ORIGINAL RESEARCH

Predictors of Primary Care Practice Among Medical Students at the Michigan State University College of Human Medicine

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Introduction: **This study examines the evolution of student and physician interest in primary care from medical school matriculation to practice, focusing on student factors that potentiate primary care (PC) practice.**

Methods: **We compiled a dataset of 2,047 Michigan State University College of Human Medicine graduates from 1991 to 2010. PC interest was assessed using the Association of American Medical Colleges (AAMC) matriculating student (MSQ) and graduation (GQ) questionnaires. PC practice was determined using AMA physician Masterfile data. C^2 analyses and logistic regression were used to examine factors that predict PC practice.**

Results: **PC interest at matriculation and at graduation were the factors most likely to predict PC practice. After controlling for URM status, gender, and rural origin, the odds of practicing PC among those with a sustained interest in PC (on both the MSQ and GQ) were 100 times higher than those with no interest in PC, on either survey ($P < .01$). Among those students who developed an interest in PC by graduation, the odds of practicing PC were 60 times higher than noninterested students ($P < .01$). Finally, among students who were interested in PC at matriculation, but not graduation, the odds of eventually practicing PC were 3.8 times higher than noninterested students ($P < .01$).**

Conclusions: **Our study suggests that cultivating PC interest at any point during medical school may predict PC practice. Early and sustained interest in primary care was the most substantial predictor of PC practice in our study, highlighting the need for primary care education even before medical school matriculation. (J Am Board Fam Med 2022;35:370–379.)**

Keywords: **Family Medicine, Logistic Models, Medical Schools, Michigan, Physicians, Primary Health Care, Residency, Surveys and Questionnaires, Workforce**

Introduction

Addressing the nation's primary care shortage and health disparities gaps requires examining the existing educational infrastructure. Institutional practices informed by Flexner[1–3] have cultivated an academic climate that favors specialization, impacting the current primary care workforce. Despite significant evidence that a primary care driven workforce decreases cost and increases quality,[4,5] the U.S. continues to do a poor job recruiting and training physicians that fulfill the nation's health care needs.[6,7] Fewer U.S medical school seniors are choosing primary care careers such as family medicine (FM); and in the last decade, less than half of the available FM residency positions have been filled by graduating U.S. medical school

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seniors.[6] While internal medicine careers represent a potential opportunity for entry into primary care, less than 13% of internal medicine physicians eventually practice primary care and this value has been declining consistently over the last 20 years.[8–10] A similar increasing trend toward subspecialization has seen among pediatricians.[3,8] Student loan debt, perceived work–life balance, perceived respect, and the income gap between specialists and primary care physicians, have all been examined as potentiators of this trend.[11,12]

There is a large body of literature describing factors influencing medical students' specialty choices. Students who choose primary care are more likely to come from lower income families, rural backgrounds, and underrepresented minority groups.[13–18] Curricular experiences seem to influence student career choice, with required time spent during third and fourth year in family medicine being positively associated with the selection of family medicine as a specialty choice.[19–21] Despite significant attrition *during* medical school, preference for family medicine at matriculation has been associated with an increased likelihood of entering family medicine residency and practice.[12,20–22] The temporal relationship between evolving student interest in primary care and eventual practice, however, remains incompletely understood.

Our purpose was to examine how student interest in pursuing primary care changes from entry into medical school to graduation and how this changing interest is associated with eventual practice. By using a large retrospective sample examining 19 years of data from our home institution, we were able to assess how factors such as specialty interest, race/ethnicity, gender, and rural origin may affect eventual practice patterns.

Methods

This study was a secondary analysis of merged data from several surveys, all using data from students who graduated from a single medical school (Michigan State University College of Human Medicine (MSU-CHM)) from 1991–2010, with the goal of capturing practice location and specialty data for graduates who were post-residency completion. Two national survey questionnaires, the matriculating student questionnaire (MSQ) and the graduation questionnaire (GQ), were administered by the Association of American Medical Colleges (AAMC) annually to all matriculating and graduating medical students. Institutional MSQ and GQ data describing students' career intentions and demographics were obtained from the AAMC. American Medical Association (AMA) Physician Masterfile data were used to create a primary care practice variable, as described below. All nonresponses were treated as missing and removed from the analyses.

Demographic Variables

Demographic data were obtained from the MSQ and from internal Michigan State University (MSU) data gathered from medical school admission applications. Female was coded 1 and male as 0. Underrepresented in Medicine (URiM)[23] was defined using the MSQ underrepresented minority indicator which included: African Americans, Mexican Americans, Native Americans (American Indians, Alaska Natives, and Native Hawaiians), and mainland Puerto Ricans. This variable was coded as 1 if yes, and 0 otherwise. Rural origin was defined using rural-urban commuting area (RUCA) code of childhood residence[24] (medical school application) and coded as 1 if RUCA was greater than or equal to 4, otherwise 0. Thus, rural origin included large rural, small town, and rural areas; on the other hand, nonrural origin included urban and suburban areas.

Matriculating Student Questionnaire Career Intentions

Table 1 shows how the primary care intentions were generated using existing variables. On the MSQ, students were asked to select a specialty in which they were most interested. Specifically, the questionnaire states: "*What general specialty are you considering?*" Responses were coded as "1," designating interest in primary care at matriculation (MSQ PCI), if they responded to this question selecting internal medicine (IM, 200), family medicine (FM, 180), or pediatrics (Peds, 500). All other responses were coded as "0."

Graduation Questionnaire Career Intentions

Given that the GQ survey questions often vary by year and frequently use different questions to investigate primary care, we used different coding schemes to construct a second binary variable, representing primary care intention at GQ, as seen in Table 1. Specifically, for 1978 to 1990, if students responded to SPEC_PREF1: "*If yes, which specialty are you planning?*" by selecting FM (06), IM (07), or Peds (19) and

Table 1. Coding Scheme Used to Indicate Primary Care Intention at Matriculation and Graduation, by Survey Year

Coding	Year	Variable Name	Questionnaire	Response Number
MSQ PCI = 1 (YES)	All	SPEC_PREF	"What general specialty are you considering?"	FM (180), IM (200), Peds (500)
GQ PCI = 1 (YES)	1978 to 1990	SPEC_PREF1	"If yes, which specialty are you planning?"	FM (06), IM (07), Peds (19)
		SUB_SPEC_PLAN	"Are you planning to become certified in a subspecialty?"	No
	1991 to 1998	SPEC_PREF1	"If yes, which specialty are you planning?"	FM (06), IM (07), Peds (19)
		SPEC_PLAN	"Are you planning to become certified in a specialty?"	Yes
		SUB_SPEC_PLAN	"Are you planning to become certified in a subspecialty?"	No
	1999 to 2004	SPEC_PREF1	"Which specialty are you planning?"	FM (06), IM (07), Peds (19)
		SPEC_PLAN	"Are you planning to become certified in a specialty?"	Yes
	2005 to 2010 (2008 was excluded)	SPEC_PREF	"Are you planning to become certified in a specialty or subspecialty? Choice of specialty/subspecialty"	FM (120), IM (140), Peds (320)
		SPEC_PLAN	"Are you planning to become certified in a specialty?"	Yes

Abbreviations: MSQ PCI, primary care intention at matriculation; GQ PCI, primary care intention at graduation; FM, Family Medicine; IM, Internal Medicine; Peds, Pediatrics. All other responses that were not indicated in this table were coded as 0.

question number 509 (SUB_SPEC_PLAN: "*Are you planning to become certified in a subspecialty?*" by selecting "No," they were considered interested in primary care at graduation (GQ PCI), and coded 1. For 1991 to 1998, if the students responded "Yes" to SPEC_PLAN: "*Are you planning to become certified in a specialty?*") and "No" to (SUB_SPEC_PLAN) with the same responses to SPEC_PREF1, they were coded as 1. For 1999 to 2004, the coding procedure was the same with 1991 to 1998 excluding the SUB_SPEC_PLAN, which was not used due to an incomplete AAMC dataset for this variable for these years. For 2005 to 2010, if students responded "Yes" to (SPEC_PLAN: "*Are you planning to become certified in a specialty?*") and selected family practice (120), IM (140), or Peds (320) for: (SPEC_PLAN: "*Are you planning to become certified in a specialty or subspecialty? Choice of specialty/subspecialty*"), they were considered interested in primary care at graduation and coded 1. Due to an AAMC error, data from 2008 were incomplete and therefore excluded. Table 1 summarizes the coding scheme.

Change in Primary Care Intentions

Based on these newly generated variables, we created variables to indicate change in PC intention from medical school matriculation to graduation, represented by the variable: PCI_MOV (PCI movement). We then classified this variable into 4 categories: (1) no interest at matriculation-no interest at graduation (Never PCI); (2) interest at matriculation-no interest at graduation (Initial PCI); (3) no interest at matriculation-interest at graduation (Developed PCI); and (4) interest at matriculation-interest at graduation (Always PCI).

Primary Care Practice

Using American Medical Association (AMA) Physician Masterfile data, we investigated the current specialty in which physicians were practicing. To confirm accuracy, and verify that Masterfile data captured a clinical practice rather than a residency training site, we enlisted a student research assistant to cross-check each variable using a protocol-driven google search. To minimize bias, we included only offices that could be verified with an active address using google maps, or hospital and medical group web sites. Current specialty and practice location were confirmed, and records from retired, deceased or inactive physicians were removed from the data set, as were records that could not be confirmed. As established in previous

Table 2. Descriptive Statistics and Response Rates of All MSU-CHM Students Graduating 1971–2010 (Original Cases) and the Subgroup of Those Students With Complete Responses to the Variables Used for This Study (Complete Cases) With Two-Sample Test for Equality of Proportions with Continuity Correction

	Total Original Cases (N_1 = 2,047)			Complete Cases (N_2 = 430, 21%)					
Variables & Responses	N_3	*P*	SD	N_2	*P*	SD	Response Rates (%)	χ^2 (*df*)	*P* values
Gender	2,047	–	–	430	–	–	100.00	0.14 (1)	0.712
Female	1,080	52%	0.50	222	52%	0.50			
Race/ethnicity	2,040	–	–	430	–	–	99.66	2.41 (1)	0.121
URM	350	17%	0.38	60	14%	0.35			
Geographic origin	1,903	–	–	430	–	–	92.97	0.42 (1)	0.515
Rural origin	595	31%	0.46	142	33%	0.47			
Practice specialty	1,535	–	–	430	–	–	74.99	3.85 (1)	**0.050**
PC	620	40%	0.49	197	46%	0.50			
MSQ PCI	961	–	–	430	–	–	46.95	0.00 (1)	0.988
Yes	550	57%	0.49	247	57%	0.50			
GQ PCI	1,059	–	–	430	–	–	51.73	0.87 (1)	0.351
Yes	431	41%	0.49	187	43%	0.50			
Initial PCI	560	–	–	430	–	–	27.36	0.02 (1)	0.887
Yes	136	24%	0.43	107	25%	0.43			
Developed PCI	560	–	–	430	–	–	27.36	0.16 (1)	0.686
Yes	67	12%	0.32	47	11%	0.31			
Never PCI	560	–	–	430	–	–	27.36	0.05 (1)	0.824
Yes	182	33%	0.47	136	32%	0.47			
Always PCI	560	–	–	430	–	–	27.36	0.14 (1)	0.712
Yes	175	31%	0.46	140	33%	0.47			

Abbreviations: Total original cases (N_1 = 2,047), the number of samples making up the total sample size; Complete cases (N_2 = 430) = the number of cases with responses to all variables used for this analyses; N_3, the number of cases with responses to each variable (this number varies across the variables); P, proportions of each variable; SD, standard deviation of the proportion; Response rates, the number of people who completed the survey items divided by the number of people who make up the total sample size; χ^2, the χ^2 test for equality of proportions of each variables between N_3 and N_2 to evaluate the representativeness of the selected samples across variables; MSU-CHM, Michigan State University-College of Human Medicine; PC, primary care practice; Initial PCI, intention at matriculation-no intention at graduation; Developed PCI, no intention at matriculation-intention at graduation; Never PCI, no intention at matriculation-no intention at graduation; Always PCI, intention at matriculation-intention at graduation.

methodology, primary care was defined to include physicians practicing FM, IM, Peds, Geriatrics, or Sports Medicine/Family Medicine without subspecialization, unless the specialty is age-specific (eg, geriatrics or adolescent medicine) *and* the physician describes themselves as practicing primary care.[13,25,26] All others were classified as nonprimary care practice. We then examined the specific specialty outcome of physicians, compared with their initial described student-level intention to practice primary care, from MSQ and GQ.

Analysis

First, descriptive statistics (proportions and standard deviations) of MSQ PCI, GQ PCI, and PC from key demographic groups (gender, URM, and rural origin) were analyzed, and their statistical associations were assessed using c^2 tests. Next, we examined the influence of change in primary care interest on primary care practice, controlling for the 3 demographic variables using logistic regression analysis. Finally, we explored which (sub) specialties were most often chosen by specific groups of students in detail. All the data management and analyses were conducted using R 4.0.3 and R Studio 1.3.1073 for Windows (R Core Team, Vienna, Austria).

Results

Descriptive Statistics of Demographics and Primary Care Intentions

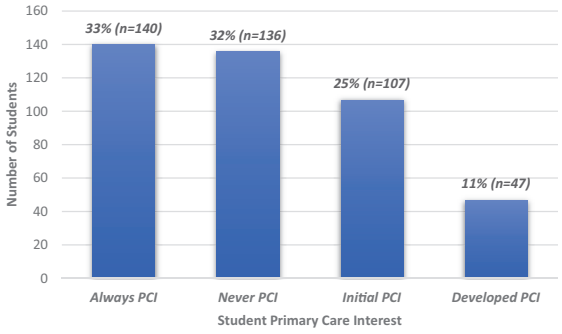
Of 2,047 responses, 21% (n = 430) were found to be complete and have valid responses that were used for analysis. Complete cases included *only* those with answers to *all* questions in the analysis. Complete cases were substantially fewer than original cases due to incomplete responses on the MSQ and GQ as well as graduates having retired or left

clinical practice. For complete cases, we assumed data were missing completely at random, and first tested whether there were statistically significant differences between the original and the complete cases using 2-sample test for equality of proportions with continuity correction. Our analytic sample slightly overrepresented the proportion of PC compared with that of the original cases (40% vs 46%, $P = .05$).

Among included graduates, 52% (n = 222) were female, 14% (n = 60) were URM, and 33% (n = 142) were from a rural background, as seen in Table 2. As of 2018, 46% (n = 198) of graduates were practicing primary care. Among those practicing primary care, 57% (n = 247) and 43% (n = 183) expressed their interest in PC at matriculation and graduation, respectively, indicating an overall decrease in PC interest during medical school. Looking at Figure 1, the 2 largest groups of students either maintained an initial interest (Always PCI, n = 140, 33%) or never had interest (Never PCI, n = 136, 32%). An additional 25% of students had interest in PC at matriculation but no interest at graduation (Initial PCI, n = 107). The smallest group of students developed an interest in primary care during medical school (Developed PCI, n = 47, 11%).

Table 3 shows how intentions on the MSQ and GQ differed across demographic backgrounds in detail. Specifically, at matriculation, the proportions of students who were interested in primary care were higher than those who were not, regardless of their gender, URM, and rural origin status. However, the pattern was reversed at graduation. At graduation, the proportions of PCI *within* female (50% vs 63%, $P < .01$), URM (33% vs 55%, $P = .03$), and rural origin student groups (41% vs 55%, $P = .02$) were statistically lower than at matriculation. Looking at their actual primary care practice (PC), female students practiced primary care more than male, but the difference of the proportions of PC for URM and rural origin status were not significant. C^2 test results also support the above patterns (see sixth and seventh columns). At matriculation (MSQ) and graduation (GQ), women were more likely to demonstrate an intention to practice primary care ($P < .05$), while there were no statistically significant associations demonstrated among URM and rural origin students. Women were more likely to practice primary care at all 3 time points ($P < .01$).

Figure 1. Proportions of students distributed among 4 groups based on their intention to practice primary care at matriculation and graduation (n = 430)



Primary Care Practice

We employed a logistic regression model to better understand what factors may predict primary care practice. As seen in Table 4, controlling for other demographic factors and groups of interests, the odds of entering primary care practice among students who were interested in primary care at *both* matriculation and graduation (Always PCI) were found to be 100 times higher than those who demonstrated no interest in primary care at matriculation and graduation (the reference group: Never PCI). The odds of students entering primary care who had no initial interest, but developed an interest in primary care by graduation (Developed PCI), were 60 times higher when compared with the Never PCI group. Lastly, the odds of students entering primary care with an initial interest at matriculation, but no interest at graduation (Initial PCI), were still 3.9 times higher than those with no interest. Interestingly, after controlling for primary care interest grouping, demographic variables including female, URM, and rural origin status, did not significantly predict primary care practice.

Specialty Choices

We then examined which specialties were practiced by students in detail. Looking at Figure 2, among students who showed an initial interest in primary care at matriculation but not graduation (Initial PCI, n = 107), 25 students (23%) still were practicing a primary care specialty, including Pediatrics (n = 10, 9%), Internal Medicine (n = 8, 7%), Family Medicine (n = 6, 6%), and Internal Medicine/Pediatrics (n = 1, 1%) specialties. The majority of Initial PCI students (n = 82, 77%) did not eventually practice primary care; the most common practice specialties were Obstetrics and

Table 3. Frequency and Proportion (%) of Primary Care Intention on Matriculating Student Questionnaire (MSQ) and Graduation Questionnaire (GQ) and Primary Care Practice, Across Demographic Variables With Chi-Square Test Results

Demographic Characteristics	Frequency (n = 430)		Proportion (%)		χ^2 (*df*)	*P* values
	MSQ PCI = 0	MSQ PCI = 1	MSQ PCI = 0	MSQ PCI = 1	MSQ PCI	
Male	101	107	23.5%	24.9%	5.466 (1)	**0.019**
Female	82	140	19.1%	32.6%		
Non-URM	156	214	36.3%	49.8%	0.074 (1)	0.786
URM	27	33	6.3%	7.7%		
Nonrural origin	119	169	27.7%	39.3%	0.405 (1)	0.525
Rural origin	64	78	14.9%	18.1%		
All students	183	247	42.6%	***57.3%***	-	
	GQ PCI = 0	GQ PCI = 1	GQ PCI = 0	GQ PCI = 1	GQ PCI	
Male	131	77	30.5%	17.9%	6.360 (1)	**0.012**
Female	112	110	26.0%	25.6%		
Non-URM	203	167	47.2%	38.8%	2.465 (1)	0.116
URM	40	20	9.3%	4.7%		
Nonrural origin	159	129	37.0%	30.0%	0.453 (1)	0.501
Rural origin	84	58	19.5%	13.5%		
All students	243	187	***56.5%***	43.5%	-	
	PC = 0	PC = 1	PC = 0	PC = 1	PC	
Male	129	79	30.0%	18.4%	9.356 (1)	**0.002**
Female	104	118	24.2%	27.4%		
Non-URM	200	170	46.5%	39.5%	0.000 (1)	1.000
URM	33	27	7.7%	6.3%		
Nonrural origin	152	136	35.3%	31.6%	0.536 (1)	0.464
Rural origin	81	61	18.8%	14.2%		
All students	233	197	54.2%	45.8%	-	

Abbreviations: MSQ PCI, primary care intention at matriculation; GQ PCI, primary care intention at graduation; PC, primary care practice; 0, no, 1, yes.

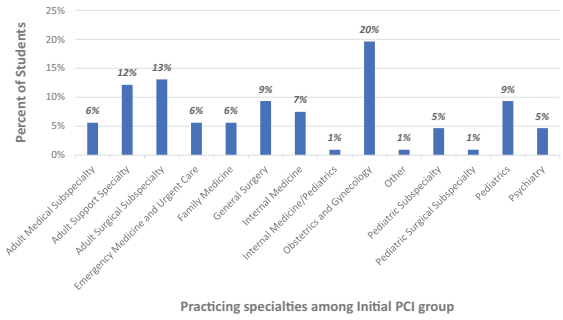
Gynecology (n = 21, 20%) followed by Adult Surgical (n = 14, 13%), and Adult Support (n = 13, 12%) specialties. A complete list of specialties within each category can be found in the Appendix. This pattern was very similar to the pattern of the group of students who were never interested in primary care (Never PCI, n = 136). Of these, 126 students (93%) chose a nonprimary care specialty, and mostly practiced

Table 4. Logistic Regression Model Predicting Primary Care Practice

	Beta	SE	Wald	*df*	*P* values	Odds Ratio (95% CI)
Always PCI	4.606	0.431	10.691	1	< 0.001	100.08 (45.05–246.01)
Developed PCI	4.094	0.505	8.102	1	< 0.001	59.98 (23.47–172.00)
Initial PCI	1.355	0.404	3.357	1	< 0.001	3.88 (1.81–8.92)
Female	0.498	0.290	1.717	1	0.086	1.64 (0.93–2.92)
URM	0.627	0.401	1.566	1	0.117	1.87 (0.85–4.10)
Rural origin	−0.185	0.307	−0.601	1	0.548	0.83 (0.45–1.52)

Abbreviations: SE, standard error; Always PCI, intention at matriculation-intention at graduation; Developed PCI, intention at matriculation-intention at graduation; Initial PCI, intention at matriculation-no intention at graduation; URM, underrepresented minority; CI, confidence interval.

Figure 2. Percent of Michigan State University College of Human Medicine students practicing in each specialty that showed an interest in primary care (PCI) at matriculation but not graduation (Initial PCI group, n = 107).



Obstetrics and Gynecology (n = 29, 21%) followed by Adult Surgical (n = 28, 21%), Adult Support (n = 19, 14%), and Emergency Medicine and Urgent Care (n = 18, 13%).

We also explored specialty choices of those students who showed an interest in primary care at both matriculation and graduation (Always PCI, n = 140). Consistent with the result of logistic regression model, most (n = 124, 89%) eventually practiced a primary care specialty. The other students mostly entered Adult Medical Subspecialty (n = 6, 4%), Pediatric Subspecialty (n = 3, 2%), and Other (n = 3, 2%). Similarly, 81% (n = 39) of students who did not show an initial interest in primary care but developed it at graduation (Developed PCI, n = 47) chose to be a primary care physician; the remainder mostly entered Adult Medical Subspecialty (n = 2, 4%) and Pediatric Subspecialty (n = 2, 4%) practice.

Discussion

Eventual primary care practice may be influenced by several factors. Our study suggests that an initial interest in primary care that is sustained until graduation seems to be one of the most important predictors; highlighting the importance of promoting primary care careers before medical school and selecting students for admission with a primary care interest. While the odds of entering primary care for students who were initially interested in primary care but had lost interest by graduation were still 3 times higher than students demonstrating no interest during their medical school career, we also found that among students with no initial interest, the odds of entering primary care among those who developed an interest at graduation were almost 60 times higher than their never-interested peers. Our data supports that identifying and fostering the interest of students with an initial interest in primary care is an important strategy to support primary care practice, but cultivating an interest among not-yet-interested students is also worthwhile. These results are concordant with prior research. Exposure to family medicine during medical school, for example, potentiates students' attitudes and career choices[14,19,27] The curriculum at our institution has historically prioritized primary care, with Michigan State University-College of Human Medicine (MSU-CHM) students during the study years being exposed to robust primary care clinical experiences including approximately 7 weeks of required outpatient family medicine, 1 week of required outpatient internal medicine, and 4 weeks of required outpatient pediatrics during the third and fourth year of medical school. More recently, MSU-CHM has undergone efforts to continue this prioritization, integrating primary care exposure throughout all 4 years of medical school.[28]

Interestingly, our study did not show a significant relationship between demographic factors and eventual primary care practice. Primary care practice in our study seems to be predicted most strongly by primary care interest, not individual demographic characteristics. These results underscore the importance of a holistic approach to primary care recruitment, and may represent an opportunity to improve recruitment strategies. The need for primary care physicians from backgrounds underrepresented in medicine, as well as those interested in rural practice is well documented.[13,17,26,29] Focusing on providing early (prematriculation) primary care career exposure with the goal of developing early interest in PC among students from rural and underrepresented backgrounds may amplify existing PC recruitment strategies by augmenting and diversifying the pool of applicants who demonstrate interest in primary care. Experts have suggested that broad career choices are often chosen as early as middle school, and that premedical recruitment should begin very early in the educational process, and include engaging with communities, high schools, and undergraduate institutions such as community colleges, to find, support, and recruit these students.[12,21,30,31] As a land grant institution, home to the pioneer community-based medical school, MSU

is well positioned to accomplish this. The College of Human Medicine also has a long and established history of developing pipeline programming dedicated to recruiting students to serve communities where there is a need. Capitalizing on this expertise through the development of primary care-focused programming that includes primary care mentorship and community outreach may enable our institution to bolster primary care recruitment.[28]

Our study endeavored not only to understand factors that would predict primary care outcome, but also what specialties might potentially draw students away from primary care careers. Overwhelmingly, among students with an initial interest in primary care, the most popular non-PC specialty at the time of practice was Obstetrics and Gynecology. This might be reflective of the changing landscape within family medicine. While traditionally family medicine has represented the broadest scope of patient care, spanning care across age groups and including several modalities and care settings including obstetric care and minor procedures, the scope of care provided by family physicians has been shrinking, with fewer family physicians providing obstetric care.[32] Obstetrics may represent the most primary care adjacent specialty, providing interested students the opportunity to combine surgical training with longitudinal care of a cohort of patients. Efforts to potentiate the primary care workforce may require rigorous interventions that focus on preserving the breadth and spectrum of care provided by primary care specialties.

Our study has important limitations. Approximations using the MSQ and GQ may incompletely characterize primary interest, and our definition of primary care did not include specialties like sports medicine where physicians may be providing some primary care. Moreover, despite being largely representative, our sample overrepresented primary care, and used only a subset of the original data due to incomplete data sets. In addition, throughout different versions of the MSQ and GQ, there was variability in the questions that were used to create outcome variables. Our study is retrospective, linking multiple data sets and using self-reported data from the AMA Masterfile database. While we cross checked all variables with multiple sources, inconsistencies between publicly available specialty practice and actual practice are possible. Lastly, this is a single institution study, limiting generalizability. Future studies will examine additional factors that may affect student primary care interest, such as student socioeconomic status and previous exposure to primary care. Studies will also include data from multiple institutions as an important next step in understanding strategies to cultivate a diverse and robust primary care workforce.

To see this article online, please go to: http://jabfm.org/content/35/2/370.full.

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Appendix. Categorized Specialty Areas

Category	Specialties Included
Adult Medical Subspecialty	Cardiology, Infectious Disease, Sleep Medicine, Neurology, Interventional Cardiology, Nephrology, Allergy and Immunology, Gastroenterology, Hematology/Oncology, Rheumatology, Cardiac Electrophysiology, Neuromuscular Medicine
Adult Support Specialty	Anesthesiology, Radiology, Pathology, Radiation Oncology, Forensic Pathology, Physical Medicine & Rehabilitation, Pulmonary Medicine and Critical Care, Pain Management, Radiation Oncology, Interventional Radiology, Anatomic Pathology
Adult Surgical Subspecialty	Ophthalmology, Dermatology, Thoracic Surgery, Plastic Surgery, Neurosurgery, Otolaryngology, Orthopedic Surgery, Vascular Surgery, Cardiothoracic Surgery, Urology, Hand Surgery, Colorectal Surgery, Trauma Surgery, Breast Surgery, Surgical Critical Care
Pediatric Subspecialty	Pediatric Neurology, Pediatric Infectious Disease, Pediatric Cardiology, Pediatric Hematology/Oncology, Pediatric Endocrinology, Adolescent Medicine, Neonatology, Pediatric Physical Medicine and Rehabilitation, Pediatric Nephrology, Pediatric Rheumatology, Pediatric Gastroenterology
Pediatric Support Specialty	Pediatric Anesthesiology, Pediatric Pulmonology, Pediatric Critical Care, Pediatric Radiology
Pediatric Surgical Subspecialty	Pediatric Orthopedic Surgery
Other	Occupational Medicine, Integrative Medicine, Clinical Genetics, Addiction Medicine