

A Comparison of Primary Care Graduates From Schools With Increasing Production of Family Physicians to Those From Schools With Decreasing Production

Doug Campos-Outcalt, MD, MPA; Janet Senf, PhD; Randa Kutob, MD

Background and Objectives: *This study investigated factors related to declining interest in family medicine by US medical school graduates. **Methods:** A questionnaire was sent to all physicians who graduated from 24 medical schools in 1997–1999, and who entered a family medicine residency, and a randomly selected equal number of graduates from the same years who entered other primary care specialties. Between 1997 and 1999, 12 of these schools had increases and 12 had decreases in the proportion of graduates choosing family medicine residencies. **Results:** Between 1997 and 1999, at schools with increasing proportions of graduates choosing family medicine, there were significant increases in the proportion of graduates who (1) had entered medical school with a specialty preference of family medicine, (2) spent their required family medicine clerkship at two or more sites, (3) ranked the competence of family medicine faculty highly, (4) reported the faculty member they most wanted to be like was a family physician, and (5) experienced clinical rotations in both family medicine and primary care. At schools with declines in the proportion of graduates choosing family medicine, there were significant declines in the proportion of graduates who (1) ranked the competence of family medicine faculty highly, (2) stated that they were encouraged to go into family medicine, and (3) reported that the faculty member they most wanted to be like was a family physician. In schools with decreases in family medicine graduates, there was a significant increase in the proportion of graduates intending a large city or suburban practice. Using binary logistic regression, the variables that remained significantly correlated with attending a school with increases or decreases in students selecting family medicine were the number of required clinical rotations in family medicine and primary care, the perception of the clinical competence of the family medicine faculty, and an intent to practice, or subsequently having a practice, in a rural area. **Conclusions:** Schools that want to increase their production of family physicians should consider admissions policies that select students inclined toward family medicine and rural practice, should adopt a curriculum that maximizes clinical training with family physicians and other primary care physicians, and should ensure that their family medicine faculty are perceived as competent role models.*

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Starting in 1997, the number of US graduating seniors choosing family medicine in the National Resident Matching Program (NRMP) declined each year; 927 fewer students chose family medicine in 2002 than did in 1997 (2,340 versus 1,413).¹ During this same time period, the number of US graduates choosing other primary care residencies (primary care internal medicine,

primary care pediatrics, and combined internal medicine-pediatrics) also declined, going from 827 in 1997 to 554 in 2002.¹ Thus, while the declining US graduate interest in primary care has affected all primary care specialties, family medicine has suffered the highest number and percentage decline.

Past studies have shown a number of variables to be associated with a school's production of family physicians. These have included the proportion of matriculating students who express an interest in family medicine,² required clinical training in family medicine,²⁻⁶ public ownership (versus private) of the medical school,⁷⁻¹⁰ the proportion of faculty in family medicine,³

From the Department of Family and Community Medicine, University of Arizona, Phoenix Campus (Dr Campos-Outcalt); and the Department of Family and Community Medicine, University of Arizona, Tucson (Drs Senf and Kutob).

and the proportion of rural students admitted.² Demographic characteristics of medical students that in the past have been found to be related to choice of family medicine include being female, older, and married.^{11,12} Some schools have regularly produced a high proportion of family medicine graduates and continue to do so in spite of recent national trends.^{3,13}

Because of the continuing trend away from family medicine by US students and the potential negative effect of this trend on the US health care system, the American Academy of Family Physicians (AAFP) commissioned a series of studies to look for causes that could be addressed. This study is one of four completed as part of that project. It includes a large number of primary care graduates from 24 schools, with the largest proportionate increases and declines in student selection of family medicine during a time period of declining interest in this specialty. These schools were selected to maximize the differences in factors that might be related to increasing and decreasing proportions of students entering family medicine residencies.

Methods

Sample

Using data collected annually by the AAFP, we listed the proportion of each US medical school graduating class entering a family medicine residency in each of 3 years: 1997, 1998, and 1999. Puerto Rican schools were excluded, leaving 118 schools. We calculated the proportion of increase or decrease of students entering family medicine in each school from 1997 to 1999. To minimize the effect of small numbers resulting in larger proportionate changes at smaller schools, schools were placed into one of three categories by size: less than 100 graduates, 100 to 150 graduates, and more than 150 graduates. The four schools with the largest proportionate increases and the four schools with the largest proportionate decreases entering family medicine in each of the three categories were identified and became the study schools (12 with increases and 12 with decreases). We selected the schools with the largest proportionate changes to increase the chance of finding significant differences. Table 1 shows the total number of schools in the United States and the number with increases and decreases in each size category.

The 24 schools selected had a total of 1,428 graduates who entered family medicine during the time period 1997–1999, inclusive. Our study included these 1,428 family medicine graduates, all 196 of the graduates who selected combined internal medicine-pediatrics (IM-Peds), and a randomly selected sample of 1,247 graduates who entered the other primary care specialties (approximately 69% of those entering internal medicine and 56% of those entering pediatrics). We chose this sampling because financial limitations permitted only a proportion of students from these schools

Table 1

Distribution of US Medical Schools by Size

Size of Graduating Class	Total # of Schools	# With Increasing Proportion of Graduates in FM From 1997–1999	# With Decreasing Proportion of Graduates in FM From 1997–1999
Less than 100	37	10	27
100–150	41	11	30
Greater than 150	40	16	24

FM—family medicine

to be included, and graduates entering other primary care specialties would be those most likely to have considered and decided against family medicine.¹⁴ The list of graduates was obtained from the American Medical Association’s physician master file.

Instrument

A questionnaire was constructed that included items on personal demographics and background; current specialty and specialty preference at matriculation; significant medical school experiences including family medicine and primary care clinical rotations; faculty role models; negative comments about family medicine by faculty, students, and residents; experiences with and perceptions about family medicine faculty and residents; desired practice location and practice content; and attitudes about specific aspects of family medicine. It also listed variables about practice style and content of primary care practice and asked respondents to rate how important these variables were in choosing a specialty. The questionnaire was pretested on family medicine residents at the University of Arizona and revised based on their comments. None of these residents were subsequent study subjects.

The questionnaire was mailed to all graduates in the study group beginning in May 2001 and ending in October 2001. Thus, those students selected for the study graduated from medical school 2 to 4 years before our survey.

Up to four mailings were used. The first included the questionnaire, the second was a reminder postcard, the third included a replacement questionnaire, and the fourth was another postcard reminder with an e-mail address to use to request another questionnaire.

Data Analysis

We used the graduate as the unit of analysis. The responses of graduates from the schools with increases in the proportion of graduates entering family medicine (from this point referred to as schools with increases)

were compared to those of graduates from the schools with decreases in the proportion entering family medicine (from this point referred to as schools with decreases). We also performed a time-trend analysis to compare responses from graduates in 1997 to those in 1999. This analysis was conducted separately for schools with increases and schools with decreases. Finally, a multivariate analysis was performed using attendance at either a school with an increase or a school with a decrease as the dependent variable.

Constructed variables included the following: the first was a variable reflecting the frequency of negative comments heard "often" or "sometimes" from faculty, residents, and students, which ranged from zero (if no negative comments were heard) to three (if comments had been heard from all three groups). A second variable included both required family medicine time and required primary care time. This variable included four categories—neither family medicine nor primary care, primary care only, family medicine only, and both family medicine and primary care.

Statistical tests included chi-square analysis for categorical variables, comparison of means (*t* test) for continuous variables, logit analysis for three-way categorical tables, and logistic regression for a multivariate analysis using attending a school with increases or decreases as the dependent measure. All analyses were performed using SPSS for Windows Version 10 or Version 11.

Results

The response rate was 51.5%; 2,985 questionnaires were mailed, 155 were returned as undeliverable, and 1,457 were completed and returned. The response rate by school ranged from 33%–73%. The mean age of respondents was 31.8 years and of nonrespondents was 31.3 ($P=.002$). There was no difference in response rate by gender or year of graduation or between schools with increases and decreases. The response rate by specialty was family medicine 57.6%, IM/Peds 56.3%, pediatrics 50.4%, and internal medicine 38.3% ($P<.001$).

In the comparison of graduates from schools with increases to those from schools with decreases, the only difference found was the proportion reporting having a part or all of their required family medicine clerkship at a university-based office—40.1% at schools with increases and 25.9% at schools with decreases ($P<.001$).

The significant results of the time trend analysis between 1997 and 1999 are shown

in Table 2. At schools with increases, the proportion matriculating with a specialty preference of family medicine increased by 7.4%, the proportion reporting spending their required family medicine clerkship at two or more sites increased 15.5%, the proportion ranking the competence of family medicine faculty in the top two categories increased 8.9%, the proportion reporting that the faculty member they most wanted to be like was a family physician increased 6.4%, and the proportion reporting a clinical rotation in both family medicine and primary care increased 16.9%.

At schools with decreases, the proportion ranking the competence of family medicine faculty in the top two categories declined 11.8%, the proportion stating that they were encouraged to go into family medicine declined 15.2%, the proportion reporting that the faculty member they most wanted to be like was a family physician declined 6.6%, and the proportion reporting they intended on a large city or suburban practice increased 10.4%.

There were three variables in the binary logistic regression that remained significantly correlated with attending a school with increases or decreases ($P<.01$). The variables were the number of family medicine and primary care required clinical rotations, the students' perception of the clinical competence of the family medicine faculty, and an intent to practice or an actual subsequent practice in a rural area. These three variables were able to predict 63% of the time whether the graduate attended a school with an increase or decrease in the proportion of graduates choosing family medi-

Table 2

Time Trend Analysis Between 1997 and 1999

	1997 %	1999 %	P Value
Schools With Increases			
Matriculates planning on FM career	21.3	28.7	.04
Two or more clerkship sites	22.6	38.1	<.001
Ranking FM faculty competence as 1 or 2	64.5	73.4	.05
Encouraged to go into FM	80.4	82.1	NS
Faculty most want to be like is a family physician	11.9	18.3	<.01
Planning on a large city or its suburb for practice	65.0	60.3	NS
Experience in FM and primary care	21.9	38.8	<.001
Schools With Decreases			
Matriculates planning on FM career	21.2	21.5	NS
Two or more clerkship sites	26.2	22.4	NS
Ranking FM faculty competence as 1 or 2	81.1	69.3	.003
Encouraged to go into FM	73.5	58.3	<.01
Faculty most want to be like is a family physician	19.1	12.5	<.01
Planning on a large city or its suburb for practice	54.3	64.7	.03
Experience in FM and primary care	25.5	25.0	NS

FM—family medicine

NS—not significant

cine. Control variables were those variables in Table 2 that were significant either for schools with an increase or schools with a decrease.

Discussion

The time trends at schools with increases and decreases are consistent with what would be expected intuitively and from past research on family medicine specialty choice. The proportion of graduates stating that the faculty member they most wanted to be like was a family physician and the proportion ranking family medicine faculty competence highly increased at schools with increases and decreased at schools with decreases. This could reflect either an influence of student perceptions of faculty on specialty choice or an effect of specialty preferences on perceptions of faculty.

Schools with increases enrolled an increasing proportion of students with a stated intent toward family medicine, consistent with other studies that have shown that family medicine specialty preferences of matriculating students is an important variable affecting a school's production of family physicians.² While the schools with decreases did not enroll a declining proportion of family medicine-interested students, the amount of encouragement for a family medicine career appears to have declined, indicating that both admissions and school characteristics that are family medicine encouraging are both important.

Previous research has demonstrated the importance of required clinical training in family medicine to the production of family physicians.²⁻⁶ The basis of this relationship is not fully understood. Exposure to the daily realities of family medicine and family physicians may provide exposure to a career not previously considered. It could also offset negative comments made by other university faculty about family physicians. Or, having required time in the curriculum may be a proxy for departmental strength or school commitment to producing family physicians.

There are three findings in this study that add to the knowledge base on this issue. First, there appears to be a relationship between the number of family medicine clerkship sites students are exposed to and family medicine choice. Second, the addition of a primary care clinical requirement to a family medicine requirement is associated with a higher production of family physicians. Both findings indicate that seeing a wider array of practice options may make primary care and family medicine more attractive. However, they could also indicate that schools that produce more family physicians have primary care and family medicine faculty who are more influential and able to obtain curriculum time. Third, schools with increases had a higher proportion of their students located at a university-based facility during the clerkship.

There has been some concern among family medicine educators that exposure to community-based family physicians may detract from the attractiveness of a family medicine career because of prevailing negative attitudes toward the practice of medicine in the community related to managed care, reimbursement rates, and other stressors. Our results indicate there may be some truth to these concerns, although we also found that the highest-rated preceptors were community based, and students who actually entered family medicine were more likely to have been at a rural site for their clerkship, possibly as a result of self-selection. The issue of clerkship location and specialty choice deserves further exploration.

The negative findings are as important as the positive findings, ie, variables that were not associated with increases or declines in production of family physicians. These include student demographics of age, marital status, and gender; involvement in a family medicine interest group; and the amount and the positive nature of contact with family medicine faculty and residents. Negative comments about family physicians by students, residents, and faculty were also not directly related to increases or decreases, although they were strongly related to perception of family medicine faculty competence.⁵

The multivariate analysis indicates that perception of family medicine faculty competence, exposure to family medicine and primary care in the curriculum, and a desire to practice in a rural area are three variables that independently predict whether a student attended a school with an increase or decrease in the production of family physicians. However, these three variables were only able to predict the type of school attended 63% of the time (50% can be achieved by chance), indicating the difficulty of translating these findings into meaningful school policy that affects specialty choice.

Limitations

There are several limitations to this study. It asked graduates to remember what they experienced up to 7 years previously in medical school. There is always a potential for recall bias in such a study design. In addition, our response rate, especially among the non-family medicine graduates and at some individual schools, creates a potential for a response bias. Finally, we included only those graduates who chose a primary care career and cannot comment on the perspectives of the large proportion of graduates who specialized. With these cautions in mind, the results are still consistent with past research and provide some insight into trends in medical education that might be affecting specialty choices.

Conclusions

Based on this study, schools that want to increase their production of family physicians should consider admissions policies that select students inclined toward family medicine and rural practice, should adopt a curriculum that maximizes clinical training with family physicians and other primary care physicians, and should ensure that their family medicine faculty are perceived as competent role models. Consistent with this study, these characteristics are present in schools with special programs for training family physicians that have demonstrated success.¹⁶⁻¹⁸

Corresponding Author: Address correspondence to Dr Campos-Outcalt, 4001 N. 3rd Street, Suite 415, Phoenix, AZ 85012-2085. 602-631-6548. Fax: 602-631-6541. dougco@u.arizona.edu.

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