 related to their personal lives, the element most frequently given a rating of satisfied was spouse/partner happiness with location (73.8%). Other elements that a majority of respondents were satisfied with included call group (66.0%), quality of local referral specialists (57.1%), and degree of intraspecialty and interspecialty collegiality (62.8% and 54.2%, respectively). Areas of neutrality or dissatisfaction included current and potential for future income (30.2% and 40.4%, respectively), as well as the variety of local specialists (35.3%). Few felt professionally isolated (28.8%). Almost two thirds, however, reported feeling overworked (65.0%).

The majority (57.1%) of respondents anticipated remaining in their present practice and three fifths (60.3%) reported they were likely to remain in rural practice somewhere in the next decade. Responses to the open-ended question of why they will remain in rural practice included feeling established with a strong sense of connection to patients and place, an overall satisfaction with practice, and being in a "great place to live." Reasons for leaving included retirement as well as dissatisfaction with low pay and a high workload.

In the bivariate analyses (Table 2), 3 dependent variables—likelihood of remaining in current practice in the next decade, likelihood of remaining in rural practice somewhere in the next decade and overall practice satisfaction—were analyzed to identify significant associations with factors the literature has determined to be related to rural practice. Being a pediatrician or family physician, being between 40 and 59 years of age and having been in practice for a longer period of time (with the exception of practicing for 20 or more years) were the factors most closely associated with respondents reporting that they were likely to stay in their current practice and/or to remain in rural practice somewhere. The self-reported size of the community where the physician had been raised was not significantly related to anticipating remaining in current or rural practice somewhere.

Factors significantly associated with staying in rural practice somewhere reflected physicians' feeling prepared to live and to practice in rural/small town communities ($P = .024$ and $P = .017$, respectively) as well as having had sufficient opportunity for exposure to rural practice during residency ($P = .005$). Interestingly, respondents' gender was significant only for women physicians reporting that they were more likely to stay in rural practice somewhere in the next decade ($P = .034$).

Items associated with physicians reporting higher overall satisfaction with their practices included not feeling overworked ($P = .043$) or professionally isolated ($P = .004$), and that seeking other physicians ($P = .014$) or mid-level providers ($P = .006$) for the practice was easy. Overall satisfaction was not related to the size of the community where the responding physician was raised, feeling prepared for rural practice, or feeling prepared for rural living.

Additional bivariate analyses indicated that family physicians were more likely than either internists or pediatricians to report having had a medical education that prepared them for rural and small town practice ($P = .007$). Furthermore, the association between having been exposed during residency and/or prepared for rural medicine during medical school showed a consistent, positive, significant relationship with respondents reporting that they felt prepared to live and/or to practice in rural and small town communities ($P < .01$). Finally, there was a strong positive association between physicians reporting that they felt prepared to *live* in small town/rural areas with their also feeling prepared to *practice* in such communities ($P < .001$).

Table 3 displays the results of the logistic regression analyses for our 3 dependent variables. Reported likelihood of staying in current or some other rural practice for the next 10 years was significantly associated with being younger and practicing in a smaller community. The likelihood of remaining in current practice in the next decade was also significantly higher among physicians who did not feel isolated. Female physicians, physicians with more years in practice, and those reporting having had exposure to rural medicine during residency were more likely to indicate that they would remain in rural practice somewhere in the next 10 years but not necessarily in their current practice. Interestingly, not having had adequate opportunity for exposure during residency was significantly related to reported likelihood of remaining in rural practice somewhere. When assessed at the multivariate level, in addition to relatively larger size of practice community, overall satisfaction was significantly associated with 3 practice issues: not feeling professionally isolated or overworked and ease of adding physicians to the practice as well as having attended medical school outside of New England.

Discussion

This study is one of the first to explore primary care physician satisfaction and likelihood of remaining in

Table 2. Likelihood of Staying in Rural Practice and Overall Satisfaction by Physician Characteristics

Characteristic	Likely to Stay in Current Practice		Likely to Stay in Rural Practice Somewhere		Satisfied Overall	
	N (%)	*P*	N (%)	*P*	N (%)	*P*
Demographic characteristics						
Age		.000		.000		NS
<30 years	0 (0.0)		1 (100.0)		0 (0.0)	
30-39 years	18 (46.2)		22 (57.9)		21 (53.8)	
40-49 years	31 (70.5)		30 (69.8)		30 (68.2)	
50-59 years	37 (68.5)		34 (69.4)		40 (72.7)	
≥60 years	2 (13.3)		1 (7.1)		14 (87.5)	
Gender		NS		.034		NS
Male	56 (56.6)		53 (54.6)		71 (70.3)	
Female	32 (59.3)		35 (72.9)		34 (63.0)	
Total years in practice		.051		.013		.037
<5	13 (39.4)		16 (50.0)		15 (45.5)	
5-9	16 (66.7)		20 (83.3)		16 (66.7)	
10-14	13 (72.2)		7 (41.2)		14 (77.8)	
15-19	16 (72.7)		17 (77.3)		15 (68.2)	
≥20	30 (52.6)		28 (54.9)		45 (76.3)	
Years in current practice		.017		NS		.023
<5	25 (45.5)		32 (60.4)		30 (54.5)	
5-9	17 (68.0)		15 (62.5)		14 (56.0)	
10-14	16 (76.2)		14 (66.7)		18 (81.8)	
15-19	12 (80.0)		10 (71.4)		12 (80.8)	
≥20	18 (47.4)		17 (50.0)		31 (79.5)	
Practice setting and characteristics						
Specialty		.04		.004		NS
Family medicine	44 (65.7)		45 (71.4)		47 (70.1)	
Internal medicine	24 (43.6)		23 (42.6)		35 (62.5)	
Pediatrics	20 (62.5)		20 (69.0)		23 (69.7)	
Population of practice community		.046		NS		NS
≤4,999	26 (65.0)		27 (75.0)		22 (55.0)	
5,000-9,999	36 (65.5)		32 (59.3)		42 (76.4)	
≥10,000	26 (44.8)		29 (52.7)		41 (68.3)	
Not feeling professionally isolated		.011		NS		.004
Agree	69 (63.3)		65 (62.5)		82 (73.9)	
Disagree/neutral	18 (40.9)		22 (53.7)		22 (50.0)	
Not feeling overworked		NS		NS		.043
Agree	31 (58.5)		30 (61.2)		42 (77.8)	
Disagree	57 (56.4)		58 (59.8)		63 (61.8)	
Training characteristics						
Prepared to live in small town/rural area		NS		.024		NS
Yes	56 (60.2)		59 (67.8)		68 (72.3)	
No	32 (52.5)		29 (49.2)		37 (59.7)	
Prepared to practice in small town/rural area		NS		.017		NS
Yes	53 (60.2)		57 (68.7)		65 (72.2)	
No	35 (53.0)		31 (49.2)		40 (60.6)	
Other						
Involved in community where live		.017		NS		.036
Yes	57 (65.5)		53 (65.4)		66 (74.2)	
No	31 (46.3)		35 (53.8)		39 (58.2)	

NS = not significant.

Table 3. Characteristics Associated with Physicians' Self-Reported Likelihood of Staying in Their Current Practice or in Rural Practice Somewhere in the Next Decade and with Overall Satisfaction*

	Stay in Current Practice		Stay in Rural Practice Somewhere		Overall Satisfaction	
Characteristic	OR	95% CI	OR	95% CI	OR	95% CI
Demographic characteristics						
Age†	0.474	0.226-0.996	0.148	0.058-0.374	1.990	0.675-5.866
Gender						
Male	‡		0.128	0.039-0.423	‡	
Female (referent)						
Years in practice§	1.530	0.963-2.433	3.099	1.712-5.611	0.790	0.406-1.534
Practice setting and characteristics						
Population of practice community¶	0.576	0.347-0.957	0.542	0.303-0.971	2.227	1.109-4.473
Feeling isolated‖	1.579	1.104-2.258	‡		1.677	1.033-2.720
Feeling overworked‖	‡		‡		2.622	1.438-4.784
Ease of adding physicians to practice	‡		‡		0.383	0.184-0.798
Training characteristics						
Exposure in residency	1.725	0.909-3.274	2.251	1.027-4.935	‡	
Opportunity for exposure in residency	0.542	0.282-1.042	0.304	0.137-0.676	‡	
Specialty training (Family practice vs internal medicine)	0.972	0.405-2.332	0.733	0.269-1.999	2.947	0.969-8.961
Medical school location (New England vs outside of New England)	1.244	0.552-2.805	0.979	0.372-2.578	0.207	0.066-0.653
Other						
Involved in practice community	1.080	0.567-2.057	1.173	0.556-2.474	0.608	0.235-1.574
Involved in community where live	0.703	0.357-1.383	0.652	0.296-1.434	0.641	0.244-1.687

*OR = odds ratio, CI = confidence interval, NS = not significant at $P \leq .05$.
†Scored 1 for <30 years, 2 for 30–39 years, 3 for 40-49 years, 4 for 50-59 years, and 5 for ≥60 years old.
‡Variable not tested due to lack of significance at the bivariate level.
§Scored 1 for <5 years, 2 for 5-9 years, 3 for 10-4 years, 4 for 15-19, and 5 for ≥20 years.
‖Scored 1-5, with 1 indicating *strongly agree* and 5 indicating *strongly disagree*.
¶Population measured as ≤4,999; 5,000-9,999; and ≥10,000.
NS = not significant.

rural practice within a small state with a mix of rural and small town communities. It reveals agreements as well as disagreements with the body of literature from more sparsely populated rural areas and adds some new areas for exploration.

The definition of rurality used by the state's Office of Rural Heath is based on meeting at least 1 of 2 federally accepted rural definitions, (ie, census designation or the RUCA classification system), or having a population less than 10,000 people and a population density below 500 people per square mile. While this is a more relaxed definition than definitions used by states with frontier areas, it is a definition not uncommonly used in New England and reflects the somewhat idiosyncratic population distribution and topography of our region.

Rural experiences during medical school and residency, having rural mentors and being exposed to "frontier" experiences (ie, areas remote from tertiary care) were important to respondents' satisfaction with practice in rural and small town communities. This finding reaffirms conclusions of previous research[12,14] and supports recommendations that educational programs must provide opportunities for students and residents to be trained in rural communities and to be paired with rural mentors.

Only one quarter of respondents to our survey reported growing up in a town with a population below 20,000. This may indicate that urban/suburban-raised medical students can be a major source of recruits—at least in a small state—to rural practice. Given the ever-diminishing pool of rural-raised[22] medical students, this finding bolsters the previous observation regarding the importance of rural education and training opportunities. Also, the majority of physicians in our study had trained outside

of the region. This is in contrast to previous findings that physicians generally remain close to their training sites.[29] Whether or not our finding is unique to a small state known for its significant medical infrastructure is unclear. It could reflect the unique situation of a state being attractive to a wide variety of medical professionals, and thus a destination site.

The population of rural physicians is aging. Among our respondents, only one quarter were less than 40 years old and nearly one half were over 50. This is congruent with the profile of rural physicians in New England overall.[5] As three fifths of our respondents expressed significant concern about the expected adequacy of physicians for their communities in the next decade, they are well aware of this trend. The difficulty of finding new physicians for their practices, coupled with respondents' assessment that there are insufficient providers currently, emphasizes that even in a less overall rural state such as Massachusetts, rural and small town communities have a difficult time with medical workforce recruitment. Rural dwellers' needs for primary care will likely increase as states—Massachusetts being the foremost—develop initiatives to expand health insurance coverage.[30] Identifying incentives such as higher reimbursement or other mechanisms for increasing income—an issue physicians in our study identified as a source of their dissatisfaction—may help attract and keep primary care physicians in rural/small town communities.[31]

It is reassuring that the majority of respondents reported that they were likely to remain in their present practice in the next 10 years, indicating a relatively stable workforce for Massachusetts' rural communities for at least the next decade. Additionally, as most anticipated remaining in rural practice somewhere in the next 10 years, these physicians appear to be a cohort committed to rural/small town practice, even if not necessarily in Massachusetts. Efforts to retain these rural practitioners may need to be a top priority for state health systems planning. Losses of experienced practitioners, even when new graduates can be recruited, can be costly for locations with fewer resources and greater competition for market share.[32,33]

Given respondents' reported dissatisfaction with their current and anticipated future income, their high level of overall practice satisfaction appears to derive from characteristics such as not feeling professionally isolated and being satisfied with their call group size. As professional isolation diminishes with the advent of a wide array of telecommunication modalities, physicians appear able to find and take advantage of avenues for professional interaction and growth. This may reflect the lesser distances in a small state as well as overall improvement in rural Internet access. Moreover, adequate call group size corresponds directly to less frequent call, which contributes to physicians feeling less overworked, greater collegiality, and reduced isolation.

Based on prior research,[10,34,35] we expected that spousal happiness with the community would have been a significant influence on practice satisfaction and plans to remain in practice. This was not a significant factor in our study. This may be due to the high degree of reported spousal happiness and may reflect the difference between practice in larger, more predominantly rural states and practice in this small state where distances less often pose a major challenge.

The association between the specialty of family medicine and staying in rural practice has been well documented[14,15,36] and is corroborated in our study at the bivariate level, both for staying in current practice and for staying in rural practice somewhere. A high proportion of pediatricians in our study also indicated that they intended to remain in rural practice. In the multivariate analyses, increasing years in practice was significantly associated only with intent to stay in rural practice somewhere. This suggests that as physicians remain in rural practice, their commitment to such practice locations strengthens, though not necessarily to their current practice location specifically.

Women are over-represented in the primary care specialties, and in previous studies they have been shown to practice primary care in rural areas less frequently than men.[13,36-40] The increasing importance of women in the physician workforce has raised concern for physician recruitment and retention in rural areas. Our finding that women were more likely than men to stay in rural practice somewhere may be unique to our small New England state whose rural and small town communities are not far distant from any urban center.

Another unexpected finding was that remaining in current practice was associated with smaller town population size. While smaller town size may magnify some of the difficulties of rural practice such as being more overworked and having less chance for vacation time, physicians in smaller towns may also feel more needed, more satisfied with their practices and more committed to the community. Alternatively, these physicians may simply have less time to conduct job searches and find it too difficult to recruit someone to take their place.

Our data support earlier findings that to an extent greater than physicians in other primary care specialties, family medicine physicians felt their medical education had prepared them for rural practice. This reinforces the importance of family medicine for the rural workforce and encourages

continued support for and improvement in the quality of such medical preparation. As rural tracks in medical education struggle to remain vibrant, we need to strengthen the quality of rural medical education for all primary care specialties.

Limitations. There are several limitations to our study. First, the self-reported nature of the data introduces the possibility of reporting and classification biases. Among other things, it is important to note that while study physicians were in communities classified by the state as rural, the population ranges of current and childhood communities that were used in the analysis were based on self-report. Second, while our response rate was high, on several parameters where we could obtain information about non-respondents, they did not distribute themselves in proportions similar to respondents. This raises the possibility of response bias, and thus limits our ability to generalize to all primary care physicians practicing in Massachusetts' rural and small town communities. In addition, while the survey instrument was pilot tested, it did not undergo more formal validation procedures. Lastly, the findings may be unique to a state such as Massachusetts (a small state with depth in the medical sector), and thus not be generalizable to other small states.

Conclusions

Our findings suggest that in a small New England state with rural pockets and many small towns, the primary care physician workforce has a unique profile and set of concerns. They also indicate that a major source of physicians for rural and small town communities in Massachusetts are physicians who have been raised in urban/suburban communities and who were trained outside of the region. Primary care physicians in Massachusetts' rural and small town communities value rural experiences in medical school and residency, as well as rural mentors. Consequently, while medical school admissions committees continue to identify student candidates from rural and small town communities, we must not discount the influence of rural educational opportunities. With an aging rural physician workforce, we must continue to identify and prepare physicians for rural and small town community practice.

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