

2016

Why Medical Students Choose Rural Clinical Campuses For Training: A Report From Two Campuses At Opposite Ends Of The Commonwealth

William Crump, Anthony D. Weaver, R. Steve Fricker, and Allison M. Crump

Follow this and additional works at: <https://mds.marshall.edu/mjm>



Part of the [Medical Education Commons](#)

Recommended Citation

Crump, William; Weaver, Anthony D.; Fricker, R. Steve; and Crump, Allison M. (2016) "Why Medical Students Choose Rural Clinical Campuses For Training: A Report From Two Campuses At Opposite Ends Of The Commonwealth," *Marshall Journal of Medicine*: Vol. 2: Iss. 4, Article 15.

DOI: <http://dx.doi.org/10.18590/mjm.2016.vol2.iss4.15>

Available at: <https://mds.marshall.edu/mjm/vol2/iss4/15>

DOI: <http://dx.doi.org/10.18590/mjm.2016.vol2.iss4.15>

Author Footnote: The authors thank Craig H. Ziegler, Ph.D., Biostatistician, University of Louisville School of Medicine Office of Graduate/Undergraduate Medical Education, for his assistance in analyzing the data for this study.

Open Access | 

References with DOI

1. Erikson C, Hampton S, Whatley M. Results of the 2014 Medical School Enrollment Survey [Internet]. 2015 [cited 2016 Aug 8]. Available from: <https://members.aamc.org/eweb/upload/Results%20of%20the%202014%20Medical%20School%20Enrollment%20Survey.pdf>.
2. Deutchman M. Medical School Tracks in the U.S. Health Resources and Services Administration Policy Brief [Internet]. 2013 [cited 2015 Apr 20]. Available from: <http://www.ruralhealthweb.org/index.cfm?objectid=28B352C5-3048-651A-FE2D53C27202BAF6>.
3. Chen F, Fordyce M, Andes S, Hart LG. Which medical schools produce rural physicians? A 15-year update. *Acad Med*. 2010 85(4):504-598. <http://dx.doi.org/10.1097/acm.0b013e3181d280e9>
4. Crandall LA, Dwyer JW, Duncan RP. Recruitment and retention of rural physicians: Issues for the 1990s. *J Rural Health*. 1990 6(1):19-38. <http://dx.doi.org/10.1111/j.1748-0361.1990.tb00188.x>
5. Strasser RP, Lanphear JH, McCready WG, Topps MH, et al. Canada's new medical school: The northern Ontario School of Medicine: Social Accountability through distributed community engaged learning. *Acad Med*. 2009 84(10):1459-1464. <http://dx.doi.org/10.1097/acm.0b013e3181b6c5d7>
6. Orzanco MG, Lovato C, Bates J, Slade S, et al. Nature and nurture in the family physician's choice of practice location. *Rural Remote Health*. 2011 11:1849-1862.
7. Rabinowitz HK, Diamond JJ, Markham FW, Wortman JR. Medical school programs to increase the rural physician supply: A systematic review and projected impact of widespread replication. *Acad Med*. 2008 83(3):235-243. <http://dx.doi.org/10.1097/acm.0b013e318163789b>
8. Farmer J, Kenny A, McKinstry C, Huysmans RD. 2015. A scoping review of the association between rural medical education and rural practice location. *Hum Resour Health*. 2015 13(1):27-42. <http://dx.doi.org/10.1186/s12960-015-0017-3>
9. Crump WJ, Fricker S, Barnett D. A Sense of Place: Rural training at a regional medical school campus. *J Rural Health* 2004; 20(1):80-84. <http://dx.doi.org/10.1111/j.1748-0361.2004.tb00011.x>
10. Crump WJ, Fricker RS. A Medical School Prematriculation Program for Rural Students: Staying Connected With Place, Cultivating a Special Connection With People. *Teach Learn Med*. 2015 27(4):422-30. <http://dx.doi.org/10.1080/10401334.2015.1077709>
11. Sesney JW, Kreher NE, Potts MJ. Graduates' Reflections on Their Rural Medical Education: The Upper Peninsula Campus Experience. *J Rural Health*. 1994 10(4):279-285. <http://dx.doi.org/10.1111/j.1748-0361.1994.tb00242.x>
12. Jones GI, DeWitt DE, Cross M. Medical students' perceptions of barriers to training at a rural clinical school. *Rural Remote Health* [Internet] 2007 [cited 29 Feb 2016];7: 685. Available from: <http://www.rrh.org.au/articles/subviewnew.asp?ArticleID=685>.
13. Krahe LM, McColl AR, Pallant JF, Cunningham CE, DeWitt DE. A multi-university study of which factors medical students consider when deciding to attend a rural clinical school in Australia. *Rural Remote Health* [Internet]. 2010 [cited 29 Feb 2016]; 10: 1477. Available from: <http://www.rrh.org.au/articles/subviewnew.asp?ArticleID=1477>
14. Mihalynuka T, Snadden D, Bates J, Scott I, Frinton V, Wilson G. Size matters: what influences medical students' choice of study site? *Med Teach* [Internet]. 2008 [cited 29 Feb 2016]; 30(4): e108-e114. Available from: <http://www.tandfonline.com/doi/full/10.1080/01421590801931170>.

-
15. Brazeau NK, Potts MJ, Hickner JM. The Upper Peninsula Program: a successful model for increasing primary care physicians in rural areas. *Fam Med*. 1990 22(5):350–355.
 16. Crump WJ, Fricker RS, Ziegler C, Wiegman DL. 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. <http://dx.doi.org/10.1097/acm.0b013e31829a3df0>
 17. Looney SW, Blondell RD, Gagel JR, Pentecost MW. Which medical school applicants will become generalists or rural-based physicians? *Journal of the Kentucky Medical Association*. 1998 96(5):189-193.
 18. Crump WJ, Miller KH, Fricker RS, Pradip P, Ostapchuck M. An innovative Technique for Faculty Development at a Rural Kentucky Clinical Campus. *J Ky Med Assoc*. 2012 110(7):274-282.
 19. Crump WJ, Fricker RS, Ziegler CH, Wiegman DL. Seeking the Best Dose of Rural Experience: Comparison of Three Rural Pathways Programs at One Medical School. *J Ky Med Assoc*. 2015 113(1):5-15.
 20. Arnett P, Weaver A, Elam C. Enhancing the physician pipeline to rural Kentucky: findings from a University of Kentucky rural recruitment summit. *J Ky Med Assoc*. 2013 111(June):159-164.
 21. Crump WJ, Fricker RS, Crump AM. Just what are rural premedical students thinking? A report of the first 6 years of a pathways program. *J Rural Health*. 2010 26(1):97-99. <http://dx.doi.org/10.1111/j.1748-0361.2009.00257.x>
 22. Crump WJ, Fricker RS, Flick KF, Gerwe-Wickham K, Greenwell K, Willen KL. A Rural Pathways Program for High School Students: Reinforcing a Sense of Place. *Fam Med*. October 2014, 46(9):713-717.
 23. Crump WJ, Fricker RS, Ziegler CH, Wiegman DL. Increasing the Rural Physician Workforce: A Potential Role for Small Rural Medical School Campuses [Internet]. 2015 *J Rural Health*. [cited 29 February 2016]; Oct 30. doi: 10.1111/jrh.12156. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/jrh.12156/abstract;jsessionid=A6B0DD29398FB4824CCE8078FE36D729.f02t01>.

Why medical students choose rural clinical campuses for training: a report from two campuses at opposite ends of the Commonwealth

William Crump, MD¹, Anthony D. Weaver, MD², R. Steve Fricker, MPA¹, Allison M. Crump, MD¹

Author Affiliations:

1. University of Louisville School of Medicine at Baptist Health Madisonville
2. University of Kentucky

The authors have no financial disclosures to declare and no conflicts of interest to report.

Corresponding Author:

William Crump, MD
University of Louisville School of Medicine
Trover campus at Baptist Health Madisonville
Email: bill.crump@bhsi.com

The authors thank Craig H. Ziegler, PhD., Biostatistician, University of Louisville School of Medicine Office of Graduate/Undergraduate Medical Education, for his assistance in analyzing the data for this study.

Abstract

Introduction

Although US medical schools have increased their enrollment by about 30%, most of the increase has occurred in urban areas. The affinity model proposes that rural training of a rural student will more likely result in a rural physician, but the exact role of these rural campuses is unclear. Do they solidify and reinforce a pre-existing career plan, do they create social and marital ties that make the transition to rural medicine easier, or could they be replaced with a briefer and more efficient rural rotation? We administered a questionnaire to students attending two different two year rural clinical campuses in the same state in order to explore their opinions regarding the advantages of a rural campus.

Methods

Two different rural M3-M4 year clinical campuses, affiliated with different medical schools in the same state, administered surveys to 70 medical students across all four years of medical school. Both schools selectively recruit rural students to the rural campuses, and require a campus decision at admission. Both schools require students to attend their first two years at an urban campus, and transfer to the rural campus for clinical education. Questions addressed student opinions on rural campus location, recommendations from others regarding attendance, campus atmosphere and social life, teaching methods and involvement in patient care. Comparisons were analyzed using the non-parametric Mann Whitney U test.

Results

The top five reasons students chose a rural campus included three aspects of rural training and two features of being rural. There were small differences between the two campuses regarding the importance of more procedures during training and more outdoor activities, the opportunity to study with friends, and strength of local leadership, reflecting differences in the practice setting and the environment of the two campuses. Differences were also noted between upper-level and lower-level students regarding the importance of studying with friends, and the chances of meeting a future spouse. Finally, very rural students (30 miles from urban area) were less concerned with availability of scholarships, and lack of fine dining, but viewed the opportunity to study with friends more favorably.

Conclusions

This study adds to the published literature by surveying students at multiple rural campuses by year of training. There were many more similarities than differences, but there were differences between the two campuses, and there were also differences as the students progressed in their training, and differences between very rural students and other students attending the campus. Rural campuses provide both clinical and social support for students contemplating rural practice. Results of the survey indicate both are of importance to the students as well, with quality of training the most important factor.

Keywords

Rural Medical Education, Rural Clinical Campus, Campus Choice

Introduction

In response to a predicted health manpower shortage, U.S. medical schools have increased their enrollment by about 30%.¹ Almost all of these schools are based in urban areas, and only 35 have a rural-focused effort.² Such an increase in graduates is unlikely to have a significant effect on the rural population that comprise 20% of Americans.³ The affinity model proposes that rural training of a student who is from a rural area will result in more graduates choosing to return to a small town to practice.⁴ Recent studies have provided support for this model.⁵⁻⁶ The programs placing the highest percentage of graduates into rural practice include preferential admission of rural students, financial assistance, and a rural immersion experience.⁷ A recently published comprehensive review found 37 published articles in English from several countries that addressed rural-based medical education.⁸ The author concludes that even allowing for methodological flaws in most of the publications, there was a clear trend toward a higher rate of rural practice among students who had a significant portion of their training in a rural area, and this trend was stronger with longer duration rural experiences.⁸

If rural students do not receive an adequate “dose” of rural experience during medical school, rural students who begin with an initial affinity for rural practice may experience “urban disruption,” becoming attracted to the urban environment during medical school, which is most commonly in urban areas.⁹⁻¹⁰ More recently, some medical schools have chosen a strategy to optimize the positive effects of the affinity model by placing clinical campus resources where students spend most of the last two years of medical school in smaller towns.

Almost all rural-focused programs allow students to self-select and therefore the effect of each step in the training pipeline can reinforce the affinity model, but this makes isolating the nurturing effect of the program itself difficult. It is also not clear which duration and structure of rural experience best reinforces those students with a rural affinity and will result in more students choosing rural practice. A longer rural experience could be more effective, but is also more expensive and potentially disruptive for students who live in urban areas near their medical schools. Established programs have rural clinical experiences varying from 6 weeks to 9 months. Rural regional campuses are designed to allow a longer immersion experience, in which the entire clinical experience is rural and the students reside in the host rural community.¹¹⁻¹⁶

If rural clinical campuses are merely attracting rural students who are already decided on a rural career, then they may not be worth the increased cost when compared with a much briefer rural experience. Alternatively, if these campuses are primarily attracting undecided rural students because of the strength of the clinical training rather than so they can spend another two years in a comfortable place, the result may be minimizing the urban disruption and directing more graduates into rural practice. With limited resources, it is an important policy question whether the nurturing effect of these rural campuses truly adds value over a rural-focused effort with shorter duration of rural experiences.

A previous report from one of the schools included in this study done before the rural campus was established found some support for the nature aspect of rural upbringing as a predictor of rural practice, but emphasized a negative effect of urban training on nurture, noting that “the cultures of medical schools tend to socialize students toward specialty careers and urban practice location.”¹⁷

In the current study we report the importance of various reasons why individual students chose a two year rural campus experience rather than remaining at the urban campus where they completed their first two years of basic science training that included the standard 4-6 week rural rotation. Our hypothesis is that although spending more time in a rural area is important, the most important reasons are the quality of the rural training. We also had heard from individual students that some negative aspects of small town living, including distance from friends developed during the basic science years and opportunities to meet a future spouse, kept some students from choosing the rural campus. We also questioned whether the negative financial considerations of moving a household after just two years would be counterbalanced enough by a designated scholarship for those who chose to make this move instead of staying in the urban area where routines and spouse jobs were already established.

Previous Publications

There have been five previous publications that addressed aspects of rural training that are important to medical students who make this choice. The oldest is from the first small rural campus in the U.S. established by Michigan State University in 1974 in the Upper Peninsula of Michigan based in Marquette (pop 21,000). They surveyed 56 graduates of the early years (1978-1989) and found that early patient care (33%), rural location (23%), and close contact with teachers (10%) were most important.¹¹

Next was a publication from one of the campuses participating in the current study that was established in 1998. They reported reasons for campus choice from 54 rural students who initially indicated interest in the rural campus (pop 20,000) during their preclinical years.⁹ The group that maintained their interest and matriculated at the rural campus placed a much higher priority on one-to-one clinical training than they did on experiencing small town life. Those students choosing the urban clinical campus placed a higher priority on big city amenities and presence of a university.

A report came from the University of Melbourne Rural Clinical School (RCS) that was established in the small town of Shepparton (pop 42,000) in 2000¹² that surveyed all medical students at the University of Melbourne whether or not they attended the RCS. Students chose their clinical site based on quality of teaching, location and transportation issues, and patient access. The most common reasons for not choosing the RCS were social issues, such as family and partner commitments, financial issues, and housing commitments. Changes that would make the RCS more attractive were financial incentives, better teaching, and promotion of the RCS program. Female rural students were more likely to study at the RCS.

In 2006, a survey of students at six of the RCS in Australia showed that more direct interaction with patients than is possible at the urban campus was the most important consideration (85%).¹³ A distant second in importance was the academic reputation of the RCS, which from further analysis translated as better clinical learning opportunities than available with urban placements (68%). Subsidized housing at RCS was third (67%), followed by connections with friends (41%).

From a survey done in 2005, the University of British Columbia in Canada compared campus advantages and drawbacks to students who remained at the urban campus in Vancouver, chose

Victoria (pop 340,000), four hours away, or chose Prince George (pop 75,000) 10 hours away.¹⁴ All students felt the urban campus was associated with greater diversity, greater variety of patients, and greater access to specialists. The smaller campuses were felt to have better lifestyle, more hands-on experiences, and better small group dynamics. Family and partner issues were significantly more important than all other factors determining campus choice.

Descriptions of the Two Campuses

The two campuses reported here are at opposite ends of Kentucky, each with a different urban parent state university campus. Both assign students at the time of admission to move from the urban campus after two years of basic science education to complete most of their third and fourth year clinical rotations at the small rural campus. And both allow applicants to commit to urban or rural campus designation prior to the admission decision.

The western campus was established in 1998 and is in a town of 20,000 that is 150 miles southwest of the parent urban campus. The town is also host to a community college with 4600 enrollees, all commuters with no on campus housing. Students are based within a rural integrated health system with a 400 bed hospital staffed by 80 physicians representing primary and secondary care specialties. The system also includes 10 satellite clinics within a 30 minute drive that are in towns of 4,000 to 8,000 that host portions of clinical rotations.

At the western campus, students participate in the same classroom lectures as the urban campus-based students by simultaneous live video connection. All curriculum elements, teaching materials, and evaluation systems are identical at the two campuses. From published overviews of this campus, potential students know that the rural campus students see 2-8 times as many patients as those based at the urban campus and participate in 2-10 times as many procedures. These overviews also note that standardized test scores and residency match rates are comparable at the two campuses. Students selected for this campus receive a scholarship during the M-3 and M-4 years equivalent to about 30% of tuition costs. This is intended to lessen the negative financial effect of moving a household after two years at the urban campus.

The applicants knew that clinical rotations on the western rural campus provide the opportunity for one-on-one learning with an experienced clinician preceptor. On some of the clinical rotations, a Family Medicine resident is on the teaching service as well. All M-3 students regardless of rotation meet for small group problem-based learning sessions twice a month, facilitated by the western campus associate dean, and participate in longitudinal care for their panel of patients in a community clinic. A longitudinal teaching skills program is in place to assist the community-based faculty in guiding the students through their required clerkships.¹⁸

The western campus has graduated 108 students, and the last cumulative published report showed that 62% of graduates choose rural practice compared with 8% who completed clinical training at the parent urban campus.¹⁹ In the same report, 48% of the western rural campus graduates chose a family medicine residency, compared to 7 % who trained at the urban parent campus.

The eastern campus is 65 miles east of the parent campus and was established in 2008, in a town of 7000 that hosts a state university with a current enrollment of 10,700 with 50% living in on-

campus housing. Medical students are based at a 159 bed hospital and its five satellite family physician clinics, with three other area hospital systems providing training in pediatrics and neurology. Didactic material from main campus is provided by both synchronous and delayed video lectures. The curriculum is comparable to main campus, and evaluation systems are identical at the two campuses. Applicants are aware of the focus on one-on-one educational experiences as well as the procedures available at the rural campus. All M3 students meet for didactic family medicine lectures monthly, and a longitudinal family medicine clinic is interwoven into the M3 curriculum. Additionally, students are enrolled in business classes at the local university, providing them the opportunity to learn more about the business of medicine. There is a clear focus on becoming a rural community leader, reflected in the name itself of the program (the Rural Physician Leadership Program).

The eastern campus has graduated 22 students, but only two have finished their residency training. Both are practicing in rural Kentucky. These numbers are too small to draw any definitive conclusions regarding the impact of the Eastern campus on subsequent rural practice.

In 2012, the eastern campus convened a meeting of rural feeder programs for the university to discuss barriers rural students face in attending medical school.²⁰ Representatives of the Robinson Scholars (a first-generation college student scholarship program), Area Health Education Centers, the Professional Education Preparation Program (PEPP), and the Appalachian and Minority Science, Technology, Engineering, and Math Majors (AMSTEMM) concluded that lack of academic preparation, lack of mentoring and peer groups, and student debt were major obstacles for rural students trying to obtain a medical education. Based on the findings of this group, a Medical School Admissions Boot Camp was created. Information was distributed to premedical advisors at regional colleges and universities across the state, and expenses were paid for a group of 20 students to visit campus for four days. The camp develops an inter-university peer group while educating the students on the admissions process and advising them on their premedical careers.

Both the eastern and western campuses have college rural pathways programs,²¹ and the western campus has a high school program as well.²² Both have dedicated admissions, so applicants are interviewed at both rural and urban campuses of each school and are admitted with a commitment to move to the rural campus after the two years of basic science education are completed at the parent urban campus. The associate deans of both eastern and western campuses work very closely with their respective parent central university admissions committee to advocate for rural students from their region, but the same admissions criteria are used for urban and rural campuses at both schools.

Method

The anonymous Campus Choice Survey was designed by using the factors found to be important in the previous publications cited, modified by the authors' personal experiences with verbal responses from former students. It was then field tested with one group of medical students and minor modifications were made. The final version was then administered to all medical students enrolled in the rural East and West programs who agreed to participate over the summer of 2015. The study was IRB approved as exempt. The completed survey instruments were coded and entered into Microsoft Excel 2010 (Microsoft, Redmond, WA). In addition to the responses

provided by respondents, hometown and location of hometown were recoded into very rural (population <10,000 and not within 30 minutes of a city >50,000 population) and all other responses were coded as not very rural. Class status was recoded into training level for first and second year medical students (M1/M2) and third and fourth year medical students (M3/M4). Once data entry and additional coding were complete, the results were imported into SPSS v.22 (IBM Corporation, Armonk, NY for analysis).

Demographic characteristics comparing the two campuses were run using SPSS crosstabulation and tested for significance using Fisher Exact Test (2-tailed) or Chi-square, as appropriate. When the responses to the 5-point scaled questions were examined, they were found not to be normally distributed. As a result, the non-parametric Mann-Whitney U test was used to test comparisons of these questions for significance. SPSS crosstabulations comparing gender, training level and rurality were then run to test for significant results.

Results

Response rate was 100% from the western campus and 88% from the eastern. The demographics of the two campuses are shown in Table 1. There is a non-significant trend towards more women at the western campus. There is also a non-significant trend towards more students from slightly larger towns at the eastern campus. Combining both campuses, Table 2 shows that three of the top five reasons have to do with training and two are aspects of being rural. Being close to home was lower in the rankings. Table 3 shows a comparison of the campuses, with students at the eastern campus ranking opportunities for outdoor activities (Mdn=4.0 vs. Mdn=3.0, Mann Whitney U=351.5, 30=40=70, p=0.002) significantly higher. There was a non-significant trend towards those at the eastern campus ranking strong local leadership higher (Mdn=5.0 vs Mdn=4.0, Mann Whitney U=405.0, 30=40=70, p=0.071 two-tailed), location near a small town higher (Mdn=5.0 vs. Mdn=4.0, Mann Whitney U=469.5, 30=40=70, p=0.081 two tailed), and location like future practice higher (Mdn=5.0 vs. Mdn=4.0, Mann Whitney U=459.5, 30=40=70, p=0.071). Those at the western campus ranked increasing chances to be admitted to medical school significantly higher (Mdn=4.0 vs. 3.0, Mann Whitney U=278.5, 40=30=70, p<0.000) and the opportunity to study with friends was actually a significant positive for the western campus students (Mdn=4.0 vs. Mdn=3.0, Mann Whitney U=437.5, 40=30=70, p=.042). Opportunities to meet a future spouse was not significant but it was noted that 14/30 (47%) of the eastern and 7/40 (18%) of the western students were married at the time of the survey, and married students were instructed not to answer this question.

Table 1: Demographic Characteristics by Campus

Gender	Campus					
	Western		Eastern		Total	
	n	%	n	%	n	%
Male	17	42.5%	18	62.1%	35	50.7%
Female	23	57.5%	11	37.9%	34	49.3%
Total	40	100.0%	29	100.0%	69	100.0%
Not significant by Fisher's Exact Test 2-tailed (p=0.145)						
Size of Hometown						
<10,000	22	55.0%	17	56.7%	39	55.7%
10,000-20,000	10	25.0%	4	13.3%	14	20.0%
20,000, 30,000	3	7.5%	2	6.7%	5	7.1%
>30,000	5	12.5%	7	23.3%	12	17.1%
Total	40	100.0%	30	100.0%	70	100.0%
Not significant by ChiSquare (p=0.500)						

Table 2: Ranked Reasons for Students' Choice of Rural Campus

Please indicate how much each of the following influenced your decision to attend the [your] Campus [†] :	n	%
Friendly atmosphere	69/70	98.6%
Opportunity for more clinical exposure	69/70	98.6%
One-on-one teaching	69/70	98.6%
Location in a small town	66/70	94.3%
Opportunity to do more procedures	66/70	94.3%
Things I heard from current [East or West] students	59/70	84.3%
Location in a place like my future practice choice	58/70	82.9%
Strong local leadership	56/70	80.0%
Location near my hometown	41/70	58.6%
Opportunities for outdoor activities	40/70	57.1%
[¶] Opportunity to study with friends	33/70	47.1%
Things I heard from physicians	32/70	45.7%
Things I heard from premed advisors	23/70	32.9%
Expected Neutral		
Increase my chances to be admitted to medical school	33/70	47.1%
Expected Negatives [§]		
Richness of local "night life"	31/70	44.3%
Quality of local restaurants	29/70	41.4%
Need to travel to [main campus occasionally]	13/70	18.6%
[¶] Opportunity to study with friends	11/70	15.7%

[†]Total Numbers shown are a combination of Answer 4 or 5, Somewhat Positive or Strongly Positive.

[¶]Shown in both because it depends on which campus most friends are located.

[§]Total Numbers shown are a combination of answers 1 or 2, Somewhat Negative or Strongly Negative

Table 3: Differences by Campus Location

Please indicate how much each of the following influenced your decision to attend [your] campus:						
Campus	Strong Negative	Somewhat Negative	None	Somewhat Positive	Strong Positive	Total
8) Friendly atmosphere						
West	0 (0.0%)	0 (0.0%)	0 (0.0%)	8 (20.0%)	32 (80.0%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	1 (3.3%)	3 (10.0%)	26 (86.7%)	30 (100%)
10) Opportunity for more clinical exposure						
West	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (15.0%)	34 (85.0%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	1 (3.3%)	2 (6.7%)	27 (90.0%)	30 (100%)
11) One-on-one teaching						
West	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (10.0%)	36 (90.0%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	1 (3.3%)	2 (6.7%)	27 (90.0%)	30 (100%)
2) Location in a small town						
West	0 (0.0%)	1 (2.5%)	2 (5.0%)	20 (50.0%)	17 (42.5%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	1 (3.3%)	10 (33.3%)	19 (63.3%)	30 (100%)
12) Opportunity to do more procedures						
West	0 (0.0%)	0 (0.0%)	3 (7.5%)	3 (7.5%)	34 (85.0%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	1 (3.3%)	4 (13.3%)	25 (83.3%)	30 (100%)
5) Things I heard from current [East or West Campus] students						
West	1 (2.5%)	0 (0.0%)	5 (12.5%)	15 (37.5%)	19 (47.5%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	5 (16.7%)	12 (40.0%)	13 (43.3%)	30 (100%)
3) Scholarship in M-3/M-4 year						
West	0 (0.0%)	1 (2.5%)	5 (12.5%)	16 (40.0%)	18 (45.0%)	40 (100%)
East	N/A	N/A	N/A	N/A	N/A	N/A
4) Location in a place like my future practice choice						
West	0 (0.0%)	3 (7.5%)	6 (15.0%)	16 (40.0%)	15 (37.5%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	3 (10.0%)	10 (33.3%)	17 (56.7%)	30 (100%)
9) Strong local leadership						
West	0 (0.0%)	0 (0.0%)	10 (25.0%)	20 (50.0%)	10 (25.0%)	40 (100%)
East	0 (0.0%)	0 (0.0%)	4 (13.3%)	9 (30.0%)	17 (56.7%)	30 (100%)
1) Location near my hometown						
West	1 (2.5%)	1 (2.5%)	13 (32.5%)	11 (27.5%)	14 (35.0%)	40 (100%)
East	4 (13.3%)	1 (3.3%)	9 (30.0%)	3 (10.0%)	13 (43.3%)	30 (100%)
17) Opportunities for outdoor activities						
West	2 (5.0%)	1 (2.5%)	21 (52.5%)	11 (27.5%)	5 (12.5%)	40 (100%)
East	1 (3.3%)	0 (0.0%)	5 (16.7%)	15 (50.0%)	9 (30.0%)	30 (100%)
19) †Opportunity to study with friends						
West	1 (2.5%)	3 (7.5%)	12 (30.0%)	20 (50.0%)	4 (10.0%)	40 (100%)
East	1 (3.3%)	6 (20.0%)	14 (46.7%)	5 (16.7%)	4 (13.3%)	30 (100%)
7) Things I heard from physicians						
West	1 (2.5%)	2 (5.0%)	20 (50.0%)	13 (32.5%)	4 (10.0%)	40 (100%)

East	1 (3.3%)	0 (0.0%)	14 (46.7%)	9 (30.0%)	6 (20.0%)	30 (100%)
6) Things I heard from premed advisors						
West	1 (2.5%)	1 (2.5%)	26 (65.0%)	7 (17.5%)	5 (12.5%)	40 (100%)
East	2 (6.7%)	0 (0.0%)	17 (56.7%)	8 (26.7%)	3 (10.0%)	30 (100%)
18) Opportunities to meet future spouse						
West	4 (12.5%)	5 (15.6%)	21 (65.6%)	1 (3.1%)	1 (3.1%)	32 (100%)
East	4 (28.6%)	1 (7.1%)	8 (57.1%)	1 (7.1%)	0 (0.0%)	14 (100%)
Expected Neutral						
13) Increase my chances to be admitted to medical school						
West	0 (0.0%)	0 (0.0%)	15 (37.5%)	14 (35.0%)	11 (27.5%)	40 (100%)
East	7 (23.3%)	3 (10.0%)	12 (40.0%)	7 (23.3%)	1 (3.3%)	30 (100%)
Expected Negatives						
16) Richness of local "night life"						
West	5 (12.5%)	11 (27.5%)	23 (57.5%)	1 (2.5%)	0 (0.0%)	40 (100%)
East	9 (30.0%)	6 (20.0%)	15 (50.0%)	0 (0.0%)	0 (0.0%)	30 (100%)
15) Quality of local restaurants						
West	3 (7.5%)	12 (30.0%)	23 (57.5%)	2 (5.0%)	0 (0.0%)	40 (100%)
East	6 (20.0%)	8 (26.7%)	15 (50.0%)	1 (3.3%)	0 (0.0%)	30 (100%)
14) Need to travel to [main campus] occasionally						
West	1 (2.5%)	3 (7.5%)	31 (77.5%)	4 (10.0%)	1 (2.5%)	40 (100%)
East	2 (6.7%)	7 (23.3%)	17 (56.7%)	4 (13.3%)	0 (0.0%)	30 (100%)
19) †Opportunity to study with friends						
West	1 (2.5%)	3 (7.5%)	12 (30.0%)	20 (50.0%)	4 (10.0%)	40 (100%)
East	1 (3.3%)	6 (20.0%)	14 (46.7%)	5 (16.7%)	4 (13.3%)	30 (100%)

†Shown in both because it depends on which campus most friends are located.

Table 4 shows only those items that were significant or showed a strong trend when the responses from both campuses were sorted by rural upbringing (very rural defined as hometown <10,000 and not within 30 minutes of an urban area), gender, and training level (M-1/M-2 (preclinical, still living in urban area) vs M-3/M-4 (clinical, living in rural area). Right at the margin of significance was that men ranked outdoor activities as more important (Mdn=5.0 vs. Mdn=5.0, Mann Whitney U=441.5, 35=34=69, p=0.051). A non-significant trend, with more women ranking opportunities for more clinical exposure, was seen (Mdn=5.0 vs. Mdn=5.0, Mann Whitney U=510.0, 34=35=69, p=0.081). There was a significant divergence by training level with clinical level students (Mdn=5.0) ranking less opportunity for studying with friends as a significant negative and more preclinical students (Mdn=4.0) ranking this as a positive (Mann Whitney U=427.5, 29=41=70, p=.036). Also approaching significance was that clinical students ranking chances to be admitted to medical school as a positive (Mdn=4.0 vs. Mdn=3.0, Mann Whitney U=447.0, 29=41=70, p=0.065). While the scholarship is not offered on the eastern campus, comparison of responses of western campus students regarding the scholarship was significantly more important to the clinical level students Mdn=5.0 vs. Mdn=4.0, Mann Whitney U=104.0, 17=23=40, p=0.006). Interestingly, more clinical level students saw limited

opportunities to meet a future spouse as a negative, approaching significance (Mdn=2.0 vs Mdn=3.0, Mann Whitney U=164.0, p=0.062).

Table 4: Differences by Gender, Training Level, and Rurality

	Strong Negative	Somewhat Negative	None	Somewhat Positive	Strong Positive	Total
Gender						
Please indicate how much each of the following influenced your decision to attend [your] campus:						
Opportunity for more clinical exposure						
Male	0 (0.0%)	0 (0.0%)	1 (2.9%)	6 (17.1%)	28 (80.0%)	35 (100%)
Female	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (5.9%)	32 (94.1%)	34 (100%)
Opportunities for outdoor activities						
Male	1 (2.9%)	0 (0.0%)	11 (31.4%)	13 (37.1%)	10 (28.6%)	35 (100%)
Female	2 (5.9%)	1 (2.9%)	15 (44.1%)	12 (35.3%)	4 (11.8%)	34 (100%)
Training Level						
Scholarship in M3/M4 year						
M1/M2	0 (0.0%)	1 (4.3%)	4 (17.4%)	12 (52.2%)	6 (26.1%)	23 (100%)
M3/M4	0 (0.0%)	0 (0.0%)	1 (5.9%)	4 (23.5%)	12 (70.6%)	17 (100%)
Opportunity to study with friends						
M1/M2	1 (2.4%)	4 (9.8%)	12 (29.3%)	18 (43.9%)	6 (14.6%)	41 (100%)
M3/M4	1 (3.4%)	5 (17.2%)	14 (48.3%)	7 (24.1%)	2 (6.9%)	29 (100%)
Increase my chance to be admitted to medical school						
M1/M2	6 (14.6%)	1 (2.4%)	19 (46.3%)	9 (22.0%)	6 (14.6%)	41 (100%)
M3/M4	1 (3.4%)	2 (6.9%)	8 (27.6%)	12 (41.4%)	6 (20.7%)	29 (100%)
[†]Rurality						
Scholarship in M3/M4 year						
Very Rural	0 (0.0%)	1 (8.3%)	3 (25.0%)	5 (41.7%)	3 (25.0%)	17 (100%)
Not Very Rural	0 (0.0%)	0 (0.0%)	2 (7.4%)	11 (40.7%)	14 (51.9%)	27 (100%)
One-on-one teaching						
Very Rural	0 (0.0%)	0 (0.0%)	1 (3.8%)	4 (15.4%)	21 (80.8%)	26 (100%)
Not Very Rural	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (4.7%)	41 (95.3%)	43 (100%)
Quality of local restaurants						
Very Rural	3 (11.5%)	4 (15.4%)	16 (61.5%)	3 (11.5%)	0 (0.0%)	26 (100%)
Not Very Rural	6 (14.0%)	16 (37.2%)	21 (48.8%)	0 (0.0%)	0 (0.0%)	43 (100%)
Opportunity to study with friends						
Very Rural	1 (3.8%)	2 (7.7%)	7 (26.9%)	10 (38.5%)	6 (23.1%)	26 (100%)
Not Very Rural	1 (2.3%)	7 (16.3%)	19 (44.2%)	14 (32.6%)	2 (4.7%)	43 (100%)

[†]Very Rural is defined as reporting a hometown size < 10,000 and does not live within 30 minutes of a city with a population >50,000.

When sorted by very rural upbringing, the scholarship was significantly more important to less rural students (Mdn=5.0 vs. Mdn=4.0, Mann Whitney U=100.5, 27=12=39, p=0.042, and these students also saw the quality of local restaurants as a significant negative (Mdn=2.0 vs. Mdn=3.0, Mann Whitney U=404.0, 43=26=69, p=0.034). Very rural students viewed the opportunity to study with friends as a significant positive (Mdn=4.0 vs. Mdn=3.0, Mann Whitney U=394.0, 26=43=69, p=0.031) but ranked one-on-one teaching slightly less important, at the margin of significance (Mdn=5.0 vs. Mdn=5.0, Mann Whitney U=476.5, 26=43=69, p=0.051).

Discussion

There is evidence that longer clinical rural training is associated with a higher likelihood of rural practice.⁸ The best duration and style of the rural immersion experience is less clear. If the resources invested in a small rural regional campus result in more undecided students ultimately choosing rural practice, this finding provides useful guidance for policy makers. However, if the students choosing to train at these rural clinical campuses have already decided on rural practice and they made this campus choice primarily to be in a setting where they are most comfortable, then it is more difficult to argue for investment of scarce resources in rural campuses. Because of student self-selection, no published study to date can prove that urban disruption occurring during the clinical years spent at an urban campus would decrease the number of rural students returning to rural practice. If rural students could be randomized to various duration and styles of rural clinical training, a more clear answer would be possible. This study is very unlikely to occur.

A recent publication did attempt to control for rural upbringing and family medicine residency choice, two of the strongest predictors of eventual rural practice. After controlling for these two variables, attendance at a two year rural clinical campus was strongly associated with later rural practice (OR=5.46 (2.61-11.42), $p < .001$).²³ In addition, experienced rural educators believe that two more formative years spent in a rural area working with role models who have chosen to practice rurally and providing students community-engaged longitudinal learning experiences with patients who share the students' cultural and social background have *a priori* validity in predicting rural practice.^{5-6,10}

A valuable study that has just begun among several U.S. medical schools with rural campuses measures rural students' opinions and affinity for rural practice as they enter medical school and tracks these variables across the four years of school. As some of these rural students move to the rural campus and some remain in the urban environment of the parent campus, changes in student perceptions and plans can be tracked and analyzed.

In this study of 70 students at two different rural campuses in a very rural state, our results show that three of the top five reasons for campus choice had to do with quality of the training provided, and not just comfort with the surroundings, similar to the findings of previous publications. However, the other two top reasons did relate to the rurality of the campus. So it appears that both categories of reasons are at work. Our sub-analyses also showed that although the campuses were different in significant ways, there were far more similarities among the reasons given by these rural students than differences. The eastern campus students ranked strong local leadership higher. In retrospect, this wording was ambiguous as some students may have interpreted this as campus leadership and others as civic leadership, and the eastern campus had a clear focus on leadership training.

Despite all official materials stating that the admission criteria for main (urban) campus and rural campus were the same for the western campus, these students clearly expressed that they thought choosing the rural campus increased their chances of medical school admission. Students at the eastern campus ranked opportunities for outdoor activities higher, and males ranked this higher as well. The western campus is located near a very well-known large lake system that hosts national bass fishing competitions, and the eastern campus is well known as a prime deer and

turkey hunting region. We have no formal survey that addresses this, but the eastern regional dean had previously noticed that most of his students were gun enthusiasts.

The difference in rankings of the opportunity to study with friends was particularly interesting. This was significantly higher among preclinical students and among those at the western campus. The western campus has a 3 week immersion experience at the western rural campus before the students assigned there begin medical school. The students work in teams to assess individual rural practices, solve a problem based case study, read reflective writings about rural practice, and share stories in a facilitated group while living at the same bed and breakfast. A detailed review of this program showed that the students formed a cohesive group before medical school even began, and many chose to remain in the same groups for study sessions during the preclinical years in the urban environment of the M-1 and M-2 years.¹⁰

Not surprisingly, the quality of local restaurants was a bigger issue for those classified as less rural in upbringing, but this was obviously not important enough for them not to choose the rural campus. The scholarship provided by the western campus was more important to the clinical level students and those with less rural backgrounds. The former may be explained by the fact that clinical students begin to consider the mounting debt and begin considering the constraints of various loan repayments options. The latter may again mean that the less rural students were more motivated by the superior clinical exposure provided by the rural campus and saw the scholarship as a compensation for what they gave up in terms of restaurant quality and the ability to study with friends who remained at the urban campus for the clinical years.

The interpretation of the ranking of the opportunities to meet a future spouse is complicated by the marked difference in the number of students already married between the two campuses. This difference is partially explained by the preference given to spouses enrolled in medical school of students who express a strong interest in the eastern campus. Among those not married at the time of the survey, it did approach significance that more clinical students (53%) considered this as a negative than did preclinical students (19%). This has face validity, as most US medical students approach their mid-twenties during the clinical years and this is the most frequent age of marriage for those in professional training. Alternatively, this could support that preclinical students are more focused on their studies and as they approach their first real job, they begin to think about marriage and find themselves in a smaller town with fewer compatible future spouses.

Limitations

These findings, despite being from two very different clinical campuses almost 10 years apart in the developmental process, only represent one rural state in one country. Generalizations to other rural clinical campuses must be limited to similar situations. Also, the mostly positive responses could have been affected by recall, confirmation, and social acceptability biases. Repeated annual measures are underway to address the first two and the entirely anonymous nature of the data collection may mitigate the third, but only partially. The response rate was high, but the groups are still relatively small and it is possible that some of the items approaching significance would reach the $p < .05$ level with larger sample sizes. In addition, with the number of comparisons made, it is possible that some of the items that appear to be significant are just the 5% that would be expected even if no real association exists. Lastly, these surveys were a single

point in time and comparisons between campuses or of preclinical versus clinical student responses may have as much to do with the unique individuals who responded as the categories analyzed. Repeated annual surveys are planned to address this issue. In addition, focus groups using our findings can form the basis of a richer understanding of the response categories.

Conclusion

Within the limits of our design, it appears that the majority of these students chose the rural campus because of the reputations of broader and deeper training available there. The ability to learn at the elbow of an experienced clinician with fewer other competing learners as well as the “first up” opportunity for procedures were important to these students. Likewise, the distance to friends from the basic science years that remained at the urban campus was perceived as a negative, but only for a minority of students. The rankings imply that some students sought out fellow students with whom they would later move to the rural campus to form their basic science study groups, so in fact this was seen as a positive. The advice of current students was rated highly, and much higher than what established physicians recommended to them. The positives of the rural campus training more than outweighed the negatives of a less rich night life and quality of restaurants that might have been found in the locale of the urban campus, at least for these rural students. A partial scholarship was important for a subset of students, and a subset put a high premium on the availability of outdoor activities. Overall, these findings support that medical students choose rural clinical campuses primarily because of the quality of training provided and not just to be in familiar surroundings.

References

1. Erikson C, Hampton S, Whatley M. Results of the 2014 Medical School Enrollment Survey [Internet]. 2015 [cited 2016 Aug 8]. Available from: <https://members.aamc.org/eweb/upload/Results%20of%20the%202014%20Medical%20School%20Enrollment%20Survey.pdf>.
2. Deutchman M. Medical School Tracks in the U.S. Health Resources and Services Administration Policy Brief [Internet]. 2013 [cited 2015 Apr 20]. Available from: <http://www.ruralhealthweb.org/index.cfm?objectid=28B352C5-3048-651A-FE2D53C27202BAF6>.
3. Chen F, Fordyce M, Andes S, Hart LG. Which medical schools produce rural physicians? A 15-year update. *Acad Med*. 2010 85(4):504-598.
4. Crandall LA, Dwyer JW, Duncan RP. Recruitment and retention of rural physicians: Issues for the 1990s. *J Rural Health*. 1990 6(1):19-38.
5. Strasser RP, Lanphear JH, McCready WG, Topps MH, et al. Canada's new medical school: The northern Ontario School of Medicine: Social Accountability through distributed community engaged learning. *Acad Med*. 2009 84(10):1459-1464.
6. Orzanco MG, Lovato C, Bates J, Slade S, et al. Nature and nurture in the family physician's choice of practice location. *Rural Remote Health*. 2011 11:1849-1862.
7. Rabinowitz HK, Diamond JJ, Markham FW, Wortman JR. Medical school programs to increase the rural physician supply: A systematic review and projected impact of widespread replication. *Acad Med*. 2008 83(3):235-243.
8. Farmer J, Kenny A, McKinstry C, Huysmans RD. 2015. A scoping review of the association between rural medical education and rural practice location. *Hum Resour Health*. 2015 13(1):27-42.
9. Crump WJ, Fricker S, Barnett D. A Sense of Place: Rural training at a regional medical school campus. *J Rural Health* 2004; 20(1):80-84.
10. Crump WJ, Fricker RS. A Medical School Prematriculation Program for Rural Students: Staying Connected With Place, Cultivating a Special Connection With People. *Teach Learn Med*. 2015 27(4):422-30.
11. Sesney JW, Kreher NE, Potts MJ. Graduates' Reflections on Their Rural Medical Education: The Upper Peninsula Campus Experience. *J Rural Health*. 1994 10(4):279-285.
12. Jones GI, DeWitt DE, Cross M. Medical students' perceptions of barriers to training at a rural clinical school. *Rural Remote Health* [Internet] 2007 [cited 29 Feb 2016];7: 685. Available from: <http://www.rrh.org.au/articles/subviewnew.asp?ArticleID=685>.
13. Krahe LM, McColl AR, Pallant JF, Cunningham CE, DeWitt DE. A multi-university study of which factors medical students consider when deciding to attend a rural clinical school in Australia. *Rural Remote Health* [Internet]. 2010 [cited 29 Feb 2016]; 10: 1477. Available from: <http://www.rrh.org.au/articles/subviewnew.asp?ArticleID=1477>
14. Mihalynuka T, Snadden D, Bates J, Scott I, Frinton V, Wilson G. Size matters: what influences medical students' choice of study site? *Med Teach* [Internet]. 2008 [cited 29 Feb 2016]; 30(4): e108-e114. Available from: <http://www.tandfonline.com/doi/full/10.1080/01421590801931170>.
15. Brazeau NK, Potts MJ, Hickner JM. The Upper Peninsula Program: a successful model for increasing primary care physicians in rural areas. *Fam Med*. 1990 22(5):350-355.

16. Crump WJ, Fricker RS, Ziegler C, Wiegman DL. 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.
17. Looney SW, Blondell RD, Gagel JR, Pentecost MW. Which medical school applicants will become generalists or rural-based physicians? *Journal of the Kentucky Medical Association.* 1998 96(5):189-193.
18. Crump WJ, Miller KH, Fricker RS, Pradip P, Ostapchuck M. An innovative Technique for Faculty Development at a Rural Kentucky Clinical Campus. *J Ky Med Assoc.* 2012 110(7):274-282.
19. Crump WJ, Fricker RS, Ziegler CH, Wiegman DL. Seeking the Best Dose of Rural Experience: Comparison of Three Rural Pathways Programs at One Medical School. *J Ky Med Assoc.* 2015 113(1):5-15.
20. Arnett P, Weaver A, Elam C. Enhancing the physician pipeline to rural Kentucky: findings from a University of Kentucky rural recruitment summit. *J Ky Med Assoc.* 2013 111(June):159-164.
21. Crump WJ, Fricker RS, Crump AM. Just what are rural premedical students thinking? A report of the first 6 years of a pathways program. *J Rural Health.* 2010 26(1):97-99.
22. Crump WJ, Fricker RS, Flick KF, Gerwe-Wickham K, Greenwell K, Willen KL. A Rural Pathways Program for High School Students: Reinforcing a Sense of Place. *Fam Med.* October 2014, 46(9):713-717.
23. Crump WJ, Fricker RS, Ziegler CH, Wiegman DL. Increasing the Rural Physician Workforce: A Potential Role for Small Rural Medical School Campuses [Internet]. 2015 *J Rural Health.* [cited 29 February 2016]; Oct 30. doi: 10.1111/jrh.12156. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/jrh.12156/abstract;jsessionid=A6B0DD29398FB4824CCE8078FE36D729.f02t01>.